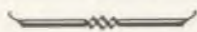


ELECTRICITY SUPPLY IN IRELAND
THE HISTORY OF THE ESB

ESB

MAURICE MANNING & MOORE McDOWELL

Electricity Supply in Ireland



*The History of
the ESB*

MAURICE MANNING AND
MOORE McDOWELL

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Maurice Manning
Moore McDowell
May 1985

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Foreword

WHEN one considers that today hydroelectric stations—Shannon, Liffey, Lee and Erne combined—supply a mere 3 per cent of our energy requirements, it is hard to believe that one of the main worries of the initiators of the Shannon scheme in the mid-1920s was the long period of years expected to elapse before demand could be raised to the level of supply. Apart from building the transmission and distribution network and managing the generating system, the most pressing responsibility of the Electricity Supply Board was to promote the use of electricity amongst a public of whom many still preferred the soft light of the paraffin lamp and had little use for power. Even into the 1930s in my grandmother's farmhouse in County Clare, water was being drawn from a spring well across the road, butter was being made in a hand churn and, as the oil lamp was lighted in the evening, the traditional 'grace for light' was said: 'the light of Heaven to our souls'. I remember, too, the general excitement when the new light and power were switched on in Drogheda in 1930 and the personal relief that one no longer had to study against the distracting buzz of the gas mantle.

The evident advantages of electricity quickly won the day against conservatism. Demand rose so well that, prolonged drought having reduced the water reserves, power from the Shannon needed to be supplemented as early as 1932 by the re-opening of Dublin Corporation's old steam station at Pigeon House which had been shut down in 1930. At the same time it is remarkable, as this history relates, that 'the Board with just two stations—Pigeon House burning inferior fuel and Ardnacrusha dependent on the weather—managed to sustain the country through the entire war and post-war period with only very infrequent interruptions'. The public finances were managed during the same years with equal economy and efficiency!

The amount of electricity now produced for sale by the ESB (mainly from oil and gas rather than turf or water-power) is no less than 170 times the output of 1930, which came wholly from the Shannon scheme. The Board's *capacity* to generate electricity has expanded by a much higher multiple and is so far ahead of present needs as to resurrect, much more acutely, the apprehensions of the 1920s.

It is not only in Ireland, of course, but everywhere in the developed world, that an abundance of low-cost energy enlarged enormously the productive capacity of the human being and, particularly in the quarter century up to 1973, supported economic growth rates and improvements in individual and social standards that were never previously paralleled and, one fears, may never be achieved again. The ESB's story, so well told by Maurice Manning and Moore McDowell, is, indirectly, the story of the growth of the Irish economy, with rural electrification playing—after an initial period of cautious use for comfort rather than power—a prominent and indispensable role in the development of agriculture and the brightening of rural life.

The confidence, vigour and innovative resolution with which the harnessing of the Shannon was tackled stand in sharp contrast to the cautiousness of our first government

in relation to financial and industrial policy. One finds oneself explaining a certain timidity in these areas by reference to the disruption of the Civil War, the need to restore law and order and basic infrastructures and, above all, the desire to establish, in face of widespread doubt, the respectability and viability of the new state. Orthodoxy in economic and financial matters seemed preferable to any indulgence in risky enterprises or novel forms of organisation. Protective tariffs for new industries were introduced very sparingly and only after searching inquiry, even though, as yet, only one person was employed in manufacturing industry for every eleven engaged in agriculture.

The undertaking of the Shannon scheme is an amazingly bold venture against such a conservative background. It was, indeed, a triumph of well-directed youthful enthusiasm, backed on the one hand by professional competence and on the other by a revolutionary political zeal not wholly quenched by the responsibilities of office in an orthodox world of free trade and private enterprise. One feels that the new government, for all its care in subjecting Dr McLaughlin's proposals to critical examination, found a welcome release for their constructive energies in this entirely novel and ambitious development.

Both the main initiators were young men—Thomas McLaughlin, a graduate of UCD in mathematics, physics and electrical engineering, convinced by his pioneering studies that 'electricity was the key to the economic uplift needed by Ireland', and Patrick McGilligan, a law graduate of UCD, Minister for Industry and Commerce at the age of thirty-three, who confounded the doubters in departments, Oireachtas and business with superior information derived from wide-ranging independent inquiries. It is refreshing to see assessments made so expertly and so quickly, and work organised and carried through so effectively, all by disciplined and dynamic young people, motivated only by considerations of the national interest. It is with all the more regret, though with understanding, that one reads of the conflict which later developed between McLaughlin and McGilligan.

When it came to deciding what kind of organisation should run the new electricity undertaking, McGilligan showed an uncommon but admirable independence of mind, concerned not with tradition or precedent or political ideology but with the most effective and economic way of getting the job done. The result was the establishment of the Electricity Supply Board as Ireland's first state enterprise. No softness was displayed towards existing private operators—they would not be supplied wholesale but would simply be taken over, with appropriate compensation. Public authorities received no compensation, on the basis that they were being replaced by a national source of supply. At a time when anything smacking of socialism was abhorrent, the government showed no pusillanimity in setting up a national monopoly in the production and sale of an essential source of energy.

As the first of many state bodies, the ESB gave good example—not always followed—in courageously standing by its mandate and resisting the assumption of responsibilities not clearly imposed on it by statute. The government abstained from day-to-day interference in management, but intervened strongly on major issues of policy, insisting on the use of turf, for instance, urging comprehensive rural electrification and requiring the installation of surplus capacity as an insurance against failure of supply. All these topics are well surveyed in the history and it is made clear that at least in some cases, for instance the debacle of the small turf stations, right was on the side of the Board rather than the government.

Excess generating capacity—an unreasonably large margin of capacity over peak demand—involves serious financial consequences, because it increases grossly and unnecessarily for many years the capital charges which have to be borne by current consumers of electricity. Since the 1960s these have been mainly industrial and commercial rather than domestic consumers. The history shows how normal engineering prudence was reinforced by such official directives as ‘the Minister is most anxious that the Board should in its plans err . . . on the side of excess capacity’. Because of changing phases in the rate of growth of demand and the difficulty of making the long-term demand projections appropriate to the time-scale of additions to capacity, experience has varied from apprehensions of shortage to the actuality of burdensome excess capacity, which has never been worse than it is at present.

The deadweight represented by surplus capacity, with which demand could catch up only after a number of years, was emphasised in *Economic Development* (1958). When the World Bank began lending to the ESB some ten years later, they remarked on the liberality of the safety margin which the Board considered it proper to maintain as compared with the 15–17 per cent range common in Europe and the United States. The Board’s margin had been roughly 30 per cent but was expressed to the World Bank as a minimum of 22 per cent. Unfortunately, the excess now is more than double the generous 30 per cent of the past. The proximate cause of such a large excess is the unexpectedly deep and prolonged recession which has resulted in unprecedented over-capacity in electricity utilities throughout the western world. Other contributing factors in Ireland have been the evident need to diversify fuel types and sources and to help to promote early development of the new national resource of natural gas. The situation is such, however, as to compel urgent attention to ways of reducing the resultant inflation of energy costs; these obviously include review of the timing of further additions to generating capacity and consideration of the economics of stimulating demand by rebates for increased use and of effective means of sharing energy supply with neighbouring sources so as to smooth out the incidence of large discrete additions to capital charges.

The history gives a balanced account of the controversy about the use of turf, describes and assesses the novel pumped storage installation at Turlough Hill, and covers such other matters of interest as co-operation with the Northern Ireland authorities in harnessing the Erne, industrial relations problems, the care of fisheries, concern for social and environmental matters and engagement in external consultancy work. The most interesting story of all, however, is that of rural electrification which well deserves the special and lively record ‘from the inside’ written by M.J. Shiel (*The Quiet Revolution*, 1984). The resourcefulness and efficiency displayed in organising this scheme and building up local support remind us, in this era of unemployment combined with glaring infrastructural deficiencies, of the capacity of the ESB, and no doubt other major enterprises, to undertake successfully schemes yielding assets of permanent national value.

The authors of the history are to be congratulated on an interesting and objective account of our foremost public enterprise, an account which shows how much the Irish people of today are indebted to the vision, zeal and courage of the founding fathers of the ESB and to the dedication and competence which have characterised, for over half a century, its management and workforce. The names of those associated with the initiation and furtherance of this great enterprise deserve an honoured place in the record of national development.

T. K. Whitaker.

Background

WHEN the Electricity Supply Board was set up in 1927 the Irish electricity industry had been in existence for over forty years. The rate of progress during those forty years had been far from spectacular: developments had been uncoordinated and isolated, legislation protected the inefficient and the established, prices were high, the number of consumers was small by international standards and, apart from lighting and heating, little use had been found for electricity in either industry or agriculture. Hostility and suspicion rather than co-operation characterised the relationship between the various elements in the industry and nowhere was this more evident than in the competition between local authorities and private enterprise.

In all of this, the Irish experience was very little different from that of Britain. Differences were more of scale and pace than of kind and probably the most striking feature of the Irish experience in the early days was the extent to which it mirrored and was influenced by British developments. This in turn merely reflected the fact that during almost all of this time Ireland was an integral political part of the United Kingdom. Moreover, as a country heavily dependent on agriculture, with no tradition of industrial development or expertise, it was unlikely to have played a significant or pioneering role in the history of industrial development. It was equally unlikely that a country which had no concentrations of industry, whose whole economic structure and philosophy emphasised the independence and autonomy of the individual unit, and where orthodox opinion saw the proper role of the state as being one of minimum interference in economic matters, should see its electrical industry develop in anything other than an uncoordinated, haphazard and slightly eccentric way. And that is how it was.

The first electric light in Ireland was an arc lamp outside the office of the *Freeman's Journal* in Prince's Street, Dublin, in 1880.¹ It was an experimental affair which aroused considerable public interest especially among leading businessmen who, like their contemporaries in England, were quickly becoming aware of the commercial possibilities of electricity. That same year the Dublin Electric Light Company, with a paid-up capital of £15,000, was floated. The status of the company can be seen from the fact that it had among its directors two of Dublin's leading businessmen, William Martin Murphy and John Findlater. The company had a small experimental station in Schoolhouse Lane, from which Kildare Street, Dawson Street and part of Stephen's Green were lighted with arc lamps on wooden posts and overhead wires. In 1881 there were seventeen arc lamps in circuit and by 1882 this had increased to 114. Supply of current was exclusively for lighting and the new service was seen as offering little challenge as yet to gas, even though a number of major companies, including Pims and Jacobs, had linked up.

The most spectacular early use of electricity in Ireland was in the North in the Portrush-Giant's Causeway-Bushmills Electric Train Service—the first electric railway in these islands. This began in 1883 and was one of the earliest examples of electric traction in the world. It was followed two years later by the Bessbrook-Newry Train Service which was also fed from hydroelectric generating stations.²

The first provincial town in Ireland to have public lighting was Carlow. The system, though simple, was advanced for its time—a generating plant on the Barrow in the flour-mill owned by Major Alexander in the village of Milford, four miles from Carlow. The Carlow system, commissioned in 1889, was opened in 1891 on a night when Charles Stewart Parnell, fighting his last by-election, was addressing a meeting there. He used the new light as a symbol and an omen of a new and free Ireland.³

These early developments were isolated. The main events which were to influence the Irish experience were taking place in London where both developments and the legislation provoked by these developments were to have consequences for Ireland.

In 1878 electric lighting had been used in London to light the Embankment and some large commercial premises. At first it looked as if the type of lamp used would have only limited use, mainly because it was of high power. These limitations changed a year later when Swan succeeded in subdividing light by using the white sheet of a continuous carbon conductor as the light source. He got a patent on this first glow lamp in January 1880 and shortly afterwards Edison got a patent on a similar invention. A year later (1881) the incandescent lamp had reached the stage of commercial utilisation.⁴

Progress in England was rapid and spectacular from this point on, though it was not always based on solid foundations. Much of the early development was speculative. Between 1880 and 1882 promoters and speculators found the market for electricity shares an easy way to quick profits. After the success of the Paris electrical exhibition of 1881, followed by the Crystal Palace and other exhibitions, money for new electrical enterprises was found without any difficulty and many companies were formed which paid high prices for patents and concessions. From time to time, speculation and rumours of new inventions were enough to send gas shares on the London stock exchange tumbling down. In 1880 fourteen companies were formed, in 1881, thirty-one, in 1882, 102 and in that year £23m. was invested in electricity alone.⁵

This speculative madness continued for a number of years and resulted in some spectacular losses. Few of the companies so formed ever supplied electricity, their main source of income being the sale of concessions and the foundation of subsidiary companies. This speculation and the heavy losses attracted public and parliamentary attention to the new electricity industry, but even if this speculation had not taken place it would have become necessary for Parliament to intervene.

The reason for this intervention was almost accidental. In order to supply electricity in an area it was usually necessary to lay cables under the public highway and, under statute, this meant that parliamentary sanction was required. This sanction could be got only through private bills. Before long these began to appear in such numbers, and often seeking powers on terms which would give a virtual monopoly to those seeking them, that a Select Committee of the House of Commons was set up in 1879 to examine the whole question and, in particular, to 'consider whether it is desirable to authorise municipal corporations or other local authorities to adopt a scheme for electric lighting'.⁶

This committee reported that the time had not yet arrived for parliamentary action but recommended that power should be given to local authorities to experiment, and it opposed the claims of some gas companies which were seeking monopoly rights as local suppliers of power to industry. In addition, this committee issued a vague directive,

which was interpreted by the Board of Trade as giving local authorities a preference, at least during the early years, over private companies, as far as the right of supplying electricity was concerned.

This report, cautious though it was, was almost obsolete before it was published, mainly because of the extraordinary development in the number of electrical companies being formed, all of them demanding privileges. As a result it became necessary to consider general legislation in order to clarify the position and in order to protect both the investor and the general public from unscrupulous exploitation. What was needed in particular was some regulation of the conflict, already sharp, between public and private interests. Some, though not all, of the larger municipal authorities were demanding that the new industry should be developed by local authorities, something which was opposed in principle and in practice by private enterprise and now, in a quick volte-face, opposed in principle by the Board of Trade. This was largely because two important public utilities, gas and water, were now held to be 'oppressive monopolies' and there was pressure that electricity supply should not become another.⁷

In 1883 T. H. Farrer, Permanent Secretary of the Board of Trade, announced that, while he was not against local authorities entering the field of electricity supply, he felt that, in general, government management was 'unfitted for enterprises involving scientific experiment' and that it was undesirable that government should embark upon what he called 'speculative enterprises'; he added that 'the real pioneering must be done by private capital and towns will not become manufacturers of electricity until the process is better understood'.⁸

The Electric Lighting Act of 1882 piloted through Parliament by the Home Secretary, Joseph Chamberlain, reflected this official caution, while at the same time recognising the interest of the local authorities. Under this act local authorities would have the opportunity to purchase a private undertaking after fifteen years. This was later expanded to twenty-one years. The general hope was that as many licences as possible would be granted, that there would be intense competition and this competitiveness would lead to rapid progress. Then, if progress was made (at no risk to the rate-payer) the local authorities could act.

The act also sought to regulate to some extent the affairs of the new industry. For example, it laid down the definition of 'undertakers'. These undertakers would be either local authorities, companies or private persons. They would come into existence either through a licence granted by the Board of Trade for seven years, which would be granted with the consent of the local authority, or else by means of a provisional order issued by the Board of Trade and subject to the confirmation of Parliament. Provisional orders could be granted without the consent of the local authority. It was felt that the local authority itself was sufficiently safeguarded by the right to purchase the undertaking after twenty-one years, or every seven years thereafter, at the 'then value' of the works and plant. The act further provided that the licence or provisional order should safeguard the public interest. To do this a definite time limit, within which certain conditions had to be laid down, was established. This was usually two years. Strangely, however, there was no obligation on the company to supply any potential consumer. In addition, a maximum price, which was usually very high, was fixed, the belief being that competition would keep the price down.⁹

As a result of this act, sixty-nine provisional orders were granted in 1883, but in 1884



The Five Lamps, at the junction of Amiens Street and North Strand Road, are a fine example of late nineteenth-century lighting standards in Dublin. They were originally gas lamps.

only four orders were issued and none at all in 1885, with only one further order being issued between 1886 and 1888.¹⁰ The act obviously checked enterprise and especially reckless private enterprise, but if it did it was only one factor in the process. The stagnation of the electricity industry reflected the general conditions of trade at the time—depression, downward price trends and general curbing of initiative. There was no real incentive for industry to adopt electricity for illumination in place of gas and there were still grave doubts about its general reliability. On top of this, the act had not encouraged capitalists to invest money in a new and unproven industry in which success would be slow.

However, things got better in the mid-1880s with a number of important technical improvements and with the beginning of an industrial revival. In 1888 a new Electric Lighting Act was passed, which provided for the purchase by local authorities of undertakings after forty-two years at 'the fair market value ruling at the time of purchase'.¹¹ The passing of this act coincided with the start of a brisk industrial revival and was followed by a steady increase in the number of applications for licences and a steady increase too in the number of companies which actually put their licences to use (479 notices of intent to apply were received in 1890, 175 actual applications were made and seventy-four of these were granted).¹²

The passing of the act did help to stabilise certain aspects of the electricity industry, especially the regulations of licences and the granting of concessions, but it made no attempt to impose any sort of standardisation or uniformity on developments, nor did it attempt to co-ordinate in any way the many developments now happening. Perhaps it would have been impossible to do this given the wide differences of opinion on virtually all aspects of technical development and given too the emergence of a wide variety of suppliers, none of them particularly anxious to be checked or regulated. Already there was controversy over the superiority of alternating current or direct current and there were wide differences of opinion on the question of high or low pressure and frequencies. Inevitably, because of the absence of co-ordination and organised development, there was very quickly an extraordinary diversity of systems in operation, many imported from the United States and Germany. Consequently, any standardisation and adoption of mass production methods in the electrical manufacturing industry was impossible, both for general plant and for appliances, and, as a result, the cost of electrical products remained high and British industry was not competitive on the world market.¹³

The local organisation of electricity was generally in accord with existing technical possibilities. The medium and large towns formed a sufficiently large area for satisfactory development, while in London there was a multiplicity of smaller units divided by (in electrical terms) artificial boundaries. Not surprisingly, the local authorities played a major part in this early development. By 1900 almost 70 per cent of the provisional orders still in force were held by local authorities while between 1895 and 1898 investment in electricity by municipal authorities jumped from £1.77m. to £6.9m.¹⁴ This concentration on local government units was intensified by the prevailing political climate which was highly favourable to municipal enterprise and to the development of local government. Later, however, when the successful development of electrical supply called for larger units than the local government area, serious technical problems arose and these problems were too often exacerbated by the civic pride and vested interests which by then surrounded so many local undertakings. This growth of

individual generating units and separate undertakings, each pursuing an uncoordinated and unrelated policy of development, may have been inevitable in the early years but the consequences of this type of development were later to bedevil attempts at standardisation and uniformity both in Britain and in Ireland.

At times in the early twentieth century the electricity industry often resembled a battlefield. Disputes took on the quality of theological disputations, with questions of opinion and approach being raised to the level of dogma. The main antagonism was between public and private enterprise—the independent undertakers and the well-organised group of municipalities. The local authorities feared the monopolistic tendencies of the electricity companies, while the companies for their part felt threatened by the growing ambitions and power of what they regarded as municipal socialism. The question of municipal enterprise was one which attracted both socialists and businessmen, though for different reasons. Gradually, the Board of Trade began to express a preference for the local authorities and this in turn provoked a reaction—the formation of the ‘Independent Freedom League’ and the sending of between four and five hundred petitions to Parliament. This organisation suggested that the Board of Trade should not accept a local authority as the properly elected representative of a community, but should find out the feelings of rate-payers before granting a provisional order.¹⁵ Unfortunately for their credibility, the spokesmen in these campaigns were often the promoters of power companies who at the same time demanded the removal of, and yet were dependent on the co-operation of, local authorities.

It was partly in response to this pressure that the government appointed a Joint Select Committee on Municipal Trading in 1900.¹⁶ This committee sat until 1903 and its report, like so many other such reports, was inconclusive. In 1907 the issue was of such importance that the London County Council elections centred around it. What was taking place was quite simply a battle for the future control of electricity—a battle as yet being fought largely in the field of propaganda and competing claims. H. H. Ballin in his book *The Organisation of Electricity Supply in Great Britain* summarises the situation as follows:

After the turn of the century the new technique of large scale production of electricity called for a re-adjustment of the industry either on the basis of large public bodies or of co-operation between the existing authorities and the new power companies. Public electricity supply over large areas was practicable only if local government could be developed to provide machinery for provincial and national collectivism, as well as for parochial collectivism if small local authorities could be induced to give up some of their power and, perhaps, some immediate advantage in the interests of regional and national development. Co-operation presupposes an attitude of give and take which was absent on either side in the municipal trading controversy. The mutual suspicion between the private and public sector of the industry is one of the main reasons for the frustration of any efforts to adapt it to the new technical conditions.¹⁷

Certainly the progress of the electricity industry in Britain and Ireland up to the First World War, though steady, was not nearly so spectacular as in other countries, especially Germany, Switzerland and the United States. Some reasons for this have already been touched upon: restrictive legislation, the early wild speculation and the diversity of systems which made co-operation and uniformity difficult. According to

Ballin, however, the root cause was neither municipal obstructionism nor capitalist greed: it lay deeper in the important social issues involved.

Side by side, public and private bodies have grown up providing electricity supply on fundamentally opposed principles, each party jealously guarding its principles, not only for their own sake, but as essential key positions for the victory of their social outlook. As the opposing sides could muster practically equal political support, stalemate resulted which confirmed absolutely the status quo. The necessity for larger units in the electricity supply industry called for the destruction of the privileged independence of small authorities which were largely municipal bodies. An attempt, however, of company promoters to create large areas appeared as an attack against the principle of public enterprise and was thus doomed to failure. Only a comprehensive government scheme would have had a chance of acceptance, which might have granted special concessions to power companies subject to proper safeguards and public control, or which would have created suitable regional local government bodies for the development of the industry.

Ballin concluded this summary by saying that

The desperate needs of the war of 1914-18 proved the complete insufficiency of the electricity industry as it then was and prepared the ground for a more active and conscious public planning of the electric supply industry.¹⁸

Developments in Ireland were rather similar to those in Britain, though on a lesser scale. As might have been expected, the main developments centred on Dublin. The Dublin Electric Light Company, already mentioned, had not had much more success than many similar companies in England and shortly after its foundation the directors, alarmed at the failures in England, were unwilling to put any further capital into a concern that was already electrically overloaded, but yet only just paying its way. The liquidators carried on until the concern was taken over by the Alliance Gas Company which claimed that it had powers under one of its own acts. The Gas Company applied for a provisional order under the 1882 Act but was opposed by Dublin Corporation who now stated that they were about to apply for the same themselves. The Gas Company was refused this order but was given permission by the Board of Trade to spend some money on purposes unrelated to its gas business. They then built a new power house in Hawkins Street with a large machine of 13 kW for incandescent lighting from which they supplied customers in the Grafton Street, George's Street and Henry Street areas. At one time there were about fourteen miles of overhead wires radiating from the Hawkins Street plant.¹⁹

From this point on, the electrical supply situation in Dublin was dominated by the Corporation. It had been given a provisional order for the supply of electricity in 1888 and had immediately set about operating under this order. It set up an 'Electric Lighting Committee' to examine the future role of the Corporation as far as the supply of electricity was concerned. This committee, which included the father-in-law of W.T. Cosgrave, Alderman Flanagan, seemed to begin on the assumption that the generation and supply of electricity should be a preserve of municipal bodies. The opening paragraph of its report issued in 1892 sums up its approach:

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 rate-payers 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 was vested in the hands of the citizens themselves.²⁰

The Corporation declared that while it had been well aware of the importance of having the electric light undertaking under its own guidance, it waited until such time as sufficient progress had been made in the development of the various systems to enable it to undertake the supply of electricity without loss to the rate-payers. It felt encouraged to take this step by what it regarded as the excellent financial results to itself and to the citizens that came from the construction of the Vartry Water Works which, according to the Corporation, gave Dublin 'one of the purest and best supplies of water in the Kingdom'. At first the Corporation had intended to use the water power on the property of the Corporation at Islandbridge from the falls on the Liffey to generate their electricity and this electricity would then be used for the lighting of the public streets. Initially it was felt that this water power would be sufficient, but after examination it was decided that in fact it would not. A change of plan then took place and it was decided that a more central station within easy reach of coal supply would be better. At this stage the committee decided that nothing hasty should be done and, in their own words, were 'determined to make themselves acquainted with all the most recent advances in the applications of electric lighting, with the various systems in use for the distribution of electricity.'

To do this properly the committee

... on *two occasions*, made a round of all the central electric lighting stations in the Kingdom owned both by municipalities and private companies, and arrived at the conclusion that an alternating current distributed at high tension, and transformed at convenient positions into a suitably low tensioned current for the consumers' houses was the system best adapted to the demand likely to be met with in Dublin.²¹

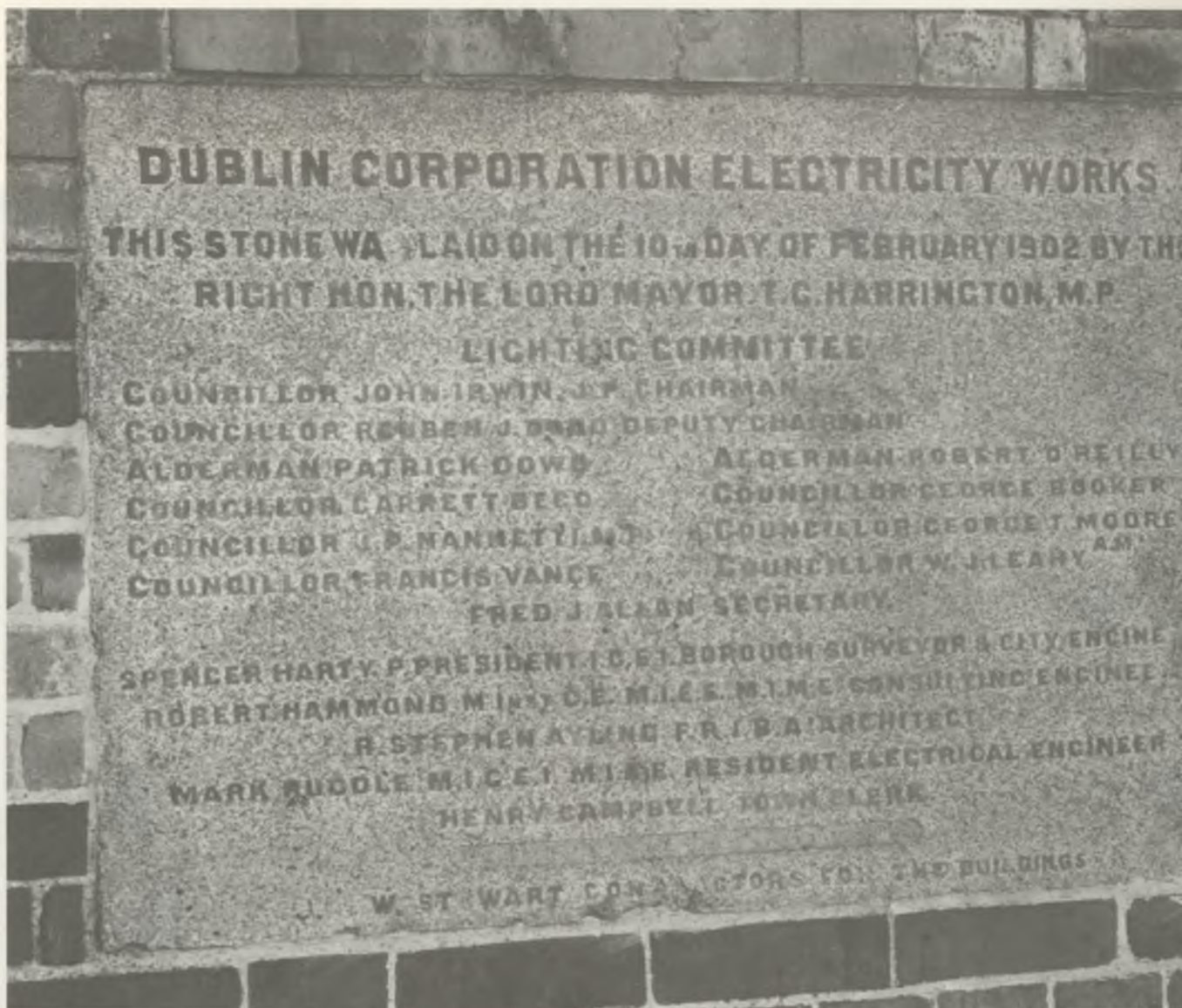
In 1890 the exertions of the committee came to fruition when plans and specifications were prepared for the first installation at Fleet Street. In March 1891 work on construction commenced and in September 1892 the station and system of street mains was completed and handed over to the Corporation. Public supply commenced at once.

The initial reaction to the new scheme was reasonably enthusiastic. Applications came in in considerable numbers so that in early 1893 extension of the street mains had to start and further extensions followed in the winter of 1894. By 1897 the undertaking was beginning to show financial progress. In that year, after paying back the usual annual instalment of principal and loans amounting to £2,400 and the interest on the outstanding balance of loans amounting to £1,600, there remained a net surplus of £950. The undertaking had now reached the stage where it had become a source of revenue for the Corporation.²²

It was at this stage that the undertaking met with a severe technical setback when the

suggested that some attempt would be made to co-ordinate these new schemes with the one already being run by the Corporation. As matters developed it appeared as if the two townships almost deliberately sought to make themselves as different as possible from the existing scheme. For a start, the city scheme used alternating current, but the townships adopted direct current. This meant that in spite of the proximity of the townships to the city, standardisation was ruled out: different voltage prevented the use of standard lamps and standard motors. It seems clear that the difference in design was to some extent influenced by local politics.²⁴ Rathmines and Pembroke felt threatened by their bigger neighbour and were anxious to preserve their independence and maintain their network independent of the city. The more they differed from the city, the longer they would continue to exist as separate entities, certainly for distribution if not necessarily for generation. Thus electricity became a pawn in the game of local politics, a further guarantee for the smaller unit against eventual absorption by the bigger neighbour, a guarantee of continuing local distinctiveness and, most of all, a guarantee against any

Foundation stone, laid on 10 February 1902, for Dublin Corporation's Electricity Works at Pigeon House.

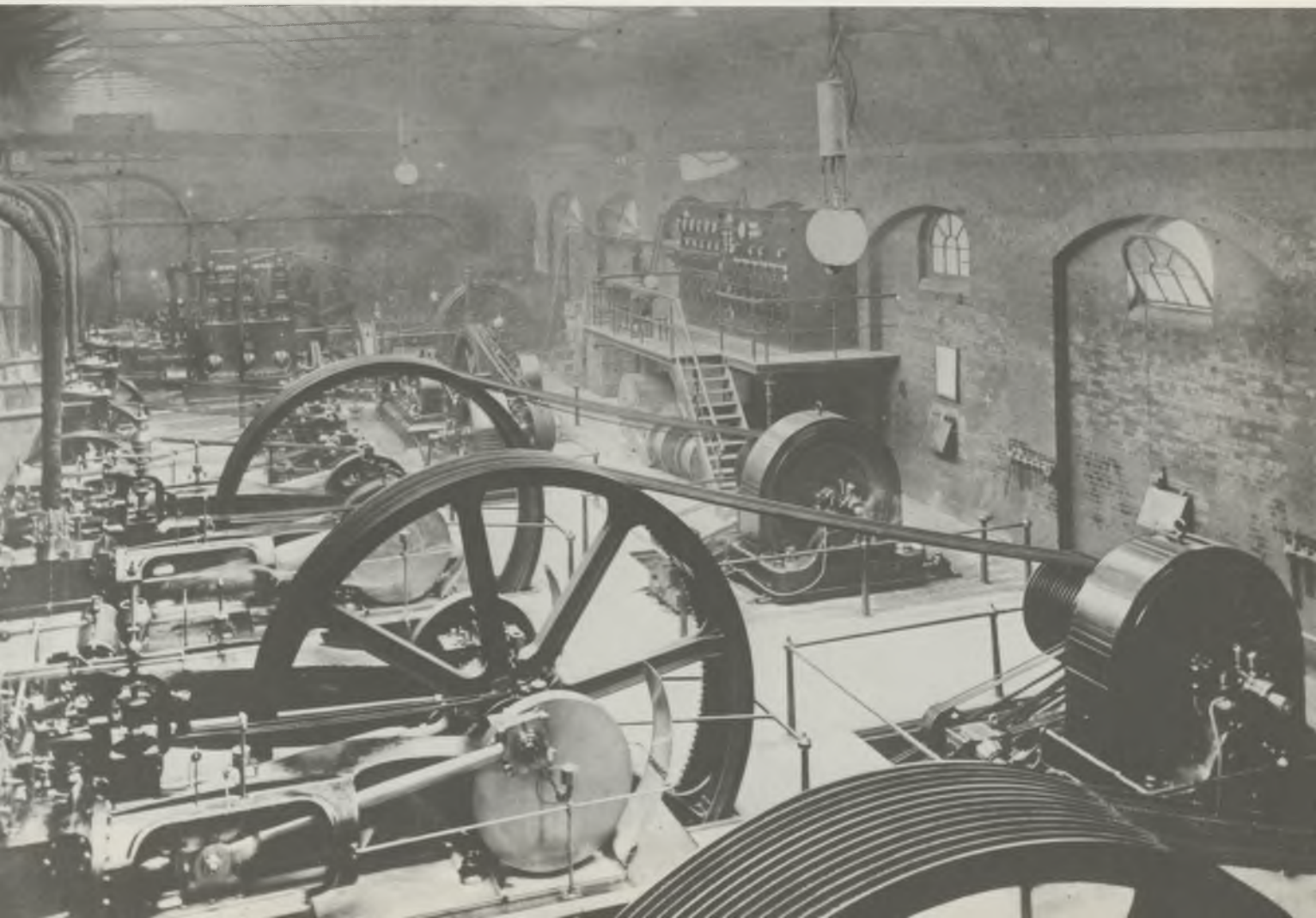


BACKGROUND

cable network supplying the consumers failed. The rubber insulation on the cables had begun to decay and it was found necessary to replace the whole of the mains by a different class of cable. Some advantage was salvaged, as the occasion was availed of to bring about some technical improvements, including the abandoning of individual transformers, distributing instead from central substations and using new bitumen concentric cables. Overall, however, the failure of the cables proved something of an embarrassment for the electricity undertaking. After only five years in existence it was being forced to undertake major structural alterations and this, combined with the fairly frequent cable failures which preceded the breakdown, created a lack of confidence among consumers, some of whom began to install plants of their own or were falling back on the old reliable, gas. Consumption decreased in 1898 by 43,000 units and, more importantly, there was a net revenue loss of £362 that year. The new mains were only completed by the end of 1899 so that total consumption showed only a small increase that year. However, as soon as the new mains came into operation there was a perceptible increase in the number of new consumers.²³

The question of municipal boundaries was soon to create problems in Ireland as it had in England. The actual jurisdiction of Dublin Corporation did not at this stage cover the entire city area. The municipal rivalry which was such a part of British life was to be found also in Dublin where a series of townships exercising independent functions existed side by side. Two of the most important of these were Rathmines and Pembroke and they soon began to develop their own schemes for electricity. Reason might have

Dublin City power station at Fleet Street, about 1900.



form of overall co-operation, co-ordination or uniformity. And so the switch-in at Rathmines was made by the Lord Lieutenant on 31 August 1900. The capital expenditure had been £71,000.²⁵

In spite of local difficulties, Dublin continued to grow. In 1904 it had six hundred and fifty consumers, with a revenue of £27,000, and its operation covered one and a half square miles. With growing demand, Fleet Street was proving to be inadequate. More than that, a number of private concerns, both in Ireland and in Britain, were attempting to buy out or take over the Corporation's electricity interest. These included the Municipal Industries Syndicate of London which proposed to spend £380,000 on electrical installations for Dublin in 1898 and the Dublin United Tramways Company which wanted a permanent arrangement with the Corporation and renewed their offer on a number of occasions in 1900. The Corporation turned down both these and other such offers and instead went ahead with plans for expansion which included the closing down of the Fleet Street plant and the building of a new generating station.²⁶

The direction of this expansion was placed under the control of the city engineer, Mr Hammond. The site chosen by him for the new plant was surprising and led to considerable local controversy. This was Pigeon House, the site of the old packet station between Ireland and Britain. It is not possible to be certain why the site was chosen but it seems that political factors determined the choice. The government had little use for Pigeon House and may well have been happy to offload it on the Corporation for this new enterprise. Whatever the reason, the decision was not a popular one. The Master Electrical Contractors of Dublin protested about the site, arguing that it was too far away from the load centre and that it had bad foundations. They wanted the new plant located at Sir John Rogerson's Quay.²⁷

A special report into the workings of the electricity supply in Dublin was commissioned. Published in 1913, it also criticised the site, claiming that its choice had been 'a mistake of great magnitude' and that it led to higher charges, duplication of staff and centres of control. This report also found fault with the type of plant used. The Local Government Board too was opposed to the Pigeon House site, arguing against the distance of transmission cables from the load centres and the amount of unremunerative cable buried in the ground, the layout of the boiler-house and the price at which the electricity was being sold.²⁸

However, the work went ahead. Generation was to be three-phase, 50 cycle, 5,000 volts, transmitted at this pressure by three-phase underground cables of 0.15 sq. in. section to Fleet Street. From this distribution centre nineteen substations were to be fed in different parts of the city. The four-wire network was a radically new step, and Dublin was one of the first cities in the world to adopt this type of supply. It was questioned at the time by a number of engineers who doubted its feasibility and reliability.

The new generating station at Pigeon House began supplying the new system of mains in July 1903 and the generating plant at Fleet Street was finally shut down in September 1903, when the entire supply to both old and new mains was transferred to Pigeon House.²⁹

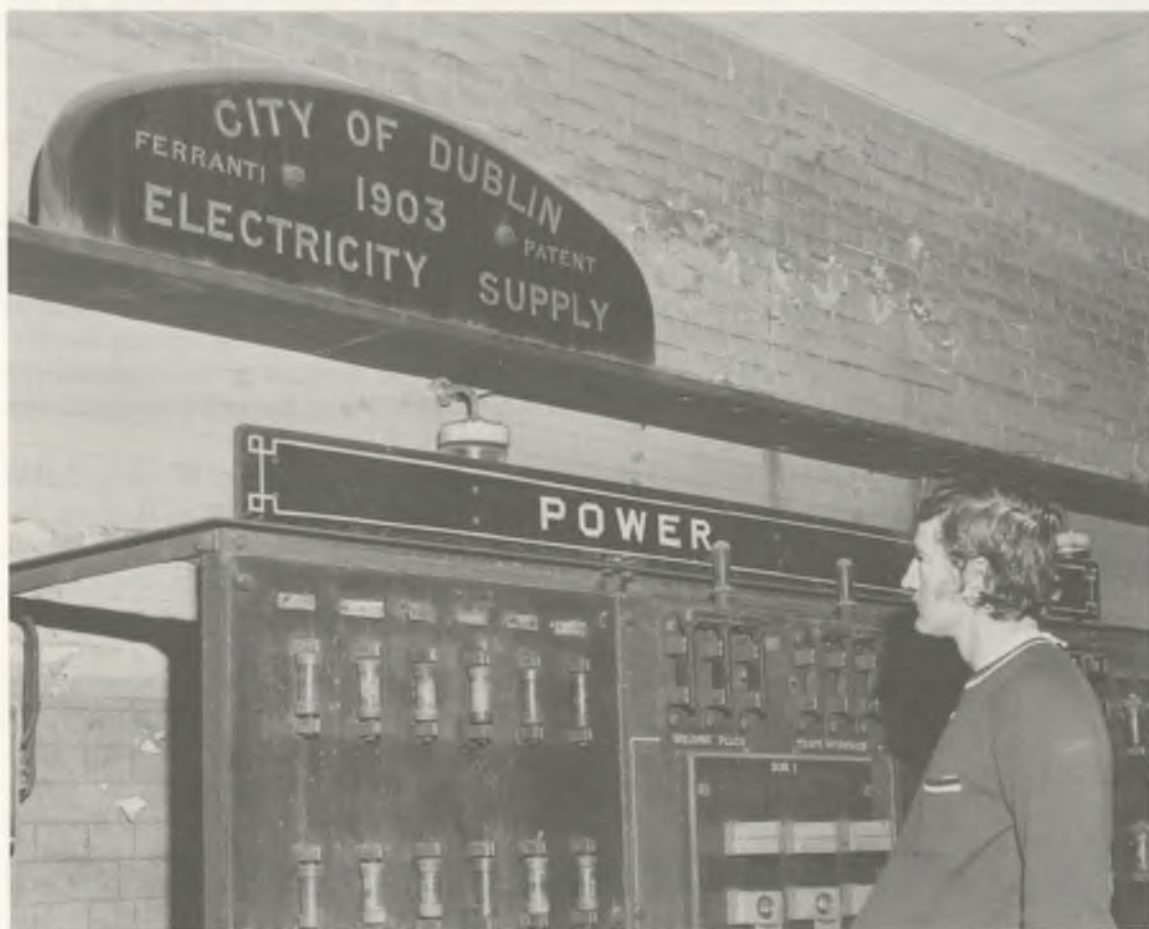
In retrospect, the Pigeon House site may not have been all that bad a choice. Because it was situated so far from the load centre, high tension transmission became essential and this necessity forced the engineers to fight for the three-phase, four-wire system of distribution, something which was strenuously opposed at the time before the Local

Government Board and in the House of Commons. Before the plan was sanctioned, the engineers had to visit Strasbourg, Mannheim and other German cities to see the scheme in operation. The Pigeon House site prevented later headaches by forcing the adoption of this distribution system, which was to become the standard system throughout most of the world. In addition, the fact that Pigeon House was not in a built-up area made expansion and later developments there possible when the need arose, something which might not have been the case had the Sir John Rogerson's Quay site been chosen.³⁰

Once the work was completed the Corporation went ahead with what was for the time an aggressive approach to the sale of electricity. This included using advertising and canvassers in search of new consumers. Efforts were to some extent rewarded with the abandoning of a number of private plants in favour of linking up to the city one and with a number of new consumers signing on.

At this time also, other developments took place which were to have considerable significance later on. In 1908 a company was formed with the intention of using Ireland's turf resources as a source of electricity supply. This was the Dublin & Central Ireland Power Company which hoped to use peat from the Robertstown district of the Bog of

Some of the original equipment at the Pigeon House plant, Dublin.



Allen to generate electricity, which would be supplied to the surrounding areas, as far as the Shannon in the west and Howth in the east, by means of overhead high-pressure electric mains. To go ahead with this it was necessary to promote a bill in the House of Commons. This bill was strongly opposed at the committee stage by the representatives of Dublin Corporation who feared competition in the Dublin area; these fears were based in part upon the fact that the company had already begun negotiations for supply to a number of Dublin companies. The Corporation got its way on this point, with a clause being inserted preventing the company from operating in Dublin. However, the Corporation need not have become quite so agitated for nothing further was ever heard of this project, or indeed of the company.³¹

The effect of the First World War on the Irish electricity industry was to arrest its growth to some extent. High prices and shortages of materials halted expansion; services to new consumers were stopped altogether. In addition, it was not possible to raise further loans. There were other factors too which depressed demand, including the stringent economies forced on consumers, the economy campaign preached during the coal shortage and the 1913 law enforcing early closing of shops. Since most electricity was used for lighting, this law had an adverse effect on supply which was further exacerbated by the introduction of daylight saving time during the war.

Overall, however, the experiences of the war were to focus attention on the possibilities of electricity. The shortages caused by the war gave a boost to those who sought alternative sources of power. The coal shortage led to the setting up in 1918 of a government committee on natural resources for the entire United Kingdom with a sub-committee for Ireland. The chairman of the Irish committee was Sir John Purser Griffith,³² a distinguished engineer who had long attacked the failure of the administration and of Irish industrialists to use Ireland's resources properly. This committee's report was published in May 1921.³³ About the same time, another commission was looking into Ireland's natural resources—the Commission of Enquiry into the Resources and Industries of Ireland. This commission had been set up by the Sinn Féin government under the chairmanship of Hugh Ryan and reported in January 1922. It too included a 'Report on Water Power'.³⁴ Both of these reports came to broadly similar conclusions, in favour of greater use of the country's water resources for the generation of electricity. Sir John Purser Griffith argued that this was logical since peat and coal were vanishing commodities while water supply was perennial. His report mentioned in particular the possibilities of the Rivers Shannon, Erne, Bann and Liffey and placed particular emphasis on the possibility of harnessing the Liffey, mainly for the reason that it was close to the greatest centre of demand, Dublin. The Ryan report, which was independent of the Griffith one, concurred broadly with these findings. There had, of course, been earlier enquiries into the natural resources of Ireland but these particular ones carried much more weight, coming as they did on the eve of independence and so soon after the shortages caused by the First World War.

Sir John Purser Griffith quickly established himself as the great advocate of Liffey development, seeing it as the ideal way to meet the demands for cheap power and lighting and he himself began to produce a stream of pamphlets, newspaper articles and speeches urging that the Liffey should be harnessed for the supply of hydroelectric power to Dublin and its environs.

To further the cause of the Liffey, a private company, the Anna Liffey Power

Development Company Ltd, was established with Sir John as its chairman.³⁵ Dublin Corporation had itself become interested in the possibilities of the Liffey and in late 1921 appointed a distinguished Swiss engineer, Herr Buchi, to examine the feasibility of the scheme. He reported in May 1922³⁶ and his conclusions were favourable to the establishment of such a scheme. He recommended the building of a storage reservoir above Pollaphouca by constructing a masonry dam a hundred feet high; the building of a power station above Ballymore Eustace with working capacity of 12 mW, giving an annual output of 28.6 million units; a small storage reservoir and a power station with a working capacity of 7.2 mW, giving an annual output of 17.5 million units, at Leixlip; and finally he recommended using the existing steam plant at Pigeon House for peak loads and emergencies. He concluded his report:

After taking all conditions into consideration, I have arrived at the conclusion that the Corporation of Dublin has a very favourable opportunity of securing energy from water in a rational way and at low cost—an opportunity which does not often occur under similar geographical conditions. If it had seen fit to build these power stations before the War, the power would have, in fact, been extremely cheap; even under present conditions the power supply would be advantageous.

Sir John Purser Griffith hoped that this scheme would be adopted as a national programme, but this desire, which had earlier been expressed in the water power resources of Ireland sub-committee's report, was forced into limbo by the continuing unrest and political uncertainty which culminated in the Civil War. It was for this reason that Sir John had decided to set up his own company to do the job, especially since he was worried about the possibility of smaller speculative companies taking over parts of the Liffey and attempting to set up smaller generating companies which could frustrate any grand overall design. He was afraid too of intervention from non-Irish companies, which would not necessarily have the common good of the Irish state at heart and which would leave supply to the city of Dublin at the mercy of foreign interests. The new company engaged another expert, Dr Theodor Stevens, to make a further study of the scheme. He reported in April 1923, just as the Civil War was coming to an end.³⁷ His reports were favourable and encouraging but added something which Sir John already felt to be essential—that control of the whole river was essential for success. Stevens worked out his scheme in considerable detail down to the costing, which envisaged a capital expenditure of £1.2m.

The fact that Sir John had expended so much time and energy on the advocacy of this particular scheme was later to cause him considerable anxiety and anger when the Free State government adopted the Shannon scheme rather than the Liffey scheme as its major priority. However, some of the studies made under his direction and made also by the Corporation at this time were to be of considerable interest and use in future developments.

During this period too other Irish towns had also been developing their own electricity supplies—usually on a limited basis. Many of these undertakings were of a very primitive nature and were usually designed merely to supply electricity to the business or the shop of the local merchant who owned the undertaking. However, a number of towns did inaugurate their own electricity supply. Bray had its electricity company in 1891, Galway in 1897, Cork also in 1897 and Limerick in 1901.³⁸

By the time the Irish Free State came into existence there were in all 160 undertakings in the twenty-six counties. These varied greatly among themselves in terms of size, source of power, type of organisation and power supply.³⁹ The great majority of these (140) were privately owned but, with the exception of Cork and Galway, all the bigger undertakings were in public ownership, that is they were run by local authorities. In the private sector most undertakings had been established with a view to the commercial sale of electricity, but in many cases this sale merely represented the disposal of surplus power from a generating plant set up originally to supply private industry and commercial requirements. In many of the smaller towns the undertakings generally consisted of a small power station with direct current generators worked by gas or oil engines, with a local distribution network. The network usually consisted of a two-wire or four-wire system on insulators fixed to wooden or steel poles. These smaller undertakings usually had no more than a few employees. Only in the Dublin metropolitan area (that is the undertakings of Dublin Corporation, Kingstown, the urban districts of Pembroke, Rathmines and Rathgar) and in Cork did a supplier have more than a thousand consumers. The average number of consumers supplied by any supplier in the country was in the region of two hundred and eighty but outside Dublin and Cork the average number was approximately one hundred and twenty-five and even here there was a very widespread variation as the table shows.

Table 1.1

1925	
No. of consumers	Suppliers
1-5	40
6-10	7
11-30	9
31-50	16
51-100	25
101-250	43
251-500	14
501-750	3
751-1,000	3
1,001-2,000	—
2,001-5,000	3
5,000 +	1

It should be noted that many of the larger companies, such as Guinness and the Dublin United Tramway Company, produced their own electricity. In addition, some local authorities produced electricity only for street lighting and did not sell to the public, so these companies would not appear on Table 1.1. There was no uniformity of tariffs, with most suppliers operating a differential tariff system and with different rates being

charged on the basis of a three-category classification: (1) lighting, (2) heating/cooking, (3) power.

In cases where the supplier differentiated in this way, the usual practice was to charge the highest price for lighting. Lighting constituted the major domestic source of demand for power and the price per unit for lighting purposes varied in different parts of the country from 1s. 6d. (7.5p) to 4d. (1.6p). In Table 1.2 are given the lighting prices per unit charged by the larger suppliers.

Table 1.2

Undertaking	Price	No. of consumers
Ballyshannon	6d. - 8d.	706
Bray	8d.	738
Cork	6d. - 7½d.	4,225
Dublin City	4d. - 5d.	12,930
Galway	5d. - 8d.	897
Limerick	7d. - 8d.	885
Pembroke	4½d.	3,030
Rathmines	4d. - 6d.	3,727

The suppliers in Bray, Dublin City, Limerick, Pembroke and Rathmines were the local authorities.

In retrospect it is hard to be enthusiastic about the progress of electrification in Ireland prior to independence. There was a wide variation in technical standards and a great diversity of systems. The total number of consumers was only a small fraction of the population. These consumers were charged a high price and for the most part had neither the appliances, the knowledge nor the inclination to use electricity other than for lighting, and even then they used it sparingly. On the part of the suppliers, there was neither the need nor the desire to seek co-ordination and co-operation. The only really large undertaking was that of Dublin Corporation, which prided itself on its efficiency. If Dublin Corporation represented—as it claimed to—all that was good in the Irish electrical tradition then, by comparable international standards, Ireland was well behind. In Dublin 33 per cent of houses had electricity, in Copenhagen the figure was 99 per cent and in Amsterdam 87 per cent. Each of these cities had to import coal from Britain just like Dublin, but in each prices were lower than in Dublin and consumption per head of population very much higher.⁴⁰

In short, the state of the Irish electricity industry reflected well neither on the departing British administration, the genius of British legislation nor the entrepreneurial skill of Irish enterprise, public or private.

Harnessing the Shannon

If Stephenson had as exacting a critic as the Shannon Scheme has in Sir John Keane, there would never have been a steam engine.

Oliver St J. Gogarty

Seanad Debates, 25 June 1925

We are so used to discussing questions like: 'should there be two handles or one on the parish pumps' that to make a proposal involving the spending of five million pounds seems something like the end of the earth.

Senator O'Farrell

Seanad Debates, 25 June 1925

WHEN the Irish Free State formally came into existence in December 1922, the question of a national electrification scheme was not seen as being either an immediate or an obvious priority. The executive council of the new state was composed of young men, none of whom had any previous experience of parliament or government and who were now faced with the daunting task of overseeing the transfer of power from one administration to another, of establishing new administrative and legal structures, organising a police force, asserting and maintaining control over the army, finding the personnel to staff key posts and restoring the country to conditions of peace and normality. The priorities of the new government were those of stark necessity, not those of choice. If it was to survive, it had to assert its own authority at home and arrest the lawlessness and near-chaos of the previous years, while at the same time building up the structures and trappings of independent statehood.

Within a matter of months even these priorities became secondary as civil war engulfed the new state and the question of military victory over the republicans became the only real priority. But even in face of these difficulties the work of nation-building did go on.¹ The period during and after the Civil War saw decisions taken to join the League of Nations, set up an unarmed police force, prepare for army demobilisation, establish a new judicial system, adopt national emblems and set in motion plans for the reorganisation of Irish agriculture.

The economy of the new state² was overwhelmingly dependent on agriculture, with an industrial structure mainly based on processing the output of agriculture—food, drink and footwear. Of a population of 2.97 million, the work force came to 1.3 million, and of this, 670,000 were engaged in agriculture. The estimated net output of agriculture was £49m.—more than twice that of industry. The distribution of the population reflected this economic structure: 2.01 million people lived in rural areas and 0.96 million in towns. The population also had a high dependency ratio (the ratio of those above and below working age to those of working age), 38:62, reflecting patterns of continuing heavy emigration.

The external economic environment of the new state was not very encouraging either. On the positive side, the high prices for agricultural goods during the First World War, coupled with the thrift of the farmers, had resulted in the clearing banks having large deposits in London, which constituted the country's external reserves. However, the 1920s were fairly depressed years for agriculture, due in part to the deflationary impact of the attempts to restore the pre-war 'normality' of the gold standard.

Internally, the Civil War had resulted in considerable damage to the country's economic infrastructure, the repair of which would be a first charge on national resources. Furthermore, and perhaps more important for those urging economic initiatives from the government, the era was one of deep financial orthodoxy, centring around the idea of *laissez-faire* and the balanced budget. Apart from forming the general standard opinion of the day, this approach was strongly adhered to in the new Department of Finance, particularly by its chief officers, Joseph Brennan and J.J. McElligott.

It was against this post-Civil War background as the new government sought to translate its independence into the reality of social and economic progress that the suggestion of a national electrification scheme was first seriously made. In retrospect it is clear that such a scheme offered almost at once a possible basis for industrial development and agricultural improvement; equally importantly, it could be seen as an act of faith by the government in the future of the state, something which was urgently required after the psychological demoralisation of the Civil War. It was important for the government that it should do something major and dramatic, and it is clear that, after some initial caution, the executive council hit upon the idea of a national electrification scheme as fitting this description. But the way in which the decision was taken characterises both the smallness and the intimacy of the Irish political scene and the determination of the government to take decisions in an ordered and scientific way. In the words of Professor Sir Keith Hancock 'the Irish Free State under W.T. Cosgrave was the objective, the unemotional, the scientific state'.³

The man who sold the idea of the Shannon scheme to the government was a young Irish engineer, Dr T. A. McLaughlin, and the history of the idea is essentially McLaughlin's personal story. He was born in 1896. In 1914 he became a student at University College Dublin, where his contemporaries included many who were to play important parts in the national movement from 1916 to 1922 and later were to be among the leading politicians and administrators of the new state, men like John A. Costello, Patrick McGilligan, Michael Tierney, Kevin O'Higgins, Patrick Hogan, Michael Hayes. The mood of UCD during McLaughlin's student days was intensely nationalistic with the Sinn Féin ideal of a self-sufficient, self-dependent free Ireland dominant. In spite of the First World War this was a period of more than usual optimism for that generation of students—they could expect to be the first Home Rule generation, and later when Home Rule ceased to be a possibility there were the wider and larger possibilities offered by the Sinn Féin rebellion. McLaughlin, who took his degrees in mathematics and physics, was, by his own account⁴ and that of his contemporaries, intensely nationalistic and affected by the mood of the times. After graduation he was appointed as assistant lecturer in physics in University College Galway, where he took up engineering 'in his spare time'⁵ and in 1922 he took a degree in electrical engineering. McLaughlin then decided that 'this degree was of little use without practical experience'⁶ and he decided that such experience could only be got abroad. At this stage



Dr T.A. McLaughlin, initiator of the Shannon Hydro-electric Scheme.

he was particularly interested in the question of Ireland's natural resources and their possible exploitation. This interest was not altogether surprising as the first Dáil of 1919 had set up a committee of inquiry into Irish resources which reported on the possibilities for developing Ireland's peat and water resources. It was this in particular which had excited McLaughlin's interest.

In the autumn of 1922 he moved to London, trying to get a job in the British electrical industry. He was not successful, but was offered a job prospecting for oil in Texas. Shortly after this he was offered and accepted a trainee job with the German firm of Siemens Schuckert and left for Berlin in December 1922. It is possible that Siemens Schuckert was already thinking in terms of possible development in Ireland; certainly McLaughlin was given considerable freedom of action and his first job was to acquaint himself with the manufacture of all kinds of electrical machinery and appliances, the application of electricity, the design of power plant and problems relating to the transmission and distribution of electricity. In fact, in his own words, he was more or less given *carte blanche* by the Germans to do as he wanted.⁷ He went on to study the long-distance transmission of power, generating electricity by overland networks. He became especially interested in the network supplying the province of Pomerania which was half the area of the Irish Free State and which he saw as a good example of what might be done in Ireland. It was at this stage that he became convinced that electricity was 'the key to the economic uplift needed by Ireland'.⁸ He was particularly impressed by the way in which Germany had set about the post-war exploitation of water after having lost some of its major coal fields, and became convinced that water must be the key element in any realistic Irish development. Up to that point he had preferred the idea of turf and had brought with him to Germany all the available reports on native power resources. However, his enquiries in Germany into the possibilities of turf development did not justify his earlier enthusiasm. He could find few engineers there to support the idea and, having studied reports from Sweden and Russia and having seen Germany's turf stations, he firmly decided against turf-generated electricity.⁹

In late 1923 he was working with the water power design department of Siemens and it was at this stage that he opened formal negotiations with the company about the possibility of an Irish development. His studies of Irish conditions had by now convinced him that future developments would have to concentrate on the Shannon and not the Liffey, which, though most spoken about up to now, he felt to be too small for a national supply. It was at this point that he began to devise a scheme based on the Shannon, without the formal approval of Siemens and without any approach having been made to the Irish government.

His preliminary calculations and rough costings showed that with his design he could get a much larger output from the river than anything previously contemplated and his estimated figures appeared to be economical. The next problem of course was how to dispose of this power, which he reckoned would be three times more than the total consumption of the Free State. At first, he thought in terms of electricity-based industries, especially electrochemical fertilisers but then quickly found that there was already too much cheap fertiliser on the world market. The second possibility was simpler and more realistic. His calculations showed that consumption of electricity in Ireland was already well below that of other countries so that there was plenty of room for expansion in a market that was as yet barely exploited and in a country as yet hardly conscious of the possibilities of electricity.

McLaughlin worked on these proposals and as they developed so did the interest and enthusiasm of some of his Siemens superiors increase. He was, it appears, very much in a hurry and impatient of any delay in executing what had by now become an obsession. One account tells of him 'bursting into a meeting of Siemens directors' because of their slowness in coming to a decision to make a formal approach to the Free State government.¹⁰ Then, having very quickly got the interest of the Siemens directors, he had the more difficult task of selling the idea to the Irish government. One of the first people he contacted was Patrick McGilligan, whom he had known at UCD and who was now (November 1923) finishing his period of work in the Free State office in London. McGilligan, who was born in County Derry in 1890, had a degree in law. He was one of the outstanding students of the period with a sharp incisive mind, an ability to master a complicated brief and had, in spite of indifferent health, a robust fighting style in debate. He had been private secretary to Kevin O'Higgins before independence and his talent was quickly spotted by the new government. At the age of thirty-one he was sent to London as secretary to the High Commissioner, James McNeill, to help finalise the details of the Treaty settlement and establish diplomatic relations with Britain. His work obviously impressed the Cumann na nGaedheal leaders in Dublin, for in October 1923 he was invited to contest a Dáil by-election for the National University of Ireland constituency. He was elected to the Dáil on 3 November 1923¹¹ and it was at this stage, as he was preparing to leave London, that McLaughlin, with whom he had corresponded frequently during the previous year, came to see him. McGilligan was immediately enthusiastic about the scheme and convinced James MacNeill, brother of the Minister for Education, Eoin MacNeill.

A month later McLaughlin was in Dublin armed with sketches and plans and with the backing of the Siemens firm, with whom he was now earning the extremely high salary of £5,000 per annum. Through another NUI deputy, Professor William Magennis, McLaughlin was introduced to the Prime Minister, W. T. Cosgrave, on 28 December 1923.¹² At that meeting Cosgrave 'on his own responsibility' turned down a proposal for developing the Shannon put up by McLaughlin.¹³

Cosgrave did not, however, dismiss the idea; in fact he was quite intrigued and agreed to further more formal discussions in the near future. McLaughlin reported back to Berlin and then on 26 January 1924 the second meeting took place. This time McLaughlin was accompanied by a senior director of Siemens, Herr Wallem, while the government party consisted of the President, the Minister for Finance, Ernest Blythe, the acting Minister for Industry and Commerce, Professor Whelehan, and the Attorney-General, Hugh Kennedy. At this meeting the government once again refused to commit itself but was prepared to discuss the matter further and to have the scheme examined by independent experts.¹⁴ A further meeting took place twelve days later on 8 February. At this meeting Herr Wallem assured the Ministers that on the basis of their examinations of the existing data and from his firm's inspection of the rivers and lakes they were satisfied that electric power in sufficient quantities and at a low price could be got from the Shannon to meet the present and prospective needs of the whole Free State. He also assured the Ministers that the scheme would include full consideration for navigation, irrigation and fishing interests and would tend to diminish flooding in areas adjacent to the river.¹⁵

The attitude of the government was now more positive if still cagey. It told Siemens



A contemporary print of Patrick McGilligan, who became Minister for Industry and Commerce in 1924, at the age of 33.

that it was not yet in a position to judge the merits of the proposals on technical and economic grounds but, because of the importance of the provision of electrical power for the future of the Free State, it was ready to give Siemens a full opportunity to further develop its proposals.¹⁶

The question was discussed at a meeting of the executive council on 26 February and at that meeting the details of a letter drawn up by the Department of Industry and Commerce were discussed.¹⁷ This letter to the Siemens firm laid out the conditions on which the government would proceed and was issued along with Siemens' reply as a White Paper on 7 March. This was the first official indication to the public of what was happening.

The White Paper pointed out to Siemens that previous enquiries into the possibilities of the Shannon had been far less optimistic than those of Siemens and that Siemens would agree to have their proposals subjected to whatever expert examination the government thought desirable. The main specific proposals were:

1. Siemens was to work out a detailed scheme for the development of electrical power from the Shannon and for its distribution over the Irish Free State to subdistribution points in various cities and towns.
2. It would make a binding estimate as to costs and report on all economic details including the prices at which power could be delivered.
3. It would examine the existing market for power and also report on the future possibilities which cheap power would promote. The government expected that particular attention should be paid to this part of the report and that the report 'should be considered and detailed'. (In fact in this section the government is clearly looking for arguments and justification should it proceed with the scheme.) 'The Government is advised that the present consumption of electricity in the Saorstát is generally of so intermittent a nature as to militate against its supply on economical terms and to the extent that your proposals contemplated an improvement, in this respect the Government would require specific explanations as to how the improvement is to be brought about.'
4. The scheme would have to represent a sound commercial proposition with an adequate return on the capital to be invested in it. It also had to be compared with any alternative for providing power in the Free State.
5. The report was to be produced by 1 September 1924.
6. The final scheme was to be submitted to experts nominated by the government and the government undertook only to nominate experts of 'European standing'. The position of the experts was to be crucial—'should the experts not approve your scheme, after your firm has had a reasonable opportunity, if it so desires, to modify any part of the scheme to which objections have been raised by the experts, it must be understood that the whole arrangement then lapses, without rights or obligations of any kind resting either on the Government or your firm'.
7. If the scheme (amended and modified, if necessary) was finally approved, the government would either promote it as a state matter or, failing this, give Siemens the first option to carry out the scheme. If Siemens failed to have the scheme financed, then the government would pay them £10,000 for time and money spent on the preparation of the report. However, if Siemens was given permission to carry out the

scheme the firm would be placed under statutory control, 'and would accept all such statutory obligations as the law of the Free State may from time to time impose on public electrical undertakings'.

8. The White Paper also declared that if the government decided to promote the scheme as a state enterprise then the contract for the supply of materials and construction would be given to Siemens, but on certain conditions—mainly governing price and quality control by the government. It was also stipulated that as much Irish labour as possible should be used.¹⁸

Herr Wallem replied to the Secretary of the Department of Industry and Commerce, Gordon Campbell (later Lord Glenavy) on 29 February accepting the conditions laid down by the government and indicating his firm's intention of getting on with the work as soon as possible.¹⁹

Siemens immediately set to work to prepare its detailed proposals, which were presented to the government by the 1 September deadline. In the meantime, the Department of Industry and Commerce set about preparing itself to handle this new enterprise on behalf of the government. Like most government departments of the time, it was comparatively small in size and scope. Its main responsibilities were the promotion of new industries and the fostering of existing ones, the development of mineral resources and the administration of laws dealing with wages, welfare and work safety. Nothing in its previous experience had prepared it for the task it might now be called upon to undertake and so from this point on the work of familiarisation and preparation went ahead. This new work coincided with a change of leadership in the department. Joseph McGrath resigned after a series of disagreements and was replaced on 4 April 1924 by Patrick McGilligan, promoted Minister after only four months in the Dáil, and not yet thirty-four years of age. McGilligan's appointment did not mean any change in policy but he brought to the department an enthusiasm and total commitment to the scheme which was to prove contagious. More than any other member of the government he was to become identified in the public mind with the Shannon scheme and if McLaughlin was the father of the Shannon scheme, McGilligan was its political sponsor.

One of McGilligan's first acts as Minister was to set up a board in the department to advise on the scheme and on electrical questions in general.²⁰ In particular, the department undertook an examination of arrangements for the generation, distribution and control of electrical supply in other countries, paying special attention to mistakes made elsewhere. The McGilligan Papers²¹ show the stream of papers and reports on electricity in other countries which came to the minister during the middle months of 1924. McGilligan himself corresponded with companies and governments in Ontario, Norway, South Africa, Belgium and Czechoslovakia and had a comprehensive report on 'National Electrical Schemes' prepared. One question of key importance was the ultimate type of controlling body for an Irish electrical industry and this report noted that 'in some countries, especially Sweden and Norway, the most important power works have been undertaken directly by the State itself.' In both of these countries too, important experimental work had been carried out at state expense and the general development had been in accord with a national plan. The report on Norway noted that the electrification scheme had made possible the development of a number of new

industries—including electrochemical and electrometallurgical industries—and that it had made Norway an important supplier of nitrates. This same report noted that in Switzerland the federal government supervised the entire industry, even though the production of power was mostly in the hands of private companies. It was claimed that Swiss industries had expanded because of the supply of electricity. Italy had set about electrifying its railways and was now exporting electricity. In Finland the electrification of transport and agriculture was progressing satisfactorily in spite of that country's spate of wars, famine and revolution. Here the state had intervened to speed up the process and had refused to grant fiscal protection to the national producers of electrical equipment although 'the purchase of good and cheap electrical machinery was of vital importance to the country'.

During this period McGilligan also studied reports on electrical developments in the US (which he was shortly to visit) and France, where he was particularly interested in the development of rural electrification.²² On the question of state involvement he found New Zealand especially relevant. Here the Public Works Act of 1908 had vested sole right of using water power in the government and the policy of the government was to supply power in bulk, leaving retail supply in the hands of local authorities. The New Zealand experience was interesting too because of the increased productivity in the dairy industry attributed to electrification. Later in 1924 the Minister was again interested in New Zealand, this time because the bulk of the machinery for a major development on North Island came from Sweden and not from Britain. He urged his officials to find out why; and the answer was money, the Swedish tender being cheaper by £1.5m.²³

In addition, officers of the department were attending conferences and familiarising the department with recent developments. In June–July 1924 a senior official, Fred Allen, attended the world power conference at Wembley, from which he reported to McGilligan on such questions as current thinking on state intervention and control, prospects for the Free State and possible 'experts' to be nominated by the government. Since no definite decisions had yet been taken on these matters Allen's report is an interesting sidelight on the type of advice the Minister was getting during this formative period.

On the question of the relationship between governments and electrical development Allen wrote that 'the unanimous view expressed was that while Government initiation, Government supervision and Government assistance were all desirable, Government management of any power scheme in any country had not justified itself so far'. Later in the report, Allen wrote that

...the general opinion expressed was that a thoroughly complete survey of power possibilities should be made by each Government over its entire territory; that it should assist development by direct loans, by debenture guarantees or by other forms of utilisation of national credit; that it should retain sufficient power of supervision to keep every undertaking upon the best lines and that where found necessary it should itself initiate schemes and issue public stock for the provision of capital. Direct State management was considered however to be so much open to interference for political reasons and to labour difficulties, that success was improbable.

Allen also quoted a paper from the US Secretary of Commerce, Herbert Hoover, in favour of state stimulation but not state control.²⁴

In terms of practical advice Allen wrote that the system adopted by the provincial government of Ontario was commended by most of the continental countries as the best model of government initiative. The government here initiated large power supplies in bulk and issued public stock to provide the capital. A board of commissioners composed of business and engineering experts was selected entirely outside political party considerations and was given unfettered management. Profits accruing after payment of dividends on stock were not handed over to the government, which had no call whatever on the funds, but were placed to a depreciation and development fund. Allen also sounded out opinion on the question of the experts. The Swiss said that Sweden could best advise the Saorstát; the Swedes and Italians recommended the Swiss as 'best as regards long distance transmission combined with comparatively light loads'; Germany was 'in the first rank as regards practical development'; France was 'good, but the engineering profession was linked too closely with the contract trade' and the US was 'first rate—but used to working at a great scale'. Allen concluded that if three experts were required by the ministry they should come from Canada, Sweden and Switzerland, and added that the only satisfactory way in which good appointments could be made was through the governments of the various countries and he said that this should not be difficult as James MacNeill in London was 'on the best of terms' with the Swiss and Swedish embassies.

One final note from Allen is especially interesting. He noted that both continental and US delegates had a poor opinion of British electricity legislation—feeling that it retarded development and was very old-fashioned.²⁵

These extracts from Allen's report are typical of the detailed advice and information being made available to McGilligan and his chief advisers during the period while Siemens was preparing its report. Clearly it was necessary to work at speed on the technical, economic and ultimately the political aspects of the project. The detailed Siemens proposals reached the cabinet on schedule at the beginning of September.

The Siemens report did everything the government had asked of it.²⁶ It provided detailed accounts of the way in which the scheme would be built, the building of the power stations, weirs, sluices, bridges and pumps. It included a detailed summary of costs, details of the economic advantages of the scheme and its effect on the economic development of the Irish Free State.

The report looked at previous schemes for electrification. It saw as an advantage the fact that Ireland's water power had so far not been developed. This meant that 'it would now be possible to start development on a large scale and on the most modern principles, utilising all the latest experience'. The report attacked any effort to develop water resources on the basis of individual areas for local development. A country like Ireland which has not many sources of water power at its disposal 'cannot afford to have its resources developed in such a wasteful antiquated way'. It dismissed the findings of earlier studies on the potential of the Shannon, especially those carried out in 1915 and 1921 by Mr Theodor Stevens which under-estimated the output and over-estimated the costs. The report had little doubt that the Shannon was the most suitable river for development. It had the largest catchment area. Its upper and middle lakes were better suited for storing water than were the Erne lakes.

The whole fall of the river amounting to 30 metres to sea level is distributed over the comparatively short lower portion of the river, so that if the water power be tapped

on the lower course, the large catchment area is fully utilised. The Shannon flows through the centre of the country and this fact makes it especially suitable for development to supply the needs of the whole country. For this reason Siemens Schuckert, after fully considering all the previous projects in January of this year (1924), proposed a completely new project to be carried out on the Shannon. This project contemplated complete utilisation of the lower course of the river in one principal hydro-electric power station at the same time improving the storing capacity of the lakes; but what is more important, it permits a gradual development of the power to meet the increasing needs of the country without calling in the assistance of heat power plant.

The energy derivable from the Shannon at Limerick is amply sufficient to supply the needs of the whole Free State for a long time to come. Only in about 10 years time presuming requirements to have by then increased considerably, would it be necessary to consider utilising other sources of water power in addition to the full development of the Shannon.²⁷

The report also dealt at length with questions of drainage, navigation and fishing, and claimed that the scheme could in fact accommodate the competing claims of agriculture, navigation and power development mainly by means of embankments which would make it possible to drain neighbouring lands independently of the level of water in the lakes. The report dealt in detail with the type of accommodation which would be needed to house the army of workmen on the scheme. It reckoned that at the peak of work about 1,550 men would have to be accommodated in huts. It also reckoned that temporary hospitals and canteens would have to be built.

Siemens paid tribute in its report to a remarkable Irish public servant, Mr J. Chaloner-Smith, on whose work much of their scheme was based. Mr Chaloner-Smith had devoted several years of private work to co-ordinating, classifying and investigating from a hydrological point of view the official records and observations relating to the Shannon flow and extending over a period of thirty years. In the interests of the community, Mr Chaloner-Smith had placed all this accumulated work and experience at the disposal of Siemens.

As soon as the Siemens report was received, the government set about having it examined by the four experts. In choosing the experts, the advice of Fred Allen was followed. Two of the experts were Scandinavian, two Swiss. All four were of impeccable standing and it was decided not to appoint any from Germany because of a possible clash of interests. The four experts were Dr Waldemar Borgquist of Stockholm, second in command of the Swedish State Electricity System, Professor Eugen Meyer-Peter of Zurich, Dr Thomas Norberg Schulz of Christiania, the main director of the Norwegian state electricity system, and Professor Rohn from Zurich. Their appointment was ratified at a cabinet meeting on 27 September.²⁸

The work of this group of experts was to be characterised by speed and thoroughness. They began by making a preliminary local examination of the country 'to acquaint themselves with the national, economical, topographical, hydrological and geological fundamentals of the scheme'.²⁹ In early October Meyer-Peter and Rohn inspected the Shannon from Lough Allen to Limerick while Borgquist and Norbert Schulz examined local conditions especially in terms of supply and demand. They visited a large number

of towns and villages and some factories and farms. Later in October an 'expert committee' was set up in Dublin and the general lines of examination laid down. Some further studies were commissioned. Then in early December the final report began to emerge and it is clear that by 11 December details of the main findings were with the cabinet³⁰ and these were announced in the Dáil a week later (19 December 1924), though copies of the actual report were not available for some months.³¹

In all essentials the experts endorsed the Siemens proposals, and judged that their estimates fulfilled all the conditions of the White Paper. The experts reckoned that the requirements in electrical energy in the Free State two or three years after the start of a national electrification scheme would be 150 million units. This would still be below the world average. As soon as electrical energy was available at cheap rates this rate of consumption would reach the world level.

The experts said that there were two main options open to Ireland as far as generating electricity is concerned—through numerous small local stations or through a centralised national plant. It came down firmly in favour of the latter. On the question of coal or water-generated electricity, it favoured water, on grounds of both cost and national independence. It also looked at the three possibilities for water development, the Shannon scheme, the Liffey scheme and the Liffey-Shannon scheme. The report stressed that no partial exploitation of water power ought to be carried out which would make a full development later impossible while on the other hand no plant should be built which could not be adapted to growing demand. The report decided that a partial development of the Shannon was the most suitable first step which the state could take. It estimated that, combined with existing steam stations, which could be called on to supply an average of 10 million units per year of peak-load energy and dry-load supplementary, the partial development was capable of delivering about 225 million units a year. It added that the proposed first development stage in no way prevented further development, and that all further developments could be carried out 'roughly within the limits of what it would cost if it were carried out co-incident with the partial development'.

The experts favoured this one-step development rather than the 'more expensive and, in general, less suitable system of development in a number of steps which necessitates various separate weir plants and various separate machine houses'.

On the question of the Liffey—already a live controversy both in and out of the Dáil—the experts felt that it could be developed later, either during the further development of the Shannon, or more probably after this, depending on how the consumption of electricity developed. However, it would not be advisable to develop the Liffey at the present time 'because it is too small, because it can supply only the needs of Dublin, and because its output capacity would be very quickly swallowed up, while four-fifths of the State would have no share in the advantages of electricity supply'. The experts also felt that the current could be delivered more cheaply from the Shannon to Dublin than it would be from the Liffey.

In another part of the report, the experts ruled against an alternative to the Siemens proposal. This was the 'National Electricity Supply Scheme' drawn up by an Irish firm, J. F. Crowley and Partners.³² The scheme was based essentially on the Liffey with 'a modest partial development of the Shannon' a few years later. This was rejected because the development of the Shannon in a number of successive steps would be uneconomic

and because the development of Shannon and Liffey would render the output of the Liffey superfluous. The experts added that the proposal of Crowley had not been sufficiently developed in its fundamental principles and that their proposition was represented 'only by a dossier—not by a scheme'.

The experts concluded on a note of optimism:

The Experts assert that the Free State finds itself today in a favourable position in relation to this electrification problem. It has before it a new development, substantially simplified by the absence of numerous unsuitable existing power stations and it has the advantage of having the wide experience acquired by other countries at its disposal. The rational electrification of the country under these circumstances with mutual goodwill on all sides should easily be carried through. The extraordinary high prices at present existing for electricity in the Free State which have a prohibitive tendency as far as development is concerned indicated that a radical change must take place in the electrical supply of the country if the population is to have the advantage which the use of electricity in all its spheres in the household, factory and farm brings with it.

With the arrival of the main findings of the experts in December 1924, it seems clear that the last doubts of the government about going ahead with the scheme disappeared. A week later on 19 December the Dáil heard the first details of the proposed scheme from McGilligan. The Dáil was coming to the end of a very busy session, but in spite of the lateness in the year McGilligan had a full house when he rose to speak. Since it was clear that much of the opposition to the Shannon scheme was going to come both from those who favoured the Liffey development, and from the existing undertakings, McGilligan went into the attack straight away. Sir John Purser Griffith, who was a member of the Senate, and Darrell Figgis, a member of the Dáil, were both strong supporters of and had a financial interest in a Liffey scheme and McGilligan of course was aware of this. Thus, much of his speech was taken up with the possibility of alternatives to the Shannon:

I quite failed to convince them [experts] that anybody in this country would plead for a series of numerous small local stations in opposition to one or more concentrated plants. It was impossible to make them realise that that point would be seriously argued. . . . It is only necessary to look at the prices at which small local stations in this country deliver to the consumer and the question is closed. . . . The matter seemed to them beyond argument; a matter which required statement and not demonstration.³³

He then went on to quote from the experts on the Crowley plan for the Liffey³⁴ and to dismiss any possibility of a go-ahead for any form of Liffey scheme.

The Minister's statement was not intended as a formal debate or as an occasion for taking any definite decision to commit the Oireachtas to the Shannon scheme. It was intended more as a means of giving information to the Dáil on what had become a question of major national importance. Yet the general lines which the debate was to follow were laid down after McGilligan's speech.

The leader of the opposition, Thomas Johnson of the Labour Party (de Valera's supporters had not yet entered the Dáil) was enthusiastic. He congratulated McGilligan on his lucid exposition, saying 'I felt while hearing the story, that I was having related by word of mouth one of H. G. Wells' stories or, perhaps, de Rongement's fantasies'.³⁵

Johnson went on to ask three important questions: Had the Erne been considered? Would Parliament have a full opportunity to examine the proposals in detail? Would it be a private or a national scheme?³⁶

Johnson was followed by Darrell Figgis, who was to be the most consistent opponent of the Shannon scheme, but whose credibility was weakened by his own admission that he had invested his life's savings in the Liffey project.³⁷

Professor Thrift of Trinity College, who was a scientist, rose above the detailed opposition of Figgis:

'I venture to hope this marks a very big day in Irish history, that we may, from this, turn our attention to the most important thing in this country and that is the practical question of how the country is to be advanced and brought into a real state of prosperity. It needs very little imagination to see in the scheme possibilities of progress and of a future for the country which may be indeed quite beyond the highest hopes of many of those who have very high hopes for it'.³⁸

And so the discussion continued. William Hewat, a representative of the business community had reservations. Connor Hogan, a Farmer's Party member urged caution. There was the danger of building 'a white elephant'.³⁹ In his reply, McGilligan tried to deal with the more substantial questions raised in the discussion. The Erne was ruled out of consideration for the present but 'if it were all Ireland we were considering it would be the second river to be developed and it would rank higher than the Liffey as an adjunct to the Shannon'.⁴⁰ He said that the estimated cost of 0.53 of a penny per unit as estimated by Siemens would not be a binding price and, on the question of state or private control, he said no decision had yet been taken but he did hint at his own preference for a state scheme and emphasised that it would not be a 'German scheme':

So that all the talk there has been since the appearance of the White Paper about a German economic stranglehold, presumably through German financial control of this scheme, has no foundation in fact and it is something that has never been contemplated. The State may be reduced to the point where there will be no other way of doing it, but we are not at that point, and I do not think we are ever likely to come to that point.⁴¹

McGilligan continued that 'he had deliberately tried to choke down his enthusiasm' and be as objective as possible. His summing up, however, showed how unsuccessful he had been in banishing all enthusiasm:

I would put it one way and one way only: that just as there was political freedom achieved a certain number of years ago, if this scheme be carried out we have got to a point where economic freedom, without which political freedom matters very little, may be brought appreciably nearer. I think that one's mind must go back to Arthur Griffith on a night like this. Thinking of his writings, his enthusiasm and his energy as to the extent to which the natural resources of the country could be developed for the good of the country—there is a definite chance here at last of utilising one of the great natural resources of the country for the good of the people of the country.⁴²

As yet there was no definite government commitment, but judging by the tone of McGilligan's speech it is clear that the government had all but decided in favour. The

full report of the experts was submitted to both houses on 7 January 1925. The first public announcement of the government's determination to go ahead was not, however, made in the Dáil. McGilligan chose the occasion of a Cumann na nGaedheal meeting in County Mayo on 22 February 1925 to do this. He said:

The Government has no hesitation in proceeding with it . . . from the technical point of view it has passed all tests . . . from the economic point of view it will put us in possession of an ample cheap supply of electricity. The most essential factor in modern times for progress in the homes, the factory and the farm . . . financially too it was satisfactory.

McGilligan concluded by saying that from now on he was 'paying no attention to uninformed critics'.⁴³

The first reaction to McGilligan's announcement came from within the Department of Finance, and was to cause severe strain between the Secretary of that department, Joseph Brennan, and the government, though, of course, this never became public at the time. It appears that the Department of Finance was not aware of the decision of the government to go ahead with the scheme until McGilligan announced it at a public meeting. The Minister for Finance, Ernest Blythe, clearly was aware of the extent to which the government was committed to the scheme by the end of 1924 and in fact approved. The remarkable point, however, is that his most senior officers, Joseph Brennan and J.J. McElligott, remained in the dark although very suspicious.

The intra-governmental controversy had begun on 13 January 1925 when Gordon Campbell, Secretary of the Department of Industry and Commerce, wrote to the Department of Finance to say that McGilligan, before leaving Ireland, had asked that a memorandum should be sent to Blythe as quickly as possible covering the problems involved in financing the suggested scheme.⁴⁴ He enclosed a set of proposals.

The country's credit-worthiness, he wrote, was at stake in the manner of financing such a scheme. If the scheme was to be put forward for adoption, it was essential that the financial end of things should first be secured. It would be useless to promote a bill to permit the scheme unless the finance plan was firmly determined in advance: 'All criticism of the scheme and every attack on it will concentrate on the finance aspect, and a determined and vigorous effort will be made to obstruct the scheme by creating impressions unfavourable to its easy financing.'

In order to open the discussion, Gordon Campbell enclosed with this letter, and another one two days later, some tentative proposals for financing the scheme. He suggested the issue of government-guaranteed short-term debentures which would give subscribers the right to a shareholding in the highly profitable Shannon power installation when the debt matured—although the state would retain at least 51 per cent of the shares. Private enterprise involvement was, therefore, still a possibility as far as the government was concerned.

Brennan wrote a long and strongly worded minute to Blythe as a result of these letters.⁴⁵ It seemed to him from their contents that the matter was now a *fait accompli*, without his even having seen the experts' report.

He suggested that the Minister would not be 'willing on the facts at present before you to allow a decision to be taken in this perfunctory manner . . .'. He went on to criticise the costing estimates submitted by Gordon Campbell as inadequate and his financing sug-

gestions as unsuitable. The general tone of his minute (and, one suspects, an accurate indicator of his attitude) is given by one of his concluding observations, in which he states that: 'Almost the whole of the minute [G.C.'s. memo] is devoted to matters which are proper for treatment by you rather than by the Minister for Industry and Commerce.'

On 11 February he replied to Gordon Campbell to the effect that, while the Minister for Finance was disposed to think that a decision in favour of state finance for the scheme would, eventually, be proper, there was no question of a firm decision without more details, especially of costing, which Industry and Commerce would have to provide.⁴⁶

In the light of this correspondence, it is clear that Brennan was both shocked and angry at the announcement made by McGilligan on 22 February. He immediately dictated a minute to Blythe saying that his attention had been drawn to the newspaper's report. (He could hardly have missed it.) He demanded to know if the decision had indeed been taken. He had no record of it. He regarded it as futile to expend the time of his officers examining the feasibility of the scheme which the government had already decided to prosecute. To add insult to injury, it now seemed that Industry and Commerce had been making financial commitments on the state's behalf without informing Finance.⁴⁷

Blythe informed Brennan that the decision had indeed been taken.⁴⁸ The whole procedure was obviously highly unusual, which raises the question of why it was followed. The probable answer is a simple one. Brennan was a formidable figure and was regarded as being extremely conservative in all financial matters.⁴⁹ The government, including Blythe, obviously guessed (and were proved right) that Brennan would be hostile, if not to the Shannon scheme, at least to expenditure on such a scale, and realised that with his formidable intellectual and administrative skills he could well block or delay the scheme. The expedient then adopted was to bypass Brennan until a final decision was taken.

In April, Blythe told Brennan that Finance still had to decide on the method of financing the scheme—that much had been left to them. In the Department of Finance's deliberations on financing, he also told Brennan that there was no question of permitting it to be done through private enterprise: 'No proposal to hand over a scheme like the Shannon to a private firm would have any chance of acceptance by the Oireachtas.'⁵⁰

The immediate reaction to McGilligan's announcement on 22 February came from one whom McGilligan could not regard as 'an uninformed critic'—Laurence J. Kettle, Chief Electrical Engineer of Dublin Corporation and a member of a distinguished Irish political family. As Chief Engineer in Dublin, Kettle obviously was not a completely disinterested observer—any major scheme like that of the Shannon clearly challenged the pre-eminence of Dublin and a national distribution system was a clear threat to the autonomy of Dublin.

None the less, he was a figure of considerable authority in the Irish electrical world and one who would have to be listened to. He urged the Minister 'to go more slowly'. He complained that the Electricity Suppliers Association of Ireland who 'have a vital interest' had not been consulted. He alleged also that the Minister had not 'an open mind' and that he was using the Shannon scheme as election propaganda.⁵¹

The full publication of the experts' report on 18 March was the real starting point of the controversy. The first reaction of the *Irish Times* was cautious but not hostile:



Laurence J. Kettle, chief electrical engineer of Dublin Corporation and a critic of the proposed Shannon Scheme.

[In] this most ambitious undertaking... success would revolutionise [the] whole economic and social life of State... failure would saddle the taxpayer with a heavy burden of financial loss. The difficulty will be having brought cheap electric current within easy reach of the people, to induce them to make use of it. It will be complicated by the very high cost of installation and above all by the inertia which is so strong a feature of our national psychology. ... It is to be hoped that carping criticism will be withheld, while constructive criticism... is given every chance. ...⁵²

Another issue now began to be raised, which was to become a source of considerable

contention before long, that of fisheries. That same *Irish Times* editorial had opined that 'if [the scheme] is put into operation our anglers may say farewell to Castleconnell'. More detailed criticisms were contained in an article by 'An Angler' to the effect that the experts knew nothing about fisheries: 'I would be much more influenced by the straightforward statement to the effect that the fisheries must go, but that the commercial gain would more than balance the loss, while vested interests would be fully compensated.' He added that fishermen generally were convinced that the scheme would mean the end of fishing on the Shannon.⁵³

The main battleground from this point on was in the letters column of the newspapers. Before long McGilligan was to charge—not unjustly—that there was an organised campaign against the scheme. In general the main opposition came from the sponsors of the Liffey hydroscheme, the distributors of electrical appliances and civil engineers. A meeting of the Irish Centre of Electrical Engineers, called to discuss the Shannon scheme on 3 April 1925, expressed itself hostile. The scheme was 'a gamble', they said. There was no precedent for embarking upon an elaborate scheme of national electrification before the industrial development of the country had created a reasonable demand, and it would mean an expenditure of £20m.⁵⁴ Before long Kettle was back in the battle. He was clearly stung by some of McGilligan's references to Irish engineers: 'The Scheme will not mean cheap power . . . cheap power will not create more jobs.'⁵⁵

By now too, Sir John Purser Griffith was in full pursuit. In the Senate on 31 March he demanded a new enquiry.⁵⁶ And the Farmer's Party was moving from initial caution to opposition. J.F. O'Hanlon TD summed up the view, saying that Germany would make immediate profit, but the Free State was gambling with its future. There was no need to rush. The experts' report would still be valid in five years; and the Shannon would not change its course.⁵⁷

The chambers of commerce were also beginning to express opposition, especially in cases where members had a stake in the existing electricity system. There were those too who raised the security issue—understandably since the Civil War was just two years over. There was no guarantee that the whole scheme would not be blown up by forces hostile to the state or that extremists would not hold the state to ransom. Horrifying pictures of the resultant flood damage were painted.⁵⁸

This increase in scepticism found an echo in newspaper editorials. The *Irish Times* issued a paternal warning on 1 April:

We believe we understand the Government's point of view. The Free State Ministers are young and ardent men, eager to lift the country *uno ictu* out of its ruts of economic and social stagnation. They are weary of inaction and of criticism which cloaks inaction. They desire to 'get things done'—to present the world with an outstanding proof of Irish energy and courage. They have decided, therefore, to gamble on the success of a scheme which, if it succeeds, will transform the industrial face of Ireland. Knowingly, they are taking great chances . . . treating important interests in an arbitrary fashion.

It went on to urge caution and to oppose 'hustle'. 'Hustle' was hardly the word McGilligan would have chosen but certainly events from this point on paid little heed to the warnings of caution from the *Irish Times* and others. On 2 April he introduced a Dáil motion on the hydroelectric exploitation of the Shannon, a bill to enable the first partial

development of the Shannon scheme. It was to be another strong performance by McGilligan. According to the *Irish Times* political correspondent it was 'an admirably lucid summary' with McGilligan speaking for seventy-five minutes without notes.⁵⁹

One of McGilligan's first targets was the Irish engineering profession. This was hardly surprising since so much of the criticism of the scheme had come from this source and clearly the credibility of the scheme could be harmed if those attacks continued:

If it is no good to provide power for domestic purposes because people will not avail themselves of it and if it does not matter whether it is cheap or dear for industrial purposes, then the opinion of Irish engineers is against that of the whole world. They are the only sane men while the whole world has gone mad. The whole world is agog about electrical development. It is spoken of everywhere. . . . We stand here and rely on Irish engineers who have little knowledge of electrical development and who tell us that it does not matter whether you progress electrically or not.⁶⁰

He later qualified this to include only those Irish engineers who had attacked the scheme⁶¹ and came back once more to this theme later in the debate:

Irish engineers have suffered through those who pretend to represent them in letter-writing to the press . . . it is an unwholesome thing that certain people by their speed in rushing into print should have almost got the engineering profession here into a state

At the construction of the Shannon Scheme at Ardnacrusha. Seated in the front row are Patrick McGilligan (second from left); T.A. McLaughlin (fourth from left); W.T. Cosgrave, President of the Executive Council of the Irish Free State (fifth from left); John J. Murphy, first Chairman of the ESB (sixth from left). Various personnel from Siemens are also in the group.



where this scheme must either be broken or the engineers in Ireland think that their dignity has suffered.

He did add that this attitude was unfair and did not represent any significant fraction of engineering opinion.⁶²

One of the striking features of all the debates on the Shannon scheme was the extent to which McGilligan was supported by his fellow Ministers and especially by W. T. Cosgrave whose detailed knowledge of the proposals emerges at many points. In this particular debate, Professor John Marcus O'Sullivan, Minister for Education, quickly intervened, attacking those opposed to the scheme:

[They are] unable to think big...[and are under] the English Colonial mind influence.... The same people who object to having a Ministry of External Affairs... who believe we are still a minor part of the UK... that this country is a preserve of English manufacturers.⁶³

The question of state involvement and nationalisation was raised by the Farmer's Party leader, Michael Heffernan. If there was any question of this, then his party would vote against. Professor Michael Tierney, in his maiden speech, strongly defended the integrity and record of his friend, Dr McLaughlin, which had been attacked by Darrell Figgis and added that those who supported the Shannon scheme had not 'fomented a correspondence in the public press from every would-be expert and from practically every idiot in the country to "down" any other scheme which is a rival of theirs.'⁶⁴

McGilligan came back to this theme in his summing-up, attacking the lack of enterprise and adventure of the 'Irish captains of industry'.⁶⁵ On the more important question of control he had two points to make. In the first place, the scheme would be government controlled: 'How far and how deep the Government will have to go on control and how far the employees will be under its control is a matter which will have to wait for the Shannon Organisation Bill.'⁶⁶ The second point was that there was no question of any alternatives to Siemens: 'If Siemens are not employed as contractors... remember the Government has no Shannon Scheme'.⁶⁷ Thus the contract would not be open for competition but clauses 11 and 12 of the White Paper would 'provide every possible check on Siemens to secure the best advantage for the country'.⁶⁸

That ended the first full debate on the scheme. The leader of the opposition, Thomas Johnson, demanded a vote, to allow those present to record their approval. The vote was fifty-eight in favour, none against, out of a total Dáil membership of one hundred and nineteen.

A month later on 1 May 1925, the Shannon Electricity Bill to provide for the production by the state of electricity generated from the Shannon was introduced in the Dáil. Its second reading was taken on 5 May. Much familiar ground was covered in the following days of debate but, bit by bit, aspects of government thinking on some of the substantial issues emerged. Early on, McGilligan addressed himself to the question of the fisheries:

In carrying out the Scheme, although all reasonable precautions will be taken to prevent injury, we do not preclude the possibility of injury being done to the fisheries, and if, in a case of conflict between fishery and electricity interests, then electricity is going to have a superiority.⁶⁹

The reluctance of the Farmer's Party and business interests fully to support the scheme continued to be shown as the debate progressed. Heffernan wanted less haste: 'People of this country are very conservative with regard to new ideas. They do not take to them as people in other countries.'⁷⁰

Major Bryan Cooper feared the advent of state socialism, 'the State swallowing all private rights—in this Bill',⁷¹ but in the national interest, he wished the scheme success.⁷²

In his reply on the second stage debate, McGilligan returned to attack critics, especially Dr Theodor Stevens, whose pamphlet,⁷³ according to McGilligan, had been written before details of the scheme had been published.⁷⁴ McGilligan assured the House that the embankments would be sufficiently strong to prevent any flooding catastrophe, the dangers of an armed attack would be fully guarded against, there would be no German monopoly, nor would there be extravagance. He ended by asking deputies for 'an act of faith—but an act of faith based upon substantial reasoning.'⁷⁵ He was obviously taken at his word for the second stage passed without division on 8 May 1925. The third stage was completed by 19 May and stages four and five were taken together on 26 May. The only real dissent at this stage came from William Hewat, who was accused by General Mulcahy (who was then a government back-bencher) of trying to sabotage the scheme by organising obstacles outside the House.⁷⁶ However, the final bill passed all stages on 26 May without a division. Two days later the second stage of the bill was before the Senate. Here it was strongly and consistently opposed by Sir John Keane, who became the first member of either House to go on record in opposition to the scheme: 'I ask that the records of this House should show that I personally have no part or lot in such a profligate proceeding.'⁷⁷

Sir John's opposition continued through the third stage on 10 June and the final two stages on 18 June and 25 June. His criticisms were numerous but the nub appeared to be his fear—his certainty—that the scheme represented 'the fatal and continuing tendency on the part of the Government towards nationalisation.'⁷⁸ He had earlier been appalled by the government's 'nationalisation' of land and he now saw electricity being subjected to the 'poisonous virus of nationalisation.'⁷⁹

In his opposition to the scheme, Sir John, who if not representative of was certainly very close to the major banking and financial interests in the state, had suggested that the government might have difficulty in raising a loan and that he would not encourage investment by his friends.⁸⁰ This attitude profoundly angered McGilligan. He had told Sir John on 7 April:

If (this) means there is going to be any stand on the part of the Banks or financial houses . . . then it may have to be pointed out to the Banks . . . that they do not own all the money that is in their possession. They are merely the trustees of that money. . . . If we have trouble with them we are in a position to meet it.⁸¹

In his final remarks in the Senate McGilligan's strictures also included Senator Bagwell, who had large agricultural and financial interests and who had advised his friends 'not to put a shilling into the scheme'.⁸² McGilligan hinted that if the big financiers did not co-operate there were other ways:

If all goes to the worst . . . then we can build ourselves on the foundation on which the whole State was brought into being, the small investor, the small man, the man who supported the National Loan to the greatest extent.⁸³

McGilligan's warning to the Irish banking interests was in part a result of his own personally radical views on banking but were also based on his own sure knowledge that the financing of the scheme would not prove a problem. As far back as February 1925 he had a letter from the chairman of the huge Bethlehem Steel Corporation in the USA, Walter S. Tower, telling him that 'at least one large financial house in New York stands ready to undertake the floating of the necessary bond issue'. McGilligan had turned down this offer telling Mr Tower that the Minister for Finance saw no problem about an internal loan in the Free State.⁸⁴

The bill passed the Senate without opposition on 25 June. Only one member in either House had actually gone on record to oppose the building of the Shannon scheme. The opposition of chambers of commerce, the hostility of some sections of the engineering profession, the reluctance of the farmers and the lukewarmness of the newspapers had not been translated into parliamentary obstacles. All that was necessary now was that the scheme should be built and that the government should decide on the plan for the future control of the generation and distribution of electricity in the Free State. According to McGilligan, as he wound up the Senate debate, the government had not yet made up its mind on this question.⁸⁵

The Shannon Scheme

ON 13 August 1925 the contract between the Free State government and Siemens was signed. The scheme was to cost £5.2m. and was to be in operation within three and a half years.¹ The question of future control and future organisation of the electricity industry in Ireland was still unsettled, but McGilligan's Department of Industry and Commerce was busily examining the possibilities, while the Minister himself was about to undertake a trip to the United States to examine the control and structure of the electricity industry there. Meanwhile, however, the work of building the scheme could go ahead.

The signing of the contract had not silenced opposition. The *Irish Independent* still had 'grave misgivings', mainly about the size of the venture and the haste involved. The *Irish Times* had become more consistently hostile:

If the country were completely satisfied that the Shannon Scheme can accomplish all that its champions say at the figure calculated, would the Saorstát be justified in such an enterprise in the present circumstances? We doubt it. The country is too poor, the State is too young and has too recently emerged from costly civil strife to justify enormous capital expenditure on centralised production of electric power on a large scale. There are far more vital and pressing problems to be solved.²

The *Irish Times* was also somewhat concerned that the contract had gone to a German firm and referred more than once to the 'Teutonising' of the Free State which would follow from such a large and vital German presence. In part this was a hang-over from the *Irish Times*'s strong anti-Germanism during the First World War, a characteristic it shared with most of the British press. Far more virulent—and impertinent—on this score was the opposition of the high Tory London newspaper the *Morning Post* which saw the granting of the contract to Siemens as 'an unfriendly action against British industry' and went on to fear the consequences of the 'establishment of a colony of skilled German mechanics' in Ireland. Nor did the opposition of the chambers of commerce soften at this stage: letters still appeared in newspapers with regular frequency condemning the whole venture as extravagant and unnecessary.

Influential as this opposition undoubtedly was, it was in no way general or widespread. By the end of August preliminary work on the scheme—the preparation of offices and housing accommodation and the building of new railway lines—had got under way, and right from the start it was clear that the whole exercise had captured the public imagination. Detailed accounts of the progress of the scheme were carried by all the newspapers. Booklets and pamphlets³ were published and widely distributed. Charabancs and trains brought excursion groups from all parts of the country to see the work in progress—indeed by the time the scheme was completed there was hardly a town or village which had not had its special excursion to Ardnacrusha. A special film on the progress of the work was commissioned and journalists came from many parts of the world to write about the scheme. Even the normally sober periodical the *Structural*

Engineer saw the scheme as so important that it commissioned a popular contemporary novelist, Valentine Williams, to record its progress. Certainly if it had been the government's intention to divert public attention away from the Civil War and to channel it into the constructive possibilities of nationhood then the Shannon scheme, described by one local paper as 'the Eighth Wonder of the World', was already a success.

The main elements to be constructed in the Shannon scheme were the head race, the tail race, the weir intake, the sluice house and the power station. The basic idea was to use the 100 feet of the fall from Lough Derg to the sea to generate electrical power. The fall was to be obtained by drawing the water from the Shannon above O'Brien's Bridge and conducting it through a head race canal approximately seven and a half miles long across the country to Ardnacrusha where the power house was to be built. From the power house the tail race would run to meet the Shannon again at Parteen Locks. Then, above O'Brien's Bridge a weir was to be constructed in the river to raise the level of the water to the level of Lough Derg, and embankments were to be built along the river to prevent flooding of adjacent land.

The scheme was to be developed in three stages and when it was completed electricity was to be distributed over the country by means of a high tension network feeding all towns and villages. The primary transmission line at a pressure of 110 kV was to extend across the country and join the two chief centres, Dublin and Cork. To facilitate distribution a substation was planned for Portlaoise and fed from the main 110 kV line.

Within days of the contract being signed the first engineers had arrived from Germany and begun work.⁴ Valentine Williams, writing in the *Structural Engineer*,⁵ gives a colourful account of these early days:

A Titan's task confronted these peaceful invaders. Ireland could bring almost nothing to their aid save the more or less willing arms of her unskilled labour. The German engineers found themselves in a virtual roadless tract of desolate pastureland with nought save a couple of miserable hamlets all the long way from Limerick to Killaloe. There was no power station they could utilise, no railway to transport the plant to the building sites, no fuel except imported, and at Limerick docks totally inadequate facilities for handling the fabulous quantities of materials required ...

As they inhaled the soft and sluggish Shannon air and watched the ragged natives pottering about their wretched hovels and dim cabbage patches in the leisurely manner peculiar to the West of Ireland peasantry, hearts less valiant than those of the professional engineer must have quailed before the magnitude of the undertaking.

Williams's florid prose does not exaggerate. The Germans had to start from scratch and virtually every item of equipment and machinery had to be brought from Germany. The first necessity was mobility and this meant building a railway. To do this almost everything had to be imported:⁶ metals, sleepers, fish-plates and locomotives and sixty-two miles of railway track. At Longpavement, outside Limerick, the Germans established their railhead, from which they ran their network of lines. Steamers arrived weekly from Bremen and Hamburg bringing, first of all, lorries to run the material from the docks to the railhead and then, to speed up work at the quayside, an electric derrick and two oil cranes were imported. This was followed by seventy-six locomotives, hundreds of small trucks, caterpillar excavators, bucket and shovel diggers, concrete mixers, stone crushers, repair plant and heavy motor boats. In all, about 30,000 tons of

large and small plant was brought in, and in addition there also came a range of German delicatessen, beer, wines and cigars, which were not available locally.

The next task was the building of large stores, a spare parts depot, engineering repair shops and a temporary power station. At the same time it was necessary to build camps and accommodation for the army of workmen. The camp at Ardnacrusha could accommodate seven hundred and fifty men in the Irish section and a hundred and fifty in the German section. Further camps were erected at Clonlara and at the weir. Generally the standard of accommodation was fairly primitive with up to thirty men per room in the unskilled section. Conditions for the Germans were somewhat better and individual dwellings were provided for those who had brought their families with them. In addition, a German school was established close to the camp to look after the German children.

All these early developments were to some extent overshadowed and jeopardised for a time by a major labour crisis which threatened the whole scheme. The dispute began on 10 September.⁷ The workers wanted 1s. 1d. an hour, while Siemens, with government backing, offered 8d. an hour. On 25 September Siemens offered £1. 12s. a week plus free lodging for a fifty-hour week. This worked out at 7½d. an hour plus lodging, and brought an immediate protest from the unions.⁸ McLaughlin entered the controversy on 28 September. Speaking on behalf of Siemens he claimed that the rate being offered compared favourably with the going rates for agricultural labourers, and it was these and not city labourers who should be the proper basis for comparison. The average agricultural wage at this stage was 25s. for a 57-60-hour week.⁹

Negotiations began on 30 September to settle the dispute and on the following day there was considerable surprise when forty-five Limerick ex-servicemen were offered and accepted a rate of 50s. a week and started work.¹⁰ Clearly an attempt was being made to break the strike and union anger focussed immediately on the man appointed by the government as labour adviser. This was Joseph McGrath, the former Minister for Industry and Commerce. McGrath had been a trade union official in his early days with the reputation of having a tough, no-nonsense approach. He was out of work and in financial difficulties when appointed by the government as labour adviser and was clearly seen by the government as the ideal man to sort out this tricky and dangerous labour problem.¹¹

The unions reacted furiously to this strike-breaking move and those going to work the following day were attacked and had to get police protection. That same day McLaughlin announced that he had more applications for unskilled labouring jobs than he could handle and was taking on new workers at the rate of forty a day.¹³ This attempt at strike-breaking did not help settlement prospects and the situation was so bad on 7 October that soldiers stood by with fixed bayonets as a German ship was unloaded.¹² The following day some German workers were attacked¹⁴ and a week later the dispute had spread to coal workers who were refusing to discharge coal to Siemens.¹⁵ Then on 19 October Siemens refused to meet the Limerick branch of the Irish Transport and General Workers Union 'because they did not represent rural labourers'—the very point the union was disputing.¹⁶

The dispute continued right through November and December, though the fact that so many men were taking the work at the rates being offered by Siemens weakened the position of the strikers. Before long both business and labour interests began to attack the



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Conducted Tours daily from the I. O. C. premises
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2nd " " 2.30 p.m., " 6.30 p.m.

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An advertisement for visits to the Shannon Scheme at Ardnacrusha during its construction.

government's 'inaction' in the matter.¹⁷ The national executive of the Labour Party attacked the wage rates and the government's role in enforcing them.¹⁸ On 2 December the part being played by the government in the strike was bitterly assailed in the Dáil by the Labour Party leader, Thomas Johnson. Certainly there was a strong suspicion at the time that Siemens might have yielded and paid higher rates especially if this would have meant better quality workers but that they were not allowed to do this by the government and that there was strong pressure too from farmers' groups who feared that higher wages would unsettle their own workers.¹⁹

A week later, in the Senate, Seamus O'Farrell of the Labour Party called upon the government for recognition of 'the right of workers to rates of wages at least sufficient to provide them and their families with the indispensable necessities of civilised life'.²⁰ By the standards of the normally urbane Senate it was a bitter debate. It showed the determination of McGilligan and the government to keep wages down so that the scheme would not be jeopardised.²¹ It showed too the passionate concern of the Labour senators and provided insights into the truly appalling labour conditions then prevailing. Senator O'Farrell regretted having to move the motion, because Labour favoured the Shannon scheme. But the conditions pertaining and the wages being offered gave him no option. 'Instead of creating a Gaelic Ireland these conditions will create an Irish China,' he said.²² He criticised the food being offered to the workers and told of men who had walked from Dungarvan, so desperate were they for work, but found the conditions unbearable. He turned in his bitterness on McGilligan, saying 'the idol has turned out to have feet of clay',²³ and ended by declaring that 'the Scheme would be cursed by those whom poverty has forced to accept work on it'.²⁴

There was a third point of view put forward in the debate, that of the hard-line employers. The Earl of Mayo, painting a picture of 'happy navvys frying their beef-steaks on a shovel',²⁵ could not see the reason for all the fuss. He appealed to Labour to 'take a broader view. . . . I hope the Labour party will not really interfere in this serious matter, because it is a serious matter to encourage men who are only too anxious to make a little mischief'.²⁶ Sir John Keane took a similar line: 'We all feel sentiment for the conditions under which labourers work and exist, but . . . there are inexorable laws of economics that you cannot get away from without ruin to the State'.²⁷

The Labour motion was defeated by twenty-one votes to ten and in spite of Senator O'Farrell's warning that Labour would use every means at its disposal to prevent the scheme being carried out²⁸ it was clear by the end of the year that the unions had lost. The rate to be paid after all would be closer to the agricultural labourer's rate than to that of the urban worker. It had not been an auspicious start, but from 1926 on things settled down, helped in part by the direct and often uncompromising methods of the labour adviser and labour disputes never again seriously threatened the scheme.

Even though the scheme had such an unhappy beginning, the blend of German and Irish workers soon began to work well. According to a later report in the *Manchester Guardian* the Germans 'set an example of more than Teutonic industry. . . . The men . . . far from home, anxious to make money, showed no desire for leisure . . . immense spells were worked . . . the eight hour day became a half forgotten dream.' That same article claimed also that the Irish workers gave good work and that 'in the final analysis the industrial education given to Irish engineers and workers would turn out to be as valuable an asset to the country as the Shannon Scheme itself'.²⁹

There was one further early setback when the steamer *SS Arabia* sank at sea in a storm in March 1926.³⁰ The steamer had been bringing a big cargo of rails, sleepers and locomotives to Limerick, which was lost along with the lives of the nineteen crew members. Siemens was later to claim that this disaster impeded progress by three to four months.

As soon as the contract with Siemens was signed, the government set up the Shannon Board of Control, the main purpose of which was to monitor the progress of Siemens, to see that the conditions of the contract were properly enforced, to liaise between Siemens and the Irish government and help solve any Irish difficulties.³¹ The chairman of the board was the Minister, McGilligan, and its secretary was a young engineer who was later to be a long-serving member of the Electricity Supply Board, James Fay. This Board of Control had its offices at 88 Merrion Square and remained in existence until the scheme was completed.

One of the first problems facing the Board of Control was to find staff capable of dealing with Siemens in high-level negotiations. McGilligan persuaded the president of University College Galway to release the Professor of Civil Engineering, J. F. Rishworth, to act as Chief Civil Engineer for the duration of the scheme.³² Finding an electrical engineer of suitable calibre in Ireland was not so easy and eventually the board secured a leading American engineer, J.F. Sothman. As far as salaries and expenses were concerned, the Board of Control had to refer back to the Department of Finance and the



The artist Seán Keating, at work on one of his paintings of the Shannon Scheme during the initial excavation period. (The painting itself is illustrated in colour, facing page 100.)

Sothman case illustrates the types of constraint under which the board had to work in seeking first-rate staff.³³ Sothman had been receiving a salary of 30,000 dollars a year in New York, with generous expenses. He came to the Shannon scheme 'because the possibility of organising the complete electrification of a country appealed to [his] enthusiasm and [his] desire to show large results.' He was told that his salary in the Free State would be £2,000—a substantial drop—but when he arrived he found that he would have to pay £367 income tax on that. He had expected £2,000 net and the Shannon Board of Control took up his case with the Department of Finance for a salary of £2,367. Rishworth wrote to the board and the department that it was incredible that the government had got a man of Sothman's calibre and experience at that salary. He said too that it was incredible that Sothman should have been willing to carry on under the conditions he had to encounter since arriving. He had been obliged to do single-handed all the eight weeks' discussions and negotiations on specifications and prices with the Siemens representatives leading up to the electrical contract. Rishworth went on:

The fact has to be faced that on the electrical side the Scheme is wholly dependent on foreign engineers and if it is to be brought to a successful end such engineers must, within reason, be given the conditions they regard as consistent with their professional position. The Government is not in a position to force them to a bargain.

The Board of Control agreed with this. So did the Department of Finance, but only after a gesture worthy of that most parsimonious of departments. Yes, agreed the department, Sothman was cheap at the price: as he asked for £2,367, he should be paid £2,300. Sothman accepted, but the whole incident illustrated the difficulties under which the board worked in seeking to attract foreign expertise and this situation was not helped by the strict control maintained by the Department of Finance over expenses incurred on official business. The allowance was 25s. a day in Germany and Switzerland, even though Sothman was dealing with the heads of firms like Siemens and Krupps. But all of that counted for little with the men who ruled with an iron fist in Merrion Street.

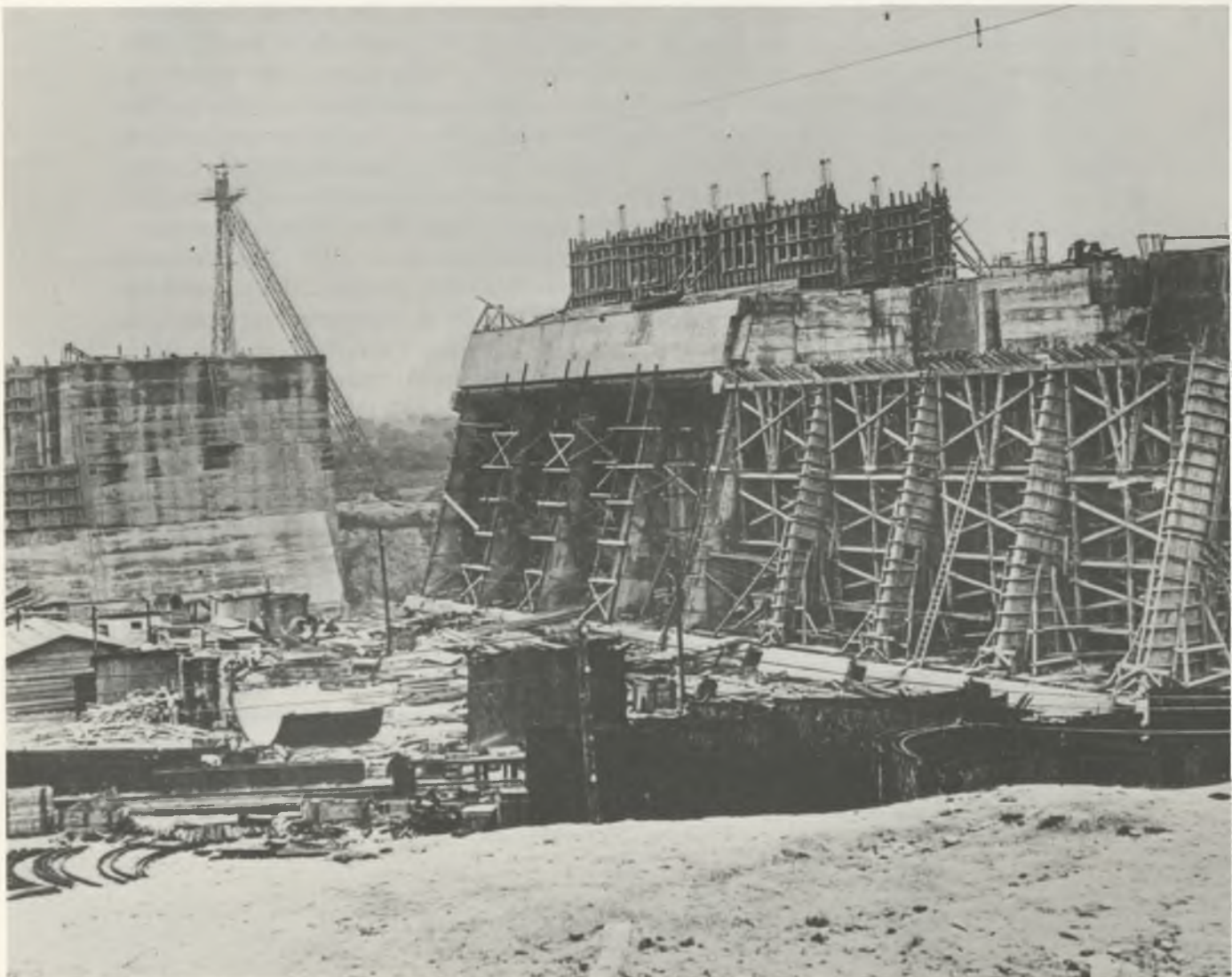
A serious row blew up between McGilligan and Siemens late in 1927. The Shannon Board of Control felt that Siemens was falling behind schedule and McGilligan, with his usual frenetic energy, was insistent that the scheme should be completed on time. In a letter to the Secretary of Industry and Commerce, Gordon Campbell, in July 1927, Siemens said that it could not finish on time and asked for six months' grace.³⁴ They attributed the delay to the strike which had lasted two and a half months, three months of bad weather, delays in the acquisition of land and 'the small output of the Irish workmen'.

McGilligan, after consulting with Rishworth, who had been permanently on the scheme, refused this request. In a very tough letter the only valid reason he would admit was the strike. He followed this up with a more gentle personal letter to Dr C. von Siemens on 18 October 1927 urging that the time schedule should be adhered to, 'for the prestige of the Government and Siemens'. Dr von Siemens assured McGilligan that 'the Shannon Scheme is far more for us than just a business problem—even national interests are at stake. This view is shared by everybody in our House.' McGilligan refused, however, to accept this plea for an extension, and in November was threatening to invoke the penalty for non-completion. Siemens replied with a twenty-page letter to Rishworth in January 1928 detailing the reasons for the delay. These included the strike

and the bad weather and also the loss of the *SS Arabia*, the fact that the main stores were burnt down in September 1927 with no possibility of replacements being found in Ireland, the extraordinary heavy rain of 28 October 1927 which caused serious damage on the site and the failure of the government to have the houses at O'Brien's Bridge evacuated as arranged. They mentioned once again 'the low working capacity of the Irish labour and the difficulty in getting skilled labour'. The government had not helped them in trying to get more skilled German labour, because permits were slow in coming and sometimes never came at all: 'one complete staff landed in Ireland and had to go back to Germany'. The letter berated the Shannon Board of Control for not having any constructive suggestions on how the work might be hurried up. It ended by asking once again for an extension of six months.

All this correspondence was private, but it is clear that rumours of possible difficulties were in circulation and in January 1928 J.C.M. Eason of Dublin Chamber of Commerce wrote to McGilligan saying he was about to refer to the Shannon scheme in a speech, and enquiring if everything was progressing on schedule. McGilligan replied that there had been 'some difficulties' but that matters were more or less on schedule.³⁵

The Shannon Scheme under construction.



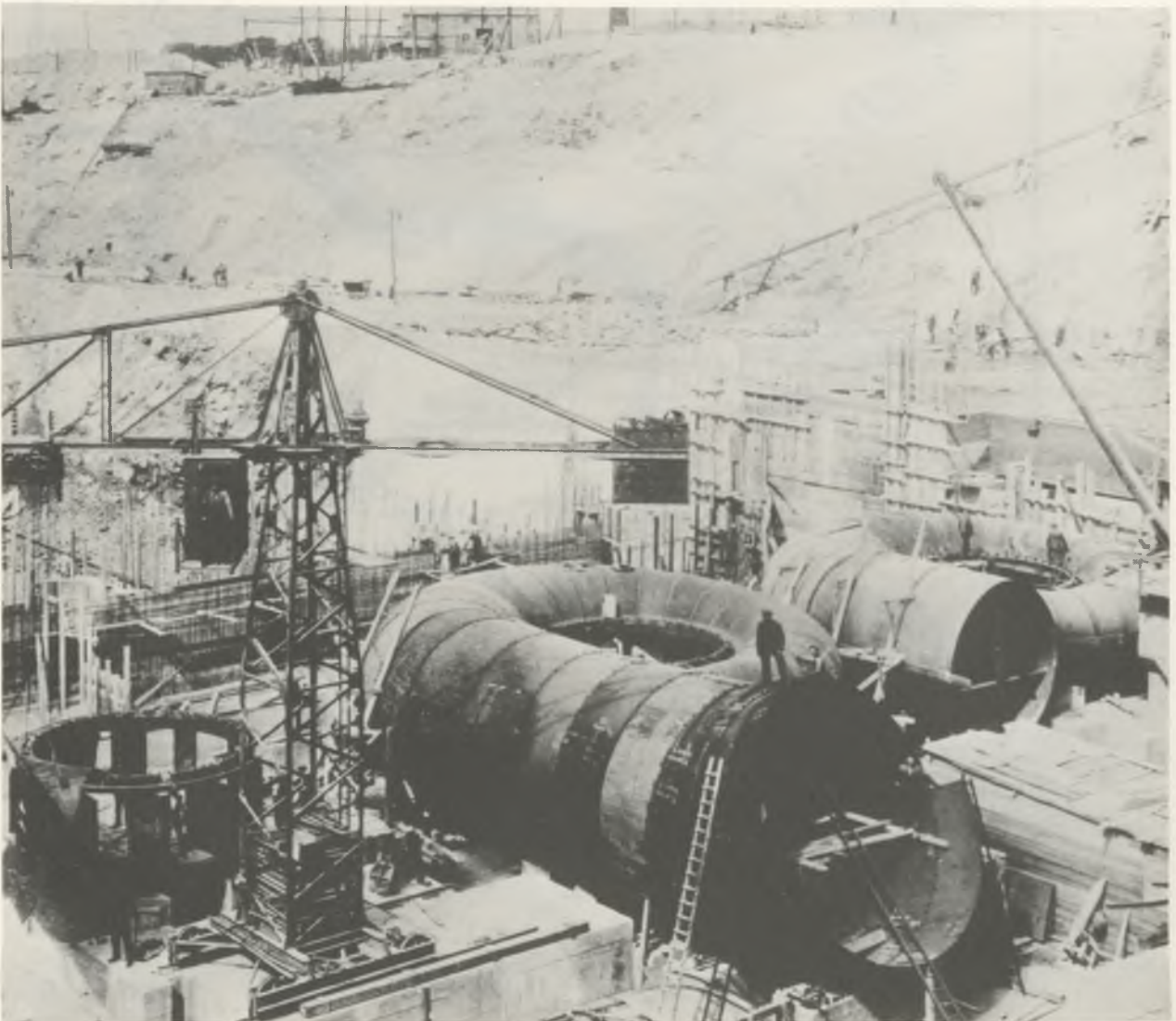
THE SHANNON SCHEME

Sharp exchanges continued between McGilligan and Siemens through the early months of 1928. McGilligan was clearly very worried that there would be a serious delay and he made this clear again to Dr von Siemens in March 1928:

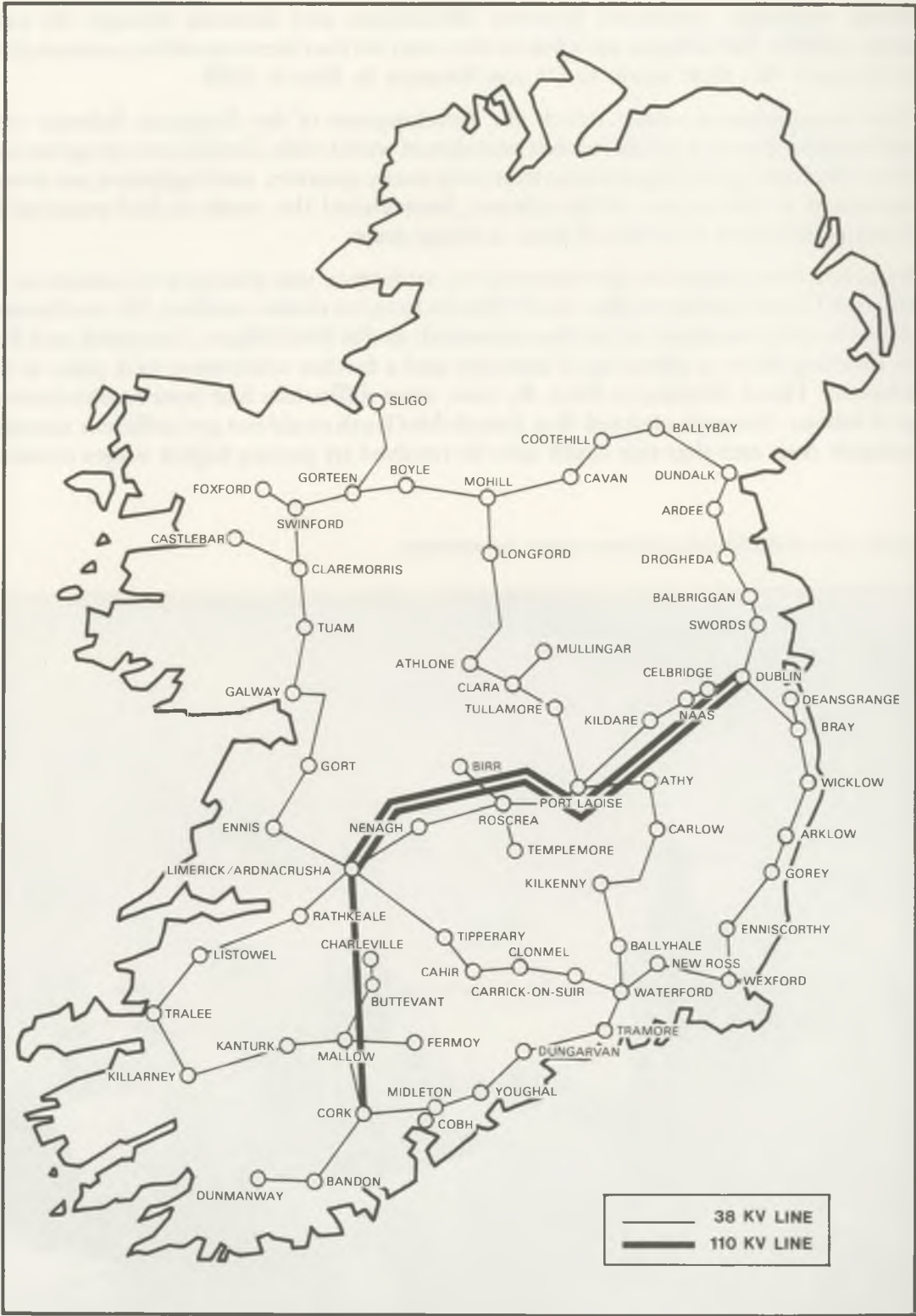
The circumstances under which the development of the Shannon Scheme were undertaken gave it a publicity that was almost world wide. Details as to progress have been received by my Department from very many quarters, and engineers, not always interested in the success of the scheme, have visited the works to find material for commendation or criticism of what is being done.

Relations deteriorated to the extent that a conference was arranged in London at the Irish High Commissioner's office on 19 March to try to resolve matters. Dr von Siemens and two leading members of his firm attended, as did McGilligan, Campbell and Fay. This meeting led to a softening of attitudes and a further conference took place in the Shelbourne Hotel, Dublin, in May. By now, most difficulties had been resolved except that of labour. Siemens claimed that Joseph McGrath could not get sufficient numbers of suitable men and that this could only be resolved by paying higher wages to skilled

A further view of the Shannon Scheme under construction.



ELECTRICITY SUPPLY IN IRELAND



The map indicates the areas served by the Shannon Scheme in 1929.

men and those doing very heavy work. McGilligan argued against higher wages, saying it was government policy to keep wages down in the interests of the national economy. He argued that they should employ more men rather than raise the wages and that they should provide better conditions for all the men, especially in the provision of food and drying facilities. Two weeks later von Siemens was again writing to McGilligan on this point arguing once more that McGrath could not get efficient men at the present wages. However, by now it is clear from the correspondence that cordial relations had been restored and that substantial progress was being made in catching up on lost time.³⁶

One major worry for the government during all this time was the physical security of the scheme. The very fact that the government saw the whole operation as being of such importance made it a prime target for subversive groups—or so the government reckoned. A conference in January 1926 between representatives of the Departments of Defence and Industry and Commerce and the Board of Works recommended that military protection of a permanent nature should be provided. This should include a barracks for three hundred men at Ardnacrusha and a detachment of the air force with two aeroplanes. There should also be a military post for twenty-five men at O'Brien's Bridge with anti-aircraft guns and in addition there would be a number of block-houses in strategic positions.

These grandiose plans foundered on the question of cost—should they be allowed, and if so which department should pay? The chief support for extensive protection came from the Department of Defence and it is hard not to suspect that department of using the Shannon scheme as an excuse to build up its own strength, especially since official government policy had meant severe reductions in all areas of the army over the previous two years. Thus the GOC of southern command in a memo in early 1926 warned 'that as private individuals can keep and use aeroplanes there is every reason to believe that organised criminals could use aeroplanes to carry out their intentions'. The Department of Finance, however, was not easily convinced. The correspondence dragged on and bit by bit the requests of the army were whittled down. By late 1928 the idea of a new barracks was abandoned. Finance was now agreeable to 'a ring of wires capable of taking a voltage sufficient to kill a man to be located at a distance of 300 yards all around the power house'. The memo added that 'this would provide very effective protection'. There was to be no more talk of aeroplanes or anti-aircraft guns and a memo in 1932 noted that 'the military ideas of Shannon protection, grandiose a few years ago, fizzled out... the whole affair looks bad and may eventually catch the eye of the Comptroller and Auditor-General'. This last point referred to a house which had been bought for officers but never used and was now being sold at a loss. 'We can only be grateful that the State has been spared the heavy and unnecessary expense on the erection of barracks.' Eventually, in 1933, the protection of the scheme was undertaken by the guards.³⁷

Another and very different problem arose in 1928 which might well have seriously impeded the final progress of the scheme—the problem of St Mo-Lúa's Oratory.³⁸ This oratory stood on Friar's Island, which was scheduled to be submerged when the scheme got under way. This provoked local protests, led by the Bishop of Killaloe, Dr Fogarty, who was a close friend of W.T. Cosgrave. For him, the oratory was not just an archaeological monument; it was far more important than that, 'because of its sacred character as the cradle, the religious cradle at any rate, of the Dalcassian race and of St Flannan and Brian Boru'.

The Shannon Board of Control called in the Professor of Archaeology at UCD, Dr R.A.S. Macalister, who argued that the preservation of the oratory was a matter of national importance. He proposed that the structure 'be re-erected on the Island on an elevated base, thus preserving its connections with its ancient site'. This proposal was entirely unacceptable to Dr Fogarty, who felt it

... would stand like a Noah's Ark in the waste of waters, inaccessible to all living things except the birds of the air and a few hardy individuals who would approach it with ropes and ladders and with the possibility of the whole structure toppling down on them.

Dr Fogarty wanted the building taken down, the stones numbered and re-erected on a new site. McGilligan agreed to this proposal in December 1928, and then ordered his officials to have the cost transferred to the Office of Public Works. On 21 July 1929 in the presence of a large crowd the last mass was celebrated on Friar's Island. It was also the first time in eight hundred years that mass had been celebrated there, and shortly afterwards the work of transferring the oratory to another site began.³⁹

Work was now sufficiently advanced for the official opening of the Shannon scheme to take place and the actual ceremony took place on Monday 22 July 1929.⁴⁰ In spite of the

President Cosgrave with his family and Patrick McGilligan (second from right) at the official opening of Ardnacrusha Power Station, 29 July 1929.



rain, which fell heavily all day, it was one of the high points in the life of the Cosgrave administration. The entire executive council, many members of the Dáil and Seanad, including the leader of the opposition, Éamon de Valera, virtually the entire diplomatic corps and leaders of industry, commerce and the professions from all parts of the country were present. There was considerable international interest and the event was covered by journalists from all parts of Europe and reports appeared in virtually every state of the US along with feature articles and editorials, usually under headings like 'Dear Old Shannon' or 'Where the River Shannon Flows'.⁴¹ Even the *Church of Ireland Gazette* covered the opening, seeing in the scheme 'a challenge to the people of the Free State to show themselves enterprising and industrious'.⁴²

The opening ceremony consisted of a special blessing by the Bishop of Killaloe, Dr Fogarty, followed by a *Te Deum*. President Cosgrave then touched a switch and the water began to trickle through into the canal. He declared, 'Henceforth the Shannon will be harnessed in the service of the nation, distributing light, heat and power throughout the Saorstát, increasing at once the comfort of our homes and the productive capacity of our farms and factories.'

By October of 1929 the power station at Ardnacrusha was generating electricity, but there remained one further bitter quarrel between McGilligan and Siemens, this time over the final costings.⁴³ A note in Berlin newspapers in January 1931 claimed that Siemens were in dispute with the Free State government over the final cost of the project. The Germans claimed that a number of 'extra costs' had arisen and claimed an extra £750,000 on the £5m. already paid. The Free State government refused, and after considerable controversy Professor Meyer Peter, one of the original experts, was asked to adjudicate. Meyer Peter judged that £163,580 should be paid to Siemens and the executive council regarded this as fair—and immediately offered £150,000. After further wranglings, Siemens—in February 1932, in the dying days of the last Cosgrave administration—accepted the government's offer, even though they did not regard it as 'adequate to recoup them for the additional expenditure which they incurred... nevertheless... they were... and are... most anxious to avoid any dispute with the Government of the Free State arising out of the great engineering achievement of the Shannon Power Scheme'.

In other words, the Cosgrave government had driven a hard bargain, and kept to it. It had confounded the gloomy prophecies of Ireland's financiers and engineers. It had defeated the unions and extracted labour at a cheap price and then to crown it all had placed one of Europe's oldest and biggest engineering firms in a situation where it had performed a great feat of engineering skill at little or no profit to itself. For a new administration, with no background in government or business affairs, it was a considerable achievement, which reflected especially on the single-mindedness, toughness, skill and at times ruthlessness of the Minister responsible, Patrick McGilligan. The *Manchester Guardian* described his role thus: '... he showed excellent judgement combined with a certain fortunate obstinacy, complete intrepidity and a wholesome ruthlessness in arranging for its execution, and in breaking down every sort of opposition.'⁴⁴

But most of all, the Shannon scheme was seen both at home and abroad as a concrete, tangible proof of Ireland's independence and separate statehood—a point taken by, among others, the *Financial Times*:

THE GOVERNMENT AND FREEDOM OF THE PRESS: By Candidus

DAILY SKETCH

INCORPORATING THE DAILY GRAPHIC

No. 6,375.

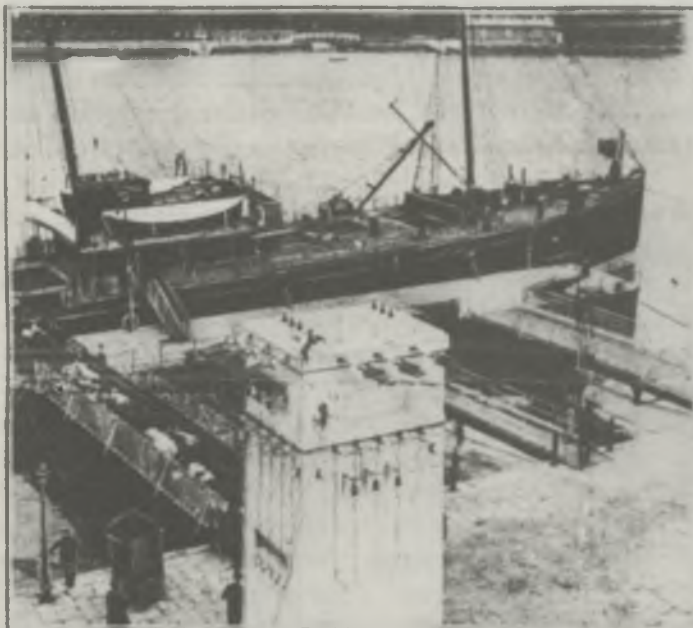
(Published on
at 10.00 a.m.)

WEDNESDAY, MAY 14, 1930.

ONE PENNY.

ARE YOU
READING
OUR NEW
SERIAL?

SHANNON LIGHT AND POWER AT WORK: FIRST PICTURES



Now, that the Shannon hydro-electric power scheme is in actual operation throughout the Free State, people of all classes, in urban and rural areas alike, are realising the advantages of electricity for light, heat and power. This daily sketch photograph, taken from Brinsford's Tower, Waterford, shows in the foreground one of the city's six transformers for the local distribution of "Shannon Light."



Shannon power applied to an Irish industry. An electrically operated shovel and hopper at work near Yellamore, cutting peat.



Mr. T. Girard, the chief operation-engineer at the Lichmanoch power station on the Shannon.



Mr. T. P. O'Connor, an expert plant operation-engineer at Ardara.



Mr. Thomas McLoughlin, who has been in the forefront of the Shannon. He is the Electricity Supply Board's managing director.



A Christian monk at Roscrea Abbey, switching on the electric power used on the Abbey farm.



"Throwing over" the last of the main switches by which Shannon power is brought into operation. Here Daily Sketch pictures its middle pages.

The *Daily Sketch* carried an illustrated feature on the Shannon Scheme shortly after electric power from it began to be used throughout the country.

For half a century the country under the British regime toyed with the suggestion of harnessing the Shannon. The British are a hardheaded and practical folk, but they jibbed at such a venture. Then the Free State came into being, and ardent untried administrators, remembering that they had always been accused of being dreamers, seized on this chance of showing what they can do.

So they flung themselves on the Shannon scheme, though never forgetting the practical benefits they hoped to realise from it for the agricultural and industrial development of the land. The President and his colleagues are the shrewdest of psychologists. They have had thrown on their shoulders the not easy task of breaking what is in reality an enormous inferiority complex and the Shannon Scheme is one—and probably the most vital—of their methods of doing it. . . . The faith of the Free State in its nation-wide hydro electric venture is as steadfast as a religious belief.⁴⁵

Establishing the ESB

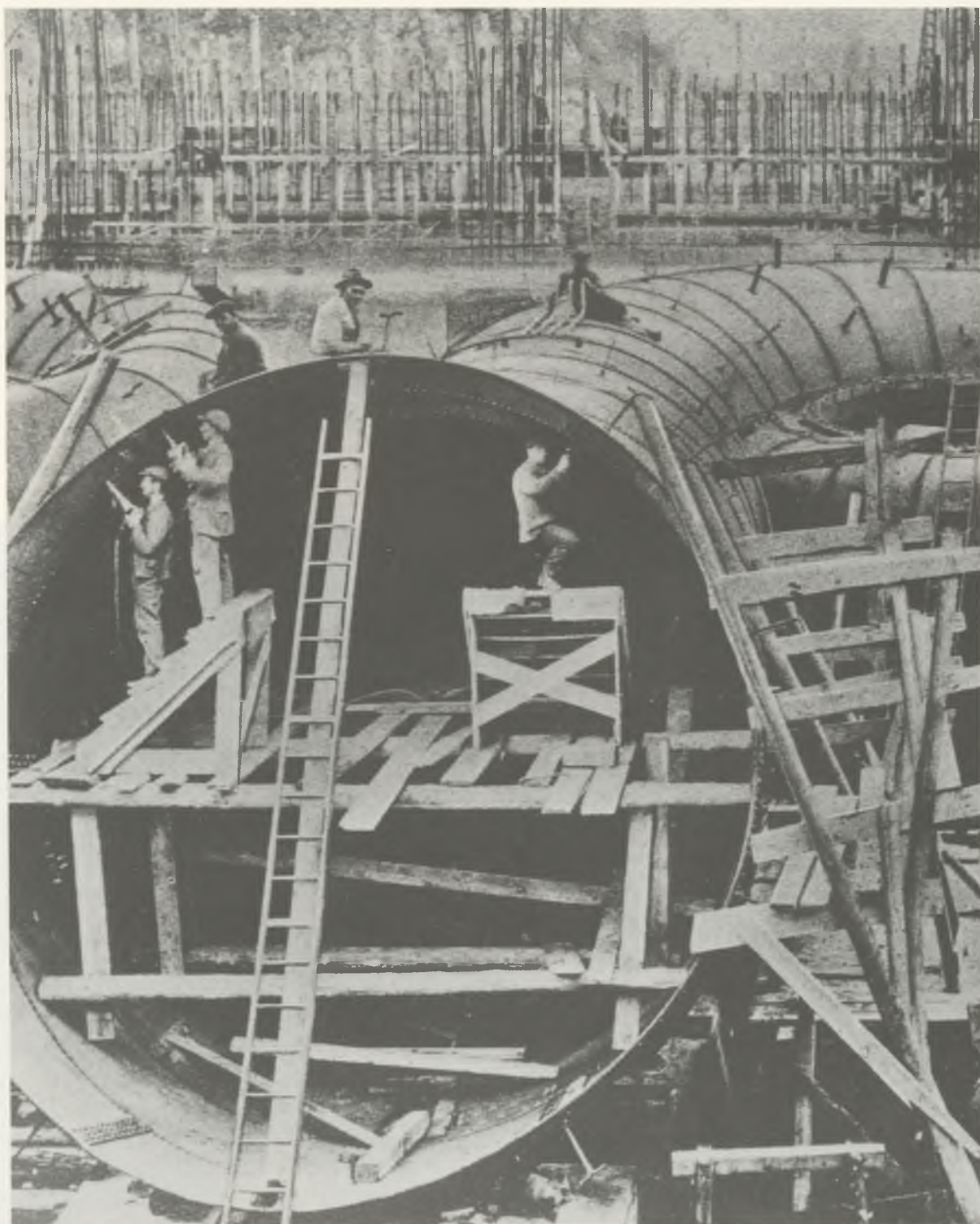
THE successful building of the Shannon scheme meant that the Saorstát government had set in motion the electrification of the state and this, the most spectacular aspect of the operation, was also in some ways the most simple and straightforward. The government now had to decide on the type of board of control it wanted for the new enterprise and the powers and composition of such a board, and to brace itself for the inevitable clashes its plans would provoke with the various vested interests, especially the existing undertakers. It had to frame this new legislation without the benefit of precedents with nothing in its short administrative history to guide it.

The size of the problem was quickly apparent to McGilligan. His departmental advisers were instructed to gather information on all existing organisational models for public utilities in other parts of the world and in particular to concentrate on countries with structures and problems most closely resembling those in Ireland. He had available for his guidance a draft scheme prepared by one of the experts, Dr Borgquist, under the rather quaint heading 'Proposal for the Organisation of an Irish Board of Waterfalls'.¹ McGilligan, along with the Secretary of the Department of Industry and Commerce, Gordon Campbell, visited the USA in late 1925 to discover as much as possible about the different types of organisation there and to examine the possibilities of having the new Irish scheme either financed from the US or actually taken over and run by a large American concern.

Obviously at this stage McGilligan's mind was still open about the type of organisation which would eventually emerge. He was, however, very clear on one thing and this is repeatedly emphasised in the memos which passed between him and the executive council and between him and his senior officials at this time. This point was that 'the whole success or failure of the Shannon Scheme depends on its ability to provide a cheap supply of electricity to as many consumers as possible and that this objective must never be lost sight of in the search for a proper organisation'. McGilligan was certain that 'the secret of a cheap supply was to be found in the control and supervision of distributive undertakings'.²

The first major question to be decided was whether the new enterprise would be under public or private control. McGilligan had little faith in either the ability or the entrepreneurial zeal of the Irish banking and business community, yet, given the economic and commercial orthodoxies of the 1920s, it would not be possible for him to reject some form of private control out of hand. Thus, part of his reason for visiting the United States was to see if some commercial firm could be found willing to run the new scheme on conditions acceptable to the government. Already a number of US firms had expressed interest in the new scheme, which had received extensive publicity in the US.

McGilligan approached this task with some caution. The object of his approach was to have as many firms as possible making competitive offers so that the best possible terms could be obtained. The commercial presence of the Free State in the US consisted



Spiral casing of turbine under construction at Ardnacrusha.

of only one trade agent, so the whole question of evaluating information raised immediate operational problems as McGilligan noted in a memo to the executive council:

Electricity corporations in New York had so many ties and affiliations with other corporations and financial houses and were so inextricably inter-linked by exchange of directorships and other more secret exchanges that it was considered advisable to take advice on the spot.³

McGilligan was fortunate in being able to get the help of James A. Farrell, chairman of the US Steel Corporation, a man who had already helped the Free State government in other matters, and who was described by the Free State trade agent, Lindsay Crawford, as 'only waiting a good opportunity to show his pride of race in some practical form. He has arrived at an age where there are no more fields of conquest to survey and is proud of the fact that he has succeeded as an Irish-American.'⁴

A general view of the works at Ardnacrusha.



In spite of this assistance, the terms being asked by the Free State government were such that much of the early interest evaporated. There was going to be no quick killing, no easy monopoly, no complaisant politicians. In particular most of the big corporations objected to the government's stipulation that unprofitable rural lines might have to be built without any guaranteed government subsidy and there were fears of slow growth of the load and of excessive deficits in the early years. Faced with these possibilities, many firms simply lost interest. In a few cases McGilligan was offered outright bribes to change the conditions and on one occasion an offer was made to bribe the entire cabinet!⁵

Eventually only two serious firms remained interested in the government's terms—the Long Island Lighting Company and a European-American consortium based in Brussels. The more serious of these was the Brussels-based firm and it sent its own experts to the Free State to evaluate conditions in early 1926. But no definite offer had been made by mid-1926 and McGilligan was clearly impatient. He told the executive council that distribution legislation had been held up and that if there was much further delay



the 'chance of a State or State controlled organisation achieving success in distribution will be rendered very remote'.⁶ In fact, it appears that McGilligan's American experience combined with his researches on the existing situations in other countries had convinced him that there was little future to be gained from any link-up with private enterprise.

A Department of Industry and Commerce paper prepared for McGilligan at this time showed some of the practical difficulties involved and the size of the challenge facing 'a regulated private organisation, should such an organisation be found'.⁷ It would 'need large capital resources with which to buy out on fair terms existing distributions and to finance subsequent extensions . . .', which was hardly possible from Irish resources. Any organisation 'taking up distribution in the Saorstát, where the use of electricity is in its infancy, would be acting as a pioneer'. This was not something which could be easily entrusted to a private organisation.⁸ But he had at least tried—something which he could always throw back at his critics. Moreover, even if he had found a suitable firm, there was another complication, which he pointed out in a memo to the executive council:

Even if good offers from private organisations had been received, these would have to be examined in the light of the principles involved in handing over to *foreign* interests complete control of a service which has come to be regarded almost as an essential service, in allowing foreigners to control such matters as the supply of current to rural areas, the supply and cost of power to industry and all determinations as to tariff policy with the obvious consequences on such selected matters as the development of a home manufacturing and electrical construction industry and the training of native engineers for, and placing them in responsible posts.⁹

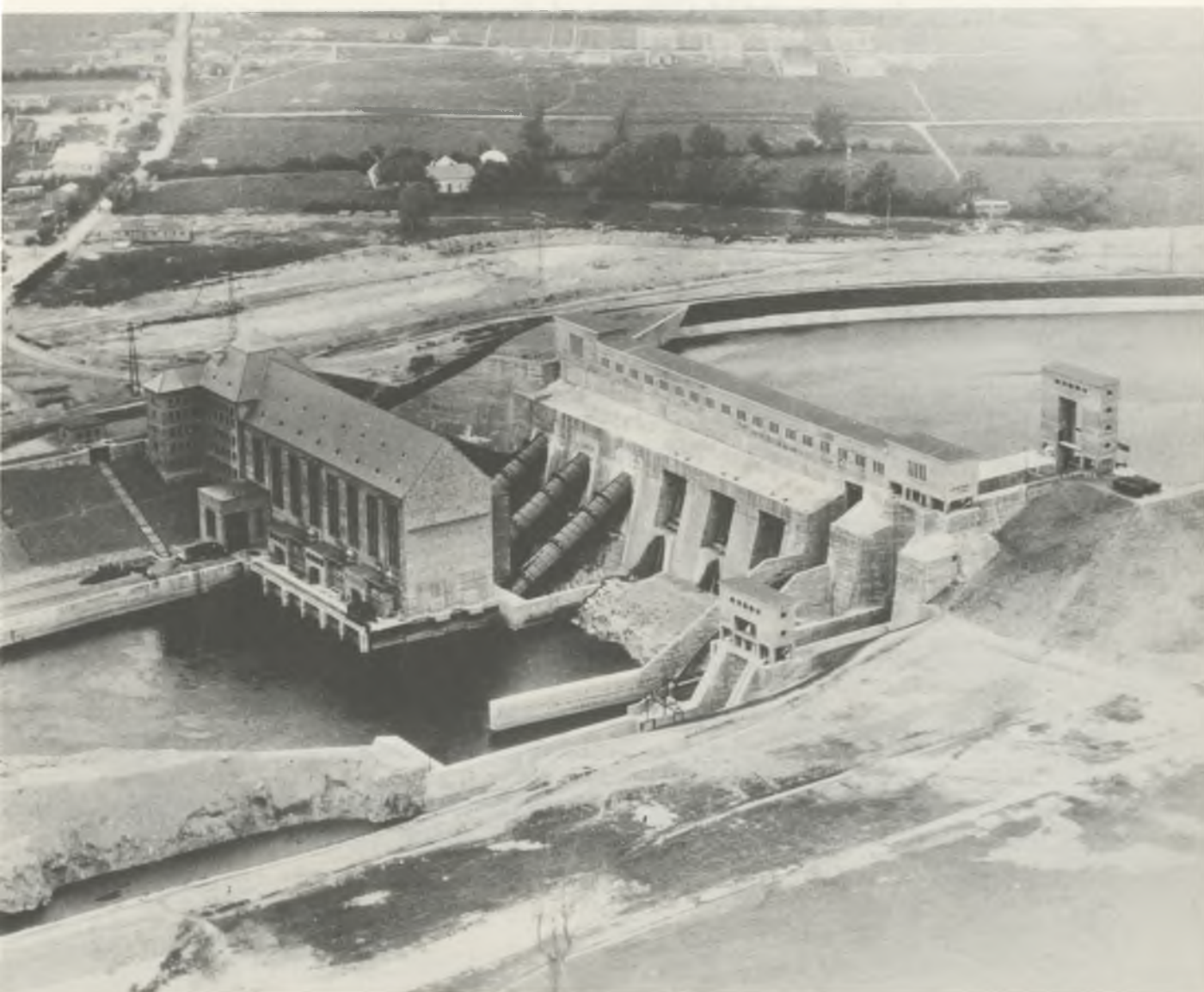
So, if private control, even 'regulated private control', was out, the answer had to be some form of government control. As McGilligan was later to say, he had discovered eight or nine different forms of governmental control in the US,¹⁰ but early on he had to decide between two broad types—a separate department of state or something completely new.

McGilligan's own views on this point were easily established. He did not want to see the enterprise entrusted to a government department and to civil servants. His early experience in London had given him little confidence in the business methods of civil servants, especially those cast in the Department of Finance mould.¹¹ He clearly stated his views on the general unsuitability of civil servants for this sort of work in a number of papers and they were accepted by the government, but only after they had ruffled some senior civil service feathers, as a rather pained memo from H. P. Boland, Assistant Secretary of the Department of Finance, indicates. McGilligan had referred to the 'inefficiency inherent in the system of State service because civil servants are allowed the privilege of permanent entrenchment irrespective of the quality of service rendered'. Boland agreed that this was 'a popular belief, but inaccurate and misleading', and followed up with a long defence of the civil service.¹² This brief altercation quickly passed and McGilligan, the executive council and the senior civil servants were soon in general agreement on the need to find something other than a civil service department to run the new enterprise. The problem was to find some sort of board of control which would have operational flexibility and still be ultimately answerable to public control.

By the end of 1926 McGilligan's own mind was beginning to clarify on what exactly was needed. A memo prepared by him at this time outlined his views:

What is wanted is a Board that will specialise in the sale of electricity, conducting as a minor operation the production and transmission of power in bulk. It should have control of sufficient funds for all that the retailing of electricity will involve, for example, propaganda, building of a distributive system, acquisition of stand-by plants, renewal or overhaul of existing systems, loans, etc. and should be constituted of a few men to whom such control can be entrusted without any check beyond the obligations to submit an annual estimate, to undergo audit of its expenses by the Comptroller and Auditor-General and to present an annual report of its proceedings to the Oireachtas, open to debate in either House. It should present a yearly estimate to the Oireachtas, to be considered by a specially appointed Committee of the Dáil before which the Board could appear, and where the Department of Finance could put forward its criticisms of the estimates. The report of the Committee to the Dáil

Ardnacrusha Power Station, completed, showing navigation lock, head race and tail race.



should recommend or modify the Vote asked for, it being open to the Government, if it disagreed with the Committee's Report, to move through any Minister for an amendment of the Vote as reported. The Board should be free to spend at its discretion up to the amount of its annual Vote, with a power to vary its expenditure under different items in the Vote as thought fit, subject to having to justify the exercise of this power in its Annual Report, and to being open to refusal of particular items in its next Annual Estimates by the specially appointed Committee of the Dáil.¹³

McGilligan's proposal of a parliamentary committee with powers to question the activities of the Board proved to be a non-starter, and ironically had to wait nearly half a century before being seriously revived by the government. It was strongly opposed by J.J. McElligott, in a memo to the executive council in January 1927.¹⁴ He argued that such a committee would have to be unlimited in its powers and it might be used for political and other ends not compatible with the pursuit of a business policy by the Board. It might conceivably occupy much of the time and energy of the managing director and members of the Board: 'Even the British who are so jealous of parliamentary control have no such provision.' In the event it was McElligott's and not McGilligan's view which won this particular battle.

In the memo already quoted McGilligan had clear and very severe views on the responsibilities of Board members. The members would be appointed for a limited period, but could be re-appointed. They would be paid and would be expected to be full-time.

Their term of appointment should then be for whatever period is thought reasonable within which to raise total consumption to the total power output. Failure to do that should be regarded as indicating incapacity on the part of the Board and the need for new appointments. Members of the Board should appreciate what was expected of them before they accepted appointment.¹⁵

McGilligan also argued at this stage that the Board should have the sole control of appointments to its staff, except that 'in some senior posts the appointment might be subject to the concurrence of the Executive Council'.¹⁶ He urged that in the early years all appointments should be temporary so that they would be on the same footing as 'a commercial undertaking dependent on results'.¹⁷

McGilligan did in fact modify some of these views when he came to draft the bill but he was conscious that if a drastic arrangement was not adopted the whole venture might fail:

... if the selling instrument is not equal in quality to the producing instrument, the courage and vision that adopted the Shannon Scheme will have failed in their purpose through timidity and irresolution in the later stages of the project. The doubling within a few years of the existing consumptions, with the biggest markets already largely exploited, is a task of at least equal magnitude to the construction of the plant and full of greater complexities.¹⁸

McGilligan wanted a Board strong on technical expertise, with set targets and with the muscle, dynamism and freedom to achieve these targets. On this last point he had to fight off a strong attack from the Department of Finance, where some of the top advisers were opposed to the idea of public monies being expended without detailed control from the Department of Finance. McGilligan, however, argued that the sort of efforts

required to make a success of the venture 'cannot be effectively exercised under the restrictions applying to departmental finance or indeed under any restrictions except those of business judgment, directly responsible to the Oireachtas. The risk of loss involved in eliminating ordinary control by officials at Finance is small.'¹⁹

The group that had most to lose from the establishment of a centralised distributing authority was of course the existing undertakers, both statutory and non-statutory. These undertakers were strongly entrenched in various chambers of commerce throughout the country, had a number of spokesmen in the Dáil and had strong support from the *Irish Times*. In addition the fact that fifteen of the statutory undertakings were also local authorities introduced an element of political controversy, of 'big government versus local government'. At first, McGilligan was not totally committed to the idea of the new Board having a monopoly of distribution and at an early stage felt that 'while the Board would be entrusted with the business of distribution throughout the Free State it would be obliged to work through local agents where these agents rendered a satisfactory service.'²⁰

The more McGilligan examined this question, however, the more he moved away from this point of view, and the more he moved away from it the more vocal became the opposition from the undertakers who saw themselves threatened with extinction. The position was that there were about ninety undertakings in the country. The figure is imprecise because some small generating plants claimed to be non-statutory undertakings but were of little real consequence in that their main function was simply to generate electricity for a shop or a mill. Of the ninety mentioned, twenty were statutory and fifteen of this twenty were municipally owned. In spite of some obstruction from the Electricity Suppliers Association, officials from the Department of Industry and Commerce began to gather information about these ninety undertakings in order to get a comprehensive picture.²¹ It quickly became clear to McGilligan and his advisers that if they were to depend on the non-statutory undertakers for the distribution of Shannon current then the whole scheme would be in immediate jeopardy. According to the evidence collected by the Department of Industry and Commerce:

... these non-statutory undertakings have always been run purely for profit and in the vast majority of cases have given a very poor service and have been badly run ... their enterprise in the past has generally been of such a nature as to leave one to doubt very much whether they are likely to handle Shannon current in a competent manner. It is in fact probably worth considering whether the interests of the State do not require their complete acquisition by the Shannon Board.²²

That in fact was the policy eventually decided on, though the whole process was to prove long, difficult and controversial. The Industry and Commerce memo just quoted warned that while the acquisition of these plants would be of little value to the new Board 'because of their generally poor quality they might nevertheless be obliged to accept exorbitant conditions from the undertakers because of the need of ensuring a proper supply to the areas controlled by these undertakings.'²³ That same memo went on to warn that if the Board was not given powers 'to acquire these undertakings compulsorily it could find itself in a rather hopeless position in the matter of promoting the sale of current', but it also made the point that the sale and pace of acquisition should be left to the Board so that it would not find itself 'burdened overnight' with a huge number of undertakings.

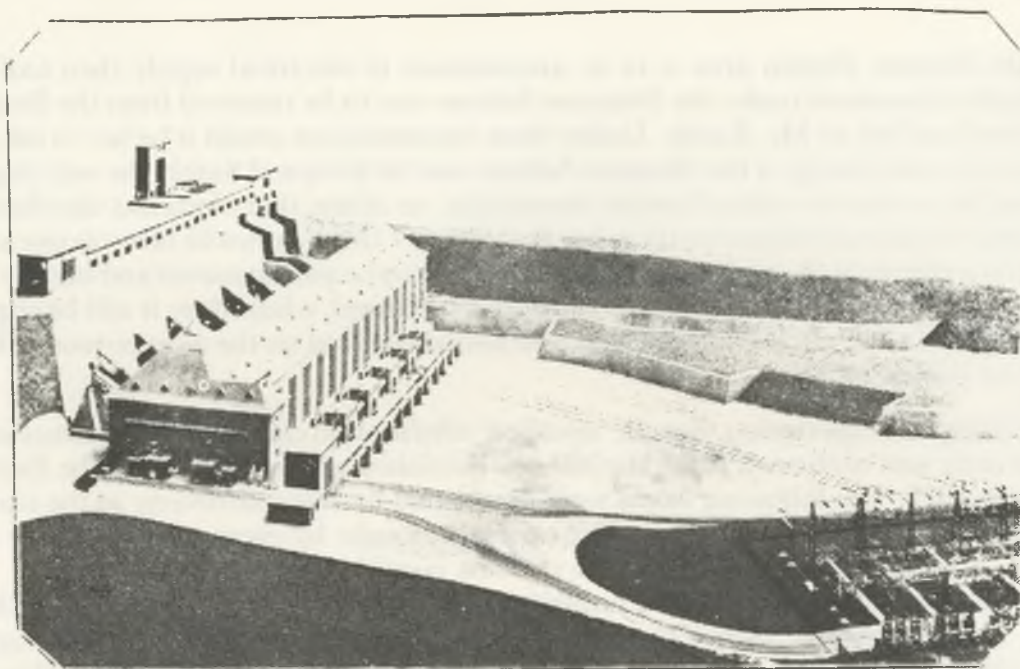
The fifteen municipally controlled undertakings offered the least difficulty. The sense of municipal pride and rivalry which had characterised English politics and which made a rationalisation and amalgamation of small authorities so difficult was not really present in Ireland. In fact, Irish local government was probably at its lowest point ever in the 1920s, because of incompetence and corruption. Not surprisingly, the various local authorities failed to raise any substantial body of public opinion in their defence apart from councillors and businessmen opposed in principle to the concept of big government. In spite of this lack of public support the municipal spokesmen, or a small section of them, sustained the controversy over a period of months. The argument that the new Electricity Supply Board should pay compensation to the municipal authorities was dismissed out of hand by the government. It was claimed by the department that ultimate control would still be with 'the people'—held in trust for them by the ESB rather than by the local authority. It was argued that 'in view of the general movement towards more central control of municipal government it would seem the obvious course to simply hand over the municipally owned undertakings to the Board'. The other five statutory undertakings would be compulsorily acquired.

The more McGilligan and his officials looked at this question the more they became convinced that the only course open to them was to give the new Board powers to acquire all undertakings compulsorily as they needed them, and that a fixed method of assessing compensation with an agreed arbitrator should be established. Time was very quickly to show that this proposition was extremely contentious, both in principle and because of the suspicion among undertakers that the arbitrator would not be impartial.

The biggest single problem was Dublin. As has been noted earlier Dublin Corporation and leading businessmen, including Sir John Purser Griffith had opposed the development of the Shannon, favouring instead the Liffey and concentrating on developing the Dublin area. Now with the new 'confiscation clauses' and the likely end of an independent Dublin system, this lobby swung into action again. Early in 1927 Dublin Chamber of Commerce recommended that Dublin, Rathmines and Pembroke should remain separate and each should continue to administer its own undertaking without any central control from the new Board. McGilligan expected a strong battle on this point but as a paper he had prepared by his officials and which he was to use in the various debates shows, he quickly realised that he could not give way. The paper was headed 'Nett Results of the non acquisition of the Dublin and suburban municipal undertakings' and it showed that if the three statutory authorities in Dublin were allowed to continue, then the new Board would have to try to provide separately for Howth, Blackrock, Dalkey, Killiney and other adjacent areas. It was argued that this would be wasteful from an economic and technical point of view and would involve anomalies in the rates and extensions.²⁴ McGilligan himself argued that

... electricity distribution has reached the stage that it no longer respects land frontiers. Much less so can it afford to respect parish boundaries... to suggest that Dublin City, Rathmines and Pembroke should have their distinctive electoral areas retained is just about as sensible as to suggest that a separate tramway system should be set up for each or to suggest that the Dublin Gas Undertaking should be broken into a number of distinctive companies.

McGilligan concluded:



THIS MODEL OF THE SHANNON WORKS

You'll see at the Show in Ballsbridge.

Have you seen our show of Electrical Fittings and Appliances at 25, St. Stephen's Green?

The model is a perfect reproduction of a wonderful engineering feat.

Our collection of Fittings and Appliances—selected from the most up-to-date American, British, French and German models—has been assembled with the aim of selling you the most perfect means of making use of the wonders of the Shannon Power.

Our Showrooms are only two minutes' walk from Grafton Street—just beside the Shelbourne Hotel. The No. 10 or 11 tram will leave you at the door.

ELECTRICITY SALES SHOWROOMS

Electricity Supply Board

25 ST. STEPHEN'S GREEN . . . DUBLIN

An early ESB advertisement for the Shannon Works. The model was exhibited at the Spring Show in Dublin.

If the Greater Dublin area is to be autonomous in electrical supply then half the possible consumers under the Shannon Scheme are to be removed from the Board's control and left to Mr. Kettle. Under these circumstances would it be fair to ask any Board to take charge of the Shannon Scheme and its fortunes? Surely the only logical thing is to cease to talk of parish boundaries, to admit that electrical distribution cannot be planned subject to them but that Greater Dublin must be taken as one area, that the electrical supply departments within it must be amalgamated and like the rest of the country made subject to a Central Control Board, whose duty it will be to plan out distribution, not on the basis of parish boundaries but on the most economic lines to the consumer.²⁵

McGilligan's expectation that the so-called 'confiscation clauses' would attract most controversy was confirmed when the bill was published and introduced to the Dáil on 9 March 1927. The following weeks were dominated by this controversy as the undertakers, threatened and fearing for their existence, fought by every means, private and public, if not for their lives at least for the best possible compensation.

At one level McGilligan found himself engulfed by letters from local undertakers, often working through their TD. A typical example is this one from the 'Monaghan Lighting Company Ltd., Gas and Electricity' sent to McGilligan through the Minister for Finance, Ernest Blythe, who was also TD for Monaghan. The letter was unlike much of the public controversy in that its whole tone was reasonable, puzzled and unsure:

In 1920 the people of Monaghan subscribed £9,040 and started this company. Since then over £400 has been spent upon extensions... supply has been satisfactory... the price (10½d. and 6d. per unit) is lower than in any neighbouring towns. We are now in a sound financial position. Many shareholders are not in affluent circumstances and if they wanted to dispose of their holdings I doubt if they could get an offer. That is because of the Bill. We should all like to help forward the Shannon Power Scheme but... are worried as to our own future.

The specific points of worry were whether there would be compensation for power house and machinery, to which McGilligan answered, yes; and whether the government would erect transformers in towns supplied by direct current and if not whether there would be compensation for the meters that would have to be scrapped, to which two questions the answer was also, yes. The letter ended: 'We ask for nothing only what we feel the Government is trying to give and that is *FAIR PLAY*'.²⁶

With queries like this McGilligan was prepared to be patient but he clearly suspected the motives and sincerity of many of the other protesters. He was not alone in this view—the Irish correspondent of the *Round Table* referred to 'the loud and artificial outcry'²⁷ raised against the Minister's proposals, and the headlines and editorial comment in the *Irish Times* and *Evening Mail* typified this 'outcry'. The most extreme opposition came from the *Electrical Times*, not surprisingly, since it spoke for the Electricity Suppliers Association:

The bill is a rich phantasmagoria of fatuities so impracticable that one hopes even the F.S. Dáil will pause before casting its electricity supply industry into such a hopeless morass. Electricity supply is at present one of the very few healthy and promising industries that Ireland possesses. Why assassinate it?²⁸

An *Irish Times* editorial on 2 April referred disapprovingly to the 'Socialism' of McGilligan's scheme, attacking his handling of the bill and claiming that the bill was confiscatory. This theme was repeated in various forms over the next couple of weeks. Comparisons were made with Russia on 5 April. 'Confiscation and Robbery' was the heading on 6 April. Once again McGilligan was accused of impatience and intolerance in his handling of the bill.

The *Irish Times* made no secret of the fact that it was endorsing the view of the 'leading Dublin businessmen' in whose business ability and judgement it obviously placed more trust than it did in the abilities of a young Minister with no business background. Just as the opponents of the Shannon scheme had used the correspondence columns of the newspapers in 1925 to register their opposition the opponents of the new bill also sought recourse to the same medium. For months on end the letters columns were dominated by protests against the bill, with the writers usually claiming some special expertise but never—or rarely—actually signing their names, using instead *noms-de-plume* obviously designed to show evidence of this expertise. Thus there flowed a stream of letters from 'Dynamo', 'Apex', 'Omega-Squared', 'Ohm Watt', 'Hasten Slowly', 'Memo' and others.

Much more subtle and serious were the private pressures exerted on McGilligan. Sir John Purser Griffith tried hard to make him change his mind and L.J. Kettle warned Kevin O'Higgins that the Shannon scheme could not succeed without the co-operation of the private undertakers.²⁹ The biggest row, however, was with the Dublin Chamber of Commerce. McGilligan's attitude appeared at times somewhat cavalier and he angered the President of the Dublin Chamber of Commerce, J.C.M. Eason, by refusing to speak at a meeting because he felt the minds of the chamber were already made up.³⁰ He did finally speak to the chamber on 13 April, but only after an earlier meeting at Rathmines had broken up in disorder, with the Minister being shouted down.³¹

McGilligan did eventually make some concessions, including better compensation terms, but refused steadfastly to give way on the central principle of compensation for statutory undertakings. His strong stand here was undoubtedly made easier by the fact that he had the backing of a totally united cabinet on this whole question. A note from the Post-Master General, J.J. Walsh, on 8 April 1927 is particularly interesting. He urged McGilligan to 'hold firm in your present resolve that every step from "the cradle to the grave" in the electricity transmission should be the sole monopoly of your Board—even to the extent of having your own staff for the installation and maintenance of house equipment.'³²

McGilligan then was clear in his own mind when he introduced the first reading of the Electricity Supply Bill on 9 March 1927. It was to be the last major piece of legislation of that Cosgrave administration and came at the end of one of the busiest ever Dáil sessions. The entire processing of the bill through Dáil and Senate took only three months, but the various debates were followed closely both in the Oireachtas itself and in the press, and all stages were characterised by controversy and a certain degree of acrimony, especially on the aspects dealing with acquisition of existing undertakings and compensation.

The acrimonious note was evident early on. It is normal parliamentary practice that a bill is not questioned at the first stage, which is merely a formality. This time, however, that practice was not observed. Alfie Byrne, who was a staunch champion of Dublin's independence, accused McGilligan of trying to rush the legislation through and of not



90,000 HORSE POWER

Of energy will be available from the Shannon Electrical Power Station next year for Irish Industry and Irish homes.

The American workman is the most prosperous on earth, because he has, on an average, three horse-power, the equivalent of thirty human slaves, helping him to produce.

No wonder he can toil less and be paid more than the workman of other lands. He is not a toiler, he is a director of machinery.

Wages and prosperity are determined by output, and the use of electric driven machinery is the key to the maximum of production with the minimum of effort. It is the secret of successful industrial organisation.

The Shannon is being harnessed to enable the Irish industrialist and the Irish worker to use that key.

Shannon electricity will lift the heavy work of industry from human shoulders to the iron shoulders of machines.

The Great Southern Railways are issuing return tickets at single fares (available for 3 days) from all stations to Limerick. Conducted tours daily by I.O.C. buses. Permits for private parties issued on application to The Guide Bureau, Strand Barracks, Limerick.

THE ELECTRICITY SUPPLY BOARD

ESB advertisement (1928).

consulting properly with the Electricity Suppliers Association (for whom Alfie Byrne claimed to speak).³³ McGilligan did, in fact, agree to talk with the Electricity Suppliers Association, but only on details, not on the general principles of the bill.³⁴ The question of whether the whole enterprise would be state-owned or in private hands was raised by Major Bryan Cooper, who felt that this was a question of fundamental importance and too big to be rushed through. When McGilligan refused to give way on this point, Cooper took the highly unusual step of challenging the first reading of the bill. Cooper's indignation at McGilligan's hasty methods was obviously shared among Labour and Farmer's Party TDs, who made up the twenty-two votes against McGilligan. However, forty members of his own party voted with him to give him a comfortable margin.³⁵

The debate proper began on 15 March and McGilligan gave a detailed account of the main aspects of the bill which may be summarised as follows:

1. The Board is to be nominated by the executive council and members will hold office for five years. The executive council can at any time dismiss any or all members of the Board but must state the reasons for such dismissal to the Dáil and Senate.
2. The employees of the Board are not civil servants, and are not pensionable.
3. The bill makes every endeavour to remove the Board from politics.
4. No member of the Board or employee can be a member of the Dáil or Senate.
5. Every year the Board must present a report which must come before the Dáil. The audited accounts are to be likewise presented.
6. The Board is entrusted with the responsibility of making the Shannon scheme a paying proposition. From 1932 onwards it must pay interest on and begin to repay all monies invested in the Shannon scheme, and all monies advanced to it under the present bill. To this end the Board is invested with certain powers and advanced certain monies.

Under the bill the Board would be able to help consumers wire their houses and would sell them equipment on hire purchase. McGilligan made the point that cheap electricity and the investment of £5m. was of no use to the house-holder unless he could get his house wired cheaply and get appliances equally cheaply.

On the question of the existing undertakers the bill gave the ESB the power to sell electricity to those at the outskirts of towns or to sell directly itself to consumers. To do the second, the Board would need to acquire existing undertakings, and this power was written into the bill. The Board would be required to pay compensation to non-municipal undertakers but would simply take over the fifteen municipal ones.³⁶

Much of the opposition to the bill was along predictable lines. The conservative view was put by Major Bryan Cooper:

This scheme is a thoroughly socialistic one, but I would admit that it is comparatively moderate and sane socialism. I do not like monopolies. I prefer in general to trust a private enterprise, but I think from the day we passed the Shannon Electricity Act it was obvious that this Electricity Supply Bill would be a monopolistic Bill.

There was no alternative. The enormous amount of preparations that were made and of capital that was sunk in it, the fact that its success or failure would make enormous difference, not merely to the future of the Government but to the future of the whole country, made it almost certain that a monopoly of its working would be claimed and that private enterprise would not be able to compete.³⁷

Major Cooper also made a plea for the undertakers, which was to be one of the recurrent themes of the debate. He argued that they had made very generous and important contributions to the development of many towns; that many people had sunk a great deal of money into these undertakings and that they should be treated with generosity and a certain amount of gentleness. One rather strange and far-seeing point made by Major Cooper was that there should be some element of worker participation on the Board. He felt that the Board might well consist of a president and two members directly appointed by the state, one member appointed by the state from a list submitted by the consumers and one member appointed by the state from a list submitted by the workers and he felt that this would 'give representation to people whose voices had a right to be heard. The state would still maintain a majority.'³⁸

The two further points made by Major Cooper at this stage in the debate were that he felt that the control of the audits should be by the Comptroller and Auditor General and not by a firm of accountants appointed by the minister. The second point was that he felt that there should be some consideration for private individuals throughout the country who wanted to continue manufacturing electricity but only for their personal use.

Cooper's open-mindedness and generous approach was not matched by another conservative, Mr J. Hewat, a major Dublin businessman. His was to be the most sustained opposition throughout the entire debate:

In the Bill before us, we have nationalisation, which Deputy O'Connell and the Labour Party so appreciate, carried to the fullest and the most extreme extent, to the fullest extent of any measure that has ever been introduced in any country. Naturally I object to the idea of nationalisation. In this Bill, following the nationalisation of the generation of electricity, we proceed to the nationalisation of the distribution of electricity and the complete elimination of private enterprise. We also find the principle laid down which, I am afraid, is growing in this country; that is the confiscation of property. In this particular case the confiscation of property applies not to the same extent perhaps as regards what is called private enterprise as to the property of municipal bodies who have erected generating stations.³⁹

Mr Hewat also made the point that was to be made by a number of other Dublin deputies throughout the debate, the fear that the profitable areas would subsidise the less profitable areas.⁴⁰ One of the biggest worries, however, concerned the political aspect of the Board's composition:

I should like to emphasise the fact that the appointment of the Board lies with the Executive Council, and is terminable at any time, and in all events terminable at the end of five years. Have we arrived at such a condition of things in this country that we can visualise appointments of that sort being non-political?

The sharp reply of the Minister for Justice, Mr Kevin O'Higgins was, 'Yes'. Mr Hewat then conceded that perhaps the present government might make competent and good appointments but that future governments might not do so, and that this was perhaps too sweeping a power to give to the executive council.⁴¹

As mentioned, the debate was frequently dominated by the question of compensation for undertakers and it was here that McGilligan made some big concessions, though never ceasing to be sharply critical of the 'obscurantist' attitude of the undertakers,

especially the Electricity Suppliers Association, which had, he claimed, hindered the full gathering of information so that an accurate assessment of the present situation could not be made.⁴²

By the time it reached its final form after a detailed Senate discussion the main provisions in the bill governing the powers and duties of the new Board had been clarified and as summarised were to provide the framework within which the new Board found itself operating during its formative years:

To produce and generate electricity in the Shannon works as soon as these works, or a portion of them, are completed and to transmit this electricity through the transmission system of the Shannon works and any extension of that system.

To control, manage and maintain in good repair and condition and proper and efficient working order each and every part or section of the Shannon works.

To distribute, utilise and sell the electricity and to promote and encourage the purchase and the use of this electricity.

To control, co-ordinate and improve the supply, distribution and sale of electricity in the Irish Free State.

Generally to perform and exercise all duties and powers which are imposed or conferred on the Board by the Act.

The debate moved through its various stages, passing the fourth stage on 20 April by thirty-nine votes to thirteen and the final stage by much the same margin on the same day. It came back from the Senate on 20 May, the last day of the fourth Dáil and the last and certainly one of the most significant of the 183 public bills passed by that parliament.⁴³

The Early Years

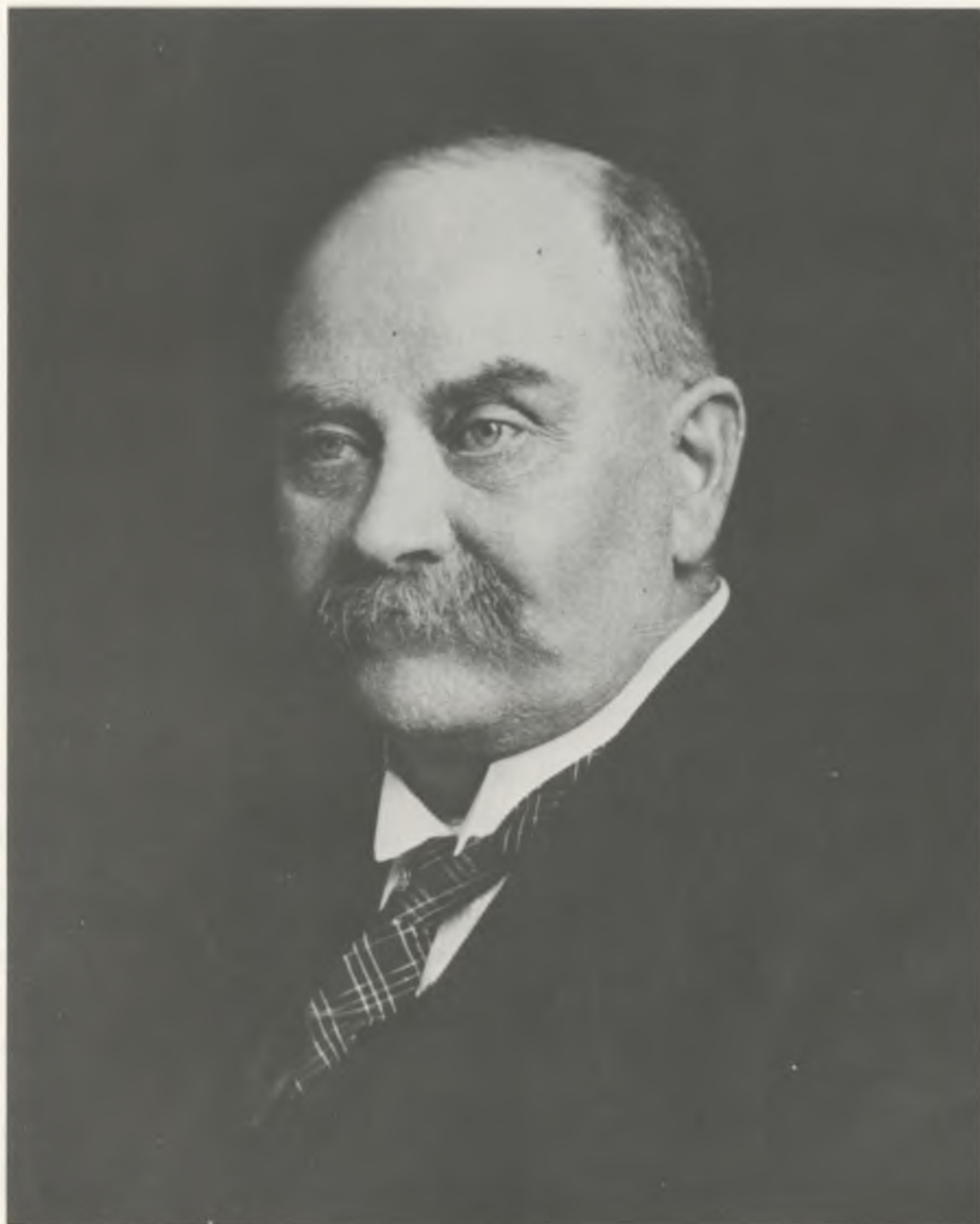
Progress and Crisis

EVEN before the ESB Bill had become law there was intense speculation both in newspapers and in political circles about the composition of the new Board. The newspapers in particular were anxious to see that no element of political corruption or placing would influence the final decision, while various interest groups, especially farmers and chambers of commerce, loudly urged that they should be given representation on the Board. Most of the political correspondents were wide of the mark in the names they proposed and almost all of them, like the political correspondent of the *Irish Independent*, were certain that McGilligan himself would be chairman or at least a Board member. That same correspondent also forecast that the other members would be Gordon Campbell, Secretary of the Department of Industry and Commerce, General Richard Mulcahy and Seán McGarry, a former Cumann na nGaedheal TD who had defected from that party with Joseph McGrath in 1925.¹ This particular correspondent was wrong in all four of his selections and most other speculation was just as inaccurate.

The ESB was formally established under Section 2 of the Electricity (Supply) Act 1927 by an order of the executive council dated 11 August 1927. The first members of the Board were Mr John J. Murphy (Chairman), Dr T.A. McLaughlin, Dr Henry Kennedy, Mr J.C. Foley and Mr Patrick J. Egan. Only Murphy and McLaughlin were full-time and one of the first decisions of the Board was to appoint Dr McLaughlin as Managing Director. Murphy's appointment at first sight appeared strange—he had been City Treasurer and later Town Clerk of Dublin and as such he had bitterly opposed the Shannon scheme and the loss of Dublin's independence. The government realised that the support of Dublin was necessary, especially at the early stages, and it was with this in mind that Cosgrave proposed that the executive council should appoint Murphy as Chairman.² Dr Henry Kennedy was secretary of the Irish Agricultural Organisation Society and a distinguished mathematician, while Messrs Foley and Egan were seen to represent commercial interests in Munster and the Midlands. Murphy and McLaughlin were each appointed for five years while the other three were appointed for two years.

RECRUITMENT

One of the first tasks of the new Board was staff recruitment. The post of Secretary was advertised and on 20 October 1927, Mr Patrick J. Dempsey, a barrister with a brilliant academic record, who had served for twenty years in the British and Irish civil service, was appointed. Other full-time staff in October 1927 consisted of two Assistant Engineers, P.G. Murphy and Joseph O'Farrell, and Dr McLaughlin's private secretary, Miss Kilkelly. The first offices of the Board were located in a two-roomed flat at 33 Upper Merrion Street, just opposite Government Buildings. After a few months the Board purchased 60-62 Upper Mount Street, which had hitherto been occupied by the British Ministry of Pensions, who still occupied 55-9, which the Board acquired a few



John J. Murphy, first Chairman of the ESB 1927-30.



Patrick J. Dempsey, first Secretary of the ESB.

years later. Another early decision by the Board was to open its banking account with the Munster and Leinster Bank.

The staff numbers in the new organisation grew quickly and by March 1929 total staff numbered 829, 583 of whom had been transferred from acquired undertakings. Some of those who were to play a major part in the growth and development of the Board were appointed in these early days, including Joseph MacDonald who later became Chief Civil Engineer, W.S. Lawlor, P.B. Kenny and John Donovan. Mr Lawlor was later Assistant Secretary and after his death in 1933 was succeeded by Mr Donovan.

Right from the start McLaughlin took a conscious decision to rely as far as possible on Irish engineers. In the context of the time it was a far-sighted and courageous decision, as there was no great engineering tradition in the country and it would have been safer to use engineers from Siemens, at least in the early stages. McLaughlin was convinced that, not only was the risk worth taking, but it was essential if the future of the ESB as an Irish organisation was to be ensured, and that the only way in which a strong engineering tradition could be built up was through hiring and giving a real challenge to native engineers. It was a decision which was to be more than vindicated by the results.

ESTABLISHMENT OF THE SUPPLY SYSTEM

An early priority for the new Board was to arrange for the distribution of Shannon electricity in the cities, towns and villages of the Free State from the transmission lines

then under construction from Ardnacrusha to the outskirts of these cities and towns. It was expected that Shannon current would be available at some time in 1929 and so a time schedule was drawn up. The Board had to try to have the maximum demand for Shannon power so that straight away revenue would be as high as possible.

The Board made immediate arrangements for a comprehensive survey of the towns and villages where no supply already existed. This survey included all towns having a population greater than three hundred people, plus a few of the smaller villages. It comprised a classification from the point of view of possible consumption of electricity of all the houses in the towns and all institutions like county homes, hospitals and convents.

In addition, an exact power survey of each town in the country furnishing full particulars of every steam, gas or oil engine and private electrical installation, had to be made, so that in the design of a network full consideration could be given to the question of load probability. Of the towns surveyed, eighty-six were chosen as being within easy reach of the Shannon lines for inclusion in the 1929 construction programme. The remainder were left over for more detailed investigation.³

The question of acquiring the various undertakings was undoubtedly the most important and controversial problem facing the Board in its early years. Unless this could be done, any attempts at standardisation of technical equipment and of rates of charge on an alternating current basis would be doomed to failure. The understandable resistance of many of the undertakers has already been noted but once the Electricity (Supply) Bill became law the Board had to decide how to put this policy into practice. The problem from the Board's point of view was summarised as follows in its first annual report:

The situation which faced the Board now was roughly as follows. In most towns the concerns were either owned by the local authority or by private interests. In the smaller towns the undertakings generally consisted of a small power station with direct current generators worked by gas or oil engines, together with a distribution network. The network usually consisted of a two wire or four wire system erected on insulators fixed to wooden or steel poles. These smaller undertakings usually had no more than a few men in their employment. The Shannon system contemplated the closing down of these stations and their replacement by a supply of Shannon electricity. As the Distribution system of these concerns was designed for direct current and as Shannon current was alternating current, the Shannon current had either to be converted in the converting station to direct current and transmitted over the existing network or the existing network had to be reconstructed for alternating current. As far as the Board was concerned, then there were two alternative courses open to it: (a) it could either sell to the local consumers, letting the owners build the converting station or letting them re-construct their networks; or it could (b) acquire the undertaking, carry out the re-construction work and sell direct to the consumer.

The first course involved three main difficulties: (1) agreement with local owners as to the bulk supply price; (2) the expenditure of capital by local owners to enable Shannon current to be distributed over their system, and (3) protection of the consumer by control of retail prices.

The Board felt that each of these difficulties could be, and probably would be, the cause of persistent haggling and dissatisfaction to all concerned. So it decided not to sell

Shannon electricity in bulk to any distributor but to acquire the existing interests and to retail Shannon electricity, thus, as the report says, 'securing direct contact with consumers with all the resultant advantages, in particular, as to possibility of load development'.

The Board also decided, for what it considered to be economic and technical reasons, that converting stations should not be erected but that networks should be reconstructed for alternating current and distribution should be made a completely automatic procedure.⁴

Having taken this decision in principle, the ESB had to begin the long and often acrimonious task of acquiring the various undertakings. In the case of towns and villages with an existing electricity supply, the Board had to postpone actual reconstruction work until the undertakings had been acquired but arrangements were made for an examination of all undertakings and a department was set up to make design plans for reconstruction.

The ESB took immediate steps to establish contact with the owners of the undertakings. Invitations were issued in the press, advertisements were placed, and the Board set about interviewing the representatives of all the more important undertakings to explain the new situation. The Board hoped that these interviews would allow an informal exchange of views, that owners would be made fully aware of the existing position and thereby be enabled to consider the best course to pursue.

Jointly with these interviews, the Board obtained from each electricity undertaking particulars of its working from a financial and engineering viewpoint. With this information, the Board felt itself better enabled to deal with the many applications received from time to time from various undertakers for sanction of expenditure on plant renewals, extensions and like purposes as well as for the raising of loans to cover expenses already incurred.

The ESB had still to live with the majority of undertakings and, under the 1927 Act, the Board was the sole authority competent to issue permits to unauthorised undertakers for the supply of electricity. These permits could be revoked by the Board at any time and initially were limited to a period of 18 months dating from 28 November 1927.

The other major practical problem facing the ESB at this stage was the construction of the networks. The Board decided that the best course was to select in the first instance towns on the Leinster Loop of the Shannon transmission system, so that as soon as these towns were ready to receive current, they might be supplied from Dublin until Shannon current was available.

The Board's networks construction programme was first applied to the towns adjoining this loop and as soon as the necessary information was obtained, plans for the network design of a number of these towns were completed and the location of transformer stations was fixed. The work of arranging with the Department of Posts and Telegraphs to prevent interference with the telegraph and telephone wires was then entered upon. Contractors were invited to tender for the erection of distribution networks and house services in the first group of eight towns, Naas, Maynooth, Newbridge, Rathangan, Celbridge, Portlaoise, Kilcock and Mountmellick.⁵ The Board had let the main cross-channel and continental contractors know of this work and had invited tenders from all sources and the first advertisements evoked considerable response in March 1928.

Problems of design, of course, varied from area to area. Dublin, for example, covered a large area and thus required a much longer period of design and construction. It was decided to include in this area the more populated districts in the south county from Killiney and Ballybrack to districts in the north county as far as Portmarnock, Malahide, Swords and Howth. All of these areas had necessarily to be treated as one unit and the transformer stations, cable and networks designed accordingly.

The existing Dublin city supply was generated at Pigeon House station and distributed from Fleet Street station through 5,000 volt speeder cables throughout the city. In order to supply this existing cable system from the Shannon transmission system at Inchicore it was necessary to erect a new main station to transform the Shannon current from 38 kV to 5 kV. A site for this station was acquired adjacent to the existing distribution station at Fleet Street, which was the load centre of Dublin city. This new transformer station was supplied by three 38kV underground cables from the Shannon transformer station at Inchicore.

The design of the station building was practically completed on 31 March 1929 and contracts had by then been placed for the complete electrical equipment. As a large amount of switchgear in the Fleet Street distributing station was of an old type and unsuitable for operation on the Shannon system, the Board decided to replace it.⁶

Cork city was at this time supplied by the Cork Electric Supply Co. Ltd., who were the authorised undertakers in the area. The Board entered into negotiation with the company for the purchase of their undertaking and shortly afterwards bought it.

The acquisition of other undertakings moved at a rapid pace. In some cases (Clonmel, Dún Laoghaire, Enniscorthy, Waterford, Dundalk, Thurles and Edenderry) the undertakers themselves made a request for acquisition and early negotiations began. And as the main construction programme had begun in towns adjacent to the Leinster Loop of the Shannon system, the acquiring of undertakings in that area was seen as a priority so as to permit reconstruction work.

Shortly after its establishment, the Board had requested every undertaker to furnish full information on the financial, administrative and engineering position of his undertaking. In most cases, the information supplied was incomplete, especially with regard to financial returns. As a result the Board, 'because it was conscious of the capital commitments which would be necessary', selected those undertakings the early acquisition of which seemed most practicable and began its own detailed financial and technical examination. It then made offers to purchase the undertakings in Carlow, Mountrath, Roscrea, Moate, Rathkeale, Fethard, Athy, Buttevant, Mitchelstown, New Ross, Dungarvan, Borrisoleigh, Bagenalstown, Listowel, Newcastlewest, Charleville, Clonakilty, Callan, Kilmallock, Kinsale, Tullamore, Nenagh, Cahir, Monasterevan, Skibbereen and Loughrea. During the same year, the Board also acquired the undertakings of local authorities in Limerick, Edenderry, Bray, Wexford, Waterford, Enniscorthy, Dún Laoghaire, Wicklow, Dublin, Pembroke, Rathmines, Thurles, Clonmel and Swinford.

The first portion of the transmission system was transferred by the Minister for Industry and Commerce to the Board in March 1929 and by 31 March 1930 the following main works had been transferred: three generating units at Ardnacrusha, the 110/38 kV transformer station at Inchicore, sixty-three completely equipped transformer stations with sites, weir and inlet works at Parteen Villa.

A supply was given to a limited number of towns over the Leinster Loop during the summer of 1929 but the main supply was not commenced until the generating station at Ardnacrusha had been transferred to the Board on 21 October 1929. In order to be ready for the running of the station, the operation staff took up duty there early in 1929.

Ardnacrusha power station was put into commercial operation on the 24 October 1929 and on that date the supply to Loop 4, over the 110 kV lines to Inchicore, was made available. Shortly afterwards, Loop 1 was put into commission and some Munster towns were supplied. A portion of the Limerick network was connected to the Shannon system on 31 October 1929, and before the end of November a substantial number of towns had been connected including Abbeyleix, Arklow, Baltinglass, Blackrock, Carrick-on-Suir, Celbridge, Dalkey, Dún Laoghaire, Durrow, Gorey, Maynooth, Newbridge, Rathfarnham, Terenure, Tramore, Waterford, Wexford and Youghal.⁷

The general operation staff for the areas covered by Loops 1, 2, 3 and 4 was organised early in the summer of 1929. For operation purposes, the Saorstát was divided into eight districts, each in charge of a District Engineer. The District Engineer was made responsible for all maintenance and repair work on transmission lines, substations and networks in his district and also for the operation of 10 kV lines substations and networks. He was provided with a normal staff of a foreman, storekeeper, lorry driver, electrician/fitter, linesman, two electricians and three improvers. Four of the eight districts, Dublin, Waterford, Portlaoise and Cavan, comprised the eastern operation division and were controlled from the eastern operation office in Dublin. The remaining four districts, Cork, Tralee, Limerick and Galway, constituted the western division and were controlled from the western operation at Ardnacrusha.⁸

To provide for the supply to Dublin city, it was necessary to construct an extension of the existing central distribution station at Fleet Street. On 11 January 1930, the new transformer station was connected to Pigeon House for the city supply. On 13 January 1930, the Ardnacrusha station was synchronised and operated in parallel with the Pigeon House station, the load being divided between the two stations. This continued until 25 January 1930 when the Pigeon House station was closed down and from that date the supply for Dublin city and also the suburbs was provided from Ardnacrusha—though this was far from being the end of Pigeon House.

Progress at the end of the year (1930) was as follows:

Networks erected or re-constructed	98 towns
Similar works in progress	31 towns
Transformer stations built	181 towns
Transformer stations in course of building	30 towns ⁹

At first a substantial portion of this work was carried out by contractors but as soon as the Board's operation staff was established in the districts, the work was entrusted to them as far as possible. The object of this was to utilise the services of the employees of the operation staff to the fullest extent possible, to familiarise them with the work and requirements of a district and to reduce to a minimum the interruptions of supply during the changeover alterations.

The following towns were put into service on 31 March 1930: Abbeyleix, Arklow, Bray, Cashel, Clonmel, Drogheda, Ennis, Limerick, Mallow, Mountmellick, Portlaoise, Sligo, Tullow, Tralee; and by that date also the Board had acquired undertakings

owned by local authorities in Limerick (31 May 1928), Edenderry (21 June 1928), Bray (12 July 1928), Wexford (12 July 1928), Waterford (8 November 1928), Enniscorthy (16 November 1928), Dún Laoghaire (17 January 1929), Wicklow (14 February 1929), Dublin (28 March 1929), Pembroke (28 March 1929), Rathmines (28 March 1929), Thurles (28 March 1929), Swinford (28 March 1929) and Dundalk (31 March 1930).

In the same period permitted undertakings were acquired on the basis of a purchase price agreed between the Board and the owners in Carlow, Rathkeale, Moate, Clones, Buttevant, Cootehill, Bagenalstown, Dungarvan, Loughrea, Athy, Listowel, Portarlinton, Cavan, Fethard, Charleville and Kells.

In all of these areas the generation of electrical energy was continued from the existing stations until the networks were made ready for the changeover to Shannon supply, but in no case was any time lost in arranging for the reception of Shannon current.

Permits issued in November 1927 to undertakers expired on 27 March 1929. These permits were renewed for a further year in May 1929 and on the 31 March 1930 there were 135 permits in force.¹⁰

The total number of consumers in towns and areas supplied by the Board during 1929/30 increased from 31,000 to 47,000. At the end of the year 40,000 of these were actually changed over to the Shannon system, while the remainder continued to receive supply from local thermal stations. The number of units of electricity sold by the Board during the year was 43 million. By the end of 1930 the number of Board employees had risen to a total of 1,602, almost double that of a year earlier.¹¹

In the year 1930/31, twenty-four generating stations were closed down and the supply to the areas covered by them was given from the national network, and the staffs employed in these stations were, for the most part, absorbed into the ESB.

Though obviously most early attention was focused on the generation and distribution programme, there were other significant formative developments during these years and indeed a number of setbacks, both financial and technical. One major question to be resolved early on was the way in which consumers' premises were to be wired. There were two immediate problems here. The first was whether or not there were sufficient skilled electricians in the country to carry out the work. To find the answer to this question the Board carried out a census in 1928 which showed that in fact there were. The second problem was finance—how to make wiring facilities widely available and how to persuade people to buy new electrical appliances without causing severe financial burdens to the consumer. The answer here was to adopt a hire purchase system to help the prospective customer with the initial capital outlay.

THE FIRST SALES CAMPAIGNS

From the start the Board's approach to sales was high-powered. McLaughlin visited the US to study sales methods there and brought with him Brian O'Sullivan, who then stayed on to do a more detailed study. On his return he was appointed Merchandise Sales Manager and showrooms were opened up in the main towns and cities, starting with Dublin, Portlaoise, Wexford and Kilkenny.

In addition, a public relations department—the first of its kind in the country—was set up under E.A. Lawlor. Under his direction a massive national publicity campaign

was launched. The aim of the campaign was to make the country 'electricity conscious', and to educate the public in all the possible benefits to be had from its use. The campaign made extensive use of all national and provincial newspapers and amounted to one of the earliest attempts at saturation coverage of the entire community.

The campaign followed a number of phases. According to the Board's annual report the advertisements in the first instance were 'of a broadly propagandist nature', dealing with the possibilities of the Shannon power scheme and the general advantages of electricity for domestic and industrial purposes. This was followed by a campaign advocating the complete and adequate wiring of houses, emphasis being laid on the fact that unless a home was well fitted with 'convenience outlets' or wall plugs, advantage could not be taken of electricity for general domestic purposes. This campaign was continued concurrently with the canvassing and again, according to the report, the results were good.

In October 1928 a lecture tour was arranged for the following towns: Waterford, Wexford, Kilkenny, Portlaoise, Edenderry, Mountmellick, Naas, Bray, Arklow, Gorey and Tullow. In addition, many lectures of an informal kind, organised under local auspices, were given throughout the country, usually based on material supplied by the public relations department and often using lantern slides to illustrate the points made.

In April 1928 agreement was entered into with the Pathé Film Co. to film the Shannon power works and the works under construction. Many booklets and pamphlets

The ESB's first showrooms in Grafton Street, Dublin.



were circulated to prospective consumers and arrangements were made to provide information to all sections of the national press. Visits to the Shannon works were continued—80,000 people visited the works during the summer of 1929 alone, and during the first three years excursion parties came from virtually every town in the country.¹²

This publicity was accompanied by an extensive canvass of consumers in the areas in which networks were approaching completion. This systematic canvassing was carried out by furnishing every occupier with explanatory leaflets regarding supply, house wiring and skilled charges. A personal call from the Board's canvassers then followed and the consumer was supplied with a form of agreement.

Before connection to the Board's mains, the house wiring was tested in every case to ensure safety in operation. At the same time, the consumer was supplied with illustrated catalogues of suitable fittings and samples of these were made available for inspection even in smaller towns.

SUPPLY PROBLEMS

To add to the difficulties facing the ESB during its first years of operation in such areas as organisation, recruitment and sales were problems of supply. Of these the first serious one arose from the prolonged and abnormal drought which occurred between January and March 1932, which necessitated using Pigeon House as well as Ardnacrusha in March of that year. The power station at Ardnacrusha was closed down for 674 hours between 13 June and 8 September 1932 owing to the need for water economy. Normally the stores available on the 1 April 1932 would have been 250 million cubic metres, but it had actually been reduced to 120 million cubic metres, as a result of the abnormal conditions in the previous January and March, which were followed by one of the driest summers experienced. Pigeon House station was, in consequence, brought into commission so that it was possible to shut down Ardnacrusha completely each night and on Sundays and thereby effect a considerable economy in water.

Then in 1933 the drought continued without relief for a period of nine months. Owing to the persistence of the drought the whole of the storage in the Shannon lakes had been fully used by 23 December despite every effort to economise water by running the available steam plant at its maximum capacity. Lough Derg had by that date reached the record low level of 32.13 metres. The level of Lough Ree had been lowered by approximately $3\frac{1}{2}$ feet below the normal navigation level as a consequence of which it was necessary to restrict navigation.¹³

Dislocation was also caused by blizzards. On 24 February 1933 the country experienced one of its worst snowstorms ever, with separate gusts of as much as 100 miles an hour, accompanied by sub-zero temperatures. The average depth of snow was 2 feet and many roads were impassable for four to five days. The storm reached its greatest intensity in County Dublin, causing severe damage to the Board's transmission system in this area. The most serious breakdowns were those on the 100 kV double circuit lines between Ardnacrusha and Dublin. Two breaks occurred on this line, one at Kilcullen, where one of the standards was damaged, and one at Crumlin, where two standards were affected. From midday on Friday 24 February until late Monday 27 February, Dublin city was isolated from Ardnacrusha and had to depend for supply on Pigeon House. Incidentally, during this storm, the Board was helped by the national radio station, 2RN, which broadcast details of progress in making repairs.¹⁴

THE ROW BETWEEN MCGILLIGAN AND McLAUGHLIN

By far the biggest problem, however, was an internal one, which ultimately involved the Board in a head-on clash with the Minister for Industry and Commerce and led to the resignation of both the Chairman and the Managing Director. The controversy, which was the source of intense public and political speculation, deeply embarrassed the government and was thought at times to jeopardise the future of the ESB.

From early in the life of the ESB the government had had difficulty in maintaining what it saw as its role as watchdog over the Board's activities. In the government's view, it was not being given the information on the ESB's activities and plans to which it was entitled. It felt that it could not judge what degree of success was attending the ESB when the basis of the latter's demand forecasts was unknown, and when the ESB seemed unable to assure the government that works planned would be executed without exhausting funds voted by the Oireachtas. McGilligan regarded himself as compromised by this lack of co-operation and complained to the chairman in June 1929:

I must make my appearance before the Dáil one of these days to deal with the constructional side of the Shannon. I have no doubt whatever that on that occasion I shall be questioned as to the distribution side and particularly on the present estimate of sales of Shannon power. Before the setting up of the Electricity Supply Board I was able to state what electricity consumption in the Free State at any time amounted to and to give estimates of the ordinary yearly increase in the demand for electricity. Now with the Electricity Supply Board functioning for over one and a half years I find myself unable to give any estimate of consumption or at the best to give only such information as would necessarily be so vague and approximate as to be of no useful service. I would request you to ask your Board to consider the situation in which I find myself and to advise me if anything better can be done to meet my wishes than the report and correspondence to which I have referred.¹⁵

This didn't meet with much success, and Gordon Campbell, on McGilligan's behalf, had to demand that the ESB deliver accounts for the period up to March 1929 by the end of July 1929. The ESB was unable to meet this demand. In fact this was not surprising, for, as emerged two years later, the ESB's accounts were in a hopeless state at this stage.

The reasons for this state of affairs are easily found. Under McLaughlin's guidance, the ESB's engineers were pressing ahead with their programme at top speed, without giving much attention to the requirements of accountability. In P.J. Dempsey's words 'Accounting principles or instructions—expressed or understood—took second place to the technical "big push" with the inevitable result that a considerable amount of chaos in recording ensued'.¹⁶ The accounting system was in such a mess that the ESB's auditors were not in a position to vouch part of the Board's expenses. The consequences of this for the ESB were summarised less than two years later by R.F. Browne, who succeeded Murphy as Chairman:

When I joined the Board last year the Accounts for the year ended 31 March 1929 had just been issued. The Report by the Auditors on these Accounts, covering a period of much smaller activity than the following year, did not encourage me to contemplate anything but serious difficulties. The Auditors, for example, had stated that they were

unable to vouch fully the amount shown due to Sundry Creditors. This meant that there were not available statements to show that all invoices were accounted for, and indicated that invoices could have been overlooked, mislaid or destroyed. In fact, this had happened. In consequence, every single purchase from the very beginning has had to be overhauled by obtaining detailed statements from all creditors, checking them with invoices already certified, and obtaining duplicate invoices for items not covered. This has involved enormous labour, and has been continuously receiving the closest attention since May last.¹⁷

There had been no stock-taking in the stores department; the contract (wiring) accounts had to be completely recalculated owing to 'loose and incomplete recording'.

The situation within the Board was now beginning to alarm the government and in February 1930, under government pressure, Murphy resigned as Chairman.¹⁸ He did, however, retain a seat on the Board of Directors and this to some extent blunted public criticism and disguised the full implications of what was happening. Murphy's successor was R.F. Browne, then in his thirties, a senior tax inspector and a man with a reputation

R.F. Browne, Chairman of the ESB 1930-60.



for efficiency and practicality. The fact that Browne was a civil servant led to some speculation that McGilligan was engineering a civil service take-over of the ESB and that its independence from government would be threatened. There was one further change, with J.M. Fay becoming a full-time member of the Board and Director of Civil Works.

The resignation of Murphy was the beginning rather than the end of the controversy. Browne immediately arranged with the Board's auditors for a special investigation into the whole accounting and recording position. The result of this enquiry was later reported by McGilligan to the cabinet—the position, he said, was 'chaotic'.¹⁹ The Board immediately decided to advertise for a new Chief Accountant and a German, Friedrich Weckler, who had worked for Siemens during the construction of the Shannon scheme, was appointed. He was to be spectacularly successful in laying down new accounting procedures, but in the meantime order had to be restored.

Not surprisingly, there was considerable delay in presenting the Board's accounts for 1929 and this delay was explained in the annual report as being due

...solely to the confusion which existed in the records of the Board by the end of March 1930. The whole recording machinery had by that time fallen into very considerable arrears and this situation was aggravated by the circumstance that much of what had been done was imperfect and unreliable. When the full facts were placed before the Board, it was agreed that the position could not be remedied except by securing the services, temporarily, of additional experienced staff and the auditors to the Board were accordingly approached to ascertain if they could meet the Board's requirements in this matter. In compliance with the Board's request, the auditors provided a large staff which has been continuously engaged on the work since July, 1930.²⁰

The report goes on to say that the task involved was of considerable magnitude, because

... by reason of looseness in the preparation of dockets and records and a serious lack of co-ordination between departments, it was evident that complete and reliable figures would not emerge without extensive investigation and reconstruction. In some instances records have had to be overhauled, partly reconstructed and checked back to the very beginning of the Board's activities. In order to produce dependable figures at 31 March, 1930, large blocks of expenditure unclassified or in suspense at 31 March, 1929, had to be broken down and analysed. For the year ended 31 March, 1930, a period in which there was considerable capital outlay, it was necessary to deal with similar large blocks of unclassified expenditure.

The analysis and allocation of this expenditure was rendered extremely difficult by reason of the manner in which issues of materials were recorded and described and of carelessness in the handling of invoices, which in many cases had been lost or mislaid. The system in operation in the stores department, which was intended to control a very substantial portion of the Board's expenditure, had broken down. The execution of the necessary work by the auditors' staff has involved the Board in an expenditure of £7,500, which appeared in the accounts, but the Board had felt that there was no alternative to this course as it was essential that the confusion which existed should be removed and that accurate figures would be available for the future.²¹

The report continued that the Board was now glad to be in a position to say that the whole ground up to 31 March 1930 had been investigated and covered and no sums were being carried in suspense. It also claimed that substantial progress had been made in bringing the records of the Board up to date and towards the compilation of the accounts for the year ended 31 March 1931.

The confusion continued throughout 1930/31 and in fact there was also a delay in presenting the accounts for that year for more or less the same reasons. This trouble with the accounts, however, masked an even more dramatic battle of principle and personalities between the two men who had done most to bring the ESB into existence, McGilligan and McLaughlin.

McLaughlin was committed to getting the job done as fast as possible and was prepared to go into debt to do this, knowing that the future of the project was such that all debts would be honoured. McGilligan, on the other hand, found this approach intolerable. He explained in a memo to the executive council on 1 May 1931:

But I do not ask the Executive Council to attempt an exploration of the question whether the Board's optimism or my anxiety as to its true financial position is the better justified. The situation which I desire the Executive Council to consider involves questions of principle, not of detail. The policy pursued by the Board is defended by it on the grounds that it alone is fitted to judge what its expenditure should be and what future advances from public funds the Oireachtas should provide for it. Its explanatory statements claim as of right an endorsement of the entire, but to me inexplicable, satisfaction, with the present position and prospects asserted by the Board.

Considered on the merits no responsible Minister acquainted with the financial record of the Board could pretend such confidence in its methods and its judgement as would justify the concession of that claim. Considered on principle my position is that the responsibility of the Executive Council and the appropriate Minister cannot be surrendered to the Board and that a Board which has consistently acted on a contrary assumption and has based on that assumption its defence of admitted breaches both of the statutory limitations on its expenditure and of its own express agreement must be reconstituted.²²

This was extremely strong talk from McGilligan and in a further memo to the executive council he concluded by urging 'the necessity of drastic changes in policy if there is to be a real prospect of the Shannon Development becoming self-supporting. Accordingly, I recommend a reconstitution of the Board.'²³

McGilligan's attitude seems very hostile until one examines the basis for his complaints. He took seriously his position of being accountable to the Oireachtas for the ESB's activities, and was concerned not only with the ESB's limits to its expenditure set by the Oireachtas. The failure of McLaughlin to observe these limits led to trouble.

Difficulties first arose in 1929 over the interpretation of the financial sections of the 1929 Act. This act had provided a ceiling of £2½m. for working capital in the early stages of the Board's activities. The Board interpreted the act as meaning that there would be further monies available on the acquisition of local authority undertakings.²⁴ On this basis, the Board, and in particular McLaughlin, had pushed ahead with expansion and development, in the process exceeding the £2½m. limit. This was unacceptable to the

Minister who cut off the supply of further monies, thus leaving the Board practically without funds. The Minister then introduced an enabling act which, according to the Secretary of the ESB, P.J. Dempsey, made a very big difference. Under the 1927 Act the Minister for Finance, at the request of the Board was compelled to advance to the Board such sums within the £2½m. limit as the Board might from time to time require. The 1929 Act changed that and stipulated that the Minister for Finance, in consultation with the Minister for Industry and Commerce, *might* advance such sums as the Board might require, subject to the stated limit. According to Dempsey 'this in effect gave for the first time a certain Civil Service control over some of the Board's activities which it hitherto had not got. This control has never lessened.'²⁵

McGilligan's justification for this increased control was the failure, as he saw it, of the ESB to honour undertakings given by it to observe the voted limits. The immediate issue was whether money allocated was for the ESB's work-in-hand alone, or also to cover liabilities of existing undertakings as and when they were taken over—a rather trivial matter, and one on which the ESB felt it was being hamstrung.

Between January and December 1930, the ESB spent nearly £500,000 over and above the limits it had agreed to observe, including £28,000 in November and December despite an express prohibition by the government. McGilligan was very angry and wrote to Browne to say that 'in the absence of satisfactory explanation I must bring the whole matter before the Executive Council as it must then be clear to the Board that my confidence in their administration could not be maintained'.²⁶

In an accompanying letter to the members of the ESB Board, Gordon Campbell said that the facts of the position 'leave the Minister no option but to conclude that the Board had deliberately disregarded the obligations which it undertook to the Executive Council, that it has conducted its operations with reckless indifference to their financial consequences, and has neither provided itself, nor furnished the Minister in spite of his requests, with such periodical calculations of its commitments in relation to its resources as ordinary commercial prudence would have dictated'.²⁷

The ESB's defence to this charge was that the expenditure had been obligatory, if the Shannon scheme was to be made economically viable. Browne replied:

In regard to the expenditure of capital, the Board at the time I was appointed had before them a large programme. It was evident in the circumstances which obtained that this could not be carried out, but it was equally clear in the interests of the Scheme that such work should be continued as would enable capital already sunk to become properly remunerative, and would render possible a total gross revenue of £900,000. This figure appeared to be the minimum requisite to cover fixed overheads, expenses and reasonable provisions. A speedy conclusion within the year 1930 of a limited programme—excluding all new areas except in a few cases where undertakings were acquired—was therefore aimed at. The supply of new areas, as you are aware, had to be ignored. Bearing in mind the resources available to the Board, I think it must be accepted that the acquisition of the Cork undertaking—involving with reconstruction an outlay of nearly £600,000—rendered impossible without breaking the arrangement to which you have referred what could be considered the minimum measure of development.²⁸

Despite a formal apology from the ESB for having broken an agreement made with

the Government, the bad relations continued. McGilligan was not satisfied with the apology, and the ESB was now forecasting a loss of £400,000 for the year 1931/2. He wrote to the Chairman to say of the Board:

It remains, nevertheless, entirely satisfied with its position. On these facts alone I feel justified in having informed the Board that it has proved itself reckless in the financial sense and has left me no ground for confidence in entrusting it with any further responsibility for public funds.²⁹

McGilligan's anger was fuelled by his belief that the ESB was alleging that he was accusing it of unworthy motives, and even of misappropriation of funds. What had begun as an economic and political disagreement was rapidly becoming a personal feud. The Minister had lost confidence in the Chief Executive, and this being the case, there could be only one outcome. McLaughlin had to go, and he duly did.

McGilligan's note to the cabinet had been sent on 1 May 1931. Two weeks later McLaughlin ceased to be a member of the Board and Managing Director, and with him from the Board went J.J. Murphy. Fay was appointed Technical Director. McLaughlin's departure was to arouse a strong public outcry and to mean a temporary rift between him and McGilligan. In retrospect it is possible to see that some sort of teething troubles were inevitable given the scale of the operation, the speed at which it was accomplished and the newness of the whole concept, and undoubtedly the government, and in particular McGilligan, were unduly legalistic and restrictive and failed to understand fully the problems of the new Board. It appears, in addition, that McLaughlin's entrepreneurial instincts, adventurousness and anxiety to get the job done were not well suited to the civil-service-type restrictions and public accountability of the new situation. This point was appreciated in later years by McGilligan who felt that in the whole controversy he and McLaughlin had both been wrong.

The consequences of the controversy were not easy to shake off. The attitude of the Department of Industry and Commerce was to continue to be somewhat suspicious, a needless distrust had been created and most of all relations within the ESB's Board of directors had been thrown into disharmony. Nevertheless, damaging as the controversy was—and for a while it did threaten the very existence of the ESB, at least in its original form—it did not mask the fact that the ESB had within a few short years set down roots that were to prove durable. It had greatly expanded its staff and services and had got down to the job of generating and selling electricity. It had begun the tedious and often difficult task of taking over the existing undertakers, thus ensuring that the country would have a unified national system, and it had begun to pioneer imaginative new sales methods.

Developments 1932-45

THE new Chairman of the ESB, R.F. Browne, had been appointed at a particularly difficult and sensitive time in the history of the organisation, having been brought in by McGilligan specifically to oversee the re-ordering of the Board's financial and accounting systems and to clarify the relationship between the government and the ESB. There were at least three good reasons why McGilligan and the government should have selected Browne. The first was his proven financial expertise, which was obviously needed if the ESB was to resolve the financial problems and confusion in which it found itself. The second was that, as a former civil servant, Browne would have a clear idea of the workings of a government department, of the relations between Ministers and civil servants and of the constitutional and legal framework within which the ESB was expected to operate. His predecessor, J.J. Murphy, had come from a local government background, where relations with central government were limited and well-precedented; but the ESB had a pioneering role, as the first ever 'state' company, which obviously required both subtlety and imagination if future conflicts were to be avoided and potential difficulties resolved. The third reason for Browne's selection was his personality. He was far from being the faceless and obedient civil servant, as opponents of the government had charged when his appointment was announced. He was in fact a strong and independent personality and had the energy and determination to carry out the job the government now wanted him to do. He made it clear to the government that he would only accept what was obviously going to be an extremely troublesome assignment if the government would support him and give him the internal freedom he estimated would be needed.¹

FINANCIAL REORGANISATION

Browne's immediate priority was the reorganisation of the Board's accounting procedures and this task, which he entrusted to Friedrich Weckler, was completed by 1933. The new system was described thus in the 1932/3 annual report:

A complete change in the system for dealing with accounts for electricity supplied was introduced during the year. The results of the new system became apparent at once in an even and punctual daily output of bills, a diminution in the volume of correspondence and a marked acceleration in the rate of collection. The average amount of outstanding debts has been reduced through the change, by approximately £125,000, thus releasing a substantial amount of working capital. Apart from this, the system makes rapidly available any statistical information which may be required in regard to consumption of energy. The production of the bills, and the recording of payments received has been mechanised. To secure an even flow of work, the period of furnishing has been standardised at two months which permits of the issue of bills to one half of the total consumers each month.

This accounting system, designed by Weckler and implemented under his supervision, was to remain the basic structure of the ESB's accounting from this point on, and needed only little modification with the passing years. Weckler himself became a naturalised Irish citizen and remained as Chief Accountant until his untimely death in 1943. During the 1930s he had had to undergo occasional sniping from extreme nationalists, including, surprisingly, the Engineers' Association, which objected to the fact that 'the accountancy branch of the ESB is controlled by a foreigner'.² On each occasion, however, the Board and his colleagues rallied to his support, but nevertheless the incidents were unpleasant and deeply hurtful to a man who had made a financial sacrifice to help the Board resolve its problems.

RELATIONS WITH THE GOVERNMENT—BOARDROOM DIFFICULTIES

Browne sought guidance from the Department of Industry and Commerce to clarify the exact relationship between the ESB and the government, but his most difficult job was probably his attempt to redefine the distribution of responsibilities among the Directors

A variety of household electric appliances on display.



of the ESB. The main problem was the personality of McLaughlin, who obviously resented the appointment of Browne, which he saw both as a threat to and reflection upon himself. Right from the start it was clear that there would be a major personality clash, especially when it became clear that McLaughlin had no intention of relinquishing in any way his control of the organisation. Thus when Browne was appointed in February 1930 he found a situation in which 'Dr McLaughlin as Managing Director had assumed full authority to run the Board subject to the General Board meeting. My predecessor had been ousted from his true position and had become a purely nominal Chairman.'³ Browne felt that McLaughlin was deliberately trying to exclude him from day-to-day business and force him into a position of isolation. The struggle between Browne and McLaughlin was inextricably linked with the financial row detailed in the last chapter, and, as has been related, in May 1931 McLaughlin tendered his resignation under government pressure.

McLaughlin's dismissal had aroused considerable public controversy, as he was regarded by large sections of public opinion as 'the man who had started the ESB'. His case had been championed in the Dáil by members of Fianna Fáil, then in opposition. Shortly after Fianna Fáil came to power in March 1932 one of the original members of the Board, J.C. Foley, died and Seán Lemass, the Minister for Industry and Commerce, recommended that McLaughlin should be appointed to the Board. Lemass obviously respected McLaughlin's qualities and the contribution he would make but also undoubtedly hoped to embarrass McGilligan and Cumann na nGaedheal. Browne was more than perturbed when he heard of Lemass's intention and he protested strongly. He had two interviews with Mr de Valera who told him the decision was not unanimous but the appointment would nevertheless be made.⁴

McLaughlin's reappointment in August 1932 was to mark the beginning of a long period of boardroom tension based on a clash between two strong personalities, each with very different views on the role of the Board of Directors and the allocation of responsibilities within it. Much of the difficulty centred in particular on the allocation of engineering functions between McLaughlin and J.M. Fay, and it was in part to strengthen the engineering competence of the Board and to provide a counterbalance to McLaughlin that Browne had L.J. Kettle appointed in 1934 as a full-time member.⁵ Kettle was a member of one of Ireland's best-known Parnellite families, a brother of Tom Kettle, the distinguished writer, poet and MP, who had died in the First World War. L.J. Kettle had been Chief Engineer with Dublin Corporation and had vigorously opposed the Shannon scheme. He was a substantial engineer and had an unrivalled knowledge of the Irish electricity industry and was undoubtedly a heavyweight addition to the directors. The presence of Kettle on the Board did strengthen the position of Browne but McLaughlin never really accepted his reduced role. Given his personality and the part he had played in establishing the ESB, it was probably asking too much to expect that he would, but the end result was a period of considerable tension and acrimony in the boardroom, which, according to Browne, had the effect of slowing down the taking of some important decisions and created an atmosphere not conducive to trust and harmony.⁶

THE REVENUE PROBLEM OF THE 1930s

These boardroom difficulties were not, of course, visible to the general public, or indeed to the majority of the ESB's employees. In one sense it was only one of a number of major



Leisure

THE house fragrantly clean. The
luncheon things crisp and snowy.
The food easily and perfectly cooked.
The Mistress of the Home free from health-
unpleasantness, free to rest and
destroying fatigue, free to rest and
read and recapture that sense of buoyant
joy in life which comes from congenial
work and compensating ease.

To enjoy the full bene-
fits of electricity the
home should be wired
not merely for lighting,
but also for the use of
electrical appliances.
This is the really sound
idea, which is being
your home is being
wired, insist on it being
adequately fitted. In
that way only can you
have perfect electrical
service.

ELECTRICITY

LIGHTS
HEATS

COOKS
CLEANS

WASHES
IRONS

with the highest degree of comfort
and efficiency for the lowest expenditure
of energy, time and money.

ELECTRICITY SUPPLY BOARD
Showrooms: 25 St. Stephen's Green, Dublin



Don't

leave the fire
in the sitting-
room when you
go to bed.

**TAKE IT TO YOUR
BEDROOM!**

If it is an Electric Fire you
can do this and when you
wake up in the morning, there
it is ready to warm your bed-
room in the chill early hours.

By the way—
this Electric
Fire is really
cheap. Call and
see for us.

**ELECTRICITY
SALES SHOWROOMS**

Operated by The Electricity Supply Board
25 ST. STEPHEN'S GREEN, DUBLIN



A MAID FOR EVERY ROOM!

A DREAM from the Arabian Nights—a dream
for the holder of a Magic Ring.

A dream come true when Electricity is the servant
in your home.

With perfect service in your home you would have
leisure to live—time to think—energy to enjoy the
good things that come your way.

Electricity will give you this perfect service if you
are willing to have it.

Would you refuse a Wishing Ring if it were
offered to you?

Why not give Electricity the chance to drive
drudgery away from you—the chance to be a
Maid for Every Room in your house?

DO IT NOW!

In wiring the house keep
in mind the full service
that Electricity can give.
You will save money later
by adequate wiring now.
Wire every room for light
and electrical appliances.

With plenty of small-
molets you can build up
your electrical service
gradually, buying at your
convenience the various
appliances, working up to
a Modern Home.

ELECTRICITY SUPPLY BOARD
Showrooms: 25 St. Stephen's Green, Dublin

Early ESB advertising emphasised the convenience of electricity in the home.

and minor problems faced by the ESB, culminating in the shortages and restrictions caused by the outbreak of the Second World War in September 1939. Before the war, the organisation had to face a major revenue problem and decide on the provision of further generation capacity.

The revenue problems that faced the ESB in the early 1930s had their origin in part in the constraints of the 1927 Act, which resulted in the Board being put under considerable financial pressure in the early 1930s. Because of the economic depression, demand had not risen at the expected rate and the high overhead costs of the system, of which interest payable to the government was a major part, pointed to overall losses of approximately £250,000 in each of the years ending March 1931, 1932, 1933, 1934.

The losses forecast for 1931/2 not only alarmed McGilligan, but they also put the ESB in a quandary. The problem was whether they should raise prices to cover the deficit, or maintain or even lower prices to increase sales. The ESB had no quantified information on the price elasticity of the demand for electricity. In spite of considerable doubts and misgivings, it decided to solve its problem by raising prices.⁷ This worked, turning a projected deficit over the next couple of years into a surplus. Nor did the Board slacken its sales efforts, and, despite the rise in prices, demand continued to expand on a year-to-year basis. This growth was mainly in the areas of low-price power—motive power, power for industrial and commercial use, power for cooking. In the higher price area where tariffs increased, the ESB ran into initial sales resistance to this increase and sales staff reported a marked cut-back in consumption. As an instance there is the report of the ESB's specialist Sales Engineer for religious institutions at the time. He described a determined effort to restrict consumption, carried to the extent that nuns were complaining of eye fatigue caused by the replacement of 40, 60 and 100 watt bulbs by weaker bulbs, in some cases as low as 10 watts!⁸

McLaughlin was influential in getting the ESB to reverse its policy of raising prices to meet financial difficulties, and over the years 1933–7 a policy of reducing prices wherever possible was adopted. The ESB's finances did not suffer, so that one suspects that the initial decision to increase charges was not the correct one.

SALES AND PRODUCTION GROWTH

Table 6.1 Consumers 1932–46

Year	Number of consumers
1932	77,134
1934	89,890
1936	116,704
1938	145,230
1940	172,545
1942	200,000
1944	222,013
1946	237,000

As Table 6.1 shows, the number of consumers rose steadily each year during the 1930s as the Board continued to extend its operations and acquire new undertakings. By the end of 1938 there were still ninety permitted undertakings in operation, as against 135 ten years earlier and 103 in 1932.⁹

By 1932 it had become clear to the Board that the forecasts made in 1925 of demand for electricity in the Free State had been too conservative. Pigeon House, shut down in 1930, had to be reopened in 1932.

The question of expansion of capacity had, therefore, to be considered. Before reaching any conclusions concerning the most desirable programme to expand capacity to meet the demand foreseen for the rest of the decade, the Board decided to seek once again the advice of one of the experts who had overseen the Shannon scheme, Dr Borgquist.

In a report prepared for the Board, the position of the ESB was established as follows. By 1931/2 the forecasts made in 1925 were already being exceeded. The total number of units generated, 153 million, was in line with the forecasts, but the peak load, 56,000 kW, was higher than had been foreseen.

Table 6.2

	Total no. units sold* (millions)	Peak load (kW)	Plant requirements (kW)	Actual plant (kW)	Additional plant requirements (kW)
1930-31	132	48,000	68,000	78,000	—
1930-32	153	56,000	76,000	78,000	—
1932-33	174	66,000	86,000	90,000	—
1933-34	200	78,000	98,000	—	8,000
1934-35	228	90,000	110,000	—	20,000
1935-36	260	102,000	122,000	—	32,000
1936-37	298	114,000	134,000	—	44,000 (10)
1937-38	340	126,000	146,000	—	56,000

*Actual to 1931-32, estimated for later years

CAPACITY DEVELOPMENT POLICY

It appeared evident to the ESB by 1932 that the Board was running out of spare capacity, although the basis of the forecasts for total demand made at the time is not clear. The figures proved to be underestimates as time passed.

The problem was to decide on the optimal development strategy. There were three options: the Board could decide to go for an increase in hydropower capacity alone, for an increase in steam capacity, or for some combination of the two.

The problem was a fairly complex one. As the constraint was on peak-load capacity, it seemed logical to opt for the much lower capital cost and higher marginal cost method of producing power over a short period of time by increasing steam generating capacity. On the face of it, this would minimise the long-run average cost of total supply.



Seán Lemass, who succeeded Patrick McGilligan as Minister for Industry and Commerce in 1932.

However, a different strategy was recommended to the Board. Part of the reason for this was the seasonal fluctuation in water availability in the Shannon. Water-survey data prepared over the years gave the Board a good indication of the rate at which it could use stored water in the Shannon to generate electricity during the summer. Increased autumn rainfall would then replenish the system's generating capacity. However, the possibility of freakishly dry weather in the autumn had also to be borne in mind, and in order to avert the possibility of inability to meet demand in the autumn, the Board was constrained to use less stored capacity in the summer than would otherwise have been permissible. Consequently, growing summer demand would have to be met through steam power, and water would, in effect, be wasted. So, from the Board's viewpoint, the policy of risk avoidance was imposing unnecessary base-load costs on the generating systems.

If, however, additional steam capacity (at relatively low capital cost) was available, then the possibility of an unusually dry autumn would pose no supply problem, since this capacity could be used to eliminate the deficiency in hydropower from the Shannon. Normally, of course, this would not have to be used.

The paradoxical result of this was that the provision of additional steam capacity would reduce the need to use steam to generate electricity in normal years, and increase the ability to meet supply requirements throughout the year with zero marginal cost energy from the hydroelectric plant. Steam capacity, then, offered an alternative, and a cheaper one, to increasing the storage capacity of the Shannon system to meet rainfall fluctuations.

At the same time, however, it was evident that the base load of the system was going to rise, too. To meet this increase with steam-generated electricity would raise costs overall. Consequently, the Board decided to choose a mixed expansion programme, with a combination of increased storage and extra generation capacity at Ardnacrusha on the one hand, and an increase in the steam generating capacity at its disposal on the other.

In deciding to increase the hydro-capacity of the system, the Board explicitly recognised the economic constraints on the exercise, established by the marginal cost of fuel for steam generation. Storage capacity would be increased only so long as the additional capital costs of so doing were equal to or less than the total fuel cost of providing for the forecast demand by means of steam.¹⁰

The main reason the Board stated for its view that base load was going to increase significantly was the possibility of an increase in industrial load. It would, no doubt, have been influenced in this by the overtly protectionist policies aimed at increased industrial self-sufficiency, which were being introduced by the new Fianna Fáil government that came into power in March 1932.

However, the general path of longer-term development of generating capacity suggested by the Board's forecasts for the later 1930s was clearly going to involve progressively declining reliance on hydroelectric power. It was already known that the cost of extending Shannon storage and increasing generating capacity were very high. In any case, the energy potential of the Shannon—a simple function of waterflow and fall—was limited. Other rivers, of course, could be harnessed, but none of these, the Liffey, the Erne, the Lee or the Blackwater, offered anything like the potential of the Shannon. It was, therefore, possible to see that in the long term the possibilities for water power were limited, and that it would be progressively outgrown by rising demand.

At the same time, Dr Borgquist pointed out in his report that technological advances and economies of scale were steadily reducing the average cost of generating electricity from steam. In the long run, therefore, the future of the ESB would lie with thermal power.

The report of Dr Borgquist and the views of the Board were passed on to the Department of Industry and Commerce in May 1932. The department, in turn, had these views independently examined and quickly came to the conclusion that permission should be given speedily to the ESB to start work at Ardnacrusha to provide additional generating capacity by the winter of 1933. This was to be done by installing a more powerful generator than those then operational, a Kaplan, which, although more costly, was technically more efficient, and would result in overall cost savings.¹¹

Although the Department of Industry and Commerce felt a little uneasy about the ESB's demand forecasts and costings, the findings of their own consultant, Professor Rishworth, reassured them, and towards the end of June 1932 they submitted a memorandum to the executive council seeking the government's approval of the ESB's plans, and the voting of the necessary monies, totalling approximately £600,000. The government acceded to this request and approved the Board's wish to award the Shannon contract on merit to Siemens Schuckert.¹²

THE LIFFEY SCHEME

The biggest single development during the 1930s was the harnessing of the Liffey. The early controversy of Liffey versus Shannon was academic and the general view was that the right decision had been taken in going ahead first with the Shannon, and the decision in principle had been taken during the early Dáil debates that the Liffey would eventually be developed.

Although a small energy source compared with the Shannon, the value of the Liffey was that it could make a useful contribution to meeting future base-load requirements and would involve comparatively low transmission costs, since it was situated near Dublin. In addition, Dublin Corporation was interested in the development of the Liffey, since such an undertaking would increase the reservoir capacity of the Dublin area.

The ESB, however, was not particularly interested in the development of the Liffey in the mid-1930s, as its problems were mainly those of meeting peak loads with existing capacity. The Liffey, had it been available, would have been a rather costly solution, given the economics of power supply, which suggest using low capital cost, high marginal cost stations to meet peak demands.

During 1934 and 1935 investigations were carried out into the feasibility of harnessing the Liffey. The results of these were made known to the Department of Industry and Commerce, and in January 1936 the Minister submitted a memorandum to the cabinet outlining his department's attitude. The expert investigation had suggested that the proposed development would cost £760,000 of which Dublin Corporation was willing to subscribe £85,000. However, projections of base-load demand indicated that the scheme would not be economically viable until 1942 or 1943. Consequently, a decision to go ahead at this time would mean a state subvention of £100,000. To meet the ESB's requirements by installing increased steam capacity would cost £500,000 less. Further factors

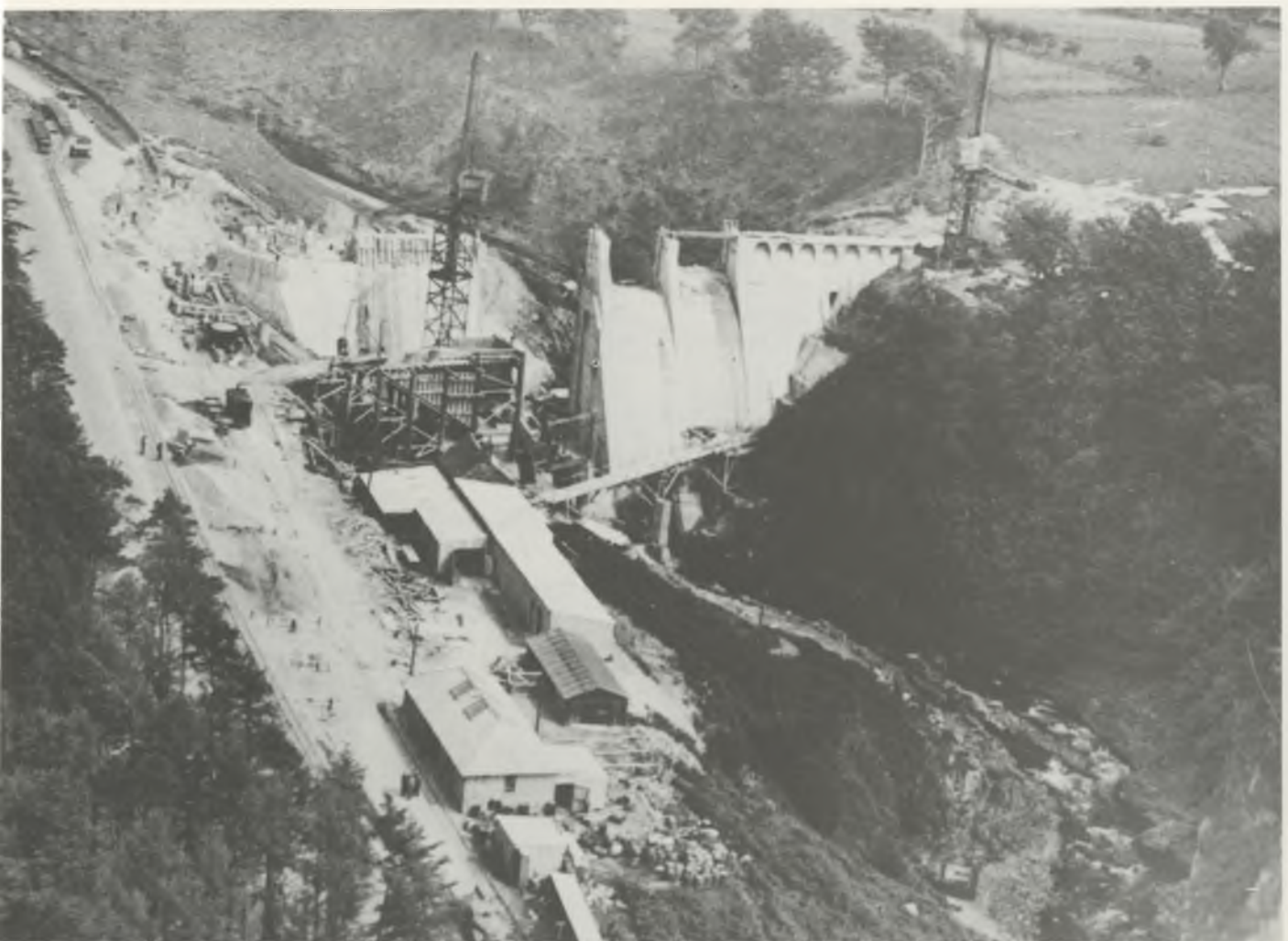
quoted against the Liffey proposal were that it would necessitate the destruction of valuable agricultural land, with possible consequences for external trade in agricultural goods. The capital imports for the scheme would amount to £340,000 (as compared to £155,000 for steam equipment for Pigeon House). In its favour, it offered higher employment during construction and would offer a strategic alternative to imported coal, which would be important in times of war. The department felt that by the early 1940s peat might be used for generating, which reduced the importance of the last point.

On balance, therefore, the department advised against going ahead. The executive council decided against the department. They may have been influenced in this by the fact that during negotiations, the Corporation agreed to increase its contribution by fifty per cent to £126,000. The ESB indicated that it was prepared to go ahead if financial arrangements were suitable, and in June 1936 it was decided to introduce the necessary legislation.¹³

The Board's peak-load problems were not solved by this decision, so in September 1936 the Minister for Finance agreed to increase the funds provided under the bill by £350,000 to enable the ESB to erect and equip a new steam plant in Cork as a partial solution to the Board's problems.

The bill was debated in the autumn session in 1936.¹⁴ McGilligan, now in opposition,

The Liffey Power Station under construction at Pollaphouca.



questioned the absence of an expert's report on the lines of that submitted to the Dáil before the Shannon debates. The Dáil, he said, would be unable to judge the merits of the bill under these circumstances. He also questioned the proposals for two stations rather than one on the Liffey. Lemass's reply was to the effect that he had confidence in the Board, and that it and the Corporation had sought expert advice and had accepted it, and that was good enough for the government. He admitted that the decision to go ahead immediately was based on the Corporation's water requirements rather than the Board's needs. It would, however, be more economic to undertake both at the same time. The government also saw the Liffey as an alternative to installing a fifth unit in the Shannon scheme—the capacity of the existing Shannon plant had been reached in 1934.

The discussions concerning the bill are significant in two respects. The bill marked, first of all, the establishment of the principle of final political decision-making in energy policy. The Board's requirements were made subservient to wider considerations by political choice, in this case the demands of Dublin Corporation. Lemass explicitly stated that it was to facilitate them that the scheme was being proposed for immediate adoption. To support this decision he stated: 'It has been estimated that the Liffey power development can be regarded as economic as compared with steam power when the total consumption of the ESB system is about 400m. units . . . in approximately four years'

The completed power station at Golden Falls.



time.¹⁵ Of course, this completely missed the point, which was, as far as the Board was concerned, that steam and water were complementary sources of energy, to meet different loads. It served, however, to obscure the issue.

The second item of significance is the emergence in government thinking of the use of peat as a serious contender for inclusion in future ESB developments and this will be discussed in a separate chapter.

In October 1937 an order was placed for the main construction work on the Liffey scheme at Pollaphouca and Golden Falls. The process of acquiring land then began. Almost 5,500 acres were to be acquired and, as much of this was in small holdings, the process was to be long and complex.¹⁶

Building began in 1938, but the outbreak of the Second World War had seriously affected the building programme since supplies of material became difficult to get and delivery was often uncertain. The whole scheme should have been completed by 1941 and by that time most of the civil engineering construction work had been completed and much of the mechanical and electrical equipment installed.¹⁷ Unfortunately, however, because of the war, not all of it had been delivered, so that at the end of 1942 the Board could not predict with accuracy when the Liffey power station would be placed in commission. The position was much the same a year later, though now the reservoirs at Pollaphouca and Leixlip had been filled. In December 1943 the Golden Falls station was brought into commission but to do this it was necessary to bypass Pollaphouca. The result was an intermittent and highly unsatisfactory operation. Soon afterwards the remaining equipment arrived and by 1945 the Liffey was contributing 15 million units, or half its estimated full annual production.¹⁸

A sad aspect of the Liffey scheme, and one not often remembered, is that it involved drowning a valley in the foothills of the Dublin Mountains, where the beautiful Pollaphouca reservoir now provides a recreation area to the west of the city. A small community had to be uprooted and a little of the pattern of Irish rural life was lost, but not totally, for in the early summer of 1939 an effort was made to preserve for posterity some record of the lifestyle of the area. The initiative was taken by Professor Eoin MacNeill, who quickly got the support of Mr de Valera. With their backing, a group of people, mainly academics, attempted to put on paper a description of the folkculture, farming methods and landholdings of the valley. One of the records of this collection is now preserved in the Irish Folklore Collection in University College Dublin.

OTHER WAR-TIME DEVELOPMENTS

The fact that Ireland was neutral in the Second World War did not in any way ease the position of the ESB in obtaining essential supplies of coal or machinery. Thus the whole period 1940-46 was to be one of severe difficulty for the ESB taxing its resources to the limit and often straining the ingenuity of its engineers who were forced to improvise and adapt in an attempt to keep machinery in operation.

The effects of the war began to be seriously felt in 1940. This was followed by an increase in the price of coal in 1941, which led to an increase in working expenditure, while the scarcity of coal created new problems, especially since the Pigeon House station was now back in full operation. Even inferior coal was hard to get and the Board had to appeal to consumers to economise in their use of electricity. An ominous note was struck in the annual report for 1940/41:

Faced with steeply rising prices for coal and materials, the Board contemplates that for the year ending 31st March, 1942 difficulty will be experienced on the basis of existing prices for electricity in covering for the interest on capital, depreciation and repayment of advances. A further factor which may intrude is that of serious loss of revenue through curtailment of supply. If this situation becomes aggravated it will be necessary for the Board to review the tariffs for electricity.¹⁹

These premonitions hardened into reality a year later:

The year was marked by unusually difficult conditions of supply, by a heavy increase in the expenditure on coal, and by a serious deterioration in the quality of the coal available. In consequence, working expenses, together with full provision for interest on capital, depreciation, repayments of advances to the Minister for Finance and repayment of capital in respect of local authority liabilities exceeded revenue by £121,000. In the exceptional circumstances obtaining, this difference is being met by a transfer from the contingencies reserve.²⁰

In November 1941, electricity charges increased by ten per cent, but in addition there was also the increasing threat of rationing. In fact preliminary arrangements were made in anticipation of rationing during the summer of 1941. In May it had been decided to discontinue the sale of cooking and heating appliances from the Board's showrooms. A year later rationing was introduced as supplies of coal became even more scarce. Connections to new consumers were discontinued. Matters deteriorated further in 1944 as by

War-time coal stocks at Pigeon House.



now deliveries of fuel were almost entirely confined to a slurry which was virtually unusable. A prolonged dry spell from February to April made matters worse still. The situation was again worsened in 1945 when the already poor fuel situation was aggravated by continuing dry weather. Increasing fuel prices necessitated a further price increase.

The supply situation can best be seen in the following figures. The number of units generated (406 million) and the number of units sold (319 million) were almost identical with the figures for 1940—but in 1940 there were 50,000 fewer consumers.²¹

These figures tell only part of the story. The war period tested the inventiveness of the ESB at all levels, especially in such things as improvisation when spare parts were not available, experimentation with new and usually much inferior types of fuel and trying to find ways of conserving the little energy there was without too much inconvenience to the consumer. Unlike the situation in the First World War when Pigeon House had a plentiful supply of coal, this time decent coal was simply not available. J.J. Kelly, then a young graduate engineer at Pigeon House remembers the coal boats coming in with grass growing on top of the coal. He discovered that the 'coal' was the scrapings off the top of slag heaps. Part of his job was to see, through sophisticated laboratory tests, if it could be burned. The workers on the ground had a less sophisticated but equally effective way of testing: they simply took a fistful of the 'fuel' and threw it at the wall, and if it stuck it would not burn. The inevitable shortages and rationing of these years, coupled with the price increases, created a certain resentment against the ESB which was not of its own making; in retrospect the incredible feature of this whole period is that with just two stations—Pigeon House burning inferior fuel, and Ardnacrusha dependent on the weather—the Board managed to sustain the country through the entire war and post-war period with only very infrequent interruptions. Conditions began to improve in 1946 when the worst of the rationing was over. As far as the ESB was concerned the end of the war marked the end of a phase of enforced inactivity and the beginning of a new and energetic phase which was to see the controversy over peat, the commencement of rural electrification and a major expansion of the Board's generating capacity.

The Turf Programme

I hope sincerely that you will not need to trouble yourself with the turf question.
Borgquist to McLaughlin, July 1937

DURING the 1927 debate on the Electricity Supply Bill much attention was devoted to the possibility of political considerations determining the selection of members of the Board. It was generally agreed that this would be undesirable and that certain precautions were necessary. Surprisingly, however, little attention was paid to a much more profound political question—the overall relationship of the ESB to the government. It was not clear whether the government expected the ESB to act as an agent of government policy, or how free the ESB was to be in formulating its policy according to what it saw as its own best interests.

These questions very abruptly ceased to be academic in the 1930s. The Fianna Fáil government, first elected in 1932 and destined to remain in office without interruption until 1948, was committed to a vigorous policy of economic nationalism and self-sufficiency. The economic war with Britain had shown that it was economically unhealthy to be reliant on a single supplier and had made that policy seem all the more urgent and desirable. Seán Lemass was the main architect of the government's policy, which emphasised the building up of protective tariffs, encouragement of native industries and the creation, where necessary, of state-sponsored bodies. Obviously, one essential cornerstone of such a policy of self-sufficiency was the availability and supply of energy.

Lemass and his colleagues saw in Ireland's vast peat bogs an untapped potential source of energy supply and it was in order to exploit and develop this resource that the Turf Development Board was established in 1934. The first head of this board was C.S. Andrews, a man who shared Lemass's outlook and who also shared much of Lemass's toughness, energy and determination in pursuit of his objectives.

It was only a short step from the setting up of the Turf Development Board to a further decision by the government that native fuels should be given priority in the development of a policy of energy self-sufficiency and that the ESB would have a key role to play in such a policy through the development of turf-burning power stations. Problems arose, however, when it emerged that the ESB found such a programme to be technically and financially unsound and resented being used to expedite the government's social and economic policies to the detriment of its own primary—and statutory—objectives, and against its own best advice.

The problem was complex and the controversy was to continue in one form or other until the 1960s. It led to periods of strained relations between the government and the ESB and caused considerable frustration within the ESB, but it did at least resolve the question of the ESB's status *vis-à-vis* government by showing very clearly that in the final analysis the ESB was not a free agent and that its ability to formulate its own policies independent of government supervision was limited.

Electro-magnet
invented in 1834 by
Nicholas Joseph Callan (right)



Shannon Scheme:
a Scán Keating painting (below)





Preparing for a Road Crossing (above)
Transformer Station (right)
Sub-Station, Merrion Square (below)



It was also a controversy in which all sides were to some extent the prisoners of their own particular interest, and where a greater mutual effort to understand the point of view and problems of the other side might well have obviated or at least lessened many of the difficulties and made some of the conflict unnecessary. The ESB for its part began with a deep-rooted (though not irrational) prejudice against turf. The government, and especially Seán Lemass, overrated the potential and especially the short-term potential of turf and dismissed the often valid objections of the ESB as entrenched and bureaucratic obstructionism. Bord na Móna, as the Turf Development Board was later named, was unrealistically optimistic about its own ability to deliver on its promises and used to the full the obvious influence it had with the government through C.S. Andrews. It was not, however, a totally fruitless controversy. In time, both sides came to modify their original positions and to see the problems of the other.

Members of the Turf Development Board. C.S. Andrews, the Board's first Chairman, is on the left.



In the end turf was to make an important contribution, especially in the 1970s when the price of oil rose dramatically. The ESB came to see turf as an important element in a diversified programme of supply and with improving technology most of the earlier difficulties were resolved. In time too the ESB and Bord na Móna resolved their differences in an entirely amicable and productive manner.

BACKGROUND

Long before the first commitment by the ESB to the development of turf-fired generating stations, the possibilities offered by turf as a source of energy had been fairly widely discussed. A typical example of the kind of promise that turf was seen to offer may be found in an address by Lt Gen Sir R.H. Sankey, R.E. (retired), delivered at the Cork exhibition conference in 1902.

According to Sankey, who had estimated both the energy yields of turf and the possibilities for hydropower to be provided by the recently sanctioned (but never implemented) Shannon power scheme, the potential of turf was far greater than that of hydropower. The Shannon power scheme envisaged an installation of 10,000 HP capacity. If this had been all the Shannon could offer, it would have been a good indicator of the limitations of hydropower. Turf, on the other hand, held out a much more tempting future. Sankey's estimates of the turf content of Irish bogs were not very scientific, and were, in fact, conservative. He suggested that, if only half the available bog area was used, turf could yield an annual 100,000 HP for 1250 years or 300,000 HP for over 400 years. Since bogs replace themselves he was encouraged to assert that 'the bogs... are the true goldmines of Ireland'—an understandable piece of hyperbole, designed to counter the fact that 'the water power of Ireland... has... a stranglehold on the popular imagination'. This, he felt, would lead to the country completely overlooking an enormous energy potential, while producing (through hydropower) a rather imperfect system, which would, in any case, require auxiliary steam power to meet peak-load demand. The potential of turf received a vote of confidence with the passing of a private act by Parliament in 1901¹ to authorise the development of bogs in the Leinster basin for electric power purposes. That scheme, however, was abandoned.

A much more thorough investigation of the potential of turf for electricity generation was produced by the Commission of Inquiry into the Resources and Industry of Ireland in its 1921 Peat Report. In this report, the commission made use of technical information on boiler design, fuel/energy conversion statistics, labour requirements, plant-related economies of scale, and the operating experience of turf-fired stations in Europe.

Its first concern was to contradict the apparently widely held view that turf-firing was inherently less efficient:

Notwithstanding statements to the contrary which appear from time to time, the best boiler practice shows that with furnaces correctly constructed for each fuel, the thermal efficiencies of [turf and coal]... will be the same. For practical purposes, the ratio of the calorific powers of the two fuels may, therefore, be taken as a measure of their relative values for most purposes.²

The methodology used in the report may now be open to serious question. Even at the time it was seen to leave some important questions unanswered. It did not, for example,

make any estimate of the capital cost differences between coal-fired stations and turf-fired stations, nor did it offer comparisons with coal-based or oil-based electricity; but it did come to one important conclusion. It argued that in order to benefit from technical economies of scale in turf-fired stations and to obtain the lowest cost per kW year, the generating capacity of stations should be of the order of 100,000 kW. Stations of this size would require, it was estimated, first-class bog areas of 30,000 to 50,000 acres each (depending on the type of generating equipment) over a fifty-year life span.³ The distribution of bogs in Ireland and water supply problems led the commission to the conclusion that such stations would not be feasible. These constraints would limit the size of stations in Ireland to 20,000 kW capacity units. The report concluded that at least one such station should be built.⁴

THE DECISION

In the mid-1930s, the economic and political situation in Ireland was favourable to the introduction of peat-based power. In the summer of 1935, a delegation was sent by the government to the USSR to study the large-scale peat production which had been undertaken in that country. In Germany and Russia, peat had been used as a fuel for generation of electricity since before the First World War.

In 1933 McLaughlin had sent a memorandum to the Minister for Industry and Commerce on the subject. In this he outlined developments to date in Germany and Russia, and the technical problems involved in using peat. His opinion was that the continuing Russian programme meant that the technical difficulties had been overcome. As to whether peat-powered stations were comparatively economic, he noted that no financial data were available on the most important German station, Kraftwerk Wiesmoor, in Ostfriesland. As in the case of Irish coal—on which he had also written to the government—there would be problems of location of an Irish peat station, which could involve high transmission costs. Finally, he noted that the economics of any such project would depend on the costs of producing the peat fuel, an area in which he had no competence.

In November 1935, in a paper delivered to the Engineering and Scientific Association of Ireland, which received some attention, Robert Tweedy, a member of the 1921 peat commission, reviewed the utilisation of peat in Russia. He also described some possibilities for using it in Ireland to supplant imported coal—in the Pigeon House station, for example—and after some colourful invective on the matter, concluded that ‘to postpone any longer the launching of a massed attack upon our bog fuel is not only unwarranted on any conceivable count, but is politically unsound, economically disastrous and socially criminal’.⁵ Such unqualified protectionist views were widespread at the time and were very close to government thinking on the matter.

During this time, the ESB and the government had been engaged in discussions concerning the development of the Liffey for hydroelectric purposes. It was becoming increasingly clear that future decisions by the ESB would not be taken in the context of the ESB alone or in its exclusive interests. The decision to go ahead with the Liffey scheme had been expedited in order to convenience Dublin Corporation and now the Department of Industry and Commerce was determined that any future plans for further generation must take into account the existence of the Turf Development Board

and should be geared towards the prospect of turf-based electricity by the early 1940s. This implied for the ESB that any extension of steam power would have to be based on domestic fuels. Effectively this meant that 'national' considerations of a political nature determined by the government were to take precedence over engineering and financial considerations in devising future ESB plans. The implications of this took some time to sink home for the ESB, especially the realisation that it was no longer a free agent but was expected to act as an instrument of government policy, on the government's terms.

For the ESB the turf programme started with the arrival on the desk of P.J. Dempsey, the Secretary, on 4 April 1936 of a letter from C.S. Andrews. This apparently innocuous document sought to inform the ESB that the Turf Development Board had 'under consideration a proposal to develop on a large scale a bog known as the Clonsast Bog situated 4 miles north of Portarlington'. The TDB wished to know if the ESB would be interested in this in the light of its future generating requirements, and expressed a willingness to meet the Board to discuss the matter.

Dempsey duly brought the letter to the Directors' attention—with no great haste, it must be said, as the contents were not discussed until 23 June.⁶ At their request he replied to Andrews to the effect that insufficient information was available to judge the feasibility of such a project. He went on to deal with Andrews's query as to whether other bogs might be suitable by suggesting that he should investigate certain bogs. There the matter rested, as far as the ESB was concerned. Nothing was heard of the proposal, officially at any rate, for nearly a year.

Then in May 1937 the Secretary of the Department of Industry and Commerce wrote a polite, if puzzled, note to the Board, in which he sought clarification on certain matters. The TDB, he said, was developing the Clonsast bog which was expected to yield 120,000 tons of turf in 1939. The question of its use in electricity generation had arisen, and the Minister understood that the ESB considered the bog unsuitable for technical reasons. The TDB, however, disagreed with this. The letter continued 'In view of this, the Minister is anxious to have the formal opinion of your Board before the possibility of using the turf... for the production of electricity is finally excluded.'⁷

Over a month passed before the Board replied. When it did so it indicated that the main technical problem was the water supply. The major difficulty was economic. When would the fuel be available (to fit into the Board's expansion plans) and how much would there be? How much would it cost? Would it be dry enough?⁸

In May 1937 McLaughlin had written to Borgquist, one of the Shannon experts, to ask his views on turf in the light of Swedish experience. Sweden had started to exploit turf in 1916 because of war-time coal shortages, but the experiment had been abandoned after the war. Borgquist replied in July:

Although we got into the turf business against our own wishes we resolved to make every effort to get a good result. We provided the best Engineer we could get and the best machinery. . . . Still we did not succeed. . . . At every point the result was less good than had been calculated. . . . Our loss by the turf experiment was about £60,000 and we were glad to lay down the production.⁹

He went on to say that they had started again in 1924/5 in order to employ conscientious objectors to conscription, who were paid for by the army; even with this free labour it still didn't pay. He concluded:

We were once discussing in our Board how it was possible that people could be so quite [sic] ignorant in regard to the calculation of costs as are the turf people. We came to the results that it was quite natural, because if they had been able to calculate, they would never have given their time to the turf job.

I hope sincerely that you will not need to trouble yourself with the turf question.

With best regards,

Your Friend,

W. Borgquist.

Given this advice it is not surprising that the Board, while co-operating with the Department of Industry and Commerce in answering its queries, did so without enthusiasm. In fact it is clear that in the early stages of the controversy not only was there a wide difference of opinion between the ESB and Industry and Commerce, but in some ways the terms of reference were quite different. For the ESB the whole question was whether a turf-burning station was feasible at all while the department started off on the assumption that it was, and the question was the terms on which the ESB would become involved. This was made very clear at the end of July 1937 when the department wrote that they were informed that cooling water was amply available and setting out firm answers to the Board's economic doubts. The ESB decided to investigate the water position for itself and informed the department accordingly. At this stage, the department began to show signs of impatience, wanting to know when the information would be available, and alarmingly (for the ESB) asking if it could not go ahead with a feasibility study based on an assumption that the water supply would be adequate.¹⁰

The ESB completed its investigations and found that there would not be adequate water on the bog. The department was notified that the River Barrow could provide it—but that was some miles away. Unless water was to be pumped expensively to the station it would be necessary to transport the peat to the river. Then, could the price of 10s.6d. per ton delivered (previously quoted by the TDB) be maintained? The ESB also brought up a new issue, the question of when, during the year, the peat would be available.¹¹ To all these difficulties the department had quick answers. The government's correspondence from late 1937 on refers simply to the 'use of Clonsast turf for the generation of electricity'. It seems clear that in collaboration with the TDB a decision had now been taken to go ahead. The ESB, however, was evidently still under the impression that the matter was as yet merely under consideration and that no firm decision had been taken. In the meantime, it continued to co-operate with the department, although it must have been growing more nervous and suspicious of ministerial intentions.

In January 1938, the Chief Design Engineer, P.G. Murphy, sent a memorandum to the Directors on the ESB's position with respect to Industry and Commerce and the TDB. He reviewed the history of the affair and informed the Board that detailed estimates had now been made of the construction costs of a 10 mW unit, followed by another, at Clonsast, and also for one at Castlecomer, using domestically produced anthracite. It was clear to him that if domestic fuel had to be used, the latter would be economically preferable and should take priority over Clonsast.¹²

At roughly the same time (early 1938), the Minister asked the Board to meet him informally in order to discuss the relative economics of the various possible energy

sources for electricity.¹³ This, he indicated, would help in the drawing up of an agreed statement on the matter which would be of use both to the ESB and to his department. For the ESB, however, the meeting turned out to be far more than an informal exchange of views and was to give a painful foretaste of things to come. Seán Lemass was by now obviously frustrated by the ESB's attitude and the meeting eventually turned into an assault on the ESB by the Minister. Lemass started by remonstrating with the Board about Pigeon House, which had been closed down after the advent of Shannon power. Now, not only had it been recommissioned to meet peak-load requirements, but the Board found it necessary in 1936 to seek funds to have the capacity of the old steam station further increased.

The government was now being asked to advance funds for another 20 mW set, coal-fired, for installation in Pigeon House. Early in 1937 Lemass had informed the Board that this extension would not be sanctioned by the government. This decision was clearly part of overall government strategy, seeking to ensure that eventually only domestic sources of power would be used. This 1937 decision was, then, a political one, designed to achieve a political objective—self-sufficiency in energy—but the ESB was not explicitly informed of this, and was planning for the future on quite different assumptions. It may well be that the ESB was slow to grasp the fact that Fianna Fáil was deadly serious about the possibility of national self-sufficiency and nowhere more serious than in those areas which Seán Lemass was later to describe in a very different context as 'instruments of Government policy' (the state companies). Whether the ESB should be blamed or praised for its failure to fit in with government strategy on a question which was as much political as economic, and whether or not it should have shown more skill in reading the political winds, are still perhaps open questions, but in 1938 Seán Lemass at least had no doubts about the answers. He was furious that the ESB had come back to him looking for a further extension to Pigeon House as an urgent requirement. He was in no way mollified by the assurance of R.F. Browne that the ESB could use turf at the Clonsast (Portarlinton) station, provided the fuel was dry enough and available in adequate quantities:

The Minister stated that his letter was an 'ultimatum' and apparently it was not being taken as such by the Board. The Government was placing 'a brick wall around the country' and Irish fuel had to be used. Comparisons with the use of imported fuels did not arise, and if any future proposals were received by him for a plant utilising imported fuels 'there would be a devil of a row'. The Minister further stressed that any failure on the part of the Collieries, the Turf Board or his own Department would not be accepted as an alibi for the Board.¹⁴

He flatly refused to sanction an extension to Pigeon House to burn coal. The Chairman and the Chief Design Engineer then tried to explain the need for Pigeon House to meet peak loads and to give the Board security of supply which would be essential by 1939. Native coal or peat would not only be uneconomic to meet peak loads, but would not be available until 1941 or 1942.¹⁵

At this stage Lemass seems to have cooled down, and a discussion of the Board's medium-term plans ensued. Browne was able to mollify him by assuring him that the proposed Pigeon House extension would be the last, and by saying that a peat-fired station or an extension to the Shannon would be next on the programme.

He also sought to obtain the Minister's consent to a proposal that the TDB should build and operate the proposed station, and that the ESB would buy the power produced by it at an agreed price. The motivation for this is clear: if the TDB built and operated the station, then they alone would bear the responsibility for solving the problem of supply (quantity and quality), about which the Board had reservations, despite Dr Andrews's frequent assertions that the difficulties could be overcome. Also, the cost of the power so generated would be clearly seen, and either the Board would have a clear case for any higher price which might be necessary, or the government would have to subsidise the use of turf openly.

Three days later, at another meeting, with Lemass absent, the department informed the Board of the Minister's decision. The department would see to it that turf was available; it was up to the ESB to use it. Furthermore, the Minister required the Board to prepare a detailed scheme for a turf-burning station within six months.¹⁶ The ESB had clearly lost the battle over turf. However, a consolation prize came its way in the form of a decision in mid-April 1938 that the Board's request for a 20mW unit at Pigeon House should be granted. Even to this, however, there was attached the rider that no further imported-fuel plant would be sanctioned and that the development of turf was to take priority.

THE PORTARLINGTON STATION

The Department of Industry and Commerce wrote to the ESB formally in June 1938 confirming that the necessary quantity of turf would be available in 1941/2 at Clonsast, at a price of 10s.6d. a ton.¹⁷ It was on this basis that the ESB was required to draw up its proposals. This was duly done, and in September 1938 the Directors informed the department that they had prepared a scheme, the financial aspects of which they would like to discuss.¹⁸

In an attempt to secure at least some of the ESB's objectives, the Directors wrote to the department offering to build and operate the station on behalf of the Minister and to purchase the supply at a price based on turf being available at 9s.5d. The ploy failed and the Minister's decision was that the ESB should build the station on its own behalf, financed in the usual way. He was not prepared to offer any guarantee involving financial penalties.¹⁹ The letter to the Board was unequivocal, saying 'the Minister is not prepared to entertain the suggestion of a guarantee. . . . Any financial loss falling on the Board by reason of any such failure must be borne by the Board.'

At this stage (late 1938) the Board seems to have given up the struggle to halt or modify the plans advanced by the government and the TDB. But before putting the scheme out to tender, they sought to clarify the price aspect: they asked Industry and Commerce for how long the price of 10s.6d. per ton could be taken as fixed. The answer they received was not very reassuring—one year, after which the ESB would have to negotiate with the TDB. This was clearly a very unsatisfactory position; as the Board pointed out, there was no serious competitive pressure on the TDB to hold its prices down. The ESB would be its only significant customer and would be negotiating from the hopeless position of being effectively bound to buy whatever supply the TDB could produce.²⁰

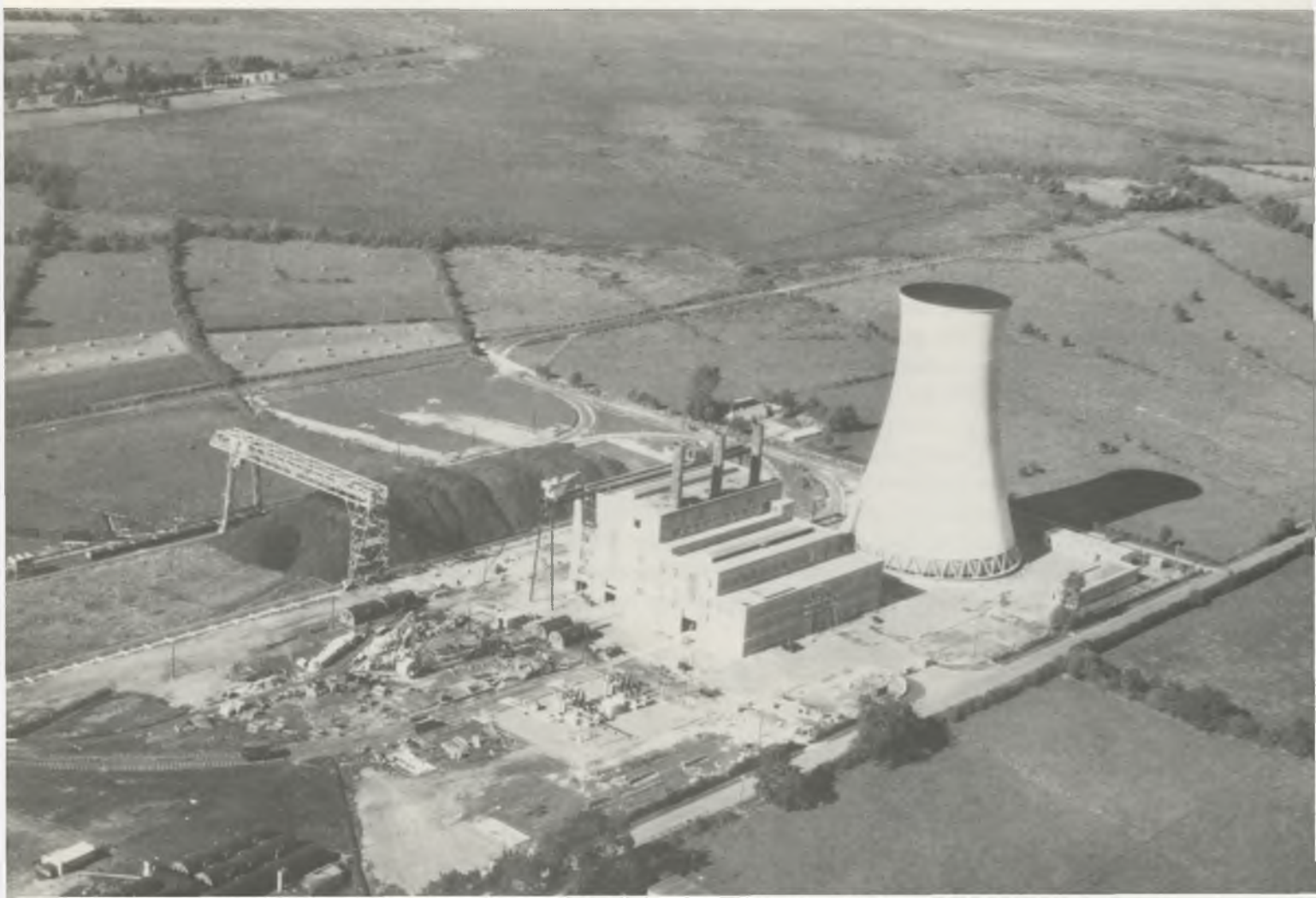
By now it was clear that the Portarlington station could not be ready before 1942 at the earliest, while demand for its output would not be there until 1943, on the basis of

current projections of power consumption. The direct increased generating cost of using turf, assuming no snags arose, was only two per cent greater than using coal, 0.336*d.* per unit as compared to 0.319*d.* at the new projected size of the station (90 million units a year). There would, however, be the cost of the extra line system to connect Portarlinton to the national grid; also, although the ESB's memoranda on the subject do not refer to it, there would be increased cost arising from the higher transmission losses; the main market was in Dublin, while the power was being generated fifty miles away.

At the end of February 1939, the ESB finally decided to go ahead, but with very serious misgivings. The depth of the anxiety felt may be judged from the fact that a founder Director, Henry Kennedy, felt obliged to dissent formally and to ask the Board to accept a letter from him in which his views would be on record. In this letter²¹ he expressed his concern that the decision was wrong on two grounds. In the first place he felt that the Board was not justified in going ahead until it received assurances that turf of an acceptable quality would be adequately available; what the Board had received did not constitute any such assurance. Secondly he expressed grave doubts as to the ability of the TDB to live up to its promise to deliver. The decision to go ahead, however, had been taken and the Board put it into effect. During the spring of 1939 it drew up its specifications and in the summer of that year advertised for tenders.

Tenders were received from Britain and the Continent. The ESB did not seriously seek tenders from the USA because of logistic difficulties if a war should break out. The main continental tenders were from Germany and Switzerland. (The Czech Skoda works

The new turf-burning power station at Portarlinton nearing completion in 1949, with peat bogs in the background.



were at this time under German control). When the tenders had been received, however, the Second World War (though at this stage still only a European war) had started. There was general uncertainty and pessimism and all tenders had various escape clauses to deal with the hazards of war.

The British firms, although tendering at a higher price,²² were obviously in a better position to deliver the equipment, although they were subject to priority orders from London. The continentals could give a firm promise to build, but clearly could not be as firm about actually getting the goods to Ireland, and they would require the ESB to carry the risk of loss. Neither the British nor the continentals could offer guarantees on prices. In spite of the uncertainty and the obvious dangers, it was decided to go ahead. The advent of war, which put a huge question mark over continuing supplies of coal, created a new sense of urgency about finding some fuel alternative based on native resources and this reaffirmed the decision to go ahead. It now looked as if the TDB could keep its price at 10s.6d. a ton, and if it could, then turf would be economical compared with coal because of the sharp increase in coal prices following the outbreak of war. And even if turf prices were not to remain stable there was at least a guarantee of supply—or so the TDB argued.

But by the spring of 1940 it began to appear that the ESB's reservations about turf supply had been justified. Industry and Commerce sought urgently to find out what the cost of electricity would be if less turf was available than had been envisaged. At this stage a new row developed between the Minister and the ESB. The Minister was under the impression that if turf was not available, coal could be used instead at (the still unbuilt) Portarlinton. This arose from an earlier letter from the ESB to the department dealing with the conversion of turf-burning plant to using coal in the event of a shortage of turf.²³ The Board had said that the conversion was relatively inexpensive but time-consuming. The department had interpreted this to mean that it could be easily undertaken. From the ESB's point of view, this was not the case, as it would involve shutting down, partially or completely, the Portarlinton station for conversion. The department assumed that coal could be quickly used to make up any turf deficiency.

The ESB pointed out that if Portarlinton was to operate on the basis of coal *or* turf, and not to close down periodically, it would be necessary to engage in a certain amount of duplication of boiler equipment which would seriously affect the economics of the station.

The ESB had no control over turf supplies and the Minister's advisers in Industry and Commerce had apparently failed to grasp the problems of fuel conversion when explained to them. Nevertheless, the Minister's reply to the news that provision for coal burning would raise the cost of electricity from Portarlinton by around 40 per cent, clearly constituted an attempt to pass the responsibility to the ESB:

It is understood that it is the considered view of your Board that [Portarlinton] is not a suitable site for the installation of coal burning plant, and that consequently the plant should be confined to that necessary to burn peat. In this connection I am to acquaint you that the Minister must require your Board to accept full responsibility for any decision arrived at on this basis bearing in mind the possibility of irregular supplies of peat due to any cause whatsoever.²⁴

After the ESB had written in an attempt to set the record straight on this point, they

received a reply from Industry and Commerce which sought further to place the responsibility for supply problems on the Board's shoulders:

I am directed by the Minister to state that it has been understood in all negotiations with your Board that the maximum output of peat required to enable the station to be run on an economic basis would not exceed 120,000 tons per annum.²⁵

In fact the ESB had made clear previously that they needed 120,000 tons, but could use more. The TDB had at the time been talking expansively of an output from the Clonsast bogs of 150,000 to 200,000 tons. From the ESB's point of view, the implications of this lengthy and confused correspondence were serious. As P.G. Murphy put it in a memorandum:

When making plans for electricity supply it is necessary to design the system to be safe (i.e. secure supply) under the worst conditions which may reasonably arise in practice. As failure of the peat production is a reasonable possibility, it must be taken into consideration in designing the generating plant.²⁶

In the light of this, he suggested that the vicissitudes of turf supply necessitated building further coal-fired plant, preferably in Cork, and the government was so informed.²⁷

The projected Portarlinton station now ran into further trouble, mainly because of doubts about the ability of the British firm to supply the boiler equipment, and it seemed unlikely that the ESB would get a priority listing from the British government to enable any such contract to be fulfilled. At the end of June 1940 the Board decided that these factors made it impossible to continue negotiations. In early August Dempsey wrote to John Leydon, Secretary of Industry and Commerce, to say that under existing circumstances 'the Board will not be able to advise the Minister of the programme of work for the erection of the Station'.²⁸ The Minister's response was to question the Board's tendering procedure and to say that he would hold it responsible for any delays due to failure to seek tenders in countries other than those already approached.²⁹

Negotiations were continued through the winter of 1940-41, without any start being made on the turf power station. The Board decided at a special meeting (28 January 1941) to ask the Minister for financial guarantees in the event of losses being incurred at Portarlinton for reasons beyond its control, while expressing its willingness to go ahead with what it wanted to be seen as an experimental scheme. In this last respect it hoped that the government would agree to reducing its size and would also agree to a coal-powered station at Cork.

The Minister was now Seán MacEntee (Lemass was Minister for Supplies) and he met the Chairman two days later. This time the Board got somewhere: the Minister accepted in principle its point of view on the financing of a deficit. He also showed himself more amenable on the issue of the price of turf. The Board clearly felt itself to be on firmer ground than for several years and began to think in terms of ditching Portarlinton if suitable guarantees did not come through.³⁰ It decided provisionally to go ahead with a single 20 mW set at Portarlinton.

L.J. Kettle dissented formally³¹ from this on the grounds that one set could go out of commission and put the TDB's turf programme in jeopardy. He regarded the Board as having been instructed to give priority to supporting that programme.

After further negotiations with the Minister the Board decided in September 1941 to go ahead and preparatory work commenced at Portarlinton. But a year later the project had not advanced much further, mainly because generating equipment was not available owing to the war. And in fact the attitude of the ESB to the project had now changed somewhat, mainly because of the difficulties in getting non-native fuels. But now a serious doubt appeared about the availability of turf in sufficient quantities. When questioned on this, Andrews said there would be no problem about providing 100,000 tons per annum but that the price 'would be very high' and that 'it was most unlikely the figure would be competitive with that of imported coal'.³²

Alarmed by this, the ESB asked the TDB to send them some cost figures on Clonsast. The TDB refused, claiming that they were not entitled by law to do so and refused later to seek any such authority.³³ The ESB then undertook its own study on the Clonsast bog, and concluded that with existing machinery an output of about 40,000 tons per annum was possible, and a maximum certain output with more equipment would be around 80,000 tons. These figures would not justify the planned 20 mW generating station.

There were such delays because of the war, however, that by this time Portarlinton was being viewed as part of the post-war development programme of the ESB, and some of the urgency disappeared from correspondence on it. The government was also softening its attitude on turf and in February 1944 gave provisional approval to a new coal-fired station in Dublin. At the same time it urged the Board to plan its future generation capacity on the basis of native fuels 'as far as practicable'.³⁴

The ESB then decided that the Portarlinton station should be reduced to 12½ mW because of the fuel problem and that it should be seen as an experimental station whose contributions to load requirements would be unimportant. It still saw the Dublin coal station as its main priority and it wished to postpone any question of a further turf station until there was clear evidence of performance from Portarlinton. This point was reinforced by the belief that turf looked like costing over three times as much as had been forecast in 1937.

The Board's downgrading of Portarlinton upset Lemass, who had returned to Industry and Commerce, even though it provided for a further possible 12½ mW set if fuel became available. However, the government approved the change, although reluctantly. Further instructions were issued to the Board in 1944 to investigate the exclusive use of turf—even in Dublin—and to prepare a list of sites. The ranking of the bogs which the subsequent study produced was, in descending order of suitability, the Brosna Basin group, with a station near Banagher, the Longford group and the Kildare group.³⁵ In the meantime, tenders were sought for the generator for the revised Portarlinton programme and the Board awarded the contract to ASEA of Sweden.

As far as further use of turf was concerned, the Board's best estimate was that a second station could be fitted into the development programme to come on stream about seven years after the war; this would be a large station using, eventually, 200,000 tons of turf to provide the fuel for two 15 mW sets. Even this, however, would not count as a major contribution to meeting the Board's needs, since a 30 mW station was relatively small and turf-powered stations were not technically suitable for providing peak-load requirements.

As soon as the war ended in 1945 the view of the Department of Industry and Commerce hardened once again on the question of the turf stations. In June 1946 the

provisional order for a coal-fired station in Dublin was revoked. The TDB now estimated that there would be sufficient turf available and that further bogs would be brought into commission. It was on this basis that the ESB was instructed to start planning further turf stations and to abandon its plans for coal-fired peak-load and standby capacity.

In the meantime, it had been decided to change once more the capacity of Portarlinton and second and third generating sets, each of 12½ mW had been ordered, so that an output of 90 million units, based on 120,000 tons of turf, was planned. The station was scheduled to start generating in the autumn of 1948, but supply difficulties made this target unattainable. By January 1947 the decision had been taken to build a further turf station at Allenwood, Co. Kildare, having a capacity of 40 mW, and a maximum output of 135 million units per annum.

Portarlinton was finally commissioned in January 1950. In the meantime the Board had become committed to building further turf-powered stations.

POST-WAR CONFLICT

The Board's internal estimates of post-war demand, coupled with governmental views on turf, had forced the ESB to start thinking in 1944 of a second turf-powered station in order to meet base-load requirements forecast for the early 1950s. The experiment had become a programme—a programme which, in the end, depended on a factor quite outside the Board's control, namely the ability of the TDB (later Bord na Móna) to deliver turf. Commitment to basing its capacity programme on the output of turf meant a serious projected steam deficiency. Technically, turf-powered stations were marginally less suitable for peak-load requirements. But in addition they could not be brought into production as quickly as coal because of the development problems facing the TDB. This, as well as the higher cost of the power generated by turf, explains the running battle between the ESB and the Department of Industry and Commerce over coal-powered capacity which went on from 1944 to 1949.

The position seemed to be that Seán Lemass and the Department of Industry and Commerce were slow to see the difficulties which faced the ESB and were suspicious of the ESB's delaying tactics. This led to considerable misunderstanding, so that when the ESB saw the need to build supplementary plant using coal to counter delays and difficulties in getting the turf stations into commission the reaction of the department was either a flat refusal or a suggestion to increase Shannon storage or to increase the capacity of Portarlinton, neither of which would be a solution to the ESB's problems. Part of the blame here must rest with the ESB for its failure to explain sufficiently well to the department the nature of its problems.³⁶

MILLED PEAT FOR ELECTRICITY GENERATION

By mid-1946 Bord na Móna was actively considering development of further bogs in Kildare and in Mayo, and clearly wanted ESB involvement. In this they were in the end successful, and it could reasonably be said that the requirements of Bord na Móna were for the next ten years a major constraint on the ESB's ability to plan its generating programme according to its own criteria of efficiency. By this time the ESB itself was

prepared to accept that its programme must give priority to utilising turf, although, in view of continuing conflict with Industry and Commerce, this attitude does not seem to have been adequately communicated over the next couple of years.³⁷

The ESB agreed to go ahead with plant for a station at Allenwood, Co. Kildare, in addition to Portarlinton, and to develop a station at Ferbane, Co. Offaly (the Brosna station) at a later date. At the same time, the question of using milled peat rather than sod peat was raised again. Bord na Móna had asked the ESB if it could be used in Portarlinton, but had been turned down.

Milled peat involves less labour, and is therefore easier and cheaper to produce. However, it contains more water and poses combustion problems in generating stations. Bord na Móna had, by 1949, ten years experience of production of milled peat for briquettes. The ESB for its part had mastered the technology of using machine-cut sod turf and was reluctant to give itself new problems with a new fuel, at least not without considerable financial incentives.³⁸

For Bord na Móna there were strong arguments in favour of trying milled peat, especially because it was cheaper and easier to harvest than sod turf. This would make it possible for Bord na Móna to reduce its prices for supplies from £2.16s.2d. (£2.81) a ton to £1.18s.10s. (£1.94) a ton (30 per cent moisture) with the same degree of profitability.

The ESB's objections were based on technological problems and economic fears. These were compounded by a general reluctance to increase the ESB's commitment to turf. The ESB felt that the time and money it had invested in mastering the difficulties of using sod turf would now be wasted and a similar expenditure of effort would be incurred if future turf power was to be based on milled peat. At the time, with the exception of some German utilisation of brown coal, experience of milled peat was confined to the Soviet Union. The proceedings of an international energy conference in 1950 had shown that the Russians were devoting a considerable amount of attention to the process, but that they had not yet come up with final answers to many of the problems involved.³⁹

The ESB also doubted that Bord na Móna could live up to its promises for milled peat any more than for sod peat. In this they were concerned not only about the quantity available, but also about its quality, since the moisture content of a considerable amount of the sod turf delivered was already over the prescribed 30 per cent moisture content, which reduced its value as a fuel. The high moisture content of milled peat was an important problem for the ESB because not only would this mean a new set of boiler construction problems, but also the reduction of the moisture content involved a loss of energy.⁴⁰

The actual decision to go for milled peat emerged through a fair amount of confusion and vacillation in the years 1951 and 1952. After the original request of Bord na Móna had been turned down by the ESB, and as a result of continued pressure from Bord na Móna, an inconclusive meeting was held between the antagonists, with the department presiding, in January 1951.⁴¹

However, on the basis of what had been said, the Minister for Industry and Commerce, William Norton, gave his decision in March 1951.⁴² The department wrote to Bord na Móna to tell them that because of the ESB's objections, the Minister had decided that the proposed Ferbane station should use sod turf, not milled peat. A pilot plant to investigate milled peat, however, was to go ahead. The ESB found it difficult to assign scarce staff resources to this project, but the minister insisted.

By August 1951 the government had changed again, and Lemass was back in office. After consultations with C.S. Andrews he informed the ESB that to wait for the results of a pilot plant was out of the question. A meeting was held between the Board, the department and Bord na Móna, at which the development of future bogs for milled peat was agreed, but the department confirmed that Ferbane was to go ahead on the basis of sod peat.⁴³

In November 1951, a report commissioned by the government from the Battelle Memorial Institute on (amongst other things) the utilisation of milled peat in Ireland was received by the ESB. The report was generally favourable to the use of milled peat. It also recommended, however, that provision should be made for the utilisation of alternative fuel—coal, oil or sod turf—in any stations designed for milled peat. Apart from the extra design cost involved, this was not welcomed by the ESB because the delivery costs of alternative fuels to milled peat stations would be high.⁴⁴

At the end of January 1952 the ESB was informed that the Minister had considered all the evidence, and had decided that the Ferbane station should use milled peat, thus reversing Norton's decision of less than a year previously.⁴⁵ The ESB, of course, acquiesced in this, and decided to drop the pilot plant project. Instead, trials were to be undertaken in the USA with the co-operation of the Battelle Institute.

Ferbane and several subsequent turf-powered stations were based on milled peat. During 1952 and 1953, tenders were sought for the electrical and civil engineering contracts for Ferbane, and work commenced in 1953. Progress on construction was slower than had been hoped because of construction problems, but the station's first set was commissioned in 1956.

THE HAND-WON TURF STATIONS

The third set of turf-burning stations was designed to use hand-won turf. The decision to include these small and inefficient stations in the ESB system, bitterly opposed by the ESB, was taken for social and political reasons.

The first indication of government interest in hand-won turf came at a meeting between Seán Lemass and the ESB in early 1952.⁴⁶ Lemass asked the ESB to investigate the question of small power stations in remote areas which would use hand-won turf. He saw these stations largely as a means of providing extra income in these areas and not as an essential part of the ESB system. And in asking the ESB to examine the question he stressed that financial considerations were not to be the dominant ones, as the government might be prepared to carry part of the burden.

In the Dáil in June 1953 Lemass was to be even more explicit on this question and on the thinking behind the new hand-won stations. He stated that the output of hand-won turf in some western areas had increased enormously under war-time conditions and that the return of peace-time conditions had led to some economic upsets:

It was precisely because we desired to restore the conditions of comparative prosperity that existed in those areas during the time of maximum demand for hand-won turf that we decided to establish there small power stations to be based upon hand-won turf purchased from local private producers. . . . The purpose of these stations is definitely a social one. It is to improve the social conditions of these areas. I do not

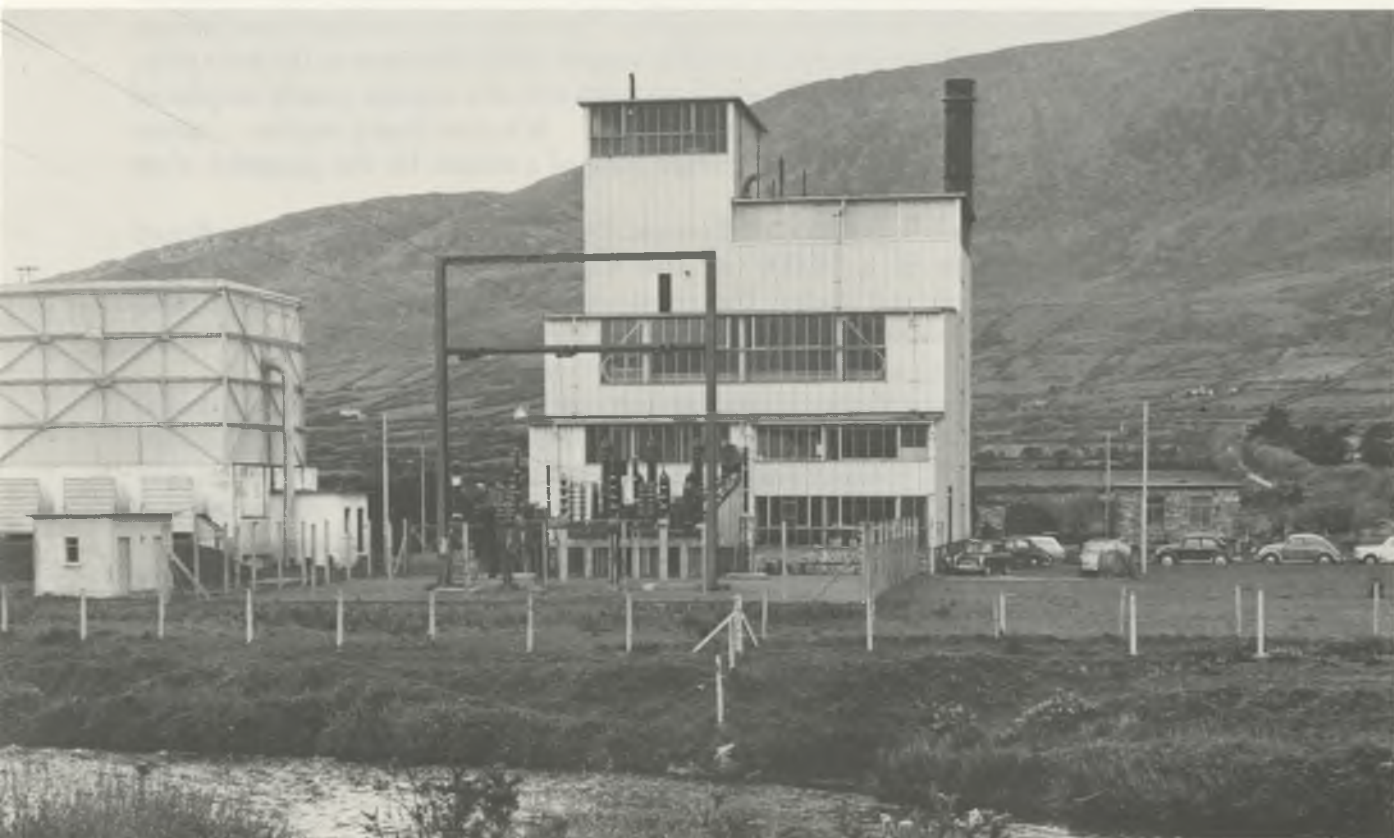
want to suggest that it will be possible to work them on as economical a basis as the much larger stations located on midland bogs. They will be less economic than the larger stations; but the economic consideration is of less concern than the social advantages they confer.

The ESB consulted with Bord na Móna in March–April 1952 about the location of such surplus hand-won turf, and identified areas in Kerry, Clare, Galway and Donegal which had potential surpluses, were impoverished and were far from any existing or proposed turf-powered stations. (Existing stations were taking small quantities of hand-won turf.)

On the basis of this, the Minister instructed the Board in June 1952, to proceed with the scheme and to commence construction in 1953.⁴⁷ At this stage the familiar phenomenon of disagreement over the terms under which turf was to be used appeared yet again. The Board's understanding, drawn from the Minister's original suggestion, was that the stations would use surplus turf⁴⁸ (i.e. non-marketable output); at times when this was not available, the cost to the ESB of having idle stations would be met by the government. Industry and Commerce, however, did not agree that such arrangements had been suggested. The importance of this question to the ESB went further than the cost of idle capital. Underlying it was the problem of whether they were to get a steady supply of turf or intermittent supplies. This would affect the type of plant to be erected.

The preliminary investigations of the ESB suggested that, given the probable quantities of turf available, it would be very expensive both to build local power stations and to use them. Each station would cost approximately £1m., and would involve annual

The peat-fired station at Cahirciveen, Co. Kerry, used hand-won turf.



overhead costs of £125,000. It would be cheaper by far in these circumstances to buy the turf and to transport it to existing power stations.

On the assumption that the ESB was to use all available turf, the quantities involved were quite large. A joint technical committee of Bord na Móna and the ESB estimated that with the advent of the ESB as a purchaser, the supply of hand-won turf within twenty miles of the proposed stations would be sufficient to warrant building 10 mW stations.⁴⁹

When this information was received by the Minister, he appears to have become a bit alarmed, and in a meeting in July with the ESB his officials emphasised that they were now concerned with using surplus hand-won turf only.⁵⁰

On the question of transporting the turf elsewhere, the view of the minister as relayed to the ESB was that:

1. the utilisation of the turf was a social, not an economic matter;
2. the presence of a generating station was psychologically important as evidence of a permanent market for surplus supply;
3. transporting the turf would appear to be a temporary measure.

The consequence of this meeting was that the ESB now found itself faced with the necessity of planning stations with an output capacity of only 1 mW. The cost of electricity produced by such small-scale plant would be much higher. The cost of using the turf locally instead of transporting it to existing stations (where it was still uneconomic) would probably be in the region of £40,000 a year, which the ESB would have to recoup from the government or from the consumer.⁵¹

In all these negotiations the ESB was at a great disadvantage as no firm estimates were available of the actual surplus tonnage of turf available. Bord na Móna could only give educated guesses of the potential output in the absence of a detailed survey, which would be expensive and would have taken a long time to complete—too long to meet Lemass's deadline for the commencement of work on the project. Understandably, they refused to give any guarantees on the availability of supplies. They went even further than this in a memo questioning the whole concept of surplus supply which they sent to the joint technical committee in October 1952: 'There is no evidence of a regular yearly surplus of hand-won turf in the areas selected for examination. . . . It is clear that a surplus . . . arises only when a stimulus is provided in the beginning of a season by the prospect of an assured market.'⁵²

This, however, made no impression on Lemass. On 28 October he ordered the Board to proceed on the basis of a 30,000-ton turf supply in each case.⁵³ The Board, accordingly, investigated and costed the construction and running of four 6 mW stations. The extra cost to the ESB was estimated conservatively (on the basis of 50 per cent availability of supply) at a capital sum of £2.055m.

This was made up of the difference between unit cost at the 6 mW stations and that at Clonsast (which was already 20 per cent more expensive than coal-burning stations) and an amount to provide necessary standby equipment to take over from the four 6 mW stations in the event, envisaged by Lemass, of turf being temporarily unavailable. If comparison was made with a coal station, the extra cost rose to £3.235m.

Certainly the economics of the project were not easy to understand. The government was planning an expenditure of £2.16m. on building the stations, plus, if the extra cost of



Showroom Display (above)
Milled peat harvesting (below)



Carrigadrohid Station
River Lee (right)

Fish farm at Lettermullan (below)



using them was not to fall on consumers of electricity, a further sum of at least £2.055m. in order to provide a gross income in the areas affected of £100,000 a year assuming 50 per cent of total possible supply was provided and at a price of £1.15s.0d. (£1.75) a ton. This would mean a social return on the investment of 2.4 per cent. The ESB was at the time using a discount factor of 5 per cent. Apart from the psychological element, whatever its worth, exactly the same benefit could be conferred by giving the ESB a sum equivalent to the capitalisation of the difference between the price paid to Bord na Móna for turf and the cost to the ESB of buying and transporting the hand-won turf to a large station. Since Bord na Móna was then getting £2.7s.6d. (£2.375) a ton for turf delivered at Portarlinton, transport costs would have to exceed 12s.6d. (£0.625) a ton before the ESB would be at a loss. If costs had been as high as £1 a ton, a capital grant of £200,000 would have enabled the ESB to purchase the turf. At the absurd figure of £3 a ton, the grant needed by the ESB would be only £2.6m.

The ESB, accordingly, once again urged the minister to review his decision, but without success.⁵⁴ Moreover, he further instructed the Board that the extra cost of using the turf would have to be met by the Board out of its general revenue.

The ESB sought legal advice from Arthur Cox. His answer was that if the government chose to direct the ESB to act in contravention of its duty under the Electricity Supply Acts (as was here the case) it had the power to do so under the 1946 Supply and Services Act, and that there was nothing the Board could do.⁵⁵

The situation was the more painful for the ESB because the government had already accepted the principle of subsidising 'social' services by the Board in the case of rural electrification. Of course, in that case, the sums involved were so large as not to have been sustainable by the Board without a serious rise in the price of electricity.

The sites for the four stations were decided, with ministerial approval, in mid-1953. They were Cahirciveen, Co. Kerry, Miltown Malbay, Co. Clare, Screeb, Co. Galway, and Gweedore, Co. Donegal. The desire of the government to get the programme under way as quickly as possible led the ESB to suspend its normal tendering procedures in order to speed up the signing of contracts. At this stage, further and hitherto unforeseen costs emerged. To guarantee supplies, it would be necessary to improve roads and bridges in the turf catchment areas. This cost would, according to the government, be borne by the National Development Fund.⁵⁶ The cost was estimated to be £850,000.

Yet another difficulty arose in organising the supply of turf. Bord na Móna had no involvement with hand-won turf and did not now want to become involved. The view of the Department of Industry and Commerce at this stage (September 1953) was that the main thrust should come from local effort and local organisation. It soon became clear, however, that such local effort and organisation was non-existent and at this stage the department told the ESB that the ultimate responsibility for supply must rest with it. The department went on to state that if the ESB had reservations about the availability of the necessary 30,000 tons per annum per station then the ESB should take action to stimulate supply. This in fact was in total contradiction of the express purpose of the programme and of the Minister's instructions.⁵⁷

On appeal from the ESB the Minister confirmed that there was to be no artificial stimulus to production, but also confirmed that the Board was to be to some degree responsible for delivery and for such preliminary requirements as road-building, at least in the planning stage.⁵⁸ Tenders were sought in late 1953, and the tender of the Swiss firm,

Brown-Boveri was accepted for the main work on the four stations. Work started on the Kerry, Clare and Galway stations in the summer of 1954, and on the Donegal station in spring 1955.

When the second inter-party government came into power after the general election of 1954, there was an attempt by the new Minister, William Norton, to have the sites of the Kerry and Galway stations changed, though not the principle of the scheme.⁵⁹ Work, however, was too far advanced to permit this and the minister had to accept the existing sites.

Inflation had by now resulted in an escalation of the projected losses to be borne by the Board from operating the stations. By spring 1955, the Board reckoned that if the stations were idle it would lose over £188,000 per annum on them. The loss would increase with use, since the Board was comparing costs with those of oil-fired stations. The amount would depend on the price paid for the turf. At £2 a ton delivered, 30,000 tons used would involve the Board in a loss of £216,000; if the price was the same as that charged by Bord na Móna at Allenwood, £3.1 per ton, the loss would be £348,000.

By May the Board's fears concerning supply began to appear justified. Only one offer of a definite nature had materialised for the Galway station—and that was for 1,000 tons. No offers had come in for the Clare station.⁶⁰ Industry and Commerce then told the Board that the price it was offering (on which the economics of the stations had been based) was far too low. That this was correct was confirmed by the ESB's man on the spot in Galway and was further confirmed when the single firm offer was withdrawn a month later.

By autumn 1955, the position was becoming very serious from the ESB's point of view. Two of the stations were due to be commissioned in less than a year, and the other two in eighteen months, without any sign of the surplus turf they were to use. The ESB wrote to Industry and Commerce, seeking guidance. At this stage, the Land Commission, which had extensive local knowledge, was brought in. That body had written earlier to the department and the ESB complaining at not having been consulted before any decisions about the stations were taken. This complaint had been politely rejected. It now reiterated its view that there was insufficient turf within twenty to thirty miles of Screeb or Miltown Malbay to meet the Board's requirements and local needs.

Consultations with the Land Commission and Bord na Móna resulted in joint advice to the ESB that it was just possible in principle to extract 30,000 tons from the bogs around Screeb, but that if this were done, the bogs would be exhausted in seven years.⁶¹ After this, the ESB would have to offer even higher prices to attract supplies from further afield.

The assumptions on which the programme had been adopted were now collapsing in every direction. It is clear that inadequate preparation had been made before taking the decision to go ahead. The ESB's minute of the meeting at which all this came into the open constitutes ample evidence of this. A political decision was taken on very shaky factual foundations. The ESB was coerced into agreeing. Bord na Móna had washed its hands of the matter; while maintaining its position as the source of expert knowledge on the bogs, it had declined to be involved. Furthermore, it seems to have advised the government rather too hastily on the supply position. Neither the department nor Bord na Móna had consulted the Land Commission. The economic consequences of the ESB's requirements on the area had not been investigated. The consequences were, to say the

least, embarrassing, as is recorded in the ESB's minutes of the meeting which illustrate the quagmire in which the Board had become stuck.⁶² (See Appendix 1.)

The question of who was responsible for all this is an interesting one. The text of the official minutes circulated later, which is much longer than the Board's version, contains a more detailed account of the arguments. (See Appendix 2.) However, while the proximate fault was that of Bord na Móna in not providing adequate data, we have already seen that this was at least partially due to Seán Lemass's demand for immediate prosecution of his plans in 1952.

The department's response to all this was to remind the Board that the stations were intended to use 'surplus' turf and that the possibility of their being out of operation 'in a particular year or years' had been envisaged.⁶³

The supply position showed no signs of improving. In February 1956, with the Clare station due to become operational in April, it looked as if there would not even be enough fuel for test running.⁶⁴ At the end of February the Board advertised for turf for the coming season at a price determined by such information on local prices as was available. The price offered was 50s. (£2.50) a ton for turf delivered at the station. By mid-May, the Galway station had been assured of supplies of only 2,650 tons. In early June, the Clare station had been assured of 1,000 tons.

Part of the problem, it had been maintained, was inadequate roads into the relevant bogs. The government had promised to make funds available to remedy this where the ESB could show evidence that lack of roads was a problem. But since the Board could only produce such derisory responses to its advertisements, in September 1956 the government cut back on the road money it proposed to spend in the area.⁶⁵

The supply problem continued unsolved. The ESB considered several schemes to increase the attractiveness of producing turf for the stations, even locally won machine-produced turf. They raised the price, and agreed to pay partially in advance (during cutting and drying) and to organise transport. The new payment arrangements were effective in increasing the supply. However, in one respect, this success marked the failure of the whole project. The supply was possible only because local entrepreneurs introduced small-scale machine cutting, thus thwarting the original object of the stations. Only at Miltown Malbay was there any prospect of the required tonnage being provided by local hand-cut supplies.

When the four stations were finally commissioned in 1957, they were (in aggregate) dependent on machine-won turf for 50 per cent of the minimum economic supply of 30,000 tons.

LATER TURF STATION DEVELOPMENTS

Between the early 1950s and the late 1960s the ESB installed a total of 407.5 mW generating capacity based on turf. This may be regarded as the 'first' turf programme, with subsequent expansion from the late 1960s onwards being treated as part of a separate programme. Despite the decision to shift the fuel base from sod peat to milled peat, planned sod peat capacity continued to be installed until the early 1960s, although it became much less important. The last sod peat installations came on stream during 1962/3, with extra capacity units at Portarlinton and Lanesboro'.

The first milled peat unit to become operational was at Ferbane (1956/7), but from then on the milled peat capacity expanded rapidly.

ELECTRICITY SUPPLY IN IRELAND

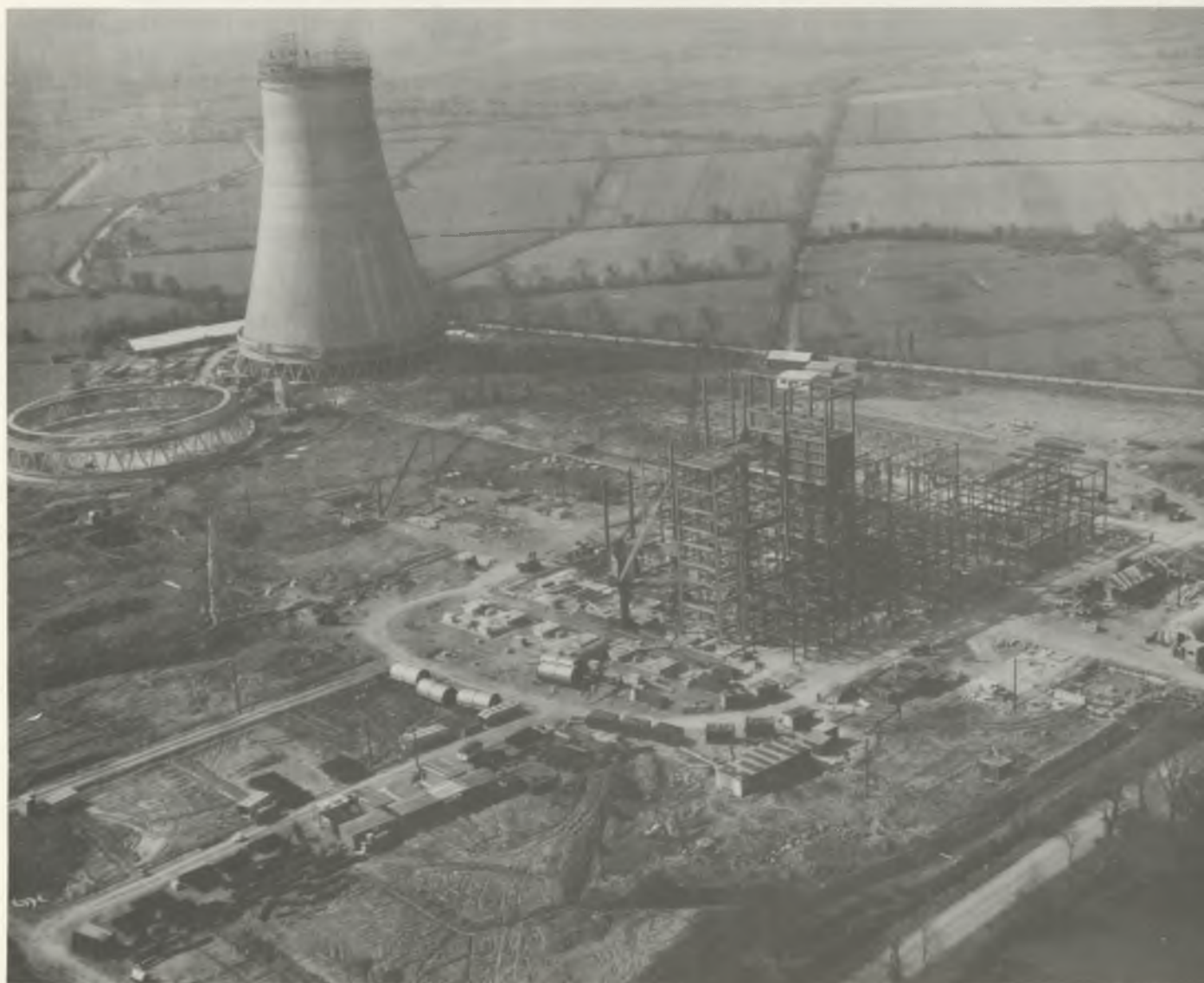
By the end of the 1960s approximately one-third of the ESB's total capacity was based on turf; of this (ignoring the small and unreliable 'hand-won' stations) two-thirds used

Table 7.1
Generating capacity of turf-powered steam stations

End of year	Sod peat	Milled peat	Total
1955-56	85 mW	—	85 mW
1960-61	105 mW	100 mW	205 mW
1963-64	117.5 mW	210 mW	327.5 mW
1966-67	117.5 mW	290 mW	407.5 mW

milled peat and one-third sod peat. Although the absolute size of turf-fuelled generating capacity was subsequently increased during the 1970s, the importance of turf in terms of percentage of total capacity peaked in the early 1960s at a little below 40 per cent. Unfortunately, from the ESB's point of view, this was at a time when oil prices were low

Ferbane Power Station under construction.



and falling. By the time oil prices jumped in the early and middle 1970s, turf had fallen back to 25 per cent of capacity, so that its ability to cushion generating costs against fuel price increases was correspondingly reduced.

By then, however, the impact on rural development—which, along with self-sufficiency, was always an important element in governmental pressure to advance the interest of Bord na Móna—had been substantially boosted by the size of the turf programme. The biggest concentration of stations was on the huge south-midlands expanse of bog, through counties Kildare, Laois and Offaly, with stations at Allenwood, Portarlinton, Ferbane, Rhode and Shannonbridge. In the north midlands, near the Shannon in County Longford, there is a large station at Lanesboro', and in Connaught, in the area of the bog deposits of County Mayo, a major station was built at Bellacorick.

REVIEW

Turf has long been and still is a valuable component in the deliberate policy of diversity of fuel sources. On at least three occasions the presence of a diversified fuel source through the existence of turf enabled the ESB to maintain output or moderate price increases. These occasions were in 1956 at the time of the Suez crisis, in 1967/8 during and after the Six Days War and then in 1973/4 during and after the embargo on oil supplies during the Yom Kippur War.

In spite of the dramatic confrontations between the ESB, the government and Bord na Móna during the early years, it would be quite misleading to see the entire episode as nothing other than conflict. It is true that at the top levels there was strain and confrontation and considerable resentment on the part of the ESB, which felt that its chances of a fair hearing on the issues involved were greatly lessened because of the close personal friendship between Seán Lemass and C.S. Andrews and because of the highly successful propaganda associated with turf development which gave that programme a 'national' flavour enabling Bord na Móna to wave the 'green flag' when it suited it. Thus the ESB got off to a bad start in its negotiations on this question and many of its objections were easily dismissed as being deliberately bureaucratic or obstructionist. And, of course, part of the problem may have been of the ESB's own making. Had the ESB shown greater flexibility and more political awareness early on and shown itself to be less hostile to turf, its credibility with the government might well have been greater and it might well have got across the real nature of its objections. It must be said that in one area, that of milled peat, the ESB was wrong. Either through a failure to appreciate Bord na Móna's arguments or (more probably) due to inherent reluctance to fall in line with Bord na Móna's requirements, the ESB was opposed to using milled peat. Experience was to show that Bord na Móna was correct in its forecast that milled peat would be cheaper to use, as is clear from the fuel cost ranking of the milled peat stations. It might be argued against this, in the first place, that the price of turf is arbitrarily decided by Bord na Móna, which could therefore make its forecasts come true and, in the second place, that the milled peat stations were newer and larger and therefore more efficient. On the other hand, the production of milled peat was less labour intensive and the cost of production to Bord na Móna would therefore inevitably fall relative to that of sod turf, and the fuel cost of even the earliest milled peat station is lower than the sod turf station.

In retrospect it is easy to see why the ESB was so reluctant to get involved in the turf programme. The essential point is that it was its well-grounded fears concerning the reliability of turf supplies as much as the actual cost of turf which caused the ESB's hostility. The cost of turf in the end (as the ESB had prophesied) came to be whatever was necessary to balance the books of Bord na Móna. The ESB was therefore not only obliged to use a fuel it did not want to use but to pay whatever price the supplier demanded for whatever quantity it was prepared to supply. In this respect the ESB was accurate in its forecasts. It was also accurate in forecasting the weather dependence of turf. In 1958, when the turf supply was seriously disrupted by a bad summer, the ESB was only able to maintain electricity output by virtue of the coal-fired steam capacity which a year earlier had appeared to be greatly in excess of requirements.

The early boardroom tension between the ESB and Bord na Móna rarely spilled over to hinder co-operation lower down the line. Once decisions were taken the two organisations co-operated and built up a working relationship which strengthened and developed into active co-operation with the passing years.

The final observation on the decision to compel the ESB to include a large turf element in its thermal generating capacity is that it may well have been a correct one from a social point of view. Whether it was so depends on how one evaluates the net difference it made to the country's balance of payments and whether the employment generated could not have been secured otherwise. Thus, while possibly highly desirable from a national point of view, the decision to use turf on the scale involved was undoubtedly a costly decision in that it imposed constraints on the ESB which raised electricity prices for the best part of a generation. (This question will again be looked at in the final chapter.)

Whether or not one feels that the decision to use turf was the right one at the time it was taken, it is unquestionably the case that a generation later the ESB was happy to have a significant turf-power generating capability. In addition to the benefits of diversification, the relative costs of fuel were completely offset by the rise in the price of oil and coal in the middle of the 1970s, which, for a while at least, resulted in the turf stations jumping to near the top of the merit order in the ESB system.

Rural Electrification

But how many of these things will be remembered in, say, 2047? I dare swear that if any event is recorded in the history books (taught through the medium of Russian) it will be none of these I have mentioned; rather it will be one which has passed almost unnoticed, amid the turmoil of the year.

Somebody—I cannot remember who—switched on the lights in some village—I cannot remember where—and rural electrification took her bow. And if that does not mean more to the country than all the rest of the year's events put together I shall be very surprised indeed.

Quidnunc in the Irish Times, 31 December, 1947.

THE question of rural electrification was to dominate the post-war activities of the ESB and the massive rural electrification scheme saw the realisation of an idea which had been considered from the earliest days. In a paper prepared by the Department of Industry and Commerce for Patrick McGilligan in 1926, it was stated that the aim of the Shannon scheme was 'the electrification of the whole Free State . . . not only the town dwellers, but the rural population as well.' It was argued then that only a state enterprise could build the sort of network which would make rural electrification possible and the point was made to the Minister that 'in designing a Shannon Management Organisation, this all-important question of rural electrification must be remembered and the main organisation so arranged as to make the carrying out of this section as simple a proposition as possible'.¹

Thus, while in the initial stages electrification was confined to towns with a population of five hundred or over, the Minister and the ESB never ceased to emphasise the benefits to agriculture and to the farming community which electrification would undoubtedly bring.

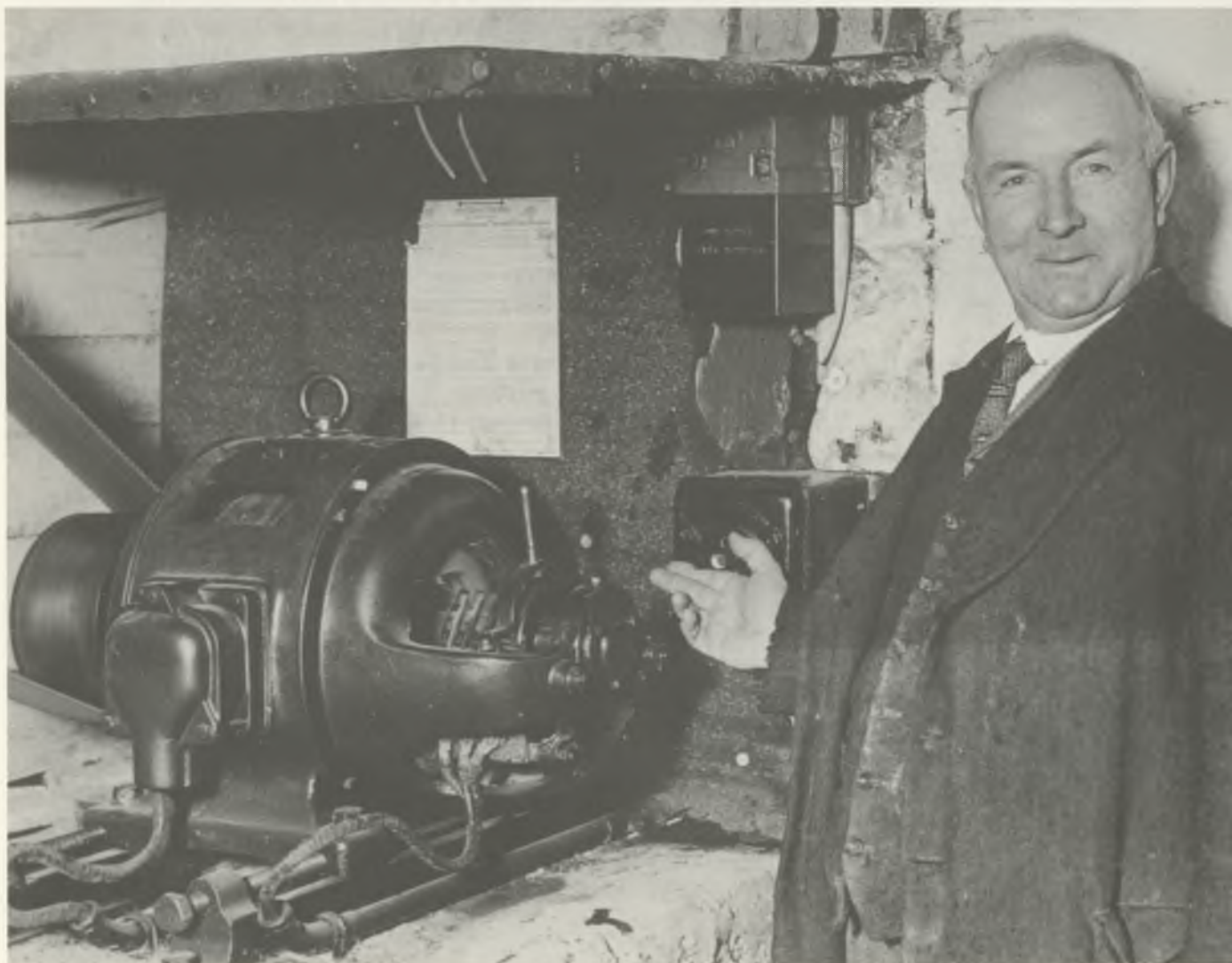
Developments in the 1930s did not include rural development even though the number of consumers had risen from 40,000 in 1930 to 166,000 in 1939 and staff increased from 1,600 to 2,500 during that same period. However, in May 1939 the government approached the ESB with a view to obtaining the Board's opinions on the feasibility of a rural electrification programme. Apart from the question of the economics of such a scheme, no provision existed in the legislation relating to electricity supply which would cover a subsidised extension of supply to the farming community. Since a subsidy of some sort would clearly be needed, new legislation would have to be drafted. The outbreak of war in September 1939, however, meant that both the ESB and the government found themselves faced with more urgent problems, and the matter was not even mentioned in the ESB's annual report for 1939/40.

Even though work was postponed it is clear that the attention of the Board and, in particular, of McLaughlin, was beginning to be focused on the challenges which rural electrification would bring with it. In a wide-ranging lecture to the Institute of Engineers

in March 1940, McLaughlin reviewed the progress of the previous decade but then turned his attention to 'the mass of the population to whom electricity supply is not as yet available . . . those living in the truly rural areas and mainly engaged in agricultural production. They are the section of the population from which comes the social evil of the flight from the land, an evil which is a great source of worry to our community.' Dr McLaughlin saw rural electrification, which represented 'the application of modern science and engineering' as one of the key ways of raising the standard of rural living and getting to the roots of 'this social evil'. He went on, however, to emphasise the size of this problem of rural electrification—'a problem not made any easier by the general economic difficulties of the present situation [the war].' He saw the whole project 'as a further major contribution which engineering science must make to the progress of the community.'²

The extension of the benefit of electrification to 'rural' areas of Ireland was, after all, inevitable. The only issues of doubt were the timing, the methods used and the manner of its financing. The impetus to this development was bound to be political, since the costs would be such as to make it impossible as a commercial venture. The price of electricity supplied to rural areas, if it was to cover the cost of supply, would be so high as greatly to

Power to the farmer.



restrict demand. Consequently, it is not surprising that the first official mention of the question in an ESB report made it clear that the government was the initiator of the programme: 'During the year [1941/2] a special study of the problem of the further extension of electricity supply to reach the farming community was begun at the request of the government.'³

The results of this study were presented to the Board of Directors by McLaughlin in April 1942.⁴ This document was to serve as the basis of the report to be made to the government. It comprised a general survey of Irish agriculture viewed as a possible market for electricity, dealing with actual and potential mechanisation, product mix and domestic use, and a preliminary scheme for organising rural electrification on a national basis. McLaughlin's report drew on the experience of rural electrification in Denmark, Sweden and Ontario (Canada), and the rural electrification administration of the USA was examined.

McLaughlin advocated proceeding by means of 'rural supply areas', to be formed in the first instance around 10 kV transmission lines supplying towns and villages. Each area: 'would be operated as a separate unit, with its own small staff, with its own rates of charge and with separate accounts books kept for each area'.⁵ These would be controlled centrally, rather than by local co-operatives. As things turned out, the idea of a multiplicity of rates of charge had to be dropped, largely for fear of political opposition on grounds of discrimination. Within each area, he proposed a uniform charge, partially to avoid administrative complications and partially in recognition of the difficulties of allocating costs in cases of joint supply. To avoid unduly high costs (and the redistribution of income between households in a given area which they would involve), McLaughlin wished to place a limit on the capital outlay on any given extension within an area. The basis of charging he suggested was a combination of a fixed charge per consumer (aimed at recovering annual expenditure on the distribution system in the area) and a variable charge depending on consumption (which would be on a sliding scale). The fixed charge would be proportionate to the floor area of the premises supplied.

McLaughlin's view was that the order of development of the various areas in the country should reflect first of all the ability of the areas to meet the costs of development. Areas in which farms were predominantly so small as to be uneconomic would be at the bottom of the list. Thirty acres was the cut-off point chosen, and this accorded with contemporary government estimates of farm viability.

The second criterion was the type of output of the farms in the area, priority being given to areas in which the demand for electricity might be expected to be relatively high, reflecting the methods of production and the product mix. He concluded that the counties showing greatest promise were: Cork, Limerick, Waterford, Tipperary, Kilkenny, Wexford, Kerry, Carlow, Louth and Dublin. Those least promising, in his view, were Galway, Donegal, Mayo, Roscommon, Sligo, Leitrim, Clare, Longford, Westmeath, Meath, Offaly, Laois, Kildare, Wicklow, Monaghan and Cavan. This ranking may seem unusual, with Kerry in the first group and the great cattle counties in the second. However, McLaughlin was basing his views on the output mix of agriculture more than on farm size and income per head. Tillage and dairying were seen as providing the greatest scope for mechanisation based on electricity. He also had in mind that the larger number of farms in medium farm size counties would offer a greater

number of consumers per area, which would favourably affect the economics of the scheme.

McLaughlin went on to outline the methods by which the province of Ontario in Canada subsidised rural electrification, both by means of capital grants and operational subsidies. The provincial government made a grant-in-aid related to the initial capital investment; it then set a ceiling to the service (i.e. fixed) charge the customer would have to pay, and met the balance. From then on, it was up to each rural power district to pay its own way (including provision for capital replacement). The rural electrification commission was conservative in its supply policy—only offering supply when customers entered into contracts in sufficient numbers to ensure that fixed charges would be covered.

On the basis of the rural electrification experience of Ontario, McLaughlin concluded that financial success for such a scheme in Ireland would require a fixed charge of 10 to 13 per cent per annum of the investment in each area with the power being supplied at the bulk supply price.

The report that the ESB made to the government in December 1942 was based on McLaughlin's document.⁶ It based its conclusions on the studies of four pilot areas included in McLaughlin's report. In addition to deciding that a single rural rate should be adopted throughout the country, it developed the preliminary report by considering alternative degrees of electrification and their financial implications. The ESB was of the opinion that fixed charges should be 12 per cent of capital outlay. Existing rural fixed charges would bring in only 10 per cent. The situation could be remedied by raising the fixed charges by 20 per cent, or by limiting extensions to those houses from which the return on fixed charges was 10 per cent or more of the cost of connection (in which case existing charges would bring in 12.1 per cent of capital outlay). If, however, this measure was adopted, only 55 per cent of houses in the pilot areas would be connected. These results were based on the assumption that all houses in any area would want to be connected. If only 80 per cent of houses wished to be connected, the position would worsen drastically. For example, if the ESB designed the system so as to enable 80 per cent of all houses to be supplied, and only 80 per cent of these took up the offer, the average return from existing charges would fall from 10.8 per cent to 9.7 per cent, with the cut-off point being supply to all houses whose connection costs were 15.6 times the fixed charges. The ESB concluded that if 69 per cent (or 80 per cent of 86 per cent) of all houses were to be connected, and fixed charges were not to be raised, a capital subsidy of the order of 50 per cent would have to be made by the government.

In August 1943 the government announced its general approval of the ESB's scheme. There were, however, certain significant alterations. The ESB was instructed to distribute electricity up to the point where capital outlay on connection was sixteen times the revenue obtainable by the existing rural fixed charges (which were to be maintained, subject to changes made necessary by inflation). This meant extending the scheme to a potential 92 per cent of rural dwellings, according to the ESB's calculations. On the assumption that *all* eligible households agreed to accept supply, the ESB, on existing rates of charge, would receive 10.5 per cent per annum on the capital outlay by means of the fixed charge to consumers. Obviously, refusal to accept supply by any significant number of householders whose connection costs were much lower than the cut-off cost imposed by the government would reduce the average return to the Board from these fixed charges.

The government decided to subsidise the Board in order to give it a 12 per cent return on its outlay. This was the figure McLaughlin said was dictated by the ESB's accounting and financing procedure. The method of subsidy agreed in discussions with the ESB was to be a 50 per cent subvention of all capital expenditure on the scheme.

The second major departure from the ESB's recommendations concerned the order in which areas were to be supplied. The government instructed the Board to prepare to start the scheme in the maximum number of areas simultaneously, with a minimum of one area per county. Subject to this, priority could be given to the most remunerative areas. The aim should be to complete the scheme in ten years.

In the context of the result of the 1943 general election, the government clearly had quite an amount to gain politically from this directive. That election had seen Fianna Fáil lose its overall majority and drop from seventy-seven seats won in 1938 to sixty-seven seats in the new Dáil. Most significant was the danger to Fianna Fáil from the new Clann na Talmhan party, which drew most of its support from small farming areas, and which with fourteen seats in its first election, was seen as the first major threat to Fianna Fáil in over a decade. Consequently, the government needed to do some fence-mending in these traditional Fianna Fáil areas of rural Ireland and the extension of rural electrification offered one such opportunity.

The ESB was not particularly put out by these arrangements, although it meant going further than they themselves recommended. The capital subvention would make it possible for them to meet their 12 per cent rate of return requirement, and had the added advantage of reducing the degree of control of the Department of Finance.⁷ That department would not be required to investigate the details of the prosecution of the scheme, and would have no discretion over subsidy payments.

In January 1944, the Minister for Industry and Commerce, Seán Lemass, approached the ESB about publishing the report. The Board agreed to this, and the report, subject to some editorial changes, was subsequently published by the government as a White Paper in 1944.⁸

The publication of the White Paper, while clearly signalling the government's intention on a question on which there was virtually national consensus, did not, however, mean that there was by now full agreement on the methods by which the scheme would be carried out and financed. The fact that the war was still continuing and the certainty of post-war shortages meant that both timing and any other specific proposals could only be tentative and it was clear that any scheme was going to involve a considerable degree of improvisation. In addition, it shortly emerged that there was some dissatisfaction within the Department of Finance about the financial arrangements agreed upon.

With hindsight one might, perhaps, say that the ESB was a little naive to think that the degree of financial independence contained in the government's proposals, which amounted to control over an element of public expenditure, would be lightly endured for long by the Department of Finance.

In April 1944, Industry and Commerce passed to the ESB for comment a memorandum prepared by the Department of Finance on the question of rural electrification subsidies.⁹ This memorandum objected to the government's proposals on a variety of grounds: uncertainty existed about the amounts involved, due to possible interest rate fluctuations as well as to ignorance of the number of houses which would accept supply;

no limits to the size of the capital grants were proposed; the method of allocating the grants seemed likely to result in wastage; finally, and this was a misunderstanding by the department, it seemed that they would have to pay *all* the costs for the first several years as little or no revenue would accrue to the Board. The Department of Finance proposed a fixed upper limit to the funds to be devoted to rural electrification together with a proviso that there should be an upper limit of 50 per cent subsidy on capital outlay. Outlays should be specifically approved by the Dáil (which meant the Department of Finance could scrutinise them). They further asked that subsidies should be limited to 'uneconomic' areas, while 'economic' areas would receive no subvention.

The ESB went some way towards meeting the department's objections, accepting that specific sums should be voted, and that the government's approach to electrification would cause legislative difficulties. They maintained, however, that even 'good' areas would, or at least could, need subvention.¹⁰ They suggested that provision should be made for an initial phase covering five years and half the country. Finance objected that the most remunerative areas would not need a 50 per cent subsidy. To this point, raised by J.J. McElligott, R.F. Browne replied that, 'owing to the speed at which it was expected the work should be done, it did not necessarily follow that the more remunerative areas would be taken in the first instance'.¹¹

They held out for the 50 per cent, adding that there had been no safety margin in the calculations. By and large, the ESB got its way in so far as legislation and governmental public intentions were concerned. But the later history of the scheme was to show that the Board had not, in fact, secured its financial position in the manner it desired.

ORGANISING FOR THE SCHEME

Rural electrification faced the ESB with a completely new set of technical and administrative problems, for which the existing machinery and procedures seemed inadequate. In February 1944 the design department was asked by the Board to report as soon as possible on suitable arrangements for the design and survey work and to investigate the quantities of materials involved in a scheme of such magnitude. Hardly surprisingly, the Chief Engineer, P.G. Murphy, quickly concluded that the scheme involved problems which his department had not encountered before and argued in favour of setting up a completely new department:

In my opinion Rural Electrification is primarily a 'Consumers' problem rather than a 'Design' one. Even if the Board should decide to place the work of the line survey on Design Department the latter cannot commence this work until it is supplied with plans showing the location of the consumers to be provided for immediately and in the future, together with their loads. Normally the provision of information as to prospective consumers and their requirements would be supplied by Consumers' Department but I appreciate that the nature and magnitude of the Rural Electrification Scheme make it a very special problem for which the existing machinery would be quite inadequate. The Board may consider the setting up of a new Department as better policy than expansion of the existing one to handle Rural Electrification but I would suggest that the first step is the nomination of the individual on whom the Board places the responsibility for this new activity so that he may undertake immediately the planning of the detailed organisation for this work.¹²

Shortly after this the Board received the advice of the chief engineer of the consumers' department, J. O'Farrell:

One must visualise that it is inevitable that suspicions will be aroused that preference is being given to one area of interest as against another. As a result the Board's existing business will be somewhat affected. I am therefore of the opinion that the work of planning must be guided by one individual and that this individual has the closest possible contact with the Board, so that the Board may be kept fully informed on all matters arising out of the work to be undertaken. Further, I am of the opinion that it would be highly desirable that this guidance should be given by a member of the Board itself. Such an arrangement would ensure that not only was the Board's declared policy on various matters maintained, but that decisions taken by the administrative staff engaged on the work would be taken in the light of the background against which the Board's policy was formed. To have a Director guiding the work would have the further advantage that the Board was in turn kept continuously informed not only of the objective factors with regard to the work of rural electrification, but of the background against which the administrative decisions of the staff with regard to the work had been made.¹³

The organisation charged with rural electrification should, he said, be capable of seeing and dealing with all aspects of the scheme, and consequently it ought to be relatively independent of existing ESB departments. It should have adequate authority to give effect to its decisions speedily and without interference. Since, however, its operation would affect other ESB activities, co-ordination and liaison would be very important. He suggested, therefore, that a single Board officer should be put in overall charge of the scheme, who would be obliged to maintain effective liaison with the consumers' department, the section of the ESB which, in his opinion, was the most aware of all the Board's interests.

The Board ordered the preparation of an internal report on organisation of the scheme in March 1944, and this was delivered in November.¹⁴ The main provisions of this report may be summarised thus:

1. The territorial unit which was to be adopted was the Roman Catholic parish, of which there were at the time around nine hundred in country areas. Existing parish councils, emergency committees and the like would be used to excite local interest in the scheme and help with canvassing and surveying.
2. Each existing Board district would contain, on average, four parishes, with an office in each one, supervised by a small rural electrification division in each district office, which in turn was answerable to the district engineer.
3. While the district accountant would have specific responsibilities with regard to accounting matters, overall success or failure of the rural electrification scheme would be the responsibility of the district engineer; consequently, he would have extremely wide discretionary authority covering employment and conditions of employment, bounded only by ESB uniformity requirements; head office would judge success or failure by the district engineer's financial returns.
4. A rural office would be set up at head office to control the districts and to act as a clearing office and liaison agency in head office.

This extremely decentralised system was, by and large, accepted by the ESB. The efficiency gains from such a system are obvious, and the criterion of judging success or failure by the district's financial returns made good economic sense.

It also fitted in with the ESB's established organisational philosophy which aimed at as much decentralisation as possible. Already the ESB was organised along district lines for sales and distribution but it was during the rural phase that the full extent of decentralisation was to become evident, making the ESB as much a local as a national organisation. Not all the efficiency gains were to be costless and it was to be argued later that the scheme adopted had some undesirable consequences for industrial relations. In general, however, the success of the ESB in developing a decentralised system of administration was to prove a key factor in the success of the rural scheme.

The ESB subsequently set up a rural electrification organisation on these lines, and, taking into account the advice of the two engineers already quoted, appointed a single officer to a position of overall responsibility—W.F. Roe, who became Chief Rural Engineer.

The choice of Roe for this key post was to prove a fortunate one. The job he was to undertake would have been difficult under normal circumstances, but with the prevailing post-war shortages and in a climate of financial stringency the circumstances were far from normal. Roe was to show considerable ingenuity in circumventing these difficulties and in conveying his own sense of urgency and enthusiasm to those working under him.

THE SCHEME

The government announcement that the scheme was about to start came in a reply to a Dáil question in April 1946. Seán Lemass, the Minister responsible, stated that work was about to start on the first rural area. He also referred to what was in fact to become a feature of the scheme—that preference in the filling of jobs would be given to ex-members of the defence forces.¹⁵

In fact it was on 14 March 1945 that detailed planning for the scheme had begun at a meeting attended by P.J. Dowling, W.F. Roe and C. O'Donoghue. This group was told that the time-scale for the scheme was ten years and that over 1,000,000 poles would have to be procured and erected. Roe was to write three years later, 'The greater part of the world was still at war. We did not know when the war would end or what the post-war world would be like. Perhaps it was just as well.'¹⁶

Getting the work started was to prove difficult. In post-war conditions shortages of materials and rising prices were the order of the day and the search for poles was to prove the greatest difficulty. When Baltic poles seemed impossible to procure, the new unit turned its attention to native sources—and Roe recounted chilly experiences marking trees in different parts of the country in the hope that they could be used.

In addition there was the task of recruiting new staff or deploying existing staff for the scheme. In fact, however, this was to prove comparatively simple. The post-war demobilisation in Britain and Ireland was to release large numbers of engineers and skilled and trained men eager for work. Indeed many were to bring from their army days not just skill and discipline but a sense of comradeship which was to be one of the outstanding and enduring characteristics of the whole rural operation. It was these

characteristics which were to sustain the operation through some of its most difficult days and enable it to make such a positive impact on community after community as it moved through the country.

The first pole of the new scheme was erected in Kilsallaghan, Co. Dublin, on 5 November 1946, and although there was no ceremony there was a cameraman on hand to photograph the occasion. *REO News* (the newsletter of the rural electrification organisation) was to recall two years later 'As the pole was raised in the gathering dusk of that November evening, those present realised that a start was being made on a scheme which was to bring new life to the hills and valleys of rural Ireland, and a new outlook and new hope to those who dwell there.'¹⁷

Shortages and supply difficulties continued to bedevil the early days but by the end of 1946 1,300 poles had been erected and thirty-nine miles of cable laid. 1947, which had one of the coldest winters ever, with post-war austerity at its worst, was the key year. In that year at least one area had been established in twenty-three of the twenty-six counties and all twenty-six had areas functioning by early 1948—the last county being Cavan. All this was done in spite of shortages and at a time when obtaining supplies was at all times hazardous. In 1947, for example, 114,000 poles were bought from Baltic

Erecting the first pole at Kilsallaghan, Co. Dublin, on 5 November 1946.



areas for delivery before the ports were closed by ice. Then it was found that not enough tonnage could be chartered and two of the boats ran aground, one being a total wreck. Eventually 95,000 poles were landed. But that was only the start of difficulties. The poles had then to be creosoted, and since there were only two places where this could be done—Dublin and Cork—there were further substantial delays in getting the poles to the rural areas. Eventually a new centre was opened in Limerick and some of the work was hived off to commercial firms.¹⁸

In December 1947 the first issue of *REO News* appeared. This paper was to appear monthly until 1961 and carried up-to-the-minute details of progress, advice and information. It helped especially to ensure communication between those in the field and those at head office. It was to prove an invaluable source of stimulation and morale boosting, and was also to be a means of swapping useful information and work hints. In addition, it enabled each district to monitor the progress and the cost efficiency of the others.

Typical of the sort of material carried by *REO News* was the correspondence on the best approach to propaganda, a correspondence which gives an interesting insight into conditions at local level. In the second issue an editorial argued that propaganda should be aimed *not*

... at securing more areas but at hesitant individuals in areas being canvassed. ... The best method is to tell the local people when any approach to the District for supply is made to get their committees on the job, and if there is not a local committee, to form one at once. Apart from the assistance the committee will give it later, it is good to get the local people interested as an organised body and let them feel they have some share in getting the benefits of electricity for their parish. When the District Engineer has agreed on tentative boundaries with the local committee, that committee should carry out a canvass. This canvass is the best possible propaganda and almost always leads to good returns. We are contemplating providing a mobile unit to give a lantern lecture and perhaps show a film whilst this local canvass is under way.¹⁹

This advice was supplemented in the next issue when an area officer drew on his experience. He said that the organiser 'should always enlist the aid of the P.P. A few words from the reverend gentleman are usually very effective and can always be relied upon to produce an awakening of interest.'²⁰ The help of any local TD should also be sought. Shortly afterwards another area officer suggested that while the help of the clergy was important, 'even better results might be achieved through the activities of energetic bodies of Muintir na Tíre, Young Farmers' Clubs or the Irish Countrywomen's Association. These should represent a better cross-section of rural life and with the support and publicity that the clergy can give should be the nucleus of a virile and representative organisation'.²¹

It may seem strange that so much initial effort had to be invested in 'selling' the idea of electricity to rural areas. But it has to be remembered that the Irish rural scene of the 1940s had changed little in nearly half a century. Emigration was still draining away much of the younger population and for the most part control of farms and businesses was still vested in the older age groups, who often could not afford to retire even if they so wished. As a result a predominantly cautious and conservative attitude prevailed and this applied as much to the adoption of a modernised and mechanised approach to

farming and business methods as it did to social attitudes. In addition to the prevailing conservatism there was also a strong tradition of frugality which placed little value on the type of domestic comforts and labour-saving devices which electricity would bring with it. The fact that electricity would remove much of the drudgery of farm life and improve the lot of the farmer's wife left many a traditionalist (and tight-fisted) farmer unmoved. The result was that the ESB crews were not just trying to sell a new product, they were also fighting against a range of entrenched economic and social attitudes and, to some people at least, were seeking to upset a whole established and familiar way of life.

It was these factors and attitudes which made the 'propaganda' side of the scheme so important, especially since a very high level of 'acceptors' in each area was necessary to make the scheme economically viable and to persuade the waverers. In such a situation the good work of the canvassers could be easily upset by rumours and myths but most of all by that nightmare creature of the early days of the scheme, 'the backslider', the person who initially agreed to take electricity and then changed his or her mind. *REO News* saw this as a problem right from the start and sought ways to minimise its effects, especially since the 'backslider' not only upset quotas and plans for rural crews but also often had a bad psychological effect, creating doubts among acceptors and sometimes leading others to back down also. The problem became less serious as the benefits of rural electrification became more evident, but it caused many headaches and much frustration in the early days.

In general, the scheme of organisation followed by the ESB in the rural programme was substantially along the lines envisaged in the earlier documents and usually worked as follows.

The ESB received applications from local committees from all over the country. The usual procedure adopted was to have a preliminary canvass of an area, carried out by the local committee, with advice beforehand from a representative of the ESB, who also outlined the potential for domestic and agricultural improvement offered by electrification. If this canvass appeared promising, the ESB would send an Area Organiser to carry out a more detailed survey; the organiser often lived in the area for two to three months. Again assuming that a satisfactory result was obtained, the area would be marked for development and placed on a waiting list according to its priority status. The ESB at the same time mounted a country-wide propaganda campaign with advertising displays and demonstrations of household and farming equipment. A demonstration unit would visit each area under construction for a week.

By the end of 1948, seven areas had been completed and 2,200 new consumers connected. These figures on their own do little to convey the sense of excitement which accompanied the completion of each new district or the gala occasion each 'switching-in' ceremony was for the villages and districts concerned. What was involved was little less than a revolution in the whole life-style of the village. The immediate benefits might mean little more than the replacement of the oil-lamp with the electric bulb or the ensuring of a steady reception of radio through the elimination of the cumbersome and unreliable batteries then in use, but in fact most people saw it as much more than these very welcome improvements and more often than not left the 'rural' crews in no doubt about the importance they attached to it. The rural programme was the one tangible piece of evidence that Ireland, like the rest of Europe, was emerging from the austerity and retrenchment of war-time. It also meant for people in the country that the Shannon

scheme which had promised so much in the 1920s was now becoming a reality. Not surprisingly then the 'switching-in' ceremonies in area after area had about them an air of excitement and promise and indeed in many areas became landmarks in time against which future events would be remembered. These excerpts from local papers over a fairly typical two-week period in May to June 1948 give some indication of the reaction of local communities to the completion of the scheme in their areas.

Lusmagh, 24 May

Over 500 people from Lusmagh Rural Area, accompanied by their Parish Priest, attended the usual post-development demonstration in Quigley's Hall, Banagher. It speaks well for their enthusiasm that, in the absence of a suitable local hall, such a large

Water on tap, one of the major benefits which electricity brought to homes in rural Ireland.



audience made the journey to the town for the demonstration. The P.P. urged all those who had not already had their houses wired to do so without delay. Fr. Fahy, P.P., also said: 'I have seen the rush candle used in the homes and it is as logical for us to accept electricity as it was for our predecessors to accept the candle and the lamp'.

Bansha, 24 May

Rev. Fr. J.M. Hayes, P.P., Bansha, switched in the village of Bansha from a platform in the Main Street. In spite of heavy rain there was a large attendance of people from the two parishes of Bansha and Knockmoyler, accompanied by the Bansha Fife and Drum Band. Afterwards, the local Guild of Muintir na Tíre entertained the R.E.O. construction crew to supper at the schoolhouse. Members of the crew contributed to the musical programme which followed. In the course of his speech Fr. Hayes said: 'it is more than an amenity, it is a revolution which will sweep away inferiority complexes'.

Abbeyshrule, 27 May

As no suitable hall was available, the local committee provided a large marquee for the occasion. Over 1,000 people were present to see the Minister for Justice, General Sean MacEoin, switch in and to hear General MacEoin say: 'Abbeyshrule today is the envy of all Ireland'. A demonstration followed to what has been one of the largest audiences to date. The subsequent supper was prepared by members of the Irish Countrywomen's Association in a temporary electric kitchen erected in the ESB demonstration van.

Clonaslee, 31 May

On the evening of 'switch-in' day a demonstration was held in Clonaslee hall, at which the P.P. spoke paying tribute to the rural scheme. It was not possible to estimate the attendance as there were more people outside the hall trying to get in, than were already inside.

Carrigallen, 3 June

A demonstration was held on the evening of the day supply was made available. The local committee complimented the construction crew on the speed at which the work was carried out. The small hall was packed to capacity.

Murrisk, 7 June

A post switching-in demonstration was held in the Gaiety Ballroom, Islandeady. The demonstration was attended by the Minister for Lands, Mr. Blowick, who spoke at some length on the rural scheme, impressing on the people that they must use the most up-to-date tools in a competitive world, and pointing out that what was considered an expensive luxury by some today became a necessity for all tomorrow. He pointed out the desirability and necessity of the fixed charge, and advised all his hearers to take supply.

The high point of the rural scheme and especially of its public impact was undoubtedly in the years 1948-51 and by then the rural scheme had become an established part of Irish life. By now the problem of the 'backslider' had become considerably less, while

improvements had been made in operating techniques and in the availability of equipment. In spite of growing financial difficulties which arose from rising costs, from the inadequacy of the subsidy and from government pressure to extend the scheme regardless of costs, the ESB continued with the rural programme up to 1956 on the basis of existing financial arrangements. That year, however, was one of great economic difficulty and the rural programme was subject to severe delays. These were due in the main to a government decision to withdraw the subsidy. Between 1956 and 1958 the ESB continued to implement the rural scheme but was obliged to carry the full cost which, of course, had then to be passed on to the public. In 1958, the subsidy was restored and this enabled the ESB to undertake the development of the remaining areas.

Two aspects of the final phase of the development programme are worthy of particular mention—the greater number of houses in each area which indicated willingness to accept supply and the change in the type of supply which was sought. The first was in part, no doubt, due to what economists or sociologists refer to as a demonstration effect. In addition, the ESB ascribed some considerable importance to the advent of television. The second point, the change in the type of supply, resulted from an increased interest in mechanising and heating water supply—a sure indicator of a rising rural standard of living. The ESB reported in 1960 that over the preceding couple of years they had undertaken up to 2,000 individual electric water installations in rural areas each year. In that year, the Board launched a group water scheme on a larger scale. In this project, the Board co-operated with the Department of Local Government.

In November 1960 the Department of Transport and Power (newly hived-off from Industry and Commerce, and responsible for the ESB) informed the ESB that the Minister, Erskine Childers, was interested in extending the rural scheme to areas which had been left outside the scope of the original programme as being too uneconomic. These numbered eighteen and contained 6,000 premises. As far as the ESB was concerned, if the government was prepared to subsidise such an exercise sufficiently, the Board was quite prepared to co-operate. In due course the government came up with an offer which was acceptable to the ESB and the scheme was extended. The subsidising of these peripheral areas was by means of a cash grant to the ESB of £90,000 plus a commitment to extend the 50 per cent subsidy operating elsewhere. With the completion of work in these areas in 1963/4, the initial development programme for rural electrification may be said to have been substantially finished.

POST-DEVELOPMENT PROGRAMME

This was not the end of the story. Up to 1960 approximately one-third of the houses in the areas developed had not been connected by the time development was complete. It was estimated that when the full eight hundred areas were developed there would remain at least 102,000 rural houses unconnected. Of these, 57,000 would represent houses which refused supply when offered; 37,000 would be houses which were outside the economic limits constraining the Board; the remaining 8,000 would be houses in isolated pockets of the country which had missed development.

Until 1953, subject to availability, supply was offered in already developed areas on the same basis as when development was taking place. However, the cost of rural electrification to the ESB was growing, so in that year special connection charges and/or

capital contributions sufficient to give a minimum return of 6.6 per cent on outlay were levied on post-development connections. Then in November 1956 there was a further restriction with the ESB requiring a minimum of 9 per cent return. Consumers were henceforth required to contribute £98 to ensure connection. The special connection charges had proved unpopular, since they meant different rates being charged to consumers in the same area. The 9 per cent cut-off decision was harsh enough to be a political liability to the government, which sought to have its effects mitigated and the cut-off rate reduced to 6 per cent.

The rural electrification organisation had to face the hostility of the consumers when the new charges were introduced, and it advised the Board of a growing resentment against the policy adopted. In its view, the additional capital required to go back to the position obtaining before November 1956 would be of the order of £100,000 per annum, and would be well worth spending to avert loss of goodwill. Under pressure from its own staff as well as the government, the Board acquiesced to these demands in February 1958.

This level of charges for post-development connection was maintained until November 1960, when, after a general increase in electricity charges, the cut-off rate was increased to 7.3 per cent.

In March 1961, the ESB told the government that when the existing rural development programme was completed in 1962, the ESB would have to cease work on rural electrification. The rising cost of rural extensions made continuation of the post-development programme impossible unless the government supplied one hundred per cent 'free' capital. The government's initial response was to set up an inter-departmental committee (including Transport and Power, Finance, Agriculture and Local Government as well as the ESB) to investigate the position. This committee reported to the government in January 1962.²² In the majority report, it recommended that the 50 per cent subsidy arrangement should be extended to post-development work, and that special arrangements should be made for development of areas outside the scope of the scheme. The Department of Finance, however, took a hard line on rural electrification. In a minority report, it asserted that rural electrification had now been sufficiently extended, and that there was no further pressing demand to be met. The government, it maintained, had been generous in its contribution to the scheme in the past and the country could not afford at this stage to grant large subsidies for services which had mainly 'an amenity value'. This approach by Finance was very much in line with the department's general philosophy on public sector spending at the time as expounded in the 1958 White Paper on economic development.

The ESB, of course, felt that 50 per cent would be quite inadequate but, internally, felt that a 75 per cent subsidy, subject to a maximum of £75 per house, with the possibility of special connection charges of up to 50 per cent of normal fixed charges, would enable the Board to supply nearly 90 per cent of the houses remaining to be connected. This had been mentioned in the inter-departmental report as a possibility. At a meeting in February 1962 it was suggested to the Minister, Erskine Childers, who said that he was sympathetic, given the Board's views on the likely development of rural demand (which was expected to grow sharply with the advent of an Irish television service). In May Childers was able to inform the ESB that the government had agreed to the 75 per cent subsidy scheme for post-development work and special arrangements for areas outside the scheme.²³

The ESB was inundated with requests for connections when this development was announced in the newspapers. The number of applicants rose by two to three hundred per cent. A programme of 16,000 connections per annum was drawn up by the REO and approved. This development meant re-expanding the organisation which had been contracting gradually as the original scheme tapered off. Now it was intended to complete the main post-development work by 1967/8.

As things turned out, the rate at which the post-development work proceeded was slower than expected. Between April 1962 and June 1964 only 13,000 connections were completed. Furthermore, there were more people, proportionally, seeking connection from the higher cost category than had been anticipated, so that the cost of the programme to the Board was higher than expected.

During 1965/6 the programme was further delayed by government restrictions on capital expenditure in the public sector. This not only meant putting back the final completion date until 1970 or later, but added to the ESB's difficulties in forecasting connection dates. The year-by-year notification of the available subsidy from the exchequer made it impossible to plan ahead work to be undertaken or to forecast manpower needs. At the same time, the improved terms of supply increased the demand for connections. The inevitable result was a backlog of unfulfilled demand and unfavourable criticism of the Board.

Between July and December 1970 the Board negotiated a new package with the Departments of Transport and Power and Finance designed to enable it to complete the final phase of the post-development scheme of rural electrification by 1975. From 1971 onwards, a fixed total capital sum of £10m. would be available to the ESB to subsidise the scheme; the ESB would determine the work programme rather than the government. This was intended to be a genuinely 'final' programme. Those who had not been supplied in the redeveloped areas before 1968 would be given one further opportunity to accept supply on more favourable terms. Industrial and other 'priority' applicants in rural areas would be catered for.

After completion of work in areas covered by this programme, they would be declared closed for subsidised supply for domestic purposes (farming, tourist and industrial users taking supply on industrial or commercial tariffs would be exempt). Any later domestic applicants would be treated in the same way as non-rural applicants.

At the time it was estimated that a further 28,000 new rural consumers would agree to take supply by 1975, and work on connecting them would in some cases continue until 1977 or 1978 as the commitment of skilled manpower to rural electrification was wound down. In the event, nearly 50,000 applications for power were received and had to be accepted. 'Ordinary' consumers who applied exceeded the estimated 14,000 by 50 per cent; 'priority' applicants exceeded the estimated 14,000 by almost 100 per cent.

This increase in connections over target was possible within the resources being made available for two reasons. First, the ESB devoted less money and manpower to system improvement expenditure in the rural areas and concentrated it on new connections. This, of course, meant that a pent-up demand for these improvements hung over the ESB at the end of the period, especially as new connections, meaning increased load, caused the quality of supply to deteriorate. Secondly, the ESB discovered that it was able to get more applicants to accept 'special service charges' than had seemed likely in 1970. Since these in effect amounted to extra contributions to the capital cost of supply in cases

where that cost exceeded a predetermined level, this amounted to saying that more people were prepared to pay a higher price for supply than had seemed politically feasible.

As the final phase drew to a close, the ESB considered the social goals behind the original scheme to have been achieved and decided in principle that it should seek to withdraw from any further commitment of its own resources or finances to subsidise rural supply.²⁴ In future, it felt, any assistance should be provided as an integral part of some existing government service (for example, as part of IDA grant schemes). In particular, the ESB felt—and made clear to the government—that there was little justification for continued subsidisation (either by the taxpayer or by the electricity consumer) of ‘the construction of expensive residences for . . . people who decide to move out of town . . . for second or holiday homes . . . or for enterprises such as garages or public houses which . . . should be able to look after themselves.’²⁵

Although, as the ESB warned the government, opposition might be expected from vested interests, including the Department of Agriculture, to a move to a commercial basis of supply, blanket subsidies no longer seemed justifiable in rural areas. The Chairman at the time, Dr Murray, expressed himself trenchantly on the subject to the Minister for Transport and Power:²⁶

I was struck by a recent newspaper report in which a local representative, when protesting against a quotation for electricity supply in one of the ‘closed’ areas, said (by way of complaining) that it looked as if people ‘will have to select their sites depending on the availability of electricity supply’. Indeed yes—just as they have to select their sites by reference to the availability of roads, water supply, schools, public transport, etc. So far as the ESB is concerned, all it wants is confirmation that its approach is to be on a purely commercial basis once the Rural Electrification Subsidy Scheme has been wound up.

No sooner, however, had the rural scheme been wound up, in early 1975, than political pressure on the ESB began to increase to maintain subsidised connections in rural areas. This culminated in a request from the minister to the ESB to extend subsidised supply to the remaining few pockets which had not been included. Envisaging both political problems for the government and public relations problems for the Board, he suggested that ‘this irritant’ might best be removed, at a negligible total cost if the ESB was to meet these demands for connection on a subsidised basis out of ESB funds.²⁷

For all the obvious reasons, the Board was reluctant to comply with this request and fresh negotiations with the Department of Transport and Power were opened. At the same time, the ESB sought to head off the political pressure on the government by a public information campaign on connection costs.²⁸

In subsequent negotiations with the department, agreement was reached on the introduction of a limited post-rural scheme by means of legislation for further government subsidies. Initially, the ESB considered that the total number of eligible applicants would be about eight hundred, mainly located in two remote areas in Kerry and Mayo. The ESB also agreed, reluctantly, to accept a deferred payment scheme for capital contributions, in certain cases where subsidised supply was not available.

The initial estimate of the number of likely applicants had been revised upwards to 2,000 by the time the bill providing for the government subsidy had been introduced.²⁹

The £300,000 subvention to the ESB which the bill proposed would, therefore, be seriously inadequate. Further, although the ESB had urged the government to pay the subsidy directly to the applicants, the bill provided for the ESB to receive this grant and so to be enabled to offer supply at a lower cost. This put the ESB in the unenviable position of explaining itself to those already connected without the subsidy and to those who did not qualify under the terms of the bill.

When the bill was introduced it was on the basis of an estimated eight to nine hundred households, mainly in the Black Valley area of County Kerry and the Ballycroy area of County Mayo, who had found themselves unable to accept the ESB's offer during 1971-5 because of the capital costs involved. The ESB had, however, warned the government that the figure of 800+ was a rough estimate and, on further investigation, had come to the conclusion that the number involved could be as high as 1,700.³⁰ In this case, the funds provided would be quite inadequate. The government, however, was unmoved; the Minister wrote to the Board:³¹

The figure of £300,000 . . . was based on the best estimates of 825 as the number of eligible householders. It is, of course, incumbent on your Board to ensure that, irrespective of the eventual total number of qualified householders, *all* applicants who satisfy the Board that they are eligible for connection . . . under the new scheme are connected on the terms indicated. . . . [The] figure of £300,000 represents the most that can be provided to your Board by way of State grant . . . (Original emphasis)

Caught in this predicament, the ESB was obliged to go ahead with this 'final' phase as best it could, having extracted from the department acceptance of some review of the subsidy position after twelve or eighteen months.³²

This last push to complete rural electrification was substantially completed by its target date, 31 March 1978, and approximately 1,100 new households were connected. In some areas, however, work continued on a very small scale into 1980, at which point further, if similar (and similarly financed), commitments had been accepted to extend supply even to some offshore islands.

By 1976, however, the bulk of the work had been done. In the thirty years since the scheme had started, 420,000 houses had been connected to the rural network, at a cost of £80m., of which the state had provided £27m. and the ESB £53m. This represented between 98 per cent and 99 per cent of all rural households, which compares favourably with connection rates elsewhere. The work done between 1976 and 1980 brought the percentage up to a negligible amount short of 100 per cent.

For the ESB, however, rural electrification as a major programme had been largely completed long beforehand, with the meeting by 1961 of the initial targets set in 1945. By that date 280,000 rural consumers had been connected and three-quarters of a million poles erected. An indication that most of the work was done came in November 1961 when *REO News* appeared for the last time after a run of fourteen years. The last issue had an article of recollections by M.J. Shiel, which included reminders of the shortages and rationing which surrounded the early years of rural development, the problems of supply and the difficulties caused by 'backsliders': ' . . . in his blackest mood the Resident Area Engineer would have said that his job was to supply electricity which could not be spared to houses which did not want supply using materials which he had not got.'³³ He also drew attention to one other aspect of the early days and one which he saw as critical

to the success of the operation—the fact that post-war demobilisation in Ireland and Britain provided a steady stream of qualified and energetic manpower, many of whom were recruited for the scheme and helped get it off the ground so quickly.

Looking back it is possible to see that the scheme of rural electrification was one of the big contributions to the modernisation of rural Ireland, constituting one of the great social revolutions of the century. It helped to transform not just the life-styles and the economy of rural areas, but also to boost the morale of people in deprived and isolated areas as nothing else, perhaps not even independence, had done. After the initial excitement the people of the countryside came to accept the rural scheme, taking it almost for granted. But this easy acceptance did not disguise the popular appreciation of the contributions the rural scheme had made to improving the comfort and efficiency of rural life, and made no less valid the judgement of Quidnunc, in an *Irish Times* of December 1947, that one hundred years later the scheme of rural electrification would be seen as one of the really significant factors which has shaped the social history of the country.

FINANCIAL NOTE

A full account of the financial aspects of rural electrification, which are fairly technical, is given in Appendix 5; we offer here a summary of the main issues.

The basic problem was that the cost of supplying power in rural areas was, and is, much higher than in urban areas because the consumers are geographically dispersed. The greater the rural coverage, the greater the cost, since electricity would be supplied to the cheaper areas first.

If potential rural consumers were to be made to pay the full cost of connecting them to the ESB system, the numbers who would ask to be supplied would be very small, and, of course, the smaller the number in any area seeking supply, the higher the cost per connection, since the grid cost would have to be recovered from a lower number of consumers. This gave rise to a need for state involvement on two grounds. First of all, the 'prisoner's dilemma' of higher numbers resulting in lower costs per consumer clearly invites such intervention, and can easily be justified on purely economic grounds. More important, however, from a political point of view, was the need to avoid public resentment if what appeared to be highly discriminatory charges between urban and rural consumers were to be implemented. There is, of course, an element of income redistribution involved in this.

Given the existing political commitment to blanket coverage of the country, which was undoubtedly a popular plan, the scheme's finances became a matter of great importance. The costs would be met either by requiring the ESB to finance them, basically by means of cross-subsidisation of rural consumers at the expense of urban consumers (including manufacturing industry), or by the government stepping in to provide a subsidy to the ESB to enable it to carry out a 'social' service to the community.

The arguments between the ESB and the government turned on which of these strategies was to be adopted. In the end a compromise was agreed in 1946, whereby the coverage of the scheme was limited, while the government would subsidise the ESB by way of 'free' capital. The ESB was constrained as to the charges it could make for connection.

As time went on, the ESB's constrained charges were eroded by inflation, the

government fell behind in its provision of interest-free advances and the scope of the scheme was extended. The extra costs fell on the ESB which meant on the consumers in general. In addition, the amount of the government grant became inadequate to meet the costs of extending supply.

The government proved reluctant to relieve the ESB of this burden, partially for the usual budgetary reasons, but also, to some extent, because it was suspicious of the ESB's accounting procedures, and felt that the ESB was not giving them the full truth on the costs of rural electrification.

As has already been noted, during the financial crisis of 1956 the subsidy was revoked, and the ESB was obliged to continue the programme entirely on the basis of its internal finances. In fact this withdrawal of subsidy was a clear breach of faith on the part of the government; the promised funds withheld from the ESB were in the region of £9m. The subsidy was restored, if incompletely, in 1958. In subsequent years, as the scheme was further extended and post-development work undertaken, further subsidy was provided, but not to the extent that the full additional weight of rural electrification was taken from the shoulders of existing consumers.

Post-war Developments

1945-60

THE two most spectacular developments concerning the ESB during the pre- and post-war periods were turf power and rural development. Turf power could be seen as a dramatic way of using native sources of power and as a visible manifestation of the government's determination to make the Irish economy as self-sufficient as possible. The rural scheme brought the benefits of electricity and an ESB presence to parts of the country which had hitherto known only the rush candle or the paraffin lamp. But however spectacular these developments may have seemed, they were only part of the overall picture. During this period decisions were being taken which would vitally affect the future development of the Board. Plans were drawn up for an expansion programme which was to enable the ESB to play a vital part in aiding and accelerating the economic expansion of the country in the 1960s. During this period a small oil-burning station at North Wall in Dublin, four small turf-burning stations in the west and a coal-burning station at Arigna were built. The hydroelectric schemes on the Erne and the Lee were completed and the new steam stations at Marina and Ringsend came into production. The ESB made a significant breakthrough in cross-border co-operation with the building of the Erne scheme, realising the type of co-operation McLaughlin had dreamed of in the 1930s. But this period too saw the emergence of new tensions between the ESB and various government departments centring in particular around the constraints placed on the ESB's freedom of action by the turf programme and on the difficulties inherent in trying to match capacity to future demand in a time of unprecedented but erratic economic expansion.

THE POST-WAR GENERATING PROGRAMME

The first major decision for the ESB in the post-war world concerned its generating programme for the years ahead.

Between 1931 and 1940, the volume of units generated on the ESB system rose from approximately 140 million per annum to nearly 440 million. The rate of increase was measured in 'redoubling periods', which means the length of time required for a doubling of the number of units at current expansion rates. At this time growth was such that the average redoubling period was 5.2 years (roughly 15 per cent per annum). However, during the war, output stagnated and even fell; the output for 1945 was 406 million units. In 1946, when the Board started to plan its generating programme for the 1950s, it had to form some opinion of the correct redoubling period to allow for. In January 1947 it supplied estimates to Industry and Commerce based on a redoubling period of over ten years. This was the result both of experience in the first couple of years after the war and the rejection by the department of its 1945 projection, which foresaw output rising from over 400 million units in that year to around 800 million units by 1955—a redoubling period of around twelve years. By late 1948, it was already clear

that the 1947 forecasts were much too low, and that generation growth was proceeding much more quickly than had then been forecast. Although the ESB was aware of the dangers of extrapolation based on two observations, it was alarmed by the suggestion implicit in 1948 output figures that the post-war redoubling period looked like being of the order of 5.3 years—more or less the same as in the 1930s, but from a much higher base.¹ This result, a 19½ per cent increase over the previous year, was achieved in spite of continuing restrictions on the use of electricity. At this time, too, the rural electrification programme was getting off the ground.

The new plant programme approved by the government and adopted was based on the 1947 estimate of demand growth. Consequently, the ESB foresaw serious capacity shortages in the early 1950s. Under the circumstances, the long gestation period of turf-powered stations made the use of that fuel less than attractive. The stations or extensions planned provided for an output capacity increase of just over 600 million units by 1955; it looked as if this output would be achieved in 1952 or 1953. It was clear that Seán Lemass's instincts in 1945 had been correct in diagnosing an undue conservatism on the part of the ESB. However, his commitment to turf was now becoming incompatible with the ESB's obligation to provide capacity to meet demand.

When the Board informed the minister, William Norton, of the position in November 1948, after the change of government, his department wrote in reply that

... bearing in mind the experience in other countries and the relatively low consumption per head in this country, the Minister is inclined to the view that the present rate of increase in demand will be increased, or at least maintained, rather than reduced, for some years hence. Consequently, ... [he] is most anxious that the Board should in its plans ... err, if at all, on the side of *excess* ... capacity.²

It was in part the Board's anxiety to meet this request which led to the continuation of the struggle to avoid using turf, since a rapid expansion of overall capacity based on turf was not, in the Board's view, possible.

The ESB moved relatively quickly to achieve an improvement in its capacity. It sought and obtained permission from Norton to double the installed capacity in the North Wall station under construction in Dublin. In giving his permission, Norton indicated that he felt the Board's programme was still inadequate and urged it to remedy the situation.³ The result of this was the proposal to build the steam station in Cork at Marina, which ran into opposition from Bord na Móna.

It should not be thought that all the members of the ESB Board were as enthusiastic about the acceleration of the expansion programme. At least one member, J.M. Fay, was of the view that existing and planned capacity would prove sufficient, and that the Board was not justified in increasing its steam capacity, as proposed, to provide for security of supply in the event of a hydro-shortage of the extent experienced in 1933 (the driest year since records began in the early 1890s). However, his recommendations were in part based on an assumption that equipment prices, which had risen with post-war inflation, would probably fall again.

It is clear that the government's misgivings about the earlier ESB forecasts were justified. Between 1938 and 1948 Irish electricity production in units per head of the population rose from 135 units to 236—an increase of 75 per cent.⁴ In the UK the percentage growth was 91 per cent, and output per head rose from 544 units to 1040; in

Denmark the comparable figures were 100 per cent, 243 and 486. Even the poorest European countries had had similar or higher growth rates. In Portugal and Turkey the increase had been 100 per cent, and in output per head 67 units to 135 and 16 units to 31 respectively.

The pattern was clear: except where production per head was already very high, as in Norway, Sweden and Switzerland, or where there had been major war-time destruction, growth in output and demand was very high. Further, the fact that this was true across countries of different incomes per head showed that even if the higher-income countries experienced a slowing in the rate of expansion of electricity demand, Ireland might expect to continue to have a high growth rate as long as income per head was rising.

In Ireland's case the growth in demand was largely in the domestic sector, where between 1944 and 1949 consumption rose by 195 million units, an increase of over 110 per cent, most of which was in urban areas.⁵ Rural electrification obviously meant a further rapid demand expansion. Consequently, the process of economic growth and

Interior view of North Wall Power Station, Dublin, which was commissioned in 1949.



development would add even more impetus to the rate of growth of capacity requirement.

In spring 1949, the capacity of the generating system was 221.5 mW; capacity under construction or approved would add a further 179 mW by winter 1953, an increase of 81 per cent, assuming everything went smoothly as planned. Even on this assumption, the increase in consumption could be expected (on a five-year redoubling period) to place the system under strain. Delays would, of course, exacerbate the problem.

In view of this, it is easy to understand the ESB's desire to move quickly to expand capacity by building coal-/oil-fired stations in positions which would be optimal in terms of output and system reliability. Hence, too, the Board's continued reluctance to expand its turf-fired programme and to engage in what it considered as time-consuming and risky experiments with milled peat.

By the end of 1949 the Board had obtained permission to go ahead with the Cork station (30 mW), and was seeking approval for the hydroelectric development of the Lee (28 mW), as well as planning, reluctantly, to build a third turf-fired station at Ferbane (60 mW). In 1950 the ESB was asked to erect a station to consume the output of the small coal-field at Arigna. None of these, however, could provide capacity before 1956; the threat of a shortage remained, and the Board sought to avert the danger by extending the Marina station under construction to include a second 30 mW set. During 1950, demand continued to grow very rapidly, with a rise of over 20 per cent. Consequently, the ESB was forced to revise upwards again its estimated capacity requirements for 1955/6; in addition, the Lee and Ferbane developments had run into difficulties which had caused construction to be postponed. Finally, Pigeon House and Ardnacrusha stations would be showing signs of age by the late 1950s and, for system reliability purposes, would have to be down-rated in terms of capacity. The Board's solution to this was to seek further extension of the Ringsend station by 30 mW immediately and a further 30 mW set later on.

By this time, the speed with which demand forecasts were becoming obsolete and the changing estimates of the capacity available to meet demand led the Board to engage in regular nine-monthly revisions of its position.⁶ It was hoped that in the longer term arrangements with the Northern Ireland authorities to link the two systems would result in increasing the overall capacity of both systems (by allowing a smaller margin for risk on each system). Negotiations, however, were still going on, so the ESB would have to provide for all its own capacity requirements in the medium term.

The growing danger of inadequate capacity may be judged from the fact that for the year ended 31 March 1951 the total of units generated was approximately 960 million. (The original post-war estimate had been for an output of 780 million units.) This output had only been possible because the year was unusually wet, which meant that the output of the hydro-stations had been exceptionally high.⁷

The views of the Department of Industry and Commerce were now pretty well the same as those of the ESB as far as the need to expand capacity was concerned. The urgency of the problem, however, was not fully accepted by the Department of Finance, which rather grudgingly gave its consent to the capacity extensions requested by Industry and Commerce in 1950. Commenting on the forecasts, the Finance view was one of some doubt:

The Minister still regards with some reserve the Board's estimates of future demand.

He notes that no analysis is available of the prospective growth in consumption by class of consumer and it appears that the forecast of demand has been based entirely on the assumption mentioned in the Board's letter to your Department of 28th February, 1950, that demand will redouble itself every six years. This assumption can be realised only if demand increases by a progressively greater amount from one year to the next, and it postulates that the increase between, say 1953/54 and 1954/55 will be over twice as big as the actual increase between 1948/49 and 1949/50.

... [E]xperience has been much more erratic, with the upward pressure asserting itself rather jerkily after periods of slackening or consolidation. The Minister [Patrick McGilligan], therefore, finds it difficult to appreciate the grounds on which your department has decided that the Board's programme is inadequate and the approval conveyed above is given on the understanding that the probable growth in demand will be continuously reviewed in the light of actual experience, the provision of generating capacity so adjusted that any temporary excess that emerges will provide no more than a reasonable reserve against contingencies.⁸

The analysis that the minister sought had, in fact, been prepared, but it seems to have been confined to internal circulation within the ESB. The reservation about the logarithmic rate of increase in consumption was certainly reasonable, as such expansion could not be continued indefinitely. However, as a short-run assumption, it was reasonable enough under the circumstances of the late 1940s and early 1950s.⁹

In the spring of 1951 it appeared probable that existing and planned capacity would be insufficient to meet demand during 1953. This was partly because of the rate of increase in consumption, but was also due to delays in bringing plant under construction into operation, in this case the new Ringsend station in Dublin. A patching operation in the form of a further extension to another Dublin station, North Wall, was proposed as a means of alleviating the shortage.

In 1951 Seán Lemass returned as Minister for Industry and Commerce. In keeping with his known views he at once asked the ESB to prepare a report outlining the possibilities of meeting all, or at least as much as possible, of the projected demand by means of domestic fuel sources—peat and hydropower. The ESB's view on the matter was clear. On the basis of existing planned and potential capacity, they were able to state that 'The clear conclusion to be drawn... is that electricity production by means of water and turf alone will be inadequate to meet the estimated demand.'¹⁰

The evidence to support this conclusion was submitted to the government, as were revised programmes outlining the potential for domestic energy utilisation for the years up to 1960/1. As far as the ESB could forecast, it seemed that even if all potential hydro-stations under consideration were built, and if turf production kept tightly to the target figures, domestic energy sources would never be able to meet more than 63.5 per cent of estimated demand. The Board's forecast was that by 1961 these sources would be sufficient to meet only 57.5 per cent of demand. There would have to be an expansion of the coal-/oil-fired generating capacity of the system.

The generating programme submitted in August 1951 had to be replaced in February 1952 and again in March 1952, because of changes in the turf production programme of Bord na Móna. Further changes in Bord na Móna's plans caused another revision in the ESB's programme to be undertaken in January 1953.

FINANCIAL DIFFICULTIES

Additional problems for the Board were caused by the financial constraints under which it operated. During 1952 work on several turf-powered stations had to be delayed or postponed because the ESB had exhausted the capital provided by legislation. Under the 1927 Act, funds were to be advanced to the Board by the exchequer, after legislative approval had been obtained, and the Dáil voted the necessary monies. This was a very lengthy procedure. For example, the Electricity (Supply) (Amendment) Act, passed on 25 March 1952 provided for works for which the Board had sought legislative approval on 27 February 1950, and which had been planned in 1948/9.

The system, as it stood, was designed to secure parliamentary control over the ESB's activities other than day-to-day matters. It was suitable for the 1920s and 1930s because of the lack of urgency concerning further expenditure on capacity. The events of 1929 to 1931 undoubtedly justified McGilligan's financial arrangements. But the pace of change in the 1950s made the costs of these safeguards less tolerable. Consequently, Industry and Commerce sought and obtained the Minister for Finance's permission to alter these arrangements. The ESB was to be empowered to borrow directly from the public (subject to the approval of the Minister for Finance).

The legislation to give effect to these changes caused the Board some concern. It provided for an upper limit of £100m. to the Board's expenditure. It also introduced amendments to the supervisory relationship of the government and the Board, which, in the opinion of the Board, would reduce its independence. Lemass wrote to the chairman about these difficulties. The limit, he said, would be amended if and when the ESB's capitalisation required it. On the question of the ESB's independence, he had the following to say:

... the provisions in Clauses 4 and 5 of the draft Bill to which the Board objects are not designed to curtail the statutory independence of the Board but rather to provide an assurance that the Board's development programme will be on the general lines which the Government has approved and that there will be no departure from this programme without the approval of the responsible Minister. In view of the magnitude of the proposed programme and the large proportion of national capital investment which it will absorb I regard it as essential that such an assurance should be given in statutory form. It is after all merely a logical extension of the control which exists at present in regard to hydro-electric projects and does no more than give statutory effect to an understanding which has always been observed in practice. From the investors' point of view I can see distinct advantages in the existence of a provision which will ensure that the programme for which they will be asked to subscribe has Ministerial approval.¹¹

The legislation went through as introduced.

DEMAND AND CAPACITY: DIFFICULTIES IN THE 1950s

In early 1953 the ESB began to become less optimistic about demand expansion. Commenting on a draft memorandum prepared by Industry and Commerce for submission to the cabinet, the Board stated that the estimate quoted (1780 million units in 1956) seemed unlikely to materialise, and that it could not forecast beyond that date.¹²

However, a reduction in the rate of increase of consumption was a worrying possibility.

Nothing happened during the year to restore the previous expansionary optimism. Not surprisingly, the result was a turn-around in the ESB's attitude to its generation programme.

In February 1954 the Board informed Industry and Commerce that the projected demand for 1955/6 was now unlikely to materialise. It had been based on the assumption of a five-and-a-half-year redoubling rate which had proved unduly optimistic. During the spring and summer of that year, the sales results coming in confirmed the view that demand was lagging significantly behind the five-and-a-half-year estimate (Table 9.1). The sales increase in 1952/3 had been of the order of 11 per cent, but the ESB had experienced temporary shortfalls before, which had been made up for by subsequent demand surges. In 1953/4, however, the increase in the generation programme agreed between the ESB and the government was beginning to look as if it would produce serious over-capacity.

Table 1
Operations department forecast (1946)
Units generated 1947/48 to 1953/54
Actual number of units generated

For year	Forecast (millions kWh)	Result
1947/48	635	620
1948/49	712	710
1949/50	815	785
1950/51	925	973
1951/52	1060	1033
1952/53	1210	1164
1953/54	1385	1296

Source: Operations department memorandum 1946 and 1953, ESB reports.

To some extent, this danger might be averted by delays in commissioning plant under construction arising from factors outside the control of the ESB: the proposed Avonmore hydroelectric scheme had run into difficulties caused by the terrain, and was still under investigation. It and other hydro-schemes were in any case becoming less attractive because of high interest rates, which adversely affected the economics of this capital-intensive mode of producing electricity. The milled peat programme was marginally retarded because of design problems, which had arisen with the Ferbane station. As against this, the four hand-won turf stations and the Arigna coal station had (under government pressure) been advanced at the expense of other work within the ESB, and the Clady hydro-scheme looked like being on schedule.

Under the circumstances, the Board had to look again at the programme for the years up to 1960/61. Here, they were not greatly helped by the fact that the chief engineer's production-orientated forecasts (which reflected an engineer's preoccupation with system security) disagreed considerably with those of the sales department. While the chief engineer was prepared to accept that his forecasts might be on the high side because

of his preoccupations, he felt that the sales forecasts were pretty certainly rather low because of the tendency of sales teams to be wary of setting up unattainable goals:¹³

Inherent in Sales Department and R.E.O. estimates which must be related to revenue earned and general balance sheet surplus or deficit, is a conservative element to ensure that they will at least reach the sales values given. This tends to a pessimistic outlook on rate of growth in demand. Operation Department's estimate of demand from the point of view of having enough plant in hand, under construction, and in project, must have an optimistic view on rate of growth in demand if a conservative and safe plant building programme is to be established. Comparing the two programmes we

For year	Increase for year estimated by Sales Dept. and R.E.O.	Operation Dept.'s present estimate is in advance of Sales and R.E.O. estimate by:	
	kWh x 10 ⁶	kWh x 10 ⁶	or months
1954/55		7	negligible diff.
1955/56	186	21	or 1.4 months
1956/57	214	37	or 2.1 months
1957/58	223	74	or 4.0 months
1958/59	243	131	or 6.5 months
1959/60	222	239	or 12.9 months
1960/61	200	419	or 25.1 months

find that in the next three years the difference in the two estimates is negligible (max. about 4 months). By the end of the fourth year from now the difference is only 7 months and five years from now the difference is only one year. This is not considered an unreasonable difference in the two estimates as they are developed from different aspects. It is not possible to forecast exactly for four or five years ahead the exact date on which a new generating set or station will be available for service. Some margin for this possible delay in availability of new plant must be included in Operation Department's estimate but no allowance for it is in the Sales Department or R.E.O. estimate of sales of units. In our experience none of the Board's new sets or stations (except North Wall extension) have ever come into service on the target date fixed at the time the plant orders were placed.

This qualified optimism on the part of the chief engineer led him to conclude:

As stated earlier it is our view that the generating plant building programme up to 1959/60 should be based on Operation Department's revised estimate. If the value of this estimate 4 or 5 years ahead, i.e. for 1958/59 and 1959/60 is found in a year or so, on re-estimate, to be too high then the plant installation can easily be slowed up to meet the actual position then envisaged.

As things turned out (see Table 9.2), neither the engineer's view nor the sales view constituted good forecasts. But then it would be unfair to blame either for not foreseeing the slump of 1955-7 two years before it happened.

Table 9.2
Generation forecasts (1953)
Operations department and sales department, 1954/55 to 1960/61
Actual number of units generated

Year	Operations forecasts			Sales forecasts		Outcome
	(i)	(ii)	(iii)	Sales (mWh)	RP	Sales (mWh)
	mWh					
	5½ yrs RP* on 1946/47	6¼ yrs RP* on 1953/54	7 yrs RP* on 1953/54			
1954/55	1580	1450	1430	1503		1462
1955/56	1765	1620	1580	1689	5.9	1573
1956/57	2005	1820	1745	1903	5.8	1648
1957/58	2300	2040	1925	2126	6.3	1775
1958/59	2600	2280	2125	2369	6.4	1898
1959/60	2990	2550	2345	2591	7.7	2096
1960/61	3390	2850	2590	2791	9.3	2262

*Redoubling period Source: Internal memoranda and ESB annual reports.

(i) Sales, based on assumed growth rate giving a Redoubling Period (RP) of 5½ years, on 1946/7 base.

(ii) Assuming 6¼ years RP, 1953/4 base.

(iii) Assuming 7 years RP, 1953/4 base.

The engineer's view seems in retrospect not only to have been rather optimistic, but also to have shown relatively little concern for the economic consequences of over-capacity, which are not really adequately described in terms of 'months ahead of schedule'. Instead one ought to look at the implications for capacity and peak load (Table 9.3):

These figures give a more accurate idea of the consequences of overestimation of demand. The difference between the forecasts and the out-turn for capacity in the first few years is unimportant, since they refer to capacity on a given day, so one month's advanced commissioning of a set would be sufficient to cause the discrepancy.

What is important is that, on the basis of existing programmes, capacity would more than double by March 1961. The peak load (on the operations department's upper estimate) would not quite double. The margin of security would therefore increase, if only by a small amount. In fact, despite the cancellation of some projects and the deferment of others, the capacity of the system rose by almost 60 per cent, while the peak load rose by only 55 per cent. The security margin rose from approximately 30 per cent

of capacity to over 52 per cent. In simple terms, there was a dramatic increase in the overhead costs of the system which, although it meant a more secure supply, could not be said to represent a conscious decision to increase security, and certainly raised the cost of producing electricity.

Table 9.3
Forecasts (December 1953)
Capacity and peak loads 1954/55 to 1960/61
Out-turn

Year	Capacity (mW) 31 March		Peak load (mW)		
	Forecast	Result	Forecast		Result
			6¼ yrs RP	7 yrs RP	
1954/55	382.5	452.5	354	348	348
1955/56	452.5	512.5	395	385	363
1956/57	512.5	567.5	444	425	378
1957/58	626.5	649.5	497	470	412
1958/59	728.5	688.5	555	520	462
1959/60	748.5	688.5	620	572	476
1960/61	768.5	723.5	695	630	540

Source: Internal memoranda and ESB annual reports.

The effects of the 1955–7 recession on the demand for electricity made some cut-back in the generation programme inevitable. In the year ending 31 March 1956 the increase in the number of units generated was 7.6 per cent. In the following year it was down to 4.7 per cent. By August 1957 the annual rate of increase was down to 4.1 per cent. As far as the ESB was concerned, this was the bottom point of the trough, and by the end of the Board's financial year demand had picked up sufficiently to give annual growth of 7.7 per cent.¹⁴ Most of this growth was in consumption for domestic purposes. Industrial demand was stagnant. In the year ended 31 March 1959 overall growth was still only 7 per cent.

These rates of increase were very much lower than those envisaged five years previously. The latter had formed the basis of the 1954 White Paper on generation capacity expansion to which the government regarded the ESB as being committed. The Board had been worried about this programme at the time of its publication. By late 1955 this concern was also being felt in the Department of Finance.¹⁵ The government, as part of its measures to meet the exigencies of the recession, and as a foundation for what was to become known as the first programme for economic expansion, had ordered a review account. Even though, under the 1954 legislation, the ESB was no longer totally dependent on the exchequer for its funds, its spending came within the area under scrutiny. The view of the department, as expressed in the subsequent 1958 White Paper on economic development, was that public sector capital formation should be diverted

from 'social' to 'productive' purposes. The building of power stations which were unnecessary would not be compatible with the new policy. Equally, the expenditure of several million pounds by Bord na Móna to develop bogs to service these stations would be unacceptable.

In 1955 the Minister for Finance had promoted T. K. Whitaker secretary of the Department of Finance. Whitaker immediately started to construct the foundations for the new policy. In February 1956 he wrote to the chairman of the ESB concerning the 1954 programme and Bord na Móna's plans.¹⁶ Bord na Móna, it seemed, was going ahead with bog development on the basis that the 1954 ESB programme would be implemented. Yet, of the 240 mW turf-fired capacity envisaged in that programme, only 140 mW were under construction or planned to be completed by 1960. This would involve Bord na Móna in wasteful capital expenditure; the situation would surely be worsened if the ESB were further to revise its own capacity programme. The ESB con-

The turf-burning station at Bellacorick, Co. Mayo.



curred with this view—except that it regarded the 1960 date as optimistic; it would not require the reduced turf total mentioned by Whitaker until 1961.¹⁷

The views of the Department of Finance were known inside the ESB and were quoted in support of deferring further turf-powered stations. Thus, the chief engineer, writing to the Board about its programme, said:

The Departmental Committee on State Capital Expenditure has expressed the view that the turf production programme should be properly integrated with the ESB generation programme and that the rate of progress should be kept in line with ESB requirements as these may be revised from time to time.

In these circumstances it would be desirable to avoid further commitments for turf plant until the result of the Departmental Committee's report is available.¹⁸

But while the ESB, with the tacit support of the Department of Finance, was proposing to cut back on the turf programme in order to reduce the degree of excess capacity, it was simultaneously seeking Industry and Commerce's approval for an extension of the Ringsend station by installing a 60mW set.¹⁹ The response from Industry and Commerce to this proposal was predictable:

The Minister has noted the position with regard to the White Paper programme of March, 1954, and it appears to him that the proposal represents a radical departure from this programme and from the policy outlined therein of basing generating capacity on native resources. . . . Before considering the proposal further the Minister would be glad to have the observations of the Board as to the reasons why it is proposed to proceed with the installation of capacity based on the use of imported fuel in advance of the planned installation of capacity which would utilise native fuel.²⁰

The ESB's reasons for wanting to expand Ringsend were threefold. It felt firstly that the expansion would take five to six years because of local difficulties and was aimed to meet demand in or around 1962 and not 1960 when a glut was envisaged; it argued also that more turf would mean too many eggs in one unproven basket; and thirdly, it was certain that production costs would be lower at Ringsend.²¹

On examination it must be said that the first reason now seems somewhat weak. The second is stronger, but it is the third that represents the real reason for the Board's request. Subsequently, however, this proposed extension to Ringsend was dropped from the programme.

In March 1956 the ESB submitted a revised generation programme to the Department of Industry and Commerce.²² The 1954 White Paper programme had provided for an increase in capacity (gross) of 650 mW by the year 1960/61. The revised ESB programme reduced this to 346 mW, mainly through delaying the commissioning of new turf stations or extensions, but also by cancelling one of them (unavoidably, because of inadequate turf).²³ The main blow to Bord na Móna was the proposal to eliminate the station at Bellacorick in Bangor-Erris, Co. Mayo, from the programme for 1960/61. Two small hydro-schemes were also dropped. The result of these changes was to reduce by nearly 50 per cent the estimated demand for milled peat for the year 1960/61.

The department was upset by this, having by now, even under a minister other than Seán Lemass, become fairly committed to turf, presumably for reasons of employment.

The accusation was made that the ESB had not warned them of the possibility of excess capacity, which was inaccurate. However, despite these objections from Industry and Commerce, the ESB received the approval it had sought for the revised programme.

During this period relations between the ESB and the Department of Finance were good—certainly better than they had been for some time—but the same could not be said of relations with the Department of Industry and Commerce. That department was still very committed to turf and was clearly unhappy with the downward trend of capacity requirements and the implications of this for Bord na Móna.

In May, the minister and his secretary and deputy secretary met the ESB chairman to discuss the position. The meeting was acrimonious, and in consequence the Board wrote to Industry and Commerce to place its views on the differences between the parties on record.²⁴ The opening paragraph of that letter summarises the attitude of the Board:

At the meeting of 2nd May, 1956, the view was expressed that the Electricity Supply Board had not in the past expressed any doubts about the generating plant programme contained in the 1954 White Paper and had not suggested a revised programme. The Board feels that this view can only be based on a lack of awareness of the facts and for that reason considers it desirable to set out in some detail the circumstances surrounding the production and the implementation of that programme.

The letter continued with a detailed recital of quotations from letters to and from Industry and Commerce going back to 1948 concerning capacity and growth in demand, which, the Board claimed, showed that Industry and Commerce had dictated the ESB's capacity despite doubts frequently expressed by the Board up to and after the 1954 White Paper. To the charge that it had not met its obligation to provide an alternative programme, the Board's reply was:

The Board had the problem of growth in electricity demand in relation to the capital programme under constant review. Although there were indications from time to time since 1954 of a slowing down in the rate of growth, the Board had not decided finally on the revisions which might be feasible and for this reason could not advise the Minister.

Some months ago two factors appeared which forced a re-consideration of plans for future plant:

1. Difficulties in regard to availability of capital. At the recent meeting with the Ministers on the capital difficulties the Board was asked to submit a revised programme having regard to its experience of the rate of growth. The Board submitted this programme without delay.
2. For the year ended the 31st March, 1956, 1,573 million units were generated compared with 1,780 million units forecast in the White Paper. The actual demand for that year was thus over 200 million units per annum less than the White Paper estimate.²⁵

When the department replied to this, it was in an angry letter, which put the blame on the ESB:²⁶

It is not correct to say that at the meeting held on the 22nd May, 1956, 'the view was expressed that the E.S.B. had not in the past expressed any doubts about the generating plant programme contained in the 1954 White Paper'. It will be observed

from the second paragraph of the report of that meeting (a copy of which was forwarded to your Chairman) that the Minister stated that he was aware of the Board's claim that the Programme had been imposed on them under the White Paper. The Minister went on to point out that, during 1954 and 1955, this Department had been endeavouring to get from the Board a precise indication of the revisions which they thought should be made in the Programme and that it was only now that this information had been supplied.

The Minister is, of course, aware that, when the White Paper was being prepared, your Board endeavoured to have the forecast of future consumption pitched in more cautious and less optimistic terms than those actually used. . . . Neither can the Minister agree that the generating programme incorporated in the White Paper was formulated by this Department; it was formulated originally by the Electricity Supply Board, taking account, however, of the Government policy of utilising native power resources to the maximum possible extent.

The department went on to point out that requests for detailed analysis of the trend of demand had not been met by the ESB. It also pointed out that during most of 1955 the ESB had revisions of the programme in mind, but had not given details to the department. It continued:

During all this period the Board was going ahead, in consultation with and in agreement with Bord na Móna, on a generating programme which called for the long-term development of bogs on a scale which, as now appears, was excessive. Furthermore, in October, 1955, when the question of the utilisation of Derrygreenagh Bog was under consideration the Board, in response to an enquiry from this department, wrote as follows:

It should be pointed out, however, that the removal of the Rhode (Derrygreenagh) Station with an ultimate total capacity of 80 mW from the generating programme will necessitate the installation of equivalent oil or coal plant elsewhere particularly at Ringsend. . . .

Having regard to the terms of this letter, the Minister refused to entertain the request of Bord na Móna for permission to install a briquetting plant at Derrygreenagh. This matter is not referred to in your letter of 11th May.

There is no reference in your letter to the proposal that the capacity of the Ringsend generating station should be increased by the installation of a 60 mW generating set to meet requirements up to the year 1961/62. This proposal was referred back to the Board for further information and it was not until 7th March, 1956, that the Minister was informed that the Board had decided in present circumstances to postpone the installation of the additional set at Ringsend.

It is clear from the facts set out in the preceding paragraphs that there was no misunderstanding on the part of the Minister when he was discussing the question of the revision of the White Paper Programme with the Chairman of the Board. It is true that, before the White Paper was published and subsequently, the Board demurred at the estimates of consumption contained in that document. The Minister feels, however, that during the past two years the Board must have become aware of what has recently emerged [i.e. that there was a risk of serious over-planting] and he is left to

assume that, if the need had not arisen earlier this year for discussions with him and with the Minister for Finance on the problem of capital requirements, the information which necessitated a revision of the programme might not have been forthcoming even at this stage. It is obvious that any proposal for a revision of the programme (which had been prepared in the first instance by the Board) would likewise have to be prepared by the Board itself, and that this Department would not, in any event, be competent to assess the technical effects of any slowing down in the anticipated rate of increase in consumption. It was for these reasons that the Board was requested from November, 1954, onwards to submit a full statement of their views and particulars of the plans which they had in mind to give effect to these views.

The Minister remains of the view that it was the duty and responsibility of the Board, as soon as they were satisfied that there was a serious risk of unnecessary or premature capital expenditure on power development, to submit to him specific proposals for a revision of the programme.

It is clear that the blame should be shared: the department had encouraged the ESB to err on the side of over-capacity; it had required that the burgeoning supply of turf should be absorbed by new generating stations; it had drawn up the White Paper programme on the basis of demand estimates which at the time were already regarded as over-optimistic. On the other hand, the ESB had not supplied detailed trend estimates on request; it does not seem to have kept Industry and Commerce adequately informed of the developing situation; and, since it would accept cheerfully the department's assessment of its own technical competence, it could not expect civil servants to read between the lines when the ESB began to voice vague disquiet about the growth of demand. It is not surprising then that the Board's reply to this long letter was rather weak:²⁷

The Board is of the opinion that any attempt to justify our respective positions by reference to isolated extracts from files is neither useful nor desirable and can only lead to misunderstandings between the Department and the Board. The Board does not wish to become involved in a long fault-finding correspondence which apparently will convince neither side and which will never be conclusive.

Whether this assessment of the responsibility of those involved is accepted or not, there can be no doubt that by late 1956 and early 1957, the over-capacity of the ESB was becoming a serious problem, even if it was clear that it was only a temporary one. Solutions offered ran along two divergent lines. The Department of Finance and the ESB were anxious to increase sales and to improve the load factor while Industry and Commerce, with the difficulties of *Bord na Móna* in mind, wanted to replace that capacity which was based on imported fuel with expanded turf capacity. Such a solution, however, would hardly stand up to serious examination. Certainly it made little sense in economic terms to attempt to reduce excess capacity by closing down existing plant in order to create a demand for further generating capacity.

Nevertheless, this course of action was mooted in September 1956, when in a letter referring to the ESB's decision to defer building the Bellacorick station in Mayo, the department put the following question:²⁸

The Minister would also be glad to know whether, if the Bellacorick station were available in 1960/61, the Board could not at that stage close down or reduce output on

stations using coal or oil so as to give priority to the use of native fuel resources for generating purposes. If the adoption of this policy would result in any additional cost to the Board an estimate of the amount should be furnished.

The Board's reply to this query was that first it would not alleviate the problem of over-capacity; and secondly it would involve a capital outlay of £2.6m. and would represent a loss of at least £300,000 for each year the project was brought forward.²⁹ The last figure was subsequently amended upwards to £600,000.

Despite this reply, Industry and Commerce continued to consider the proposal as a viable option and, having explicitly recognised that it involved laying off Ringsend and Marina, wrote in May 1957 asking the ESB to supply further information on the implications of advancing Bellacorick and Shannonbridge.³⁰ When the ESB met the department to discuss the proposal, it pointed out the difficulties in implementing it.³¹ In doing so, it based its demand growth forecast on an assumption of a six per cent per annum increase, which turned out to be unduly pessimistic. Just as, in the early 1950s, the Board seems to have over-reacted to demand growth exceeding projections, they now over-reacted in the opposite direction. The Board's forecasting ability was somewhat weak, but the same charge could be laid against most public economic agencies at the time, the government included.

On the basis of these forecasts, the ESB saw no need for the Shannonbridge and Bellacorick capacity before around 1965. However, Industry and Commerce was unwilling to let the matter rest, and, showing a somewhat idiosyncratic idea of economics, returned with the following questions:

Would a new milled peat station be an 'economic' proposition in the sense that the all-in cost of producing current at it would be at or below the present average cost for the Board's whole system? On the assumption that an additional milled peat station was erected, and that this meant that the Ringsend and Marina oil stations were worked only to half capacity, what would be the additional cost (including capital charges) of producing current at these stations over a period of one year, i.e. to what extent would the Board's total expenditure on the generation of current be increased by reason only of the non-utilisation of these stations to their full capacity?³²

The alternative approach to the Board's problems was to solve them by stimulating demand. This line of action was suggested to the directors by the chief engineer in October 1956. In the three previous years, domestic consumption had only increased marginally, despite an active sales campaign. This was attributed to competition from oil and bottled gas. To combat this, further 'selling' of electricity to the public was necessary. Two methods were open to the Board—direct publicity and the financing of hire-purchase sales. The latter seemed particularly desirable because it is in itself profitable and because of the increase in power consumption it produces. The chief engineer recognised the need for economies in such areas as manpower and rural electrification, 'but in our opinion the last economy should be in selling activities.'³³

At the time, the measures taken by the inter-party government to eliminate what appeared to them to be an unacceptable balance of payments deficit were not helping the Board. In addition to raising taxes and lowering real disposable income in the private sector, the measures included special import levies on a wide range of consumer

durables, including cookers, refrigerators, and washing machines. Furthermore, quota restrictions reduced the available range of choice of such goods.

In August 1957 the Department of Industry and Commerce did an about-turn on the solution to excess capacity. In a letter to the Board, the department made no mention of building turf-powered stations. Instead, it pressed the Board to consider means of increasing its sales:

The Minister is of the opinion that, in these circumstances, it would be for the economic benefit of the country to sell all the electricity which can be produced, and which is in excess of the present demand, at little more than the cost of the fuel used in producing it which, it is understood, is about 0.76*d.* per unit from oil or milled peat. It is imperative that an outlet should be sought, both at home and abroad, for this surplus production. As regards internal consumption, the Minister considers that it would be economic for the Board to offer current at a reduced rate, possibly guaranteed for a period of years ahead, for domestic and industrial consumption in excess of the 1956/7 level. This should have the effect of increasing demand by existing consumers and might also alter, to the country's advantage, the economics of starting new industries, particularly those in which fuel costs are high, e.g. electro-chemical industries. The Minister would be glad to have the views of the Board on this proposal.

As the measures suggested in the preceding paragraph would take some time to produce effects, and as installed capacity might still be excessive in relation to demand, the Minister considers that the possibility of negotiating the sale of current in bulk to the Six-Counties or Great Britain should also be actively investigated. He appreciates that the capital costs and the technical problems associated with the proposal to sell electricity to Great Britain may be such as to rule out its immediate consideration, but he desires, nevertheless, to have the views of the Board on the proposal. With regard to the sale of electricity to the Six Counties, the Minister desires to have an early report on the matter.³⁴

This volte-face was undoubtedly due to the work then in progress on the economic development White Paper and to the views of the Department of Finance which dominated government policy. Shortly afterwards, T. K. Whitaker wrote to the chairman to give his views on the ESB's problems. The contents of the letter are ample evidence of the origin of the change of heart demonstrated by Industry and Commerce. In the course of it, Whitaker observed:

I cannot see that it is any escape from this problem to put oil-burning stations in 'moth balls' and go ahead with capital expenditure on new milled peat stations. We would still have excess capacity at present even if the two oil stations at Ringsend and Cork were shut down, so we do not need any further stations. I know of no industrial developments in the offing which would absorb even a fraction of our enormous excess capacity. The oil refinery I gather will take only some 8 to 10 mW of output. The domestic use of current will rise sluggishly, depending mainly on an improvement in real national income.

We have, therefore, a vast production potential of energy in excess of present requirements. We have the capital already installed and unless the capacity is profitably employed the public will have to continue bearing unnecessarily high charges

for electricity. Instead of putting stations in 'moth balls' and incurring further duplication of capital expenditure and current costs we should be trying to find ways of selling all the electric energy we can produce—and if we succeed in this we can then go ahead with new capital expenditure on milled peat stations.

On the home front would it not pay us to offer current at a reduced rate for a period of years for domestic and industrial consumption in excess of the 1956–57 level? As well as boosting demand by existing consumers this might alter to our advantage the economics of starting new industries, particularly those in which fuel costs are high.

But as even this is not likely to absorb quickly or completely our excess capacity, should we not seek an export outlet as well, e.g., by negotiating the sale of current in bulk to Northern Ireland?

Politically, perhaps the most important part of this letter was the first paragraph:

Unless it is unequivocally recognised that there is a very substantial excess capacity already, it will be all the more difficult to curb proposals for a further increase in capacity, including proposals that existing stations using imported fuel should be taken out of commission to make way for new stations using milled peat.³⁵

The Board's attitude to its capacity did indeed suggest mild equivocation. It sought to reduce the rate at which new plant was to be introduced in order to avoid excess capacity. At the same time it was reluctant to describe its current position as one of excess capacity, since it regarded much of the 'excess' of capacity over peak load as a legitimate safety margin—which, arbitrarily, if not rigidly, the ESB fixed at 30 per cent.³⁶

Where price reductions were concerned, the Board was informed by its legal advisers that the terms of the 1927 Act would make sales at a price below full average cost of dubious legality.³⁷ In addition, the engineers felt that the price elasticity of demand for electricity was insufficient to increase sales sufficiently to warrant the reduction.³⁸ There would also be serious administrative problems. Oddly enough, the ESB file dealing with this does not include the views of the sales organisation, which may be an accurate reflection of who the real decision makers within the Board were. Attempts to sell surplus power to the Northern Ireland authorities came to nothing. The Board wrote to Industry and Commerce to tell the department that price reductions were not feasible and that the ESB would instead concentrate on promotional activity.³⁹ A reduction in the tariffs on electrical goods was asked for, too. The result of this was a rebuke to the chairman from Seán Lemass (back at Industry and Commerce since the March election) which is reproduced here in full.

9 October 1957

Dear Mr. Browne,

I have seen the reply sent to my Department's letter of 21st August last regarding the possibility of finding additional outlets for electricity and I must say that it disappointed me greatly. Indeed, I think it reveals a very unsatisfactory attitude to the whole question of increasing sales.

For almost two years now it has been abundantly clear that the biggest problem facing the Board is that of achieving a rapid and sustained expansion of sales in every direction. It is very disquieting, therefore, to see so little evidence of new ideas coming up to the Board from its sales organisation. The sales organisation seems to be content

to proceed on well-worn lines and I cannot escape the feeling that there is a lack of initiative in coping with the sales problem that now besets the organisation. Sales, in my opinion, are now the most important aspect of the Board's work.

It seems to me that if any real impression is to be made on the problem of securing a worthwhile expansion in the demand for electric current, the industrial side must be tackled, and tackled with vigour. Even if it were accepted — which it is not — that the recent lull in industrial expansion were likely to continue, that would by no means imply that the industrial demand for electric power was doomed to stagnation. It is up to the E.S.B. to go out after business, to compete actively and, by the quality of its sales and service organisation, to overcome competition from imported fuels.

The present position in which native energy resources are under-utilised while energy is being imported in various forms at high cost is the very antithesis of sound national economics. The Board has a vital part to play in remedying this position, but to do so an entirely new outlook is required on the part of its sales organisation. As I have said, this is now the most important aspect of the Board's work and I should be glad if you would inform me in detail of the lines on which the Board propose to seek a solution of this problem.

Yours sincerely,
Seán F. Lemass

Clearly then, Lemass saw the ESB's main problem as being its failure to achieve adequate sales, not its having too much planned and existing capacity. The implications of this for the generating programme were obvious. Clearly too, the Lemass view of turf as an essential component of 'sound national economics' was proving a durable one.

Whitaker's fears were proved justified when, at the end of October 1957, the ESB was informed by Industry and Commerce that the government had decided that the Bellacorick station should be reinstated in the programme and work commenced immediately.⁴⁰ If it should prove necessary to underutilise existing imported fuel stations, the ESB would be compensated by the government. In the event, this did not prove necessary.

It is difficult to escape the conclusion that the Finance view, all-powerful in the cabinet when Sweetman was minister, was overruled by the weight of the political importance of Lemass in the Fianna Fáil cabinet which succeeded the inter-party government of 1954-7.

RECOVERY

During the summer of 1958, undoubtedly encouraged by the revival of demand, the ESB reopened the question of the Shannonbridge station with Bord na Móna and Industry and Commerce.⁴¹ The engineers would have preferred to extend the Rhode station—and the Board concurred after examining the case—and a decision to go ahead with the Shannonbridge station was not taken until well into 1959.

The 1954 programme had been delayed by the recession of the mid-1950s. By 1966, however, it had been substantially implemented and most of the stations and sets envisaged were now operational. With the completion of this programme, the second stage of the ESB's development—turf power—was finished. In 1965/6, the generating system of the Board was as follows:⁴²

ELECTRICITY SUPPLY IN IRELAND

Capacity: Hydro	219.0 mW
Steam (turf)	367.5 mW
Steam (other)	473.0 mW
Total	1059.5 mW
System Peak Load	815.0 mW
Security Margin	244.5 mW

However, in spite of the considerable expansion programme during the period 1945–60, which included the building of the four small turf-fired stations, the coal-burning station at Arigna, the completion of the hydro-schemes on the Erne and the Lee and the coming into production of the new steam stations at Ringsend and Marina, the overall experience of the ESB in relation to capacity development was one of frustration, and the main source of this frustration was the constraints imposed through the turf programme.

In retrospect it can be seen that many of the problems facing the ESB in the post-war period were different in nature to those that had faced the Board during its earlier years. In particular there was the great and growing difficulty of matching capacity to future demand. There was, too, the conflict between the requirements of sufficient capacity to meet the needs of industrial development and the responsibility to provide power as cheaply as possible. There were also the growing tension between the overseers of the civil service, who had their own set of responsibilities and criteria, and the ‘doers’ in the semi-state body charged with performing a specific set of functions in which they had something approaching a monopoly of expertise. The ESB also found during this period that its objectives could on occasion be forestalled or frustrated because of the clashing objectives of different government and departmental policies in its area of competence.

THE ERNE

There was one further important development during this period which was to have important political significance and which was to see the ESB become involved with the Northern Ireland authorities in peaceful co-operation. This was the decision to develop the Erne as a source of hydropower.

Plans to harness the Erne had been contemplated in the 1920s and actually formulated in the 1930s but it was only in the years after 1946 that the development took place. The importance of the Erne development is twofold: it is the second most important source of hydropower in the country and it was the first significant act of co-operation on a substantial scale between North and South since the partition of the island in 1922.

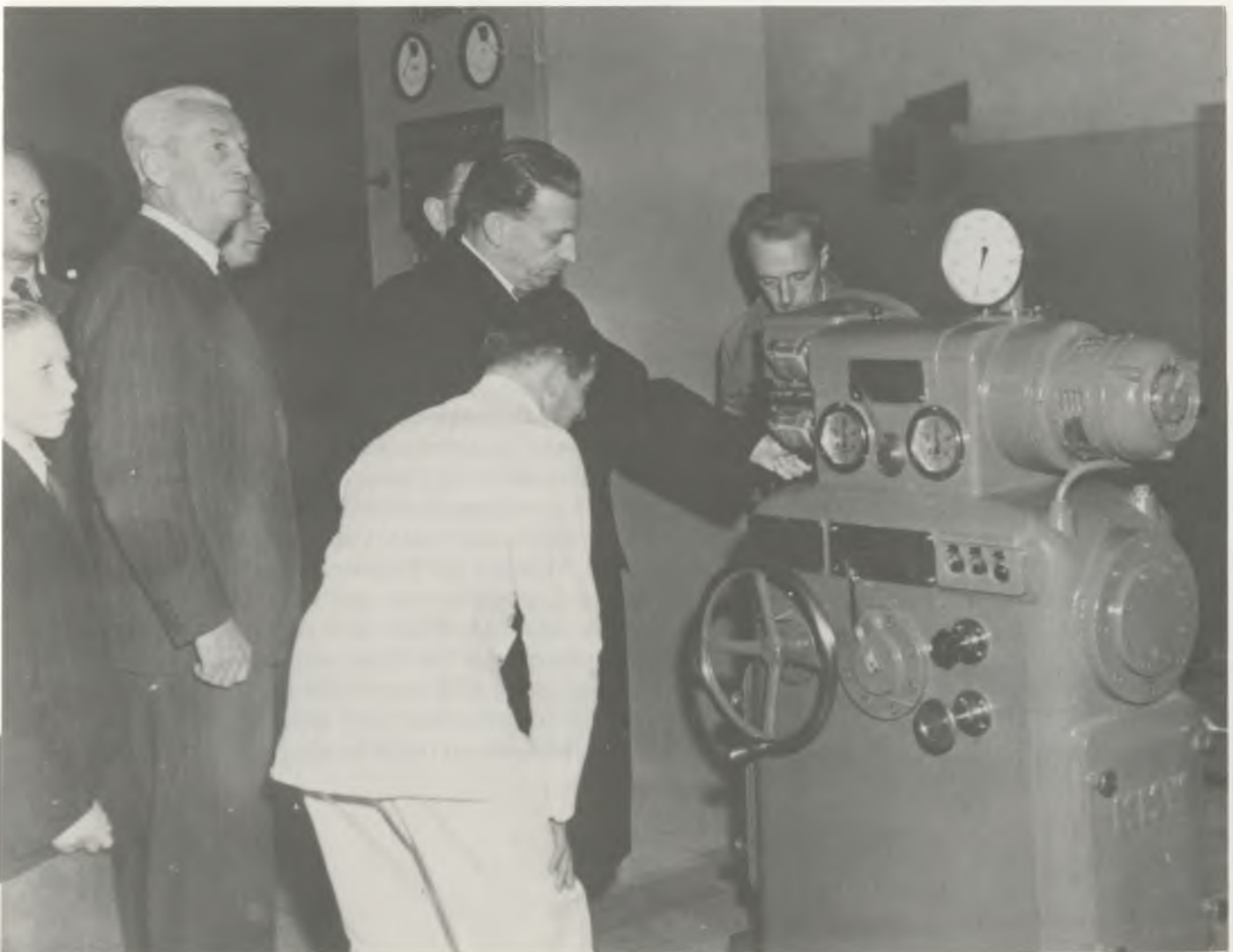
The development of the Erne scheme would not have been possible without this close co-operation, because the point at which the river was to be harnessed lay close to the boundary between the two jurisdictions, just a couple of miles from the Atlantic, with the vast bulk of the Erne systems lying within Northern Ireland. Obviously then the Erne hydro-scheme in the Republic depended to a large extent on the management of the very large lake system, and the natural storage for the scheme which lay upstream in Northern Ireland.

After the establishment of the two separate administrations in 1922, each had to co-operate in the operation of the sluice system which controlled the water levels in Upper and Lower Lough Erne. An expansion of this co-operation would be essential if the proposed hydro-development of the Erne was to be successful.

This development had been foreseen for some considerable time. The Water Power Resources Committee in 1922 had emphasised its potential and detailed hydrometric investigations had been carried out for the committee by Theodor Stevens. These results were, however, untraceable when the ESB began its own detailed investigations in the late 1930s.⁴³

During 1938 and 1939, while the ESB was carrying out these studies, it became involved, both officially and unofficially, with the Northern Ireland authorities over the Erne—even before there was a firm decision to harness the river as a source of energy. This arose because of proposals to lower the water level in the two lakes for drainage. North-South co-operation on drainage was already institutionalised in the form of a Lough and River Erne Drainage District, constituted in 1863, managed by a drainage board elected annually, and operating four sluices, two in the North and two in the South.

Seán Lemass, Minister for Industry and Commerce, and R.F. Browne, Chairman of the ESB, at the official opening of the Erne Scheme on 1 October 1952.



When the question of lowering the water level arose, the ESB was automatically involved, since any significant alteration of the system could affect its potential for electricity purposes. The Northern government sought the ESB's advice, which proved difficult to provide in the absence of data. More important, however, was the delicate question of relations between two administrations which were not particularly friendly at this stage. The Northern government was suspicious and hostile while in the South there was the strongly held view that any joint ventures with the North helped to recognise and institutionalise the unacceptable fact of partition. The whole situation was fraught with ambiguities and pitfalls but, in spite of this, one of the ESB's leading engineers, Joseph MacDonald, had been taking unofficial initiatives. MacDonald had been gathering hydrometric data and had also become friendly with his opposite number in the North, Major Shepherd. Arising out of this there was a free flow of relevant information, but as soon as this was discovered, there was an immediate rebuke from the secretary of the Department of Finance, John Leydon, who wrote to the ESB chairman, R.F. Browne, to say that he was: '... very much surprised, having regard to the various delicate and complicated aspects of this problem, to learn that one of your engineers had approached the Northern Government Authorities direct.'⁴⁴ This reprimand brought an assurance from the ESB that the practice would cease, and an explanation of the circumstances in which the contacts had arisen.⁴⁵

This rebuke did not, however, mean that the government did not want to press ahead with the Erne development and, though fully conscious of the political difficulties, it pressed the ESB to come up with detailed plans.⁴⁶ As a result, the ESB continued its investigations during the war and by 1943 was in a position to offer the government a firm set of proposals. These resulted in the 1945 Electricity Supply (Amendment) Act which gave the ESB the necessary legal and financial means to commence the Erne scheme.

The development was to comprise two separate stations, one at Cliff, close to Beleek, and one further downstream at Cathaleen's Falls. When fully developed, the proposed Erne system would have a capacity of 80 mW, 20 at Cliff and 60 at Cathaleen's Falls, and would be able to deliver between 160 and 200 million kWh to the ESB's network. Changes in the course of the development resulted in a capacity in 1976 of 65 mW, 20 at Cliff and 45 at Cathaleen's Falls.

Prosecution of the scheme depended vitally on the undertaking of engineering work on the riverbed across the border in Northern Ireland—and, therefore, on the goodwill of the Northern Ireland government. At this stage, although the ESB was continuing to exchange information unofficially with the relevant Northern agencies, it was unwilling to enter into any overt negotiations until formal contacts had been established between the two governments.⁴⁷ This reflected the ESB's unwillingness to be caught offside again on the touchy subject of partition. In April 1946 this formal contact was established—the Department of Finance in Dublin wrote to the Ministry for Finance in Belfast to open negotiations. Once this hurdle had been cleared, progress was very rapid. In fact the Northern authorities proved to be co-operative all along. From their point of view the works proposed would enhance the drainage potential of the Erne, which would bring immediate benefits to the North at minimal cost, as the ESB was to carry the expense of the engineering works. Presumably, the Northern authorities were also favourable in general to cross-border co-operation, as such developments could be seen to help to nor-

malise political relations without compromising the position of the North within the UK. For the South, as has been noted, such normalisation contained an element of *de facto* recognition, which might have political repercussions if misinterpreted. This may explain what the ESB felt was unreasonable delay on the part of the Dublin authorities to establish official contacts with their Northern counterparts—which delay at one stage seemed to place the whole scheme at risk.⁴⁸

Legal complications existed in the North as well. The provisions of the 1920 Government of Ireland Act, which partitioned the island and established the Northern government, gave that government power to engage in projects like the Erne only within the territory under its jurisdiction. Until amending legislation could be passed at Westminster, co-operation would have to remain unofficial. The required powers became available under the 1947 Northern Ireland Act, and the Northern government was in a position to enter into a formal agreement with the ESB. The drafting of the agreement and the heads of bills for supporting legislation took over two years, and the agreement was not signed until September 1950.

These delays in reaching agreement between the parties concerned on either side of the border did not prevent the ESB from commencing work. This is hardly surprising, since it is clear that both governments were agreeable in principle, and only details remained to be settled.

In April 1945, the Dublin government had given the ESB permission to commence work. The following month, using direct labour rather than contractors, the ESB started the first stage of the civil undertaking, even though there was as yet no certainty that the scheme would be completed, because of the absence of an official agreement with the Northern authorities. By early 1946 work was in progress on the sites of both the proposed stations. Post-war supply difficulties and temporary labour shortages resulted in some delays, but the first of the two Cliff sets was commissioned in August 1950, and the first Cathaleen's Falls set was commissioned in November 1951. In April 1952 the second Cathaleen's Falls set was commissioned. The final stage of the preliminary Erne development—the second Cliff set—could not be brought into service until the civil engineering works on the Erne across the border were completed. Consequently, the second Cliff set was not commissioned until 1955.

The Erne developments made a significant—if not spectacular—contribution to the national system. But politically it was to mark an important milestone in North-South relations. It was an example of the type of co-operation that was beneficial to both sides but which was possible only when a situation of mutual trust and confidence had been built up and when each side was prepared to respect the sensibilities of the other. Unfortunately, the achievement of the Erne was to stand in dramatic isolation in the history of North-South relations, a symbol of what was possible, but for long a lonely symbol. However, the experience of the Erne and the good relations with the Northern Ireland Electricity Board were to be put to good use in the 1960s, when once again the ESB was to play a major part in fostering practical co-operation across the political divide.

Fisheries

ONE substantial if peripheral area of ESB activity which was not envisaged in 1927 was the Board's involvement in fisheries. Today the ESB owns the only commercial fishery in the Shannon estuary and controls all fishing rights on that river above Corbally Mill Weir in Limerick including those of all rivers, lakes and canals flowing into the Shannon; it owns the only commercial fishery in Cork city and the fishing rights in the two Lee reservoirs and the Inniscarra tailrace; it has a commercial fishery too on the Erne and owns substantial fishing rights on the Erne, the Liffey and the Clady. In addition, the Board's fisheries division carries out a continuous programme of research into the habits, breeding and rearing of salmon and trout, monitors pollution levels and has made a considerable contribution to the investigation of the salmon disease which has affected a number of Irish rivers in recent years.

THE SHANNON SALMON FISHERIES

While it was not envisaged that the ESB would become involved in fisheries in the early years, there was a realisation at the time that the building of the Shannon scheme might do damage to some of the fisheries on that river. Right from the start, however, Patrick McGilligan declared his and the government's priorities:

The White Paper definitely foreshadows that it might be necessary to neglect the fishing interests in the cause of power production. It foreshadows that fishing interests will not be allowed to predominate against the greater interests of power production.¹

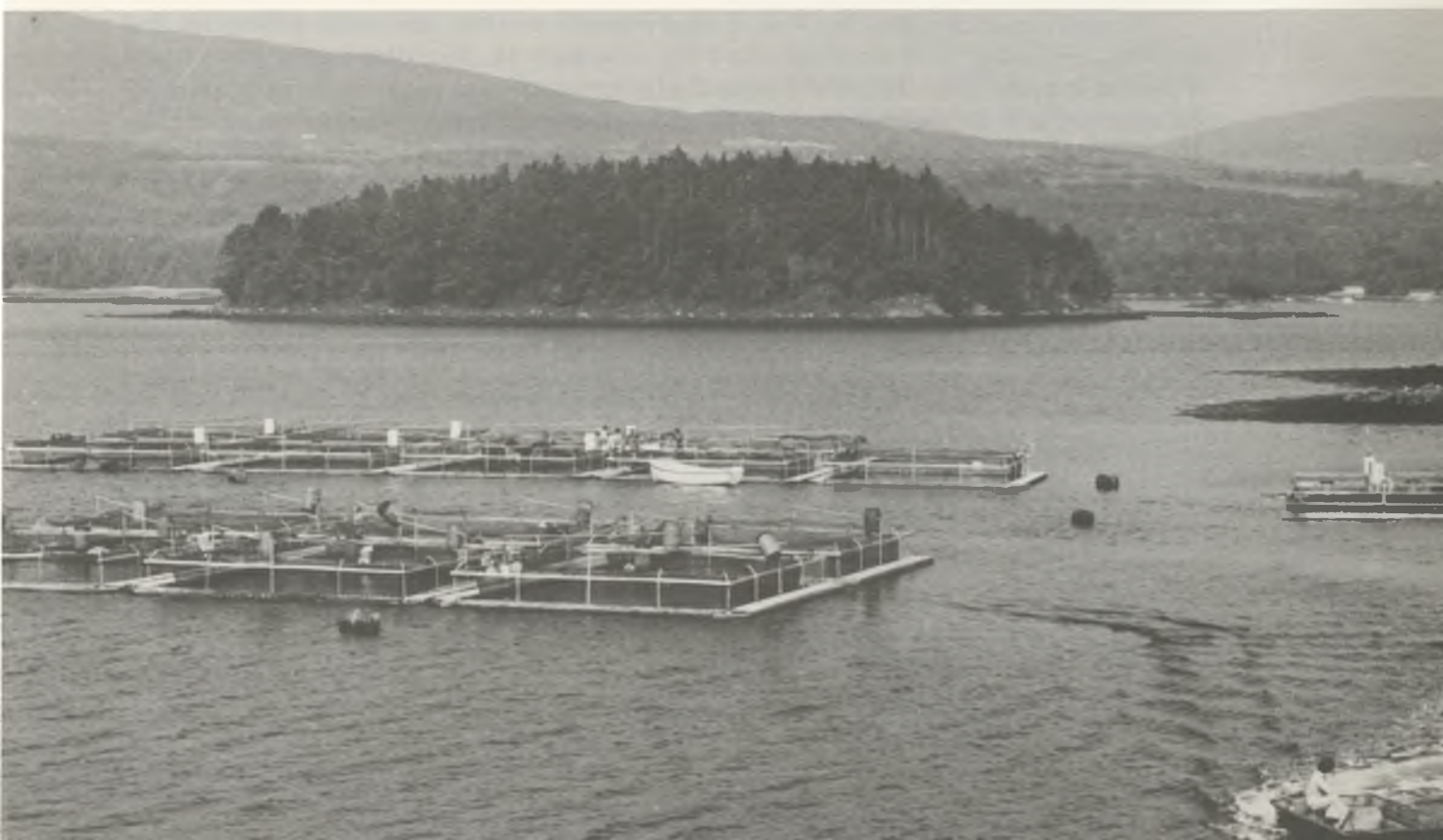
Even as McGilligan was speaking various fishing interests were becoming very apprehensive about the possible effects of the scheme on what were regarded as some of the finest salmon rivers in Europe. The example of what had happened in other countries was all too clear. By the end of the nineteenth century many of the best virgin salmon waters in Europe and North America were nearing destruction as a result of industrialisation. Water power had been harnessed to turn the wheels of textile mills denying the salmon access to their normal spawning grounds; chemical waste from smelters, mines and foundries had poisoned the water and tons of untreated sewage had robbed it of its oxygen. What was happening in Ireland was clearly on a different scale; nevertheless the potential dangers to the fishing industry from the electrification of the Shannon were evident, at least to some of the better informed fishing interests.²

The electrification of the Shannon had resulted in the damming of the river and then its diversion into a seven-mile headrace with a hundred-foot fall into the tailrace before returning to the main river. This meant that uprunning fish were met by two barriers—the power and intake dams. At first it was thought that a ship-lift might accommodate the fish, but this proved to be impracticable, mainly because the fish would not face into still water. A fish ladder at the intake dam was tried, and this became the only means of passage from the lower to the upper waters.

In the case of fish passing down to the sea, the problem was to keep them away from the turbines. With mature fish this could be done with gratings but it was not possible to get a mesh sufficiently small to exclude the salmon fry which were drawn into the turbines and killed, though a surprising number managed to pass unharmed through the turbines. In addition, the large fish who missed the open passage at the intake dam and passed down the headrace collected in large numbers behind the turbine gratings and often appeared to stay there. Eels too were prevented from getting upriver.

Under the 1925 Shannon Electricity Act, the Minister for Industry and Commerce was liable for any damage to Shannon fisheries due to the construction of the Shannon works. As soon as the extent of the damage became clear and after its first series of confrontations with the fishery interests, the department estimated that it would be required to pay between £10,000 and £12,000 per annum out of revenue to provide compensation for fisheries. The prospect of never-ending claims and continuous litigation was sufficient to concentrate the mind of the department, and it began to look at various schemes which would preserve the fisheries. Compensation—or rather the saving of it—was not the only consideration. It was also realised that the fisheries could constitute a valuable national asset.³ It seems that a decision in principle had been taken as early as 1928 to bring the fisheries under some form of unified control, either direct state control or indirect control through the ESB. In September of that year Gordon Campbell wrote to the head of the Office of Public Works, Sir P.H. Hanson saying that if some form of unified control could be achieved, then the Department of Fisheries believed that damage to fish passing through the power scheme could be prevented, 'and that in all probability the fisheries could be made a genuinely remunerative undertaking to the State after some years.' Campbell added that 'since the future of the fisheries largely depends on a sensible regulation of the water flow . . . obviously there must be the closest possible co-operation between the new fishery authority and the ESB.'⁴

Salmon farm at Mulroy Bay, Co. Donegal.



Lengthy discussions took place between the ESB and the Department of Industry and Commerce during 1929/30 and agreement in principle on the main points appears to have been reached. These were that the ESB would assume control of the Shannon fisheries, that the ESB would acquire these fisheries, would allow private fishing on a restricted scale and would also develop fishery stocks.

In a memorandum to the ESB Board of 1 May 1930 J.M. Fay summarised the specific proposals dealing with the acquisition of the fisheries and the main area of contention between the ESB and local interests. These proposals were:

1. To allow the continuance of *net fishing* in the free waters of the Estuary under a more restricted licence to any person who cannot show that they have been occupied on this fishery during the last three years.
2. To purchase the fixed engines (namely weirs, etc.) in the Estuary and to close them down.
3. To acquire the *lax weir* and to use it for the purpose of catching all the salmon and eels to be caught by the Fishery Authority under the Scheme.
4. To acquire the Fishery rights of the *Abbey fishermen* and to re-let this portion of the river for *rod fishing* only.
5. To acquire the *rod fisheries* and to re-let for *rod fisheries*.
6. To prohibit fishing in the waters at present indicated as 'free' adjacent to the weir. It is understood that these waters should not really be free, but that the owners have not taken the trouble to enforce their rights. The value of the fisheries in question is very small.⁵

Work went ahead on the drafting of legislation, but when a copy of the main proposals was shown to the ESB in February 1931 they were clearly unacceptable.⁶ The main difficulties, which were summarised by Fay, concerned the future purchase of local fisheries and the difficulties this would create for the ESB. Fay argued that these should be purchased by the government and then handed over to the ESB. He was also opposed to the retention of the board of conservators with control over the activities of the ESB. This, he felt, would be extremely cumbersome.⁷

The ESB began negotiations with the government on these and other difficulties, but nothing had been fully resolved when the Cumann na nGaedheal government was defeated in early 1932. The new Fianna Fáil government was aware of the need for legislation, especially its leader, Eamon de Valera, whose constituency of Clare was affected by the Shannon scheme and who had had representations made to him by some of his constituents. In spite of this awareness, however, fisheries did not find a high place on Fianna Fáil's crowded list of legislative priorities. In addition, Seán Lemass, the Minister responsible, decided that he wanted to take a fresh look at the whole question. To that end he set up an inter-departmental committee drawn from his own department, the Board of Works and the fisheries section of the Department of Lands and Fisheries. This committee published its report on 25 May 1933 and this report, which made recommendations on such questions as compensation to those who suffered loss and the future organisational control of the Shannon fisheries, was to form the basis of the government's subsequent legislation, the Shannon Fisheries Act of 1935.⁸

The committee conducted its deliberations against a turbulent background. The main problems centred around a group of fishermen in Limerick, the Abbey Guild of

Fishermen. These fishermen, drawn in the main from eight or ten families who had been fishing the lower Shannon for centuries and who had given themselves the title of the 'Abbey Guild of Fishermen' in 1905, saw their main source of livelihood threatened by the Shannon scheme. With some exaggeration, the author of a booklet *The Abbey Fishermen*, William Lysaght, declared that 'the combined depredation of every poacher since Thady Quill could not match the damage done by the E.S.B. in one year'. After some early controversy the Abbey Fishermen sought permission to fish in the tailrace and when this was refused there began a long and bitter campaign of illegal fishing, a campaign which culminated in what has been described as 'the battle of the tailrace'. The main ingredients of this battle were the clashes between the Abbey men and the Gardaí and bailiffs, the frequent arrests and occasional jail sentences, the fisticuffs and dunkings in the night-time water. One of the more dramatic nights in this battle is described by William Lysaght:

At 11.00 p.m. that night there was a full muster of fishermen at their moorings in the Grand Canal. Mr. Denis Hayes, their champion, impressed upon them that under no circumstances was violence to be used. They proceeded to Corbally and re-grouped at St. Thomas's Island. The nets were prepared for fishing and on the stroke of midnight they moved off towards the tail-race. Signs of great activity were apparent at the demarcation line between the Shannon proper and the disputed waterway. Bailiffs and Gardaí had three launches with searchlights at their disposal. Two of these launches were moored, one at either side of the navigation gap in the chain barrier. The remaining boat had a roving commission.

Rumour had it that the electricity would be turned into the chains, but this did not deter the fishermen. The Turbines at the Power House were turned on full power to create a strong current, presumably to make the handling of the boats more difficult. Inspector Lane shouted a warning that the tail-race was out of bounds, there was a moment of hesitation, but with a cry of 'Up Garryowen' and a few deft strokes of their paddles, Randy and Lully Hayes sent their boat surging in between the chains behind one of the launches. This was the signal for concerted action. In a matter of minutes all the boats were inside—the battle was on.

There was considerable confusion as the Gardaí and Bailiffs tried to apprehend the fishermen. Some boats were captured and the names of the occupants taken. The fishermen, acting under orders, did not resist and gave their names when asked. In the meantime most of the other boats had evaded the launches and proceeded upstream to the Power Station where they began to fish. Eventually the launches caught up with them and before the night was over 42 names had been taken. At approximately 3 a.m., the boats returned to base in Sandmall. The night's catch was 14 salmon but 9 nets had been seized. Three boats succeeded in eluding the launches. Despite the lateness of the hour a large crowd of people had collected on the bridge over the tail-race where they gave the fishermen vocal support. Some stones were thrown from the bridge, and a Bailiff, T. O'Connor, received minor injuries.

The City was agog with excitement the next day, as stories of the night's events filtered through. Reporters from the National and Cross Channel papers hurried to Limerick. An emergency meeting of fishermen in the afternoon worked out a plan of campaign for that night. The start was re-arranged to take place at 8 o'clock in order

to give the public an opportunity to witness the protest. At 8 p.m. the fleet moved off from the Sandmall in pairs. Onlookers described it as resembling a naval convoy. Thousands of people lined the banks of the tail-race in addition to the armed military brought in as reinforcements. As the boats approached it became apparent that the proceedings of this night would not go off quietly. Every move of the Bailiffs was met with a round of booing. As the boats entered the tail-race the Bailiffs pounced, using grappling irons from their launches. Several boats were forced ashore where they were seized and the names of their crews taken. In the excitement the other boats made their escape and as on the previous night proceeded upstream and commenced to fish. Later some of the catch was tossed ashore to the public. When the Bailiffs who had apprehended the first boats made off after the others, the captured boats were retaken by the fishermen much to the satisfaction of the crowd, who cheered lustily. Several free fights took place between Bailiffs ashore and members of the general public. In one such incident Willie Gilligan (R.I.P.) of Peter Cell, was forced at bayonet point to leave the scene while in another incident J. McNamara (no relation to fishermen) of Convent Street, and a Bailiff exchanged blows. At this stage the Gardai intervened and began to beat McNamara, who was rescued by Peadar O'Donnell [Sinn Féin TD for Donegal during Civil War] who was present as a reporter for *An Phoblacht*.⁹

Salmon packing at Mulroy Bay.



But it was not enough, and when the Shannon Fisheries Bill was introduced into the Dáil in late 1934 Seán Lemass clearly indicated that the Abbey Fishermen's battle had been lost when he emphatically restated the basic principle of McGilligan that in the case of a clash, the interests of the electricity works were to predominate over those of the fishery owners. Thus the main provisions of the bill would hand over control and management of fisheries on the Shannon to the ESB, and the Board would be charged with the duty of managing and preserving the Shannon fisheries. The Board would have the power to acquire fisheries and those fisheries already under the ownership of the Department of Industry and Commerce and the Office of Public Works would be transferred to the Board.

The debate itself was particularly low-keyed and non-partisan, which is hardly surprising, since many of the provisions had already been in existence in McGilligan's time.¹⁰ Lemass argued that it was essential to buy up the existing fisheries and claimed that the amounts being paid in compensation for damages done, and which would be paid over the next number of years, amounted to more than it would cost to buy out the fisheries. He argued too that there was no alternative to handing over control to the ESB:

It is the body which has got very intimate associations with the Shannon, associations of such a nature as would be bound to bring it into conflict with any other body given control of fisheries. Its whole administrative machinery is available to ensure that it will be able to undertake its new task in relation to the Shannon in such a manner as to enable it to get the best possible results from the development of the fisheries without allowing the development of its plans to be of such a nature as to interfere with the primary function of the Board in generating electricity. It will be necessary of course for the Board to expend substantial sums of money on the development of the fisheries and on their protection. In fact the whole case for taking over these fisheries and handing them over to any Board is to enable that expenditure to be undertaken.¹¹

In spite of strong pleas from Limerick and Clare TDs he was adamant that local fisheries, even the famous, long-established Abbey Fishermen, could not remain as they were. If they did, then it would be they, and not the Board who would get the main benefit of the Board's energy and expense.¹²

The position is that it is almost impossible to contemplate the adoption of any scheme that does not include acquisition of the various fishing rights of the Abbey fishermen. Are we to abandon the whole idea of trying to organise and develop the resources of the Shannon fisheries because of the trouble of acquiring the interests of that group? Are we to throw away what may prove to be a very valuable national asset because it happens to be politically inconvenient?¹³

The bill had passed all its stages by February 1935, when it became law. One of the first tasks of the ESB's new fisheries section was to acquire the fisheries and pay compensation. This acquisition was done during the years 1935-8, sometimes in the face of considerable local opposition. When the Board acquired the fisheries there were forty-nine stake weirs licensed in the estuary. In addition, there were seventy-five drift nets and over twenty-five draft nets. At Castleconnell were situated some of the most valuable rod fisheries in the world. The number of fish required to support all this fishing effort was considerably in excess of the stock and an already dangerous situation had been

further worsened by the hydroelectric development, which had affected salmon stocks by cutting off the major section of the catchment to spawning fish and confining the fish to a fraction of their former area.

During this period of acquisition the Board realised 'that there was a real danger that salmon as a species would disappear from the Shannon from Limerick upstream.'¹⁴ The Board consequently saw its first objective as the conservation of the small remaining stock. No commercial fishing was carried out in the private fisheries between 1935 and 1941 to allow the maximum number of salmon upstream for propagation purposes. Some unsuccessful experiments were also carried out at Ardnacrusha to try to keep the salmon from the tailrace.¹⁵

Other developments during these years included the construction of Thomond Weir. The building of this weir was based on the known habits of the fish, especially the fact that all salmon aiming to ascend the Shannon and its tributaries above Limerick city were obliged to come to the weir on their way upstream. The weir was built to replace all the old catching methods in operation prior to the hydro-scheme. Apart from labour economies the main value of the weir was that it provided full information on the number of fish in the Shannon at Limerick and above it. From 1943 on, the Board's commercial take at Thomond Weir was held at twenty-eight per cent, this rather low figure being determined by the Board's desire to repopulate the river. It was largely due to Thomond Weir that the Mulcair now provides the basic stock of fish for the Shannon as it is today.¹⁶

Apart from the Mulcair, the retention of the escapement at seventy-two per cent at Thomond Weir did not have the desired affect of substantially increasing the stocks, mainly because access to the main feeding grounds above Ardnacrusha and Killaloe was cut off to the fish. Many efforts were made to find a solution to the question of reopening the main river to ascending salmon and the conclusion was eventually reached that this could be achieved only through the construction of a modern fish pass at Ardnacrusha. The pass came into operation in 1959, and as a result the fish once again had an open channel to the vast feeding and spawning ground.¹⁷ To accelerate the development of the stock the Board built a large hatchery and rearing station for salmon at Parteen, which has operated with considerable success. The station at Parteen produces annually 200,000 one-year-old salmon smolts in addition to a very substantial number of reared parr. It also enabled the ESB to rear fish for other rivers damaged by hydroelectric development, such as the Lee, Liffey and Erne, as well as fish for rivers in the Limerick district which had suffered from salmon disease. Later the work at the hatchery advanced a further stage with smolts being reared at Parteen for transfer to Connemara, where an experiment in rearing salmon in cages in the sea is being carried out jointly by the ESB and Údarás na Gaeltachta.

To meet a growing demand for the restocking of brown trout on ESB waters, rearing tanks for 100,000 were constructed in 1964. The hatchery's contribution to the salmon stocks of the Shannon is large: the spawning run at the Parteen fish pass in 1975 was a record 3,056 salmon; and of the 1,845 fish examined, 1,025 were hatchery reared. Twenty-five million salmon eggs have been hatched since the hatchery opened in 1959.

These improvements and new techniques were constantly in danger of being neutralised through the existence of drift-net fishing in the Shannon estuary. This fishing was legal and was carried out under licence. From the point of view of the ESB the

situation was highly unsatisfactory. A report prepared for the Board in 1967 stated:

From a management viewpoint it is difficult to conceive a more short-sighted or more inefficient method of regulating a fishery than on the basis of drift and draft nets. Hazard of uncertain weather can upset the working of a fishery to such an extent that natural fluctuations cannot be assessed with any degree of accuracy.¹⁸

The 1935 Act had limited the number of drift and draft net licences but this limitation was offset by new netting techniques and new netting fibres. The main problem was that such fishing was unsupervised, no limits were imposed on the amounts caught, and absolutely no regard was taken for future propagation. In addition, illegal methods were frequently used and poaching took place on a substantial scale.¹⁹ In view of this, the Board recommended to the government in 1967 that it should abolish the public right of fishing on the Shannon and at the same time provide for payment of compensation by the ESB to the existing fishermen or those who had taken out licences in the previous few

Grading salmon smolts at Parteen hatchery, near Ardnacrusha.



seasons. This point was again made in 1971 in the course of the ESB's submissions to the Inland Fisheries Commission.

OTHER FISHERIES

The Shannon was undoubtedly the biggest single area of activity, but it was not the only case of the ESB's fishery involvement. The principles that had been recognised in the Shannon fisheries legislation were followed in the Electricity (Supply) (Amendment) Act of 1945 which dealt with hydroelectric developments on other rivers. Once again power was given to the ESB to compensate, acquire and manage the fisheries directly involved. In the course of time, the Board acquired all the fishing rights which were directly interfered with by the construction of schemes on the Lee (all fishing rights in the two reservoirs and the Iniscarra tailrace), the Erne (all fishing rights downstream from the border at Belleek to the head of the tide and the only commercial fishery in the estuary), the Liffey (all fishing rights from the main road bridge at Leixlip and the reservoirs at Leixlip, Golden Falls and Pollaphuca) and the Clady and Crolla river system. By the late 1970s, the ESB was operating a hatchery at Carrigadrohid (on the Lee) as well as at Parteen. In addition the experiment in salmon rearing led to the establishment of a 'sea farming' project run in co-operation with Údarás na Gaeltachta under the joint company name of Bradán Mara.

In addition, by virtue of the provisions of the Shannon Fisheries Acts, the ESB found itself the owner of the vast area of trout and coarse fish waters in the midlands and upper areas of the Shannon. This area was to prove one of the most troublesome for the

Testing oxygen levels in the Kilmastulla River, Co. Tipperary.



Board—especially in its relations with the long-line fishermen on Lough Ree. After the acquisition of the Shannon fisheries in 1938, the Board permitted the Lough Ree long-line fishermen to continue using long lines for eels on the lake. The fishermen enjoyed a bonanza during the war when prices for eels rose sharply on the London market. This led to overfishing which, coupled with the delayed effect of the interference with the ascent of elvers at Ardnacrusha, resulted in a reduction in the catches in the three eel weirs operated by the Board and eventually to the closing of two of the three weirs.

The Board attempted to curb the activities of the Lough Ree fishermen after 1945 and this was to result in a period of strained and difficult relations for the next fifteen years. In spite of injunctions, prosecutions and jail sentences the men continued to fish. Even more important than their overfishing was the fact that they—or some of them—made frequent raids on Lough Derg where the ESB had begun a major restocking programme in 1953. These raids often resulted in the seizure of boats, fish and lines and in heavy fines, and as a result of this tough policy the men raised the question of compensation in 1965. As a starting point they requested the Board to restock Lough Ree for five years, during which time they would not fish there but asked instead to fish in Lough Derg. This was unacceptable to the ESB, and at a meeting in Athlone on 11 November 1965 the fisheries manager, J.F. Williams, told the men that he could not recommend that they fish Lough Derg under any circumstances and that he could not see how the

Boating and sailing at Pollaphouca Lake, Co. Wicklow.



restocking of Lough Ree could develop successfully in five years while they continued fishing.²⁰

After long negotiations, Williams put the following proposals to the men:

- (1) The Board would not allow them to fish on Lough Ree.
- (2) The re-stocking of Lough Ree would take up to ten years.
- (3) The Board would consider compensating them on an *ex-gratia* basis for loss of livelihood if they all agreed to cease fishing permanently.

In spite of these negotiations the fishermen continued during 1966 to raid the lakes of the Shannon for eels, and there was one very serious assault on the Board's staff, a number of jail sentences and heavy fines. By 1968 however, progress was being made and in that year more or less general agreement had been reached between the men and the Board on the amounts to be paid with the Board making it clear that any breach of the agreement would be visited with heavy penalties.

Despite the ESB's efforts to curb illegal fishing, and the heavy investment of money and expertise in hatching and rearing salmon fry for release into the various salmon rivers under its control, the ESB fisheries reports right through the 1970s reported growing concern over salmon numbers. The fish pass counts fell fairly steadily—on the Erne, for example, it dropped from just under 11,000 in 1966 to barely over 2,000 in 1976, having been as low as 1,000 in 1974. By 1979 it had fallen to just over 400. The failure of attempts to curb over-fishing (often illegal) in the estuaries, poaching in the rivers and the continuing depredations of the salmon stocks at sea was exacting a steady toll on the salmon runs, which even a major restocking programme could not offset.

The proliferation of different interests in fishing led in 1961 to the setting up by the government of a liaison committee to co-ordinate policy as far as the various fishery interests were concerned. A policy was laid down to avoid any conflict of interests in relation to the development of different areas for trout, coarse fish and salmon. As far as trout fishing was concerned, the ESB granted a ninety-nine-year lease to the inland Fisheries Trust in respect of the various waters it acquired for trout development. In addition, because the ESB was anxious to encourage local participation in the management of the fisheries, a number of agency agreements were given to local clubs in the Shannon catchment. The liaison committee agreed that no specific agency should be granted in respect of coarse fish waters. It was felt that the overall statutory ownership of the waters by the Board enabled the maximum value to be obtained from a unified control and avoided the vesting of specific areas of the river in local bodies, therefore enabling Bord Fáilte and the Inland Fisheries Trust to permit coarse fishing to the greatest possible extent.

The Board also made one brief and unsuccessful attempt to revive and foster the tiny oyster fishing industry on the Shannon. The main mover behind this attempt was the fisheries manager, Liam Forde. After the passing of the second Fisheries Act (1938) he began to look seriously into the possibilities of an oyster industry. The main reason appeared to be social, and his scheme was largely an attempt to revive a local fishing industry as a subsidiary to the salmon industry.²¹

His researches in 1938 showed that oyster beds on the Shannon had been worked up to the end of the First World War. He then discovered through the secretary of the fisheries branch of the Department of Agriculture and Fisheries, J.D. Rush, that a recent survey

had concluded that the oyster beds had silted up and would no longer be suitable for the cultivation of oysters. Forde, however, felt that this survey had not consulted sufficiently with local interests and organised a further survey. This effort uncovered tons of oyster shells and dozens of large oysters. Forde then sought to get control of those beds for the ESB and to establish an oyster industry in the Shannon estuary. This claim by Forde led to immediate conflict with Rush, who argued that this was a matter for the Sea Fisheries Association and not for the ESB.²²

At this point Forde applied a little political pressure. In his own words he 'got hold of the Clare deputies and made a direct approach to the Minister.' This pressure resulted in a ministerial order of 1 July 1939, which vested the oyster beds in the ESB for a period of fifty years. Under Forde's direction work then began to try to revive the industry. Seed oysters were imported from Brittany and, in order that the oysters could be marketed abroad, a purification plant was built at Tarbert which was completed in 1941. Little real progress followed, partly because of war-time conditions, and partly because of the failure to follow up the initial experimental planting to any great extent.²³ A further effort was made in 1948, this time with the aid of a French expert, M. Dalido, editor of the periodical *Cultures Marines*, who felt that the potential of the Shannon for oysters was enormous. About 200,000 seed oysters were planted near Carrig Island, and by 1955 oysters were being purchased at Fenit, Co. Kerry and planted by the ESB. This experiment was not, however, a success, and a reassessment showed that the total stocks laid between the years 1939 and 1941 amounted to 1,740,000, while total sales amounted to only 206,000. These fisheries were closed down in 1955 because the Board felt that there was no immediate prospect of improving the oyster position without long-term biological surveys and expenditure. Further investigations showed that a number of errors had been made in the early attempts at development and that the recurrence of periodic low salinities would make further developments risky.

The question of the future involvement of the Board with oyster fisheries was reopened in 1959 when the firm of Clayton Love sought to lease the fisheries. The Board then commissioned a further investigation into the feasibility of the industry based on past experience and current research. The expert who investigated, Dr Duncan Waugh, reckoned that a viable industry could be created but that it would require investment and time—certainly a sustained effort over seven years—before there could be any profit.²⁴ The fisheries branch of the ESB endorsed this view, but did point out the dangers as they saw them, the fact that the development would be speculative, that there was no tradition of oyster fishing on the Shannon and that the amount of employment it would offer would be very small.

Finally, in April 1960, the Board decided not to proceed with the development of oyster fisheries and in July of that year the ministerial order, which had been granted twenty-one years earlier, was revoked at the request of the Board, thus bringing the entire experiment to an end.²⁵

REVIEW

Looking back over the ESB's involvement in fisheries over the past half century, it can be seen that the nature and pattern of this involvement has been changing in the past fifteen or twenty years. Up to the end of the 1950s hydro-generation was predominant, and during this period there was a high proportion of the total hours when the hydroelectric

station loads had to be fairly accurately specified. Any departures from these loads would have repercussions on the amount of thermal plant to be provided. In addition, any departure would also substantially affect generation costs, both at that time and later when the compensatory generation adjustments had to be made. It was for this reason that the ESB became involved in the control of fisheries, but in turn any change in water flows could adversely affect the runs of salmon and eels, both from the point of view of catching adults and the number of young fish, smolts or elvers. The conflict between electricity and fishing interests was one which could not easily be resolved.

Even though hydropower now provides only twenty per cent of the ESB's total generation capacity and the Board now has more freedom in its use of hydropower, its fisheries operation must work within continuing constraints, especially the need to have the full available plant capacity on load when the critical annual peaks require it.

Any assessment of the ESB's record in fisheries must be made within these constraints, and priority must be given to electricity over fishing interests. The situation of unified and clear-cut ownership (achieved at some considerable cost) has enabled consistent management policies to be pursued in the long-term interest of fishery development. In addition, the ESB has made available substantial capital for the development of the fisheries under its control, has trained and organised an enthusiastic and expert staff in fisheries management and has consistently sought to involve local and relevant national interests in the business of fisheries management.

Amenity area near Leixlip Power Station, Co. Kildare.



Electricity in an Expanding Economy 1960-73

BY the middle of the 1960s the original 'domestic' generation programme of the ESB was nearing completion and, in an economy that was showing signs of unprecedented economic growth, the Board was planning to introduce a new dimension in power stations—large oil-powered stations chosen for reasons that were economic rather than socio-political.

The 1960s were also a time when the basic considerations concerning the running of the whole system were subject to change and re-evaluation. Rural electrification was drawing to an end—and a 'frontier' era for the ESB was coming to a close. Some of the structures that had been created since 1927 were becoming obsolete, and, in particular, the ESB began to run into serious industrial relations problems. In addition, the whole economic basis of the operation began to change from around 1960 onwards. The Ringsend and Marina stations clearly pointed the way in which the ESB was moving. Demand was rising rapidly and was forecast to continue to do so. Growing demand and the projected decline in the importance of turf and hydropower meant a new set of considerations in the areas of system security and system operations, with peak-load requirements and merit ranking assuming greater importance than before.

The early 1960s also saw the departure from the ESB of many of those who had guided it from its earliest days. Dr McLaughlin had retired in 1958, and although his early power and influence had never fully returned, he still remained a considerable personality within the ESB while enjoying great prestige in Irish society generally. In 1960 R.F. Browne, Chairman since 1930, retired. While in office his influence was probably more dominant than that of his predecessor or of any of his successors. The circumstances surrounding his appointment were controversial and somewhat acrimonious, but after some initial resistance he quickly established his own personal authority. He carried the brunt of the ESB's often difficult negotiations with the government on turf, rural electrification and the post-war development programme, and in the process displayed an ability to fight doggedly and with skill in the interests of the ESB, while never losing sight of the ESB's wider role in national development. In 1959 Browne's successor, T.F. Murray, joined the ESB as Deputy Chairman and succeeded to the chairmanship a year later. Murray had had a distinguished career in the Departments of Finance, Supplies (under Seán Lemass during the war years) and Industry and Commerce. It was suspected at the time that the appointment of somebody so steeped in public service ways was—at least in part—an attempt to bring the ESB under closer departmental control, especially since Murray had such a detailed knowledge of the ESB and had such long experience of dealing with the ESB from the Industry and Commerce point of view. These fears for the future autonomy of the ESB were strengthened by the undoubted personal stature of Murray, but in fact proved to be utterly groundless. Murray made the transition with little apparent difficulty, indicating from the start that he would be a tough and determined defender the ESB's independence. He quickly became a very



Dr T.F. Murray, Chairman of the ESB, 1960-75.

effective champion of the ESB in his dealings with his former colleagues in the civil service, aided no doubt by his long experience of the ways of ministers and the workings of government departments. He was to remain as Chairman right throughout the 1960s, steering the ESB through its greatest phase of expansion and presiding over—and in part initiating—a major reorganisation of the Board's organisational structures and

industrial relations procedures. He retired in 1975 and was succeeded by Professor Charles Dillon.

Other founding members of the organisation who retired in the 1960s included Patrick Dempsey, who was Secretary from 1927 until 1958, P.G. Murphy, the first engineer recruited by the ESB and later to be its Chief Engineer, and William Roe who had had overall responsibility for the rural scheme.

ECONOMIC BACKGROUND, 1960-73

The recovery from the 1956-8 recession assumed the characteristics of sustained long-run growth in output and employment. After a decade in which, despite fluctuations in output, no significant long-term growth took place, the upswing of 1959/60 came to be seen as the first phase of a sustained period of economic expansion.

The causes and main components of this welcome development have been analysed and documented elsewhere;¹ from the point of view of the ESB the most important features were the rise in real disposable incomes and the rapid expansion of industrial output. Rising real incomes meant increased consumer demand for electricity; in particular (and encouraged by the ESB's marketing policies) it resulted in a very rapid growth in demand for space-heating, particularly night storage heating. The latter was, of course, the source of a much-needed growth in sales revenue and also helped the overall economics of the ESB as it enabled the Board to flatten out the daily load curve. It was, however, to raise problems in relation to future developments, and these are described later on in this chapter.

As the 1960s progressed it became clear that industrial use was going to be the main source of output growth for the ESB. In earlier years the pattern of electricity demand had been dominated by growth and fluctuation in domestic use. By the early 1960s this dominance was being challenged by the growth in industrial demand. By the end of the period of economic expansion in 1974 growth in industrial demand was between fifty and a hundred per cent higher than domestic demand growth.

Again, this meant welcome growth in sales revenue, but it also brought problems for the ESB. First of all, the increased importance of the ESB as an energy source for industry, and of industry for the general well-being of the economy, meant that 'system security of supply' (the degree of certainty of supply) inevitably became a matter of growing importance. Secondly, quality of supply (in terms of voltage, etc.) had to be even more carefully monitored, since electric motive power and calibration equipment is extremely sensitive to fluctuations in voltage. Thirdly, the growing dependence of the economy on electricity meant that industrial relations problems were assuming much larger proportions. Finally, the expansion of industrial demand meant a growth in base load rather than in peak load. This not only implied further flattening of the load curve (in general welcomed in any electricity undertaking), which could cause problems given existing off-peak marketing, but it also meant that the risk of over-supply or under-supply was increased. To meet a rising base load efficiently means increasing the system's number of large-scale generating sets—units of 200-300 mW. Overestimation of demand several years ahead would then leave the system with expensive surplus capacity and correspondingly increased fixed costs per unit sold.

Underestimation, on the other hand, would mean either greater system security risk,

or some form of rationing, or one would have to resort to high variable cost peak-load sets to supply the increase in base-load demand. Furthermore, the larger the sets being planned, in general, the longer the lead time before commissioning and the greater the inherent riskiness in demand forecasting. Forecasting itself was not being made any easier by the fact that a single successful coup by the IDA—a smelter, for example—could at a stroke add 10 per cent to base-load demand.

The programme in which the ESB engaged during these years had three separate aspects. In the first place, the Board put into effect plans to build a series of large (by ESB standards) oil-fired thermal stations; secondly, it became involved in the nuclear power question, although events were to force the ESB to postpone this project indefinitely in the late 1970s; thirdly, there was the Turlough Hill pumped storage station, plans for which had been under consideration for a decade when work started in 1968/9. In addition to these main areas, the ESB was involved in the finishing off of the turf programme and the establishment of the interconnector with the North of Ireland.

TURF

At the beginning of the 1960s turf-powered stations were in commission at Ferbane, Allenwood, Portarlinton and Lanesboro', in addition to the four small turf stations on the western seaboard. Stations were planned for Rhode (1960/61) and Bellacorick (1962/3). Extensions were also programmed for existing stations. By 1964 the ESB's system included 285 mW of turf-fired generating plant—approximately 33 per cent of its total steam capacity.

Two issues regarding turf concerned the ESB during the 1960s. The first was the rate of utilisation of the turf bogs under development, which affected the life expectancy of the stations built to take the output of the bogs. The second concerned the timing of the construction and commissioning of the Shannonbridge turf-fired station and other sets already programmed.

In the first of these matters, Bord na Móna had its usual problem—finding a demand for its forecast output.² The ESB, on the other hand, sought to minimise the cost of the power it generated. The problem arose at Allenwood where the ESB contended that an increase in turf consumption would increase the overall cost of power.

The ESB argued that extra available turf should be used to prolong the working lives of the turf stations rather than to increase the sales of Bord na Móna in the shorter run, especially since this could involve capital outlays on extending existing turf-burning plant.

The ESB and Bord na Móna had been arguing over this matter for most of 1959 and into the spring of 1960. Unable to come to an agreement with the ESB, Bord na Móna appealed to the government on the basis of the established policy of giving priority to domestic energy sources, and the need to provide a market for Bord na Móna's projected output.³

Sod turf, as used at Allenwood, was now more expensive than milled peat⁴ (bearing out Bord na Móna's contentions during the dispute over milled peat a decade earlier). But this was only one of the reasons why the ESB was unwilling to increase its utilisation

of turf at Allenwood. Given the projected increase in demand and capacity, the increased output from Allenwood in the mid-1960s would be of no consequence. In a bad turf year, the extra capacity at Allenwood would lie idle for a long time. The ESB would have preferred to help Bord na Móna out of its difficulties, which were due to bad turf years, by increasing the price it would pay for fuel supplies. It was even prepared to move any surplus turf from the Kildare bogs supplying Allenwood to the small sod-turf stations in the west.⁵

The ESB was of the opinion that any capital expenditure to extend Allenwood would be totally wasted, since the existing plant was capable of absorbing all the available turf, over a longer period of time. The remedies suggested would cost the ESB less than the proposed extension. The Department of Transport and Power was in favour of the Allenwood extension, but this time no order to go ahead was issued. Instead, the two boards were instructed to continue their negotiations. This was a surprise to the ESB, which fully expected to be ordered to proceed with the Allenwood extension. The negotiations continued right through 1960. In the course of these negotiations the ESB reduced its estimates of the excess costs of the Allenwood extension, which by January 1961 it put at approximately £50,000 per annum (as compared to the initial estimate of £150,000). Also the growth rate of 7 per cent per annum in demand assumed in 1959/60 was beginning to look much too conservative and the ESB began to worry about a capacity shortage in 1964/5. Consequently, the Allenwood extension would not mean idle oil-plant in the mid-1960s. As a result a satisfactory compromise was reached: Bord na Móna agreed to supply the extra sod turf at Allenwood at the milled peat price, and the ESB agreed to go ahead with the extension.

The second area of concern over turf was the timing of new capacity. In the case of most of the turf stations what was at issue were the dates of commissioning and extensions to those stations already agreed on in principle. One station, however, Shannonbridge, had been indefinitely postponed during the difficulties of 1956–58, and the interests of the ESB and Bord na Móna clashed directly here, since the ESB would have preferred not to build it at all, but to increase the planned oil-fired capacity.

The ESB saw itself as having three generation strategies open to it for the years from 1964 onwards:

1. It could proceed to have all approved sets in existing turf stations and the full Shannonbridge station operational by the end of the 1960s, which strategy would be in line with the wishes of Bord na Móna and in keeping with the stated policy of the government that native fuels should be given priority.
2. It could opt to 'stiffen' the system by immediate coal/oil development to overcome system security problems and to minimise overall costs, and follow these stations by further turf development, which would stretch into the 1970s.
3. It could go for a compromise — a sandwich development, with simultaneous development of coal/oil and turf stations.

The choice the ESB would have made if left to its own devices is obvious—the second option—but political realities left no possibility of this programme's meeting with government approval. Consequently, the ESB submitted the 'sandwich' programme for government consideration in June 1959.

Bord na Móna was a little suspicious, of course, of the details of this programme and

sought further guarantees on the turf plant.⁶ The ESB felt it necessary to reassure Bord na Móna about its intentions and sought to be diplomatic in its dealings with Bord na Móna. Thus, the new Chairman, T.F. Murray, wrote to P.G. Murphy, the Chief Engineer, about the negotiations, in the course of which he observed:

... if we are to avoid criticism, and maintain proper relationships with Bord na Móna and the Department, we must arrange our programme in such a way as to ensure that the oil station programmed for 1964–65 does not come into commission ahead of the two milled peat stations planned for that year. ... As Bord na Móna representatives still showed themselves as sensitive on the problems involved, I appreciated your carefulness in handling them. ... I think that in the interests of good relations we must continue to show restraint in our dealings with that Board.⁷

When, in due course, ministerial approval for the ‘sandwich’ programme arrived, it was subject to two conditions—that turf-powered sets planned for 1964/5 should be commissioned before the oil station planned for that year, and that in the event of any excess capacity emerging, the turf stations should be given priority.⁸

The ‘sandwich’ programme involved commissioning 180 mW of oil-fired capacity and 160 mW of turf-fired capacity (including the Shannonbridge station) between 1964/5 and 1968/9. By the end of 1966, all the turf stations had been commissioned, and, with the exception of the extension to Shannonbridge in 1975/6, the ESB’s turf programme was completed. Turf at this point accounted for 407.5 mW of the ESB’s total of 1,169 mW capacity; 27 per cent of total capacity and marginally under 43 per cent of the system’s thermal capacity.

The extension to Shannonbridge was originally planned for 1964/5. As late as October 1963 the ESB was planning on introducing it around 1969, directly after the planned coal/oil station at Great Island. However, in December 1963 the extension was postponed because Bord na Móna decided that it needed the turf supply earmarked for Shannonbridge No. 2 for making turf briquettes. In 1969 it was reinstated in the ESB’s programme, by order of the Minister for Transport and Power. The briquette scheme had fallen through, and consequently, the Minister, Erskine Childers, wrote to Murray in June of that year:

I have decided that the ESB should now proceed to install the second 40 mW generating unit. I appreciate the economic penalties involved for the Board, but I am satisfied that, with the planned rapid growth of oil fired generating capacity, the additional cost will have but a very small and diminishing impact on consumers.⁹

The ESB protested that this would cost the consumers £0.5 m. per annum for the life of the station—an estimate accepted by the Minister. However, the government decided that the installation of the unit should go ahead because, in its opinion, it was justifiable on social grounds.

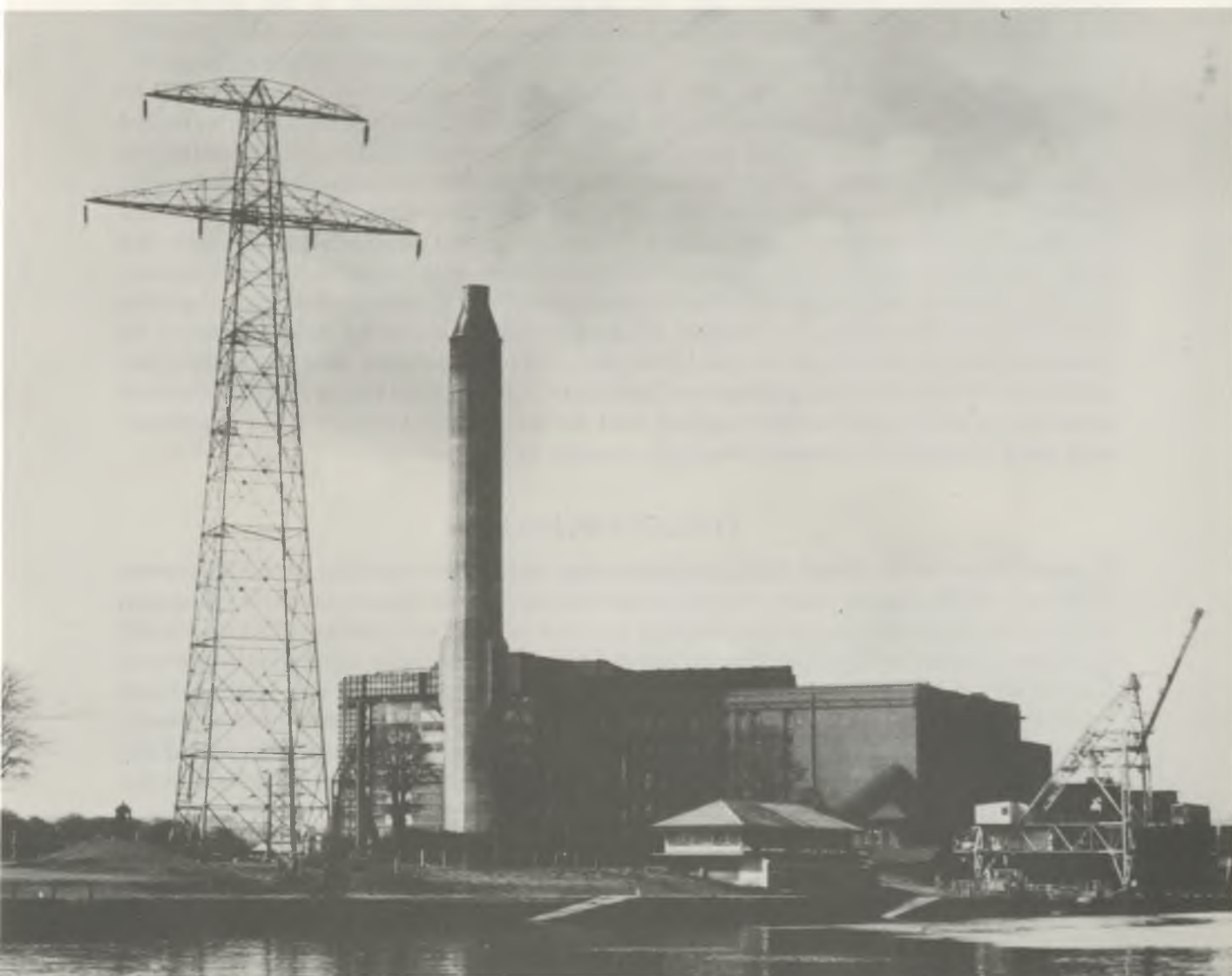
The ESB’s conservative attitudes to turf were completely reversed by the rise in oil prices after 1973, but it is doubtful if this addition to generating capacity will be looked on gratefully in retrospect. It was a dispute over manning this unit which caused the power cuts in January 1977, during one of the coldest months on record.

OIL

As we have seen, the ESB opted for a 'sandwich' programme for steam development in the middle to late 1960s. In deciding to supplement the turf programme with other steam, the ESB had to choose between coal and oil. In principle, stations could be built which would use both fuels, although this would involve extra capital expenditure. Even after the decision had been taken to construct the first of these new stations near Waterford—subsequently known by the site name of Great Island—the question of the fuel to be used was still undecided. After the Suez crisis of 1956, the price of oil had increased sharply. The increase was sufficiently large to make peat a competitive fuel, both sod and milled peat in 1957, and milled peat in 1958.¹⁰ Coal, too, had become more expensive, but between 1957 and 1961 the price of oil to the ESB fell by over 35 per cent and coal fell by slightly under 32 per cent. However, from that point on, coal began to rise in price, while the price of oil drifted downwards. This downward drift continued—except for interruption at the time of the Six Days War—until the early 1970s.¹¹

In the light of this, the ESB opted for oil as the fuel for its new stations—although, at the planning stage, each was designated coal/oil—and the ESB was clearly prepared to

Work in progress on the extension to Marina Power Station, Cork, in 1963.



use coal if the price was right. After the decision had been made to build the second station on the Shannon estuary (Tarbert) the Chief Engineer advised the Board that it should designate the southern and western thermal stations as oil stations (Marina, Great Island and Tarbert), but that further stations on the east coast should be designed basically as coal stations, but capable of using oil.¹² This advice was based on uncertainty about relative fuel prices and was accepted.

As time went on, however, the growing discrepancy between coal and oil prices brought this decision into question. In July 1965 the ESB decided that the new Dublin plant, Pigeon House 'B', should be designed for oil only, a decision which meant that by the mid-1970s the system would be dependent on oil for seventy to eighty per cent of units generated, depending on the weather. The only stations capable in principle of burning coal were Ringsend (at two months notice) and Marina (from which vital equipment had been moved to the turf station at Bellacorick). Undoubtedly, this policy minimised the cost of producing power, given stable oil prices, but it made the system more vulnerable to sudden shortages, such as those of 1967 and 1973, and to any rise in the relative prices of oil. It also put the ESB at the mercy of the suppliers.

These factors influenced the ESB's decision in the late 1960s to examine seriously the possibility of building a nuclear station in the Republic. However, in spite of the ESB's own worries about the future price and stability of oil supply and the possibility of an eventual nuclear programme, the oil programme continued to be prosecuted vigorously. Further capacity for the system for base-load purposes was provided exclusively by successive extensions to the three oil-burning stations, Pigeon House 'B', Great Island and Tarbert. The only exception to this pattern was the extension to Shannonbridge. In these extensions the ESB made full use of the effects of technical change and the level of demand on optimal size. In the early 1960s, the individual sets being ordered were 60 mW. That such large sets should confer economies of scale is easily understood; indeed, one might be tempted to ask why they were not purchased in the first place. There were two main reasons. Firstly, projected demand increases were not large enough to justify such massive discrete changes in capacity until relatively recently. To have built such units twelve years earlier would have meant excess capacity for some time. Secondly, the amount of capacity which has to be held in reserve for system security is, in part, a function of the largest set in operation. The cost of this, proportionate to the total sales, falls as total sales grow. Clearly then reconciliation of system security and cost minimisation required that the introduction of very large sets should wait until the level of demand was high enough to warrant it.

TURLOUGH HILL

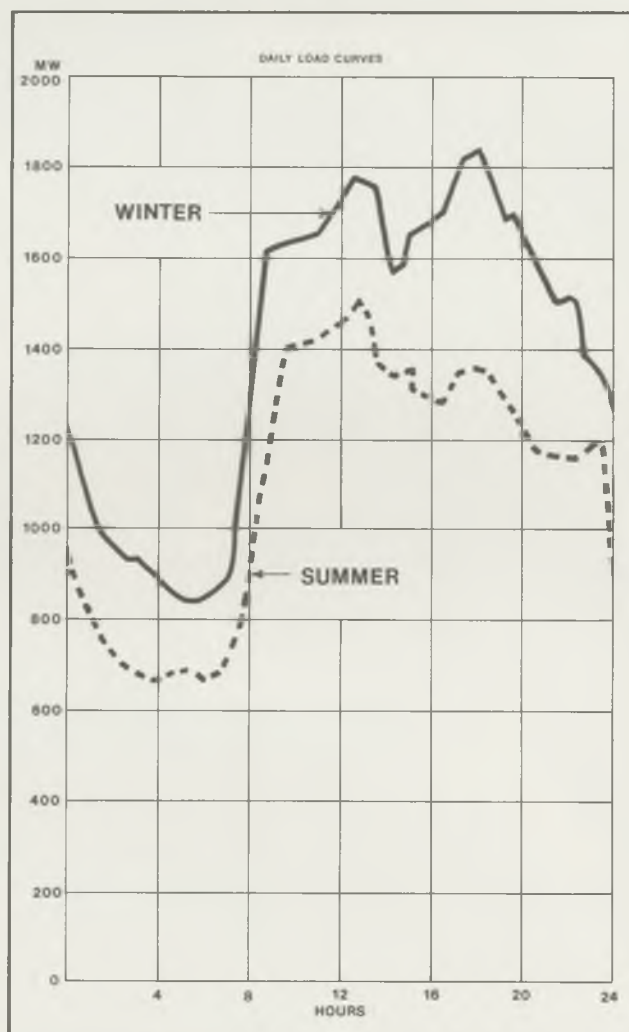
In many ways the Turlough Hill pumped storage station developed by the ESB between 1968 and 1975 was the most exciting undertaking by the Board since the Shannon scheme. Although the general technology was not new, as such stations had been built elsewhere, it was the first of its kind in Ireland.¹³ It involved civil engineering works on a large scale and of a type to catch the public imagination—a massive underground chamber, housing a power station, the construction of an artificial lake on a mountaintop and the building of tunnels through the mountain. For those who visited the works while under construction, especially during the later stages, comparisons with the



Turlough Hill: an aerial view of the upper reservoir and lower lake.

fantastic and futuristic creations in the James Bond films then fashionable were inevitable.

The publicity value of all this was, of course, not lost on the ESB which went to considerable lengths to facilitate the public in viewing the project.¹⁴ An additional motive for effective public relations in connection with Turlough Hill was the growing concern at the time with environmental matters, one of the results of which was to persuade the



ESB, at considerable expense, to provide for underground power lines from the station for some distance in order to protect the Wicklow skyline from the intrusive effects of pylons marching across the hills.¹⁵

The motives of the ESB in building the Turlough Hill project were not, however, simply the desire to engage in a novel exercise in technology, although the challenge undoubtedly appealed to the Board's civil engineers, nor to mount a massive public relations programme. As far as the ESB was concerned, Turlough hill had to justify itself in terms of the economics of electricity generation. To understand the reasons for the

ESB's decision to go ahead it is first necessary to look at some rather technical aspects of the economics of electricity supply.

First of all, it should be stressed that a pumped storage station is not a net energy contributor to a power system. Its basic function is not to generate electricity but to translate electricity generated at one point in time into power supplied at a subsequent point in time. It is expensive, not only because the plant involved is massive, but also because of the inherent inefficiency of such a mechanism. This inefficiency occurs in all energy conversion processes: even in the most efficient thermal steam stations currently operational, approximately 40 per cent of the calorific energy contained in the fuel is delivered as power to the grid. In the case of a pumped storage unit, oil or coal is converted into electricity at a thermal station; the electricity is used to pump water uphill to a storage station; the water is later released to drive turbines which provide an output of power as required, but in the process a further energy loss of 25 to 40 per cent occurs. So, 100 kWh of power supplied to pump water up a hill will yield only 60-75 kWh when the water flows down again through the turbines. If there is a loss of energy of up to 70 per cent of the original fuel potential, the question arises, why build a pumped storage station? Why not simply build another thermal station?

Electricity has to be supplied under certain constraints. The first of these is that electricity cannot be physically stock-piled. This means that fluctuations in demand must be matched by supply instantaneously. The second is that the pattern of consumption of electricity shows marked daily and seasonal peaks and troughs. From the accompanying graph, which shows the peaks and troughs of a winter and a summer day, the size of the problem may be easily grasped.

The ESB has to provide a level of capacity sufficient to meet peak demand with a reasonable degree of certainty, allowing for possible system breakdowns. Clearly, this means having spare capacity at off-peak times, the cost of which has to be met. In general, the technology of electricity generation is such that the ESB faced a trade-off between capital (i.e. fixed) and variable costs in generation. Hydro-stations, for example, are expensive to build, but the marginal cost of power from them is close to zero. Gas turbine units, at the other end of the spectrum are (relatively) cheap to buy—but the marginal cost of electricity produced by them is quite high.

Since the ESB was bound to meet fluctuating demand, its costs would, in general, be minimised if it used high-capital-cost plant intensively to meet base load, and low-capital-cost plant with high operating costs to meet peak load. This minimises system overhead costs per unit generated. It would be extremely expensive to attempt to meet peak load with, say, a 400 mW thermal station or a hydro-station (if one were available) which would be idle for eighty per cent of the day. Consequently, in planning to meet variable demand, the aim should be to produce this energy with a cheaply built set (e.g. a gas turbine), despite its higher fuel costs per unit produced.

In principle, a pumped storage station is an alternative to such a unit. If cheap power is available from existing stations to pump water in the storage station, and if the capital cost is not *too* high, and interest rates applicable to the capital are low enough, then a pumped storage station can compete as a power source for peak-load purposes with low-capital-cost, high-marginal-cost units such as gas turbines. It has the added attraction that by enabling existing thermal stations to be used on a steadier basis, it enables them to operate more efficiently technically, further reducing their average cost of power

supplied. Finally, the pumped storage station has the advantage of increasing system security: in the event of a breakdown elsewhere, the pumped storage station can start delivering energy virtually instantaneously, which avoids either shedding load or voltage reductions.

If, as may be the case, such low-capital-cost sets as gas turbines are unacceptable for reasons of reliability or because of technical problems, then the alternative to pumped storage is the most efficient base-load plant that could be added to the system, which, in this instance, would have been a coal-/oil-fired thermal station of equivalent output. Peak-load justification of the pumped storage depends on its capital-related costs per mWh delivered being sufficiently less than those of the thermal station. The ESB's interest in pumped storage, then, arose from two considerations: *the economic matching of capacity to peak load* and *the maintenance and improvement of system reliability*.

Up to the early 1960s, the ESB's main concern in matters of system security arose from the weather-dependence of existing generating stations: the possible combination of a dry winter followed by a wet summer had to be provided for. However, as the system expanded and more coal-/oil-based thermal capacity was introduced, and as demand expanded, the provision of peak-load capacity and the ability to meet forced 'outages' began to replace weather insurance in the ESB's order of priority. As early as 1960, Siemens Schuckert had reported to the ESB that when peak load reached 670 mW, there would be room in the system for the economic deployment of a 140 mW pumped storage unit.¹⁶ However, at this time the ESB was still preoccupied with weather-dependency problems. In addition there were restrictions under which the Board operated with respect to turf, which compelled the ESB to use the various stations, not according to their merit ranking, but in such a way as to consume such turf as was available. Consequently, the Siemens report was not seen to be of immediate relevance. However, with the fall in the importance of turf- and hydropower during the 1960s, system reliability became increasingly a matter of providing for sudden changes in demand or breakdowns in the generation or transmission systems.

At the time when preliminary investigations into the feasibility of a pumped storage system were undertaken, security was listed last among the advantages to be derived from pumped storage.¹⁷ The ESB's attention was concentrated on the project as a means of meeting peak demand economically and improving the general system load factor.

The ESB based its calculations of Turlough Hill on a comparison between the proposed pumped storage station and an equivalent steam plant. In mid-1965, the ESB estimated that a pumped storage system would involve lower annual fixed costs of around £0.675m.¹⁸ The pumped storage station was projected to generate power for 1,300 hours each year, delivering 312,000 mWh. If it did so, fixed cost savings would amount to slightly over £0.002 per kWh, that is 0.2p per kWh, which is quite a significant amount.

Station efficiency was estimated at 75 per cent, and assuming labour costs to be the same, then the overall economics of the project as a peak-load station depended on whether the increased cost of fuel per unit of electricity generated via pumped storage was sufficient to outweigh the fixed cost per unit reduction. In addition, reduced system costs of electricity supplied by thermal stations arising from higher efficiency through more constant utilisation would have to be taken into account.

On this efficiency assumption, the direct overall cost of Turlough Hill would be lower

than an equivalent thermal station provided that the fuel costs of electricity at the equivalent thermal station and at the station or stations supplying pumping power were less than 0.7 pence per kWh delivered.¹⁹ Allowance for reduced fuel and maintenance costs at the thermal stations arising from steadier usage would raise this limit marginally.

In November 1966 the fuel cost per unit generated at Ringsend or Marina—two of the most efficient stations in the ESB's system—was 0.117p per unit. With larger oil-powered stations coming on stream, this was expected to fall to around 0.113p per unit, provided that oil prices did not rise.

One can conclude, therefore, that, on the figures available in the early to middle 1960s, Turlough Hill made good economic sense to the ESB as a peak-load station when compared with its thermal equivalent. Whether it would have shown up as well against modern gas turbines is another matter, but at the time, the ESB felt that gas turbine technology was still in need of considerable improvement. In 1968 the costings undertaken by the ESB for the World Bank—which was being asked to help finance the project—came out as follows:²⁰

	Pumped storage	Thermal	Gas turbine
Capital cost/kW	\$112	\$132	\$70
Fuel cost/kWh	0.2p	0.175p	0.3p

The small difference between fuel costs for pumped storage and thermal stations arises from an assumption that Turlough Hill would be supplied with power from large new stations having fuel costs as low as 0.125p per kWh at current prices, while the alternative was a relatively small and less efficient thermal station having fuel costs of 0.175p per kWh. This, on the face of it, suggested an unfair comparison, but in fact this is not the case, since one could not contemplate building a 600 mW thermal station for peak-load purposes, and such stations were envisaged as being necessary to meet base load in the 1970s and as having surplus capacity at off-peak periods. The later calculations, incidentally, were based on less optimistic assumptions concerning the energy efficiency of pumped storage—63 per cent as opposed to 75 per cent.

As far as comparisons with gas turbines were concerned, obviously the greater the use of pumped storage, the less important would be the lower capital saving costs of a gas turbine implicit in the lower capital cost per kW and the more important would be the lower fuel costs of the pumped storage system. In addition, a gas turbine set involves more maintenance and has a higher 'outage' risk. Finally, neither gas turbines nor peak thermal stations offered the spinning reserve advantages of pumped storage, important for system flexibility and security, but quantifiable only in terms of reduced required capacity margin, which is difficult to estimate.

The underlying assumptions on which the ESB was relying were that demand would grow at an overall rate of 9 per cent on average into the first half of the 1970s, and that this growth would be accompanied by a comparatively stable load curve.²¹ This would justify a peak-load project which, at the time of its inception, represented nearly 20 per

cent of the ESB's existing capacity. The ESB also had in mind the possibility of building a nuclear station of at least 600mW, the economics of which would both greatly affect and be affected by the existence of a pumped storage station to absorb off-peak power at marginal cost, which, for practical purposes, could be taken as zero.

A further factor affecting the decision to build Turlough Hill was the agreement to build an interconnector with Northern Ireland. The possibility of some sort of co-operation between North and South in electricity supply was deeply rooted in the early days of the ESB. As far back as March 1930 *The Irish Times* had carried the headline 'Shannon Power for North—Disquieting Rumours'. This referred to a speech the Northern Minister for Labour (and future premier) J.M. Andrews made at the Mid-Down Unionist Association at the headquarters of the Unionist Party at Glengall Street. According to Andrews, there had been a disquieting rumour 'to the effect that the Minister for Industry and Commerce in the Free State had been conferring with a commissioner representing the Northern Ireland Government' and that as a result they were likely to get electricity supply from the Free State. He did not want to be unfriendly to the Free State, but 'these rumours had no foundation'. It would 'not be a safe thing for Northern Ireland to take electricity from the Free State'. They did not want to place themselves under the power of the Free State, and it would be strongly opposed. A few months later the question of a link with Northern Ireland was again touched upon, though this time in a very different vein. In October 1930 McLaughlin declared, 'My one ambition in connection with the Shannon Scheme is to see interconnection to Northern

Generator hall, Turlough Hill Power Station.



Ireland.' He added that this could mean cheaper electricity for consumers on both sides and could lead to practical co-operation and understanding.

The experience of building the Erne had provided the basis for mutual co-operation between the electricity boards of the North and the South, and from that point on, the ESB was to be one of the first major institutions in the South which sought to establish a working relationship on questions of mutual interest with its opposite number in the North. In the past the ESB had done this in a quiet and low-key way, excluding as far as possible any political considerations, emphasising the mutual practical benefits to be had from co-operation. This approach was again adopted, and the advantages to both sides from an interconnector were soon to be apparent. By introducing risk sharing between the two systems it reduced the level of excess capacity required overall. It had the advantage of enabling both sides to save money on generating capacity, while improving the security of supply in both areas. Even more dramatically, it permitted the two systems to be planned and operated virtually as one, and it could be considered as the first step in an ultimate link between the ESB and the electricity system in Britain, via the shortest route.

Politically, the question of the interconnector was highly sensitive. At one level it represented North-South co-operation at its best, but this immediately made it suspect to hard-liners on both sides. As a result, the ESB was anxious to play down the importance of the interconnector and was not at all pleased when, after the Sunningdale conference of 1974 (when practical co-operation at economic and social levels between the North and South became a political priority) it was asked by the government to be more public in its dealings with its Northern Ireland counterpart. The ESB was convinced that the only real co-operation could be achieved away from the glare of politics and publicity and was worried lest it unwittingly created problems for the Northern authority. In the event, the interconnector soon became a target for the terrorists and was unable to function as intended.

The arguments in favour of a pumped storage project as part of the ESB's development programme for the 1970s were now seen to be sufficiently compelling for the Board to undertake preliminary investigative work, and an obvious starting point for such investigation was in County Wicklow, a mountainous county, with numerous lakes and an adequate source of pumping power and relatively near the country's main load centre. This work was undertaken during 1963 and 1964. In the end a site near the Wicklow Gap was selected, which is now known as Turlough Hill. Oddly, the hill overlooking Lough Nahanagan (the lower lake system) had no name assigned to it on the Ordnance Survey Map. Having established this the ESB was free to give it any name it wished. The engineer (J. O'Riordan) who carried out the original survey of the site and had recommended its selection decided to name the hill after his only son, Turlough. It was an interesting coincidence that 'turlough' is the Gaelic name for a dry lake—one which loses its water through a swallow hole in dry weather.

During 1965 and 1966 the ESB proceeded with further evaluations of the economics and system relevance of the proposed pumped storage station. The results of studies were very favourable and, in March 1966, an article appeared in the *ESB Journal* explaining the workings of the scheme and describing the proposed development at Turlough Hill.²² By mid-1966, the ESB had decided to go ahead, if possible, but formal approval in principle for the scheme by the government was not sought until the spring of 1967. This

approval was forthcoming—with a rider that the environmental impact of the development should be reduced to a minimum.²³

Before seeking to obtain the final go-ahead from the government, the ESB decided to retain outside consultants to advise on geological and construction questions. The firm which supplied the main consultancy services was Lahmeyer International GmbH of Frankfurt in West Germany, which had written to the ESB offering its services as a result of the appearance of the article on pumped storage in the *ESB Journal*.

To help with the financing of the project, the ESB approached the World Bank. At first these efforts were not successful, but following representations made by the Department of Finance²⁴ the World Bank agreed in 1969 to lend the ESB 14.5 million dollars, which would cover about 80 per cent of the direct foreign exchange cost of the project as estimated at the time, at an interest rate of 6½ per cent over twenty-five years. Since the Central Bank of Ireland's rediscount rate at the time was over 8 per cent, these terms were very favourable.

This first contact between the ESB and the World Bank was the beginning of an association which has since continued. The bank apparently was so impressed with the general competence of the ESB's technical and managerial staffs that it took the initiative in putting forward the name of the ESB for a consultancy role for a project which the bank was financing in the Philippines.

Preliminary work on the site was carried out in late 1968 and early 1969. The main contracts for the civil engineering and generation were awarded in June 1969, and work began in the following autumn. Almost from the beginning, however, the scheme was to suffer a series of setbacks which at times called into question the wisdom of the entire undertaking and its ultimate contribution to the overall system. In fairness, very few of these setbacks were of the ESB's own making. By the time work had started (1969) the estimated total cost of the scheme had risen from the 1966 figure of £11.07m. to £14.5m. This was not completely unexpected—the consultants retained had advised the ESB in September 1968 that it would cost £12.7m. The main reasons for the increase in costs at this stage were a major replanning of the generation equipment and serious underestimates of construction costs. Now, a premonitory note was sounded in the advice tendered to the Board: 'it is in the nature of a project of this type where major expenditure is involved in excavations and tunnelling and construction within a mountain, that estimates even at this stage cannot be regarded as firm.'²⁵

As far as the economic viability of Turlough Hill was concerned, the increase in costs reduced by over a third the fixed-cost advantage of the scheme over a thermal alternative. The latter had also risen in capital cost with inflation—but only by 5.7 per cent, as compared with 30.8 per cent for the pumped storage system.²⁶ The fixed-cost saving per kWh of projected annual output of 312 gWh was reduced to 0.136p. The critical level of fuel price per unit of pumping power above which overall costs per kWh on the 1967 basis of calculation would be higher was correspondingly reduced to 0.45p.²⁷

During 1970 and 1971, further unforeseen difficulties arose with the project. Firstly, the artificial reservoir caused problems—the excavated rock proved unsuitable for the embankment necessitating fresh quarrying; secondly, there were delays due to a national cement strike in 1970 and a strike on the site in 1971; thirdly, the internal geological structure of Turlough Hill proved more complicated than had been supposed, necessitating increases in construction costs. Finally, of course, inflation raised labour

and material costs. The result of all this was that by November 1971 the estimated completion costs had risen to £19.5m. and the final cost was to be £22m.²⁸ This level of price was sufficient to bring seriously into question the fixed-cost advantage of Turlough Hill over an equivalent thermal station. However, at this stage, given what money was already committed, such a comparison was merely an exercise in what might have been. It is difficult, however, to escape the conclusion that if the final costs of Turlough Hill had been known before the project was started, it would not have been possible to justify it on grounds of peak-load economy alone. Such a pessimistic conclusion at that stage would have been unwarranted and would have failed to take into consideration the proven value of pumped storage so that even with rising costs there were compelling reasons to continue.

At the same time that rising capital costs were threatening the viability of the scheme, the shape of the load curve was also changing. During the 1960s the load curve had tended to become flatter, with the valleys being filled in by increased industrial load and rapid increase in the use of storage heaters for domestic purposes. In the early 1970s the growth rate of night load for the latter was as high as 25 per cent per annum.²⁹ At one point it seemed possible that the forecast growth of demand, coupled to the pumping requirements of Turlough Hill, would virtually totally flatten the load curve. This would obviously reduce systems overhead costs, but would increase the system security risk, since the loss of a station during the day would mean shedding load for up to fifteen hours, and a loss at night would mean no pumping power for Turlough Hill.

The implications of this for the pumped storage plant were not cheerful. Unless there was a major change in the way the load was developing, the usefulness of Turlough Hill as a peak-load station would be very limited. By 1972, the system operations view was that under existing development plans, and given existing load trends,

... the cost per mWh for Turlough Hill will generally place it in the merit order at about the same level as the 30 mW sets, cheaper only than North Wall and the gas turbines [the first of which were about to be included in the ESB's programme], so that on economic grounds its running may not be extensive unless spinning reserve considerations ... alter the picture appreciably.³⁰

At this stage, then, Turlough Hill looked like being only marginally acceptable. Nor was this position improved by the rise in the price of oil after 1973, which further worsened its peak-load potential.

As things turned out, however, Turlough Hill became an extremely valuable asset to the ESB, because of its potential as a source of spinning reserve. The failure of the interconnector with Northern Ireland (through a terrorist bombing) reduced system security seriously, and the interconnector currently shows no sign of being made operational in the near future. Under these circumstances, the availability of 240 mW instantaneously assumes major importance and Turlough Hill has been heavily called on. The second factor in its favour was the considerable teething troubles the ESB had experienced with the new large oil stations, especially Tarbert and Great Island.

In retrospect, the building of Turlough Hill can be seen as a major innovation in civil engineering in Ireland. The generation equipment used was of a highly sophisticated and advanced kind and in the process of construction the ESB showed considerable concern for the environment, as can be seen from the materials used in the construction

of those parts of the scheme which are visible, from the reseeded of the works at the top of the hill and the burying of the power lines leading to the station. The whole operation aroused considerable public interest during its construction and was undoubtedly the most impressive piece of civil engineering undertaken by the ESB since the end of hydro-electric development in the 1950s.

The project was imaginative, excellently executed and as far as could be judged at the time of its inception economically viable. It may be that some responsibility attaches to the ESB for some of the rises in the construction costs; more careful research might have shown where the difficulties lay. But all such work involves taking calculated risks, which by definition means the possibility of something going wrong. And of course the ESB can hardly be faulted for not foreseeing in 1965 the level of oil prices which would obtain in 1975, or the recession which accompanied them and which reduced the pressure on generating capacity forecast for the middle to late 1970s.

INDUSTRIAL RELATIONS

The 1960s were not, however, to be simply a period of painless expansion and boom for the ESB. The ESB was to hit the headlines in a series of dramatic and bitter strikes, which led to considerable public criticism of labour relations within the ESB and to a major enquiry designed to find means of preventing further labour disputes. The problems began to become serious in the late 1950s, but their origins are much further back in time.

In the early days the ESB was small enough for the problems of individual employees to be dealt with at Board level—as the detailed Board minutes amply illustrate. Further—and this held true until around 1960—one could argue that the ESB was a developing organisation, pushing at new frontiers, expanding supply, building a new industry. Opportunities for advancement were easier than was later to be the case, when most of the development was completed and operations were dominated by the problems of keeping the system running rather than the more exciting tasks of revolutionising the lifestyle of a country. It would seem that the ESB's machinery for industrial relations did not change to meet the changing circumstances of the organisation.

Between 1927 and 1960 the ESB experienced a mere eight strikes, six official and two unofficial; none seriously threatened supply. Between 1961 and 1968 the number of strikes was thirty-eight, eleven of which were official. Since 1960 electricity supply has been disrupted or threatened with disruption on a serious scale six times, in 1961, 1966, 1968, 1971, 1973 and 1976.

This record of recent years represents a general tendency in Ireland towards a higher incidence of strikes. The ESB was merely one of many organisations affected by the rapid economic and social changes of the 1960s, which put unprecedented strains on industrial relations structures at all levels. These strains were to be all the greater in the ESB, both because of its size and because of its unique vulnerability to industrial relations pressures arising from the fact that virtually any strike in the ESB was a threat to the whole community.

But part of the problem also lies with the ESB itself, and in particular with its failure to predict future trends and difficulties and to devise new industrial relations structures to

keep pace with the overall growth of the organisation. These failures were to be analysed in the Gleeson report of 1961 and the interim and final Fogarty reports of 1968/9.³¹

The first stages of industrial relations in the ESB were very much an *ad hoc* process. The origins of a personnel policy are to be found in the establishment in 1935 of a staff section in the Board's administration. This comprised three or four people, and was charged with such matters as retirement arrangements, personal files and the supervision of salaries. In civil service terms, it was a sort of 'establishment' section. Its contacts with industrial relations problems were slight and of a chance nature. These were dealt with by the Board itself through the secretary. The Board did not engage in any delegation of powers in this area, and what existed on paper could hardly be said to constitute a personnel department. Thinking changed somewhat during the war when the first ESB tribunal was set up and a personnel officer was appointed and started work after the war. The structure of the ESB's personnel relations remained virtually unchanged from this time until after the Fogarty report of 1968/9. The personnel department itself expanded, but its position with respect to the Board and to the employees remained unchanged. In effect, the department found itself sandwiched between the two and did not have significant negotiating power.

The position of the personnel department was not helped by the autonomy of the districts. District Engineers had a very large measure of responsibility for all that happened in their areas. One might suspect that the approach to industrial relations which would be taken at this level might lack sophistication, and that any increase in the functions of the personnel department would constitute an encroachment on the powers of the District Engineers, which would be resisted.

On the employees' side, two tribunals emerged during the 1940s. The first of these was the Manual Workers' Tribunal, established under the ESB (Superannuation) Act of 1942. Although this constituted the first major development in industrial relations in the ESB, it did not emerge as a result of Board or union pressure, but as part and parcel of the act, which included a provision whereby strikes could affect service for the purposes of pension calculation. A tribunal to supervise this was established, and, logically enough, was given an extended brief to deal with general industrial relations problems. It was confined to manual workers, as the clerical staff was not unionised and was not considered to constitute a problem.

By 1948, however, things had changed. Disputes had broken out among the ESB's white collar employees, and, in line with the recommendations of the Casey report of that year, the government established by statute in 1949 a general (i.e. non-manual) tribunal. The reason for having two tribunals seems to be that the two sections of the ESB's staff saw their interests as disparate in many cases. Further, it was argued that a single tribunal might result in inflexibility with alteration in terms affecting one group directly constituting a precedent for the other group. There may, of course, have been an element of pure class distinction as well, something which was not helped by the long-standing statutory distinction between *officers* and *servants* in the local authority service which also applied to the ESB.

Both tribunals, although statutory, were not compulsory, and neither side was obliged to use them. Unilateral submissions could be made. In practice, however, the ESB always used the tribunals, and the unions nearly always.

The increased incidence of industrial trouble meant that the ESB's industrial relations

were not all they should be. The immediate consequences of the strikes which ensued was the establishment of the Gleeson Committee (1961/2) and the Fogarty Committee (1968/9) to enquire into the situation. These enquiries came to the conclusion that both the unions and the ESB needed to reform their procedures.

On the union side, the ESB faced a fragmented union membership. There were twenty-seven unions or associations operating in the ESB in 1961, six white-collar, twenty blue-collar, operating as a loose group (the ICTU 'ESB Group of Unions') and one other blue-collar union. There was evidence of inadequate co-ordination between unions, of competition between them, of lack of confidence on the part of the members in them, which generally reduced union efficiency and caused unofficial actions to be taken by employees. The unions did not seem to be aware of their own problems and did not seem to be serving their members adequately in terms of providing channels of communication between the largely autonomous districts and head office negotiations. The Fogarty report summarised the position thus:

... we do not find that the unions in the ESB are equipped to think ahead, to head off new problems before they arise, to reform their own structure and procedures in time to meet new circumstances, to act cohesively at local as well as national level and with cohesion between the two levels, or to carry their members along in the feeling that they belong to a united labour movement with well thought out priorities and with justice, participation and good service for every member.³²

Where the ESB was concerned, organisational structures were not designed to minimise labour problems. Bad communications existed between the districts, head office and back again. When problems arose, excessive delays in dealing with them were cited. Fogarty quotes a feeling that 'a proposal disappears up the line into a cloud of unknowing and re-emerges, if at all, with a memorandum saying that an impersonal entity known as the Board has turned it down.'³³

Both reports stressed the difficult position of the ESB's personnel department owing to inadequate negotiating power, which in effect reduced it to the status of a glorified messenger boy, so that the unions had little reason to take it seriously. This lack of delegation of authority was general in the ESB at the time, and the Board seems to have unduly concerned itself in day-to-day matters rather than concentrating on longer-term policy. The complacency which was ascribed to the unions also seems to have affected management, with the result, again to quote Fogarty, that '... the ESB does not seem to have thought ahead enough and has too often been caught short of a policy on problems which might have been more fully foreseen.'³⁴

The reforms suggested by these reports may be grouped as follows.

Managerial Changes within the ESB

Both reports agreed that the personnel department should be upgraded, its head joining the ESB executive and being given serious negotiating powers: its staff should be expanded. Improved communications—implying more integration and, therefore, less autonomy—should be established between head office and district management levels. The Chairman and Board should leave more day-to-day running to top management and concentrate on overall planning matters.

Industrial Relations Structures

Both reports argued that the existing two tribunals should be abolished (although Gleeson notes that the employees' side did not want this). Gleeson suggested a unified tribunal to replace them; Fogarty suggests using the Labour Court; the outcome was a voluntary single tribunal within the ESB, set up by both sides, after the government abolished the previous two tribunals in 1969.

Union Reforms

The unions, it was suggested needed to deploy increased expertise and to spend more time and money serving their members and doing research into areas of industrial relations problems in the ESB; they would also have to improve inter-union relations and the reports urged that incentives to unions merging within the ESB should be considered.

Union-ESB Relations

Gleeson suggested that the ESB needed to adopt an active rather than passive policy in communicating with the unions—this was endorsed by Fogarty who urged the ESB to go to considerable lengths to help the unions in serving their members by providing such facilities as might be needed; the establishment of worker representation at Board level involving the unions was also suggested by Fogarty.

The more specific of the proposals were quickly implemented by the ESB. The response of the unions was slower and less positive. The ESB recast its management structures in the light of the criticisms made. The government legislated to abolish the existing tribunals and the personnel department was accorded the enhanced status recommended. More recently worker representation has been accepted. Whether these changes will be sufficient to bring about a state of continued good industrial relations it is too early to say, but on the ESB side at least there does appear to be evidence of a new realistic approach to industrial relations, which one informed commentator described as 'a hard-headed recognition of the realities of an industry employing 11,000 people. It is in marked contrast to the approach of management in the past, which was not unlike that of a Hebrew prophet groaning over his people.'³⁵

The government had pulled back from a policy of involvement in ESB disputes to some extent. It had burnt its fingers badly in 1968 when strikers had ended up in jail under the Electricity (Special Provisions) Act of 1966 which made it illegal for ESB employees to go on strike under certain circumstances. On this occasion, the impasse had been broken only by the ESB offering to pay the fines of the workers involved, though in fact the Department of Justice never sought payment of the fines. In 1972, the government refused to get involved in a serious dispute involving the ESB shift-workers which was resolved when the ICTU unions refused to recognise the shift-workers' pickets. The Fogarty committee had stated in 1969:

We reject the thesis, which we suspect is too widely spread in the ESB, that electricity supply must be maintained at all costs. In certain circumstances the cost of maintaining it could be far higher than the cost of an interruption.³⁶

It has been argued³⁷ that the same view was widely held in government circles as well,

and that the warnings of the Fogarty Report were taken to heart, so that it ceased to be the case that discontented workers could take it for granted that any dispute would be quickly settled by a government-inspired cave-in by the ESB. The Shannonbridge dispute of 1976-7 offers evidence of the correctness of this approach.

THE JOINT INDUSTRIAL COUNCIL

The industrial relations problems of the ESB during the 1960s resulted in a formal government decision, long before the Fogarty reports of 1968 and 1969, that the Board's arbitration procedures would have to be changed. In February 1966 the government announced that the existing internal tribunals in the ESB would be abolished. These had been established by legislation in 1946 and 1949 for the manual and 'other' members of the Board's staff respectively. That there should be some such change was not unwelcome news to the members of the Board of the ESB who felt that the existing arbitration machinery was no longer effective and that they were being unfairly blamed outside the ESB for the labour difficulties that threatened supply. Apart from the personal positions of individual members, the Board felt that the tribunals gave rise to a situation in which the ESB was, *de facto*, obliged to accept arbitration while union representatives were not, but were free to take further action on the basis of the tribunal

Representatives of all trade unions and associations catering for ESB employees at Head Office on 13 April 1970 to sign the agreement which brought the ESB Joint Industrial Council into being.



awards being a 'starting point'. Furthermore, it was concerned that generous tribunal awards were setting wage trends outside the ESB with harmful consequences.

The government's decision was that, having abolished the tribunals, they would legislate to ensure that disputes within the ESB would be referred to the Labour Court. The unions and other staff associations did not accept this proposal and sought to maintain an in-house forum for discussion of grievances, not simply because of their experience of settlements, but also because of a widespread view that the peculiar circumstances of ESB-related problems would more easily be dealt with by conciliation mechanisms which involved people having day-to-day familiarity with the organisation of the ESB.

The bill giving effect to the government proposal to abolish the tribunals was introduced into the Dáil in April 1966, but was not finally passed into law until June 1969. In the meantime, protracted negotiations took place between the ESB and the unions and staff associations. In the course of these negotiations, initial reluctance by the unions and associations to abandon separate arbitration procedures was a major difficulty. Discussions on union and ESB proposals continued through 1967, 1968 and the first half of 1969. At this stage, the passage of the bill into law brought matters to a head, with union representatives indicating that some form of industrial action would be contemplated if the government decision to abolish the tribunals was implemented without a satisfactory replacement. Eventually, pressure from the unions resulted in a commitment from the Minister for Labour that domestic arbitration machinery could continue to exist in the ESB, though in a non-statutory form. The Labour Court provided conciliation services to help bring the staff representatives and the Board to agreement on a set of proposals to establish a single arbitration body, a Joint Industrial Council, which, by means of a combination of permanent and floating membership, would meet the need for separate consideration of 'manual' and 'other' staff problems within a single negotiating framework. Final agreement on this unified structure was reached in February 1970.

The agreement setting up the JIC provided for an independent chair, permanent representatives of the staff elected by them and a permanent representative of management appointed by the ESB. In addition, for hearings on matters in dispute, one person from each side, nominated by reason of their familiarity with the relevant issues, joins the permanent members. As with the old tribunals, the findings of the JIC are not binding on the unions or on the ESB, but the experience since 1970 has been that, despite this, the JIC has been of considerable use in improving industrial relations and eliminating disruption. Over the first decade the JIC dealt with over nine hundred matters of dispute and the judgement of one of the people most closely involved is that:

Most of its work—in terms of the number of cases—concerns relatively minor grievance problems when seen from an overall viewpoint, but of serious concern to the individuals involved. Providing a mechanism for guaranteeing full and fair consideration and discussion of the issues has probably been more important in terms of satisfactory relations than a guarantee that all grievances will be dealt with to the satisfaction of the complainant. Success in achieving this is in no small measure attributable to the offices of the Chairman, Mr Con Murphy, who operates outside the E.S.B. as a statutory Rights Commissioner and was on several occasions re-appointed as Council Chairman by agreement of both management and unions during the 1970's.

Dealing effectively with problems as they arose, however, was seen as only part of the process of improving industrial relations and the ESB's work environment. In a sense, this was only the reactive side of staff relations policy. The council could, and would, act to help to iron out difficulties when they arose and where direct discussion between the parties involved had not produced an agreement. What it could not do, other than very indirectly, was to change the viewpoints, attitudes and motivations of all those engaged in the various parts of the ESB and their representatives. Something more radical in approach was needed if the declared aim of both the government and the Board in 1967—securing industrial peace and freedom from disruption—was to be realised, and the ESB took the required initiatives as a consequence of the restructuring of its top management in 1970 which resulted, among other things, in the commitment of considerably increased resources to personnel in general and industrial relations improvement in particular.

NEW ESB INITIATIVES: TOWARDS A COMPREHENSIVE PERSONNEL POLICY

As part of the 1970 management restructuring and in line with the recommendations of the Fogarty Committee, the Board created the post of Personnel Director and appointed P.J. Moriarty as the first incumbent with the specific task of initiating industrial relations reforms within a redeveloped personnel activity. Mr Moriarty introduced necessary changes to strengthen management's capacity to address industrial relations reform in the short and long term, to provide for more effective day-to-day operations and for strategic planning. Among other things, he accepted the general move towards employee participation in decision-making which was developed at that time by circulating a discussion document on personnel policy for the ESB on which staff views were sought in advance of its adoption by the Board.

In the personnel policy document, the Personnel Director put it to the unions and the staff that a general and agreed policy on personnel was the key to peaceful and progressive change within the ESB. Noting that an unstated goal of being a 'good and progressive employer' was hardly a sufficient basis for policy, he underlined the Board's '... conclusions that the absence of a comprehensive statement of E.S.B. personnel policy is a weakness, as the overall intentions of the E.S.B. were not clear to staff. As well as that, management was in need of a statement of general principles of philosophy to guide it.'

The basis of this document was the view that a service like the ESB could only function effectively if it was recognised that decision-making could not depend on autocratic structures, but required consent, and if, further, all concerned recognised a common interest in placing co-operation to achieve their collective ends ahead of sectional interest. These in turn required more open management, greater consultation and the support of a lifetime work environment which encouraged individuals and groups to sink differences in co-operative effort. As a general personnel policy goal it proposed 'the continuing development of an effective workforce to meet the increasing needs of the community in a working environment which is human, open and participative, and which provides an equitable reward system and opportunity for personal development'. To

realise this general aim, the document suggested some concrete objective of providing an acceptable level of electricity service to the community at minimum cost to the customer:

1. a commitment to security of employment as far as possible;
2. elimination of divisions (especially white- and blue-collar ones) amongst employees;
3. commitment to 'social' interests and problems of employees (an example of which was to be the ESB's pioneering approach to alcoholism in the workplace);
4. recognition of stress and other non-monetary aspects of employment;
5. improvement of internal communications and exposure of policy for discussion;
6. the use of conciliation and discussion to solve differences at all levels;
7. acknowledgement of trade union rights and interests;
8. a reward system which is both externally competitive and internally 'fair', in the sense of recognising responsibilities and relativities as well as outstanding performance;
9. merit appointments and career prospects;
10. improved training and educational exposure at all levels.

The objective of the exercise was to secure a comprehensive agreement between the ESB and all the representatives of those working in the ESB which would address in a positive way the reduction of conflict, provide flexibility on productivity improvements, including staffing, and provide a realistic career structure for all staff within the terms of

At the first case to be heard by the Joint Industrial Council in September 1970, the Chairman, Mr Con Murphy, is in the centre, with representatives of ESB unions on his right and representatives of ESB management on his left.



their capabilities. The negotiations which ensued were lengthy and in the event did not realise the basic objective of one all-embracing agreement, even though in large measure the outcome ensured that all staff would have similar conditions of employment and operate a single system of industrial relations procedures. The areas which could be agreed in common formed a central agreement with additional clauses dealing separately with the productivity and pay details of the main employment groups, which, in general, met a uniform standard.

The 1973 policy document's main ideas were incorporated in an updated Board statement on personnel policy in 1980 which, however, placed more specific emphasis on the relationship between the employment environment of the ESB and the service obligations which are shared by all who work in the ESB.

This later policy document showed also some other significant shifts of emphasis, for example, in noting as a prime priority the need for uninterrupted supply and an emphasis on competitive promotion possibilities and on the potential of developments such as the Board's consultancy programmes.

How successful has their policy been? Most commentators would agree that by the mid-1970s it was bearing fruit: the revised industrial relations mechanisms were established and functioning well: relations between employees and management were based on a published policy and were improving. Certainly the groundwork laid in the early 1970s helped to contain the internal tensions which arose as the ESB sought retrenchment and redeployment of resources after the first oil crisis, as demand for electricity stopped growing, and there was a recurrence of industrial relations problems in the mid-1970s.

However, despite the setbacks occasioned by the difficulties of 1975-7, subsequent developments suggest that the foundations laid at that time have survived intact. It proved possible in 1981 to put together a single comprehensive agreement which covered all ESB staff and was aimed at securing industrial peace and implementing change over a three-year span with *de facto* (if not *de jure*) agreement to be bound by negotiating procedures, including financial penalties for non-acceptance of JIC recommendations. The agreement covered virtually every aspect of employment—disputes, pension rights, pay, incentives, demarcation, change—and has measured up well to its objectives. As such, it was regarded in the ESB as a landmark in industrial relations and evidence that the efforts in the late 1960s and early 1970s had been worthwhile.

The importance of the ESB to the Irish economy increased dramatically during the 1960s. Demographic and structural changes meant that during these years industry and services replaced agriculture as the country's main source of economic growth. To both of these, electricity is a major and growing input. The growth in the economy necessary to provide the jobs for a potentially expanding population depended on, among other factors, the availability of power at competitive prices. Accordingly, it became more and more important that the ESB should get its sums right when planning its capacity expansion.

Yet, in reaching these decisions, the ESB continued to face the difficulties imposed on it by constraints on its freedom of choice. As has been seen, it was only in the later 1960s that the utilisation of turf was dropped as a priority. To add to these, the rural pro-

gramme continued to absorb resources and to impose costs on the system as a whole. This conflicted directly with the original and still central role of the ESB as a source of cheap energy on which to base an expansion of industrial output and employment.

Finally, as the 1960s drew to a close, the stable world economic order based on cheap oil, more or less steady economic growth, stable exchange rates and low inflation, began to show signs of cracking up. Consequently, the problems of forecasting demand and of meeting it as economically as possible became more and more difficult to solve. Thus, while the pressures on the ESB to reach the right conclusions grew with the size and consequences of the decisions, the environment within which those decisions had to be taken became more and more uncertain. Nor were matters improved by the fluctuations in the growth rate of the Irish economy. Under these circumstances, it was not surprising that some of the investment decisions taken during the 1960s were not always justified by subsequent events. What is surprising is, in retrospect, the very limited degree to which this happened. By and large, the investment decisions taken were proved to be justified.

Nuclear Power

IN 1963, with the greater part of the turf programme operational, the ESB's generation capacity was 69 per cent based on hydroelectric stations and turf, plus the small coal station at Arigna. From this point onwards, the coming on stream of successive oil and coal/oil stations steadily reduced this percentage until by the early 1970s the system's capacity was over 60 per cent dependent on oil. During the 1950s the Board had on several occasions warned the government of the dangers of over-dependence on turf and water, and their warnings had been given weight by the effects of the weather on effective capacity in 1958. Oil was seen as essential to system security. For exactly the same reasons, the Board began to become anxious about its oil-fired capacity during the later 1960s. Once again, these fears turned out to be realistic. The Six Days War of June 1967 and the cutting of the Trans-Arab pipeline in 1970 placed the system in jeopardy.

To some extent the ESB was able to reduce the inherent riskiness of oil dependence by reducing its reliance on Near and Middle East oil. Contracts were negotiated with the Soviet Union, which for some years supplied 40 per cent of the ESB's needs.¹ These supplies were not interrupted by the events of 1967 and 1970, but the ESB was well aware of the vulnerability of such a source of supply to any change in political alignments.

During the 1960s, the secular decline of coal production in the OECD (Organisation for Economic Co-operation and Development) countries as a whole continued. The price of coal made it uncompetitive with oil for generating power, and its supply was dwindling, although proven reserves vastly exceeded those of oil. The problem, of course, lay in the labour-intensiveness of coal production. Consequently, coal did not seem, during the later 1960s, to offer a practicable alternative to oil as an energy source for the ESB.

The need to find some such source became greater as time passed. It was clear long before the events of autumn 1973 that the glut of oil that had existed in the 1950s and early 1960s was a thing of the past. A major symptom of the change in the relationship between supply and demand was the emergence of the United States as a net importer of oil for the first time. The ESB's unease at the situation appeared in a submission made to the Department of Transport and Power in the spring of 1973:

Your Department is already fully conversant with the difficulties which are expected in the procurement of fuel oil. . . . Over 70% of the known . . . reserves are concentrated in the Middle East and in Africa. . . . Another major factor is the changeover of the United States from being an oil-exporter to an oil importer—the enormous significance of this development is only now beginning to emerge, and as yet no one has been able to assess accurately its long-term effects on the world energy situation.²

No one, that is, except the OPEC countries, themselves!

In the face of a steadily rising world demand, oil prices had been edging steadily

upwards for some time before the dramatic cartel action which followed the Yom Kippur War, and it was this general movement and not just the political cohesion of the OPEC countries which provided the basis for the huge increases which were implemented in 1974/5. In fact, the ESB had been aware of this change for some time, and by the early 1970s was incorporating into its generation programmes explicit assumptions of rising oil prices in the 1970s and 1980s.

The position as seen by the ESB was that unless some diversification was planned, it would depend on imported oil for 83 per cent of its energy requirements by 1980/81, assuming there was no major change in the rate of growth of demand in the intervening period.

Other possible sources of energy were, of course, examined. Hydropower offered little scope for further development and much the same applied to turf. Coal, for reasons already noted, had been effectively ruled out from 1967 onwards. Consideration had been given to such sources as tide power, wave power, wind power and solar power, but these were regarded as either only marginally significant or requiring technological development on a time and money scale which the ESB could not afford. As a result the only serious alternative source of energy seemed to be nuclear power.

The ESB had been maintaining a 'watching brief' on nuclear energy since the late 1950s. However, no mention of nuclear power was made in the contemporary development plans which covered the period up to 1969 and were concerned with finishing off the turf and hydro-developments and the introduction of the first really large and efficient thermal stations at Marina, Great Island and Poolbeg. The ESB confined itself to keeping abreast of what was going on by limited participation in conferences and committees. A. J. Harkin was the country's representative at the European Nuclear Energy Agency (ENEA) since 1956. When the question of an Irish application to join the EEC arose in 1961, the ESB was unenthusiastic about joining the Euratom group, since it was seen as irrelevant to Ireland's problems for at least ten years.³

In 1963 the government, in the shape of the Department of Transport and Power, began to take a more active interest in nuclear energy and sought greater participation in ENEA and related activities.⁴ Harkin was obliged by pressure of other commitments to resign from the ENEA steering committee. However, the Board continued to attend conferences on nuclear power in its own capacity and gradually absorbed the experience of other countries already in the field, building a useful stock of knowledge on the matter.

In February 1965 the government approached the ESB with a view to setting up a nuclear energy board.⁵ The ESB agreed to participate in the preparations for this, although at this time there was no prospect at all of nuclear generation of electricity in Ireland until the late 1970s at the very earliest.⁶

The passage of time and the accumulation of information within the ESB together with the nuclear programmes of various European and other OECD countries made a more active approach on the part of the ESB inevitable. During 1966 the Board's generation department began to carry out preliminary investigations into the likely role of nuclear power in the ESB's generating plant programme. Contacts were established with various firms engaged in the production of reactors and the first tentative appearance of nuclear plant in a development programme was made in 1967. In October of that year, undoubtedly worried by the oil-dependence issue in the aftermath of the June War, Dr Murray wrote to the Minister for Transport and Power to suggest

the establishment of a nuclear energy authority. The ESB's express priority in this matter was the training of a corps of qualified personnel to administer a nuclear programme.⁷ In November the government informed the ESB of its decision to introduce the necessary legislation to set up such an authority.

Between 1966 and 1968 the ESB's project department devoted considerable time to research into the feasibility of nuclear power in Ireland. This resulted in a series of reports to the Board outlining the technical options and the economic basis and network implications of commissioning a set in the late 1970s.⁸ Their general conclusion was that a nuclear station would be a desirable addition to the generating system at around that time. It would, it was felt, be competitive with coal, but would cost more per kWh delivered than oil-powered stations at 1967 oil prices. The gain in reduced fossil fuel dependence would make the marginal increase in cost per kWh tolerable.

On the basis of these reports the ESB pressed ahead with contingency planning for nuclear power. By early 1970 the Board had decided that a nuclear station should be introduced around 1980.⁹ It was appreciated that on conventional economic grounds it would be unlikely to be justifiable.

The 1972 generation development report contained the recommendation that a nuclear plant should be commissioned in 1981/2. The putting back of the commissioning date was due, in the first place, to a reduction in 1971 and 1972 of the rate of growth of demand from the 10 per cent assumed to around 8 per cent. The second reason was that the minimum economically feasible size was estimated to have risen from the 400 mW, considered in 1970, to 500 mW, which would not be justifiable until the load was considerably higher than had been forecast for 1979/80. Even in 1981/2 it would be very costly, but the ESB was worried about continued deferment, as the expertise built up by the Board's engineers might be dissipated. A prolonged postponement might make it very difficult to hold this team together.

The economics of the projected scheme, a 500 mW station, depended on the size of the base load available and the fuel cost of the alternative, an oil-powered station, as well as the relative capital costs. The nuclear station would cost twice as much as its oil equivalent, and proportionately less of this could be financed internally by the ESB.¹⁰ Capital-related charges amounted to two and a half times those of the oil station. These exceeded the capital-related and fuel costs of oil-based power sufficiently to raise the price of every unit forecast to be sold by 0.034p per kWh in 1981/2. This would, of course, decline as base load expanded and oil prices rose, but the additional cost seemed unlikely to be eliminated much before 1990.¹¹

Though fully conscious of these factors, the ESB decided to seek the government's approval to go ahead. It did this in the knowledge that the government approved in principle of the preparation of plans for a nuclear station. In addition, the ESB had taken steps to acquire a suitable site, which had been submitted by the ESB to the newly constituted Nuclear Energy Board and by that board in turn to the government.¹²

By any standards the decision to be taken was a particularly risky one. It was accepted that a sufficient base load to sustain a nuclear reactor in 1981 would depend on the existence of an operational interconnector with the Northern Ireland system, but in fact the connector had suffered continued disruption in the intervening years. It was also explicitly recognised that if the exploration then taking place off the south coast resulted in commercially viable gas finds being made available to the ESB, the nuclear station

would be a non-starter. Yet some decision had to be made, and in March 1973 a formal application for government approval was submitted. In this submission all the difficulties the ESB faced were rehearsed, and the risks involved in going ahead and in not going ahead were spelt out. The advantage claimed was a modest diversification of energy sources. The ESB urged the government to accede to its request, which it did in November 1973.

The oil embargo which followed the Arab-Israeli war of 1973 and the fourfold increase in oil prices had contradictory effects on the nuclear programme. The ESB's fears for security of supply and undue dependence on oil were now widely reflected in media comment and political statements. The immediate consequence of this was to enhance the attractiveness of nuclear power as an alternative energy source to fossil fuels. In January 1974 the government was criticised in the press for not having moved more decisively in favour of nuclear power in the preceding three years, despite the ESB's known views on the need for such a station by the early 1980s.¹³ This criticism was based on arguments concerning the increased relative cost of oil and security of supply. It explicitly assumed that growth in demand would continue more or less unabated: '... by 1982, the rate of growth of consumption will mean that the output [of a 650 mW nuclear station] will just about meet the needs of ... 10% of the total electricity requirements of the 32 counties.'¹⁴

This, of course, was a crucial assumption. As the ESB was only too well aware,¹⁵ the relatively small additional cost of nuclear power in the early 1980s, justified as the price of supply security, was very vulnerable to a failure of demand to materialise as expected. Internally the ESB continued in 1974 to be optimistic about demand. Although in comparison with contemporary European figures a 10 per cent growth rate, assumed in 1969, was considered to be potentially open to doubts, the ESB at the time in Irish circumstances saw no reason to adjust their forecasts downwards.

As 1974 progressed, however, the recessionary impact of the oil price rise began to take its toll. In the year ending 31 March 1974 total electricity sales were up 7½ per cent on the previous year. This was composed of a 10 per cent growth in April–September, with a fall off to 5 per cent in the second half of the year. In the year ending 31 March 1975, however, while capacity continued to expand (up from 1944 mW at 31 March 1974 to 2090 mW at 31 March 1975) electricity sales were almost static. Industrial and commercial sales rose 1.2 and 1.5 per cent respectively, but domestic sales fell by 1.6 per cent.

The ESB was obliged to curtail its development programme, and the decision to build a nuclear station was deferred. This was reinforced by the government decision in 1974 that the ESB would be allocated 60 per cent of the expected gas flow from the Kinsale field.

This delay did not reflect any change of mind by the ESB on the ultimate necessity of introducing a nuclear station into the generating system. But the sudden collapse in demand growth meant that the system would have significant excess capacity if the station were to come on stream in 1981 or 1982. In addition, the known gas allocation and the possibility of an increase meant that a diversified primary energy supply was now feasible with greater flexibility, lower capital costs and a shorter gestation period. Accordingly, the proposed introduction of nuclear power was postponed.

Nevertheless, the view which was firmly held within the ESB—in common with most generating authorities—was that there was no alternative in the long run to nuclear

power. While 'alternative energy sources', solar power, wave power, wind power, and so on, were continuously under review, their potential seemed extremely limited, and likely to be solely of marginal usefulness to the ESB. Equally, the view sometimes expressed that the ESB should await the development of a technology to deliver fusion power seemed then, as now, to mean waiting until well into the twenty-first century at least. Conventional fission-based nuclear power in one or other of its operational modes seemed to be the only way out of dependence on fossil fuels.

This view was fairly universally accepted in the power industry, which in early 1974 was distinctly optimistic about nuclear power. Based on the view that, as one expert put it, 'nuclear energy is currently, and will be over the next ten years the only possibility for replacing traditional sources of energy,'¹⁶ a rapid expansion of Europe's nuclear capacity was being forecast.

During this time, the ESB had had to face a gradual build-up of 'environmental' concern over the question of whether nuclear power was inherently too dangerous to be allowed to become widely used under any circumstances. This movement of opinion had generated a considerable degree of support in the United States, where an alliance of 'consumerist' activists and worried scientists had begun to have a substantial influence on public opinion.¹⁷ Now in 1973 and 1974 the same questions began to be asked in Europe, including Ireland.¹⁸

The areas of doubt about the safety of nuclear power which were of most concern were those related to plant safety, the danger of 'melt-down' or less serious radiation

Carnsore Point, Co. Wexford, which was under consideration as the site for a nuclear power station.



leaks, and disposal of highly radioactive and end-product materials resulting from the fission process inside the reactor cores.¹⁹ The ESB had foreseen that ecological issues were bound to arise following a decision to 'go nuclear', and, even before the announcement in May 1974 that Carnsore in County Wexford was the Board's preferred site, was devoting considerable efforts to answering environmental critics.

Although the downturn in demand in 1974/5 had meant postponing the commissioning of the proposed station by three years to 1983 or 1984, the Board remained convinced that nuclear power was inevitable and was desirable for system planning for the mid-1980s. If, however, political opposition on environmental grounds continued to grow, it seemed unlikely that government permission to proceed with the Carnsore project would be let stand. In that event the ESB would be obliged to find some other means of meeting the base-load requirements of the mid-1980s, which in effect meant either more oil again or heavy dependence on coal.

Coal, however, posed its own problems. From a narrow security point of view, increased dependence on coal would once again involve relying on an imported primary energy source. It would, of course, be less vulnerable than oil, under present circumstances. However, the level of coal imports necessary to replace the nuclear capacity proposed would be four times 1974 coal imports,²⁰ and would involve the ESB in substantial port and transport problems. Furthermore, it would involve siting constraints for generating plant, which in turn meant extra transmission costs. Finally, although the ESB did not lay much emphasis on it at the time, coal left a lot to be desired environmentally.

By mid-1976, the question of nuclear power had become a live one again for the ESB. During the year the economy began to show clear signs that the recession caused by high oil prices was over. During the autumn of 1976 industrial output started to expand rapidly and over the winter of 1976/7 unemployment declined steadily from its 1976 peak of 110,000, approximately 9 per cent of the workforce. Electricity demand had shown a return to the growth experienced before 1973 and sales in 1976/7 were up nearly 11 per cent on 1975/6.

In the light of the extreme volatility of demand as experienced over the previous decade, the Board's strategy was increasingly influenced by the need to preserve a high degree of flexibility. The basic planning policy was designed 'to keep options open as long as possible while questions of supply, cost and demand [were] being clarified.'²¹ In the short term, therefore, much emphasis would be placed on gas turbines as a means of flexible response, and on turf development with Bord na Móna as a means of fuel supply diversification. But continued long-term growth inevitably meant a choice between coal, oil and nuclear power. Oil, however, carried the penalty of unreliability of supply, although by 1977 the real price of oil had fallen back considerably from its 1975 peak. The choice was reduced, therefore, to coal or nuclear power, with a possibility of a mixed coal/nuclear development strategy as well.

The ESB view was that coal and oil prices were likely to move together, and, since high and rising oil prices were being forecast on a secular basis, coal prices would move upwards too. Consequently, the substantially higher capital cost of nuclear power (over £500 per kW capacity, compared with approximately £280 for coal) would be offset by the already lower, and likely to decrease, relative fuel costs.²² If, then, sufficient base load was available (and here the interconnector was important), a nuclear station seemed

more attractive from about 1986 onwards. Coal, on the other hand, was less critically dependent on the load growth. Economically efficient units of 200–300 mW capacity were feasible if coal was used. The minimum efficient scale of nuclear station would be about 650 mW. Choice of a coal-based strategy would, therefore, reduce the risk of excess capacity should the load not materialise. Further, in the event of unforeseen growth, the lead time for a coal station, especially for a further development at an existing site, was shorter than for a nuclear station.

Finally, the nuclear station would impose extra security margin costs on the system, since spare capacity to cover the nuclear capacity would have to be built into the system to guard against a supply failure at the nuclear station.

The ESB's strategy in the face of these problems was to adopt a mixed coal/nuclear programme. In addition to the Moneypoint coal-powered station on the Shannon estuary, the Board decided in principle to seek to have a nuclear station in operation by the late 1980s, fuelled by the light-water reactor system recommended by its engineers.

By early 1978 it was clear that the government was in favour of giving the ESB its approval of the proposal to build a nuclear station. The Minister for Energy, Desmond O'Malley, speaking at a political meeting in Limerick, described nuclear power as '... the only source of energy that could make a significant contribution to the country's electricity needs for some time to come.'²³ This speech was generally interpreted as foreshadowing the early announcement of a firm decision to go ahead with a nuclear power station.²⁴

Environmental opposition to nuclear power, however, once more became a serious problem. In the Wexford area, the station had originally been a welcome development,²⁵ seen as promising immediate employment prospects and (oddly) a potential tourist attraction.²⁶ Now local groups began to have second thoughts.²⁷ The proposed site at Carnsore became the objective of sit-in demonstrations with anti-nuclear activists from Britain and Europe joining Irish protestors.

The issue was the subject of a heated debate in the Dáil, with opposition deputies expressing doubts about the wisdom of proceeding without further consultation. An inquiry by a committee drawn from both Dáil and Senate was proposed.²⁸ The ESB's view, as expressed by the chief executive, Dr J.J. Kelly, in January 1978, was that such an inquiry would be welcome and was probably inevitable.²⁹ It would at least permit the issues to be debated properly and an agreed decision to be reached.

The government, however, while announcing its intention to publish a Green Paper on energy policy for public debate before making a final decision, could see no benefit in the form of new information emerging from such an inquiry and refused to hold one.³⁰

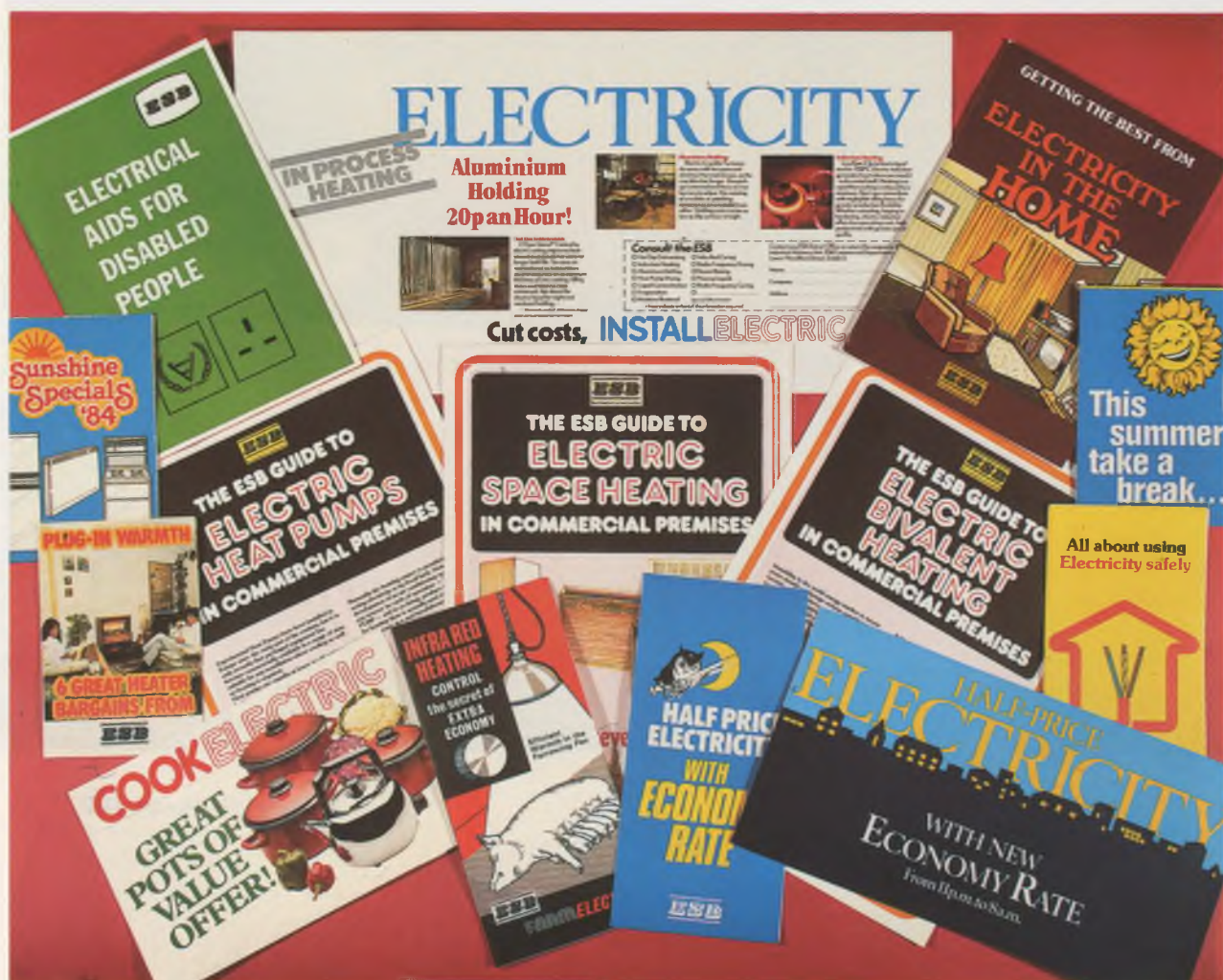
Despite the clear evidence that government thinking very much favoured a nuclear station, no formal decision to go ahead was made. Instead, the promised Green Paper appeared in July 1978.³¹ This, while stopping short of an outright government commitment to nuclear energy, made it clear that a nuclear power station was inevitable at some stage. Having reviewed the issues of accident risk and waste disposal, the Green Paper emphasised that these problems were capable of being solved. It also noted³²—without comment—the view of the EEC heads of government announced in Bonn in July 1978 that 'the further development of nuclear energy is indispensable and the slippage in the execution of nuclear power programmes must be reversed.' The government's opinion, which favoured Carnsore rather than other proposed sites, was summarised as follows:



Upper reservoir, Turlough Hill



Shandon at night (above)
Access Tunnel, Turlough Hill (right)
Product advertising (below)



Coal-fired and nuclear-powered generating plant appear as the only realistic alternatives [to oil] now available towards meeting our likely future demands for electricity. . . . To opt for one to the exclusion of the other would be merely exchanging our existing dependence on imported oil for an equally heavy dependence on another source of energy.³³

At the end of 1978 the stage seemed set for a rapid decision on a firm commitment to go ahead with a nuclear station at Carnsore. Events in the Middle East in January 1979, however, completely changed the outlook for nuclear power. The fall of the Shah of Iran unleashed the second oil price shock which produced a severe recession in the OECD countries.

The consequences of the recession for growth in electricity demand resulted in the nuclear project being placed in a condition of suspended animation. Faced with an unprecedented fall in demand in 1980/81, with a likely maximum average growth rate of 5 per cent over the decade ahead, and a more likely average growth rate of around 3 per cent, the ESB was forced to the conclusion that nuclear power was unlikely to be viable before the end of the century.

In any case, the minimum efficient size of a nuclear station was increasing steadily, more rapidly, in fact, than projected growth in demand. This meant that a minimum cost nuclear station would compromise the system's security of supply unless a significant safety margin of spare non-nuclear capacity was built at the same time. An operational interconnector with the UK would, of course, alter this, but at the time it seemed a doubtful basis for long-term planning.

At the same time the decision to pump natural gas to Dublin and to allow the ESB to use a substantial volume for the Poolbeg station after conversion from oil meant a further diversification and reduction in supply risk. Developments at Moneypoint, too, militated against nuclear power. The ability to expand the coal-powered station by small (300 mW) increments made the building of a 1,000 mW nuclear station much less attractive. In addition, the coal-importing facilities under construction would be sufficient to permit other coal-powered stations to be built, being supplied by coal transhipped in barges from Moneypoint. Despite the problems which coal would bring, the balance had now decisively swung in its favour, and ESB planning for the 1990s proceeded on the basis of coal and gas, with nuclear power being deferred indefinitely.

The Impact of World Recession 1974-78

THE outbreak of war between Israel and Egypt in October 1973 marked the end of an era of relatively stable and rapid economic growth in the developed world. These hostilities, however, almost certainly merely accelerated and accentuated a downturn in the economic fortunes of the west which was already gathering strength. The 1970s were undoubtedly dominated by what was seen as OPEC-induced recessions. But if the rising price of oil is to be blamed as the proximate cause of the recession, then it must also be said that oil prices were already rising long before the Yom Kippur War and this trend was already being signalled to the ESB as early as the spring of 1972.

In reality, however, one suspects that it was not only the rise in the price of oil which caused the problems of the 1970s. From the mid-1960s onwards inflation had been steadily accelerating in the OECD countries. This was partly due to the fiscal policies being pursued in the United States as the administration sought to finance the Vietnam War without raising taxes or cutting expenditure on the social programmes of President Johnson's 'Great Society'. Accelerating inflation was also partly due to the widespread policy of attempting to reduce unemployment by deficit-financed expansionary fiscal policy.

It is reasonable, therefore, to assume that at some time soon after 1973 contractionary fiscal and monetary policies, aimed at lowering inflation, would have been generally adopted in the OECD countries. This would inevitably have caused substantial recession at some time in the middle 1970s.

From the ESB's point of view there was more to the 1974 oil crisis than a change in the price of energy and a fall in demand. In both 1974 and 1979 quantitative restrictions on oil supplies caused considerable disruption in the energy industry. For electricity production this meant not merely a shift in cost and revenue functions, but a completely new set of problems concerning security of supply. By the early 1970s the ESB was over 60 per cent dependent on oil as a primary energy source. In the past, weather could affect the output of hydro-stations or the quality or quantity of turf, but nothing like the possibility of an oil embargo had ever threatened the ESB's ability to meet demand.

This greater degree of uncertainty, together with a collapse in demand growth and a dramatic shift in fuel prices, completely changed the environment within which the ESB had to operate. New constraints appeared as government and EEC pressure, as well as generation problems, obliged an organisation that had been established to produce and sell energy to adopt publicity and other stratagems designed to conserve energy, i.e. to reduce sales. Methods of planning based on relatively stable prices and steady and fairly predictable demand growth now had to deal with substantial relative price shifts and extreme volatility of demand.

THE IMPACT OF THE RECESSION ON DEMAND GROWTH, CAPACITY REQUIREMENTS AND GENERATION PLANNING

During the spring of 1973, despite the gradual increase in oil prices, the ESB's view of the world continued to be optimistic. Reviewing its position to the government, the Board based its forecasts on an assumed growth rate in demand of about 10 per cent, as had been experienced in the recent past.¹ But there were difficulties. For example, if no change in primary energy sources was undertaken, the country would depend on oil for 80 per cent of its electricity requirements by 1980. Coal might offer some relief, but it, too, raised problems both of handling and of security of supply. The position of the ESB in relation to natural gas was unclear, and the availability of the interconnection with Northern Ireland was at best doubtful. These problems, coupled with optimism about demand growth, had led the ESB to the conclusion that a nuclear power station should be brought into commission in the early 1980s. The increased security of supply it would provide would involve a 4 per cent tariff increase at first, but in the view of the Board, this was unavoidable if the government's often expressed views on ability to meet demand were to be implemented. Clearly, the system could not be left as vulnerable as it would be with 80 per cent of its primary energy coming from one source.

At this time the ESB's total generating capacity was just under 1,800 mW. Even without a nuclear station, it was proposed to add a further 1,500 mW by the end of the decade. Of this, 1,000 mW would be oil-based, while only 40 mW were based on peat. In fact, if the Turlough Hill pumped storage station (290 mW) was classified as indirectly oil-based, the position was that out of a total of over 1,500 mW extra capacity all but 220 mW (from gas turbines and turf) would be fuelled by oil.²

Turf could obviously provide an alternative source of supply but at the time economic considerations made it unattractive. Bord na Móna was anxious to secure an outlet for extra turf under its 'third development programme' and, backed by the unions concerned, was pressing the ESB to extend the stations at Bellacorick and Shannonbridge. The ESB estimated that the extra electricity cost would be equivalent to a life subsidy of between £3,000 and £3,500 per person for each of the extra employees of Bord na Móna, should the extensions be undertaken.³ Far from wanting such extensions, the ESB felt that it was now important to start planning for the controlled phasing out of the turf programme. Many of the main bogs had been in production for twenty years, and the original sod turf stations had already exceeded their design life.⁴

By the early months of 1974 all this had changed. The initial alterations to the ESB's plans reflected the oil embargo and its threat to security of supply rather than the change in demand, although demand in January 1974 was no higher than in January 1973, a fact which the ESB attributed to the success of its energy conservation publicity over the previous couple of months. As the collapse in demand growth continued, however, the implications for the ESB of its existing generating programmes began to cause serious concern. If there was no change, should the interconnector not be available and should the annual growth be only 7½ per cent, a surplus generating capacity of over 800 mW was envisaged for the early 1980s.⁵

Faced with these difficulties, the Board drastically revised its generation programme. It decided to abandon plans for the final stage of the Poolbeg station in Dublin, to defer any decision on nuclear power, to negotiate with the Marathon oil company with a view to obtaining natural gas to fuel 500 mW generating capacity and to co-operate fully with

the Bord na Móna third programme by increasing peat-fired generating capacity by 160 mW.⁶

At this time, the ESB continued to hope that the collapse in demand would be very short-lived. Throughout 1974 the length and severity of the first oil recession was generally underestimated, and given the consequences of under-providing capacity, the ESB was reluctant to base its programme for the next ten years on a drastic reduction in demand growth.⁷

No recovery appeared. Late 1975 and early 1976 marked the worst period of the recession; electricity demand continued to stagnate. Further postponements in commissioning plant had to be accepted. A general mood of pessimism had set in.

The recession had at least one significant result for the Board's planning. Hitherto, the ESB had in general regarded itself as having to plan capacity so as to meet an independently determined, but somewhat unpredictable growth in demand as cheaply as possible, given security and fuel use constraints. If demand is exogenous, albeit stochastic, then efficient organisation consists in developing a satisfactory forecasting methodology, and using engineering and other inputs to obtain the minimum cost of supply. During the 1950s this approach had been less than successful because of forecasting failures. The 1960s, however, had been a period in which the approach worked quite well, because demand growth was high and relatively stable. The ESB, now faced with a stagnant overall demand, which was subject to considerable volatility, had to adopt a different approach to its long-term planning. It had to consider the feasibility and desirability of managing its demand.

Black Valley, Co. Kerry, where the final phase of rural electrification was completed in the late 1970s



The Board was asked to accept that the time was ripe for this fundamental change in its planning strategy. What was needed was basic research to attempt to establish what, from the ESB's point of view, could be regarded as a 'preferred' rate of growth. This would reflect the cost to the ESB of meeting different demand growth rates, and the implications for the rest of the economy of such growth rates in electricity supply. Then, having established a 'preferred' growth rate, the ESB should begin long-term planning with a view to ensuring that this preferred rate, or something close to it, materialised. Clearly this meant adopting an active marketing strategy, both in pricing policy and in publicity and advertising.⁸

The need for such an integration of the marketing and production sides of planning had been foreshadowed by the experience of the 1960s. It will be remembered that one of the uses for which the Turlough Hill station was originally planned was to use off-peak generating capacity. Simultaneously, the marketing side of the ESB was successfully reducing this capacity by selling night storage heating.

The Board accepted this new approach to planning, and with it a suggestion that a more 'economic' rather than 'engineering' approach to the issues of supply diversity and security of supply should be adopted.⁹ In this last respect, the Board decided in April 1976 to change its minimum criterion for supply security to that of one failure to meet supply in five years (at a given probability level).

By late 1976 industrial output was picking up, and this was reflected in electricity sales. Caution bred of experience, however, allied to this new commitment to development planning, produced a different approach to strategy. Instead of making a prediction for demand over the next five years or so and setting up a generating programme to meet it, the ESB's plans explicitly took uncertainty into account.¹⁰ This uncertainty made it undesirable to produce a formal long-term basic generating programme. Instead, emphasising the need to plan to meet uncertainty rather than to match forecasts, the ESB now sought to establish strategies which would enable it to meet demand without over-investing, which meant both planning capacity and influencing demand. It was (correctly) seen to be more desirable to engage in an active marketing strategy and to purchase relatively high-cost (but short lead time) generating equipment in the shape of gas turbines rather than to plan for the cost-minimising capacity to meet an expected value for demand which was perceived to have a high variance. Long-term cost minimisation *ex ante*, in other words, would be helped by deferring major plant decisions until demand uncertainty could be reduced.

Overall, the 1974-6 recession caused the ESB to delay the introduction of some planned stations and to alter its fuel mix. In these areas, one of the casualties was the demand for the services of highly skilled engineering teams. For humane reasons, but also to protect its investment in the skills of this cadre of highly paid personnel and to help meet its salary costs, the ESB launched a new venture—a programme designed to sell the service of its human capital, the consultancy contract programme.

CONSULTANCY CONTRACTS

There is no doubt that the impact of the recession of the mid-1970s was the major spur to the ESB's involvement in undertaking consultancy contracts overseas. The matter had been formally raised in 1970 when the heads of the technical departments wrote to the

Chief Executive suggesting that the ESB should explore the opportunities for selling ESB consultancy abroad. The Board rejected the idea on the basis that engineers were required to meet the continuing growing demand for electricity in Ireland. Subsequently, the transmission department obtained approval in March 1973 to carry out testing in manufacturers' works for countries such as Australia, which were very far from European manufacturers, or for utilities which had not the necessary technical expertise. Although a brochure was prepared no contract was obtained.

The original impetus for this development came from the transmission department, which suggested to the Board in late 1971 that it should review its attitude to engaging in consultancy.¹¹ Previously, the view was held that it was not appropriate to become involved in competition with private consultant engineers, either separately or in consortia in general consulting work, and that relations with other generating authorities should be based on reciprocal information flows rather than sale of expertise. Now,

Nigerian students on a training scheme at Poolbeg Power Station.



however, the question of ESB involvement with a major consortium, Irconsult, had arisen and Córas Tráchtála (CTT) had indicated that substantial market opportunities existed, which would not be confined to the technical aspects of generation. From the ESB's point of view, these developments offered the possibility of offsetting overhead costs by utilising expertise at slack times. There was also the possibility of a spin-off of sales opportunities to Irish industry.

This view of the potential benefits from consultancy activities came to be accepted and in early 1973 Board approval was given to the transmission department to do some consultancy work in the area of cable testing for a UK cable manufacturer.¹²

The collapse of demand growth in late 1974 and early 1975, which obliged the ESB to alter its generating programme fairly drastically, provided the incentive for a substantial increase in consulting activity from these modest beginnings. The programme was at first a provisional one; the difficulties experienced by Irconsult suggested caution. The consortium had spent £100,000 over two years without securing a major contract. Nevertheless, the Chief Executive, J.J. Kelly, accepted the advice of the Head of Distribution, Colm McCabe, that a limited budget of £25,000 should be approved for consultancy work, with a proviso that the programme would be terminated if no major contract was secured before January 1977.

From the first the ESB's attention was primarily concentrated on the Third World and the Middle East oil-exporting countries. In this they were actively supported by CTT, which initiated contacts in many cases and lent its considerable expertise, information network and on-the-spot presence to the ESB wherever necessary.

In addition, the ESB co-operated with the Department of Foreign Affairs, which, since Ireland's accession to the EEC, was involved with overseas aid programmes to the ACP (African, Caribbean and Pacific) group of countries under the European Development Fund scheme. In this connection, the question of seconding ESB staff to developing countries arose.

The first major result of this activity was the opening of negotiations with Saudi Arabia in April 1975. Involved were proposals for the ESB to advise on, or help train for and help establish a unified electricity service for the Saudi government. This would cover the training and recruitment of local personnel, the secondment of ESB staff to the Saudi authority, the preparation of plans for a rural electrification programme and technical advice on the programme of integration of the existing independent generation undertakings in Saudi Arabia.

At roughly the same time the ESB also started to investigate the possibility of engaging in consultant advisory work in Egypt on rural electrification. In addition to the obvious advantages to the Board, this move was viewed by the government as being politically very important from Ireland's point of view, given the shifting balance of power in the Near and Middle East and the development of the EEC policy towards the Arab world.¹³ A contract was also secured to train staff for a power station at Sapele in Nigeria.

There then followed nine somewhat frustrating months with the ESB coming second in World Bank contracts for Ghana and Egypt. For the failure of these and other bids, the reasons given were the classic 'hen and egg' situation of not being able to get overseas work without first having overseas experience. During this period the ESB became a founder member of DEVCO, which ultimately became an association of thirty-seven Irish state-sponsored and national bodies who promote, stimulate and co-ordinate their activities in development co-operation with overseas countries.

Helpful as these developments were to the growth of the ESB's consultancy programme, they certainly caused some headaches for those involved. It may well have been a welcome new frontier to an organisation facing a stagnant market at home, but it was not an easy ride for those involved; Colm McCabe reported after a trip to the Middle East:

The method of working in Arab countries has to be seen to be believed. It requires patience to the nth degree and the percentage of effective time . . . is not more than two hours per day. Every Arab I met was very friendly and helpful, but delegation of authority is almost unknown. There is literally no middle management level.¹⁴

Paraphrasing the advice of his contact in Saudi Arabia, he said he was counselled as follows:

Please understand that you must not try to get any fixed decisions on this visit, otherwise we might tell you we are too busy to discuss it. Give us time. We move slowly and the system of delegation . . . is crazy. Do not, however, go away and wait for us to contact you. Keep in touch. The world is at our door. Next week and the week after other people will come. You understand our needs. You will get work sooner rather than later. Remember this, once you start to work for us, you will never stop having work to do for us.

In more ways than one, consulting was proving to be a novel experience for ESB staff, used as they were to the blunter, more time-conscious methods of negotiation of the European and American world of business.

The breakthrough came, unexpectedly, in May 1976 in Bahrain. The Bahraini director of electricity, Jamil Al Alawi, was persuaded to visit the ESB. As a result, Mr Al Alawi invited the ESB to submit proposals for the development of electricity supply in Bahrain. These resulted in a visit to Bahrain to analyse the problems. The first ESB team to work abroad went to Bahrain in July 1976. The ESB secured a contract for the design and supervision of all transmission substations and cables in Bahrain from 1977 to date. By January 1977 there were forty ESB employees, plus their families, working in Bahrain, with two classes of Irish children being taught by Irish teachers.

The first visit to Saudi Arabia in May 1975 bore fruit when the ESB obtained a contract in December 1976 to do the design and supervision of generation and distribution networks in the Al Baha and Al Kharij regions. As at other times since 1927, the question of the legal status of a new type of activity for the ESB arose. The 1927 Act could not easily be construed as establishing an overseas aid institution. Less importantly, the legislation clearly envisaged provision for generation, distribution and sale of electric power within Ireland.

The legal position of the Board in engaging in commercial consultancy work overseas needed amendment. The government, anxious to facilitate the ESB sought to give it the necessary statutory power and, having consulted with the ESB about its requirements, agreed to introduce legislation giving the ESB powers to carry out consultancy and training in and out of Ireland, provided that the revenue from such activities was not less than the expenditure incurred.¹⁵ The government, however, refused, despite pressure from the ESB, to allow the ESB to form limited liability companies, which would limit the risks the ESB could face on an overseas assignment, especially where day-to-day operation of plant was involved.

The government's proposals also envisaged ESB consultancy activity within Ireland. In this respect the ESB faced a problem: consultancy activity within Ireland on any substantial scale could involve competing with existing engineering consultancy firms for a limited amount of work. When newspaper publicity was given to the Board's interest in such work within Ireland,¹⁶ the Association of Consulting Engineers in Ireland expressed its concern on the matter to the ESB.¹⁷ Since one of the original reasons for undertaking consultancy work had been to ensure profitable employment for qualified engineers during the recession, the Board was sympathetic to the view that solving its internal problems at the expense of displacing engineers in the Irish private sector was hardly desirable. Accordingly, the Board approved a policy memorandum from the Chief Executive on consultancy operations which aimed at eliminating this possibility.¹⁸ It was decided that while there would be unrestricted competition in tendering for consultancy contracts outside Ireland, the ESB would limit its internal consultancy activities. It would compete for work only where it enjoyed 'unique' expertise—e.g. high voltage work, cable jointing, hydrometric surveys. Although willing to undertake assignments

Trainee cable jointers from Bahrain.



on request, it would not in general seek work in the conventional areas covered by existing consultancy or contracting interests.

At the same time as it reviewed its relations with the other consultant engineers in Ireland, the Board laid down general guidelines on consulting activity. The overall benefits to the country which would result, it was hoped, would be substantial—it would help Irish exporters, would directly provide a small measure of employment and would yield extra net revenue to the ESB to help to defray rising electricity generation costs. To ensure that such an outcome did in fact materialise, the ESB proposed from the first that consultancy should stand on its own feet and be subject to review. In particular, the Board was determined that decisions on entry into consultancy contracts would be made on a strictly commercial basis. The fees charged should adequately compensate the ESB, covering labour, travel and subsistence costs and making a contribution to the ESB's overheads. It was intended that priority would be given to low-risk activities, e.g. training, design and consultancy. While setting-up costs might be incurred over the initial period they would have to be small and of short duration. A net profit on consultancy work was envisaged for the year ending 31 March 1978, i.e. within two years.¹⁹ To monitor development, to ensure that targets were achieved—or the causes for not achieving them identified—and to ensure a reliable information flow to the Board, a consultancy committee of ESB senior management was established, which reported to the Chief Executive.

As the consultancy programme began to achieve results in the form of negotiations for training contracts in Egypt and Bahrain and power station contracts in Ghana and Nigeria, the Board decided to establish it formally as a division of the ESB, trading under the name of Elecsupply International. By the end of 1976 Elecsupply had substantial work under way both inside and outside Ireland. Domestically, advisory work was being undertaken for (among others) two semi-state bodies, NÉT (the state-owned fertiliser producer) and the newly established Bord Gáis Éireann (the Irish gas board, which had been established to distribute the natural gas flowing from the Kinsale Head field). Overseas, Elecsupply was engaged in negotiating joint contracts with major engineering groups based in western Europe and the US. Independently, it continued to seek new Third World projects.

The target of a profit by 1977/8 may have been too conservative: a gross margin of 12 per cent on direct outlays was achieved in 1975/6, the ESB obtaining a surplus of £18,000 on expenditure of £166,000. However, this did not take into account any management expenses which ought to have been assigned to the consultancy operation. It was clear that a proper assessment of profitability would depend on more sophisticated management of financial data than simply the difference between direct expenditure and sales receipts.²⁰ When such data were produced in September 1976, the results showed that the ESB was on target. Initially it had hoped for a figure of £3m. contract work by 1977/8. By mid-1976 work valued at over £1.5m. had been secured. It was estimated that by the end of 1976/7 the contribution of the consultancy operation to salary and other ESB overheads (assuming employment to be constant) would be of the order of £3³/₄m. The relative success of the consultancy group was thought²¹ to be due to a variety of factors. The ESB had over the years been responsible for a greater proportion of its own design work than was usual among electric utilities, and the attitude of fostering reliance on domestic resources they expressed was favourably received by the authorities in many less developed countries. A further advantage was that, since

Ireland had no industrial base in electrical capital goods or related areas, the ESB was seen to have no vested interest in recommending plant or equipment. The ESB was also an organisation used to dealing with problems on the kind of scale to be found in many client countries, and its experience in rural electrification was particularly important. Outside the technical field of system construction, the ESB was able to offer wide-ranging managerial advice based on its own experience over fifty years. Finally, the fact that Ireland was politically unaligned was helpful.

Through 1977 and 1978 the ESB continued to expand its consultancy activities. In one respect, the programme ran into problems created by its own success. It began in certain areas to run into manpower constraints. This was partly due to the fact that many of the consultancy contracts obtained required a significant input of managerial as well as engineering expertise. The original surplus manpower problem had arisen, however, from the collapse in growth of the generation programme, which is inherently more dependent on engineering skills.

Consequently, whereas secondment of staff to overseas posting had been a welcome element in the consultancy programme earlier on, it had become much less attractive by 1976 or 1977. The Board was reluctant to engage further staff in order to execute the consultancy programme. This was partly because of the original justification of the programme, but also because, ever since the Fletcher report in 1972, the ESB felt itself to be under pressure to reduce staffing levels.

Other problems arose from the cost and the social difficulties for members of the staff engaging in long-term work overseas. Not only are subsistence and travel costs usually very high, but it was often the case that there was considerable overall productivity loss due to travel, fatigue and acclimatisation. For a combination of these reasons, as time passed there was an increasing emphasis on in-house rather than field consultancy operations. Where training was concerned, this was additionally justified by the benefits to the Irish balance of payments of having trainees come to Ireland rather than exporting teachers to other parts of the world.

Between 1975 and 1980 consultancy contracts in overseas countries were undertaken in the following territories: Bahrain, Egypt, India, Iran, Lesotho, Malawi, Nigeria, Philippines, Saudi Arabia, Sudan, Switzerland, Tanzania, the United States and Zambia.

The results of consultancy were positive in many ways. It greatly improved morale during the period 1975-7 when there was no growth and a very uncertain future for a lot of staff. It not only provided jobs for over two hundred people, but it also created a pool of staff with experience outside the ESB and outside the country for future promotional positions. Financially, consultancy contracts yielded a total income of £46m. and made a total net contribution of £5m. to the profit and loss account of the ESB, in addition to relieving ESB overheads of £16m. up to 31 March 1983.

EMPLOYMENT, EFFICIENCY AND PRICING

In 1972 the government received a report from a group of experts it had commissioned to enquire into the efficiency of the ESB. This report, the Fletcher report, is described in more detail in the next chapter. One of its conclusions was that there existed a degree of overstaffing in the ESB. This was so from a purely technical point of view, but in reality,

ELECTRICITY SUPPLY IN IRELAND

the ESB was constrained by such factors as fuel use policy, trade union practice and general pressure for employment creation to employ more people than were strictly necessary. There existed some room for reductions in staff and the ESB began to eliminate overstaffing from 1972 onwards. To do so the Board intended to rely on natural wastage to reduce the total manpower and on sales growth, but the onset of the recession made the latter a non-starter.

Despite this, physical manpower efficiency within the ESB improved substantially right through the recession in demand (see Table 13.1):

Table 13.1 Manpower efficiency

Year	Units sold (millions)	1970/71 = 100	Consumers (thousands)	1970/71 = 100	Network (km ³ 000)	1970/71 = 100	Staff	1970/71 = 100	Fletcher index	Labour efficiency ratio
1970/71	4,862	100.0	806	100.0	109.4	100.0	12,130	100.0	100.0	1.00
1971/72	5,271	108.4	818	101.4	112.2	102.6	11,838	97.6	103.3	1.05
1972/73	5,705	121.8	845	104.8	114.8	104.9	11,708	96.5	108.2	1.12
1973/74	6,152	126.5	874	108.4	117.4	107.3	11,643	96.0	111.6	1.17
1974/75	6,153	126.5	901	111.8	119.8	109.5	11,505	94.8	113.8	1.20
1975/76	6,259	128.7	931	115.5	122.0	111.5	10,910	89.9	116.5	1.30
1976/77	6,783	139.5	959	119.0	124.0	113.3	10,759	88.7	120.8	1.36
1977/78	7,329	150.7	986	122.3	126.1	115.3	10,845	89.4	125.4	1.40

Source: ESB reports and internal documentation

From the ESB's point of view, however, it can be seen that the recession increased its costs by a further factor in addition to oil prices: between 1973/4 and 1975/6 total sales rose by only 1½ per cent; the number of consumers, however, rose by over 6 per cent and the size of the network to be serviced by 4 per cent.

The Fletcher report's index for efficiency comparison (a 1:2:2 weighted average of sales, consumers and network) rose by 25 per cent, while staff numbers fell by 10 per cent, with a consequent dramatic improvement in the physical labour efficiency ratio.

During the recession of 1973-7, productivity growth in the ESB was maintained in the face of generally stagnant demand. Units sold per employee rose by 29 per cent; this was made up of a fall of 8 per cent in numbers employed, while units sold rose by 19 per cent. National Prices Commission consultants, however, in 1978, while accepting this improvement, were of the view that the productivity growth ought to have been higher, given trends in what were felt to be comparable UK regional electricity boards.²² This, however, did not appear to take into account adequately certain structural differences between the ESB and UK regional boards. These included the pure scale economies (available because UK authorities, being interconnected, can accept the outage risks of very large stations), population density differences and differences of availability of hydropower.

More important, perhaps, was the fact that with the exception of the old Pigeon House station, not one generating station in the Republic has been retired since the end

of the Second World War; in the UK, by contrast, there has been a continuous trend of replacement of older by newer (and lower manpower) stations. In major part, this is due to the size of the ESB's continuing commitment to turf. Since these older stations continue to be used, they bias downwards the ESB's labour productivity figures for comparison purposes.

A second major factor has been the continuing practice in the ESB of carrying out most of its own design and construction work rather than setting it out to tender. This obviously means a large engineering head office staff.

When electricity prices began to rise sharply in the wake of oil price increases, and in the aftermath of the discussion of ESB costs in general by the National Prices Commission, a new pricing system was introduced. This sought to establish a base price per unit of supply, to which the ESB would add a further element designed to cover changes in the cost of fuel (principally oil). This fuel cost variation clause in the total price was approved by the Prices Commission, and applied on a six-monthly basis with a provision for any surplus or shortfall to be carried into the subsequent period for adjustment. It was listed separately in the consumer's two-monthly statement, and was designed to have two results. It was felt that a separately identified item for fuel costs made it politically easier to raise electricity prices as oil prices rose, since the public would be presented with a direct link between the two. It would simultaneously allay fears of unjustified increases since it meant that consumers would not be suspicious that the ESB was using fuel price increases as an excuse to raise prices to cover other costs which, perhaps, should be subject to more rigorous control.

The two-tier price system, however, led to difficulties for the ESB. With all increases having to be sanctioned by the Prices Commission (which was politically necessary, if of doubtful legality, given the terms of the 1927 Act), the Board now found itself having to deal with questions on the non-fuel elements in costs in isolation. This led to dispute between the Board and the Prices Commission as to what were indeed 'costs'; the Prices Commission did not on occasion allow full amortisation of capital, yet the ESB was statutorily enjoined to include it as a cost by the 1927 Act. The issues involved in this question are summarised in Chapter 14; at this point it suffices to note that the ESB was most reluctant to concede to the view held by the Prices Commission,²³ which refused consistently to permit the ESB to raise its charges to cover increased amortisation.

In yet another way, the system of Prices Commission approvals was a considerable burden to the ESB during these years. Inflation had been accelerating sharply since the early 1970s, and as a consequence wage rate adjustments became more frequent and (nominally) larger. The ESB was expected to agree to the terms of the nationally negotiated wage increases agreed under the series of national wage agreements. Yet the delays in dealing with applications to the National Prices Commission added to governmental delays in approving the commission's price adjustments left the ESB unable to recoup increased wage costs through a rise in the base rate of supply.

At the same time as it attempted to cover sharply rising fuel and labour costs and to deal with restrictions on amortisation, the Board was also engaged in implementing a long-term change in pricing policy. In 1973 the ESB decided to restructure its pricing system with a view to better financial planning and to eliminating certain economic illogicalities and inconsistencies.

The policy revision envisaged:

1. the phasing out of promotional 'follow-on' unit rates;
2. common unit charges for urban and rural consumers, with differences in capital costs to be reflected in fixed charges;
3. the simplification of rates structures;
4. major consumer categories to be 'self-financing'.

The rationale behind these changes was both economic and political. Economically, lower follow-on rates of charge, and many of the special rates agreed in the past, bore little or no relation to the marginal cost of supplying power, either in the short run or in the long run. Politically, the ESB could see no reason why it should continue indefinitely to operate a price system which involved substantial cross-subsidisation between groups, and not even cross-subsidisation between richer and poorer, but arbitrarily on the basis of where people lived. There were administrative savings too in reducing the multiplicity of rates of charge. This was of necessity a long-term project if the ESB was to avoid inflicting undue hardship resulting in resistance to the proposed simplification.

In the following years considerable progress was made. By 1977 the ESB was well on the way to reducing the number of standard rates of charge from the 1973 figure of thirty-four to fourteen. In early 1977 the Board decided to eliminate the last unit charge differences between urban and rural consumers.

The area where most difficulty was met was in relation to objective 4 above. The problem here was that the pricing system had in the past been biased in favour of domestic supply at the expense of commercial users. The economic illogicality of this is obvious, but equally apparent is the likelihood of political resistance to any move to eliminate it. Given that the years 1974/6 had seen sharp increases in rates of charge anyway, the Board had felt unable to pursue this objective. The recession, involving both stagnant or falling real incomes and rapid inflation, made it necessary to delay such moves until better times.

Times-of-day rates were introduced as part of the marketing strategy designed to help load management. Ideally, this should have involved three rates, winter peak, intermediate and night rates in descending order. Taking into account the experience of the UK and France, where such a system ran into consumer resistance due to its complexity, the ESB decided to opt for a simple two-tier night/day rate. Additional metering costs, which had to be borne by the consumer in the form of a higher standing charge, meant that this new option remained attractive, however, only for larger domestic consumers; the break-even point was at about 8,000 kWh per annum. Relatively few consumers took advantage of the new structure of prices.

The advent of more stability in oil prices and in the foreign exchange markets after 1976 resulted in a diminished need for the fuel variation charge, and it was effectively eliminated in mid-1978, the charge being fully incorporated in the base rate. (On previous occasions the National Prices Commission had partly incorporated it in adjusted base rates.) Nominally, however, it remained operational at a zero rate, thus enabling it to be reactivated when necessary.

At the same time, the ESB was able, for the first time since before the Second World War, to announce a general reduction in electricity prices. This was possible because of continued growth in sales, stable oil prices (in dollars) and an improvement in the pound/dollar exchange rate. This reduction, averaging about 5 per cent overall, dis-

criminated marginally in favour of industrial users. It was, however, short-lived. The Board had hoped to introduce a smaller reduction in early 1978 and hold prices until some time in 1979.²⁴ The requirement to implement the Prices Commission's recommendation, foreshadowed by a ministerial announcement in the Dáil, left the ESB with no financial slack to meet non-fuel-related increases in costs which were already foreseen.

Consequently, by the end of the year a further application had been submitted to the Prices Commission. This was, of course, overtaken by the turmoil in Iran. The subsequent 50 per cent rise in the real price of oil set off a steady rise in all energy prices which continued for over two years.

Assessment

The ESB 1927-77

THE ESB was the first Irish state enterprise and as such was a pioneering effort. At the time of its establishment there was little comparable in other countries and nothing in the previous history of Ireland on which it could be modelled. In spite of extensive examination of structures and legislation in other countries it quickly emerged that a considerable amount of experimentation and innovation would be inevitable. The decision to establish a nationalised industry flew in the face of all of the economic and financial orthodoxies of the day and the degree of risk involved was heightened by the absence of any significant engineering tradition in Ireland and by the scarcity of skilled manpower.

That the ESB succeeded in its original objectives and fulfilled the hopes of its founders is beyond dispute. The preceding chapters have detailed the way in which the Shannon scheme was built, the absorption of the undertakers into a national system of supply and distribution, the extension of supply to all parts of the country through the rural scheme and the essential part played by the ESB in the process of industrial expansion especially during the 1960s and 1970s. What criteria may reasonably be used in evaluating the ESB's performance over the years?

This question raises considerable problems, for although there does exist a large technical literature on economic efficiency criteria for nationalised industries and the application of efficiency criteria to electricity supply,¹ it is difficult to apply these criteria to the ESB, because right from the start it had different criteria laid down for it in the 1927 Act and in subsequent amending legislation. Furthermore, the general rules by which the economic performance of public sector enterprise in Ireland may be judged have never been politically agreed—indeed have never even been the subject of adequate informed discussion—unlike the position in Britain, for example, where the government has given considerable attention to the subject.² Another difficulty is that the ESB has never been free to pursue its statutory objectives independently of state intervention. Over the years its fuel supply, its generation plant, its pricing policy and even its level of employment have all at some time or other been the subject of governmental directives inspired—perhaps properly—by considerations which had little or nothing to do with the economics of electricity supply. So, in a sense, judgements on the performance of the ESB will inevitably involve judgements on the performance of the governments under which it has operated over the past fifty years.

FINANCIAL OBJECTIVES

In the private sector the efficient working of a market system is compatible with the goal of profit maximisation—indeed, under certain assumptions, depends on it. However, profit maximisation is not usually an acceptable goal for a publicly owned industry. Unfortunately, what is to take its place is only too rarely spelt out. The problem of

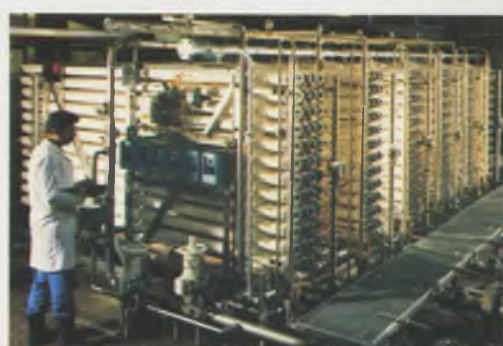


National Control Centre, Bahrain (above)
Ensuring continuity of supply (left)
Submarine cable crossing
River Shannon (below)





Electricity in industry



economic efficiency criteria in the public sector is concerned with finding rules which are both operational and quantifiable and which reflect social objectives, to supplant the text-book goal of profit maximisation which may be acceptable in the private sector. If such rules cannot be found it becomes very difficult to find any yardstick by which to measure the relative performance of public sector enterprise.

The classic approach to this problem is to start from the position that the public sector firm should maximise the net social value of its output, i.e. produce an output which is socially optimal both in price and quantity. To do this, the firm must equate the marginal social value of output to its marginal social cost.³ The use of the term 'social' denotes that non-commercial factors should be taken into account (e.g. income distribution effects, externalities, the balance of payments). From this general rule, and taking into account institutional constraints and socio-political requirements, a further set of rules concerned with pricing and investment criteria may be derived.

'Social' considerations are often difficult to quantify and moreover, by their nature, are based on explicit political decisions, expenditure on which ought to be openly decided. If this is accepted, then the public sector enterprise is relieved of the burden of making 'social' decisions. It is concerned with operating within specified guidelines; the rules for pricing and investment it is asked to follow are straightforward commercial ones while the government which stipulated the 'social' dimension also looks after 'social' considerations by directly purchasing output from the enterprise or by taxing or subsidising one or more of the inputs.

Typically, the public enterprise is required to operate some target rate of return on new investment, and to yield some minimum return on capital already invested. The pricing policy follows from this: prices must meet the financial targets imposed, and bear some relation to marginal social cost. It is not necessarily true, as is frequently supposed, that price should actually be equal to marginal cost.⁴

The approach outlined is one in which the firm is asked to maximise social value subject to certain constraints. An alternative approach, sometimes used, is to take the level of output and prices as a constraint imposed by the government, while requiring the firm to produce the output at minimum social cost. The behavioural rules which flow from this requirement are similar to those flowing from the first approach.

The general objectives of the ESB are laid down in the Electricity Supply Act, 1927. In section 19(d), the ESB is required: 'to control, co-ordinate and improve the supply, distribution, and sale of electricity generally in Saorstát Éireann'. This is a very general mandate, with no limits set to the involvement of the ESB in the area of electricity supply. Limitations appear in the form of the financial guidelines for its operations set out in section 21(2). These stipulate that

... revenue derived in any year ... will be sufficient and only sufficient (as nearly as may be) to pay all salaries, working expenses and other outgoings of the Board properly chargeable to income in that year (including the payments falling to be made in that year by the Board to the Minister for Finance in respect of interest and sinking fund payments on advances out of the Central Fund) and such sums as the Board may think proper to set aside in that year for reserve fund extensions renewals, depreciation, loans and other like purposes.

We may note that at two points this section leaves the ESB unguided: (1) what exactly



Professor C.T.G. Dillon, who became Chairman of the ESB in 1975.

is to be 'properly chargeable to income', and (2) just how much the Board ought to set aside for the various purposes listed.

These are not just legal quibbles and they were treated with caution by the ESB, which spent considerable amounts of time and money having the matter examined by its solicitors and by counsel. The same is true of the detailed and obscure sections dealing with prices and with the treatment of existing undertakings when absorption by the ESB was under consideration.

In practice, of course, under successive governments, the ESB has complied with conventional accounting norms, and the method of drawing up its accounts has been the same as in the private sector. Arising out of this confusion—or at least lack of clarity—there are two very different approaches to evaluating the ESB's performance over the years in this sector. One view would translate section 21(2) into economics, roughly as follows:

The ESB is to aim at equating price to average cost of production, with the qualification that costs of production are to be taken as including depreciation and amortisation of capital plus an undefined amount to be set aside as funds for further investment in the system; allowing this definition of costs, the ESB should aim at making no profit.

Under this approach it can be argued that the only operational rule being laid down here is the link between price and average cost. The definition of cost, however, is not one which would be recognised by either an accountant or an economist. Consequently, even this rule degenerates into the requirement that price shall be some undisclosed multiple (not necessarily fixed) of average cost, which, of course, is not really a rule at all. No attempt is made to provide the ESB with any criteria by which to judge whether an investment is justifiable; no provision is made for pricing policy which stands up to examination; no requirement is spelt out for a return on capital employed. Under these circumstances, it can be argued, the ESB was not being enjoined in any consistent fashion to engage in optimising behaviour in the first sense outlined above, namely maximising the net social value of its output; nor was it being asked to approach the problem of efficiency from the opposite viewpoint, that of cost minimisation, since no price/output target was being fixed and, apart from the requirement in section 19(d) to 'improve' the supply of electricity, there is little or no emphasis in the act on the notion of efficiency or cost minimisation as a goal.

It is not, of course, the case that the ESB failed to apply financial criteria to investment decisions, or that they expended inadequate time and thought on the question of tariff structures, or that the ESB has shown itself heedless of considerations of efficiency. Far from it; but it remains the case that such rules as were applied were of necessity developed within the ESB, and not subject to public scrutiny other than through reports from *ad hoc* investigating committees appointed by governments.

Commenting on the ESB's statutory financial objectives in general, the Fletcher report in 1972 noted that there is in the 1927 Act no explicit incentive towards improved performance, either in the sense of cost minimisation or of social value maximisation. The concept of zero net profit contained in the relevant section of the 1927 Act might appear to offer some target, but, to quote the report '... it is not the kind of target referred to above; it does not place a meaningful concept of profit in relation to a meaningful concept of capital.'⁵

The 1927 Act defines profit in an unusual manner. Normally, profit is taken to mean any surplus over interest, operating costs and depreciation. The definition in the 1927 Act refers to any surplus over operating costs plus depreciation, plus loan amortisation, plus sums set aside 'for reserve fund, extensions, renewals, loans and other like purposes.'⁶ This means that the ESB may raise funds from sales revenues to finance further investment by including depreciation and amortisation in cost. In this way the ESB is enabled to build up on equity capital stocks.

In recent years this aspect of the 1927 Act has led to some controversy over the ESB's pricing policy. Since 1971, the Board has felt itself obliged to comply with the requirement that it should submit its proposed price increases to the Prices Commission. Whether the legislation which established the Prices Commission is legally binding on the ESB is at least a moot point, given the provisions of the 1927 Act. In the end, however, the ESB has politically no option but to comply.

Both the Prices Commission and the Fletcher report have drawn attention to section 21(2) and its economic implications. This has resulted in controversy over what has become widely known as the 'double depreciation' provision, although it covers a wider area than depreciation alone.

It could be contended that if the ESB is not supposed to make a profit, then it should not be allowed to fix its prices so as to provide a surplus over operating costs, interest and depreciation. If this were done today, then undoubtedly the price paid for electricity would be lower, as the consumer would not be asked to provide investment funds for the ESB. In so far as it is not done, part of the price of today's electricity represents the provision of capacity to supply tomorrow's consumers. To the extent that the ESB can raise investment funds through present revenues, it avoids having to go to the market to borrow the capital it requires to develop the system, or having to borrow through the government, or obliging the government to 'subscribe' equity capital (as in the case of Aer Lingus). Nevertheless, the price of electricity can be said to contain a contribution from today's consumers to provide power more cheaply for both present and future consumers.⁷

However, it does not follow that it can be established that today's electricity prices would be lower if the ESB had been obliged to finance all its investment by borrowing *ab initio*. Against the reduction in today's charges that would be made possible by not providing funds for investment must be offset the interest cost of the funds which would have had to be borrowed to build the system as it stands today, which would be substantially higher than current interest charges.

Consequently, all we can say is that if the ESB were to be forced to change to one hundred per cent loan finance, there would be a once-for-all reduction in the price of electricity to consumers, which would be eroded over time as the equity element in the ESB's balance sheet was reduced to zero with the passage of time.

In fact, one hundred per cent loan finance is not really an option for the ESB; its ability to raise funds on the open market depends on its perceived ability to support the loan, and, if it is not permitted to build up an equity base through internally generated funds, it would be forced either to seek government equity participation or, increasingly, to rely on borrowing from the government. The burden of the ESB's development would then fall on the public capital programme. Inevitably, this would mean increased direct control by the government and civil service over the ESB's operations.

In a memorandum to the authors, the late Dr Murray, formerly Chairman of the ESB, set out the ESB's views on the criticisms which have been made of this area of its financial policy. The ESB's attitude is that if the ESB is to be compared with private enterprise, then like must be compared with like. It, too, must be allowed to finance from current revenue a reasonable proportion of its capital needs. Some argue that the real test of the present system is whether or not it operates to the benefit of electricity prices, bearing in mind the alternative, which is to borrow outside the Board some or all of the capital now generated internally. It is argued that in an organisation like the ESB, which has a continuing need for new capital on a very large scale, the present system gives cheaper electricity than any alternative.

It is further argued that the fact that an entirely pragmatic approach has been adopted is entirely consistent with the non-doctrinaire philosophy on which the ESB was founded, and that by avoiding the misleading concept of operating profit adopted by other state enterprises it was possible to secure a proper contribution from revenue towards capital outlays without at the same time generating acrimonious debate about profits. Finally, it should be said that the ESB upholds the retention of the present practice, not solely on the provisions of the 1927 Act, but because the present system keeps down, and has kept down, the price of electricity in the long run.⁸

It is difficult to quarrel with Dr Murray's contention that like should be compared with like. Furthermore, although the 1927 Act appears to require that no profits (in the act's sense) should be earned by the ESB, it would be hard to argue that funds invested by the ESB should earn a zero net return, given that they have an opportunity cost. The provision for depreciation and amortisation ensures that there is a positive net return, although this method of securing the return leaves open the question whether the return is too low, too high or just right. Moreover, the practice of requiring a proportion of current revenues to finance further investment helps to ensure that the ESB does not treat investment funds as 'free' if they are internally generated.

Finally, it is worth noting that during the negotiations with the ESB over financing the Turlough Hill project in the late 1960s, the World Bank insisted on obtaining from the ESB a commitment on limiting loan financing as a means of obtaining investment funds as a precondition to its receiving support from the World Bank.

The alternative approach is to consider the ESB's performance in a piecemeal fashion. Any overall assessment of the ESB's record must take into account the fact that in many vital areas of performance it was not a free or independent agent, and this was particularly true of the constraints placed by governments over the years on the capacity of the ESB and on the ways in which this capacity was to be generated.

PRODUCTION CONSTRAINTS

There are three ways in which the capacity of the ESB's system was different from what the Board in principle desired it to be at various times. First there was the question of the introduction, commissioning or extending of particular stations. As has been related earlier, the Liffey scheme in the 1930s was introduced ahead of time to facilitate Dublin Corporation. Then, after the war, the ESB was obliged to build stations it did not want (the four 5 mW stations on the western seaboard for example) and to commission extensions to stations to oblige Bord na Móna (Allenwood and Shannonbridge B for

example). Obviously these temporarily or permanently added excess capacity to the system.

The second and more serious way in which such constraints operated is on overall system capacity. The World Bank in 1968 noted that the ESB had 'a minimum reserve capacity of 22% which is high compared with the 15-17% range common in Europe and the U.S.'⁹ In 1972, the Fletcher report suggested that in providing for a margin for security, the ESB had been 'over-cautious' and urged it to re-examine its policy.¹⁰ There is, in reality, a trade-off between system security and overhead costs of supplying power, since security involves carrying unused capacity. Ideally, some optimum point on this trade-off is chosen. It may well be that the ESB would have independently chosen the security margin it has had. This decision, however, was taken out of its hands by a series of government directives in the years 1947 to 1950. In May 1947 the ESB was told that the Minister for Industry and Commerce wanted it to ensure that 'installed capacity, including standby capacity, will not merely meet current demand, but permit of an active sales campaign.'¹¹ In November 1948 the ESB was instructed '... that the Board in its plans for additional generating capacity were to err, if at all, upon the side of excess rather than insufficient capacity.'¹² In April 1949 the Minister advised the ESB that when drawing up a new development plan to replace its existing one, which he felt to be inadequate 'The Board should... base its plant on the provision at every stage and under the most adverse conditions of excess rather than insufficient capacity.'¹³ Finance and political support, the ESB was informed, would be forthcoming to ensure the rapid development '... of an ample margin of available capacity under all conditions.' These instructions were confirmed over a year later, when the Minister advised the ESB to ensure '... that the aggregate generating capacity available should be sufficient to meet all demands, even in a very dry year, and that such capacity should be supplemented... so as to maintain from year to year, such a margin of excess capacity over demand.'¹⁴

Whatever the views of the ESB were, these instructions gave little leeway, and clearly indicated that the cost of unused capacity for security purposes was to be given little weight in the calculations of required capacity. The situation was not changed by the Fletcher report's comments on capacity margins. The government issued no new instructions to the ESB, and it is not surprising that the ESB decided to maintain its existing security standards despite the suggestions in the Fletcher report.¹⁵

A third area in which the ESB's capacity could be constrained is in relation to the government's overall control of the economy. This has not in practice been effective, but the matter was raised during the 1956-8 difficulties (see Chapter 9 above) and also in the late 1960s when the ESB was notified of the need to keep its capital spending within limits dictated by the government's policy on public sector capital expenditure.¹⁶ In fact this, in the end, came to nothing, but it scarcely needs to be pointed out that what was involved was a case of the government suggesting a new constraint on the ESB, which was almost certainly incompatible with the existing constraint of security of supply.

In the long run the most onerous constraint imposed on the ESB has been the requirement to give priority to the use of native energy sources. This requirement affected system security adversely in two respects. It made the ESB's thermal capacity unnecessarily weather-dependent, forcing the ESB to maintain excess thermal capacity to meet weather contingencies as well as normal mechanical failure risks. Secondly turf-powered

stations have been found by the ESB to be more prone to mechanical failure. But most of all, turf has been consistently more expensive as a means of producing power than coal or oil, except during the years of the Suez crisis, 1957–8.

The oil crisis after 1974 did, of course, change this pattern. The fourfold rise in oil and coal prices was not matched by similar rises in turf prices. The turf stations in consequence jumped to the top of the merit order—but by this stage their total contribution to the ESB's capacity had shrunk to less than 20 per cent, so that this had relatively little effect on the ESB's overall costs (see Appendix 3).

PERFORMANCE

Having made these observations we now look in broad terms at the ESB's performance and achievements over the past half century. Table 14.1 gives an overall impression of these main developments and the main achievements.

Without taking each figure separately, it can be seen that the table points to a huge development in the scale of the ESB's activities and a general continued trend towards increased efficiency. Attention may be drawn, for example, to the general increase in the load factor, which is an indicator of system efficiency. Attention should also be drawn to the average price per unit sold. This is an absolute figure with no allowance being made for the decline in the value of money. One might roughly divide the 1977/8 average price by 7 or 8 to get its 1930/31 purchasing price equivalent. When this is done it can be seen that in this respect the ESB's record is spectacularly successful.

Where capacity margins have been concerned, we have just seen that the ESB has been operating under constraints imposed by the government. These may have resulted in a level of system capacity higher than would otherwise have been chosen by the ESB, although this is not easy to demonstrate conclusively. Nevertheless, some of the over-capacity which has existed at certain stages is due to the fact that several times the ESB's forecasts of demand were fairly wide of the target. This was perhaps inevitable, given the variability of annual growth rates and the difficulty of predicting them. The World Bank was able to comment in 1968 on 'a remarkably constant growth rate,'¹⁷ but it turns out that this is a constant average growth rate, with a wide dispersal of actual rates around the mean. Apart from the inherent difficulty of accurately forecasting demand in any year under such circumstances, the ESB was faced with the requirement that it must plan to meet not only forecast demand but also unforeseen changes in the rate of growth of demand. To complicate matters further, the ESB is expected not only to predict these, but to do so for a period of time which is six to ten years in the future. It is expected to have available at all times to meet these demands exactly the right amount of plant, neither too much nor too little; it is expected to be able to predict well in advance the optimum course of action to follow in selecting fuels and deciding on plant technology. A recent example of what is involved in forecasting in the electricity industry illustrates the difficulties involved. Decisions had to be made in 1978/9 by the ESB on nuclear versus other power sources for the early to mid-1990s in the absence of any reliable information on fossil fuel availability and price and against a background of great uncertainty about the operational status of the interconnector with Northern Ireland. Under such circumstances the chances of making what may in retrospect be a 'wrong' decision are obviously very high, and if the ESB fails then there is no one else the customer can turn to. It is only fair to say that no other industry has such an exacting remit.

Table 14.1

	1930/31	1935/36	1939/40	1946/47	1950/51	1957/58	1963/64	1968/69	1970/71	1973/74	1977/78	1981/82
Generating capacity (mW)	93	140	175	194	292	649.5	849.5	1,290	1,437	1,578.5	2,539.5	3,287
Peak load (mW)	47.6	87.9	118.7	161.0	251.0	412	674	1,050	1,203	1,386	1,802	1,999
Load factor (%)	31.8	31.6	39.0	40.4	44.1	49.1	48.9	51.7	54.1	60.0	56.1	58.3
Generated (million kWh)	119.8	244.1	407.0	571.9	972.9	1,774.8	2,900.8	4,749.0	5,921	7,253.1	8,828.4	10,386
Units sold (million kWh)	85.5	187.0	318.6	453.7	770.4	1,424.6	2,376.0	4,012.3	4,862.0	6,880.6	7,329.9	8,661.7
Number of consumers	69,045	116,704	172,545	240,030	343,376	570,545	678,054	765,213	805,736	873,764	986,256	1,096,950
Average price per unit sold (pence)	0.86	0.67	0.60	0.71	0.73	0.9	0.858	0.858	0.907	1.188	2.865	5.969
Number of employees	1,544	1,809	2,328	2,641	3,499*	5,231**	9,117	10,895	11,751	11,643	10,845	12,441
Balance sheet (£m.)	9.5	12.3	16.6	21.3	37.1	108.9	167.1	238.0	291.8	382.8	436.4	1,034.4

*Plus approximately 3,000 casual employees.

**Plus approximately 2,000 casual employees.

While a rule-of-thumb approach may be difficult to justify at a theoretical level, it is worth noting the degree of success which attended the last major attempt to forecast electricity demand in Ireland, Booth's 1966 study.¹⁸ Based on both cross-section and time-series estimates of demand functions for electricity, Booth obtained no less than five superficially plausible rates of growth of demand for electricity. These were 3.8 per cent and 5.6 per cent (cross-section) and 8.1 per cent, 8.7 per cent and 16.8 per cent per annum (time-series): of these he opted for the 8.1 per cent rate, which on 1963 data meant a forecast of electricity sales of 4.9 million kWh in 1970. The actual sales were (1969/70) 4.4 million kWh and (1970/71) 4.862 million kWh, which suggests a figure of around 4.6 million kWh during the calendar year 1970. This forecast is not a bad one—it was only 6 per cent off target, which for a forecast four years ahead is quite respectable. This was moreover derived, not from any model of the demand for electricity, but simply by taking a time trend. It is little wonder, then, if engineers follow the same methodology. The average growth rate from 1963/4 to 1969/70 was 10.2 per cent, with a range of 6.2 per cent to 12.9 per cent.

However, a 6 per cent error in sales is more than sufficient to increase seriously the risk of load-shedding in case of an emergency; furthermore, the ESB has to plan up to ten years ahead so it is understandable that it should err on the side of caution, especially given the instructions from the government on meeting demand. However difficult it may be to justify the rule-of-thumb approach, combined with guesses about future supply conditions, it has to be accepted that by and large it has worked since the war, in that the margin of spare capacity has not fluctuated greatly until recently.

The Central Electricity Generating Board in Britain, under government instructions, has always attempted to make use of advanced forecasting models, and has followed sophisticated financial and planning criteria in its capacity programmes. Despite these aids, it found itself in severe difficulties on more than one occasion in the 1960s, and was obliged to shed load during the very cold winter of 1962/3, which caused widespread disruption and misery. The ESB was able to avoid any such eventuality, which was a matter of some pride to the Board, as we can see from the following paragraph of a letter of that time from the Chairman, Dr Murray, to the Minister for Transport and Power, urging a speedy decision on a proposed expansion of the Ringsend station:

The strain thrown on the electricity system in recent weeks emphasises dramatically the need for having adequate generating capacity available to meet all contingencies. The effects of a widespread failure of power supply—by way of loss of production and in terms of human suffering—have been illustrated in a striking way in Britain. My Board takes pride in the fact that despite the unusual length and severity of the cold spell, it was able to maintain continuity of supply and avoid load shedding. In thus meeting fully all the demands made on the system the Board appreciates that it was only fulfilling the commission entrusted to it by the Government and the community, but the need to ensure an adequate margin at all times has served to increase its anxiety at the delay which has occurred in securing approval for the Ringsend set.¹⁹

The role of the ESB as a vital part of the infrastructural basis for Irish industrial development is part of the explanation for the rate of growth of the system. By 1970 this rate of growth was one of the highest in Europe, and a continuation of industrial demand growth was causing the ESB to worry about the possibility of financing capacity growth

to meet it. That electricity is necessary to industry everyone is aware. But the scale on which demands can be made is not always appreciated. Five industrial plants established between 1965 and 1970 required between them the provision of 37 mW capacity²⁰ plus a margin for security. This is the size of a single turf-powered station. Since then, suggestions have been made that a smelter industry should be established here. If electrically powered this would require something in the region of 200–250mW, or about 12 per cent of capacity in 1977. It is hardly necessary to point out the implications of uncertainty about such major developments for the ESB's forward planning of generating capacity.

EMPLOYMENT LEVELS

One further aspect of Table 14.1 which deserves comment concerns the number of ESB employees, and the accusation of overmanning. Between 31 March 1964 and 31 March 1972 the number of employees rose from 9,117 to 11,751 and reached a peak of 12,138 during 1971. The first formal criticism of this position is contained in the Fletcher report,²¹ which confined itself to reporting findings on staff size from a purely technical point of view, while recognising 'all kinds of local practices and traditions, such as management staff relationships, trade union activities and emigration.'²²

The critical findings of the Fletcher report were based mainly on a comparison with a single Swedish power company, Sydkraft, although some comparisons were also made with British data. In spite of reservations about the comparability of the data the strong impression given by the data quoted in the Fletcher report is of a serious degree of overstaffing.

Table 14.2
Fletcher report data (1971–2)
(Thermal stations, manning)

Station age	Capacity	ESB	Sydkraft
17 yrs	120 mW	1.43 Men/mW	0.98 Men/mW
16 yrs	240 mW	1.23 Men/mW	0.78 Men/mW
under construction	268 mW	0.51 Men/mW	0.51 Men/mW

In using the Sydkraft data, the Fletcher report seems to have covered itself adequately against the charge of not comparing like with like; allowance was made for differences in the patterns of production and distribution. Even after such allowances had been made, the conclusion of the Fletcher report was that staffing levels in the ESB were about 20 per cent above what could be justified. The importance of this lay in the fact that payroll costs had been rising as a proportion of total costs (from 23 per cent in 1961/2 to 28 per cent in 1970/71) and already constituted nearly twice (28 per cent compared to 16 per cent) the proportion of total costs of the consolidated British system.

One of the reasons offered for this degree of overstaffing was the absence of flexibility

in the use of manpower, which is a feature of Irish trade unionism. In fact it appears that one of the first points brought to the attention of the Fletcher committee by ESB management was the existence of overstaffing in the belief that the prospects of solving the problem without industrial upheaval would be improved if its existence was clearly set out in a report by outside experts.²³

Between 1972 and 1975 the National Prices Commission published several reports dealing with ESB costs, in which it, too, drew attention to staffing levels. In 1973, dealing with an application to have the price of electricity raised, the NPC refused, in the light of the Fletcher report, to sanction a portion of the rise sought on the grounds that it was supposed to cover the increased payroll which would arise if and when the number of ESB staff was increased by one per cent as projected. It also refused to allow a price rise to cover the initial cost of a productivity deal, although this was subsequently overruled by the government. The consultants' report on which it based its attitudes produced the NPC data on Table 14.3. The concerns quoted relative to the ESB are, in each case, those which are most comparable, given the differing responsibilities of the various authorities. The conclusion of its consultants was that the ESB was overstaffed by between 15 and 20 per cent.

Table 14.3
NPC data 1973/74

Employment increase 1965/74		Numbers employed	
		1974	
ESB	+20%	11,643	
Scottish Hydro	- 1%	3,673	
South Scotland	-16%	13,526	
Southwest England	-22%	8,124	
England & Wales	-21%	216,191	
Sales increases 1965/74		Units sold	No. of consumers
ESB		129%	25%
Scottish Hydro		158%	17%
South Scotland		58%	8%
Southwest England		76%	17%
England & Wales		46%	13%
Sales per consumer		% Increase	
		1965/74	
Scotland Hydro	191%	ESB	83%
South Scotland	160%	South Scotland	41%
Southwest England	132%	Hydro	120%
		Southwest England	50%
Units sold per employee		Consumers per	
		employee	
		1965/74	
ESB	+ 91%	ESB	+ 5%
Scotland Hydro	+162%	Scotland Hydro	+19%
South Scotland	+ 83%	South Scotland	+30%

These findings were accepted in principle by the ESB, though there were substantial reservations about some of the actual figures cited. Nor was the ESB prepared to accept that the problem was entirely of its own making or that it was in any sense unique in having such a problem. Indeed for the first thirty-five years of its existence the Board was influenced by the compelling national need to maximise employment. This led in turn to a general emphasis on job creation and job retention which gradually became an integral feature of industrial organisation and trade union expectations in Ireland.

Nevertheless, negotiations were entered into with the unions on productivity deals designed to reduce manpower levels and the ESB was able to note in its annual report for the year ending March 1976 that despite a rise of over 40 per cent in capacity installed, a 31½ per cent rise in output (in the face of a recession) and a 7 per cent rise in the number of consumers, it had reduced its staff from 12,138 in 1971 to 11,505 in March 1975 and 10,910 in March 1976. This reduction went a very long way towards removing the level of overstaffing which had been remarked on by both Fletcher and the NPC.

In a similar exercise during 1978, the National Prices Commission again monitored productivity trends in the ESB. These showed that absolute labour productivity in the case of the ESB appeared low relative to overall UK figures, and to those in area boards selected by the NPC's consultants for comparison. The improvement in productivity in the ESB's case during the period 1973-7 far outstripped the performance of the UK industry. In the UK, while overall capacity remained roughly constant, gross labour productivity in the industry rose by a little over 7 per cent. This was achieved mainly by saving labour as new plant replaced old. The ESB, however, in the face of sluggish demand growth, had a capacity growth of 21 per cent. Despite this, labour productivity improved by 29 per cent. In the ESB's case, however, virtually no old plant was decommissioned during this period.

Given the structural disadvantages (low population density, lower sales per customer, security of supply, diseconomies of smaller scale networks, production diseconomies of smaller scale stations, higher labour content of older (especially peat-fired) stations under which the ESB has always operated, the lower level of absolute productivity is understandable. The improvement in productivity during a recession is all the more noteworthy.

To this should be added the fact that the ESB, as already noted, does much more of its own design work than the UK regions, and carries a correspondingly higher staff overhead. The consultancy programme from 1973 onwards was specifically designed to redeploy some of this overhead capacity, and it was successful in this respect. This, however, is a productivity gain which is not captured by measurements of electricity sales per employee, which must be regarded consequently as an underestimate of true productivity gain.²⁴

ORGANISATIONAL REFORM

The industrial relations difficulties discussed in the last chapter had a further consequence within the ESB. It was evident from the problems besetting the Board that its internal structures in general were in need of re-examination. In earlier years, the ESB had had to undertake similar exercises, as the size of the organisation outgrew existing management structures.

The ESB decided to call in outside management consultants, and asked the international McKinsey firm of consultants to advise them. The result of this was a major restructuring of the ESB. In their report, the McKinsey consultants commented on changes in the environment of the ESB. The development programmes which had been to some extent imposed on the ESB were now (1968) more or less completed. The ESB, therefore, was entering an era of much greater freedom in its decision-making. This, of course, meant that the impact of management decisions was correspondingly increased. At the same time, the top management of the ESB was changing, as the people who had been with the Board from its foundation retired in the late 1960s.

McKinsey recommended major changes in the management structure of the ESB. They advised that all management activities should be co-ordinated under a single executive. In a sense, this meant handing over the day-to-day running of the Board to its own staff, as the Board of Directors and the Chairman would be separated from such functions and would be concerned with longer-term policy matters and final decision-making. Too many lower-level decisions had traditionally gone all the way up to the Board. This had been of great benefit in the early days of the ESB, but now made for managerial inefficiency. Henceforth policy making should be clearly separated from managerial functions.

In addition, McKinsey recommended the assignment of more specific responsibilities to senior executives and (flowing naturally from the new role of the Board of Directors) greater delegation of responsibility and authority down the managerial line.

The ESB acted promptly to implement these recommendations in their entirety, without compromise. The Chairman, Dr Murray, thus presided over change which divested him of many of the powers and responsibilities that had been his since 1960. A new management team was appointed within three months of the receipt of the McKinsey recommendations, with a new Chief Executive, J.J. Kelly, being chosen to implement the reorganisation.

SOCIAL RESPONSIVENESS

The 1927 Act set out to establish the guidelines for the operations of a national public utility. Its principal concern, therefore, was with the efficient production and distribution of electricity. Even then, however, the concept of efficiency being enjoined on the ESB was not simply that of market economics. The motivation behind the decision to establish a public enterprise entity was expressly given by Patrick McGilligan during the Dáil debates: it was seen as an engine for economic growth and development, and a means of raising living standards.

Over the years—for example with turf development, or with rural electrification—the government has steadily increased what might be called the ‘social’ as opposed to ‘market’ dimension of the ESB’s responsibilities. This has, of course, caused difficulties, as the ESB has found from time to time that meeting the obligations of its social mandate as defined by government has been in conflict with, or even incompatible with, existing definitions of its financial obligations. Such, however, has not by any means always been the case. In the case of fisheries, for example, the ESB has been able to undertake a ‘social’ function, despite its inherent unprofitability, because of the statutory powers given to it. Equally, the ESB has found itself capable of ‘social’ development in general

promotion of the use of electrical equipment, since to do so not only clearly carried out the intentions of McGilligan that it should aim at raising the standard of living of the bulk of the population, but also made sound commercial sense in terms of creating scale economies in electricity production.

Inevitably, the growth of the ESB as a source of domestic and industrial or commercial power resulted in a growing sense of social responsibility, independently of statutory obligations or commercial common sense. No organisation employing the best part of 2 per cent of the non-agricultural labour force (and an even higher proportion of the skilled labour force), and whose turnover is equivalent in size to 4 per cent of GNP, can treat the economic and social environment as a datum. The sheer size of the ESB now means that its internal decisions on, for example, investment projects can have significant effects on the country's balance of payments. Pay settlements and employment practices have demonstration effects on negotiations elsewhere. Its costs are a major element in the overall determination of national competitiveness. Its generating and distribution activities have come to have a substantial potential impact on the physical environment. Consequently, though subject to the need to be financially viable, the ESB's decision-making and programmes have increasingly reflected its perception of the requirement that it should show social responsiveness.

While this is not entirely a recent development, it would be fair to say that up to the 1960s this approach to its affairs was more passive than active, determined more by the ESB's statutory or political obligations and the need to stimulate demand growth than by a positive policy aimed at implementing a conscious social programme.

By the early 1960s, however, the social dimension began to appear increasingly in the ESB's reports: references are made to scholarship schemes established some time previously (with the co-operation of the Irish Countrywomen's Association) to domestic science courses at An Grianán; and the Board reports its progress with careful landscaping around the Cathaleen's Falls hydropower station (both in the 1961 report).

Through the 1960s, the public importance of such social activities is recognised by the extension of the type of activity and by an increase in the time and money devoted to them. The ESB became involved in various educational and research activities, aimed at increasing agricultural efficiency—pig breeding and dairy farming being two major examples. The fisheries division devoted resources to solving the problem of UDN disease, the scourge of salmon fishing at the time.

The growth in national concern with the environment is reflected in the commitment of resources by the ESB to amenity protection, the great care taken to preserve the Wicklow countryside in the case of Turlough Hill being perhaps one of the best known examples. At the time, the ESB received considerable criticism and bad publicity over the decision to replace its 150-year-old Georgian offices in Dublin's Fitzwilliam district. This seems in retrospect, whatever its merits, to have overshadowed the efforts then being made (and which have continued) to further amenity conservation. Through the late 1960s and early 1970s, for example, the ESB increased its vigilance against river pollution and the 1973 report instances the case of prosecutions being brought against polluters on the basis of information supplied by the ESB. The same report mentions continuing survey work of pollution in the Liffey estuary and Dublin Bay (in co-operation with the Dublin Port and Docks Board) and the proposal by the ESB to establish a wildlife sanctuary around the Pollaphouca reservoir.

This growing concern with the social aspect of its activities led the Board to include a separate section in its annual report from 1973 onwards dealing with 'Social Responsiveness'. This section of the report has provided information on the ESB's most important involvements in the area of the environment, economic, political and physical. Perhaps the most important of these reports, from an economic viewpoint, is the 1977 report, which also commemorated the fiftieth anniversary of the establishment of the ESB. In the relevant section the Board drew attention to the implications of its position as a 'provider of a vital national service', and as a heavy user of the nation's capital resources.

It continued by enunciating the ESB's view of its role as a source of increased industrial productivity through economic energy supplies, its capacity to enhance that productivity through dissemination of information, its opportunities—especially through consultancy and advisory work—to foster the development of talent and enterprise, and the responsibility of its important position in the labour market in terms of leadership in developing constructive industrial relations. In this last connection, mention ought to be made of the alcoholism programme launched within the ESB. This, occasioned not at all by any unusual prevalence of the problem, reflected the growing concern in the 1970s with treatment of this social problem in a humane way, reflecting the approach to it as a dysfunction, rather than a matter of personal responsibility.

On the economic front, too, it should be recorded in the area of social responsiveness that the Board has in the 1960s and 1970s attempted to co-operate with stated government objectives, even at the expense of its own financial targets. Between 1978 and 1982, it added substantially to the number of its staff in compliance with the stated policy that semi-state bodies should seek to maximise employment; this added perhaps as many as 1,000 to the Board's payroll. It also gave priority to the purchase of Irish inputs to its operations. The 1980 report notes that 85 per cent of the national purchases of its distribution divisions went to Irish firms that year (50 per cent of overall purchases were from Irish firms), which contrasted with the virtually zero uptake of Irish goods at the time of the Shannon scheme in 1927-32. The Board noted (1982 report) its activities in 'launching' purchases of Irish-designed goods.

In addition to these economic activities, the social responsiveness of the ESB has inevitably led it into political involvement, such as North-South co-operation with the NIEB in the Electricity Co-Operation Committee of the mid-1960s. It has also resulted in a commitment by the Board to non-political commitment such as sponsorship of the 1981 Year of the Disabled.

In its own words (1981 report), 'in 1973 the Board formally . . . acknowledged Social Responsibility as a key element in the management of the business'. In the years to come, the ESB's problem will be how to reconcile this recognition with its previous and surviving commitment to good commercial practices in the generation and distribution of electric power.

REVIEW

The men who founded the ESB, the first Irish state venture, especially Patrick McGilligan and T.A. McLaughlin, saw it not just as a vital national service without which the future industrialisation of the state and increased agricultural efficiency

would be impossible, but as something much more—a tangible and striking demonstration that national independence meant more than symbolic and constitutional changes. It was to show both at home and abroad that a new generation of Irish people had the ability, the courage and the initiative to embark on a project that no British administration had dared to contemplate. It was to show that in doing this the new administration was not afraid to go against the advice and the pressure of the financial and commercial establishment of the day. The enthusiasm and impatience of McGilligan and McLaughlin were shared by all the early pioneers. In fact the early ESB was above all a young person's organisation—energetic, imaginative, optimistic, capable of making mistakes but with the resilience and self-confidence to bounce back and with the stamina and commitment to sustain itself through controversial and difficult times. In those early years mistakes were made. Some, especially the early financial crisis, might well have been averted if the pace of development had been slower and if McLaughlin had been more cautious. But then if caution had been a part of McLaughlin's personality there might never have been a Shannon scheme.

The early pace could not last indefinitely and with time the mood changed. The ESB became bigger and perhaps less personal. There were periods of consolidation and of retrenchment when little new seemed to be happening. Yet in the 1930s the harnessing of the Liffey began, the first shots were fired in the long battle over turf, the Board became involved in fisheries and, most importantly of all, the slow and tedious business of buying out the undertakers and ensuring a centralised national electricity service was continued. The Second World War brought a halt to expansion and there were times during that war when little could be done and when even to keep things going strained the resources and imagination of the Board's employees. Nevertheless, in spite of appalling shortages and incredible difficulties, the ESB continued to play its essential role during all this period. When the war ended, the pent-up energy and enthusiasms burst forth again, and this time were channelled into the rural electrification scheme, one of the great social revolutions in Irish history, the effect of which was as profound an agent of social and economic change as the Land Acts of the late nineteenth century had been.

In the 1950s and 1960s the pace of change accelerated even further as the ESB provided the essential infrastructural service without which the economic take-off would not have been possible; and then after the oil crisis of 1973 the ESB sought to cushion Irish industry against the worst effects of that crisis while still maintaining essential services and planning to meet future expansion.

As this book has shown, the ESB has now been an integral and essential part of Irish life for over half a century. In the 1920s and 1930s when politicians and parties could agree on very little, the ESB at least was outside political controversy. It was one of the very few institutions in the state in which all parties and groups could and did take pride. The ESB has always maintained a scrupulous political neutrality, seeing itself as belonging to the nation as a whole and not to any one group or section. It has succeeded in living up to the high ideals of its founders who wanted the ESB to be an organisation whose principal objective would be at all times to serve the needs of the Irish people and to help make possible the economic and social progress of the Irish state. The evidence suggests that these hopes for the organisation and these expectations from it have been fulfilled and that the trust given has been honoured.

Appendices

APPENDIX I

Extracts from ESB minutes about hand-won turf stations

The Land Commission . . . was of the opinion that there is not enough turf within 20/30 miles of Screeb and Miltown Malbay to meet the requirements of the E.S.B. and other local needs and leave enough for domestic purposes. Bord na Móna did not agree with this view. The Land Commission stated there were about 7,000 families in Connemara and each required an average of 15 tons of turf per annum, i.e. a total of about 100,000 tons. . . .

The Land Commission maintained that the 30,000 tons could be got only by utilising tracts of undeveloped bogs in Northern Connemara. . . . The bogs from which it was hoped to supply the station were the only practical source of turf in South Connemara and the Land Commission was particularly anxious to conserve them. The requirements of the station would reduce the lives of these bogs considerably. Bord na Móna pointed out that even without the station, the Land Commission admits that the bogs in question would not last more than another 35 years, some much less. . . . After some further discussion the Land Commission and Bord na Móna agreed that provided *ALL* the factors are favourable, i.e. provided an “economic” price is offered and provided the bogs are drained and developed and the accommodation roads made available, the E.S.B. should be able to get 30,000 tons of turf a year for Screeb station for a period of 7 years. The bogs would then be exhausted and it would be necessary for the E.S.B., by offering better prices, to tempt the suppliers to cut turf further afield. . . .

In so far as Miltown Malbay is concerned, Bord na Móna maintained that the surplus turf they had estimated should be available during the life of the station. The Land Commission said it . . . was not in a position to challenge Bord na Móna’s estimates. Replying to Dr. McLaughlin, Bord na Móna said the E.S.B. would get the turf if it offered the right price but admitted that in doing so it would deprive the ordinary consumers of supplies of turf. When asked by Dr. McLaughlin what was meant by ‘the right price’ or ‘an economic price’, Bord na Móna said the market price. Dr. McLaughlin pointed out that in that case the Board would be competing with local institutions and other consumers who would be bound to suffer in consequence.

The question was raised as to why the Land Commission had not been consulted by the E.S.B. or Bord na Móna. Bord na Móna said that in the minutes of the meeting of the Joint Technical Committee held on the 15th April, 1952, it is stated that in regard to the life of the bogs it was agreed that it would be necessary to consult the Irish Land Commission in due course. Bord na Móna had assumed that the E.S.B. would do this, but Dr. Andrews agreed with Dr. McLaughlin that it would have been reasonable for the E.S.B. to assume that Bord na Móna itself would consult the Land Commission. . . .

Referring to Screeb station Mr. MacCarthy (Industry and Commerce) said that in view of the fact that the bogs would last only seven years he would have to explain to the Minister why that site had been chosen. Dr. McLaughlin said the Board had no choice in the matter; it received a specific direction from the Minister in the Department’s letter of the 21st April, 1953. Mr. MacCarthy agreed but said the Minister’s choice must have been determined by advice which he had received. That advice would have been the Minutes of the Joint Technical Committee Meeting of the 29th May, 1952, incorporating Bord na Móna’s survey. Bord na Móna said that it had undertaken this survey at the express request of the E.S.B. Actually Bord na Móna had no

desire to become involved in any way in these small stations—though in reply to Dr. McLaughlin, Dr. Andrews said it was he who had suggested the idea to the Minister in the first instance. The survey was prepared therefore solely for the consideration of the E.S.B. and the E.S.B. would have to accept responsibility for any use which may have been made of the survey. Dr. McLaughlin repudiated this suggestion pointing out that Bord na Móna was the authoritative body for all matters relating to turf production and he quoted the Department's letter of the 28th October, 1952, from which it was clear that the Minister was relying on Bord na Móna's survey as set out in the report of the 29th May, 1952, in regard to supplies of turf for these small stations. Mr. MacCarthy said that in the circumstances he would leave open the question of responsibility for the selection of the site.

APPENDIX 2

Extract from Departmental minutes about hand-won turf stations

The records in the Department showed that Bord na Móna had been asked to make a survey of areas in which turf supplies to local requirements was likely to be available. . . . These reports . . . put the potential supply of hand-won turf in the case of Screeb at 32,000 tons a year and in the case of Miltown Malbay at 24,000 tons a year. There was no qualification whatsoever in these reports and no suggestion that the supplies would not be available over the life of the stations.

Andrews replied that Bord na Móna had said that further examination was needed and that the Land Commission should be consulted, and "that they regarded themselves as having completed their part of the assignment when they recommended the areas for further examination" Mr. MacCarthy said it seemed strange to him that Bord na Móna could even have considered that they were giving the reports expected of them if they confined themselves to indicating availabilities of turf in a previous year and ignored the likely continuance of supplies. . . . [T]he reports had in fact for each area made a forecast that stated supplies would be available [T]he E.S.B. were surely entitled to assume that the estimates had regard to the estimated life of the stations. . . . Dr. Andrews then mentioned that the former Minister (Lemass) had told him in very definite terms that Bord na Móna was to have nothing to do with the establishment or operation of the stations once it had furnished the report asked for by the Joint Technical Committee.

APPENDIX 3

Excess Capacity and Fuel Costs

In 1961 if the rule-of-thumb of the largest set plus 6 per cent of peak load were applied, then, given a peak load of 606 mW, desired capacity would be 702 mW. In fact it was 724 mW. This difference cannot, however, be fully assigned to turf efficiency, since it may also reflect either indivisibility of plant or a decision to opt for system security on the basis of government instructions which are cited in the text. Given the existence of this over-riding instruction it is perhaps best to treat this aspect of the cost of using turf as an imponderable. The only judgement which can be made is that the actual level of excess capacity seems rather high.

It is possible to offer some calculations of excess fuel, capital and total costs on the conservative assumption that overall excess capacity was zero. Such calculations have already been published for three years in the late 1960s by J.A. Bristow¹ and, in a slightly amended form, are given in Table A.1.

APPENDICES

Table A.1
Excess costs (generating) of domestic fuel utilisation for years 1966/7—1968/9

Bord na Móna turf				Hand-won turf				Native coal				Total native fuel*			
generated kWh (millions)	Excess fuel costs pence/ kWh	Excess capital costs pence/ kWh	Total excess costs pence/ kWh	generated kWh (millions)	Excess fuel costs pence/ kWh	Excess capital costs pence/ kWh	Total excess costs pence/ kWh	generated kWh (millions)	Excess fuel costs pence/ kWh	Excess capital costs pence/ kWh	Total excess costs pence/ kWh	generated kWh (millions)	Excess fuel costs pence/ kWh	Excess capital costs pence/ kWh	Total excess costs pence/ kWh
848.8	0.207	0.052	0.259	27.2	0.344	0.422	0.766	72.5	0.178	0.104	0.282	948.5	0.209	0.067	0.276
1055.4	0.182	0.046	0.228	22.4	0.418	0.520	0.938	72.5	0.164	0.106	0.270	1150.1	0.185	0.059	0.244
1613.2	0.153	0.031	0.184	39.4	0.289	0.301	0.599	60.3	0.146	0.131	0.277	1712.9	0.156	0.041	0.197

*TNF: kWh generated multiplied by total excess cost per kWh; the result differs marginally from Bristow (1972) because of rounding errors.

There are marginal differences between the two sets of assumptions.

In Dublin, Cork and Waterford in 1968/9 total consumption of power amounted to 61 per cent of the output of the system; but local (thermal) capacity generated only 45 per cent of total output.² Net imports therefore came to 16 per cent of total system supply. In the same year, 9 per cent of total power generated was lost in transmission on the high voltage transmission system. We may, therefore, suppose that the *gross* loss due to having to import power to the load centres was of the order of $0.09 \times 0.16 \times 100$, or 1.4 per cent of system output. Against this must be set off the reduced cost of supplying power in the areas near the turf stations because of the proximity of the various turf stations. These areas consumed roughly 18 per cent of total output, while producing 38 per cent of total supply. If we assume that the transmission losses in these areas are increased by 9 per cent of 18 per cent (i.e. all production is based near the load centres, with 'exports' from the load centres to areas near the turf stations) there is very little to choose between. But if we simply assume that capacity outside the load centres is reduced so as to eliminate exports to the load centres, then, while there are marginally increased transmission costs within the areas actually directly served by the turf stations (since there will be fewer stations) the net result is a lowering of transmission costs overall, by an amount in the region of 1 per cent to $1\frac{1}{4}$ per cent of total power generated. This, in 1968/9, would have been equivalent to a sum of somewhere between £350,000 and £400,000. It is obvious that while these conclusions apply to the year 1968/9, the excess transmission costs arising from the use of the turf stations was higher in earlier years—since the proportion of total power generated in these stations was higher—and has declined since that date. It is also the case that the level of excess transmission costs is partly determined by the load distribution; if the ESB assigns base load to the turf stations, it rises.

The same conclusion, of course, applies to the level of excess fuel costs. Cost minimisation, as has been pointed out previously, requires that, given the capacity of the system, the load should be assigned to the various stations according to their merit ranking in terms of variable costs, which, in effect, means fuel costs. Unfortunately, from the ESB's point of view, the constraints under which it has operated have governed plant utilisation, too. The government explicitly required of the ESB that it should use native fuels for base load thermal power as early as 1938.³ This decision was confirmed from time to time,⁴ and did not really lapse until the late 1960s when the demand for power had already outstripped the capacity of Bord na Móna to meet it with turf supplies. The following table shows the merit ranking by fuel costs, the plant factor use and actual order of use of various stations for the years 1963/4, 1965/6, 1967/8 and 1969/70.

ELECTRICITY SUPPLY IN IRELAND

Table A.2
Fuel cost and use order

Station	Fuel	1963/4			1965/6			1967/8			1969/70		
		Fuel cost order	Plant factor	Use order	Fuel cost order	Plant factor	Use order	Fuel cost order	Plant factor	Use order	Fuel cost order	Plant factor	Use order
Hydro-stations	—	1	34	8	1	46	4	1	38	7	1	30	14
Tarbert	Oil	nc	nc	nc	nc	nc	nc	nc	nc	nc	2	44*	13*
Great Island	Oil	nc	nc	nc	nc	nc	nc	2	8*	15*	3	54	8
Marina	Oil	3	61	3	2	62	2	4	53	3	4	99	12
Ringsend	Oil	2	71	2	3	47	3	3	61	1	5	56	6
North Wall	Oil	4	31	10	4	27	10	5	23	12	nc	nc	nc
Shannonbridge	Milled peat	nc	nc	nc	5	44	5	7	46	4	7	60	4
Rhode	Milled peat	6	26	11	6	29	9	10	33	8	8	51	11
Arigna	Domestic coal	7	73	1	7	64	1	9	59	2	12	70	1
Bellacorick	Milled peat	5	33	9	9*	13*	8	27	11	9	51	10	
Ferbane	Milled peat	8	47	7	9	26	11	11	30	10	10	54	8
Lanesboro' A	Sod peat	10	55	5	10	33	8	12	13	14	11	59	5
Lanesboro' B	Milled peat	nc	nc	nc	nc	nc	nc	6	32	9	6	63	3
Allenwood	Sod peat	11	59	4	12	41	6	13	43	5	13	63	2
Portarlinton	Sod peat	12	49	6	11	37	7	14	39	6	14	55	7
Pigeon House	Coal/oil	9	13	12	nc	nc	nc	15	3	16	nc	nc	nc
4 x 5 mW stations	Hand-won peat	13	23	13	13	16	12	16	14	13	15	20	15

nc: not in commission or not in use

* in use for part of year only

Source: ESB annual reports

The implications for the level of excess fuel costs are obvious. Apart from the years 1957 and 1958 (after the Suez crisis) turf was always a more costly way of producing power than oil or coal, but it was given priority in use.

Temporarily at least, this situation was reversed by the high rise in oil prices in 1974 and succeeding years. The fourfold rise in oil and coal prices was not matched by the price of turf. The turf stations in consequence jumped to the top of the merit order, but by this stage their total contribution to the ESB's capacity had shrunk to less than 20 per cent, so this had relatively little effect on the ESB's overall costs.

It may be as well at this stage to comment on the view expressed by Bristow (1972) and the Fletcher report that while the ESB was subject to excess costs as a result of capacity and fuel constraints, these were roughly offset by the implicit subsidy involved in rates exemption. This led to the Fletcher report recommendation that the exemption should be abolished. This is a sustainable argument on *ceteris paribus* assumptions in comparison with other industries. Other things rarely are equal, however, and the basis of the recommendation is not as strong as it looks. It is difficult to think of an expanding industry in this country that is not heavily subsidised through capital grants and export tax relief. Although it must be a matter of judgement we feel that, in these circumstances, the case for removing rates exemption is unproved. In addition, we doubt that the ESB's requirements are a major drain on local authority resources, especially if the contribution of the employees to local authority revenues is taken into account. We see no reason, therefore, to shift a burden of (in 1976 prices) around £12m. to electricity consumers in the form of rates payable on ESB installations.

APPENDIX 4

Pricing policy

As has already been pointed out, there is a large literature dealing with the question of pricing in electricity supply—the size reflects the complexity of the issues involved, and is sufficient to preclude anything other than a superficial survey in this book. However, reviewing the position of the ESB as far as pricing is concerned is made considerably easier by the existence, not only of ESB data, but also of two relatively recent studies dealing with the matter. One of these is the Fletcher report already cited. The other, earlier, but much more sophisticated treatment of the issues is contained in one of a series of ERI papers by J.L. Booth, published in the mid-1960s.¹

Considering the factors governing the design of a tariff structure, Booth lists three separate objectives of the structure: (1) the meeting of financial obligations, (2) economic efficiency and (3) equity.

These may be explained as follows:

1. The ESB must meet certain financial targets laid down in the 1927 Act. But even in the absence of the 1927 objectives, the ESB would have to be able to pay its bills, so, in the absence of subsidies, revenues must be at least equal to costs, both taken over a period of time. The tariff structure must ensure this.
2. The tariff structure of a concern like the ESB if fixed should be so designed as to secure the optimal use of existing resources and to be compatible with general economic objectives in terms of economic growth.
3. Prices should be 'fair', in the sense that the consumer is asked to pay either what the service is 'worth' to him or her, or the cost of the power consumed. There is another sense in which equity affects pricing, which Booth explicitly refuses to treat, which is the question of income redistribution (e.g. free electricity for old-age pensioners).

The order in which we have listed these targets reflects their priority as seen from the point of view of the ESB, with (1) taking precedence over (2) and (3), and the ESB having its preference for (2) over (3), especially when the emphasis in (3) frequently is on income redistribution. In fact, the ESB's attitude to (3) is that such considerations are not properly the business of the ESB at all.

If we ignore the income redistribution question, the general result of economic theory suggests that the best way to construct a tariff system to meet these requirements may be found by making use of fixed and variable charges. Thus if, for example, we allocate the fixed costs of running the system between consumers by means of some set of fixed charges for supply, while selling power according to a set of prices meant to cover the variable costs, total costs will be equal to total revenue, while the price of power will be related to the cost of supplying it and people will be asked to pay a price which reflects the benefits derived from it. In real life this solution may be difficult to apply: there are problems of allocation of joint costs; there are variations between short-run and long-run marginal cost; there are the difficulties of persuading people to accept a tariff structure reflecting marginal cost if it involves higher rates; there are disadvantages in having a tariff structure which is complicated—and optimal pricing is difficult to separate from a complicated structure of prices.

The difficulties that arise in optimal pricing for a given capacity are compounded by the fact that prices are set in advance while the structure must remain relatively stable over time if undue costs are not to be imposed on consumers. This means that pricing decisions have capacity implications for the future, an instance being the effects of the sale of 'surplus power' at off-peak periods for storage heating during the 1960s which had the effect of adversely affecting the economics of the Turlough Hill pumped storage station. The price charged may have been equal to short-run marginal cost, but in retrospect seems to have been below long-run marginal cost, and, if it was to be maintained, required a capacity expansion to provide the power demanded at that price.

The administrative and other complications involved in implementing an optimal price system under conditions of imperfect information are such as to make it an impracticable suggestion. The existence of uncertainty exacerbates the problems, especially where demand forecasting is concerned. With the best of intentions, the price structure which is implemented will in consequence not be optimal, in all probability. One can only expect that it will be as close to being optimal as possible: '... perfection remains something outside of this world and politics remains the art of choosing between various shortcomings.'²

The implementation of a tariff structure must reflect factors other than the purely technical economic ones: 'A good tariff system must take account of the probable reactions on demand, and must in other words be realistic; it must in addition be comprehensible and manageable, otherwise it will fail in its object, however perfect it may be in theory.'³

When the ESB took over the Shannon works, and began to supply power nationally, it was faced with a bewildering variety of rates of charge in the various areas for which it became responsible. Guidance on pricing from the 1927 Act was scant. The ESB was enjoined by section 21(1) to charge such prices as would enable it to comply with its financial obligations under section 21(2). Provisions were made for ESB control of prices by permitted undertakers, and for prices to be charged (relative to existing prices) on taking over the supply of an area. There was also a prohibition on preferential treatment (section 91), whereby the ESB was obliged to make supply available on equal terms to all willing to take it in any area coming within its control. This last was potentially a serious constraint, and, as we have seen in the case of rural electrification, it had to be relaxed.

In its first report, the ESB published its principles on tariff structure: prices should be such as to make it possible for the greater number of consumers to take supply while the price charged for each purpose 'should be such as to correspond as closely as possible to the cost of supplying it for that purpose.'⁴ The widespread practice of charging different rates for supply for different domestic purposes was to be dropped. An annual fixed charge plus a low charge per unit consumed was adopted as the general rule for domestic use. Initially, Poor Law Valuation was used to calculate the fixed charge. The unit charge fixed was 2d., slightly under 0.8p in decimal currency. This, while a dramatic reduction on existing prices, was absolutely a fairly high price. If we allow for inflation, it would be about 7p in 1977. In the Dublin area, the fixed charge was higher, but the unit charge was only 1d.

In 1929, a maximum demand system of charges for industry was introduced which, it was hoped, would improve the ESB's load factor.

The financial difficulties the ESB experienced in the first couple of years' operations led the Board to raise prices in December 1931, a move which met with considerable sales resistance from consumers. one distressed salesman reported that in convents 40 and 60 watt bulbs were being replaced by 10 watt bulbs, with the expected results for the eyesight of the inhabitants.⁵ There was a sharp fall-off in the rate of increase in electricity demand and the number of new consumers. Undoubtedly, the onset of the depression was partly responsible, but the continued growth in electricity demand for motive power (the price of which had not been changed) suggested that the increase in the absolute and relative price of electricity was a major factor in this showdown.⁶ This is reinforced by the success the ESB met in increasing sales for cooking purposes when the rate was reduced by between 12½ per cent and 25 per cent (depending on area).⁷ Further reductions in price for certain types of domestic use of electricity were introduced in 1934. In general, there was a tendency to introduce reducing scale tariffs which greatly favoured intensive use of power, both for domestic purposes and for industrial and commercial power, which was in both cases accompanied by a rapid expansion in demand over the next few years. Large scale consumption for lighting purposes was further encouraged by large price cuts during 1939.

Between 1929/30 and 1939/40, the consequence of the ESB's tariff policy and public response

to it was that the average price per unit sold fell by nearly 45 per cent, from 2.66*d* (1.1*p*) to 1.47*d*. (0.6*p*). Apart from a slight rise in 1932/33 this fall was a continuous one, and despite a generally falling price level in the 1930s, the relative price of electricity fell significantly.

During the years after the Second World War, the ESB tariff system was consolidated, with inter-area differentials being removed; one exception was the extra charges in rural areas. This was the only area in which the ESB (until recently) ran into imposed price constraints. We have already seen that the government in the years from 1945 to 1950, did not allow the ESB to take inflation since 1939 fully into account in the connection charges they applied under the rural electrification scheme. At the same time, it forced the ESB to lower its rate of return cut-off point at which it would extend supply, which in effect required the ESB to engage in cross-subsidisation through pricing. The rural programme involved the ESB in abandoning its pricing policy in the post-development phase too, but this time it was due as much to pressure from within the ESB as from the government.

By and large, however, the tariff policy was its own affair until the advent of the Prices Commission, to which the ESB was required to submit applications for price increases for permission to implement them. It is to be doubted whether such a body constitutes a serious constraint on pricing, since if it accepts the ESB's financial criteria, there is little it can do other than ratify price increases made necessary by rising costs. It could, however, cause some financial problems to the ESB by postponing such increases for the duration of the application. However, one would simply expect that this would result in the ESB making its applications ahead of the time at which it needed the increase. The Prices Commission has, however, acted as a means of spurring the ESB to greater efficiency by forcing it to justify increases in prices, and might well be seen as in part supplying the missing incentive to efficiency commented on by the Fletcher report.

Prior to the Prices Commission, ESB tariff policy has twice in recent years been the subject of outside investigation. The first occasion was in the aftermath of a 7 per cent tariff increase sanctioned by the government in 1966, the first increase since 1960. The size of this increase and public reaction to it persuaded the government to establish the Electricity Prices Advisory Body, which reported to the government in 1967.⁸ This report analysed the ESB's cost structure and drew attention to the extra costs imposed by government policy on turf and rural electrification. It was critical of the ESB's depreciation policy, which was based on a somewhat conservative estimate of asset lives and which continued to depreciate assets after they had been fully written off. It also drew attention to the implications of the ESB's amortisation policy. However, with the exception of one (in our view questionable)⁹ criticism of the ESB's off-peak pricing policy, it concluded that the increases sought were justified, although it suggested that the ESB should consider voltage reductions as an alternative to what seemed an excessive margin for safety in its generating capacity.

Then in 1970/71, the Fletcher committee enquired into the ESB's affairs in general. Once again, this was the outcome of a request by the ESB to raise its tariffs. This report was somewhat critical of the remaining complexities in the ESB's tariff structure (different prices for different uses, requiring multiple wiring and metering), but in general it concluded that the ESB's basic tariff strategy was the correct one. Even in its criticisms, the Fletcher report found itself echoing views already held within the ESB, which, it was hoped, would soon be translated into a radical change in tariff structures.¹⁰ One of its more immediate recommendations was the introduction of a variation clause into the tariff structure. This was implemented, and came to be of great importance to the ESB in the years after the rise in oil prices in 1974.

The economic, political and legal complexities for the ESB of arriving at a correct pricing strategy are neatly illustrated in the following passages from a letter from the Chairman to the Minister for Transport and Power in 1970.¹¹ The context is the question of provision of energy to potential large scale industrial users, such as a smelter.

In examining the question of tariffs there are many aspects to be considered, perhaps the most important point being whether or not the securing of these industries is considered by the Government to be in the national interest. In each of the cases mentioned, practically all the production would be for export and in the case of the first Aluminium Plant a contribution of £25 million towards the national balance of payments was mentioned. In attempting to secure these industries we are in competition with countries in other parts of Europe and, indeed, in other parts of the world. Energy charges are a vital component in production costs of such industries and we are satisfied that our Standard Rates of Charge for energy would not be competitive. By costing on a marginal basis we can offer rates which are more in line with those offered by international competitors, particularly if the capital required by us to meet the demand is provided by the industry concerned. (It is possible that, in certain cases industry of this kind would consider putting in its own generating plant but there are substantial reasons also why they would wish to be part of a general supply system and there are likewise advantages to us in securing a load of this size even on a marginal cost basis.)

A decision to negotiate special rates on a marginal costing basis will certainly lead to debate on the question whether there is justification for special treatment for these industries. It could be argued that they are thereby getting preferential treatment compared with all existing industries which, through the application of the standard tariff structure, carry their appropriate share of *all* Board charges (including those for old and uneconomic plant, extra costs of turf, deficiency on rural electrification, etc.). It is felt, however, that any doubts about the legality of special treatment on the lines suggested can be resolved by making it clear that any other industry which is similar in scale and which is prepared to put up the capital required for power supply, will be accorded similar treatment. It will be evident, however, that the conclusion of special arrangements of this kind is not a matter to be determined solely by the Board on purely commercial grounds.

It will be noted that the figures show considerable variation, representing the degree of utilisation of the domestic fuel plant. The more the latter are used the lower the excess fuel and capital *cost per unit generated* they impose; however, the more they are used the greater the *overall excess cost* to the ESB system (£2.618m. in 1966/7, £2.806m. in 1967/8 and £3.374m. in 1968/9). These figures are, in our view, conservative estimates. Bristow derives his excess fuel costs by using a comparison of the fuel cost of producing power at existing oil stations on their *actual* rather than *potential* load factors. The fuel efficiency of any thermal station improves with steady as opposed to intermittent usage. Hence, we may conclude that the true excess fuel cost is higher than that given by Bristow, with similar implications for the overall excess cost.

We can also make an educated guess—but no more—at the excess transmission costs imposed. These arise because the decision to use turf effectively constrained the ESB to place the stations concerned a long way from the system load centres. Net power ‘exports’ from the area of generation suffer costs arising from power losses in transmission. In order to arrive at an estimate of the losses involved, we may either suppose that capacity equivalent to the entire turf-fired capacity was sited near the load centres (Dublin, Cork and Waterford) with power ‘exported’ then to the rural areas; or we may suppose that capacity sufficient to supply the ‘imports’ of the load centres is sited there, with power to the rural areas being supplied by a smaller mW capacity based on turf in those areas.

APPENDIX 5

Rural Electrification—the Subsidy Problem

When the ESB presented its report to the government in 1942 it was clear from the amount of effort which had gone into costings that success or failure of the scheme from the ESB's point of view depended crucially on the government's financial support. The level of support needed in turn depended on the degree of coverage which the scheme envisaged. In most areas, supply would necessitate extension of the ESB's 10kV tertiary network, which was the 'backbone' of rural electrification. Whether these were newly built, or already there, they would have to support a 'spur' 10 kV system, almost all of which would have to be built from scratch. To this would have to be added the large number of transformers necessary to convert power to 220 volts, and the installation and metering equipment for each consumer. In December 1942 the ESB estimated that the total cost of rural electrification (at pre-war prices) would be in the region of £17.1m. The estimated capital cost per dwelling ranged from £49.50 down to £34.80, depending on the density of population in the area and the existing network. This was based on the assumption that *all* houses in any area would be connected.¹

If the number of houses to be connected in any area was reduced by eliminating the very costly ones, the estimated overall cost, and cost per connection came down. If, however, for any given cut-off point in connection costs, less than one hundred per cent of the houses which qualified accepted supply, the overall cost would be reduced only minimally and the cost per connection would increase. The ESB's problems were therefore:

1. To establish the costs of different degrees of coverage.
2. To obtain the government's decision on the coverage to be offered with an accompanying subvention sufficient to meet the differences between the cost of supply and the charges which the ESB would be allowed to exact.
3. To maximise the degree to which houses which were eligible took up the ESB's offer of connection.

The first was easily achieved; and in the third, the Board's propaganda activity had a satisfactory result. The problem for the ESB which caused difficulties was the second. Indeed it may be said that the Board never found a solution acceptable to it.

The starting point of the ESB's financial calculations was the return on capital it saw as necessary to make the scheme financially viable. At 1941 interest rates, this was calculated as follows:

Interest	5.0%
Depreciation	2.5%
Sinking fund	0.48%
Other (mainly maintenance)	4.0%
	12.0%

The question arises why the ESB included both depreciation *and* sinking fund. The answer is that it sought to write off the Board's indebtedness over twenty-two and a half years and, at the same time, to build up a capital replacement fund over the life-time of the rural network. This very conservative double-counting approach reflects the provisions of the 1927 Act which enjoined the Board to provide for some development from its internal flow of funds. This continues to the present day to be a feature of the Board's accounts, and the inter-temporal welfare aspects of this approach have never been fully argued out in public.

Within the limits set by this approach, the ESB's calculations were rational, since the amounts credited to depreciation and sinking fund accounts were presumed to accumulate at 5 per cent per annum compound. Later on this was to cause the ESB difficulties, since logically a fall in

interest rates, while it would reduce the interest payable on capital advanced to the ESB would, under this system, oblige the ESB to increase the amounts charged to depreciation if the twenty-two and a half years target was to be adhered to, and to increase the sinking fund charge.

Since the latter was presumably based on a reasonable estimate of the life of the network, it was justifiable to treat the sinking fund period as exogenous. However, a fall in interest rates should be accompanied by an increase in the length of time over which the ESB felt obliged to pay back the capital advanced (since it implies a fall in the social rate of time preference). Only if the fixed period was imposed on the ESB by a government department could the ESB justify regarding this pay-back period as independent of interest rates. This matter, however, was never clarified, and it led to misunderstandings with the Department of Finance.

The Board based its calculations on detailed analysis of the four trial areas it had surveyed. It concluded from this exercise that:

1. if all the houses in any area were to be connected, existing rural fixed charges would yield approximately 10 per cent on capital;
2. if connection was confined to those houses whose connection costs did not exceed ten times existing fixed charges, the return from existing fixed charges would be around 12 per cent—but 45 per cent of houses would not be supplied;
3. the percentage supplied would rise to 92 per cent if the cut-off point was a connection cost of sixteen times fixed charges, and the return on capital would then be $10\frac{1}{2}$ per cent.

If less than one hundred per cent of eligible houses took the supply offered by the ESB, the return on capital would fall in proportion to the square root of the percentage which refused supply. Thus, at a 14:1 cut-off, 82 per cent of houses would be eligible; if all these took supply the return would be 10.8 per cent; if 80 per cent took supply, the return would fall to 9.6 per cent.

The government, therefore, had to choose between subsidising the ESB's capital costs and allowing the ESB to raise its fixed charges. In reaching a decision, the government would have to bear in mind that if it opted for higher charges, this would not only be politically unpopular, but could reduce demand significantly, perhaps even to the point of making the scheme hopelessly costly in terms of outlay per household accepting supply. The ESB advised the government that it would be unwise to seek to finance the scheme by raising fixed charges, which advice was accepted by the government.

If existing charges were to be maintained, subsidisation would have to be either by an interest-free advance from the exchequer or by an operating subsidy. The government and the ESB agreed on a subsidy in the form of interest-free advances. The degree of subvention would have to be very extensive since free capital reduced the cost of the scheme to the ESB by only the amount of interest it was not obliged to pay, given that depreciation etc. had to be provided for. If the return required was 12 per cent, and existing fixed charges yielded 10 per cent, the ESB would require approximately 50 per cent of the capital to be provided interest-free to bridge this gap.

By the end of the war it was apparent that the 1942/3 costings were much too low; the timber supply problem also imposed extra costs, since concrete poles were more expensive. However, concrete poles would involve less maintenance, and could be depreciated over a longer period. These last two factors meant a reduction in the target return of around 2 per cent. If concrete poles were used, the savings on depreciation and maintenance would be offset by a fall in the yield on capital arising from any given level of fixed charges, since the cost of the concrete poles was considerably higher. The government would, therefore, be called on to subsidise the ESB by approximately the same percentage of a much larger total investment. The government was prepared to let the ESB raise its fixed charges by only 20 per cent over pre-war levels. Consequently, regardless of the use of timber or concrete the gap between the target return and the yield of the ESB's fixed charges widened seriously. It had been estimated previously that a target

rate of 12 per cent (assuming 5 per cent interest rates) and an expected return of 10 per cent would require a subsidy in the form of 50 per cent of capital being interest-free. It now seemed that the same degree of development would result in a difference of over 4 per cent between target and yield, necessitating a subsidy of 77 per cent interest-free capital.²

With interest rates now much lower than during the war (a result of the UK Labour government's less than successful economic strategy) the government now found itself faced with a subsidy demand for nearly 80 per cent of the capital outlay, which, using concrete poles, was provisionally put at between £30m. and £40m. The Department of Industry and Commerce began to look for ways to reduce this, initially by investigating the possibility of limiting the subsidy to the 50 per cent originally envisaged, while meeting the remainder out of the ESB's operating surplus on the rest of the system, or simply subsidising rural consumers out of the revenue earned in the towns. The ESB estimated that a rise in the price of electricity of the order of 8 per cent would be necessary.

The Department of Finance became concerned at this early stage not only about the size of the proposed expenditure, but about the manner in which the figures submitted had been reached, and also about the puzzling degree to which the total sums involved seemed to change. In the eyes of Finance, Industry and Commerce had been slipshod in its approach to the whole problem:

The Minister is surprised at the completely different versions of the finances of the scheme presented in the latest memorandum. Following so soon upon a memorandum in which the post-war cost was placed at £40 million and wooden poles were said to be unobtainable, it is a surprise to learn that the cost of a scheme using only concrete poles would be, not £40 million, but £28 million and that, in fact, sufficient wooden poles are available either from home sources or from abroad, to assume 50% use of such poles, which would reduce the estimate to £24½ million. Three years after the scheme was represented to the Government as costing £20 million on the basis of pre-war prices — a representation on which the 50% subsidy provision in the 1945 legislation was based — that estimate is repudiated as unreliable and a revised figure of £14 million is furnished which had been arrived at, not by reference to any new factors, but to considerations which were relevant from the outset and to which attention was directed in this Department's minute of the 31st March, 1943. In relation to an undertaking involving such a large investment of national resources as rural electrification, there should have been a thorough appreciation of the importance of ensuring by careful analysis and presentation, in consultation with the Electricity Supply Board, that the material on which decisions as to policy were to be based should be as complete and as reliable as possible. It is regrettable that, as now appears, the project should have been presented on an altogether inaccurate and misleading basis to this Department and to the Government.³

Perhaps the Department of Finance was simply not in possession of the full facts. However, to a department not immediately involved with the implementation of the scheme, the gyrations of the cost estimates must have appeared alarming. In fact the position was that the original £17m. estimate had been quickly raised to £20m. This was the estimate of the cost of one hundred per cent coverage at 1939 prices; 86 per cent coverage with 80 per cent acceptance would cost around £14m. at 1939 prices; one hundred per cent coverage at post-war prices, based on concrete poles, would cost around £40m., while the reduced coverage would cost £28m.; if more wooden poles than had been thought possible were available, this would be reduced to £24.5m.

Part of the problem here, one suspects, lay in the less than cordial relations which existed at the time between the Departments of Industry and Commerce and Finance.⁴

Industry and Commerce, in the meantime, was trying to deal with the problem by finding ways to reduce the degree of subsidisation. One solution which was suggested was to eliminate the sinking fund requirement. Lemass asked the government to approve a decision to get the

ESB to go ahead on the basis that if the degree of subsidisation needed turned out to exceed 50 per cent, amending legislation would be introduced. The government agreed to this, and in July 1946 Lemass issued instructions to the ESB to proceed immediately with the scheme, explicitly guaranteeing that any subsidy needed in excess of 50 per cent would be provided, at first from existing government funds, but, if the need continued after two years, by subsequent legislation.⁵

So, as had been described already, the Board went ahead under the provisions of the 1945 Act, which allocated funds to meet the conservatively estimated cost of the first five years' programme.

By spring 1947, even the revised cost estimates were beginning to look too low. The ESB was now in a difficult position. Legislation provided it with authority to withdraw £5m. from government funds, half as a loan and half not repayable. The government, notwithstanding the provisions of the 1945 Act, had ordered the Board to go ahead with the scheme, even though it was now evident that completion of the first phase would require the expenditure of funds greatly in excess of that for which statutory provision had been made. The Board felt itself obliged to comply with the government's instructions.

At the same time, its policy of charging only the pre-war fixed charge + 20 per cent (as permitted by the government) began to run the ESB into further difficulties, as it met demand for connections from would-be consumers the ratio of whose cost of connection to annual fixed charges exceeded that on which the Board's costings were based. Meanwhile, Lemass had in the Dáil publicly committed the ESB to providing supply up to a cut-off point of a 16:1 ratio.⁶ The Board at first decided to supply the extra marginal consumers at no extra cost, and then, on hearing what Lemass had said in the Dáil, decided to ask for higher fixed charges in these cases. This was subsequently approved by the government.⁷

The costliness of the scheme caused the ESB to revise its basis for selection of areas for electrification in 1948. As already explained, the government had obliged the Board to adopt a wide geographic spread. Now that that had been done, the Board sought to return to a programme connecting the most promising areas first, by providing for such a ranking of areas within each rural district, with a provision that each district should undertake a minimum programme each year.⁸

By spring 1948, the results coming in bore out the contention that the 50 per cent subsidy was inadequate. To produce a break-even in districts already supplied, the subsidy would have to be around 60 per cent.⁹ This figure was less than the 80 per cent + which had been mentioned, because of returns which were higher than estimated but also, to some extent, because the earlier years of the programme had included an above average number of 'good' areas. The ESB sought to have the difference made up from transitional funds, as the government had agreed. This request was sat on by the authorities for five months. Then in October 1948, Industry and Commerce wrote to inform the ESB that the government would not alter the basis of subsidisation on the grounds that insufficient information to justify a change was available as yet.¹⁰

The increase sought was not granted, nor was money to be made available out of transitional funds. On consulting its legal advisers, the ESB was informed that the 1927 Act would not prevent them going ahead with rural electrification under these circumstances, provided they took steps (in relation to existing consumers) to ensure an overall break-even in their finances.

Negotiations on the subsidy position between the ESB and the government continued through the winter of 1948, right through 1949 and into 1950, with the government continually questioning the Board's financial procedures in a manner which suggests delaying tactics. The Board warned the government that if an increased subvention was not forthcoming, it would prove necessary to raise rural fixed charges, both absolutely and relative to urban charges, which would be very unpopular in rural areas.

Costs were continuing to rise, and the economics of the scheme (from the ESB's standpoint) were continuing to deteriorate. By spring 1950 the continuation of the programme, as far as the

Board was concerned, would necessitate an 80 per cent subvention, and a decision was urgent. The Chief Engineer (rural) wrote to the Board to give it his opinion on the matter:

No statement has yet been received from the Government as to what subsidy, if any, they will pay in excess of the 50%. The Board has a direction from the Department of Industry and Commerce to complete the scheme in 10 years after materials become available. Materials are now freely available and the Minister has said recently in public that the only factor limiting the rate of progress is shortage of technical staff. This difficulty is probably also near solution. We are working at the rate of somewhat over £1 million per annum. The Board would hardly like substantially to increase the rate of progress without knowing more definitely the financial basis for the scheme. Accordingly, if the Board is not to be put in a false position with the public, the question of the subsidy and rate of progress should be fixed without more delay.

As correspondence and enquiries from officials have failed to achieve any progress, it is felt that an approach from the Board to the Minister will be necessary if a conclusion is to be reached.¹¹

Part of the ESB's problems may have been the result of the dominance of engineers in decision-making and negotiation. As we have already seen, the government—or at least its advisers—was confused and suspicious over ESB costings, with different and apparently irreconcilable figures being quoted under different circumstances. It was also true that experience with rural electrification so far could only provide suggestive rather than conclusive evidence on subsidy requirements. The Chief Accountant wrote to the Board warning it of the weakness here of its negotiating position:¹²

There is, undoubtedly, the probability—a more suitable word might be the certainty—that the 50% subsidy at present available will prove insufficient to make rural electrification wholly self-supporting. There is not, however, in my opinion, sufficient evidence to enable assessment of the extent to which it will be inadequate.

It will be appreciated that the Minister and his officials will seek every positive evidence and a very accurate measure of the inadequacy of the present subsidy, particularly as long as the Board's Revenue Account continues to show a surplus. Mr. Dowling's report in itself, quoting as it does a variety of percentages, is evidence that stability has not been achieved. This fact was demonstrated also by the varying experiences in rural areas up to the end of the last financial year. I would not be surprised if it is the absence of an ascertained position that makes the Government officials so unresponsive.

Indisputably, it would be most desirable that the Board should know the exact financial basis on which rural electrification is being developed, but I believe that the Board would be well advised to base its policy on the known fact that it is entitled to advances up to £5,000,000 under Section 41 of the 1945 Act. Anything more than this Section provides is a matter of pure speculation.

On the basis of a cabinet committee report, John A. Costello wrote to the ESB in April 1950 to inform it formally that the government could not find any basis for increasing the subsidy. However, he left the door open by asking the ESB to discuss the matter with him if it found this decision unacceptable. The ESB took up this suggestion and subsequently met the cabinet committee. The government side indicated that it did not want to face further subsidy expenditure at that time. (The Korean War was causing general financial difficulties.) The ESB was sympathetic to this, and said that, provided a review was promised in, say, 1953, they could soldier on with funds already allocated. The review was promised, with the rider that its conclusions could not be prejudged.¹³ There the matter rested for two years.

The issue of the order of development of areas now came into dispute. The ESB had been concentrating on the most economic areas, subject to a limited geographical spread constraint. This

had been tacitly accepted by the government. However, with the change of administration in the 1951 general election, governmental attitudes changed, too. Seán Lemass was back at the Department of Industry and Commerce, and his approach to decision-making placed political and social considerations first. His views were put to the ESB Chairman in October 1951:¹⁴

I think that it is undesirable that any area should be precluded from early development because it is backward, in the sense that the small size and scattered character of the premises in it make it impossible for it to compete successfully with better-off areas, no matter what number of residents agree to take the supply.

I do not consider that it is essential to deal with the more remunerative areas first. While this may be important from the viewpoint of the Board's finances, I think that I can give you an assurance that adjustment of charges or other arrangements will be made when required to keep the Board's financial position in order.

Lemass went on to suggest that the ESB should take the number of those seeking supply in an area into account when selecting areas for development. The Board's view was that if any such change was to be undertaken, it should only be in the context of increased subsidisation.¹⁵ The ESB also felt that the definition of 'backward areas' would require some precise definition. This, naturally enough, proved to be extremely difficult.

In the end, the ESB suggested a compromise: areas would be ranked by a combination of return on investment and willingness to accept supply. This new scheme was put to the government in July 1952, and ministerial approval was given in June 1953.

By this time, the question of a review of the Board's position with respect to rural electrification had fallen due. The funds for the programme under existing legislation were exhausted in the summer of 1953. The government indicated that legislation to finance the continuation of the programme would be introduced.¹⁶ Its intention was that the programme would not only go ahead, but would be accelerated. This was because of its direct employment content and 'the advantages it would confer on the rural population.' (The government's political position was felt to be weakening in mid- to late 1953,¹⁷ and indeed Fianna Fáil lost the ensuing general election in 1954.) The ESB was easily able to step up its work in rural electrification and achieved Lemass's target of a 50 per cent increase in the rate of development within three months of being asked to do so. However, whatever the intention of the government about subsidies in 1953, the following year and a new inter-party government brought a complete change in attitudes. Industry and Commerce wrote to the Board to raise the question of abandoning the subsidies completely:

It appears that the Board's liability to repay 50 per cent of the capital cost of rural electrification, including the payment of interest, has had but little effect on the profitability of its operations as a whole. Last year, for example, the Board could, apparently, have undertaken the full liability for rural electrification and still have shown a clear net surplus of over £100,000.

In these circumstances and having regard to the fact that the expansion of sales in the future should ensure that the satisfactory position of the Board's finances will be maintained, the Minister would be glad to learn whether the Board would agree that it should be possible, without detriment to the rate of future development of the scheme, to terminate the provision of subsidy by the State at an early date (say, from 1st January, 1955), the Board undertaking as from that date to meet the full charges for rural electrification except on capital which has already been repaid to the Central Fund from voted monies.¹⁸

In the last paragraph of this letter the Minister, W. Norton, also informed the ESB that he proposed a retrospective withdrawal of the 1954 subsidy.

In a way, the ESB helped to draw this problem down on itself. Despite heavy pressure from the

government, it had found itself unable for many years to meet a request that its rural accounts should be kept completely separate. The government, quite reasonably, attached considerable importance to the matter of the accounts. In 1951 the Department of Industry and Commerce put the case as follows:¹⁹

The Minister, and the Minister for Finance, considers that the publication of the financial results arising out of the rural electrification scheme is a necessary corollary to the provision of special assistance for this scheme from public funds and he cannot accept that the technical accounting problems arising are of an intractable character. The statements of capital expenditure, revenue, etc., hitherto produced for Departmental information are admitted by the Board to be incomplete and the information regarding the rural electrification scheme published in the Board's reports must be similarly described. The absence of full accounts makes it impossible to assess the view expressed in the Board's last two reports that a subsidy of one half of the capital cost will not be sufficient to make rural electrification self-supporting. The adequacy or otherwise of the subsidy being a matter of major concern to the Minister and also to the Minister for Finance and the public, a continued failure to produce adequate particulars is extremely difficult to excuse. Having regard to the practice of other undertakings, the Minister does not understand the reluctance of the Board to present accounts for rural electrification with a specific explanation of the apportionments adopted. It is assumed that these apportionments, while in some cases of a rough and ready nature, would on the whole be reasonable. In any discussion of the question of subsidy, it would be open to either party to review the basis adopted.

The ESB had maintained that technical accounting difficulties made it impossible to provide separate accounts for rural electrification. These difficulties stemmed from the problems involved in allocating general systems overheads between rural and non-rural supply. The ESB, however, seems to have had other motives (at least for part of the time) for not publishing the accounts as requested. This reluctance was due to a fear in the ESB that the accounts, if conventionally published, would be open to 'misinterpretation'. In 1948 the Chief Accountant had written to the Chairman to say, concerning the economics of rural electrification and the accounts: 'This uneconomic nature is not disputed, nor is separate accounting required to demonstrate it. What is required is a measure of the inadequacy of the revenue earned.'²⁰ Or, one might say, figures to support the ESB's point of view. Although actual expenditure on rural electrification, and revenue from it, could be ascertained exactly, the Chief Accountant continued: 'This does not necessarily mean that it would be desirable or convenient to prepare and publish special accounts for that part of the Board's activities'. The main reason he offered for this was the overheads allocation problem, which undoubtedly was a serious one.²¹

This approach to the accounts was approved by the Directors at a subsequent Board meeting. The ESB provided the department with supplementary figures on rural operations, but did not supply complete accounts. However the Board might justify this on technical accounting grounds, it is nevertheless true that, in at least one instance, the ESB's reluctance was due to a conviction that if the accounts were presented in an orthodox fashion, the conclusion might be drawn from them that there was no need for the increased rural subsidy the ESB claimed was necessary.²²

This fear arose because depreciation on work undertaken in any one year did not enter that year's accounts, being started only in the following year. Revenue accruing, however, did appear in the accounts for the year in which it was earned. The consequence of this was an apparent surplus. This was due to the rapid rate of expansion, with depreciation, lagged one year, below its 'true' level.

Whatever the position about the accounts, as far as the ESB was concerned, the underlying economics of the rural programme had not changed. Naturally enough, the Board could not

agree with the government's decision to withdraw the subsidy. However, the government remained of the view that: '... if the subsidy were abolished, the current loss on the rural scheme would be less than one half of the capital charges and well within the capacity of the undertaking as a whole to bear.'²³

The Board continued to contest the issue through the winter and spring of 1954/5, but, in fact, a decision had been taken, and the Board's representations had little effect. In March 1955 they were informed that the 1955/6 estimates would not contain any funds for rural subsidisation. The government was quite willing to admit its true reasons for this decision: 'The government was influenced in its decision to terminate the subsidy by the urgent necessity of reducing demands on the Exchequer and confining such demands to the most essential services.'²⁴

The position for the Board was worsened by the fact that 'arrear' of subsidy had been allowed to build up, i.e. investment had been undertaken by the ESB without its getting 'free' funds. The government now proposed to wipe out the government's liability to provide these funds, so that the capital on which the ESB was liable to pay interest would be increased by £4m.

The situation was serious for the ESB. The return to capital being obtained from existing fixed charges was of the order of 5½ per cent; the loss of subsidy was equivalent to over 2½ per cent of capital employed in rural electrification; to recoup this loss would require a 50 per cent increase in fixed charges, assuming no fall-off in the number of connections, which, to put it mildly, was unlikely. A loss of around £1m. per annum on the rural account within five years seemed probable—6 per cent of total revenue, 12 per cent of rural revenue.²⁵ Not surprisingly resistance to continuing with the programme grew within the ESB. The Chief Engineer, P.G. Murphy, lobbied in favour of a cut-back. The rural organisation, while it accepted that losses would be incurred, were less anxious to retrench, seeing only minimal improvements to the ESB's financial position being achieved by such cuts. The accountants, naturally, sided with the Chief Engineer in this; their view of the likely costs of continued rural electrification were even worse than those just quoted.

The governmental financial exigencies resulted in a cut-back in the rural programme in late 1956. The ESB had already started to plan for such a cut-back during the summer. The views of the Chief Engineer and the accountants had been reinforced by the Department of Finance,²⁶ which had warned the ESB that cuts in public expenditure were coming, and that the Board's capital requirements could not be taken as being certainly met.

The ESB had already delayed its plant programme because of demand forecast revisions and now proceeded to add a rural cut-back with Finance's encouragement. The Department of Industry and Commerce, apprised of this, objected to the rural cut-back. The Secretary of that department wrote to the ESB demanding that: 'Any reductions in the expenditure of the Board that may be necessary because of present financial difficulties should be achieved otherwise than at the expense of rural electrification.'²⁷ To which, of course, the ESB's answer was—sort it out between yourselves and Finance.²⁸

During the discussions concerning the rate of reduction, the ESB's attitudes were dominated by a desire to reduce the rate at which the rural programme was being executed; the Department of Industry and Commerce, being concerned with employment, maintained pressure on the Board to go slow on any cut-back. But, in the end, and subject to some compromise, financial pressures carried the day, and a cut-back in the programme was decided on in October 1956. The compromise involved both a smaller reduction in the number of work crews than originally envisaged and also a diversion of capital from relatively profitable post-development work in existing rural areas to construction in new areas.

Although rural rates of charge had been increased by 10 per cent during 1956, the ESB estimated that it would lose 6 per cent per annum on capital invested in rural electrification. If the scheme went ahead at fifty areas per annum, it looked as if the Board would be losing around £870,000 per annum by early 1962. Industry and Commerce was at the same time asking for a

development rate of eighty areas per annum, which, had funds been available, would have raised the ESB's losses to over £1m. per annum by 1961/2.

The Board's view was that the financial burden of the rural programme was becoming unsustainable. When Fianna Fáil returned to power in 1957 the ESB sought to impress this on Seán Lemass, who, at a meeting with the Chairman, told Browne that he was aware of the Board's problems, but did not offer any hope of renewing the subsidy. He did, however, reduce considerably the number of areas to be completed annually, compared with his department's demand for eighty.²⁹ However, even the sixty areas he sought constituted, in the eyes of the Board, an impossible target, given the availability of finance. Internally, the ESB had its own reasons for wanting a lower figure: a quick completion of the programme would face the Board with redundancy problems with its construction crews. A tailing-off of the programme would enable the ESB to organise a smooth and relatively painless reduction in its rural manpower, some of whom would continue to be needed for post-development work.

During 1957, the financial aspect of the rural programme deteriorated further. By July it was clear that the loss was running at 30 per cent above estimate. For the year ending 31 March 1957 the deficit was £491,000, of which around £390,000 was due to the withdrawal of the subsidy. The estimated loss for 1961/2 was revised upwards to almost £1m. (without an accelerated programme). As part of its campaign to persuade the government to change its mind, the ESB asked its auditors, Kennedy and Crowley, to prepare a report on the cost of the rural scheme to the ESB, which was duly presented to the government. Its main conclusion was that the cost of rural electrification was so high, and growing so quickly, that it could not be financed from surpluses earned elsewhere, and consequently, that an overall loss by the ESB on its operations was inevitable within a year or two. In presenting this report, the ESB made it clear that unless the financial position was changed, they would be obliged to cease working on the rural programme.

This threat was taken seriously, and the department met the Board's representatives. It was made clear that there would be no retrospective subsidisation, but further work might be helped. At the same time, the ESB lobbied the Department of Finance about its problems. Faced with a deficit of between £500,000 and £600,000, which was likely to grow, the reaction of T.K. Whitaker, the Secretary, was that expenditure on rural electrification should be reduced, as funds for subsidisation were simply not available. Politically, of course, this was not feasible as the ESB was well aware. This was emphasised by Lemass, who told the Board that 'rural electrification could not be stopped without creating a severe political crisis'. Faced with the Board's threatened insolvency, he came round on the question of the subsidy, and declared himself in favour of restoring the sums which had been retrospectively withdrawn, saying that the Minister for Finance agreed with him. His optimism on this matter, however, was prudently tempered by a realisation that funds were scarce.

APPENDIX 6

Members of the Board of the ESB

Boyd, Liam 1976-	Golden, H. 1947-1950	Murray, Dr T. 1959-1975
Browne, R.F. 1930-1960 <i>Chairman:</i> 1930-1960	Hatch, D. 1979-	<i>Chairman:</i> 1960-1975
Cohalan, John 1979-1984	Kelleher, C. 1974-1982	Murphy, J.J. 1927-1931
Connolly, R.J. 1973-1975	Kelly, J.J. 1979-1981 <i>Chief Executive</i>	<i>Chairman:</i> 1927-1930
Digby, J.P. 1953-1963	Kennedy, H. 1927-1968	Ó Cearbhaill, B. 1959-1974
Dillon, Prof. C.T.G. 1975-	Kettle, L.J. 1934-1950	Power, G.N. 1978-1983
<i>Chairman:</i> 1975-	Kevans, P.J. 1982-	Rush, J.D. 1951-1953
Egan, P.J. 1927-1935	Lambert, C.G. 1964-1977	Ryan, A. 1982-1984
Fay, J.M. 1929-1957	Leydon, J. 1929-1930	Ryan, J.A. 1951-
Foley, J.C. 1927-1933	McCarthy, C. 1983-	Ryder, A. 1979-
Forde, Liam 1934-1950	McLaughlin, T.A. 1927-1957	Scally, S. 1975-1979
Gilmartin, T. 1979-	MacMahon, T. 1953-1976	Sweetman/Fitzgerald, Barbara 1973-1978
Godsil, R.B. 1978-1982	Moriarty, P.J. 1981- <i>Chief Executive</i>	Tonge, J.C. 1960-1969
		Wyley, J.P. 1979-

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CHAPTER TWO

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12. Details given by Cosgrave, *Dáil Debates* X, 2015.
13. *ibid.* 14. *ibid.*
15. Details given in Government White Paper, published 7 March 1924.
16. *ibid.* 17. Cabinet Minutes, 26.2.1924.
18. White Paper, 7 March 1924.
19. These disagreements are best treated in M.A. Valulis, *Almost a Revolution – The Army Mutiny 1924* (Tower Press, Kent, 1984).
20. Interview between authors and Mr McGilligan, September 1974.
21. Made available to authors. Now in UCD archives.
22. McGilligan Papers. 23. *ibid.* 24. *ibid.* 25. *ibid.*
26. Siemens Report, ESB library. 27. *ibid.*
28. Item no. 5, Cabinet Minutes, 27.9.1924.
29. Experts Report, ESB library.
30. Item No. 4, Cabinet Minutes, 11.12.1924.
31. The initial reports were in German and a team of translators had to be employed to produce the full report.
32. Details of the Crowley proposal are contained in the Experts Report.
33. *Dáil Debates* IX, 2814. 34. *ibid.*, 2824 seq. 35. *ibid.* IX, 2840.
36. *ibid.* IX, 2841. 37. *ibid.* IX, 2842. 38. *ibid.* IX, 2844. 39. *ibid.* IX, 2847.
39. *ibid.* IX, 2847. 40. *ibid.* IX, 2848. 41. *ibid.* IX, 2852.
42. *ibid.* IX, 2856-7.
43. *Irish Times*, 23.2.1925.
44. Department of Finance; ref. F35/1/25.
45. *ibid.* 46. *ibid.* 47. *ibid.* 48. *ibid.*
49. See R. Fanning, *History of the Department of Finance* (Dublin 1978).
50. Department of Finance; ref F35/1/25.
51. *Irish Times*, 24.2.1925.
52. *ibid.*, 19.3.1925. 53. *ibid.*
54. *ibid.*, 4.4.1925. 55. *ibid.*, 1.4.1924. 56. *ibid.*
57. *ibid.*, 14.4.1924. 58. *ibid.*, 27.4.1924. 59. *ibid.*, 3.4.1924.
60. *Dáil Debates* X, 1772. 61. *ibid.*, X, 1882. 62. *ibid.*, X, 2020.
63. *ibid.* X, 1959-60. 64. *ibid.* X, 1907. 65. *ibid.* X, 2035.
66. *ibid.* X, 1778. 67. *ibid.* X, 2031. 68. *ibid.* X, 2048.
69. *ibid.* XI, 882. 70. *ibid.* XI, 910. 71. *ibid.* XI, 926. 72. *ibid.* XI, 2217.
73. T. Stephens, *The Shannon Scheme in True Perspective* (Dublin 1926).
74. *Dáil Debates* XI, 1193. 75. *ibid.* XI, 1260. 76. *ibid.* XI, 2216.
77. Seanad Debates V, 292.
78. *ibid.* V, 716-7. 79. *ibid.* V, 717. 80. *ibid.* V, 718.
81. *ibid.* IV, 1079. 82. *ibid.* V, 750. 83. *ibid.* V, 751.
84. McGilligan Papers. 85. Seanad Debates V, 766.

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2. *Irish Times*, 6.5.1925.

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4. *Irish Times*, 15.9.1925.
5. *The Structural Engineer*, December 1927.
6. Details in *The Engineer*, 2, 9, 16, 23 December 1927; 23, 30 March 1928.
7. *Irish Times*, 11.9.1925.
8. *ibid.*, 26.9.1925 9. *ibid.*, 29.9.1925 10. *ibid.*, 2.10.1925.
11. P. McGilligan, interview with authors, 1924.
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15. *ibid.*, 17.10.1925. 16. *ibid.*, 20.10.1925. 17. *ibid.*, 2-4.11.1925.
18. *ibid.*, 20.11.1925.
19. *Manchester Guardian*, 23.9.1929.
20. Seanad Debates VI, 34. 21. *ibid.* VI, 109. 22. *ibid.* VI, 37.
23. *ibid.* VI, 35. 24. *ibid.* VI, 42. 25. *ibid.* VI, 45.
26. *ibid.* VI, 46. 27. *ibid.* VI, 52. 28. *ibid.* VI, 60.
29. *Manchester Guardian*, 23.9.1929.
30. *Irish Times*, 16.3.1926.
31. Shannon Board of Control files in McGilligan Papers.
32. McGilligan Papers.
33. Papers and correspondence in the McGilligan Papers.
34. Full correspondence in the McGilligan Papers.
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4. Lindsay Crawford to McGilligan, McGilligan Papers.
5. P. McGilligan, interview with authors, October 1974.
6. Memorandum to Executive Council, May 1926, McGilligan Papers.
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10. Dáil Debates XVIII, 1900.
11. Letter to T.A. McLaughlin, 1924, McGilligan Papers.
12. H.P. Boland to McGilligan, February 1926, McGilligan Papers.
13. McGilligan Papers. 14. *ibid.* 15. *ibid.*
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19. *ibid.* 20. *ibid.* 21. *ibid.*
22. *ibid.* 23. *ibid.*
24. Paper with McGilligan Papers.
25. *ibid.*

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28. In McGilligan Papers. 29. *ibid.* 30. *ibid.*
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32. McGilligan Papers.
33. Dáil Debates XVIII, 1545.
34. *ibid.* XVIII, 1548.
35. *ibid.* XVIII, 1551.
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42. *ibid.* XVIII, 2020.
43. *ibid.* XIX, 2621.

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16. Memorandum to authors, 1974.
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18. Interview with authors, 1974.
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20. ESB annual report 1931. 21. *ibid.*
22. McGilligan Papers. 23. *ibid.*
24. P.J. Dempsey, Memorandum to authors. 25. *ibid.*
26. McGilligan Papers.
27. *ibid.* 28. *ibid.* 29. *ibid.*

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4. *ibid.* 5. *ibid.*
6. *ibid.*; and interview with authors, October 1975.
7. Secretary's files, ESB library. 8. *ibid.*

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12. *ibid.*
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15. *ibid.*
16. ESB S6/04/1-22.
17. *ibid.*
18. *ibid.*; and annual report 1946.
19. Annual reports 1940-41.
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CHAPTER SEVEN

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2. Sinn Féin commission of enquiry into the resources and industries of Ireland (Dublin 1921), 43.
3. *ibid.*, 74-5.
4. *ibid.*, 77.
5. *Irish Times*, 15.11.1935.
6. ESB S6/42/1.
7. *ibid.*
8. *ibid.*
9. Borgquist to McLaughlin, 9.7.1937, ESB S6/42/1.
10. Maguire (Industry and Commerce) to Dempsey, 30.9.1937, ESB S6/42/1.
11. Dempsey to Leydon, 21.10.1937, ESB S6/42/1.
12. Memorandum, ESB S6/42/1.
13. Ferguson (Industry and Commerce) to Browne, confirming telephone conversation and Browne's minute of it, 19.1.1938, ESB S6/42/1.
14. ESB minutes of meeting 25.3.1938.
15. Board minutes and memoranda make it clear that the ESB discussed these problems at length, but did not disclose their reasons to the government; ESB S6/42/1.
16. ESB minute of meeting, ESB S6/42/1.
17. Leydon to Dempsey 25.6.1938, ESB S6/42/1.
18. Dempsey to Leydon, 5.10.1938, ESB S6/42/1.
19. ESB minutes of meeting, 7.10.1938, ESB S6/42/1.
20. ESB memorandum, December 1938, ESB S6/42/1.
21. Letter to the Board, 16.3.1939, ESB S6/42/1.
22. The lowest technically acceptable continental tender for cranes, turbines and boiler plant was £179,000; the lowest British tender was £287,000.
23. ESB S6/42/1 and Board minutes for 15.3.1939.
24. Ferguson (Industry and Commerce) to Dempsey, 29.5.1940, ESB S6/42/1.
25. Ferguson to Dempsey, 2.7.1940, ESB S6/42/1.
26. Memorandum, 4.6.1940, ESB S6/42/1.
27. Dempsey to Leydon, 11.6.1940, ESB S6/42/1.
28. Letter, 2.8.1940, ESB S6/42/1.
29. Ferguson to Dempsey, 18.9.1940, ESB S6/42/1.
30. Board minutes for 4.2.1941, ESB S6/42/1.
31. Letter, 5.2.1941, ESB S6/42/1.
32. ESB minutes of meeting between Browne and Andrews, 6.4.1943, ESB S6/42/1.
33. Lawlor (Turf Development Board) to Browne, 30.6.1943, ESB S6/42/1.
34. Ferguson to Dempsey, 10.2.1944, ESB S6/42/1.
35. Ferguson to Dempsey, 15.9.1944, ESB S6/7/10.
36. For example, see the ESB's own minutes of a meeting between the ESB, the department and the TDB on 8.5.1946. The ESB's own officers asked the Board subsequently to clarify the

points of difference between them and the TDB. In replying to this request the ESB limited itself to reference to earlier correspondence where a lucid exposition of its problems would have been more helpful. As a result in the spring of 1947 the minister was still pressing the ESB to submit plans based on water and turf alone, capable of meeting any demand that might arise. Letter 19.3.1947, ESB S6/42/1.

37. Board minutes, 23.7.1946.
38. Minutes of meeting between ESB and Bord na Móna, 4.8.1949.
39. Board memorandum.
40. Chief Engineer's report to the Board, 16.2.1951.
41. ESB minutes of meeting, 17.1.1951.
42. Industry and Commerce to ESB, 8.3.1951, ESB S6/40/3.
43. ESB minutes of meeting, 28.8.1951, ESB S6/70/3.
44. Peat fuel report, December 1951, ESB library.
45. Industry and Commerce to ESB, 25.1.1952, ESB S6/40/3.
46. Note on meeting 2.2.1952, ESB S6/53/1.
47. Industry and Commerce to ESB, 6.6.1952.
48. ESB's minute of a meeting with Industry and Commerce, BnM and the parliamentary secretary to the minister, 29.5.1952.
49. BnM report to the joint technical committee meeting, 29.5.1952.
50. ESB minutes of meeting, 15.7.1952.
51. Internal report to the Board, F. Harkin, 12.9.1952.
52. BnM submission to joint technical committee meeting, 6.10.1952.
53. Price (Industry and Commerce) to Dempsey, 28.10.1952.
54. Dempsey to Leydon, 27.11.1952.
55. See chapter 8 below, and appendix on the financing of rural electrification.
56. Thekla Beere (Industry and Commerce) to Dempsey, 6.2.1953.
57. Shanley (Industry and Commerce) to Dempsey, 6.2.1953.
58. ESB minute of meeting with Industry and Commerce, BnM and ESB, 20.7.1954.
59. Ó Cearbhaill (private secretary to Minister) to Browne, 20.7.1954.
60. Dempsey to Leydon, 19.5.1955.
61. Department minutes of meeting between ESB, BnM, Land Commission and Industry and Commerce, 7.11.1955, ESB S6/40/7.
62. ESB S6/53/1.
63. Industry and Commerce to ESB, 19.1.1956, ESB S6/40/7.
64. Memorandum, Head of Generation to Chief Engineer, 26.1.1956.
65. Industry and Commerce to ESB, 29.8.1956.

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2. McLaughlin to Irish Centre Dublin 1940. Text in ESB library.
3. ESB annual reports 1941-2.
4. ESB. S9/36. 5. *ibid.* 6. *ibid.*
7. P.J. Dowling, 'The Organisation of Rural Electricity' (November 1943), ESB S9/36.
8. *ibid.*
9. ESB S9/36/1, 2.2. 1944. 10. ESB S9/36/1.
11. Meeting between ESB and Department of Finance, 1.9.1944, ESB S9/36/1.
12. ESB S9/36/1, 28.11.1944.

13. ESB S9/36/1. 14. *ibid.*
15. Dáil Debates C, 1433.
16. *REO News*, Vol. 1, No 4.
17. *ibid.* 1, 12. 18. *ibid.* 1, 1. 19. *ibid.* 1, 2.
20. *ibid.* 1, 3. 21. *ibid.* 1, 4.
22. ESB S9/36/1. 23. *ibid.*
24. Board minutes, 10.9.1974.
25. Letter from Chairman, ESB to the Minister for Transport & Power, 17.9.1974, ESB S9/36/1.
26. *ibid.*
27. Minister for Transport and Power to Chairman ESB, 21.5.1975, ESB S9/36/1.
28. At the same time as he asked the ESB to remove the 'minor irritant' referred to, at the Board's expense, the Minister (a) conceded the general undesirability of a blanket subsidy; (b) suggested that the ESB and local authorities should inform people of the relation between siting decisions and connection costs. *ibid.*
29. Electricity (Supply) (Amendment) Act 1976.
30. Secretary of ESB to Secretary, Department of Transport and Power, 4.11.1976, ESB S9/36/1.
31. Letter, Minister for Transport and Power to Chairman, ESB, 16.12.1976, ESB S9/36/1.
32. Notes of a meeting between representatives of the ESB and the Department of Transport and Power, 4.3.1977, ESB 0/290/(5).
33. *REO News*, Vol. 14, No. 11.

CHAPTER NINE

1. Forecasts of units generated, ESB S6/00/4.
2. Price to Dempsey, 15.11.1948, ESB S6/00/4.
3. Memorandum to the Board, 23.8.1949, ESB S6/00/4.
4. The dates in this paragraph are drawn from the Organisation for European Economic Co-operation sources quoted in the *Electrical Review*, 5.7.1949, and quoted in memorandum of the Chief Engineer to the Secretary in response to queries raised by J.M. Fay.
5. *ibid.*
6. Dempsey to Leydon, 23.1.1951, ESB S6/7/10.
7. Chief Engineer's memorandum to the Board, 21.3.1951, ESB S6/00/4.
8. Department of Finance Minute, 7.12.1950, DF F100/7/50.
9. Here we assume that long-run consumption may indeed be linearly related to income per head, but with Irish consumption adjusted for income per head lower than elsewhere, the rate of increase in consumption would exceed the rate of increase in income per head. This trend would be reinforced by the subsidisation of consumption inherent in the rural electrification programme. The result, if we hypothesise a logistic function adjustment mechanism of actual to equilibrium consumption as a function of income per head, would be something akin to a constant percentage rate of increase in consumption in the early part of the adjustment.
10. Chief Engineer's memorandum to the Board, 7.8.1951, ESB S6/00/4.
11. Lemass to Browne, 4.2.1953, ESB S14/30/1.
12. Dempsey to Leydon, 14.2.1953, ESB S6/00/4.
13. Chief Engineer's memorandum to the Board, 15.12.1954, ESB S6/00/4.
14. ESB annual reports for years ending 31 March 1956, 1957, 1958 and 1959.
15. Department of Finance confidential memorandum to the ESB, October 1955.

16. Whitaker to Browne, 29.2.1956, ESB S6/00/4.
17. Note of meeting between Deputy Chief Engineer and T.K. Whitaker, 2.3.1956, ESB S6/00/4.
18. Memorandum to the Board, 2.12.1955, ESB S6/00/4.
19. ESB to Industry and Commerce, 9.12.1955, ESB S6/00/4.
20. Industry and Commerce to ESB, 23.12.1955, ESB S6/00/4.
21. Chief Engineer's memorandum to the Board, 3.1.1956, ESB S6/00/4.
22. ESB to Industry and Commerce with enclosures, 23.3.1956, ESB S6/00/4.
23. ESB to Industry and Commerce, 11.5.1956, ESB S6/00/4.
24. See arguments over turf programme in chapter 7.
25. *ibid.*
26. T. Murray (Industry and Commerce) to Dempsey, 3.7.1956; ESB S6/00/04.
27. Dempsey to Secretary, Industry and Commerce, 24.7.1956; ESB S6/00/4.
28. Murray to Dempsey, 20.9.1956, ESB S6/00/4.
29. Letter, 29.9.1956, ESB S6/00/5.
30. Murray to Gargan, 8.5.1957, ESB S6/00/4.
31. Agreed minutes of meeting, 22.5.1957, ESB S6/00/4.
32. Murray to Gargan, 30.5.1957, ESB S6/00/4.
33. Memorandum, 30.10.1956, ESB S6/00/4.
34. Murray to Dempsey, 21.8.1957, ESB S6/00/4.
35. Whitaker to Browne (Personal), 5.9.1957, ESB S6/00/4.
36. Browne to Whitaker (Personal), 7.9.1957, ESB S6/00/4.
37. Arthur Cox to Dempsey, 23.8.1957, ESB S6/00/4.
38. Memorandum to the Board, 13.9.1957, ESB S6/00/4.
39. ESB to Industry and Commerce, 18.9.1957, ESB S6/00/4.
40. Murray to Dempsey, 30.10.57, ESB S6/00/4.
41. ESB to Bord na Móna, 17.6.1958, ESB S6/00/4.
42. ESB annual report for year ending 31 March 1966.
43. The ESB and the government tried to trace these results in the archives in both Dublin and London, but they had disappeared. However, some information was available from the existing small water-power station at Ballyshannon, operated by John Myles and Company.
44. Leydon to Browne, 5.10.1938, ESB S6/08/23.
45. Browne to Leydon, 11.10.1938, ESB S6/08/23.
46. Leydon to Browne, 2.2.1939, ESB S6/08/23.
47. J. McDonald (ESB) to J.M. Jones, Director of Works, Government of Northern Ireland, 27.3.1946, ESB S6/08/23.
48. The ESB was worried that delays could result in the team working on the scheme being disbanded; c.f. ESB to Industry and Commerce, 28.3.1946, ESB S6/08/23.

CHAPTER TEN

1. Dáil Debates on the Shannon scheme White Paper, X, 1954-78.
2. This problem had been under discussion between the Departments of Industry and Commerce and of Fisheries for some time before the scheme was completed and proposals to secure the survival of the fisheries had already been discussed in detail; memorandum, J.M. Fay to Board, 24.4.1930, ESB S6/1/1.
3. From 1920 to 1927 inclusive, the average value at London prices of the annual salmon and eel catch on the lower Shannon was approximately £55,000 (memorandum, J.M. Fay to Board, 1.5.1930, ESB S6/1/1).
4. McGilligan Papers, UCD archives.
5. *ibid.*

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7. Board minutes, 10.10.1931.
8. No. 4 of 1935.
9. William Lysaght, *The Abbey Fishermen* (Teavy Press Ltd., Limerick 1964). All rights reserved. Extract reprinted by kind permission of the author.
10. In particular, of course, the principles governing compensation already set out in this 1925 Act.
11. Dáil Debates LIII, 1729.
12. *ibid.* 13. *ibid.* LIII, 1930.
14. Board report, submitted to the Minister for Agriculture and Fisheries, 'Salmon Fisheries of the River Shannon; Commercial Fishing and the Development of the Salmon Stocks', (January 1967), 1. 15. *ibid.* 16. *ibid.*
17. No salmon passed this point up to 1959; between 1959 and 1965 the fish pass count rose from 1,100 to 7,200 (1967 report, appendix 2.) 18. *ibid.*, 3.
19. *ibid.*, 5. Fishermen were openly admitting using illegal netting techniques and were pressing for them to be legalised. This activity increased *pari passu* with the salmon flow arising from the ESB's conservation efforts. Over-fishing, legal and otherwise, contributed to a decline in the salmon run on the Shannon (12,000 at the Thomond Weir in 1973; 3,000 in 1977). Greater damage, however, was being done by the exploitation of the newly discovered Greenland salmon feeding ground. (Also Secretary ESB to Secretary Department of Fisheries, 29.6.1977; copy ESB S6/1/30.)
20. Minutes of meeting; ESB S6/1/36.
21. The Board had considered the possibility of developing an oyster fishery during 1935, but had been advised that the 1927 Act did not empower them to do so (Arthur Cox to ESB, 8.2.1937; ESB S6/1/30).
22. Memoranda and correspondence 1938-9, ESB S6/1/30.
23. ESB files indicate little activity: on the main file a Board minute noting the purchase of oysters in March 1941 is followed by a belated payment of consultancy fees to a British consultant, C.W. Dodgson in December 1945, for advice given in May 1939.
24. ESB S6/1/30.
25. The Board retained outright ownership of one oyster fishery at Carrig Island, Co. Kerry. After approaches from many interested parties over the years, the ESB advertised to lease this fishery in 1970.

CHAPTER ELEVEN

1. Refer to K.A. Kennedy and B.R. Dowling, *Economic Growth in Ireland* (Dublin, Gill & Macmillan 1978), *passim*.
 2. The swing from turf to briquettes (using milled peat) in industrial and domestic markets would leave Bord na Móna with surplus sod turf capacity; minutes of meeting, ESB, Bord na Móna and Industry and Commerce, 17.7.1959, ESB S6/00/4.
 3. Bord na Móna to Industry and Commerce, 24.6.1959, Industry and Commerce PF 1349/5.
 4. Full cost of electricity per unit sent out from generating stations in October 1959 was as follows:

Coal (Ringsend)	0.52d.
Milled peat (Ferbane)	0.63d.
Sod turf (Allenwood)	0.77d.
Sod turf (Portarlinton)	0.82d.
- Source: ESB to Transport and Power, 28.11.1959, ESB S6/00/4.

5. Minutes of meeting, 5.9.1960 between ESB Chairman and officials and the Minister for Transport and Power and officials, ESB S6/00/4.
6. Bord na Móna to Industry and Commerce, 24.6.1959, Industry and Commerce PF 1349/5.
7. Memorandum—Chairman to Chief Engineer, 18.7.1959, ESB S6/00/4.
8. Secretary, Transport and Power to ESB, 25.1.1950, TP SS 4289.
9. E. Childers (Minister) to T. Murray, 6.6.1969, ESB S6/00/4.
10. Memorandum to government, 22.2.1967, ESB S6/00/4.
11. The cost of oil to the ESB (not the same as the free-market price because of long-term contracts) for these years is given in the Fletcher report, Appendix I; there is evidence that the ESB was very successful in smoothing its costs over time without, on average, paying over the odds by shrewd contracting.
12. Memorandum, 21.8.1963, ESB S6/00/4.
13. Pumped storage stations had been constructed in both western Europe and America, but for the most part these were designed to meet seasonal problems, rather than daily peak load and, therefore, were technically different in some respects from Turlough Hill. At the time of writing, further pumped storage in the ESB was under consideration but is unlikely to be introduced until nuclear power is available for pumping purposes.
14. Public interest in the works compelled the Board to construct a carpark and to provide guides, while laying down restrictions on hours at which the site might be inspected; c.f. memorandum on control visits from Chief Civil Engineer, 1.4.1970, ESB S6/00/4.
15. See, for example, a report in the *Irish Times* of 15.2.1969 on the environmental aspects of Turlough Hill. The ESB commissioned a British landscape expert, Miss Sylvia Crowe, to advise on these problems. The ESB's willingness to co-operate with Bord Fáilte (the Irish Tourist Board) and interested groups clearly reflects the lesson it learned from the controversial decision on the destruction and replacement of the Georgian buildings in which its Head Offices were located.
16. 'Pumped Storage for the E.S.B.', Siemens Schuckert, September 1960.
17. 'Pumped Storage on the E.S.B. System', ESB civil works department report, June 1963, p. 1.
18. 'Further Report on Pumped Storage Turlough Hill Project, Co. Wicklow', ESB civil works department report, June 1966, pp 10-13.
19. Authors' calculations: if efficiency is 75 per cent, then the fuel cost per unit delivered from Turlough Hill is approximately 1.3 times the fuel cost of a unit delivered to the station; then as long as fuel costs are less than 0.7p per kWh, the extra fuel cost is outweighed by the capital cost saving (0.3 of 0.7p is 0.21p).
20. 'Ireland: Electricity Supply Board — Pumped Storage Power Project', internal report of the International Bank for Reconstruction and Development (The World Bank), March 1969, 10-11. Copy ESB S6/29/1.
21. D.J.A. O'Riordan, 'Pumped Storage' *ESB Journal*, March 1966.
22. *ibid.*
23. Transport and Power to ESB, 28.3.1967, ESB S6/29/1.
24. T.K. Whitaker to T. Murray, 10.1.1968, ESB S6/29/1.
25. Assistant Chief Engineer to the Board 8.1.1970; ESB S6/29/1.
26. *ibid.*
27. Authors' calculation, same basis as in note 19 above.
28. Assistant Chief Engineer to Chief Engineer, 16.6.1971; ESB S6/29/1.
29. Generation development report (December 1972), 28, ESB S6/00/4.
30. *ibid.*
31. *Report of the Electricity Supply Board Commission of Enquiry 1961* (Chairman, Martin Gleeson) (Dublin Stationery Office 1961), PR 6867, *Interim and Final Reports of the Committee on Industrial Relations in the Electricity Supply Board* (Chairman, M.P. Fogarty) (Dublin Stationery Office 1968 and 1969).

32. Final Fogarty report, 32, ESB library. 34. *ibid.*, 69. 34. *ibid.*
35. Charles McCarthy, *The Decade of Upheaval – Irish Trade Unions in the 1960's* (Dublin 1973).
36. Final Fogarty report, 34, ESB library.
37. McCarthy, 125.

CHAPTER TWELVE

1. Memorandum prepared by Director, Generation/Transmission, January 1972, ESB S6/00/4.
2. ESB to Transport and Power, 16.3.1973, ESB S6/00/4.
3. Chairman, ESB to Secretary, Transport and Power, 2.11.1961, ESB S6/00/4.
4. Transport and Power to ESB, 9.4.1963, ESB S6/00/4.
5. Transport and Power to ESB, 24.2.1965, ESB S6/00/4.
6. Memorandum on nuclear power and electricity supply in Ireland, prepared by A.J. Harkin, Chief Engineer, ESB, and made available to Transport and Power, November 1965, ESB S6/00/14.
7. ESB to Transport and Power, 21.10.1967, ESB S6/00/14.
8. C. O'Farrelly, Canadian G.E. Ventine Project 1966, ESB P(N)/RO February 1967. C. O'Farrelly and S.F. Coakley, *Preliminary Report on the Likely Role of Nuclear Power in the ESB Generating Plant Programme*, ESB P(N)/RI April 1967. C. O'Farrelly and S.F. Coakley, *Nuclear Power Economics*, P(N)/R2 March 1964.
9. ESB to Transport and Power, 21.10.1967, ESB S6/00/14.
10. ESB to Transport and Power, 17.4.1970, ESB S6/00/4.
11. 1972 Development Plan pp 13, 14, ESB library. 12. *ibid.*
13. cf. Kerry McCarthy, 'Why the Government must speed up our nuclear Power Station', *Irish Independent* 23.1.1974: '... there is no doubt the dithering of both ... Governments ... has cost ... a lot of money ... unless the present Government treats the nuclear power project as an urgent priority, more money will be wasted.'
14. *ibid.*
15. ESB Generating Programme, December 1972. It was forecast that the nuclear power station would add 0.034p/kWh (1971 prices) to overall costs in 1981/2, and that this would decline to 0.003p/kWh by 1987/8.
16. Sigvar Eklund, Director of the International Atomic Energy Authority in Vienna, 17 January 1978: quoted in *European Report* No. 108.
17. See, for example, the report prepared by Ralph Nader, *The Nuclear Fuel Cycle*; published by Union of Concerned Scientists, Cambridge, Mass. 1973.
18. e.g. I.R. McAuley, 'Should we build a Nuclear Power Plant?' *Irish Times*, 19.12.1973.
19. e.g. Michael Viney 'Site off Irish Coast Used for Radioactive Dumping' *Irish Times*, 6.3.1975.
20. S.F. Coakley, 'The Present Status of Nuclear Power in Ireland' Paper delivered to Institution of Electrical Engineers, TCD, 20.11.1975. (Text in ESB library.) Estimated coal imports at 2 million tons a year.
21. ESB annual report, 1976/7, 5.
22. S.F. Coakley, *Nuclear Power — Current Position*, ESB Project Department; report PN/R14, September 1977, 6.
23. *Irish Press*, 30.1.1978. Speech to a Fianna Fáil Cumann meeting in Limerick.
24. See, for example, the commentary on the speech contained in the *Irish Times* report of 30.1.1978 headed 'Government go-ahead soon for nuclear power station'.
25. e.g. headlines: 'Nuclear Power Plan — County Wexford has hit the Headlines', *Enniscorthy Echo*, 3.5.1974; and 'After years of waiting, last weekend's announcement [of building the

- nuclear station at Carnsore] has been enthusiastically welcomed', *Wexford People*, 3.5.1974. The attitude of other parts of the country may be judged from the *Sligo Champion* headline of the same date, 'Easkey loses bid for Nuclear Power Plant'.
26. cf. *Enniscorthy Guardian*, 8.2. 1974; 'Nuclear Station could be big tourist attraction'.
 27. cf. speech by Brendan Corish, TD, in the Dáil 22.2.1978 Dáil Debates CCCIV, 177-85.
 28. Dáil Debates CCCIII, 1711-1722; speech by Barry Desmond, TD, also Dáil Debates CCCIII, 1733-1740 and Dáil Debates CCCIV, 173-177, speech by John Kelly, TD; also speech by Brendan Corish, TD *loc. cit.*
 29. Interview in *Cork Examiner* 18.1.1978.
 30. Dáil Debates CCCIII, 1722-1732, speech by Desmond O'Malley, TD, Minister for Industry and Energy.
 31. 'Energy-Ireland: Discussion Document on some current Energy Problems and Options', July 1978, PRL 7336. 32. *ibid.*, 66. 33. *ibid.*, 81.

CHAPTER THIRTEEN

1. Letter to the Department of Transport and Power, 16.3.1973, ESB S6/00/4.
2. Letter to the Department of Transport and Power, 27.3.1973, ESB S6/00/4.
3. Board memorandum, September 1973, letter to Department of Transport and Power, 26.9.1973, ESB S6/00/4.
4. Letter to Department of Transport and Power, 4.10.1973, ESB S6/00/4.
5. Memorandum, J.J. Kelly to Board, May 1974.
6. Board minutes, 11.6.1974.
7. Generation Development Programme Review, December 1974, ESB library.
8. Memorandum, P. J. Moriarty to Director, Generation/Transmission, 12.2.1976, ESB S6/00/4.
9. Board minutes, 13.4.1976. It was accepted that 'Our revised energy policy will be concerned not only with the choice and procurement of primary energy but also with seeking for electricity its optimum share of the market for secondary energy.' It was noted that the sales department was already involved in developing market models to produce optimal strategies for individual loads.
10. 1976 Generation development report (November 1976), ESB library.
11. Memorandum, 8.11.1971, Chief Executive to department heads, ESB 0/290 (1).
12. Board minutes, April 1973, ESB 0/290.
13. Memorandum, Head of Distribution Department to Chief Executive, 29.5.1975, ESB 0/290 (I). 14. *ibid.*
15. After long consultation with the ESB and other interested parties, the ESB's authority was extended to provision of consultancy services by the Electricity (Supply) (Amendment) Act of 1978. 16. *Irish Times*, 19.6.1975.
17. Association of Civil Engineers of Ireland to ESB, 1.7.1975; ESB 0/290.
18. Board minutes, 9.9.1975; ESB 0/290 (1).
19. Marketing strategy memorandum, 2.1.1976, ESB 0/290 (2).
20. Minutes of consultancy group, 30.8.1976, ESB 0/290 (3).
21. Report from Assistant Chief Executive to Chief Executive for Board meeting, 12.10.1976, ESB 0/290 (3).
22. Report of consultants, October 1978; reply of ESB, ESB 3/331.
23. Secretary, ESB to Secretary, Department of Transport and Power, 14.6.1976, ESB 3/3/31.
24. ESB to Prices Commission, 3.5.1978, ESB 3/331.

CHAPTER FOURTEEN

1. Good general surveys of the area are found in: Alec Nove, *Efficiency Criteria for Nationalised Industries* (London 1973); Michael Webb, *The Economics of Nationalised Industries* (London 1973); Ralph Turvey, *Economic Analysis and Public Enterprises* (London 1971). See, for example, Ralph Turvey, *Optimal pricing and Investment in Electricity Supply* (London 1968).
2. The position in the UK serves as a contrast to this: apart from the numerous books and articles on the subject, the UK government has given considerable attention to the question and White Papers have been submitted to Parliament; see for example: *Ministerial Control of the Nationalised Industries* (HMSO 1968); *The Financial and Economic Obligations of the Nationalised Industries*: (CMND 1337 HMSO 1961); *Nationalised Industries: a Review of Economic and Financial Objectives* (CMND 3427 HMSO 1967).
3. 'Marginal' cost means the increment to total cost from producing an additional unit of output; marginal value is similarly defined. If marginal cost exceeds marginal value *net* value (i.e. total value minus total cost) can be increased by reducing output; if marginal cost is less than marginal value, output should be expanded; if they are the same, output is optimal..
4. This principle has been long established. See R. Lipsey and K. Lancaster, 'The General Theory of Second Best', *Review of Economic Studies*, 1956. However, under certain assumptions it is possible to show that optimal pricing involves relating price to marginal cost (see Turvey (1971) ch. 3); a further argument for using marginal cost pricing sometimes offered is that it is at least a consistent, if arbitrary, rule; see M. J. Farrell, 'In Defence of Public Utility Price Theory', *Oxford Economic Papers*, 1958.
5. Report by the ESB Investigation Committee (Chairman, John Fletcher), (Dublin, The Stationery Office 1972), para. 4136. 6. *ibid.*, para. 4133.
7. As we pointed out in Chapter 7 above, this aspect of the ESB's finances has never been fully discussed in public, although some attention was drawn to it in the Fletcher report in 1971. What it amounts to is a requirement that an unspecified proportion of the ESB's capital requirements should be met through an internal flow of funds. It was unspecified on two counts—the amount being amortised obviously bears little relationship to capital requirements since it is some proportion of previous capital expenditure; and the volume of the funds so used depends (see the quotation from Section 21 (2) above) on what the Board 'thinks fit'.

Two aspects of this policy require investigation. In the first place, a decision to depreciate more than 100 per cent of the value of an asset over its lifetime involves asking today's consumers to pay for part of the capital cost of meeting demand in the future through prices for power which are higher by the amount of the excess depreciation. In other words, they are being taxed by the ESB. This involves an intertemporal income transfer which, *prima facie*, needs justification. The second aspect concerns the manner in which the ESB treats such funds. The ESB should not regard them as 'free', since, although the Board may not have to pay interest on them, they have a social opportunity cost, reflecting either the social rate of time preference or the return available on the funds were they to be invested elsewhere.

There is evidence, that, although the ESB does take current rates of interest into account in its investment decisions (in estimating capital costs) it ignores them where internally generated capital is concerned. For example, in 1972, comparing capital costs of oil and nuclear stations, the ESB's Generation Development Report (p. 13) explicitly removes interest and amortisation charges from that proportion of the funds for either projects available from its own resources.

Clearly, the present book is not the proper place to pursue these matters. We mention them as examples of the implications of the constraints under which the ESB has had to operate over the last fifty years which, on the face of it, suggests that the time has come to re-

examine the policy directives to the ESB and possibly to scrap and replace the 1927 Act from which, by and large, they stem.

8. Memorandum to authors from Dr T.F. Murray.
9. World Bank *op cit.*, 11.
10. Fletcher report, para. 3863.
11. Industry and Commerce to ESB, 29.5.1947, ESB S6/00/4.
12. Industry and Commerce to ESB, 15.11.1948, ESB S6/00/4.
13. Industry and Commerce to ESB, 13.4.1949, ESB S6/00/4.
14. Industry and Commerce to ESB, 11.10.1950, ESB S6/00/4.
15. Memorandum, J.J. Kelly, Chief Executive, to the Board, 9.1.1973, ESB S6/00/4.
16. Transport and Power to ESB, 30.5.1968, ESB S6/00/4.
17. World Bank, *op. cit.*, 10.
18. J.L. Booth, 'Fuel and Power in Ireland: Part I — Energy Consumption in 1970,' ERI Paper No. 30 (Dublin 1966).
19. Murray to the Minister for Transport and Power, 26.2.1963, ESB S6/00/4.
20. These plants were those of Nitrigin Éireann Teo. (15 mW); Cement Ltd. (8 mW) Avoca Mines (5 mW); Pfizer Chemicals (4 mW); and Snia Viscosa (5 mW).
21. Fletcher report. 22. *ibid.*, para. 3911.
23. Memorandum to authors from T. Murray.
24. The labour efficiency ratio declined from a peak of 1.40 in 1977/8 and 1978/9 to 1.27 in 1981/2. This reflected stagnant demand in 1980 and 1981 coupled to rising staff numbers. The latter, amounting to an increase of approximately 2,500, was in part a response to government pressure to 'create jobs' in the years 1978 and 1979 which involved the ESB taking on an extra 500 employees. The details on sales, network and consumers for the years 1978/9 to 1981/2 are as follows (1970/71 = 100):

Units sold	Consumers	Network	Staff	LER
163.8	126.1	117.4	93.1	1.40
176.1	129.4	120.0	98.2	1.37
172.0	132.8	121.4	102.5	1.33
178.2	136.1	122.8	109.6	1.27

APPENDIX THREE

1. J.A. Bristow, 'Hidden Subsidies in Irish Electricity Supplies' in A.A. Tait and J.A. Bristow (eds), *Ireland - Some Problems of a Developing Economy* (Dublin 1972).
2. *ibid.*
3. Industry and Commerce to ESB, 16.4.1938; ESB S6/00/4.
4. cf. letters, Industry and Commerce to ESB, 7.5.1945 and 26.6.1951; ESB S6/00/4.

APPENDIX FOUR

1. J.L. Booth, 'Fuel and Power in Ireland: Part II—Electricity and Turf' paper No. 34, Economic Research Institute (Dublin, August 1966) *passim*, but esp. pp 24-30.
2. International Union of Producers and Distributors of Electrical Energy (UNIPED), *General Principles Governing Electricity Tariff Framing* (1964) 58, ESB library. 3. *ibid.*, 60.
4. ESB annual report for year ending 31.3.1928, p. 14.
5. 'The Revenue Problem of the E.S.B.', internal ESB memorandum, July 1933, ESB library, Secretary's files. 6. *ibid.*

REFERENCES

7. ESB annual report 1932/3, 9.
8. *Report of Enquiry into Charges for Electricity* (Dublin, Stationery Office, 1967).
9. *ibid.* The report seems to suggest that off-peak prices should contain some element of capital cost; this is not elaborated, and difficult to understand.
10. Fletcher report, paragraph 3691, ESB library.
11. Letter, 4.3.1970, ESB S6/00/4.

APPENDIX FIVE

1. Both the capital cost per dwelling supplied and the ESB's subsidy requirement were extremely sensitive to this type of assumption. Relatively small changes in the percentage of houses taking up supply would have drastic consequences on the scheme's finances; cf. Dowling *op. cit.*
2. Board memorandum, 13.3.1944, ESB S9/36/1.
3. Finance to Industry and Commerce, 3.6.1946, DF F35/4/39.
4. For an account of these problems the reader is referred to J.R. Fanning, *History of the Department of Finance* (Dublin, Gill & Macmillan 1974).
5. Industry and Commerce to ESB, 2.7.1946, ESB S9/36/1.
6. Dáil Debates XCIX, 1525.
7. Industry and Commerce to ESB, 26.7.1946, ESB S9/36/1.
8. Memorandum W.F. Roe to Board, 29.1.1948; contents approved, 4.2.1948; ESB S9/36/1.
9. Pp 38, 39; the report suggested basing off-peak tariffs on average fuel costs rather than marginal fuel costs, i.e. to include turf, although all such units were generated in oil stations.
10. Industry and Commerce to ESB, 25.10.1948, ESB S9/36/1.
11. Memorandum, 1.3.1950, ESB S9/36/1.
12. Memorandum, 10.3.1950, ESB S9/36/1.
13. ESB minutes of meeting, 20.10.1950, ESB S9/36/1.
14. Lemass to Browne, 30.10.1951, ESB S9/36/1.
15. Browne to Lemass, 6.11.1951, ESB S9/36/1.
16. Industry and Commerce to ESB, 8.8.1953, ESB S9/36/1.
17. Budgetary problems and growing balance-of-payments difficulties were tying the government's hands, and inflation was making matters worse, ESB S9/36/1.
18. Industry and Commerce to ESB, 26.10.1954, ESB S9/36/1.
19. Copy in ESB S9/36/1.
20. See footnote 8 above.
21. *ibid.*; the allocation for overheads is not, however, an insoluble problem. One is left with the impression that it was inconvenient rather than impossible for the Board to deal with this problem satisfactorily. 22. *ibid.*
23. Industry and Commerce to ESB, 21.1.1955, ESB S9/36/1.
24. Industry and Commerce to ESB, 2.3.1955, ESB S9/36/1.
25. Memorandum, Head of Distribution to Chief Engineer, 16.3.1955, ESB S9/36/1.
26. Department of Finance to ESB, 4.8.1956, DF F35/6/54, ESB S9/36/1.
27. Industry and Commerce to ESB, 17.8.1956, ESB S9/36/1.
28. ESB to Industry and Commerce, 17.8.1956, ESB S9/36/1. The ESB's attitude to this dispute is indicated by the fact that for the next several months most correspondence between the ESB and either department was 'copied' directly by the ESB to the other department.
29. ESB minutes of meeting, 11.4.1957, ESB S9/36/1.

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