

Fifty first Annual Report For year ended 31st March 1978

ELECTRICITY SUPPLY BOARD
IRELAND

ELECTRICITY SUPPLY BOARD
Lower Fitzwilliam Street, Dublin 2, Ireland.
Telephone: Dublin 765831 and 771821

Board Members

PROFESSOR C. T. G. DILLON, M.E., C.Eng., F.I.E.I., F.I.E.E., F.I.Mech.E., Chairman

L. BOYD

R. B. GODSIL

C. KELLEHER

G. N. POWER, F.C.A.

J. A. RYAN, M.A., LL.D.

S. SCALLY, B.Sc. (Econ.)

Chief Executive

J.J. KELLY, M.E., LL.D., C.Eng., F.I.E.I., F.I.Mech.E.

Assistant Chief Executive

P. J. MORIARTY, F.C.I.S., M.I.P.M.

Directors

Commercial **M. J. SHIEL,** B.E., B.Sc., C.Eng., F.I.E.E., M.I.E.I.

Generation-Transmission **S. TINNEY,** B.E., B.Sc., M.I.E.E.

Finance **J. B. O'DONOGHUE,** F.C.C.A., A.C.M.A.

Personnel **P. J. MORIARTY,** F.C.I.S., M.I.P.M.

Secretary

J. F. WILLIAMS, F.C.I.S.

Significant Facts

	1977/78	1976/77
REVENUE		
Electricity	£210,029,000	£173,429,000
Appliance Sales (Net of Taxes)	£4,895,000	£4,609,000
Installations	£2,023,000	£2,511,000
ASSETS	£532,363,000	£466,976,000
SALES (million units)	7,330	6,783
GENERATION CAPACITY (MW)	2,540	2,290
PEAK DEMAND (MW)	1,802	1,634
LOAD FACTOR	56.1%	57.1%
CUSTOMERS	986,256	959,428
EMPLOYEES	10,845	10,759

(Cash figures are rounded off to the nearest thousand)

Prl. 7181.

ESB

Fifty first Annual Report For year ended 31st March 1978

ELECTRICITY SUPPLY BOARD
IRELAND

Contents

	Page
GENERAL REPORT	2
Electricity Production	5
Electricity Sales	6
Trading	7
Finance	9
Major Construction Works	10
Transmission	12
Distribution	13
Personnel	14
Consultancy	15
Fisheries and Conservation	16
Social Responsibility	17
Map of Systems	18
ACCOUNTS	
Profit and Loss Account	21
Balance Sheet	22
SCHEDULES	
Electricity Income and Expenditure Account	23
Trading Account	24
Statement of Source and Application of Funds	25
Statement of Capital Assets	26
Statement of Current Assets and Current Liabilities	27
Statement of Redemption of Borrowings and Sinking Fund Investments	28
Statement of Borrowings	29
Statement of Interest and Amortisation of Borrowings	30
Statement of Capital Reserves	31
Statement of Generation Costs	32
Fisheries – Commercial and Conservation Operations	33
Notes on Accounts	34
Auditors' Report	36
APPENDICES	
Number of Customers and Electricity Sales	38
Growth of Electricity Sales and Number of Customers	39
Analysis of Units Sold	40
Generation Load Duration Curves	41
Generation Statistics	42
Particulars and Performance of Generating Plant	43
Typical Daily Generation Load Curves	46
Transmission System	47
Distribution System	48
Weekly System Demand	Inside back cover

To the Minister for Industry, Commerce and Energy

In accordance with the provisions of the Electricity Supply Acts, 1927-76, the Board presents its Annual Report and Accounts for the year ended 31st March, 1978. At the conclusion of its 50th Anniversary year, the Board is happy to record a number of very satisfactory achievements. A financial surplus of £4.1 million was recorded after meeting all proper charges, thus reducing, from £8.6 million to £4.5 million, the deficit which had accumulated during the difficult years of recession; the price of electricity was reduced by 7½%; a significant improvement was made in our customer services and the consultancy service was expanded in the international field. Advantage was taken of a number of favourable factors during the year viz., buoyancy in electricity sales; stability in international oil prices; improvement in sterling parity rates; a reduction in interest rates and above average output from the hydro stations.

Growth in the demand for electricity showed an 8.2% increase over the previous year, reflecting the continuing improvement in national economic wellbeing. A price reduction in electricity charges of 2½% was effected in the Autumn of 1977 and a further reduction of 5% followed from the April/May 1978 billing period. These significant reductions were made possible by notable achievements in the management of the cash resources. Substantial forward purchases of dollars on advantageous terms, when sterling parity with the dollar was at its strongest, were made to finance oil requirements and foreign currency interest payments for 1978. The adverse changes in sterling parities since experienced have demonstrated the wisdom and prudence of the forward purchases effected with the full approval and co-operation of the Central Bank. In accordance with the recommendation of the National Prices Commission, the Fuel Cost Variation has been set at zero rate with the basic charge being adjusted accordingly.

There are indications that the outcome for the current year will be less favourable. Interest rates are beginning to rise again and the Government has initiated a reappraisal of the present pricing policy for natural gas. The immediate effect of any upward readjustment of the existing contractual price for indigenous gas to be supplied to the Board will be to add further pressure on the electricity business.

Energy:

Uncertainty about future energy sources, cost of fuel and the growth rate for electricity demand continue to be the dominant factors in planning the electricity system. Demand for electricity will depend on the pace of national economic and social development throughout the 1980's. Because of this inter-dependence it is not possible for the Board to make firm projections about the long-term demand for electricity but the Board must ensure, in the national interest, that at no time will the country be short of electricity to help its development. There are three strategic elements in the generation plan put forward by the Board – firstly, a readiness to meet an average annual growth in electricity demand over the next decade of up to 8½% per annum, if required; secondly, a maximum degree of flexibility to enable the Board to review and revise its plant and fuel programme; thirdly, in the interest of security of supply and economic cost, to have a good range of primary fuel sources. The generating plant programme already under construction, will meet future electricity demand up to the early 1980's. A programme containing the options available beyond that date was submitted to the Government in the Autumn of 1977. A central feature of the programme is the need for a national conservation effort on the use of energy generally and, in addition, it is the Board's desire to see the maximum use of indigenous resources consistent with overall economic cost to its customers. While the Government is considering the options, it has requested the Board to resume the public information programme on nuclear energy. This is currently being carried out and the Board again reiterates its policy of maintaining a completely open approach on all aspects of the energy debate and of providing the fullest possible information to the public.

The public debate in progress has been heightened by the general interest in alternative energy sources. In Ireland, additional peat supplies which will be made available to the Board as a result of the Bord na Mona Third Development Programme will be used for the generation of electricity. Substantial progress has been made in the experiments to burn low grade coal at Arigna and if these are successful, the construction of a 40 MW extension to the existing Power Station would be considered. The Cahirciveen Power Station is being used for experiments in

biomass conversion and the use of solar panels in individual homes is under investigation. Internationally, the possibilities for wind and wave power are being studied and the Board, through its membership and contribution to various international organisations, is effectively linked to the world-wide research in these areas. In the case of wave power, measurement studies by the Board off the West Coast of Ireland are being appraised. It is the Board's hope that eventually some of these sources will play a significant part in the provision of Ireland's energy needs and the Board will be glad to include them fully in its programme as soon as they are proven and are commercially and economically viable for the supply of energy to its customers. At their present stage of development, they cannot affect the basic decisions, which must be taken for the period under consideration i.e. in relation to new generation plant to be commissioned in the latter half of the 1980's.

Financial Structures:

The electricity supply industry is largely capital intensive and its growth necessitates continuing heavy levels of capital expenditure. The financial structure of the E.S.B. based on legislation provides the Board with the capacity to service existing debts and enables future borrowings to be made as necessary. A number of loan operations was on hands at the end of the year to restructure the borrowing portfolio. The primary objective of the operations is to extend the maturities of short-term loans negotiated in the recent past and to improve the ratio of sterling to other currency borrowings. The operation has been completed and gives an advantage of reducing foreign currency exposure by $60 million and of avoiding re-financing of debt which would otherwise have matured in the early 1980's. These changes in the Board's liabilities will be mainly reflected in the accounts for 1978/79.

The Board has also been examining the implications of the most recent recommendation of the Accounting Standards Committee on the subject of Inflation Accounting. This interim guideline provides for the inclusion in published accounts of a separate statement showing the financial results as amended by specific adjustments. In line with the experience of all capital intensive industries, such an approach in the Board's case would have had an adverse effect on the outcome for 1977/78 taking all factors into account. Even with a reduced rate of inflation now being experienced, the need to recognise the significance of inflation and financial results prepared on historic costs remains a matter of serious concern and importance. Consequently, the Board is considering the question of publishing a separate set of accounts in accordance with the recommendations of the Accounting Standards Committee.

Social Responsibility:

In last year's Annual Report the Board referred to its awareness of the high level of social responsibility which attaches to its role as a leading employer in the country, its significant technological base, its impact on the environment and as a large user of the national capital resources. This attitude has permeated the Board's approach to its business since its foundation and has manifested itself in many of the important decisions which have been taken over the years. Specific details of some aspects of this important area are shown in a separate section of this Report and in future years it will form a regular feature of the Report and efforts will be made to quantify the benefits.

Customer Service:

It remains a major objective of the Board's business to improve the services to its customers and the measures described in last year's Report to assist customers were refined and extended. A new budget payment plan was offered as an alternative to optional monthly billing. The Saving Stamp Scheme was extended, a new bill format was introduced and special efforts were made to respond with understanding and sympathy to the problems of customers experiencing difficulty with the payment of their electricity bills. The success of these measures from every point of view owes much to the co-operation received from customer and community organisations and from Social Welfare Officers, with whom there has been a high degree of consultation and liaison. Policy is to decentralise decision making with a view to bringing it as close as possible to the customer.

Larceny of Electricity:

It is unfortunately necessary to refer to the many instances of the

larceny of electricity which were detected during the year. The Board is concerned, not only at a serious loss of revenue which is occurring, but also at the methods being used which are extremely dangerous and can result in loss of life. Steps to detect the larceny are being intensified and prosecution of offenders is taking place.

Staff:

In anticipation of the necessary Order by the Minister under the Worker Participation (State Enterprises) Act, 1977 to introduce worker participation, the Board has put in hand the necessary arrangements to proceed with the election. Discussions are taking place with the Trade Unions in readiness for this major development.

The staff of the Board at the year end was 10,845 and the Board records its thanks to all its staff for the manner in which they performed their duties during the year and for the favourable outcome which has resulted.

Board Membership:

Mr. Richard B. Godsil was appointed a Member of the Board by the Government on 10th January, 1978 as a replacement for Mr. C. Gordon Lambert who ceased to be a Member following his nomination by the Taoiseach to Seanad Eireann. Senator Lambert had served as a Board member since 1964.

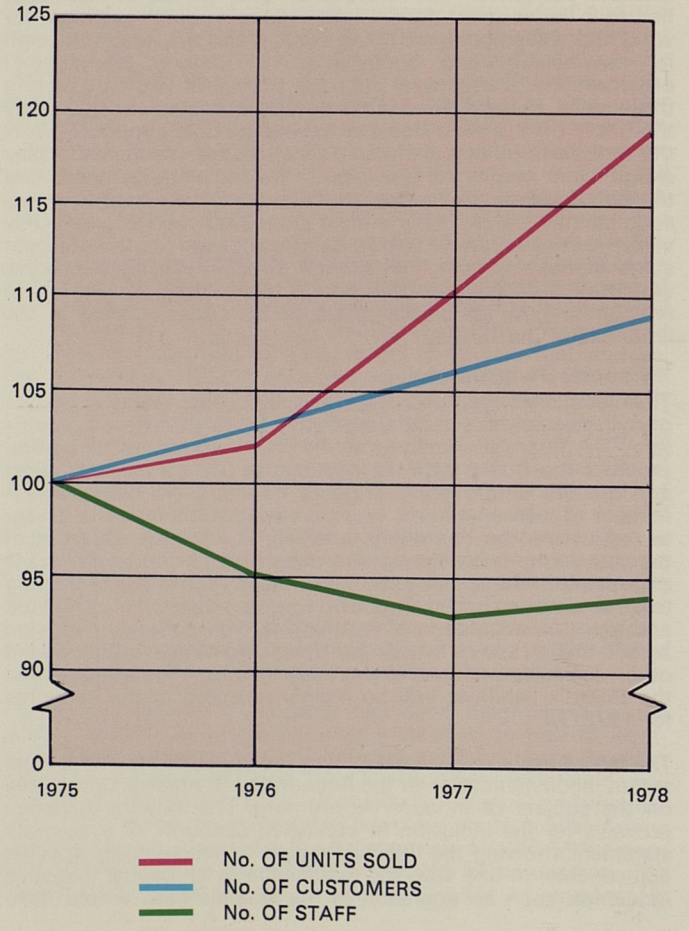
Mrs. Barbara Sweetman Fitzgerald, who was a Member of the Board for the period covered by the Report, completed her term of office on 30th April, 1978. Mr. Gerard N. Power was appointed by the Government as a Member of the Board to fill the vacancy thereby created.

(Signed) *Charles T. G. Dillon,* Chairman
Liam Boyd
R. B. Godsil
Con Kelleher
Gerard N. Power
John A. Ryan
Seamus C. Scally

(Signed) *J. F. Williams,* Secretary
11th July, 1978.

GROWTH OF E.S.B.

1975-1978



Electricity Production

System Demand required the generation of 8828 million units, an increase of 8.2% over the previous year. The recovery in electrical demand continued through the year although the growth rate was somewhat lower than the previous year.

The peak demand of 1802 MW was 10.3% higher than last year and occurred on 18th January, 1978. The annual load factor was 56.1%.

The seasonality of hydro inflows followed a similar pattern to the previous year; the low (63% of normal) inflows during the first six months were offset by very heavy inflows during the second half of the year so that total generation from hydro stations for the whole year was 3% above the historic average.

Voltage was reduced on four days in November, 1977 due to unofficial industrial action at Ringsend Generating Station. Voltage reduction was also necessary on 13th March because Tarbert Generating Station was unavailable due to mechanical faults. Appeals were made to customers to reduce consumption and as a result of their co-operation it was possible to avoid load disconnection. On three other occasions some load was automatically disconnected for short periods due to the sudden loss of generating plant.

The North/South interconnection was again unavailable throughout the year.

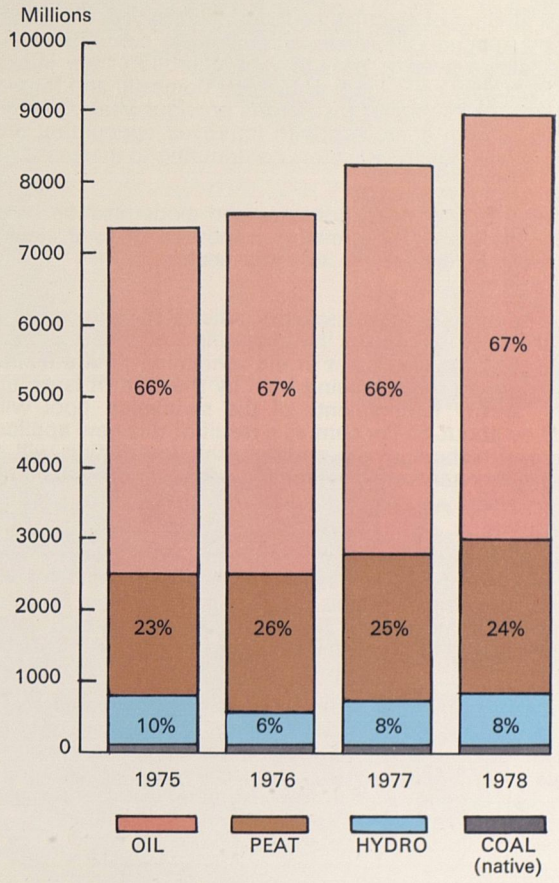
System frequency was maintained between 49.86 Hz. and 50.14 Hz for 95% of the time.

The overall thermal efficiency of conversion of primary energy to electricity was 32.0% compared with 31.1% last year.

A new 250 MW oil fired generating unit was commissioned at Tarbert and the total installed capacity at 31st March 1978 was as follows:

Hydro plant (conventional)	219	MW
Hydro plant (pumped storage)	292	MW
Steam plant (sod peat)	117.5	MW
Steam plant (milled peat)	330	MW
Steam plant (oil)	1538	MW
Steam plant (coal)	15	MW
Gas Turbine plant (oil)	28	MW
	2539.5	MW

ENERGY SOURCES UNITS GENERATED 1975-78



Electricity Sales

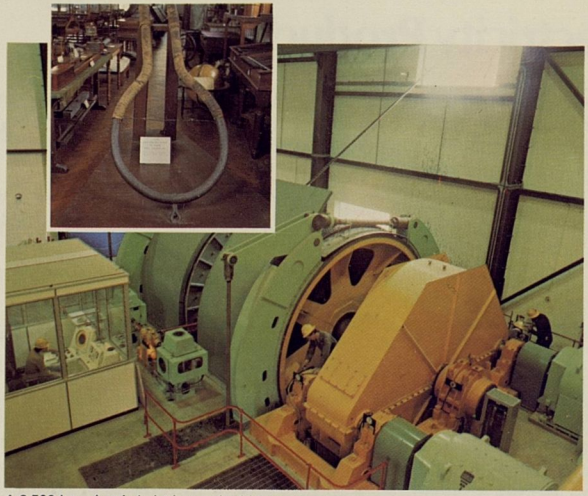
The total amount of electricity sold during the year increased by 8.1% (see Appendix 3). While all customers contributed to the increase, above average growth was recorded in the industrial sector. Electricity consumption by rural domestic and farm customers was 10.2% higher than in the previous year. Continuing economic growth combined with improved agricultural output and prices were the main factors contributing to increased sales.

The introduction of new industries and modernisation of older ones is reflected in the growing proportion of total electricity sales which are made to the industrial sector.

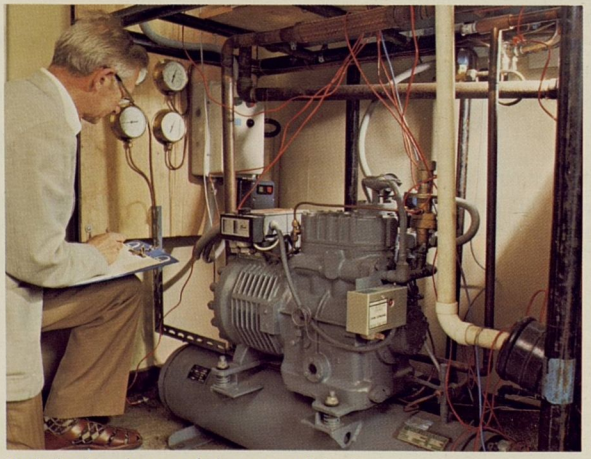
As a contribution to the objective of national energy conservation the Board has encouraged the installation of a heat pump and ozone water treatment plant in the swimming pool attached to the new sports complex being built by the staff. It is estimated that the energy requirements of the swimming pool will be reduced by about 50 per cent as a result of this new application of electrical technology. In addition, this installation will set a new improved standard in swimming pool environment.

During the year, a study was carried out of the research programme being undertaken by a German undertaking on air-to-water heat pumps in domestic premises, as a result of which work has commenced on the installation of two such heat pumps in domestic premises here. It is expected to have both installations operational for the coming heating season.

The Board continued its examination of controlled systems, solar assisted systems and district heating. It is hoped that those responsible for insulation levels in buildings will contribute towards more efficient energy usage by reducing building heat losses. This would result in lower running costs and make the capital costs of new heating systems more acceptable.



A 2,500 h.p. electric hoist in a major Irish company and (inset) the world's first electro magnet developed by Fr. Callan at Maynooth College in 1834.



Monitoring the performance of a heat pump at University College, Galway as part of an ESB/UCG energy conservation project.

Trading

The three activities – appliance sales, appliance repairs and installations contracts – showed a combined net loss of £314,192 on a turnover of £7,844,324. In the previous year, there was a combined net loss of £97,145 on a turnover of £7,910,232.

The Board's review of trading policies continued during the year and it considers, in spite of the difficulties being encountered, that it is in the customers' interest and the interest of the industry generally for it to provide trading services. New policies are being implemented to allow the continuance of these activities while meeting the need to operate profitably.

Appliance Sales:

The volume of sales in the second half of the year exceeded targets, but the increase was not sufficient to offset the reduction in business in the normally more profitable first half – this experience was common to the retail electrical appliance trade.

Turnover increased from £4,609,137 to £4,894,520 and the result was a net loss of £39,649 compared with a net profit of £48,333 in the previous year.

Appliance Repairs:

Progress towards the objective of breaking even on the activity was maintained. The turnover for the year was £926,557 and a loss of £117,471 was incurred. In 1976/77, the turnover was £789,707 with a loss of £118,343. The financial results do not accurately reflect the progress made because delay in obtaining the sanction for price increases in line with the National Wage Agreement caused a substantial loss of revenue.

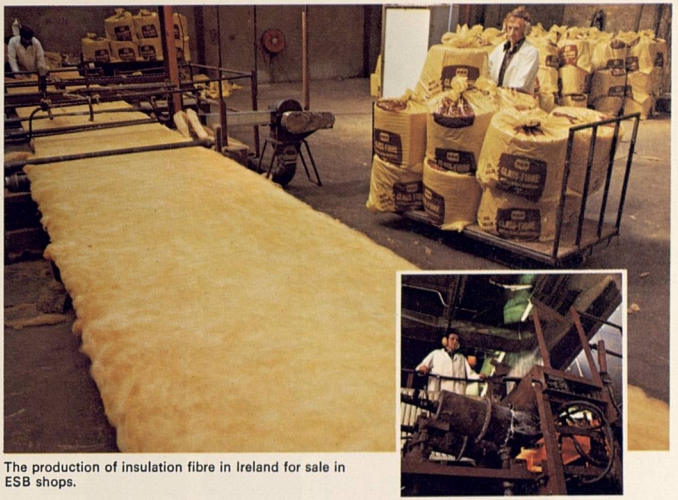
Methods and techniques are being continuously updated and refined in order to improve the quality and efficiency of service.

Installations Contracts:

The Board's Contracting Service had a difficult year.

The recession in the electrical contracting market was reflected in the reduced turnover of £2,023,247. The outcome for the year was a loss of £157,072 compared with a loss of £27,135 in the previous year.

Revised policies for this activity were decided by the Board during the year. These policies are designed to meet the changing situation.

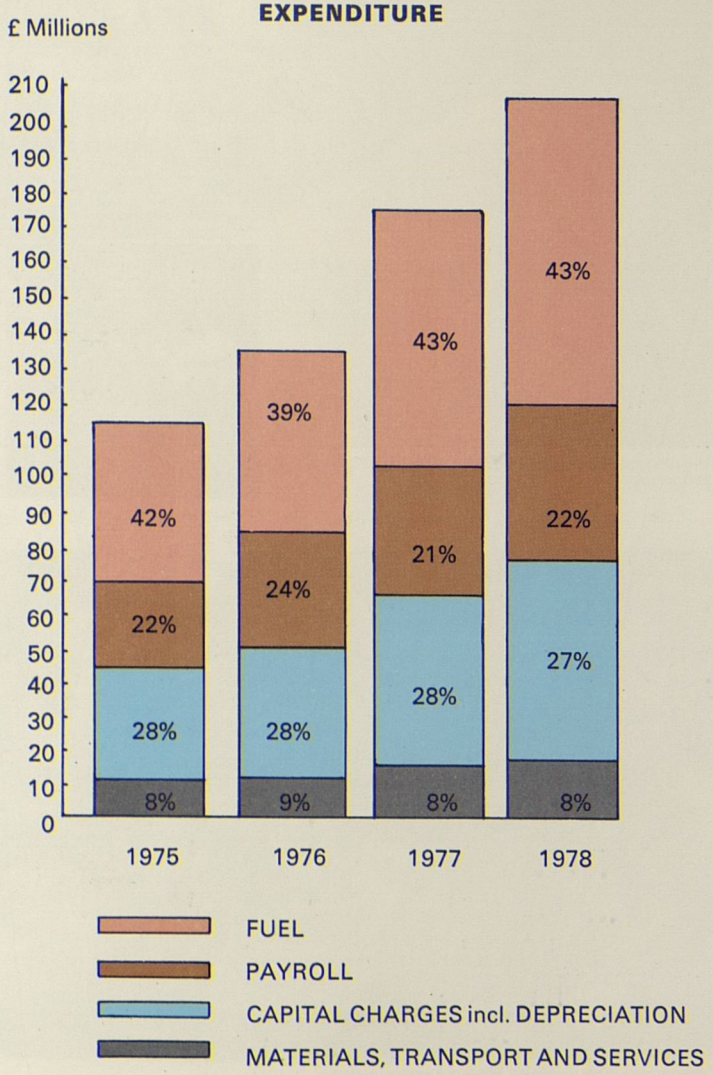


The production of insulation fibre in Ireland for sale in ESB shops.

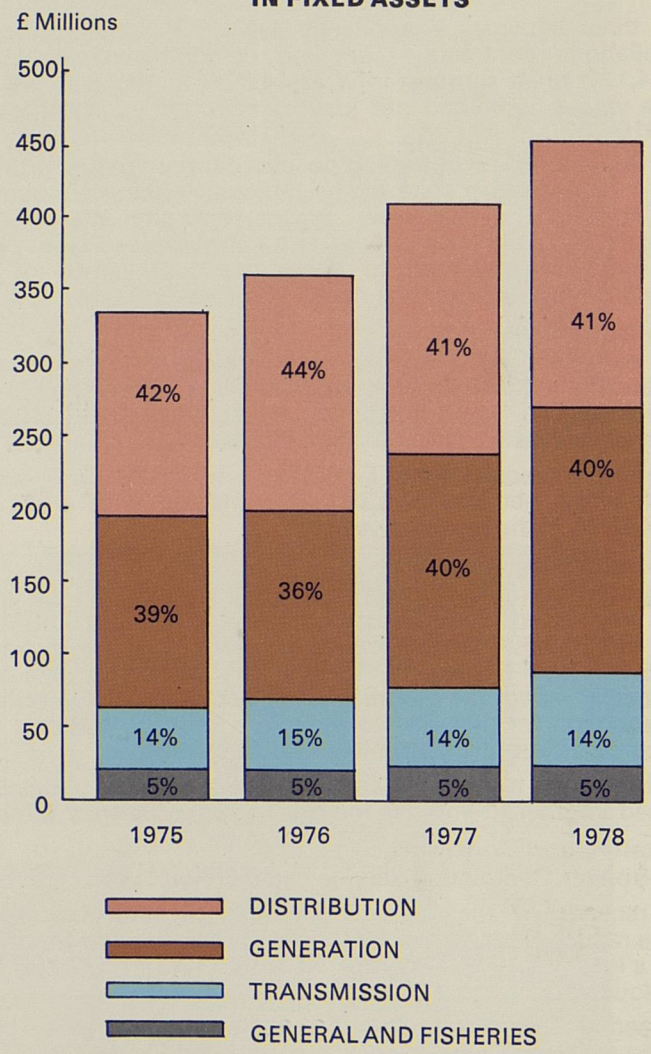


Cookers, with high insulation levels for energy saving, being manufactured in Ireland for the E.S.B.

EXPENDITURE



CAPITAL INVESTMENT IN FIXED ASSETS



Finance

Revenue Income and Expenditure

Revenue Income was £210,900,762, an increase of £36,795,322 over the previous year while expenditure at £206,829,292 showed an increase in the year of £31,602,594.

Summarised figures are as follows:

	Year Ending 31st March, 1978	*Preceding Year*
	£	£
Expenditure:		
Fuel	87,996,276	76,023,268
Payroll and other direct costs	62,122,849	51,248,873
Capital charges including depreciation	56,710,167	47,954,557
	206,829,292	175,226,698
Revenue Income	210,900,762	174,105,440
	4,071,470 (Surplus)	1,121,258 (Deficit)

After taking account of capital appreciation on temporary investment and of losses on trading activities and deducting expenses on new borrowings, the result for the year was a surplus of £4,073,219, which decreases the total deficit carried forward to 1978/79 from £8,636,982 to £4,563,763.

Capital Expenditure:

Expenditure in the year was £67,358,564. After allowing for retirements of assets of £1,971,234 investment in capital assets increased to £532,362,970(See Schedule D).
Assets brought into commission during the year were £43,871,655 bringing the total value of assets in service at year end to £451,930,586. Work in progress was £80,432,384; work approved amounted to £674,784,959 leaving £142,421,989 of approved work to be completed.

The Electricity (Supply) (Amendment) Act 1974 authorises capital expenditure of £700 million for general purposes.

Expenditure in the year was financed by:

(a) balance of Funds forward (Ref. – Schedule E).

(b) internal resources arising mainly from charges for depreciation of assets and from supply contributions (Ref. – Schedules D and I).

(c) issue of redeemable public stocks on the home market (Ref. – Schedule G).

(d) private placement with American Financial Institutions. (Ref. – Schedule G).

(e) final drawing of a loan from the World Bank (Ref. – Schedule G).

(f) project finance from banks/suppliers for the purchase and erection of major plant (Ref. – Schedule G).

(g) deferred instalment of rural subsidy and a special payment (£300,000), under Electricity Supply (Amendment) Act 1976.

Major Construction Works

Further progress was made on the Generating Station Construction Programme and at the end of the year the position was as follows:

Tarbert Generating Station Extension, Co. Kerry (Oil fired) 2-250 MW Sets:

The second 250 MW unit was commissioned in April 1977 and the Station Extension was formally opened by the Minister for Industry, Commerce and Energy in October 1977.

Poolbeg Generating Station Extension, Dublin (Oil fired) 1-270 MW Set: (The capacity of the existing station is 2-120 MW Sets).

Erection of the main plant was almost completed and work had commenced on the early stages of the plant commissioning programme.

The extension was scheduled to be completed in late 1978 (i.e. the original target completion date).

Aghada Generating Station, Co. Cork (Gas fired) 1-270 MW Set:

The civil engineering work associated with the main plant was completed. The marine works, the construction of the chimney and administration building and the erection of the boiler plant had commenced.

The station was scheduled to be completed in 1980/81.

Marina Generating Station Extension, Cork (Gas fired) 1-83 MW Set: (The capacity of the existing station is 2-30 MW Sets and 1-60 MW Set).

The main civil engineering work was almost completed.

Erection of the gas turbine and waste heat recovery boiler had commenced. The conversion of the existing boiler to allow for the use of natural gas was completed.

The plant was due to be commissioned on target in late 1978.



Poolbeg Generating Station, Dublin, where a 270 MW extension is nearing completion.

Extensions to Shannonbridge (Co. Offaly) and Lanesborough (Co. Longford) Generating Stations (Milled Peat fired):

The Minister for Industry, Commerce and Energy approved the construction of further extensions to these stations.

The scheduled completion dates were 1982/1983 (Shannonbridge) and 1984/1985 (Lanesborough).

Parteen Weir, Co. Tipperary:

The main plant for the small (0.6MW) hydro generating set on the River Shannon at Parteen Weir has been ordered.

The plant was due to be commissioned in 1979.

Coal Fired Generating Station:
The initial design concepts for a major station capable of using coal or oil were under investigation.

Nuclear Generating Station Project:
Work continued on the investigations into this project and on its progression through the various planning stages.

Investigations:
The utilisation of the additional peat supplies which will become available as a result of the Bord na Mona Third Development Programme has been under examination by the Board. During the year the Government approved the construction of extensions to the stations at Lanesborough and Shannonbridge.

Further investigations were carried out during the year in conjunction with Arigna Collieries Ltd., into the possibility of using low grade "crow coal" from the Arigna, Co. Leitrim area for electricity generation. A final series of tests were scheduled to take place by next Autumn using the fluidised bed combustion technique. If these are successful the construction of a Generating Station fired by "crow coal" with an approximate capacity of 40 MW would be considered. There is only one Power Station of this magnitude in the world at present which uses the fluidised bed combustion technique. The Arigna coal has several unusual features – it has a high ash melting point (1500°C), over 55% inert material in the fuel and negligible sulphur.

The possibility of developing further small hydro-electric schemes is under investigation at present.

Other Energy Sources:
The Board continued its investigations into the possibility of using new sources of energy for the generation of electricity.

Design information on wave energy developments at home and abroad was being studied.

The research project on biomass conversion continued at Cahirciveen 5 MW station.

The monitoring of developments in wind energy, solar energy, etc., continued.



An 83 MW gas turbine (equivalent in capacity to the entire Shannon Scheme) being delivered to Marina Generating Station, Cork City.

The natural gas fired Generating Station under construction at Aghada, Co. Cork.



Transmission

220kV Transformer Stations

Construction work was nearly completed on two new stations at Finglas, Co. Dublin and Cashla, Co. Galway and on the major extension at Poolbeg, Dublin; commissioning was scheduled for 1978/79 in all cases. The 310 MVA generator transformer at Poolbeg will be the largest transformer on the Board's system. Design work continued on two new stations at Flagford, near Carrick-on-Shannon and Aghada, Co. Cork; construction was due to commence in 1978/79.

Further extensions of three existing stations are planned.

110kV Transformer Stations

Two new stations (at Cobh and Aghada), and an extension of the existing station at Whitegate were commissioned during the year. The station built under contract for Nitrigin Eireann Teoranta at Marino Point was completed.

Work was in progress on the extension of stations at Marina and Thurles. New stations at Enniscorthy and Fermoy and the extension of the Rathkeale station were at the design stage.

The switchgear and relay protection changes associated with the direct earthing of the 110kV system continued in all existing stations.

Lines

The Tarbert-Knockraha 220kV line (143 Kms.) was completed and commissioned. The 220kV line from Tarbert to Cashla (96 Kms.) was almost completed and was due for commissioning in June 1978. Work had commenced on the 220kV double circuit line from Aghada to Knockraha (26 Kms.); work was due to commence on the 220kV lines from Knockraha to Ringaskiddy (20 Kms.) and Cashla to Flagford (88 Kms.). Survey work was in progress on the 220kV line from Flagford to Louth (110 Kms.).

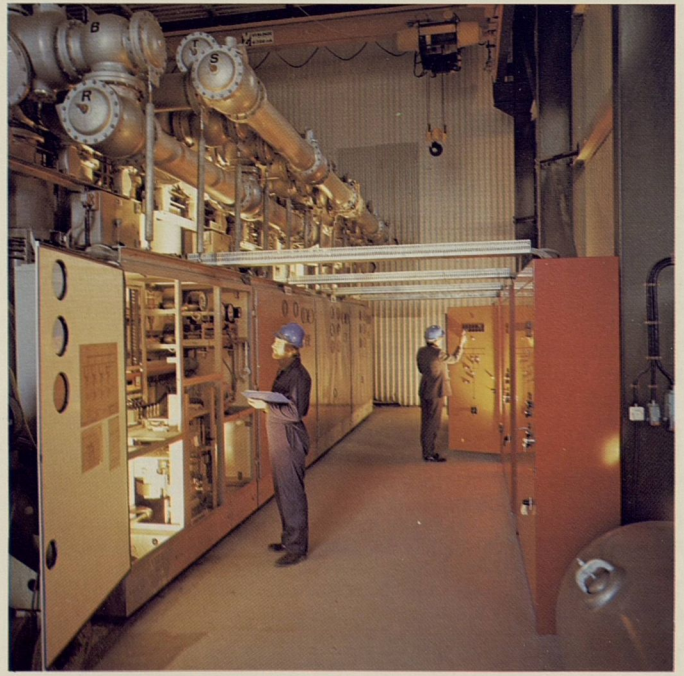
During the year 29 Kms. of new 110kV lines were erected and commissioned. A further 70 Kms. were under construction at the end of the year. The work of reconstructing the old (pre 1939) copper-conductored lines continued and 21 Kms. were decommissioned and replaced by new lines.

Cables

Work commenced on the construction of the 220kV submarine cable crossing of the River Shannon at Tarbert which was referred to in last year's Annual Report. Two pipe lines, approximately 2.2 Kms. in length, were constructed on the North Shore. These were pulled simultaneously on to a prepared bed on the river bottom in readiness for the installation of the cable in the Summer of 1978.

Pipe installations for the Poolbeg-Finglas 220kV cable were almost completed and cable installation had commenced. A short section of 220kV oil filled cable was installed and commissioned to connect the new generator transformer at Poolbeg to the switching station.

Tenders were sought and orders placed for the 220kV cable for installation at Aghada and for the Ringsend-Poolbeg 110kV cable connection.



Totally enclosed 220kV switchgear (the first of its kind in Ireland) which was installed recently at Poolbeg Generating Station, Dublin.

Distribution

A severe snow storm in mid February caused a prolonged loss of supply to approximately 67,000 customers, mainly in the Cork, Waterford and Wexford areas. Work on the restoration of supply was hindered in the early stages by the extremely difficult snow conditions and later flooding delayed work in the Wexford area where the longest outage occurred. Repair crews from unaffected areas of the country were brought in to assist local staff in restoring supply as quickly as possible. It was noticeable that those areas where the comprehensive planned maintenance programme had been completed were less affected by the snow storm than other areas.

During the year new and quicker methods of locating faults and repairing equipment were developed for Irish conditions. One of these was a van specially equipped with a range of sophisticated instruments for the location of underground faults. The operator is provided with a choice of methods, and as a result, the average time taken to locate underground cable faults has been greatly reduced to the benefit of the customer.

An electricity supply system, similar to those on the other Aran Islands, was built and commissioned on Inishmaan by the Board who acted as Consultants/Contractors for the Diesel Generating Station and the overhead networks. The scheme was financed by Roinn na Gaeltachta and is run by Comharchumann Inis Meain Teo.
The Board continued its policy of encouraging Irish industry. The total value of orders issued was in the region of £48 million of which over £31 million went to Irish firms. As a result of the Board's initiative announced in last year's Report, it was possible to place trial orders with Irish firms for materials which were previously imported.

The work involved in reinforcing the Distribution System to cater for new customers and increased demand from existing customers is considerable and is comprised of a large number of relatively small reinforcement projects. The volume of work increased by 3% compared with the previous year and the total number of new houses connected was 26,000 compared with 23,500 last year.



Line fault detection can be carried out rapidly with the aid of compact equipment (inset) designed by E.S.B. staff.

Rural Electrification:

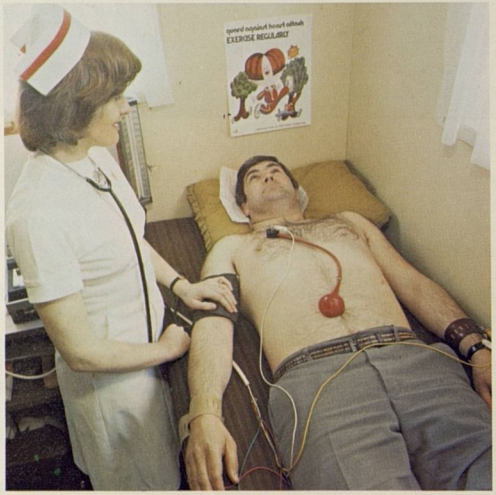
Work under the Electricity Supply (Amendment) Act, 1971 was completed during the year and work continued on the provision of supply to approximately 1,500 applicants who were eligible under the Electricity Supply (Amendment) Act, 1976. When this work is completed more than 400,000 rural premises will have been provided with electricity since 1946.

Electricity supply has enabled the rural dweller to avail of piped water, television, and all modern domestic appliances as well as lighting, cooking and heating. It has also been a major factor in the development of agriculture.

In March, 1978, revised arrangements for applicants seeking unsubsidised supply were approved. This will result in more favourable terms to many applicants.

Personnel

It was a satisfactory year on the Industrial Relations front with claims and disputes being processed in an orderly manner and settled through the machinery agreed with the Trade Unions. In Ringsend Generating Station, however, some shift workers took industrial action which reduced seriously the availability of plant but due to the co-operation of the public in reducing demand, interruptions to supply were avoided. Once again, the Board acknowledges the critical role played by the Industrial Council under the Chairmanship of Mr Con Murphy in the maintenance of industrial peace.



The Irish Heart Foundation's Mobile Mediscan unit in operation at an E.S.B. premises.

The increased demand for electricity and the expansion of Board activities which had been curtailed during previous years, provided the opportunity for some additional recruitment of staff. The special scheme for voluntary early retirement was concluded.

The groundwork for an extensive programme of job evaluation for some categories of staff in the technical and supervisory areas was completed with the adoption by the Board and the unions of a jointly-developed scheme. The initial programme of evaluation was well under way by the end of the year, with the full co-operation and participation of the unions and the staff in the categories concerned.

The expected major development in employee participation – the election to the Board of employee members under the Worker Participation (State Enterprises) Act 1977 – had not taken place by the end of the year as the Ministerial Order had not been made. However, arrangements for implementing the Act in the Board have been discussed with the trade unions in preparation for the Minister's decision.

A Board-wide survey of staff attitudes was carried out in May 1977. A representative sample of 1,773 staff gave their views on a wide variety of work related topics. The results will serve to identify priority areas for attention in maintaining a satisfactory management/staff work climate.

Staff in the Board at the 31st March 1978 totalled 10,845.

Consultancy

The initial impetus to the Board's involvement in the consultancy business came from the reduction in development at home during the recession of the mid seventies. It provided an opportunity to protect employment, and encourage staff development. With the resumption of load growth and the gradual reduction in staff numbers, the phase of protecting employment has passed, but the benefits to the Board and the country from consultancy are such that a decision has been made to remain in this business.
The Board has significant advantages in marketing consultancy services mainly as a result of its policy of developing native expertise in all areas of its operations. The Board's organisation is also of a comparable size to organisations in other countries seeking these services. Involvement in overseas consultancy contributes to the main electricity trading account, earns foreign currency and assists other Irish firms in the national export drive.

It is hoped to expand the Board's overseas activities considerably over the next few years through a continued marketing effort.

During the year over one hundred staff worked overseas on consultancy projects on a long or short-term basis. In many cases staff on long-term assignments were accompanied by their families. Over seventy members of overseas utilities attended training courses in Ireland. Assignments during the year included:

Bahrain: Work continued on all aspects of this assignment for the Bahrain State Electricity Directorate, which includes consultancy services relating to transformer stations; the training of Bahraini staff; temporary loan to the Directorate of engineering, accounting and technical staff; and consultancy reports prepared in Ireland on a wide range of engineering, financial and commercial matters. In addition, the Board has been awarded contracts for the design of a major Load Despatch Centre and seven-storey building; and in association with a leading Swiss consultant, for studies and investigations relating to a large power station development. There are at present about 50 ESB staff in Bahrain, including 25 with families.

Saudi Arabia: During the year work commenced on this assignment which covers tender analysis, supervision of erection and commissioning for the rural electrification of the Baha region of Saudi Arabia. Tender analysis has been completed and design review and site work are on schedule. At the end of the year there were 14 ESB staff in Saudi Arabia, 4 of whom were accompanied by their families. The Board has recently accepted an offer to do similar work in the Al Kharj Region, near Riyadh. The contract in Saudi Arabia will last for about three and a half years.

Others: Work continued during the year on the Management Consultancy Contract with the National Power Corporation of the Philippines and the training programme for Nigerian staff. Training courses were provided for Tanzanian and Bahraini staff and two members of the Board's staff are on secondment to the Lesotho Electricity Corporation acting as Managing Director and Chief Accountant. Consultancy services were also provided at home in areas where the Board has specialised expertise.



Staff from the Bahrain State Electricity Directorate receiving training at an E.S.B. cable jointing school.

Fisheries and Conservation

The total expenditure on Fisheries and Conservation amounted to £413,295. Income from the sale of salmon and eels was £134,070 and miscellaneous income amounted to £7,661.

It was another bad year for salmon with a further decline in landings. The Board's catch on the River Shannon and the salmon run on the River Erne were the lowest ever. The salmon run on the Liffey did not alter significantly. The Board has commented in many previous reports on the decline in salmon stocks and expressed its view that the main reason for the decline was the lack of any effective regulation of salmon fishing at sea. The Board wishes to record its appreciation of the action which the Minister for Fisheries is taking to remedy the situation.

The Board again did not fish the Clady or Erne in the interests of stock conservation. In its view the poor returns in recent years from the River Erne would warrant conservation measures such as a ban for a number of years on public netting in the estuary.

The beneficial effect of the hatcheries at Parteen and Carrigadrohid on the development of salmon stocks in the Rivers Shannon and Lee is significant – during the year 20% of the catch at Thomond Weir and a much larger part of the run in the River Lee were hatchery reared.

The total eel catch was 15% lower than the previous record year; income from sales was higher, mainly because of increased prices.

There was further progress in the salmon rearing project sponsored jointly by the Board and Gaeltarra Eireann and the first year's crop of 10,500 salmon was sold. Difficult problems remain to be solved, particularly those relating to losses of young salmon and early maturation. Experimental work in these areas is continuing.

During the year the Board approved a five year development plan at an estimated additional cost of £500,000.

The Board continued its activities in the field of water pollution control; it is expected that these will be at a lower level in future with the coming into operation of the Local Government (Water Pollution) Act, 1977 and the increased responsibility being given to local authorities in this matter. The Board hopes that they will be given all the resources they require to discharge this important function.

The Board's annual Fisheries Report, published separately, deals with these activities in more detail.



Fin-clipping of young salmon at an E.S.B. hatchery and rearing station.

Salmon angling on the River Shannon.



Social Responsibility

While the Board's primary role is the provision of an electricity service, it also accepts the social dimension of its activities and continued to expand this during the past year.

Energy conservation, the promotion of jobs and of industrial expansion, the combatting of inflation, and the protection of the environment continued to be major tasks for the community. The Board records some of its contributions to these.

In the interest of energy conservation, the Board no longer promotes the use of electricity per se, even though this puts added pressures on the business, and it now directs its marketing campaigns to the wise use of energy and the effective reduction of load peaks.

Special encouragement and assistance continues to be given to Irish industry and results were evident during the year. An example was the outcome of the major construction programme just completed at Tarbert generating station; the Board succeeded in raising the percentage of orders to Irish sources to 53% (£23 million) of the total prime cost of the station, a significant achievement considering the high level of technology involved. During the year there was an open display to Irish industry of the range of goods which the Board still finds it necessary to import; however, 65% of total material purchases are now procured in Ireland.

The consultancy activity was initially undertaken to forestall the possibility of having any excess expert capacity during the recent recession and this activity is now being expanded to provide extra jobs and spin-off to Irish industry.

The Board's considerable training facilities are being used more extensively by outside interests.

Electricity prices were reduced by 7½% during the past year and thereby helped to offset inflation.

The impact of continued high costs for energy was further recognised by the introduction of special measures to deal on a personal basis with genuine cases of hardship.

New designs for networks and sub-stations were developed to improve the visual impact on the environment.

The Board maintains defined policies and codes of ethics for its social responsibility to its staff, its customers and to the community. It includes specific programmes in its schedule of plans as, for example, improvements in welfare and human relations (e.g. its alcoholism programme carried out with the co-operation of the National Council for Alcoholism, pre-retirement courses), promotion of safety to the customer and to the public, decentralisation of activities from Dublin, and follow-up on the social implications of the Rural Electrification Scheme.

General outline of the

GENERATION and TRANSMISSION SYSTEMS

31st March, 1978

HYDRO STATIONS

STEAM STATIONS

STEAM STATIONS PROJECTED

PUMPED STORAGE STATION

220 KV TRANSFORMER STATIONS

220 KV TRANSFORMER STATIONS PROJECTED

110 KV TRANSFORMER STATIONS

110 KV TRANSFORMER STATIONS PROJECTED

220 KV LINES

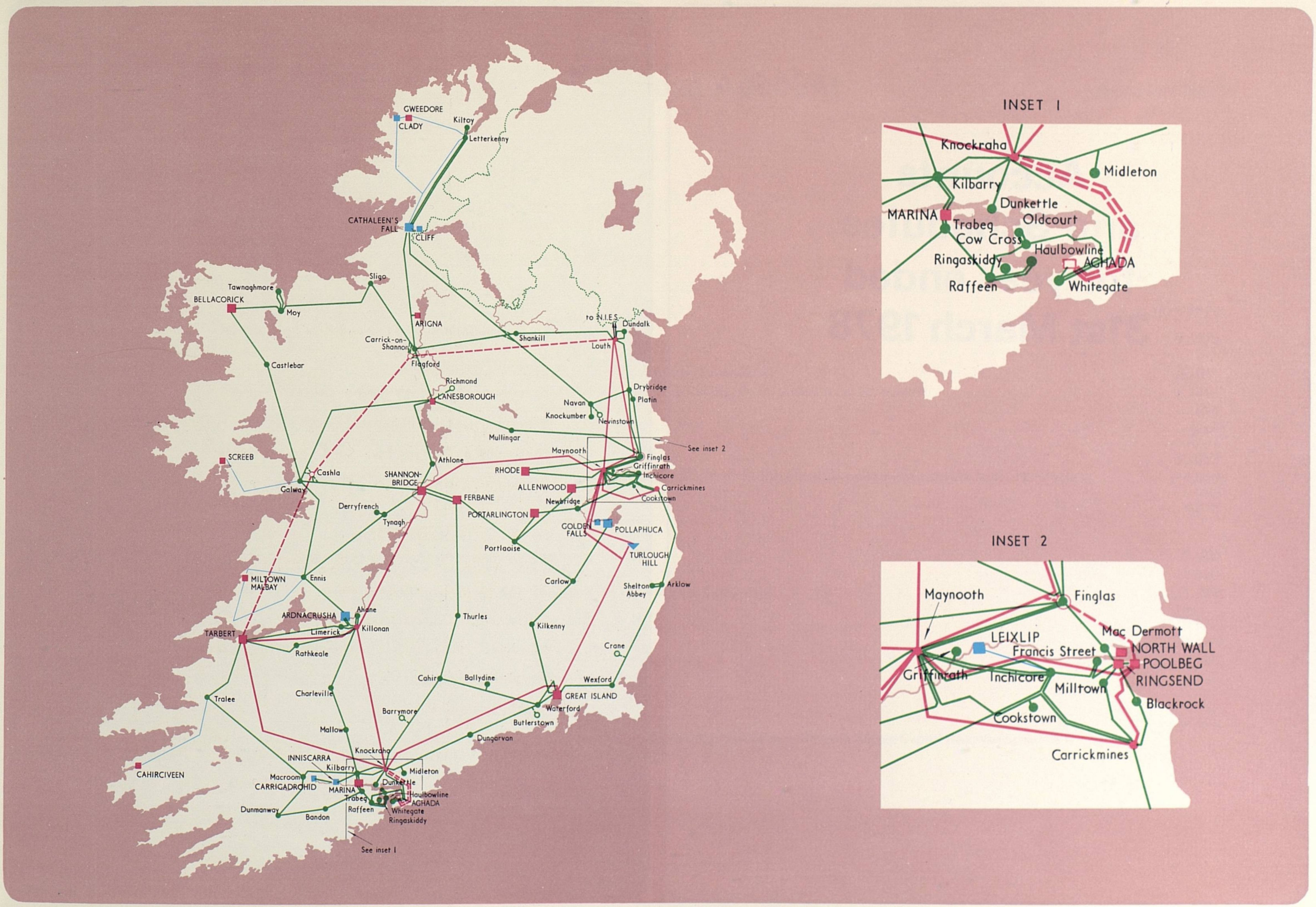
220 KV LINES PROJECTED

110 KV LINES

110 KV LINES PROJECTED

OTHER HIGH VOLTAGE LINES

275 KV LINES



INSET 1

INSET 2

Accounts and Schedules for year ended 31st March 1978

ACCOUNTS

1.	Profit and Loss Account	21
2.	Balance Sheet	22

SCHEDULES

A.	Electricity Income and Expenditure Account	23
B.	Trading Account	24
C.	Statement of Source and Application of Funds	25
D.	Statement of Capital Assets	26
E.	Statement of Current Assets and Current Liabilities	27
F.	Statement of Redemption of Borrowings and Sinking Fund Investments	28
G.	Statement of Borrowings	29
H.	Statement of Interest and Amortisation of Borrowings	30
I.	Statement of Capital Reserves	31
J.	Statement of Generation Costs	32
K.	Fisheries – Commercial and Conservation Operations	33
L.	Notes on Accounts	34
	Auditors' Report	36

Profit and Loss Account

Account No. 1

1976/1977 £000's		1977/1978 £000's
	Operations	
14,352	Electricity Trading before Amortisation of Borrowings (Schedule A)	23,011
(97)	Appliance Sales, Repairs and Installations Contracts Trading, Profit/(Loss) as per Schedule B	(314)
—	Appreciation of Temporary Investments	574
(284)	Expenses on new Borrowings	(258)
13,971		23,013
(15,473)	Amortisation of Borrowings, as required by Section 21 (2) of the Electricity (Supply) Act, 1927 (See Note – Schedule L)	(18,940)
(1,502)	Surplus(/Deficit) for Year	4,073
	Non-Operating Income and Credits	
2,701	Non-repayable Supply Contributions	3,108
471	Credits arising on ESB Stock Cancellations	1,326
930	Interest on Sinking Fund Investments for Repayment of Borrowings	1,725
2,600		10,232
(3,172)	To Capital Reserves	(4,434)
(930)	To Sinking Funds for Repayment of Borrowings	(1,725)
(7,135)	Deficit brought forward from previous year	(8,637)
£(8,637)	Surplus/(Deficit) carried forward to next year	£(4,564)

Note: Adjustments in year-end parities of foreign borrowings have been reflected in Repaid Capital Reserve (Schedule I)

Account No. 2

Balance Sheet

31st March, 1977					31st March, 1978
£000's	*Reference*		£000's	£000's	£000's
466,976	Schedule D	**Total investment in Capital Assets** including work-in-progress		532,363	
151,490	Schedule D	Less Accumulated Depreciation		168,948	
315,486					363,415
101,586	Schedule E	**Current Assets**		114,542	
		Less:			
45,605	Schedule E	**Current Liabilities**		66,395	
55,981		**Net Current Assets**			48,147
15,480	Schedule F	**Sinking Fund Investments,** at cost			24,879
£386,947					£436,441
		Financed as follows:			
333,786	Schedule G	**Borrowings**			356,707
		Reserves			
45,529	Schedule I	Capital		58,445	
15,694	—	Sinking funds for borrowings		25,278	
		Revenue Reserves:			
500	—	Plant, self-insurance	500		
75	—	Others	75		
				575	
(8,637)	Account No. 1	Profit and Loss Account balance (deficit)		(4,564)	
53,161					79,734
£386,947					£436,441

Note: At 31st March, 1978 contractual capital commitments amounted to approximately £43,500,000 (1977 – £51,500,000)

Signed: C. T. G. Dillon *Chairman*

Signed: J. J. Kelly *Chief Executive*
J. B. O'Donoghue *Director, Finance*

Electricity Income and Expenditure Account

Schedule A

1976/1977 £		£	£	£	£	1977/1978 £
173,428,908	**Income** – Electricity Sales	210,028,777				
676,532	– Miscellaneous Income	871,985				
174,105,440						210,900,762
	Expenditure:	**Generation**	**Transmission**	**Distribution**		
76,023,268	Fuel	87,996,276				
41,566,366	Operation, maintenance and local charges	21,714,397	2,299,950	26,870,578		
9,520,287	General charges	5,277,175	1,331,758	4,360,255		
15,522,000	Depreciation	7,913,470	2,281,190	7,106,840		
162,220	Fisheries net cost	268,736				
142,794,141		123,170,054	5,912,898	38,337,673	167,420,625	
16,958,923	Interest	9,039,524	3,025,872	8,403,520	20,468,916	
159,753,064		132,209,578	8,938,770	46,741,193		187,889,541
14,352,376						23,011,221
15,473,634	Amortisation of Borrowings as required by Section 21 (2) of the Electricity (Supply) Act, 1927	8,203,641	2,831,126	7,904,984		18,939,751
£(1,121,258)	Surplus/(Deficit)					£4,071,470

Notes:

Charges include: Local Rates £869,482 (£732,307), Central Transport and Stores Depot Costs £922,361 (£840,010), General Publicity £455,277 (£469,228), Bad Debts £220,178 (£167,653), Audit Fee £21,000 (£18,000), Board Members' Remuneration (including full-time Chairman) £20,370 (£20,477).

Fuel includes purchased electricity £34,611 (£38,420).

The previous year's figures are shown in brackets.

Trading Account

Schedule B — Appliance Sales, Repairs and Installations Contracts

1976/1977					1977/1978			
Appliance Sales	Appliance Repairs	Installations Contracts	Total		Total	Appliance Sales	Appliance Repairs	Installations Contracts
£	£	£	£		£	£	£	£
4,609,137	789,707	2,511,388	7,910,232	Turnover, exclusive of VAT	7,844,324	4,894,520	926,557	2,023,247
3,558,295	642,859	2,098,501	6,299,655	Direct Costs	6,299,181	3,803,646	737,927	1,757,608
1,050,842	146,848	412,887	1,610,577	Gross Profit	1,545,143	1,090,874	188,630	265,639
				Overheads:				
570,248	260,228	231,798	1,062,274	Payroll costs	1,202,187	640,680	301,038	260,469
61,266	—	—	61,266	Publicity	76,927	76,927	—	—
109,841	—	—	109,841	Premises costs	133,671	133,671	—	—
52,494	4,963	20,866	78,323	Sundry expenses	86,947	58,355	5,063	23,529
208,660	—	187,358	396,018	General charges and interest, as apportioned	359,603	220,890	—	138,713
1,002,509	265,191	440,022	1,707,722		1,859,335	1,130,523	306,101	422,711
£48,333	£(118,343)	£(27,135)	£(97,145)	Profit/(Loss) transferred to Profit and Loss Account	£(314,192)	£(39,649)	£(117,471)	£(157,072)

Statement of Source and Application of Funds

Schedule C

1976/1977 £	*Reference*		1977/1978 £
		Source:	
13,971,546	Account No. 1	Operations before Amortisation of Borrowings	23,012,971
—	Schedule H	Provision towards premium on Stock Redemption	572,742
16,347,218	Schedule D	Depreciation	18,260,403
2,281,656	Schedule D	Credits on disposal of assets	1,168,573
930,305	Account No. 1	Interest on sinking fund investments	1,725,301
33,530,725			44,739,990
2,701,161	Schedule I	Non-repayable supply contributions	3,107,518
43,163,553	Schedule G	Borrowings	40,032,373
£79,395,439			£87,879,881
		Application:	
46,229,014	Schedule D	Capital expenditure	67,358,564
10,526,320	Schedule F	Redemption of borrowings (net)	18,956,547
464,839	Schedule F	Payment of premium on Premium Stock	—
7,923,568	Schedule F	Increase in sinking fund investments	9,398,768
14,251,698	Schedule E	Net movement in current assets/current liabilities	(7,833,998)
£79,395,439			£87,879,881

Schedule D

Statement of Capital Assets

	Total at 31st March, 1977 £	Additions Less Retirements during year £	**Total at 31st March, 1978 £**
Generation	162,233,658	18,930,088	**181,163,746**
Transmission	56,592,523	4,796,278	**61,388,801**
Distribution	170,226,274	15,228,650	**185,454,924**
General Buildings, Transport and Working Equipment	20,801,918	2,945,405	**23,747,323**
Fisheries	175,792		**175,792**
	410,030,165	£41,900,421	**451,930,586**
Work-in-Progress, including payments on account	56,945,475		**80,432,384**
Total Investment in Capital Assets (at cost)	466,975,640		**532,362,970**
Deduct Accumulated Depreciation, as below	151,489,865		**168,947,607**
Net Investment in Capital Assets	£315,485,775		**£363,415,363**

Accumulated Depreciation:	£	£	£
Provision for depreciation of assets together with proceeds of disposal or stores value of assets retired, less assets retired, as at 31st March, 1977		151,489,865	
Movements in year:			
Depreciation of assets	18,260,403		
Credits arising on disposal of assets retired	1,168,573		
Assets retired	(1,971,234)	17,457,742	
Total as at 31st March, 1978			**£168,947,607**

Note: Work carried out in the year amounted to £67,358,564 (1976/77 £46,229,014)

Statement of Current Assets and Current Liabilities Schedule E

31st March, 1977 £		Nominal Value £		£	£	31st March, 1978 £
	Current Assets					
501,641	Cash at bank and in hand				675,494	
16,059,179	Temporary cash deposits				10,653,066	
16,560,820						11,328,560
	Investments, at cost:					
1,927,524	E.S.B. Stocks	2,048,126	(1976/1977 £2,494 571)		1,840,333	
—	Government Stocks	7,605,766	(1976/1977 £ Nil)		5,550,736	
687,512	Units of Account	684,689	(1976/1977 £ 758,436)		658,292	
2,615,036						8,049,361
	Accounts Receivable:					
	Electricity: billed			16,255,481		
	unbilled			21,631,274		
37,067,043					37,886,755	
11,034,112	Trading including Hire Purchase				13,021,303	
5,023,611	Miscellaneous				7,431,275	
53,124,766						58,339,333
	Materials at cost:					
14,800,805	Fuel				18,929,532	
13,125,677	Others				16,265,099	
27,926,482						35,194,631
1,358,933	Repayable Work-in-Progress at cost					1,630,434
£101,586,037						£114,542,319
	Current Liabilities					
15,765,822	Accounts Payable					28,525,861
1,143,247	Progress Payments on Repayable Work-in-Progress					1,514,052
6,711,906	Borrowings – To finance Trading Account debtors					5,331,838
7,764,156	Supply Contributions and Deposits					11,826,048
7,575,314	Accrued Charges and Provisions					11,675,360
6,644,849	Accrued Interest on Borrowings					7,522,415
£45,605,294						£66,395,574

Schedule F

Statement of Redemption of Borrowings and Sinking Fund Investments

1976/1977 £		1977/1978 £
	Redemption:	
438,183	Sinking Fund utilised in year	1,174,008
7,511,495	Funded redemption – Schedule H	10,479,754
470,847	Credits arising on ESB Stock cancellations	1,326,377
8,420,525	Reflected in Repaid Capital Reserve – Schedule I	12,980,139
2,576,642	Non-funded redemption	7,302,785
£10,997,167	Total redeemed during year – Schedule G	£20,282,924

Sinking Fund Investments:

		Nominal £	Market £	Cost £	
	Opening Balance:				
1,382,733	ESB Stocks	1,908,017	1,793,956	1,731,299	
5,307,578	Government Stocks	9,646,500	8,542,294	8,342,051	
866,453	Bank Deposits			5,406,982	
7,556,764					15,480,332
864,451	Interest Received				1,540,037
7,962,139	Addition in year – Schedule H.				9,032,739
16,383,354					26,053,108
	Utilised in year:				
	Towards redemption of borrowings			1,174,008	
	Payment of premium on Premium Stock			—	
903,022					1,174,008
	Closing Balance:				
	ESB Stocks	6,250,489	6,769,656	6,073,671	
	Government Stocks	19,996,034	19,353,085	18,805,429	
	Bank Deposits			—	
£15,480,332					£24,879,100

The Closing Balance £24,879,100 plus interest accrued £398,630 represents the full Sinking Fund Reserve of £25,277,730 (1976/77 £15,693,698).

Statement of Borrowings

Schedule G

Amount of Borrowing £			Balance Outstanding 31st March, 1977 £	Borrowed during year £	Redeemed during year £	Adjustment for currency changes £	Balance Outstanding 31st March, 1978 £
	Irish Pound and Sterling:						
68,450,236	Advances	– Minister for Finance	48,224,772	—	1,289,171	—	46,935,601
500,000	Loan	– New Ireland Assurance Co. Ltd. 6% – 1962/87	289,110	—	21,842	—	267,268
14,865,000	Loan	– Central Bank of Ireland 7¼% – 1972/87	11,536,620	—	820,069	—	10,716,551
4,791,500	Loan	– Central Bank of Ireland 5½% – 1973/79	1,369,000	—	684,500	—	684,500
5,000,000	Stock	– 6% – 1968/78	2,550,430	—	510,500	—	2,039,930
12,000,000	Stock	– 6% – 1982/87	6,086,549	—	1,700,000	—	4,386,549
16,500,000	Stock	– 6% – 1984/89	8,651,484	—	190,000	—	8,461,484
13,000,000	Stock	– 7% – 1986/91	9,335,630	—	685,500	—	8,650,130
7,000,000	Stock	– 7¼% – 1988/93	5,235,040	—	375,734	—	4,859,306
9,250,000	Stock	– 9½% – 1985/90	7,822,102	—	100,000	—	7,722,102
12,000,000	Stock	– 9% – 1992/95	9,653,393	—	722,168	—	8,931,225
11,300,000	Stock	– 13% – 1983/85	10,807,508	—	444,012	—	10,363,496
10,750,000	Stock	– 10% – Premium (20%) 1980	10,280,000	—	200,000	—	10,080,000
6,000,000	Stock	– 9½% – Premium (20%) 1981	5,594,399	—	436,377	—	5,158,022
8,200,000	Stock	– 9% – Premium (20%) 1983	—	8,200,000	599,110	—	7,600,890
16,800,000	Stock	– 13% – 1988	—	16,800,000	805,094	—	15,994,906
5,842,467	Project Finance	– British Banks/Suppliers	2,267,107	1,405,329	467,256	—	3,205,180
			139,703,144	26,405,329	10,051,333	—	156,057,140
	Other Currencies:						
30,000,000 $	Revolving Credit	– Banking Syndicate 1980/84	17,446,932	—	—	(–) 1,343,873	16,103,059
40,000,000 $	Revolving Credit	– Banking Syndicate 1978/82	23,262,577	—	—	(–) 1,791,831	21,470,746
30,000,000 $	Revolving Credit	– Banking Syndicate 1978/80	17,446,932	—	6,201,550	(–) 1,583,546	9,661,836
40,000,000 $	Revolving Credit	– Banking Syndicate 1980/84	23,262,577	—	—	(–) 1,791,831	21,470,746
14,500,000 $	Project Finance	– International Bank for Reconstruction and Development 6½% – 1974/94	8,938,477	—	247,248	527,800	9,219,029
20,000,000 $	Project Finance	– International Bank for Reconstruction and Development 7¼% – 1976/87	11,247,673	—	624,439	358,936	10,982,170
15,000,000 $	Project Finance	– International Bank for Reconstruction and Development 7¼% – 1977/88	8,603,954	115,088	511,023	340,270	8,548,289
2,000,000 $	Project Finance	– Irish Bank – 1976/81	930,502	—	223,341	(–) 63,039	644,122
30,000,000 $	Registered Notes	– Japanese Banks 7¾% – 1973/92	13,957,546	—	885,217	(–) 995,034	12,077,295
12,000,000 $	Registered Notes	– U.S. Syndicate – 1983/92	—	6,201,550	—	239,674	6,441,224
15,000,000UA	Bearer Bonds	– Units of Account 8¼% – 1972/86	9,265,987	—	904,985	2,229,677	10,590,679
50,000,000Sw. Fr.	Bearer Notes	– Swiss Banks 7% – 1980	11,415,525	—	—	3,247,232	14,662,757
1,338,080Sw. Fr.	Project Finance	– Swiss Bank – 6½% – 1975/81	218,212	—	47,410	53,426	224,228
1,000,000,000B.Fr.	Registered Bonds	– Belgian Banks 7½% – 1983	15,860,428	—	—	1,262,860	17,123,288
700,000,000B.Fr.	Registered Bonds	– Belgian Banks 7½% – 1983	11,102,300	—	—	884,001	11,986,301
1,000,000,000B.Fr.	Registered Bonds	– Belgian Banks 8¾% – 1980/89	15,860,428	—	—	1,262,860	17,123,288
192,177,330F.Fr.	Project Finance	– French Banks	5,263,057	7,156,421	586,378	333,917	12,167,017
22,905,240Sp. Pes	Project Finance	– Spanish Bank	—	153,985	—	(–) 104	153,881
			194,083,107	13,627,044	10,231,591	3,171,395	200,649,955
	TOTAL		£333,786,251	£40,032,373	£20,282,924	£3,171,395	£356,707,095

Schedule H Statement of Interest and Amortisation of Borrowings

1976/1977 £		£	£	1977/1978 £
	Interest on:			
	Advances from Minister for Finance		2,169,624	
	Borrowings in Irish pounds and sterling	9,439,057		
	Add:Provision for funding of premium on redemption of ESB Stocks (below)	572,742		
			10,011,799	
	Borrowings in other currencies		14,386,175	
			26,567,598	
	Less interest from temporary investment		3,147,612	
19,430,610				**23,419,986**
	Amortisation of Borrowings:			
	Redemptions:			
	Minister for Finance		1,289,171	
	Others		9,190,583	
			10,479,754	
	Investments for sinking funds	9,032,739		
	Less: Provision for funding of premium on redemption of ESB Stocks	572,742	8,459,997	
15,473,634				**18,939,751**
£34,904,244				**£42,359,737**
	Allocated as follows:			
	Interest:			
	Income and Expenditure Account		20,468,916	
	Trading Account		174,400	
	Fisheries		6,085	
	Capital Works		2,770,585	
19,430,610				**23,419,986**
	Amortisation:			
15,473,634	Income and Expenditure Account			**18,939,751**
£34,904,244				**£42,359,737**

Statement of Capital Reserves

Schedule I

	£	£	£
Non-Repayable Supply Contributions:			
Contributions from State under Electricity (Supply) Acts towards capital cost of supplying rural areas – as at 31st March, 1977	25,239,826		
Received in year	1,600,000		
		26,839,826	
Other contributions – as at 31st March, 1977	7,166,107		
Received in year	1,507,518		
		8,673,625	
			35,513,451
Repaid Capital Reserve:			
Amortisation of Borrowings, less write-off of intangible assets, adjustment for changes in currency parities and discounts on stock issues – as at 31st March, 1977		13,122,951	
Movements in year:			
Amortisation of Borrowings	12,980,139		
Adjustment for changes in currency parities	(3,171,395)		
		9,808,744	
			22,931,695
Total as at 31st March, 1978			**£58,445,146**

See Note 7, Schedule L re changes in currency parities.

Schedule J

Statement of Generation Costs

Generation	Fuel	Operation	Maintenance	Local Charges	WORKS COST 1977/1978	Per Unit Sent Out	WORKS COST 1976/1977	Per Unit Sent Out	Depreciation	TOTAL COST 1977/1978	TOTAL COST 1976/1977
	£	£	£	£	£	Pence	£	Pence	£	£	£
Coal/Oil											
Marina	3,239,751	561,518	1,104,470	151,804	**5,057,543**	2.341	5,772,313	1.639	268,790	**5,326,333**	6,039,937
Ringsend	7,375,184	1,158,799	1,661,744	228,003	**10,423,730**	2.255	13,717,025	1.689	634,019	**11,057,749**	14,349,472
Arigna	929,824	210,593	240,419	43,158	**1,423,994**	2.871	1,413,986	2.172	45,072	**1,469,066**	1,459,835
Great Island	14,937,784	589,815	882,203	142,406	**16,552,208**	1.375	12,149,655	1.350	704,383	**17,256,591**	12,857,608
Tarbert	27,794,296	866,194	775,097	182,023	**29,617,610**	1.269	15,930,687	1.237	2,484,274	**32,101,884**	17,537,069
Poolbeg	16,456,838	690,562	783,281	166,745	**18,097,426**	1.230	19,126,147	1.067	982,855	**19,080,281**	20,107,838
Sod Peat (Machine)											
Portarlington	841,045	368,247	331,135	62,438	**1,602,865**	2.220	2,005,308	1.618	77,662	**1,680,527**	2,083,016
Allenwood	1,716,701	486,047	352,990	69,430	**2,625,168**	1.582	2,579,869	1.333	115,910	**2,741,078**	2,697,744
Lanesborough	757,655	242,112	203,534	38,323	**1,241,624**	1.471	1,085,231	1.207	48,053	**1,289,677**	1,134,092
Milled Peat											
Ferbane	3,905,126	694,943	870,309	133,641	**5,604,019**	1.274	5,180,954	1.086	275,838	**5,879,857**	5,458,711
Rhode	2,999,889	504,764	1,068,215	124,367	**4,697,235**	1.266	3,787,216	1.088	219,777	**4,917,012**	4,007,102
Bellacorick	1,270,919	357,902	585,539	74,849	**2,289,209**	1.357	2,334,345	1.091	123,167	**2,412,376**	2,458,015
Shannonbridge	2,968,833	460,897	466,661	83,627	**3,980,018**	.953	2,172,146	.960	484,414	**4,464,432**	2,473,681
Lanesborough	1,681,148	242,112	164,952	36,087	**2,124,299**	.804	2,031,671	.789	134,779	**2,259,078**	2,166,642
Sod Peat (Hand-Won)											
Four 5MW Stations	462,834	331,701	220,939	52,605	**1,068,079**	3.956	964,240	3.639	68,280	**1,136,359**	1,032,480
Peak Station											
North Wall	623,838	277,067	131,585	56,122	**1,088,612**	—	1,566,703	—	124,806	**1,213,418**	1,691,381
Total - Fuel Stations	87,961,665	8,043,273	9,843,073	1,645,628	**107,493,639**	1.382	91,817,496	1.269	6,792,079	**114,285,718**	97,554,623
Hydro											
Shannon	—	272,587	497,480	106,900	**876,967**	.257	731,185	.267	140,635	**1,017,602**	869,637
Erne	—	145,016	207,299	59,981	**412,296**	.165	387,013	.162	196,492	**608,788**	584,372
Liffey	—	38,630	88,806	18,351	**145,787**	.329	125,623	.295	49,231	**195,018**	174,804
Lee	—	86,365	90,539	29,845	**206,749**	.242	179,234	.201	123,199	**329,948**	302,327
Clady	—	24,768	16,913	2,454	**44,135**	.337	35,834	.317	27,051	**71,186**	62,857
Pumped Storage											
Turlough Hill	—	188,239	207,497	63,859	**459,595**	—	376,336	—	584,783	**1,044,378**	960,713
Total – Hydro Stations	—	755,605	1,108,534	281,390	**2,145,529**	.405	1,835,225	.386	1,121,391	**3,266,920**	2,954,710
Total – All Stations	87,961,665	8,798,878	10,951,607	1,927,018	**109,639,168**	1.319	93,652,721	1.214	7,913,470	**117,552,638**	100,509,333
Electricity Purchased in bulk (net)										**34,611**	38,420
Central Transport and Stores										**36,894**	36,330
General Charges										**5,277,175**	4,300,524
Fisheries (Net Cost before Amortisation)										**268,736**	162,220
TOTAL COST										**£123,170,054**	£105,046,827

Fisheries — Commercial and Conservation Operations

Schedule K

Total Cost 1976/1977 £		£	Total Cost 1977/1978 £	Analysis of Commercial and Conservation Operations: Commercial £	Conservation £
239,420	Direct Costs		**323,267**	150,930	172,337
	Overheads and General Charges:				
61,012	Payroll expenses and charges	74,115			
7,000	Depreciation	7,000			
6,188	Interest on Borrowings	6,085	**87,200**	27,175	60,025
313,620			**410,467**	178,105	232,362
	Less:				
151,400	Sales of fish, letting of fishing rights and miscellaneous income		**141,731**	134,070	7,661
162,220	Net Cost before Amortisation, as per Electricity Income and Expenditure Account		**268,736**	44,035	224,701
2,727	Amortisation of Borrowings		**2,828**	1,483	1,345
£164,947	**Net Cost for Year**		**£271,564**	£45,518	£226,046

Schedule L

NOTES ON AND FORMING PART OF THE FINANCIAL ACCOUNTS AND SCHEDULES

The Accounts are prepared in accordance with the Electricity (Supply) Acts. Section 21 (2) of the 1927 Act reads:

"All charges made by the Board after the appointed day for electricity (whether derived from the Shannon works or otherwise) sold by it in bulk or direct to consumers and for goods sold and services rendered by it shall be fixed at such rates and on such scales that the revenue derived in any year by the Board from such sales and services together with its revenue (if any) in such year from other sources 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 such 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."

Accounting Policies

1. **Capital Assets:**
   Capital Assets are valued at cost. Cost includes prime cost, overheads and interest costs during construction.

2. **Depreciation of Capital Assets:**
   Assets are grouped and allotted lifespans in line with international practice. Depreciation is provided on the straight line method on all assets in commission on 1st April each year (other than on new generation stations) even where they have exceeded their allotted lifespans. In the case of new generation stations depreciation commences from the date of commissioning if prior to 31st December.
   Assets when retired from service are charged against, and proceeds of disposal or stores value are credited to, Accumulated Depreciation.

3. **Materials:**
   Stocks of materials and fuel are valued at average cost.

4. **Repayable Work-in-Progress:**
   Installations Contracts are valued at direct cost together with appropriate overheads; sundry works at direct cost.

5. **Accounts Receivable:**
   The figure for Accounts Receivable in the Statement of Current Assets and Current Liabilities is net of a provision for doubtful debts, considered adequate in relation to the size and nature of the business. Bad debts are written off as they arise.

6. **Capital Borrowings:**
   The Statement of Borrowings includes borrowings initially contracted for a period in excess of twelve months, irrespective of phased repayment arrangements, and of the lapsed portion of repayment period.
   Discounts on Stock issues have been charged against the Repaid Capital Reserve. Other borrowing costs are charged against Profit and Loss Account.

7. **Borrowings in Foreign Currencies:**
   Irish Pound Equivalent is at exchange rates ruling at year end. Changes are reflected in the Capital Reserve.

8. **Amortisation of Borrowings Charge:**
   Stock Issues and Long Term Borrowings (15 years and over) – Charge is in line with the contractual agreements.
   Other Borrowings – Charge, within the lifetime of the borrowing, is determined in line with a policy of achieving:
   : Maturity term of 10-15 years – full retirement at maturity.
   : Maturity term of less than 10 years – at least half retirement at maturity.
   Where Borrowings are drawn down in full, for a period in excess of six months, proportionate amortisation is charged in the year.
   The sinking fund provision towards the premium element payable on redemption of ESB Premium Stock is included in the charge for interest.

9. Temporary Investment:
Transfers of temporary investments in stocks/securities to Sinking Fund Investments are costed at prices current at the time of transfer.

10. Non-Repayable Supply Contributions:
Non-Repayable Supply Contributions are credited to Capital Reserves (Schedule I) via the Profit and Loss Account (Account No. 1).

11. Hire Purchase Transactions:
Profit on Hire Purchase sales is taken in the year of sale. Credit for interest is taken in equal instalments over the Hire Purchase term.

12. Apportionments:
(a) Capital Expenditure bears interest on the average value of (1) work-in-progress (2) stocks held and (3) advances made to suppliers in respect of capital works, at the rates appropriate to the financing of individual projects, and a proportion of general overhead expenses calculated at a percentage rate on the prime cost of work paid for during the year.
(b) Appliance Sales, Installations Contracts and Fisheries bear their relevant proportion of general overhead expenses and interest.
(c) The proportion of Appliance Sales and Installations Contracts overhead expenses related to the promotion of sales of electricity is included in the overhead expenses charged to Electricity Income and Expenditure Account.

13. Taxation:
The Board is liable for Corporation Tax at the reduced rate specified in Section 79 of the Corporation Tax Act 1976. Because of large continuing capital expenditure, liability to tax will not arise in the foreseeable future and a tax equalisation reserve is not deemed necessary (unutilised capital allowances at 31st March, 1978 are estimated at £144m.) Had a Tax Equalisation Reserve been provided, the accumulated figure would now be an estimated £25.5m. (31st March 1977 – £20.4m.).

14. Exceptional Expenditure:
Essential maintenance and repairs are charged to the Electricity Income and Expenditure Account in the year in which the liability arises, on an estimated basis if necessary. Costs incurred to improve system efficiency are charged to the Electricity Income and Expenditure Account over the number of years corresponding to the benefits secured.

15. Accounting Year:
Income and Expenditure are aligned on a 52 or 53 week year as appropriate. The year 1977/78 is a 52 week year. (1976/77 – 52 weeks).

Auditors' Report

As Auditors appointed by the Minister for Industry, Commerce and Energy, with the consent of the Minister for Finance, we have examined the Profit and Loss Account, Balance Sheet, and attached Schedules A to L of the Electricity Supply Board.

In our opinion, the Profit and Loss Account and Balance Sheet together with the Statement of Source and Application of Funds (Schedule C), when read in conjunction with the other Schedules and the Notes appearing thereon, give, under the historical cost convention, a true and fair view of the results of the Board for the year ended 31st March 1978, and of the state of the Board's affairs as at that date.

Harcourt House,
Harcourt Street,
Dublin 2.
30th June, 1978

Stokes Kennedy Crowley & Co.,
Chartered Accountants

Appendices for year ended 31st March 1978

Nos.		Page
1.	Number of Customers and Electricity Sales	38
2.	Growth of Electricity Sales and Number of Customers	39
3.	Analysis of Units Sold	40
4.	Generation Load Duration Curves	41
5.	Generation Statistics	42
6.	Particulars and Performance of Generating Plant	43
7.	Typical Daily Generation Load Curves	46
8.	Transmission System	47
9.	Distribution System	48
10.	Weekly System Demand	Inside back cover

Appendix 1

Number of Customers and Electricity Sales

District	No. of Customers at 31st March		Electricity Sales Units sold in year ended 31st March	
	1978	1977	1978 (millions)	1977 millions)
Athlone	55,163	53,791	265.1	245.4
Cork	111,173	107,962	911.6	863.2
Dublin City	141,142	140,184	1,160.1	1,100.3
Dublin North West	113,697	107,614	961.5	878.3
Dublin South	62,487	60,804	476.1	449.3
Dundalk	76,265	74,203	684.4	596.5
Galway	57,331	55,267	321.4	293.1
Limerick	89,448	87,275	760.0	724.7
Portlaoise	65,973	64,215	456.1	420.4
Sligo	88,616	86,446	390.5	338.4
Tralee	46,941	45,561	270.7	228.8
Waterford	78,020	76,106	672.4	644.8
Total	986,256	959,428	7,329.9	6,783.2

Growth of Electricity Sales and Number of Customers

Appendix 2

Year Ended 31st March	Units Generated (and Purchased)* Millions	Units Sold to Customers Millions	Revenue From Electricity Sales Thousands	Average Price per Unit sold Pence	Total Customers
			£		
1930	60.9	43.2	478	1.108	48,606
1935	206.1	157.0	1,258	0.800	103,037
1940	407.0	318.6	1,946	0.612	172,545
1945	406.3	319.0	2,458	0.771	228,008
1950	784.8	626.2	4,774	0.763	310,639
1955	1,461.7	1,192.2	9,522	0.800	461,901
1960	2,096.0	1,692.2	14,724	0.871	610,946
1965	3,240.2	2,682.6	22,488	0.838	697,491
1966	3,546.2	2,953.3	24,077	0.817	716,113
1967	3,851.0	3,238.1	26,690	0.825	726,561
1968	4,246.4	3,570.1	29,898	0.838	745,430
1969	4,749.0	4,012.3	34,457	0.858	765,213
1970	5,245.7	4,411.6	39,400	0.892	786,500
1971	5,921.0	4,862.1	44,082	0.907	805,736
1972	6,234.2	5,271.7	51,750	0.982	818,516
1973	6,749.1	5,705.1	60,321	1.057	845,119
1974	7,253.1	6,152.0	73,063	1.188	873,764
1975	7,298.7	6,153.1	111,261	1.808	901,000
1976	7,534.6	6,259.0	136,277	2.177	931,469
1977	8,160.5	6,783.2	173,429	2.557	959,428
1978	8,828.4	7,329.9	210,029	2.865	986,256

The above table shows, quinquennially from 1930 to 1965, and for each year since, the number of units generated and sold, the revenue, the average price per unit, and the number of customers.

*Excluding units absorbed by storage pumping.

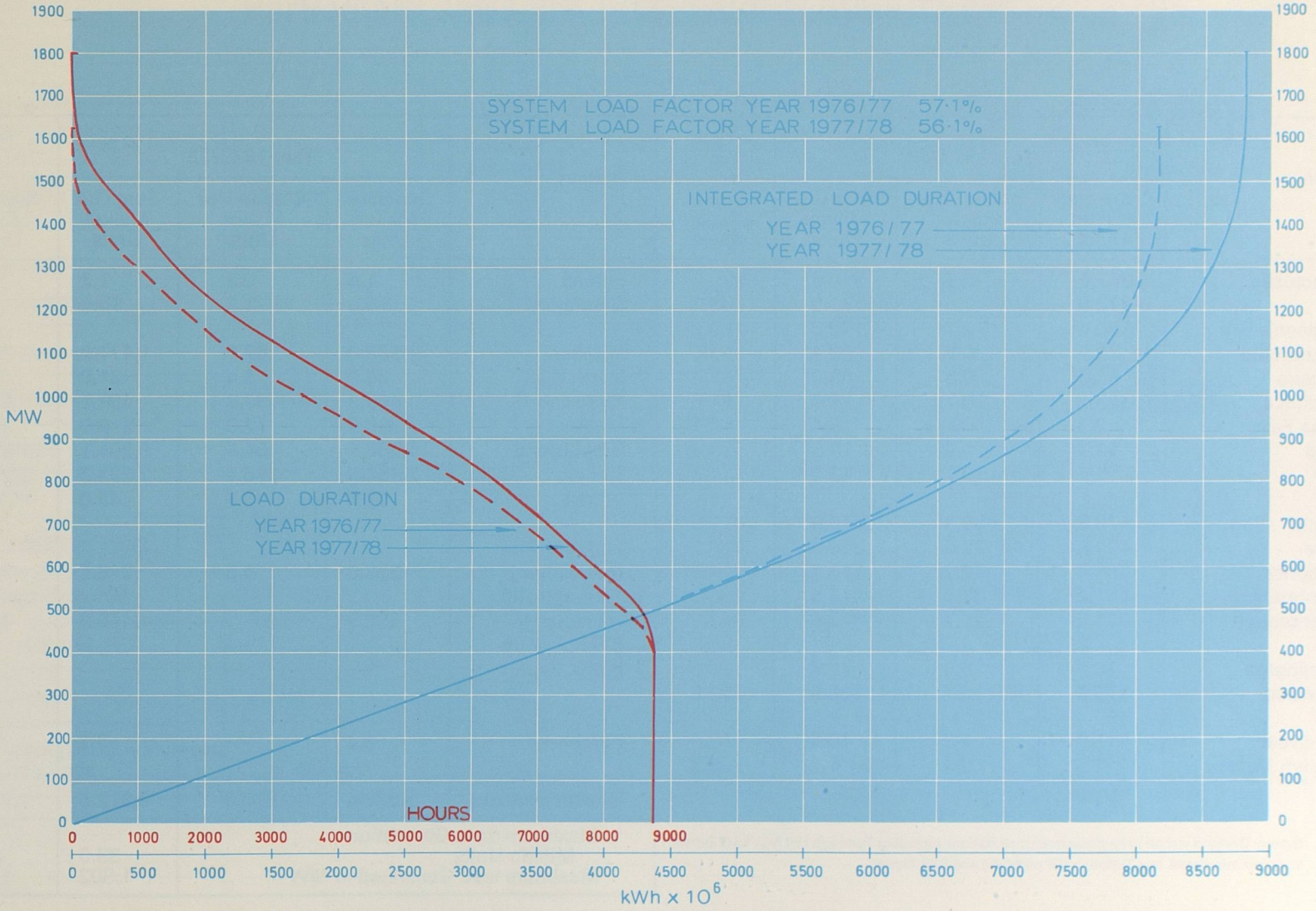
Appendix 3

Analysis of Units Sold

Class of Supply	Year ended 31st March 1978 (Millions)	Year ended 31st March 1977 (Millions)	Increase (Millions)	Percentage Increase
DOMESTIC				
General Supply	2,894.2	2,690.7	203.5	7.6
Night Space Heating	197.3	215.0	– 17.7	– 8.2
	3,091.5	2,905.7	185.8	6.4
COMMERCIAL				
Lighting	244.0	232.6	11.4	4.9
Heating, Cooking and Waterheating	334.4	323.7	10.7	3.3
Motive Power	240.5	230.0	10.5	4.6
Night Space Heating	212.1	211.8	0.3	0.1
Public Lighting	93.4	88.6	4.8	5.4
Maximum Demand	146.4	84.4	62.0	73.5*
Miscellaneous	219.7	213.6	6.1	2.9
	1,490.5	1,384.7	105.8	7.6
INDUSTRIAL				
Maximum Demand				
High Tension	1,985.6	1,772.6	213.0	12.0
Low Tension	617.6	576.6	41.0	7.1
Miscellaneous	144.7	143.6	1.1	0.8
	2,747.9	2,492.8	255.1	10.2
TOTAL	7,329.9	6,783.2	546.7	8.1

*The increase arises mainly from transfer to maximum demand of customers, whose consumption was recorded in previous years under other headings; and from the connection of new customers on maximum demand.

SYSTEM LOAD DURATION AND INTEGRATED LOAD DURATION CURVES
YEAR 1977/78



Appendix 5

Generation Statistics for the Year 1977/78

Station	Year 1977/78			Year 1976/77
	Generated Million Units	Station Use Million Units	Sent Out Million Units	Sent Out Million Units
Ardnacrusha	343.5	2.9	340.6	273.7
Cliff	72.0	1.0	71.0	68.7
Cathaleen's Fall	180.4	2.1	178.3	169.9
Carrigadrohid	22.9	0.5	22.4	23.5
Inniscarra	63.8	0.8	63.0	65.6
Pollaphuca	23.1	0.7	22.4	21.5
Golden Falls	8.5	0.1	8.4	8.1
Leixlip	13.7	0.2	13.5	13.0
Clady	13.2	0.1	13.1	11.3
Ferbane	478.8	38.8	440.0	477.0
Rhode	400.5	29.6	370.9	348.2
Bellacorick	181.4	12.7	168.7	214.0
Shannonbridge	451.2	33.7	417.5	226.2
Lanesborough	371.3	22.7	348.6	347.3
Portarlington	78.7	6.5	72.2	123.9
Allenwood	176.6	10.7	165.9	193.6
Cahirciveen	11.7	1.3	10.4	12.9
Milltown Malbay	1.5	0.4	1.1	1.3

Station	Year 1977/78			Year 1976/77
	Generated Million Units	Station Use Million Units	Sent Out Million Units	Sent Out Million Units
Screeb	1.5	0.3	1.2	2.6
Gweedore	15.8	1.5	14.3	9.7
Poolbeg	1,539.0	67.8	1,471.2	1,793.0
North Wall	35.0	3.4	31.6	70.2
Ringsend	499.4	37.2	462.2	811.9
Marina	228.9	12.9	216.0	352.2
Great Island	1,268.5	64.4	1,204.1	899.9
Tarbert	2,488.9	155.4	2,333.5	1,288.2
Arigna	53.3	3.7	49.6	65.1
Turlough Hill (generation)	253.0	4.5	248.5	312.7
Turlough Hill (pumping)	450.9		450.9	492.1
E.S.B. Import	—	—	—	—
E.S.B. Export	—	—	—	—
Purchased	3.2	—	3.2	3.2
System Demand	8,828.4	515.9	8,312.5	7,716.3
Maximum daily Generation Million Units			33.0	30.5
Maximum load Generated in MW			1,802	1,634

Note: System Demand is total units generated by all stations including Turlough Hill plus ESB Import and units purchased, less Turlough Hill pumping and ESB Export.

Particulars and Performance of Generating Plant

Appendix 6

Hydro Stations

Station	Location	Average annual generation million units	Plant Particulars		Plant Performance for year ended 31/3/'78		
			Generating Sets		Units sent out millions	Plant load factor %	Works cost per unit sent out (pence)
			No.	Capacity (MW)			
Ardnacrusha	Shannon	310	4	85	340.6	46.2	0.257
Pollaphuca	Liffey	45	2	30	44.3	8.8	0.329
Golden Falls			1	4		24.3	
Leixlip			1	4		39.2	
Cliff	Erne	275	2	20	249.3	41.2	0.165
Cathaleen's Fall			2	45		45.9	
Carrigadrohid	Lee	77	1	8	85.4	32.8	0.242
Inniscarra			2	19		38.4	
Clady	Clady	13	1	4	13.1	38.1	0.337
Turlough Hill – Pumped Storage	Co. Wicklow	—	4	292	248.5	—	—

Appendix 6 contd. Particulars and Performance of Generating Plant

Steam Stations

Station	Location	Plant Particulars					Plant Performance for year ended 31/3/'78			
		Generating Sets		Boilers			Units sent out millions	Plant load factor %	Fuel cost per unit sent out (pence)	Works cost per unit sent out (pence)
		No.	Total Capacity MW	No.	Total Capacity Tonne/hour	Fuel Type				
Arigna	Co. Roscommon	1	15	1	75	Coal	49.6	40.7	1.875	2.871
Lanesborough	Co. Longford	2	60	1 1	100 173	Sod Peat Milled Peat	84.4 264.2	51.0 80.8	0.898 0.636	1.471 0.804
Rhode	Co. Offaly	3	80	3	364	Milled Peat	370.9	57.3	0.809	1.266
Bellacorick	Co. Mayo	2	40	2	191	Milled Peat	168.7	51.9	0.753	1.357
Shannonbridge Shannonbridge	Co. Offaly	1 1	40 40 80	1 1	173 173	Milled Peat Milled Peat	417.5	64.6	0.711	0.953
Great Island	Co. Wexford	3	240	3	853	Oil	1,204.1	60.5	1.241	1.375
Tarbert Tarbert	Co. Kerry	2 2	120 500 620	2 2	473 1600	Oil Oil	2,333.5	46.0	1.191	1.269
Poolbeg	Dublin City	2	240	2	760	Oil	1,471.2	65.7	1.119	1.230
		2	28	Gas Turbine Sets						

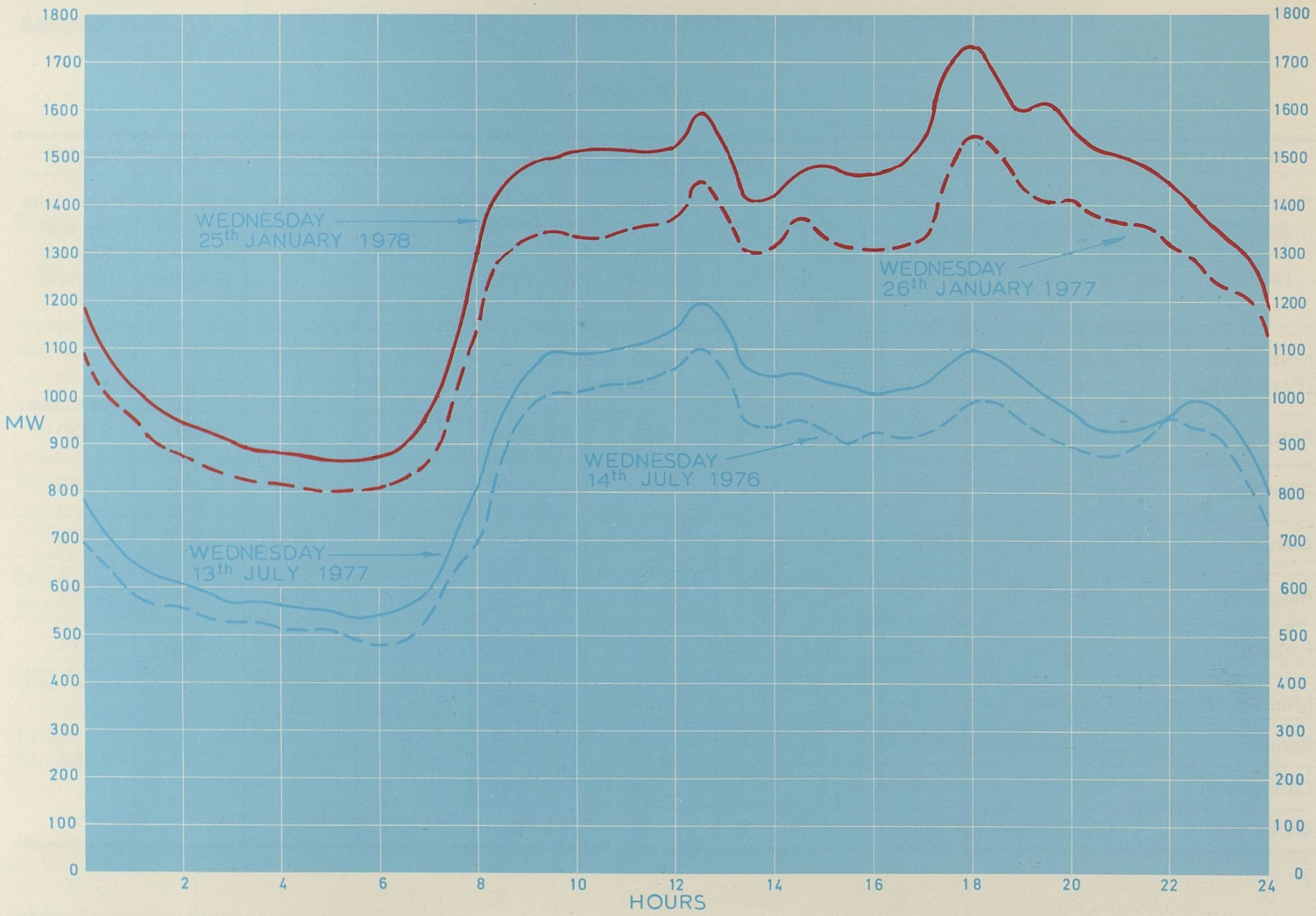
Particulars and Performance of Generating Plant **Appendix 6 contd.**

Steam Stations

Station	Location	Plant Particulars					Plant Performance for year ended 31/3/'78			
		Generating Sets		Boilers			Units sent out millions	Plant load factor %	Fuel cost per unit sent out (pence)	Works cost per unit sent out (pence)
		No.	Total Capacity MW	No.	Total Capacity Tonne/hour	Fuel Type				
North Wall (Peak Station)	Dublin City	3	48	3	225	Oil	31.6	8.3	1.974	—
Portarlington	Co. Laoise	3	37.5	3	205	Sod Peat	72.2	24.0	1.165	2.220
Allenwood	Co. Kildare	2	40	4	273	Sod Peat	165.9	50.5	1.035	1.582
Marina	Cork City	3	120	4	522	Oil	216.0	21.8	1.500	2.341
Ringsend	Dublin City	6	270	7	1114	Oil	462.2	21.2	1.596	2.255
Ferbane	Co. Offaly	4	90	4	430	Milled Peat	440.0	60.9	0.888	1.274
Miltown-Malbay	Co. Clare	1	5	1	28	Sod Peat	27.0	17.4	1.714	3.956
Screeb	Co. Galway	1	5	1	28	Sod Peat				
Cahirciveen	Co. Kerry	1	5	1	28	Sod Peat				
Gweedore	Co. Donegal	1	5	1	28	Sod Peat				

Appendix 7

SYSTEM DAILY LOAD CURVES YEAR 1977/78



Transmission System at 31st March, 1978

Transmission Stations

Transformer/Switching Stations	No. in commission	Increase for year	Total capacity in kVA	Increase or decrease in capacity for year in kVA
220 kV Stations	10	Nil	600,000 at 275/220 kV	Nil
			2,253,000 at 220/110 kV	Nil
			560,000 at 20/220 kV	Nil
			420,000 at 13/220 kV	Nil
			397,000 at 10/220 kV	Nil
			357,000 at 10/110 kV	Nil
			20,000 at 110/ 6 kV	Nil
110 kV Stations	69	2	2,783,500 at 110/ 38 kV	+15,000
			59,000 at 110/ 10 kV	Nil
			80,000 at 110/ 6 kV	+20,000
			110,400 at 38/ 10 kV	Nil
			1,151,000 at 10/110 kV	Nil
			88,000 at 10/38/110 kV	Nil
			5,000 at 10/ 38 kV	Nil

Transmission Lines and Cables

Lines and Cables	Length kms.	Increase or decrease for year kms.	Description
275 kV lines	10.5	Nil	6 x twin 485 sq. mm. double circuit SCA
220 kV lines	25.8	Nil	6 x 600 sq, mm. double circuit SCA
220 kV lines	730.1	+ 142.8	3 x 600 sq. mm. single circuit SCA
220 kV lines	276.8	Nil	3 x 425 sq. mm. single circuit SCA
220 kV lines	3.9	Nil	3 x 425 sq. mm. twin, SCA
110 kV lines	1.8	Nil	6 x 95 sq. mm. double circuit copper
110 kV lines	139.8	— 19.1	3 x 95 sq. mm. single circuit copper
110 kV lines	100.8	+ 0.4	6 x 200 and 6 x 300 sq. mm. double circuit SCA
110 kV lines	3081.7	+ 26.8	3 x 200 to 3 x 425 sq. mm. single circuit SCA
220 kV cables	30.8	+ 0.2	3 single core oil filled
110 kV cables	22.9	Nil	3 single core oil filled
110 kV cables	17.9	Nil	3 core oil filled
110 kV cables	25.6	Nil	3 core pipe compression

Appendix 9 Distribution System in Commission at 31st March, 1978

A. Distribution System (Excluding Rural Networks)

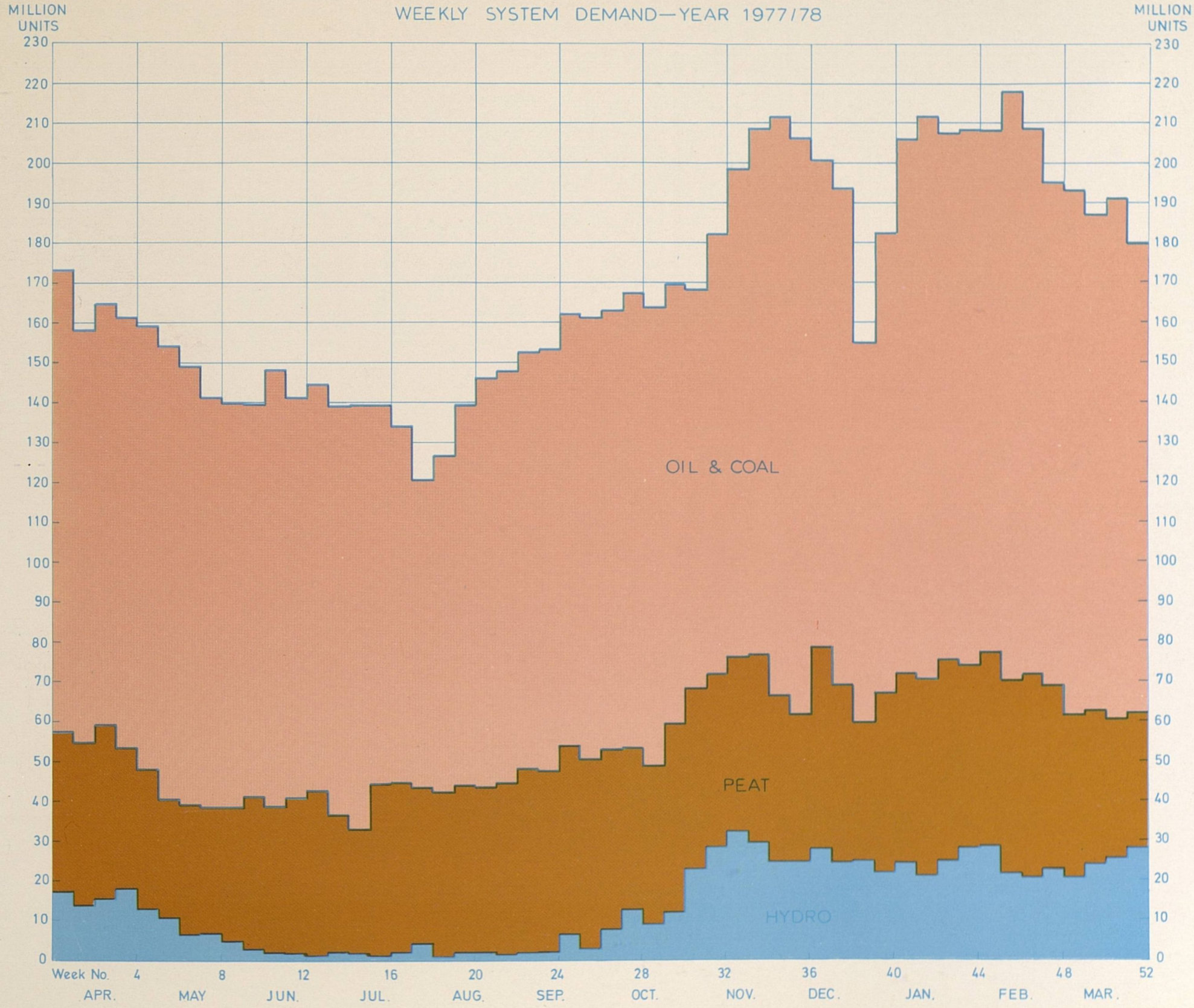
Transformer Station	No. in commission	Increase (+) or Decrease (—) for year	Total Capacity in kVA	Increase (+) or decrease (—) for year in kVA
38kV Stations	331	+4	2,255,900	+53,600
10kV Stations (excl. U.R.D.)	9,454	+323	2,127,783	+74,536
10kV Stations U.R.D.	1,876	+108	108,181	+6,767
5kV Stations	53	Nil	32,590	Nil

Distribution Lines and Cables	Length kM	Increase (+) or Decrease (—) for year kM.	Description
38kV Lines	5,113.8	+72.9	3 x 25 to 3 x 300 sq. mm. Cu. and SCA.
38kV Cables	247.9	+0.1	3 x 95 to 3 x 680 sq. mm. copper and aluminium.
10kV Lines	6,604.2	+97.2	Single and three phase
10kV and 5kV Cables	2,467.4	+108.0	2 x 16 to 3 x 240 sq. mm. copper and aluminium
3.3 kV Cables	3.7	Nil	3 x 185 sq. mm.

B. Rural Networks (approximate extent)

Length of 10kV lines Single and Three phase kM.	10kV Stations No. in Commission	10kV Stations Single and Three phase Total Capacity in kVA.
62,470	92,500	1,109,200

WEEKLY SYSTEM DEMAND—YEAR 1977/78



DISTRICT OFFICES AND DISTRICT MANAGERS

ATHLONE 6-8 Church Street Telephone: Athlone 2611	T. P. Haugh, B.E., B.Sc., D.P.A., M.I.E.E.
CORK 113 Patrick Street Telephone: Cork 26851	T. V. Fahy, B.E.
DUBLIN CITY 49 Fleet Street Telephone: Dublin 772961	J. J. McEvoy, B.E., C.Eng.
DUBLIN NORTH-WEST Clanwilliam House Mount Street Bridge Telephone: Dublin 688933	S. Nolan, B.E., M.I.E.E.
DUBLIN SOUTH Leopardstown Road Stillorgan Telephone: Dublin 881683	T. C. Costello, B.E., C.Eng.
DUNDALK Chapel Street Telephone: Dundalk 32211	V. Gallagher, B.E.
GALWAY Sean Mulvoy Road Telephone: Galway 7641	P. Osborne, B.E., B.Sc., C.Eng., M.I.E.I.
LIMERICK 41 O'Connell Street Telephone: Limerick 45599	D. P. Greene, B.E., M.I.E.I.
PORTLAOISE Abbeyleix Road Telephone: Portlaoise 21327	J. F. Heslin, B.E., B.Sc.
SLIGO Castle Street Telephone: Sligo 5261	D. Gallagher, B.Sc.
TRALEE Edward Street Telephone: Tralee 21333	A. F. Kelly, B.E., B.Sc.
WATERFORD The Mall Telephone: Waterford 3301	B. Rafferty, B.Sc., C.Eng., M.I.E.I.

Designed by: Public Relations Office, E.S.B.
Printed by: Graphic Printers Limited, Dublin.