

Electricity market opening - the time to win

The Director General of Electricity Supply for Northern Ireland

Introduction

I have been asked by the Minister for Enterprise Trade and Investment, Sir Reg Empey, to consider the issues associated with further market opening and to publish my report.

I have concluded that full market opening is feasible and could be the catalyst for further industry structural reforms which will result in lower prices.

I have also concluded that market opening without these structural reforms will not produce real competition and such competition as it does produce will result in higher prices. Meaningful consumer choice cannot precede the achievement of low cost efficient generation. Consumer choice will be a consequence of competition, not the cause.

Since the Minister asked me to produce this report the European Commission has published a draft Directive on the electricity market. This envisages all non-domestic markets being open to competition by January 2003 and all domestic markets by 2005. At present it is not clear when the Directive will be agreed and become law.

Northern Ireland owes its progress to liberalisation to the European Union's Internal Market in Electricity (IME) Directive. In terms of market opening Northern Ireland is fully compliant with the Directive two years ahead of the Directive's requirement. Thanks to Northern Ireland's industrial structure, 35% market opening allows much smaller firms access to competitive markets than is the case in the Irish Republic or in most, if not all, other European Union member states.

The new draft Directive provides for member states being able to ensure security of supply, protection of the environment and social inclusion. I believe that the proposals in this paper are fully in accordance with the spirit of the draft Directive. However, until the Directive becomes law it is for each member state through its own institutions - in our case the Northern Ireland Executive and Assembly - to decide how fast their own electricity market should be liberalised.

Comments on this paper and views, opinions and recommendations on further electricity market liberalisation should be forwarded to James Hutchinson, OFREG, Brookmount Buildings, 42 Fountain Street, BELFAST BT1 5EE by 29 June 2001.

Executive Summary

It is widely believed that competition in the electricity market will lead to lower prices. In the right circumstances this may be true but lower prices are by no means automatic. Northern Ireland has high generation costs for three reasons:

- > over-priced long term contracts;
- > power stations with low efficiencies; and
- > lack of competition.

Of these three causes of high generation costs, lack of competition is the least important. However an acceleration of liberalisation could act as the catalyst for tackling the two principle causes of high generation costs quickly since unless they are dealt with further market opening will not lead to lower prices and could indeed have the opposite effect and push prices higher.

Producers cannot sell at below cost or they will go out of business. Competition can deliver lower prices but only after the inefficiencies which contribute to the high costs have been taken out of the industry. But once a lower cost, more efficient industry is in place, competition will only drive prices to the lowest possible level if:

- (a) the market structure denies generators market power; and
- (b) transaction costs are negligible.

An inappropriate market structure creates the risk of stranded costs and price instability and could make it harder to achieve environmental objectives and eliminate fuel poverty. Electricity is - unlike other emergent competitive industries such as telecoms - an environmentally damaging product for which it is imperative that demand growth is discouraged.

If Northern Ireland drifts into a fully competitive electricity market prices will rise. But we could move quickly to a fully competitive market in generation and supply which would produce lower prices. A fully competitive market will reduce prices if:

- (a) long term contract changes are completed;
- (b) the requirement that suppliers for the franchise market buy all their electricity from NIE's Power Procurement Manager is ended;
- (c) customers below, say, 100kW as an interim step are grouped by areas and "bulk buy" from suppliers. Customers above 100 kW would be allowed to choose their supplier but must have half hourly metering;
- (d) suppliers to the domestic market are obliged to offer customers a menu of tariff options and assume all the obligations in NIE's Supply price control;
- (e) the Power Procurement Business, by operating in accordance with its licence conditions, ensures good market behaviour;
- (f) the Transmission System Operator (TSO) is made fully independent and charged with system security and levying Public Service Obligations (PSO's), for environmental, social and other policy related objectives; and

- (g) legislation is introduced to allow long term industry re-financing, particularly to deal with the cost of the past and to provide for price controlling generation; and in addition to protect the environment and the fuel poor;

On this basis Northern Ireland could achieve a fully competitive electricity market by April 2002 without any loss of momentum on environmental, economic and social policy objectives. This scenario would produce, on a sustainable basis, substantially lower prices than customers face today.

Structure of this Report

This report consists of an **Executive Summary and four chapters.**

- Chapter 1** Sets out the requirements for generation competition and Northern Ireland Electricity Supply Industry's (ESI) experience of competition to date;
- Chapter 2** Describes what needs to be changed in Northern Ireland to create the conditions for having a genuinely competitive market;
- Chapter 3** Discusses Supply competition; and
- Chapter 4** Describes how a fully liberalised genuinely competitive market which would drive down prices could be established quickly in Northern Ireland.

Abbreviations used in this report:-

NIE	Northern Ireland Electricity plc
DETI	Department of Enterprise Trade and Investment
OFREG	Office for the Regulation of Electricity and Gas
ROI	Republic of Ireland
T&D	Transmission and Distribution System
NFFO	Non Fossil Fuel Obligation (Imposed on NIE by DETI)
PPB	Power Procurement Business
PPM	Power Procurement Manager
ESI	Northern Ireland Electricity Supply Industry
PSO	Public Service Obligations
IPP	Independent Power Producers
CHP	Combined Heat and Power
BST	Bulk Supply Tariff
STS	Second Tier Supplier
TSO	Transmission System Operator
CCGT	Combined Cycle Gas Turbine
SONI	System Operator Northern Ireland
kW	Kilowatt (1000 watts)
MW	Megawatt (1000 kilowatts)
GW	Gigawatt (1000 megawatts)
kWh	Kilowatt hour (1 unit of electricity)
MWh	Megawatt hour (1 thousand units of Electricity)
GWh	Gigawatt hour (1 million units of electricity)
PES	Public Electricity Supply Licence
IME	European Union's Internal Market in Electricity Directive
SNIP	Scottish to Northern Ireland Gas Pipeline

Chapter 1

GENERATION COMPETITION

Introduction

If competition in the electricity market is to be of value to customers it will be so only because it brings lower prices both in the short run and on a sustainable basis while providing a quality of supply which - at worst - is as good as they enjoy at present. With an undifferentiated product such as electricity where in practice the electricity which powers a customer's appliances may not be that bought by the customer's supplier, it is difficult to see that competition can have anything else to commend it.

It is generally accepted that perfectly competitive markets are the most efficient way of ensuring that customers secure goods and services at least cost. However, in the absence of such a theoretical ideal, for a sufficiently competitive market to exist and deliver the lowest possible prices, at least five conditions must be met. These are:

- > supply should exceed demand;
- > there must be a number of competing suppliers - none of them able to set prices;
- > the industry must produce efficiently at low cost as no industry can sustain itself if it sells below cost;
- > there must be effective means of transporting goods to market which are not subject to bottlenecks; and which poses no significant barriers to entry or exit;
- > there must be efficient market trading structures in which buyers and sellers have confidence.

In the absence of any of these conditions the market will not produce the lowest prices for customers.

At privatisation only one of these conditions was met by the ESI in Northern Ireland. The ESI then was certainly capable of producing much more electricity than the 6500 GWhs which customers were then demanding. All the other conditions for a successful competitive market were absent. There were few producers, each producer had a monopoly on part of the demand curve; the industry's costs were high partly because it was overpriced when it was sold but also because it was technically inefficient; there was no market structure and the means of delivering goods to market (the T&D system) limited the market to indigenous producers i.e. to companies generating electricity in Northern Ireland.

In economic theory, these deficiencies should be rectified by the opening of the market to competition as efficient new entrants would come into the market and incumbents would either reduce their prices or go out of business. In practice, in the case of a small market like Northern Ireland it is more likely that the competition which ensued would be imperfect since there is no market incentive on the private sector to meet all these conditions - quite the contrary. Imperfect competition with the opportunity to make monopoly profits is the market structure instinctively sought by the private sector in every time and in every place. If competition is to work the

conditions must be put in place before or - at worst - as the market develops in order to send the correct signals to investors.

Chapter 2 of this paper deals with the steps taken or which need to be taken in Northern Ireland to:

- > ensure a sufficient number of producers of electricity;
- > to drive down generation costs;
- > to transport electricity efficiently to market without constraints or bottlenecks;
- > to develop a trading mechanism in which customers and sellers can have confidence.

In addition, it will be necessary to ensure that any changed structure conserves the environmental and social provisions of the present structure.

Generation in Northern Ireland

At privatisation Northern Ireland was over-endowed with generation capacity, all of which had to be paid for by customers. Moreover, NIE was required to add 45MWs of renewable capacity by 2005 with the first 15MWs being commissioned in 1996.

Demand growth, contract restructuring and liberalisation have brought both a better balance between supply and demand and reduced the proportion of capacity which is contracted to NIE. The total amount of generating capacity which must be located in Northern Ireland in order to provide a sufficient reserve margin to cover eventualities such as peaks in demand coinciding with plant failure is now reduced by the ability to call on generators in the Irish Republic and in a few months from Scotland.

Table 1 on the next page gives the total amount of capacity available and contracted in Northern Ireland each year.

Table 1: Demand and Capacity

(Actuals to 1999/2000, estimates 2000/2001 to 2004/05)

Year	Unrestricted Peak ¹	Contracted Capacity ²	NFFO Capacity	Uncontracted Capacity	Other Uncontracted Capacity ⁴	Units Sent Out (GWh)
1992/93	1390	2243	-	-	30	6838
1993/94	1432	2243	-	-	30	7058
1994/95	1467	2243	7	-	38	7195
1995/96	1500	2243	13	-	43.5	7369
1996/97	1541	2123	15	-	60.4	7567
1997/98	1557	2123	15	-	68.4	7683
1998/99	1665	2123	15	-	95	7971
1999/00	1692	2063	18	-	108.9	8151
2000/01	1726	1769	18	294	108.3	8325
2001/02	1762	1769	20	177	110.5	8571
2002/03	1797	1714	20	512	110.5	8774
2003/04	1833	1654	20	512	110.5	8976
2004/05	1870	1594	20	392/792 ³	110.5	9188

- 1 Unrestricted Peak - system max demand adjusted to remove load management and include embedded generation
- 2 Capacity under long term contract to NIE, includes 125MW of the Moyle Interconnector from 2002/03 and assumes Kilroot on 520MW Oil firing (on coal reduce by 130MW)
- 3 High figure assumes 400MW new IPP, either at Coolkeeragh or elsewhere
- 4 Includes embedded generation, CHP and renewables other than NFFO

As the table shows, there is a growing gap between Northern Ireland's electricity needs and the amount under contract to NIE. Moreover, as 232MWs of the remaining contracted capacity consist of Gas Turbines which are high cost specialist units for providing support for the entire system in extreme conditions, the predominance of contracted capacity in providing for total electricity needs day in day out is over stated by these figures.

It is against this background that measures for further liberalisation need to be considered.

Northern Ireland's experience of electricity competition

Northern Ireland has already some experience of market opening and the competition which thereby becomes possible.

Since privatisation Northern Ireland has had full market opening in electricity supply. However, as all suppliers had to buy their electricity from the PPB there was, in practice, no supply competition. A few UK wide chains who wanted a single supplier for the whole of the UK were the only customers of any significance to use this provision.

While Supply competition has been for most customers an empty formula, the fact that it is already legally in place is at this juncture a considerable advantage. The issue is not about the desirability or practicality of supply competition for all customers. It is simply how should this be converted into a practical reality.

Since 1998 the market in green electricity has also been 100% open. Any customer can buy green electricity from any supplier who in turn may source it from any renewable generator. To date only NIE's Supply Business has responded to this business opportunity on a province wide basis, although there are examples of local green generators supplying their own local customers. There is, however, growing interest in this area and competition in renewable electricity may become more important in the near future. This year has already seen a ten fold increase in sales of renewable electricity directly to customers choosing to buy it because it is green.

Since 1999 Northern Ireland has also - under the requirements of the IME Directive - had generation competition. Initially, this applied to 26% of the market but it has grown to 35% this year. Two years ago only 240 customers were eligible but this year this will grow to 680.

Market opening means that eligible customers no longer have to buy their electricity from PPB - though they may if they wish, and in practice many do still buy some and some still buy all of their electricity from PPB. However because of its initial dominance in the Northern Ireland market PPB is obliged to sell its electricity to all suppliers and final customers at a single set of published prices known as the Bulk Supply Tariff (BST). It is accordingly prohibited from striking individual deals with each purchaser.

Northern Ireland's experience of a competitive generation market is to date limited to two years of atypical conditions. The generation sources used to supply the competitive market are - and will remain for another year - exclusively made up of generators which originally supplied the whole market under contract to NIE. In the near future these generators will face competition from external generators supplying customers through interconnectors or from new IPPs, CHP and renewables in Northern Ireland and from a lower cost PPB.

In the meantime valuable lessons have been learned from the experience to date. The IPP sector in Northern Ireland is very exposed to world fuel price fluctuations and particularly to the price of gas. The average winter price of gas doubled in the second year of market opening. Unlike the franchise customer the eligible customer has been largely exempted from the costs of the privatisation arrangements. They pay for the operating and fuel costs of the plants they buy from. They do not pay for the capital costs because these have either been written down or bought out, though obviously new entrant IPPs will expect to recover their capital costs in the price of the electricity they sell. In the first period of market opening with very low fuel prices competition was able to deliver significant price reductions - according to Electricity Association data reductions of around 23% were achieved, or 25% in real terms..

However the doubling of fuel costs which began to gather momentum from the spring of 2000 eroded these early gains by eligible customers - though they should still be better off than buying at BST as they still enjoy the right to buy at BST if it is to their advantage.

Northern Ireland's limited exposure to competition to date demonstrates beyond any doubt that lower prices come from driving costs out of the generation business. If costs are high - and in Northern Ireland poor thermal efficiencies and the privatisation contracts have made them high - then competition is powerless to reduce costs.

Indeed, on the basis of experience to date it would seem that as costs rise new entrant companies lose their appetite for the market. They walk away leaving the field to Ireland's two incumbent companies.

Competitive Opportunities in the Electricity Supply Industry

The electricity supply industry may be thought of as a supply chain which starts with a producer and ends with a customer. Figure 1 shows this diagrammatically . The parts of the chain which may be subject to competition are the production stage - generation - and the retail stage - supply. The middle portion i.e. the wires which bring the electricity from the power station to the customer's meter is a natural monopoly. (People who want the opportunity to buy from somebody other than NIE miss the point. NIE's principal business is the operation of the wires and irrespective of the supplier and generator who provide the electricity the customer will have to use NIE's wires - and complain to or about NIE if they are off supply.)

Fig 1 : Electricity Delivery Chain

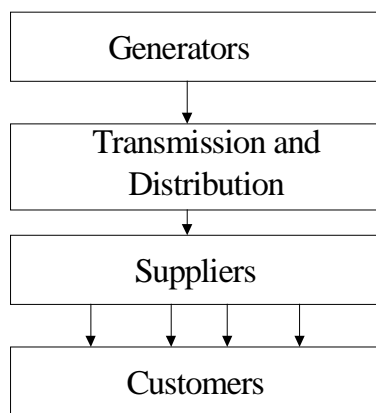
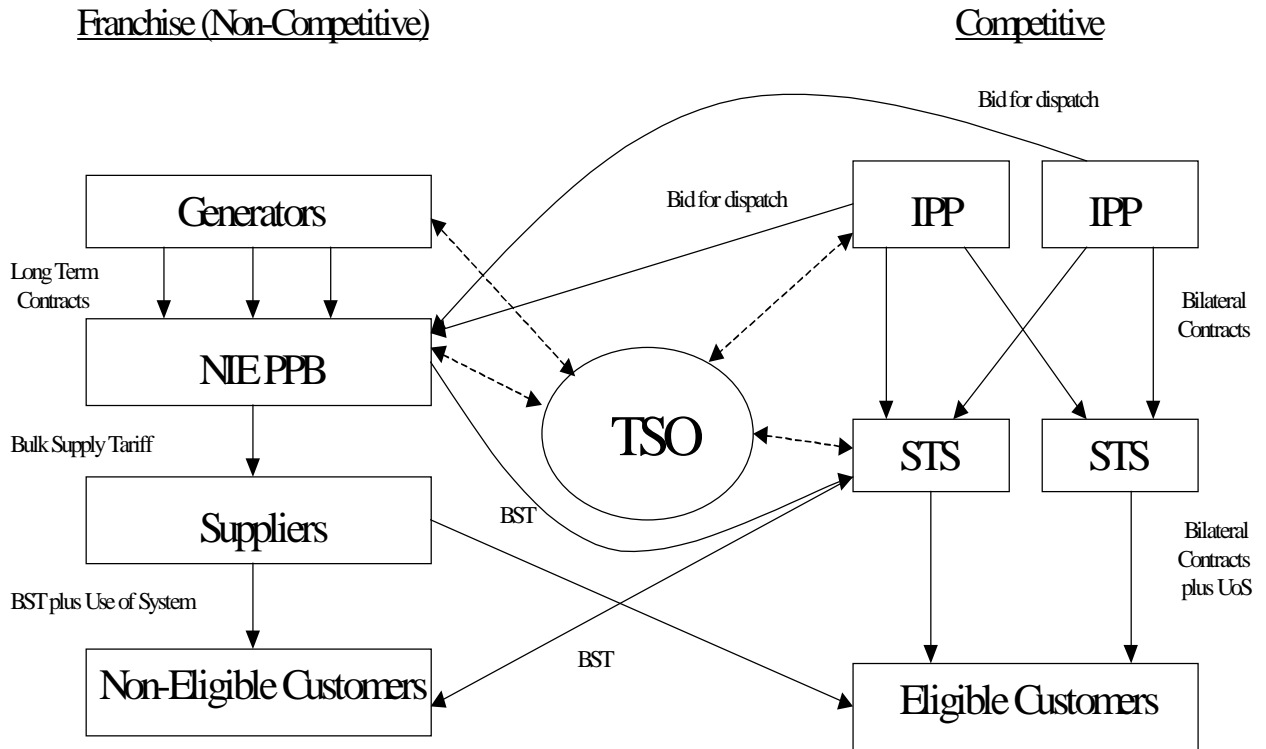


Figure 2 on the next page shows the present competitive structure in Northern Ireland.

Fig 2 : Market Structure 2001



It will be seen that there are in practice two partially interconnected markets. The restrictions on the merging of these two into a single market are that:

- > PPB can only sell to STSs at Bulk Supply Tariff (BST); and
- > STSs must buy from PPB if they want to sell to franchise customers.

In every other respect the market has already been fully liberalised and all other market transactions are permitted. Thus:

- > IPPs can trade among themselves;
- > PPB and IPPs can trade between each other;
- > STSs can trade between themselves;
- > PPB can sell to suppliers outside Northern Ireland at a price other than BST;
- > any market participant can buy or sell renewable electricity to any other market participant;

- > interconnectors are open to third party users and capacity is allocated in an open, transparent and competitive way; and
- > market participants are free to develop other products such as a forward price for electricity.

In formal terms all that needs to be done to fully liberalise the generator market in Northern Ireland would be to end the requirement that suppliers selling to franchise customers must buy from PPB. The corollary would be that PPB would be free to sell its output on the same terms as any other generator i.e. at the market price.

It does not however follow that such a move by itself would lead to falling prices and real competition. Our experience in Northern Ireland is that formally we have fully competitive markets in supply and renewables and in the most desirable 35% of the generation market but each successive year brings less and less competition. The year 2001/2002 will see less IPP capacity actually trading in the market than the previous year and the lowest number of STSs since the market opened. **Market opening by itself is no guarantee that anything worthwhile will happen.**

Ending the requirement that all electricity sold to franchise customers must be bought from PPB is a necessary step towards a fully liberalised market. But it is not by itself sufficient to produce a competitive market. Other steps will be necessary.

Chapter 2

The Pre-conditions for Competition

Introduction

Competition in generation is difficult to achieve even in large markets. The fuels and technology for producing electricity differ considerably as do the external costs of production - emissions, nuclear decommissioning, disposal of ash and other solid waste etc. While competitive outcomes appear to be feasible over short periods between technologies which have radically different costs this has only been achieved - firstly - because substantial costs have been written off or amortised in pre-competitive markets and- secondly- because the non storability of electricity - with the resultant need to profile production both within the day and across the year - creates niches which different types of producers are able to colonise. Even in large markets it is far from clear how generation competition will work in the longer term. Competition in generation pressurises competitors to opt for the currently lowest cost technology - which is combined cycle gas turbines (CCGT). The need to maintain competitive edge pushes the industry to seek ever greater efficiencies. In the short term however the key question is ensuring that the market has sufficient competitors for their rivalry to force down prices. But technically one medium sized power station would suffice for Northern Ireland's needs if the only objective were to produce the required amount of electricity at least cost.

In principle, however, the existence of interconnectors should provide the opportunity for access to the market for sufficient producers for Northern Ireland to have competition in generation. But while having enough generators is a necessary condition for competition it is by itself not a sufficient condition. A new IPP whose costs are the lowest in the market place and which is in a position to set prices will not drive prices to the lowest possible level. In capacity terms one new IPP is all that Northern Ireland requires. But in competition terms that IPP must be challenged by the market to produce at the low cost at which it is economically capable of operating profitably.

Northern Ireland will probably have for the foreseeable future power stations at Ballylumford and Kilroot. There are proposals for a power station at Coolkeeragh and other proposals such as lignite and a further gas fired power station are credible even if not all proceed. More importantly the Scottish and ROI interconnectors will allow access by generators in GB and the ROI to customers in Northern Ireland - provided always that there are no system constraints.

Customers in Northern Ireland also have the opportunity to purchase renewable electricity or in some cases use combined heat and power (CHP). At present renewables - for which the market is already 100% open - look set to mount a serious competitive challenge now that some "teething problems" are on their way to being resolved and proxy carbon taxation is reducing their cost disadvantage.

In terms of the potential number of producers who should be physically able to access the market, there does not appear any longer to be an obstacle to the introduction of generation competition - provided all aspirant gas fired IPPs can be assured access to gas supplies on equal terms.

Driving Down Generation Costs

In capacity terms Northern Ireland could be fully supplied with electricity exported from GB and the ROI. In practice, there are sound operational reasons why this is unlikely to be practicable

but even if it were, it is doubtful if such an outcome would be acceptable to customers in Northern Ireland because of the perceived security of supply risk it would represent unless electricity in consequence became substantially cheaper. Generation located in Northern Ireland will provide an essential component of Northern Ireland's supply. Indeed there is no reason why costs for new generation should be higher than in GB or the ROI. The one cost which might be higher in Northern Ireland is fuel transportation costs. This should be small and more than offset by other locally controllable costs. It is however essential to ensure that all possible steps are taken to minimise fuel transportation costs.

The willingness of external producers in GB and the ROI to compete down the price of electricity in Northern Ireland will depend entirely on the price set by local producers.

At present local producers have high costs and poor efficiencies. The combination of contract renegotiations and demand growth have reduced the cost of availability payments from £145m in 1993/94 to £147m in 1999/00 (the last year before market opening made such comparisons invalid) a fall in real terms of 16%. In pence per kilowatt hour (units sold) this was 1.981 pence in 1999/00 compared to 2.262 pence in 1993/94 which is a fall in nominal terms of 14% and in real terms about 25%. The improvement is considerably better than the price of availability predicted at privatisation of 2.8 pence by 1998. Nevertheless the unit cost of availability is still about twice what customers should be paying for modern competitive generation.

The second cost factor is thermal efficiency - ie the efficiency with which the power station converts primary fuels such as oil, coal and gas into electricity. Our record is deplorable. Table 1 shows our thermal efficiency compared to other countries in the European Union.

Table 2

Conversion Efficiency 1998

E.U average	39.4%
United Kingdom	41.0%
ROI .	37.7%
Northern Ireland	31.07%

Sources: Eurostat and NIE

Changing generating technologies should dramatically improve our efficiency figure. The combination of the Ballylumford, Coolkeeragh and Kilroot proposals should lift the industry's efficiency from 31% to about 43%. Moreover, as the effect of converting Kilroot to orimulsion gives similar unit cost reductions at full load this understates the real gain. At a gas price of 20 pence per therm and a Kilroot coal price of 1.2 pence per kWh the fuel cost of producing 9000 GWhs with the present technology and efficiency is about £169m. The fuel cost of the same output spread equally between the same three stations after the changes in technology would be about £112m - a fuel price reduction of about 34%.

These figures illustrate that it is absolutely vital that Northern Ireland modernises its generating capacity and that doing so has a greater impact on final prices than competition. And the higher the fuel price the greater the price protection given to electricity customers by efficiency gains.

The contract renegotiations are amongst other things concerned with driving costs out of the existing contractual arrangements so that the remaining contracted stations can compete in a modern competitive market.

The changes to Ballylumford's contract have been successfully concluded. The existing 951 megawatts of contracted capacity will be replaced by 600MWs of CCGT which will be operational in 2002. The marginal price of Ballylumford's output should fall by 36% and the ability of the Power Procurement Manager (PPM) to trade with other generators should result in this greater efficiency impacting on costs in the eligible customer market.

Moreover, the Ballylumford contract has been designed so that most of the capital costs will be repaid over the first ten years. The true cost of Ballylumford to customers in these ten years will therefore be over-stated.

It is possible to reduce the cost of Kilroot in a similar way and to greater immediate effect. The changes which have been proposed for Kilroot would result in customers paying for the capital cost over the life of the plant and not over the next ten years. The use of orimulsion instead of coal would increase output for the same fixed cost, produce a lower unit cost and accelerate environmental improvements.

Northern Ireland's generation industry is on its way to having the lower cost production capability which is an essential pre-condition of generation competition. But unless the Kilroot contract is changed Kilroot will be out of market and its excess cost will represent a stranded cost. As this cost is entirely avoidable customers cannot be asked to meet it.

Any new generation constructed in Northern Ireland would have to be capable of producing electricity at the lower cost levels necessary to be internationally competitive. This holds for Coolkeeragh and all the other current proposals. But if no third station is constructed DETI will need to consider the implications for security of supply. The draft Directive should remove the inhibitions on discussion of this issue up to now.

In conclusion this second condition for a competitive market in generation - namely efficient low cost power stations - is partly met already and is capable of being fully met.

Transporting Electricity to Market

Markets require buyers and sellers to be able to interact. In the first place they must be able to communicate what is available, what is sought and the terms and conditions for the transaction. Secondly the seller must be able to physically deliver the goods to the buyer. Thirdly, the buyer must be able to pay for what has been delivered and the seller must have confidence that he will be paid.

The electricity market differs from the market for other goods and services in that dedicated systems are needed to facilitate the interactions between buyer and seller.

The most obvious aspect of this is the network of wires which connects the power station to the customer's meter.

Until very recently the "islanded" nature of the Northern Ireland system limited the potential scope for trading electricity to buyers and sellers within Northern Ireland. From next year customers will be able to buy from producers in GB as well as the ROI and in principle from further afield. In the space of six years Northern Ireland will have changed from total isolation to one of the most open systems in Europe as measured by the interconnector capacity as a percentage of maximum demand. Moreover this is a two way process. Generators in Northern

Ireland will be free to sell to buyers outside Northern Ireland.

Capacity on the North South interconnector has now been auctioned for the second full year in both directions. Capacity on the Moyle interconnector has been auctioned for the first three months of 2002. In the summer OFREG will publicly consult on the way in which all interconnectors will be made accessible to those who want to use them from 2002 onwards. Prospective users will be able to indicate the sort of mix of day ahead to one or more years of firm or interruptible capacity they would like to be able to buy.

The development of the interconnectors is a major step in meeting another pre-condition for a competitive market. However there are other conditions which need to be satisfied.

The first is that there should not be transmission constraints either internal or external to the Northern Ireland system. There are constraints on transmission in the ROI. The extent to which external transmission constraints may diminish the fullest value being derived from interconnection will only become clear once the interconnectors are fully operational.

Secondly, the system must be managed in a way which does not discriminate between generators. Managing the system on a day to day basis is the responsibility of the Transmission System Operator (TSO) who should be totally free of any association with any of the system's users. An efficient transportation system requires an independent TSO. To a considerable extent this has been achieved in Northern Ireland with the establishment of a System Operator Northern Ireland (SONI) as the TSO as a wholly owned NIE subsidiary. However it is clearly desirable to have SONI taken out of both NIE's and Viridian's control - a move which might require primary legislation. OFREG will publish a consultation paper on this in the course of this year.

Thirdly, the transmission system must be developed in a way which does not incorporate commercial bias. Network planning may influence the viability of existing power stations or the location of new power stations though this is less likely in a small system such as Northern Ireland with postalised transmission charges.

Finally, the transportation system has to be as low cost as possible. T&D costs in Northern Ireland have not fallen since privatisation to the extent they have in GB. This is not the place to comment on the reasonableness or otherwise of the divergence in T&D prices in Northern Ireland from the trend in GB. But high T&D costs forming an ever increasing percentage of total electricity costs weaken the pressure for generation competition. If generation costs are 75% of total costs competition which reduces generation costs by 4% knocks 3% off final bills. If generation costs are only 50% of final costs because T&D costs are high, then that same 4% reduction only reduces final bills by 2%. Generation competition's value to customers becomes diminished in these circumstances.

An efficient market trading structure

In any market buyers and sellers need to be able to settle their payments. If this facility does not exist or deteriorates so that one or both parties lose confidence in it, markets cease to function, economic activity declines and ultimately there is social and economic chaos.

Electricity markets not only need a market structure in which buyers and sellers have confidence but the peculiarities of electricity give them special difficulties. As electricity cannot be stored, distrained or returned to sender the market has to function on the basis that whatever is recorded by metering as having happened did actually happen. Electricity has other peculiarities - for

example the inevitability of “losses” en route between power station and customer, the fact that the production and consumption of electricity are instantaneous, that the customer should not however be affected if his producer fails to produce and indeed that there is no necessity for the electricity which customer “A” buys from supplier “B” who ordered it from power station “C” to actually be the electricity which powers customer “A”’s factory or lights his house.

For an electricity market to work all the electricity and financial flows - including all the unpredictability and unplanned variations in flows - have to be capable of being settled and settled regularly and efficiently.

The TSO in addition to managing the physical flows on the system has to manage system financial settlements. For the 35% market opening in Northern Ireland the TSO put in place an “interim settlements system” which could be refined in the light of experience. Its principle virtues are its simplicity and its low cost. At present 35% of the electricity used in Northern Ireland is traded on a system which cost around £100,000 to set up and approximately £100,000 per annum to run.

Market opening to 100% of the market could involve customers in having to incur considerable costs. Customers who are not at present eligible i.e. the franchise customers fall into two broad categories. There are about 50,000 non domestic customers and about 630,000 domestic customers.

Electricity’s market value varies during the day and throughout the year because of variations in demand and variations in cost. When demand is slack - for example on summer nights - only the lowest cost power stations run and as it is a buyers’ market the price is not bid up. On a winter evening when demand is at its highest the value of the last unit of electricity produced will be high. This natural market outcome makes it possible for high cost producers to meet the peak demand and still cover their costs. In a fully competitive market producers who only operate for a few hundred hours a year have to be able to recover all their costs from the very high prices during these peaks.

Electricity suppliers selling to domestic customers do not reflect the spikiness of half hourly electricity costs in the tariffs they set. Typically the tariffs would smooth the price over the year which means that the supplier is recovering more than his costs in the summer but selling at a notional loss in winter evenings.

However, in order to facilitate the transactions between suppliers and generators it is necessary to record accurately not only how much electricity customers consumed but precisely when they consumed it. This half-hour by half-hour history of consumption is the customer’s load profile. The day and night rates with which economy 7 customers are familiar is a crude form of profiling.

Taking domestic customers as a whole it is possible to devise a profile which averages the profile of all such customers. For non-domestic customers it is necessary to install half hourly metering which sends data by telephone line to enable financial settlements to take place.

The total cost of a system with this degree of sophistication for Northern Ireland will not be known until serious research into costs is undertaken. However sufficient information is available to enable an approximation to be made.

The half hourly metering of 50,000 non domestic customers would be around £450 per site or £22.5m. NIE’s T&D business would need £5m for additional computer facilities for Meter

Point Administration.

The annual running cost of this system including telephone lines would be about £6m. Thus for non-domestic customers the costs would be of the order of £28m plus £6m per annum.

Most of the smaller non-domestic customers might prefer not to pay for half hourly metering and instead go for load profiling along with domestic customers. If this were to happen, the cost of say 10,000 customers on half hourly metering and the rest on load profiling would be £4.5m for half hourly metering and £35m for load profiling. This assumes an average cost per customer of £50. The cost in GB in 1998, where they may be presumed to have enjoyed some economies of scale, was £33 per customer.

The wholesale settlement system which would be needed to handle the transactions between suppliers and generators would add a further £10m to the cost. This gives a total cost of £55 - 60m for start up and about £6m a year to run. If companies were to recover this cost from customers over seven years - as they did in England and Wales - this would add £14 - £15m a year to the cost of electricity. If the entire cost were borne by the 65% of "new" eligible customers this would be about 0.25p per kWh which would add about £10 per year to the average domestic bill. This 0.25p per kWh for transaction costs is at least 50 times more than the transaction costs of the present 35% market opening for which the transaction cost charge is something of the order of 0.005p per kWh. One further reason why Northern Ireland would be more exposed to transaction costs having an adverse effect on prices would be the relatively small number of units consumed per customer. Scandinavia's per capita electricity consumption is three to four times Northern Ireland's. To persuade customers that this would be a penalty worth incurring it would be necessary to show even larger compensating reductions from competition that could not have been obtained at lower cost. But over the next few years the cost of these types of systems should fall.

There are alternatives to the British model. For example the Scandinavian countries which trade via the Nordpool : Norway, Sweden, Finland and Denmark have formed a market which is based on the use of bilateral trades and a highly liquid and transparent spot market, and yet retains a high degree of state ownership at the Grid level. This is combined with active supply competition (for example Finland has over 200 suppliers for a population of 5 million) and low (but relatively volatile) wholesale prices.

The system is itself dependant on the interaction and co-operation of the system operators within each state and the effective management of interconnection and transmission bottlenecks to ensure the efficient operation of the market. This constraint management allows trades across borders to be carried out in the most efficient way, and bottlenecks are managed specifically to reduce the adverse price effects of transmission constraints. The Nordic trading model is also characterised by a highly active derivatives market which allows market participants to lay off the risk of bilateral contracts by in effect buying insurance as well as contracts for delivered energy. Such features allow participants therefore to operate at lower cost.

Whichever other model we choose to examine we must note that there are significant costs of balancing and settling the electricity trades, and given the size of the Northern Ireland (or indeed the island of Ireland) market, this alternative is not a feasible model to follow. If we examine the two Irish systems against the Nordic model, they are relatively small in customer numbers, are low in average consumption terms (and hence have a higher cost per unit of electricity traded when considering relatively fixed settlement costs), have relatively high cost generation (as opposed to the availability of low cost hydro power in Norway) and are not sufficiently competitive to allow the efficient operation of a spot market because of the dominance of large

players.

A competitive market also needs to have an exchange - real or virtual - where buyers and sellers can trade. This trading mechanism has to be one in which both sides - but particularly buyers have confidence. They need to know that the trading mechanism is not being exploited or gamed by those producers or suppliers who have market power. It has taken twelve years from privatisation to achieve this to the satisfaction of all parties in England and Wales. Scotland is not yet included. During this period England and Wales have moved from a trading pool to a system of bi-lateral trades. Competition Act powers are likely to be too slow to be effective in this kind of market though it is conceivable that an early hanging “pour encourager les autres” would instil sufficient fear into the market as to ensure that there was no abuse of market power.

The eligible customer market in Northern Ireland is based on bilateral trades between independent generators (IPPs) and suppliers (STSs). As STSs can purchase from PPB the existence of the PPB effectively caps the price which IPPs can charge. But at present the cap set by the PPB is itself high being a function of the PPB’s high cost contracts with inefficient plant. Only if the cost of the PPB’s contracts reduces will the effectiveness of the PPB in setting a price cap improve.

If it is to inspire the market to behave in a way which delivers the sort of competitive outcomes which a properly functioning competitive market would deliver, PPB must have plant which is sufficiently low cost to be challenging and must have sufficient capacity to be capable of forcing a large portion of the market to respond to the challenge.

Table 3 on the next page gives PPBs contracted capacity between now and 2010 against estimated peak demand.

Table 3

Year	Unrestricted Peak MW	PPB Capacity MW	PPB Capacity as % of Peak
2001/02	1762	1427 ¹	80.9%
2002/03	1797	1372	76.3%
2003/04	1833	1312	71.6%
2004/05	1870	1252 / 1382 ²	66.9 – 73.9%
2005/06	1908	1136 / 1266	59.5 – 66.3%
2006/07	1946	1136 / 1266	58.3 – 65.1%
2007/08	1985	1136 / 1266	57.2 – 63.8%
2008/09	2025	1011 / 1136	49.9 – 56.1%
2009/10	2065	1011 / 1136	48.9 – 55.0%

Clearly PPBs potential maximum share of the market would decline gradually with time, as would its technological edge. In an all-Ireland market its role is further diminished. It would pose no market threat to more efficient new entrants prepared to trade keenly but it would be positioned so as to protect customers from new entrants abusing their position. It would also protect Northern Ireland's customers from having to pay high prices to inefficient producers.

In the absence of PPB there is no mechanism which would effectively force IPPs selling to the whole of the Northern Ireland market to sell at prices which are reflective of their costs. The indications from elsewhere suggest that IPPs would price to the maximum level which the market would bear.

Moreover, a market as small as Northern Ireland would provide little opportunity for good off-take bilateral contracts between IPPs and final customers. The absence of long term contracts of any sort would increase the riskiness of investment, raise the cost of capital, increase price volatility and possibly lead to periodic power shortages; Northern Ireland could re-enact the California market in miniature. There can be no guarantee that an untrammelled free market in generation will deliver sufficient generation when it is required, or at prices which are comparable with those in GB - problems which are recognised by the draft Directive.

Finally, customers have to be confident that there will be sufficient capacity to cover accidents and emergencies, the daily and annual peaks in demand, supply the home market if prices rise externally, and generally provide for system security. In a large market it may be possible for market forces to cover all these aspects. There is no reason to believe that in a small market there will be sufficient capacity to enable a civilised society to continue to operate at an acceptable cost.

¹ 2001/02 – 2003/04 assumes Kilroot on Coal at 390MW, all data assumes 232MW Gas Turbine (GT) capacity is not included in PPB capacity.

² 2004/05 – 2009/10 : higher figure assumes Kilroot on Orimulsion at 520MW

In summary, therefore, a market mechanism in which customers and sellers can have confidence has to:

- > produce prices which reflect the costs of a competitive market;
- > facilitate all desired transactions without high transaction cost eroding the value of competition;
- > protect system security.

None of these requirements will be readily met in a market as small as Northern Ireland. Any failure to meet them could prove to be very costly for customers. Northern Ireland's competitive market structure must be based on clearly allocating responsibility for meeting those three requirements.

STRANDED COSTS

One further issue which may be associated with market opening is that of stranded costs. Stranded costs are those costs that cannot be recovered in the market place. Stranded costs are a problem of success. The possibility of stranded costs would arise if PPB, faced with full market opening, were unable to recover in the market place sufficient to pay the owners of Kilroot and Ballylumford powerstations the amount which it is contractually bound to pay them.

This is the reverse image of some of the possible problems described above. It only arises if new entrants are attracted to the Northern Ireland market who undercut the PPB contracts. The extent to which PPB would have stranded contracts would be the extent to which new sources of supply forced down the market price. PPB would not face stranded costs for the full extent of their contracts and should be able to sell the output of both plants - but at a loss. The loss would, however, be considerably less than paying the plants their availability payments but not operating them.

Therefore, it would be prudent for PPB to seek to ensure that as much cost as possible was driven out of its existing contracts so that it minimised the risk of exposure to stranded costs. If, after doing that, its costs are still above market this implies significantly lower prices than today. Customers should not therefore be unhappy about paying for stranded costs if, after contract changes, prices were lower than they are now. On the other hand if stranded costs arise because of a failure of NIE to adjust its contracts, then it would be inequitable to require customers to meet a cost arising from the failure of NIE to manage its contracts efficiently.

CHAPTER 3

SUPPLY COMPETITION

At the other end of the chain from generation to consumer is the supplier - the entity which retails electricity to the final customer. Supply like generation and unlike T&D - can be undertaken by a number of companies competing against each other. Unlike generation, supply is not capital intensive and does not require long horizons for the recovery of costs. In theory, supply competition should be easier to stimulate than generation competition.

In Northern Ireland, in addition to NIE's Public Electricity Supply licence (PES) , thirteen licences have been issued to second tier suppliers (STSs) who can supply customers. However, few of these STSs are active. In the first year there were four STSs competing for eligible customers. In the second year there were three. This year there are only two. It is of course possible and indeed widely expected that there will be more interest by cross-channel STSs from April 2002 when the Moyle Interconnector begins its first full year.

STSs are entitled to sell to any customer in Northern Ireland. If they sell to eligible customers or if they sell renewable electricity they are entitled to purchase their electricity from any generator. If they sell to the 65% of customers who are not eligible they must - unless they sell renewable electricity - buy their electricity from PPB.

Supply competition has not developed in the franchise market. NIE's PES Business has a tight price control with profit based on a margin of 0.5% of turnover. It is a tighter price control than that traditionally imposed on PESs in England and Wales. An STS selling to a franchise customer would therefore face the same generation costs and the same T&D costs as NIE PES. The only area of cost over which they could compete is the 5-7% represented by the supply component of final price. Clearly, this does not have much scope for creating competitive gains which could be passed on to customers as price reductions. Not surprisingly, there has not been much interest by STSs in competing for franchise customers.

There is, moreover, the question of the pricing structure for franchise customers. NIE PES averages charges across the year but electricity varies in value during the day. As was explained in Chapter 2 full market opening requires either half hourly metering for each customer - which is at present too expensive to be self-financing for small customers - or profiling which imputes an average load shape to each class of customer. This approximation of consumption based on averaging - which is used below 100 kW customers in GB - is also expensive in terms of set up and operation. It also encourages gaming - the search for customers who diverge from the profile who can be profitable for STSs but, by definition , it increases the costs of the rest of the market.

Fully opening the market means that any STS would have the right to sell generation from any power station to any customer. If this were done it would expose PPB to the risk of stranded contracts as it would lose its captive customer market for its contracted generation capacity - which of course is only a problem if PPB's capacity is above market price which it clearly need not be. As indicated above, this type of load profiling system with half hourly metering for larger currently ineligible customers could cost £60 million.

However, there must be a serious question as to whether keen competition would follow the setting in place of these arrangements. It is difficult to get STSs to compete for the 650 large customers who are currently eligible. In GB the view that about four million customers are necessary to sustain a supply business has been gaining ground. In Northern Ireland there are less than 700,000 customers. The belief that STSs which will not compete for the accounts of

large users will invest in door to door selling to solicit business from individual households is simply not credible. **It is quite conceivable that the cost of full supply competition would be incurred without inducing challengers to enter the market place.**

In practice full supply competition could make the attainment of social, economic and environmental goals more difficult to achieve. Affluent customers are more attractive than impecunious customers. Measures to reduce fuel poverty and provide an incentive for energy efficiency - such as a two-tier tariff with a lower price for the first 1500 units - might be more difficult to introduce. NIE's PES business is currently incentivised to persuade domestic customers to consume less electricity. Could this kind of incentive operate in a fully competitive market?

Fuel poverty is not primarily about electricity prices since the major item of household fuel expenditure is space and water heating. High electricity prices certainly exacerbate the problem in that the £50 extra which a household has to spend in Northern Ireland for the same amount of electricity as a household in GB could otherwise be used to afford more warmth. Similarly, if all the lights and appliances in the house were efficient the household might have another £50 a year to spend on warmth. The combination of high prices and inefficient use of electricity probably deprives fuel poor households of over £100 per annum of income that could otherwise be at their disposal for warmth.

However, the structure of the electricity market is important for the tackling of fuel poverty for two reasons. The first is that it can facilitate the driving down of electricity costs to the fuel poor in particular, and ensure that their price of electricity relative to other customers does not rise. Secondly, it is important because the market structure can itself stimulate the direct tackling of fuel poverty.

The following features of the Northern Ireland electricity market may be regarded as helpful to fuel poor households:

- > the abolition of standing charges;
- > the absence of surcharge with the new keypad prepayment meter;
- > the incentive on NIE PES to promote energy efficiency and reduce household consumption;
- > the £2 per customer levy which raises over £1m per annum to be directly spent on tackling fuel poverty, including insulation, heating controls and heating systems.

If fuel poverty is to be eliminated these measures must be protected and developed. Poorly designed market structures may not do this.

Accordingly, I propose commissioning research to advise me on the way in which further market opening can be achieved without weakening still further the most vulnerable households in Northern Ireland.

CHAPTER 4

An ultra competitive response

If customers are to benefit from competition most of the benefit will have to come from generation competition, since supply costs are a small element in the total cost of electricity - about 5%. On the other hand, it is the behaviour and the room for manoeuvre of STSs that will be a principle determinant of the scope for and effectiveness of competition.

The only test by which customers will measure the success of competition will be its effectiveness in reducing prices to the level in neighbouring markets whose size and number of participants allows them to become, or approach, properly competitive markets. But as has been noted earlier, producers cannot sell at below cost. The two conditions necessary for successful competition in Northern Ireland are:

- > that the industry's costs are driven to the lowest possible level; and
- > that the institutional arrangements in the market prevent exploitation by any of the players.

It is possible to reduce costs in Northern Ireland so that the costs which must be met are similar to those of other regions.

The following are necessary to do this:

- > changing the Kilroot contract so that it is within market;
- > changing the financing arrangements for the gas pipeline (SNIP) so the producers in Northern Ireland are not disadvantaged;
- > ensuring that transaction costs are kept to a level which does not offset competitive gains;
- > gradually phasing out the cost of the past by allowing refinancing through long term bonds.

The institutional arrangements for a fully competitive market in Northern Ireland are tantalisingly close to completion.

(a) **Achieving generation competition**

As has been mentioned above, Supply is, in theory, 100% open and the market for renewables is 100% open. Generation competition is 35% open. To formally complete market opening it would suffice to change the Supply Competition Code so that there would, no longer, be a requirement that suppliers to the franchise market must buy their power from PPB. This would at a stroke give 100% market opening and if the long term contracts were in market, do so without any risk of stranded costs.

(b) **Avoiding transaction costs**

This leaves the issue of transaction costs. One of the problems with a market the size of

Northern Ireland is the difficulty in attracting suppliers to compete in the market. There is on present evidence no reason to believe that STSs who have failed to show an interest in large customers would want to send door knockers out to drum up a customer base at domestic level.

Full market opening must be managed in a way which avoids additional costs and which stimulates a culture of competition. Market opening should not be an inert event in competition terms; it must itself be designed and executed in such a way as to ensure that genuine competition is the result. This means the first stage must be to attract in competitors and once competition “takes” pushing market opening to the lowest levels. To stimulate competition as a transitional measure customers should be grouped - initially by district council areas or bulk supply points for example. Customers grouped together in this way should be much more attractive to STSs and by “bulk buying” should be able to obtain a better price than individual customers. The difficulty lies in finding a way of grouping customers which makes sense in both electrical and competition terms. Customers could be grouped by bulk supply points, possibly linked to District Council areas, but the former have impermanent boundaries and suppliers would need to know the characteristics of the customers within each area. Grouping bulk supply points would diminish the problems of impermanent boundaries and enable areas to be devised which would at least be partially based on bulk supply points. The objective would be to create a number of areas roughly coterminous with two or more Council areas which could be offered to suppliers as potential customers with an inventory of their customer characteristics so that interested suppliers could compete against NIE PES business initially for two to five years. The billing and metering could be provided as a common service by NIE PES which should be able to apply a different tariff to different areas. An industry implementation group - such as the IME implementation group - could sort out the details.

(c) Effective customer choice

Once a supplier has secured the right to supply a particular area there should be an obligation to allow the customer to chose the type of electricity product that best suits their needs and preferences. In particular, each supplier could be required to offer:

- (i) a normal tariff in which the price of electricity is flat throughout the year;
- (ii) a tariff in which the price is bench marked against a competitive market price and the customer takes market risk;
- (iii) a renewable tariff - though any renewable supplier can also supply any customer.

Suppliers might be required to develop other tariffs which include two tier tariffs to encourage energy efficiency or time of day or load management tariffs to smooth the peakiness of the normal domestic profile.

In this way the individual customer would have effective choice while being spared the high transaction costs associated with GB’s market opening. There would, however, as at present, be no bar on any individual customer immediately opting out of such an arrangement by installing half hourly metering and the ultimate objective would be to enable each customer to switch supplier as soon as the market has attracted strong supply competition and ways must have been found of minimising transaction costs.

(d) Market guarantors

The means to prevent market abuse already exist in embryonic form. The PPB has licence conditions which oblige it to operate in the public interest. In a fully liberalised market it would be more free than at present to make the fullest possible use of its assets. It ought, however, in the medium term to be taken out of NIE and given an independent status underwritten by legislation. It can however for the immediate future function as a guarantor of generator good behaviour - but only if the Kilroot contract is changed. Suppliers could be required to buy a percentage of their supply from PPB if those contracts had been placed in a satisfactory form - with such an arrangement being digressive over time.

Secondly, the independence of the TSO has to be formally established as well as his responsibilities for system security and network planning. This too may require legislation.

I propose publishing separate consultation papers on the future of the TSO and PPB in the light of reactions to the proposals in this paper. An ultra competitive response could - setting aside the residual costs of privatisation - give customers in Northern Ireland a better outcome than customers in GB as it would combine efficient generation, low transaction costs, customer choice well integrated with the community's social, economic and environmental goals and thus lead by progressive steps to full customer choice of supplier.

CONCLUSIONS AND RECOMMENDATIONS

Northern Ireland can move quickly and efficiently to a fully competitive electricity market which will deliver lower prices if it is recognised that the lack of critical mass in the market, the present pass through nature of supply and generation costs, and the structure we have inherited, require us to customise our competitive market to our own requirements - at least initially.

There are only two essential steps which must be taken. Both could be carried out under the existing industry structures:

- > Suppliers to the franchise customer market should not any longer be required to buy from PPB;

- > Customers below 100kW max demand should be grouped geographically to enable them to bulk buy. Customers who want to opt out would be free to do so but would have to install half hourly metering.

For these two steps to deliver an outcome which is satisfactory to customers, action must be taken to drive costs out of the industry and avoid the introduction of new costs. This is all feasible but it will require the leadership of Government to secure the full co-operation of the industry.

On this basis a fully competitive market could be introduced by 1 April 2002. The longer term measures to underpin this market could then be the subject of primary legislation which could take into account the experience of market opening.