

**ENERGY EFFICIENCY, FUEL POVERTY AND THE SUPPLY  
PRICE CONTROL**

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## **Executive Summary**

**This paper is concerned with three interlocking themes - energy efficiency, electricity prices and fuel poverty. Its starting point is an assertion that the minimum amount of electricity which is central to a modern quality of life should be subject to different treatment to the electricity which is not required to provide an energy service and is therefore in effect consumed unnecessarily.**

**Accordingly, basic electricity requirements should be met as cheaply as possible. Energy efficiency should be encouraged by charging a higher price for marginal units of electricity. The fuel poor should be aided by special measures.**

**The Government has appointed the Northern Ireland Housing Executive (NIHE) as Northern Ireland's Home Energy Conservation Agency (HECA) and charged it with reducing the consumption of energy in the existing housing stock by 34%. The need for the policies of public agencies to be aligned so that they complement each other in meeting public policy targets is obvious. The proposals in this paper reflect an intention of achieving this sort of "joined up" approach to public policy by changing domestic tariffs in a way which will help the NIHE to achieve the Government's policy target while protecting low income customers.**

**NIE's Supply Business should be encouraged to sell energy services rather than increased volumes of electricity and incentivised to become an energy services company. This approach to electricity pricing, energy efficiency, fuel poverty and NIE's Supply Business price control leads logically to a commitment: to strive to ensure that customers in Northern Ireland who consume electricity efficiently have electricity bills which are at least as low as they would have in Great Britain for the same quality of energy service.**

## **ENERGY EFFICIENCY, FUEL POVERTY AND THE SUPPLY PRICE CONTROL**

### **Purpose of this paper**

Measures already taken have ensured that Northern Ireland has the electricity price regime in the United Kingdom which most effectively encourages energy efficiency among all classes of domestic customers and facilitates Northern Ireland Electricity (NIE), and the voluntary and statutory bodies with which it works, in the delivery of energy efficiency measures. The purpose of this paper is to set out options for building on the experience to date and **to accelerate the drive to deliver low cost energy services to all domestic customers in Northern Ireland and in particular to the fuel poor.**

### **Introduction**

High energy prices and household incomes which are below the UK average both increase the acuteness of fuel poverty and the effectiveness of energy efficiency measures in tackling it. Energy efficiency measures, as well as reducing energy bills, have the additional benefit of also reducing CO<sub>2</sub> and other emissions and thereby contribute to improving the environment.

By appointing NIHE as Northern Ireland's Home Energy Conservation Agency (HECA) the Government has made clear its commitment to reducing the amount of energy consumed by each house in Northern Ireland. The objective of reducing consumption by 34% can only be achieved by an increase in the efficiency with which energy is used. As the Public Electricity Supplier NIE has a duty to assist in the achievement of this objective and indeed has already begun to develop a good partnership with NIHE.

The coincidence of a problem and an opportunity has been highlighted in successive Ofreg consultation papers. As a result of actions taken following public consultation the approach to energy efficiency has become increasingly sophisticated and a capability of delivering energy efficiency measures to all energy users but particularly the fuel poor has been progressively developed. In October I announced that the levy would be raised in stages to an average of £2 per customer and pegged at that level for the duration of the present price control. In addition there is a further energy efficiency incentive on NIE Supply Business to promote energy efficiency by all classes of customers. As a result of these incentives NIE achieved a 79 GWh saving last year. The number of GWhs of energy saved by NI electricity customers through energy efficiency levies is given in the table below.

**Table 1**

	<b>Target GWhs</b>	<b>Achieved GWhs</b>
1997/98	55	55
1998/99	55	79
1999/2000	80	125*
2000/2001	110	160*

\*estimated

This year NIE completed the second phase of tariff restructuring which enabled it to abolish the standing charge for 70% of domestic customers. The foregone revenue is recovered through the unit charge which links it directly to consumption. This has the effect of incentivising customers to reduce their consumption by taking cost effective energy efficiency measures. Despite having the highest generation and T&D costs in the British Isles the 37,000 NIE domestic customers who consume low quantities of electricity (up to 1000 kw/hs per annum) pay less than they would anywhere in GB.

### **Economy Seven**

This paper discusses changes which would effect the 561,000 domestic customers on the Standard Domestic Tariff. It does not affect the customers who are on Economy 7. Clearly similar principles could be developed for these customers, though on a less ambitious scale, except where Economy 7 households have opportunities to save electricity through insulation measures and in particular cavity wall insulation.

### **Philosophy**

This paper is based on the assumption that there is a basic requirement common to all households to have access to a minimum amount of electricity in order to enjoy a reasonable quality of life. This minimum amount should therefore be provided at the lowest possible price. Secondly, there is an obligation on all electricity users not to damage the environment by wasting electricity. From this it follows that the consumption of electricity beyond that required by efficient appliances should be discouraged by price signals. Thirdly, it is recognised that while this approach will deliver lower fuel bills to the majority of low income households who are also low energy users and will deliver strong energy efficiency incentives to above average consumers of electricity, there is a minority of above average consumers who are both low income and unable to afford energy efficiency investments. This last category of consumers require special measures in both their own and society's interest in order to install energy efficiency appliances.

## **STRUCTURE OF THIS PAPER:**

### **PART I - THE MARKET CONTEXT**

This paper is divided into three sections. The first section sets out the background against which this new approach to energy efficiency and fuel poverty is being considered.

The second section deals with the tariff structure which would recognise customers' needs for electricity at as low a price as possible as a basic requirement for a decent quality of life while at the same time providing price signals to customers to use electricity efficiently.

The third part deals with ensuring that NIE's Supply Business is incentivised to sell energy services rather than electricity and to persuade its customers to consume electricity more efficiently than - on average - they do at present. If electricity customers in Northern Ireland are to enjoy the lower electricity bills which are attainable through using energy efficient appliances then special forms of assistance will be required for those households who cannot afford to finance energy efficiency investments themselves. NIE must be allowed the resources to enable it to do this. Part III of this paper is therefore an alternative approach to a Price Control for the Supply Business.

#### **Market Opening and Fuel Poverty**

In Great Britain there is now full domestic competition which means that every domestic customer can both choose his or her electricity supplier and change supplier with 28 days notice. By contrast in Northern Ireland, market opening is at present limited to 26% of the market. As required by the European Union's Internal Market in Electricity (IME) Directive this will grow to 35% of the market by 2003. Whether the market should be opened beyond 35% still has to be decided.

Normal domestic customers, excluding Economy 7, represent about 85% of customers by number but only about 30% of total electricity consumption. Domestic customers therefore represent the last 30% by consumption. Opening the market by level of demand to reach domestic customers would mean that market opening would have to move from 35% to 100%. In other words the requirement of the Directive would have to be greatly exceeded before standard domestic tariff consumers would be affected.

#### **Domestic Competition**

The case for full market opening in Northern Ireland will have to be considered. In theory, at present there is full competition insofar as any householder could choose to change supplier i.e. to buy electricity from a supplier other than NIE. This situation has pertained since privatisation. In practice, this has never had any effect for two reasons. The first is that the alternative supplier would have to buy electricity from NIE's Power Procurement Business and of course pay the same Use of System charges as NIE. Consequently about 96% of the cost of supply would be common to NIE Supply and any other supplier. Secondly, to measure the cost of the electricity consumed the customer would need half hourly metering as electricity is more expensive at some

times of the day than at others. Half hourly metering is at present too expensive to be worth installing in a private house though metering costs should fall. An assumed profile of consumption for domestic customers has been the way this problem has been handled in GB. However, even if profiles were adopted there would still be a requirement for a system of settlements between generators and suppliers. For competition to deliver benefits the price reductions must exceed the additional cost of settlements. It is not clear at present whether this would be the case in Northern Ireland. With an undifferentiated product such as electricity it is questionable if customers would welcome higher prices as a worthwhile price to pay for the right to change suppliers. The case for full domestic competition must therefore rest on a thorough cost benefit analysis and such an analysis will in due course be carried out.

In Northern Ireland there is the additional complication of the Power Procurement Business's (PPB) long term contracts. If full domestic competition appeared as a result of the cost benefit analysis to be desirable any move to full domestic competition would have to take into account the risk and cost of stranding NIE's existing contracts. In other words if the capacity behind these contracts could not be sold on to suppliers at a price which covered the cost of the contracts this would create a stranded cost which would be recovered from either companies or customers. The consequent levy which customers might face would further negate any putative benefits of competition. One way of minimising any such risk would be to drive the cost of long term contracts down to as low a level as possible to ensure that in the event of full market opening the contracts would be competitive. However, the more successful the contracted capacity is in the market place the smaller would be the benefits from full competition as the existing contracts would be effectively delivering the lowest possible prices. **In other words, market opening with high cost contracts could create a stranded cost problem; with low cost contracts market opening would not deliver price reductions and might even lead to higher prices because of the additional cost of the settlement system.**

At this stage the most important point which must be registered is that while the costs and benefits of full domestic competition must be explored this is of much lower priority than opening the market to larger electricity customers where the benefits of competition are already evident and are not in dispute. The priority in market opening is to decide if market opening should be at a faster level than that prescribed by the IME Directive which envisages 35% market opening by 2003 with no further mandatory opening beyond 35% before 2006. The pace and extent of market opening will be explored over the coming months - taking into account events in both Scotland and the Irish Republic.

What is clear is that full domestic competition before 2005 is unlikely to be a practical proposition in Northern Ireland. Delivering immediate benefits to domestic customers must rely on other methods. It is some of these which are the subject of this paper.

### **Reducing Domestic Electricity Prices**

There are four factors which affect the customer's electricity bill. These are:

- S the cost of generation;
- S the cost of transmission and distribution (T&D);
- S the cost of supply;

S the efficiency with which electricity is used.

At present in Northern Ireland the share of each of these elements of the household bill is:

S	generation	57%
S	T&D	39%
S	Supply	4%

The amount which the householder must pay depends on the cost of these three elements and the total amount of electricity used. The cost of generation and of T&D will continue to come down in the years ahead. They are however outside the scope of this paper.

While Supply only accounts for 4% of the average electricity bill it has an importance out of all proportion to this because it is through the way in which Supply is delivered that there exists the greatest scope for ensuring that electricity is consumed efficiently. Both generation and T&D have no direct bearing on the efficiency with which electricity is used. **But one unit of electricity supplied to a customer can provide the same amount of light for 10 hours or 50 hours for exactly the same price depending on the type of light bulb used.** It is the customer who makes the key decision about the type of light bulb and it is the Supply Business that has an interest in helping the customer make that decision. The lightbulb example can be extended to most household appliances.

**Effectively tackling fuel poverty, high electricity bills and reducing emissions all turn to a considerable extent on incentivising the Supply Business to sell, not electricity but efficient cost effective energy services.**

### Electricity - an essential service or a luxury?

There is a degree of ambivalence in much of the discussion about energy and climate change. Electricity is recognised universally as being essential for even a modest quality of life. But each unit of electricity consumed - if it is from a fossil fuel - adds to pollution. Consequently, there is a lack of clarity about the pricing policy of society for electricity. On the one hand, because it is essential, it should be priced as low as possible - and this has been the thrust of UK policy with regard to domestic customers. On the other hand, because it is polluting, it should be priced so as to discourage its usage and this is the view underlying the energy taxes applied to the non-domestic sector.

Both views are right. However, even if households improved the efficiency with which they used electricity by 30%, the average household consuming 3300 Kw/hs per year, which is used for comparisons and benchmarking, would still require 2310 Kw/hs per annum.

## **PART II - A TARIFF STRUCTURED FOR ENERGY EFFICIENCY**

A tariff structure which charged a lower price for the essential units and a higher price for the units which are discretionary - that is which could be avoided by the adoption of energy efficiency measures - would incentivise customers to reduce their consumption. This is because it would shorten the payback on energy efficiency measures and give effect to the principle that the polluters i.e. the inefficient users of energy, pay for the environmental damage they do.

The Annex gives worked examples of how customers could benefit under these proposals. The figures used are illustrative, not prescriptive. It is the principle that is important rather than the specific figures which can be adjusted.

### **Objections to a two-tier tariff**

There is no legal or administrative barrier to a two-tier tariff. NIE had a two-tier tariff last year for all domestic customers and for some domestic customers this year as it phased in the abolition of standing charges. These two-tier tariffs were however regressive in that it was the marginal units which were lower priced.

The objections which might be raised are that it would penalise poor customers who could not afford energy efficiency measures and, secondly that it is not in NIE's interest to discourage the consumption of electricity.

A third objection might be that it could be a barrier to full domestic competition. I do not regard this last point as a serious objection. Should it be decided to introduce full domestic competition then all suppliers would have to compete on identical terms. Those terms could include a requirement that there must be a specified percentage differential between the price at which the household basic requirement was sold i.e., a standard specified amount of say 2000 kWhs, and the price at which subsequent units could be sold. Furthermore, full domestic competition is at best several years away.

### **The Fuel Poverty Objection**

The problem of fuel poverty is more closely linked to the high cost of space and water heating than the electricity bill though clearly high electricity bills and inefficient electrical appliances are a factor.

A two-tier tariff structure would by itself be a major help to low income households with a low or average electricity consumption. Low income households are over-represented among customers with low levels of electricity usage. However, there may be low income households who would not be able to respond to the price signals to use electricity more efficiently. It is essential that such households should not be worse off as a result of a two-tier tariff structure. It is estimated that 170,000 customers in Northern Ireland might be regarded as fuel poor. According to figures collected by the Housing Executive from its tenants about their electricity bill about 83% of tenants - other than those on Economy 7 who would not be affected by the proposals in this paper - should be better off under these proposals even before applying energy efficiency measures. As the illustrative figures in the Annex show, two thirds of all customers would be better off with a two tariff structure even without additional investment in energy efficiency and 94% of customers would be better off with only a 10% improvement in their energy efficiency. And with comprehensive energy efficiency measures all customers would be better off.

## **PART III - AN ALTERNATIVE APPROACH TO A SUPPLY PRICE CONTROL**

### **Incentivising the Supply Business**

If energy bills are to fall through energy efficiency it requires a regulatory framework which incentivises NIE to deliver this kind of outcome. In the first instance this requires tackling the apparent contradiction between the desirability of consuming less electricity and the company's commercial interest in selling electricity.

At present the Supply Business has some incentive to save electricity in that it can claim 0.4p per KWh over and above the target funded from the energy efficiency levy. But its principal source of profits for its regulated business comes from its allowed 0.5% profit on turnover and the efficiencies with which it succeeds in reducing its costs below its allowed revenues. It also still has a residual interest in sales growth as a proportion of its revenue is sales related.

NIE's Supply Price Control was set in 1997 and it is due for review shortly with a new price control coming into effect in 2002. Market opening has the effect of taking some of the customers outside the scope of the price control and income in the eligible customer market is unregulated - on the assumption that it is secured by competing effectively in the market place. Income from other products such as renewable electricity and energy efficiency services including CHP are also not subject to price control on the same basis - i.e. that other companies are free to compete in those markets.

However, for the foreseeable future there will be a Supply Price Control for domestic customers. In the normal course of events it might be expected that the efficiency gains which the Supply company has made during the existing price control period would be passed back to customers in the form of lower prices and the profit allowance reset at 0.5% on turnover. Would this conventional approach be the most effective way of delivering benefit to customers and incentivising the company to do even better in the future?

### **The Supply Business performance**

The Supply Business of NIE has delivered a good deal to its customers during the present price control period. The cost of Supply to the average NI customer has been significantly below the cost in England. In addition, the Supply Business has administered the energy efficiency scheme with flair and offered new products such as the "eco tariff". Shareholders have benefited too as efficiency gains have substantially exceeded expectations.

A conventional price control is one approach to the future. It would result in a one off price reduction for the average domestic customer of perhaps £2 per annum. The Supply Business's profits, if linked to turnover, would decline as both T&D costs and generation costs fall. The same percentage efficiency gains would not yield as significant profits as in the past and it must be doubtful if there is still scope for substantial efficiency gains. It is difficult to see this conventional approach leading to the innovation required to enable the company to tackle the interlinked topics of total fuel bills, fuel poverty and environmental emissions. It would severely limit the business's horizons and be a recipe for becoming a declining and demoralised business. This sort of future

is bleak for both customers and shareholders.

### **An alternative approach to price control**

An alternative approach would be to set out the objectives which the Supply Business should be expected to deliver and seek then to create the type of regulatory framework which enables it to meet its objectives for the mutual benefit of both customers and shareholders.

### **The Objectives**

The objective of the Supply Business, in addition to those which it currently has, should be cross referenced to the objectives which Government has set the Northern Ireland Housing Executive as Northern Ireland's HECA. **The Supply Business should be incentivised - taking generation and T&D costs as given - to act in such a way as to ensure that the domestic sector's electricity bill falls, that household CO<sub>2</sub> emissions fall, and that household electricity consumption falls without any reduction in the standards of service customers have come to expect.**

At present despite the improving efficiency of electrical appliances and smaller household sizes, the amount of electricity consumed per household in Northern Ireland continues to rise. The figures are given below in Table 2.

**Table 2**

<b>Year</b>	<b>kWhs</b>
1993	3640
1994	3639
1995	3746
1996	3804
1997	3696
1998	3769

The conclusion from Table 2 is that while there may be year on year fluctuations - which are mainly influenced by weather - there is a positive trend of year on year increases in household consumption. The 129 kWh per household increase over 6 years is equal to around 80 GWhs or 3% of domestic consumption - an average of about 0.5% per annum per household. While improving generation efficiency will reduce the CO<sub>2</sub> emissions per household it is only improved efficiency at the customers' side of the meter which can reduce total consumption.

But electricity demand in the domestic sector appears to be income elastic - that is it increases as incomes rise. Given rising incomes and the growing number of electrical appliances per household, the trend of increased consumption per household is likely to continue inexorably. Reducing electricity consumption in a society which is becoming richer, especially when electricity prices are falling in real terms, requires a radical change in consumer culture. Such a change will not happen of its own accord; it could be brought about by ensuring that there was a strong champion for change. NIE Supply - properly incentivised - could become that champion for change.

Incentivising NIE's Supply Business to develop in this direction might include the following incentives:

- S A price control with no revenue linkage to unit growth. If there are costs associated with unit growth this increases the incentive to avoid growth.
- S A linkage with customer growth since this increases costs but is outside the company's control.
- S An incentive to reduce average household consumption of power.
- S An incentive to invest in energy efficiency and other measures which reduced customer costs.
- S An incentive to reduce the CO<sub>2</sub> content of the average Kilowatt hour of electricity it sells.
- S An incentive to remove the higher costs currently borne by customers on pre-payment meters.

In addition, the company would no doubt expect a minimum level of profit similar to the 0.5% on turnover linked to the price controlled market allowed in the present price control.

However, if NIE is to be incentivised to promote energy efficiency it is clear that there is a balance to be struck between the level of incentive and the ease with which the target can be achieved. If NIE's task is made easy or achievable at low risk and cost then the incentive should be calibrated accordingly. But the existence of an incentive is not a matter in respect of which customers should be indifferent. If it is desirable that NIE should be successful in reducing energy consumption then it is in the public interest to structure the price control in such a way as to improve the chances that NIE will be successful.

### **Financing Energy Efficiency for the Fuel Poor**

The biggest obstacle which NIE faces in delivering energy efficiency measures - particularly to the fuel poor - is the financing cost. The benefits of these measures have to be sufficient to both repay the capital cost and cover the financing cost as well as providing NIE with the incentive to stimulate the activity. There may be 40,000 high consumers of electricity who could be regarded as fuel poor requiring an average saving of 400 units to be better off under a two tier tariff than at present. This implies a need for an investment in energy efficiency appliances of about £4-5 million. This should be affordable if NIE is allowed an appropriate incentive structure.

In order to facilitate NIE Supply becoming an effective energy efficiency company it might be possible to place the money which might otherwise be returned to customers in the form of a price reduction in 2002 into a fund which would be available to finance the energy efficiency measures carried out by NIE. The fund would be administered by some independent body such

as the Energy Saving Trust and be accessible to other supply companies. However, unlike the money raised under the Energy Efficiency Levy the energy savings which this fund would facilitate would count towards NIE's incentive payments. In this way the efficiency gains which the company has made under the present price control would, in the period after 1 April 2002, provide benefits to both customers and shareholders. As the company would face a much reduced cost in delivering energy efficiency a lower or tapered incentive payment might be appropriate.

### **A Win-Win-Win Supply Price Control**

If incentive regulation is to work to best effect then price controls have to operate in such a way as to provide a stable environment in which companies can make efficiency gains and consider it worthwhile to make the investments needed to secure efficiency gains. The longer the period in which companies can plan, the more likely they are to be able to realise efficiency gains.

If the Supply Price control is to become much more orientated towards incentivising the company to sell energy services and reduce costs for customers then the company should also have an incentive to reduce more conventional costs faced by customers.

As has already been noted the Supply costs borne by domestic customers are small. There is however one exception and that is the cost borne by pre-payment meter customers. These customers, despite enjoying a small degree of cross-subsidy, pay £18 per annum more for electricity than customers with conventional meters. Pre-payment meter customers are not necessarily lower income households but a high percentage of those who have prepayment meters are low income households and may have difficulties in meeting their energy bills. It is socially undesirable to require the poorest households to pay more for their electricity. A "new look" Supply price control should incentivise NIE to deal with this issue.

The sort of changes in culture, with incentives to deliver low cost, environmentally clean energy services instead of low cost electricity, must be brought about by incremental change. These culture changes are taking place within NIE now but it would be a mistake to expect that further changes could or should take place suddenly on the coming into effect of a new price control in 2002.

If the key objective is to drive down electricity bills by consuming electricity efficiently, identifying the right incentives becomes more important than minimising the costs of the Supply business. It would therefore be possible for the existing price control to be continued beyond 2002 for a period of say three years until 2005 with no price drop in 2002 but with a price control which by increasing the X figure slightly would ensure that the Supply business's prices should not rise.

Such a price control could be a win for customers, a win for shareholders and a win for the environment.

### **How it would look to customers**

The test of this sort of approach is how it would impact on individual customers.

A two tier tariff would mean that even with our present high - in comparison with GB - generation and T&D costs - customers who consumed less than 2000 units per year should be no worse off than customers in GB. Customers consuming more would have a return on energy efficiency appliances about 50% greater than in GB with resultant shorter pay back periods. It should be possible to set tariffs so that two-thirds of customers would be automatically better off than at present even before applying energy efficiency measures. Prepayment customers would enjoy even greater benefit from coming into line with non-prepayment customers.

However, to get a true comparison it is important to look behind the crude figure for electricity consumption at the quality of energy service - lighting, refrigeration, washing clothes and dishes etc - which the electricity supply facilitates. On the assumption that an average domestic customer's consumption of 3300 should be about 2640 if the household had efficient appliances, then the comparison is between the 3300 per annum standard GB customer and the 2640 energy efficient customer in Northern Ireland. A customer in Northern Ireland who used 2640 units efficiently would enjoy the same quality of light and power and refrigeration etc as a customer who used 3300 units with standard appliances. He or she would save over £40 per year compared to the current tariff structure. This would give an annual bill of £245.52<sup>1</sup> compared to £297 at present. Moreover, as the examples in the Annex show, with a tariff structure stimulating energy efficiency the opportunities exist to bring the average domestic electricity bill below GB even with generation and T&D costs significantly above GB levels.

Customers who use large amounts of electricity but who refuse to invest in energy efficiency would not enjoy reduced electricity bills but that would be their choice. Facilities do exist to allow NIE to collect the cost of approved energy efficient appliances on the electricity bill including the bills of customers on pre-payment schemes. Moreover, customers who could not afford energy efficiency measures should be assisted by the increasing funds being made available for energy efficiency.

The Annex contains worked examples which show that only those who, in effect, volunteer to pay higher prices need be worse off. All customers will also benefit from falling generation costs and the new T&D price control in 2002.

## **The Risks**

It might be objected that a dramatic fall in electricity demand of 20% would "strand" some costs in the system which would increase unit costs for all customers. A sense of proportion needs to be retained about this. A 20% reduction in domestic demand in one year is a degree of success which is unlikely to be achieved. But even if it were it would only represent about 6% of total demand and - given growth in customer numbers and economic growth - a net fall in demand of about 4%. It would also imply an investment in energy efficiency in one year by or on behalf of domestic customers of about £80m - as the entire cost of the energy efficiency investment which will deliver many years of benefit would have to be incurred at the beginning of the life of the investment. While success on this scale would be certainly welcome it is more likely to be

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<sup>1</sup>Assumes 2640 units at 8.55p instead of the present price of 9p and 660 units of electricity avoided at a cost of £19.80.

achieved over a longer period. Ofreg has modelled change-over scenarios and does not consider that there is any risk of energy efficiency increasing electricity prices.

The opposite risk is that the approach outlined in this paper will not lead to a fall in demand, because neither customers nor NIE respond to the incentives to invest in energy efficiency. As NIE already shows, it does respond readily to incentives so the risk of no energy efficiency investment taking place is, I believe, very small. But if this turned out to be an experiment that failed there is no long term contractual or financial commitment such as would be associated with a power station or a take or pay contract. This approach can be modified and improved if it works or we could easily revert to the present or another approach if it does not. It is a “no regrets” option.

### **Bringing it all together**

The purpose of this paper has been to explore the scope for changes in both tariff structure and the way the Supply business is price controlled to see if fuel poverty - at least with regard to electricity - could be eliminated and the upward trend in electricity consumption per household be reversed thereby reducing both electricity bills and CO<sub>2</sub> emissions.

The elements in this strategy would include:

- S the energy efficiency levy which is already in place;
- S a two price tariff which could be introduced in 2000 incentivising all domestic customers to reduce their consumption of marginal units of electricity;
- S increasing NIE Supply's incentives to sell energy efficiency and removing the incentive to sell more electricity. These incentives are partly in place but could be significantly enhanced in 2002 or earlier if the company agreed;
- S placing from 2002 onwards an amount of money which would otherwise be passed on to customers by way of price reductions into an energy efficiency fund;
- S incentivising the company through an agreed rate of return to reduce costs for pre-payment customers; and
- S allowing the present price control to continue with the above modifications until 2005 in order to improve the incentive to Supply to make efficiency gains.

## Conclusion

Northern Ireland customers do not have to have the highest electricity bills in the European Union. Work is in hand to reduce the cost of generation and T&D. Domestic customers have seen their bills fall in real terms in recent years. In nominal terms the average domestic bill after VAT is now 17% less than in 1996/97 and in real terms 23% less.

With growing world wide pre-occupation with the emissions produced as a by-product from electricity generation there will be increasing pressure on all consumers to use energy more efficiently. The proposals in this paper would incentivise all domestic customers to use electricity more efficiently, incentivise NIE to sell energy services rather than raw energy and by reducing the premium on the Eco tariff - facilitate the growth in sales of renewable electricity.

The proposals in this paper do not purport to be the definitive statement on energy efficiency and fuel poverty. They are relatively unsophisticated and over time would require refinement and development. But they do at least point both energy suppliers and customers in the direction which sooner or later they will have to go. With growing pressure internationally to tackle the problems of green house gas emissions I would not be doing my duty to customers - and in particular to customers on low incomes - if I did not take steps now to enable domestic customers in Northern Ireland to switch early and painlessly to more efficient and cost-effective ways of using electricity.

The role of energy supply companies, and in particular NIE Supply, while it enjoys a de facto monopoly in the domestic market, must move from selling electricity to selling energy services including energy efficiency. Customers must be enabled without hassle to consume electricity in ways which minimise damage to the environment.

These proposals are not intended to be prescriptive. There may be other ways of achieving the same effect and I am ready to explore with NIE the merits of these or any other proposals the company or others may put forward to change the regulatory incentive structure to facilitate NIE's evolving into an energy services company.

I would wish to take into account the views of elected representatives and other interested parties, particularly those in the electricity supply industry, consumer interests and organisations concerned with fuel poverty and environmental protection.

Any comments should be forwarded to Seamus O'Hare by 24<sup>th</sup> January, 2000  
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## Annex

This Annex is to show the impact which these proposals could have on domestic electricity bills for customers in Northern Ireland. It should be stressed that it is only one of a possible range of outcomes. It also shows how domestic electricity bills here would look compared to bills in GB. It should, however, be borne in mind that reductions averaging £25 for a typical domestic customer (3300 KW/hs per year) are expected to come into effect in GB in 2000.

The illustrative figures for the two-tier tariff for NIE which have been used are 8.55p for the first 2640 units of electricity and 9.75p for units thereafter. It is also assumed that the cost of avoiding a unit of consumption is 3p. (The cost of avoiding a unit is the cost of the additional expenditure required for the energy efficient appliance). The figure of 3p is somewhat pessimistic since the experience of the Energy Savings Trust would suggest that the cost should be about 2p.

The tables show that:

- (a) for the same quantity of electricity, customers in Northern Ireland are paying £34m more than they would be in GB or £48m at next year's expected prices;
- (b) the two-tier tariff approach by itself, even without energy efficiency, would result in lower prices for about two thirds of electricity customers in Northern Ireland;
- (c) the achievable energy efficiency gains would result in lower electricity bills for all customers i.e. only those who volunteer to have higher bills need to have them;
- (d) in the absence of an equivalent energy efficiency campaign in GB the total cost gap for customers as a whole would fall by £25m to £9m.

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Table 5 Comparison of GB and NI tariff options

Table 6 Comparison of present NI tariff with 2TT tariff

Table 7 Comparison of present NI tariff with 2TT tariff including 10% energy efficiency

Table 8 Comparison of present NI tariff with 2TT tariff including 20% energy efficiency

It should be noted that the increased price gap with GB which is shown in Table 2 on the basis that there is no energy efficiency investment, would not actually occur as the Supply Business's price control limits the allowed revenue and an over-recovery in one year would be rebated to customers the following year.

**TABLE 4: Comparison of 2TT with 20% energy efficiency, and GB tariffs**

No of units consumed per annum	No of customers	cumulative percentage in each category	New E.E tariff (0.8)	Average GB Bill 1999/00	Difference per Bill (£) (+ve value means NI is less expensive)	Difference per group (£)
			£	£	£	£
500	23000	4.0933	37.20	62.92	25.72	591,483.33
1000	14000	6.5848	74.40	101.33	26.93	377,066.67
1500	25000	11.0340	111.60	133.83	22.23	555,833.33
2000	39000	17.9747	148.80	166.42	17.62	687,050.00
2500	52000	27.2290	186.00	198.83	12.83	667,333.33
3000	62000	38.2630	223.20	231.24	8.04	498,480.00
3500	65000	49.8309	262.32	262.77	0.45	29,033.33
4000	60000	60.5090	304.32	294.27	-10.05	-603,200.00
4500	52000	69.7633	346.32	325.77	-20.55	-1,068,773.33
5000	43000	77.4159	388.32	357.27	-31.05	-1,335,293.33
5500	33000	83.2888	430.32	388.77	-41.55	-1,371,260.00
6000	25000	87.7380	472.32	420.27	-52.05	-1,301,333.33
6500	18000	90.9414	514.32	451.77	-62.55	-1,125,960.00
7000	13000	93.2550	556.32	483.27	-73.05	-949,693.33
7500	9000	94.8567	598.32	514.77	-83.55	-751,980.00
8000	7000	96.1025	640.32	546.27	-94.05	-658,373.33
8500	4500	96.9034	682.32	577.77	-104.55	-470,490.00
9000	3700	97.5618	724.32	609.27	-115.05	-425,697.33
9500	2500	98.0068	766.32	640.77	-125.55	-313,883.33
10000	2000	98.3627	808.32	672.27	-136.05	-272,106.67
10500	1500	98.6296	850.32	703.77	-146.55	-219,830.00
11000	1000	98.8076	892.32	735.27	-157.05	-157,053.33
11500	1000	98.9856	934.32	766.77	-167.55	-167,553.33
12000	750	99.1191	976.32	798.27	-178.05	-133,540.00
12500	750	99.2525	1,018.32	829.77	-188.55	-141,415.00
13000	750	99.3860	1,060.32	861.27	-199.05	-149,290.00
13500	500	99.4750	1,102.32	892.77	-209.55	-104,776.67
14000	400	99.5462	1,144.32	924.27	-220.05	-88,021.33
14500	400	99.6174	1,186.32	955.77	-230.55	-92,221.33
15000	300	99.6708	1,228.32	987.27	-241.05	-72,316.00
15500	300	99.7242	1,270.32	1,018.77	-251.55	-75,466.00
16000	300	99.7775	1,312.32	1,050.27	-262.05	-78,616.00
16500	250	99.8220	1,354.32	1,081.77	-272.55	-68,138.33
17000	200	99.8576	1,396.32	1,113.27	-283.05	-56,610.67
17500	200	99.8932	1,438.32	1,144.77	-293.55	-58,710.67
18000	200	99.9288	1,480.32	1,176.27	-304.05	-60,810.67
18500	100	99.9466	1,522.32	1,207.77	-314.55	-31,455.33
19000	100	99.9644	1,564.32	1,239.27	-325.05	-32,505.33
19500	100	99.9822	1,606.32	1,270.77	-335.55	-33,555.33
20000	100	100.0000	1,648.32	1,302.27	-346.05	-34,605.33
	561900					-9,098,254.67

Extra paid by all NI domestic customers compared to GB would be £9,098,254

**TABLE 5: Comparison of GB and NI tariff options**

No of units consumed per annum	No of customers	Cumulative percentage in each category	Present tariff	New tariff (1.0)	New E.E tariff (0.8)	New E.E tariff (0.9)	GB Bill
			£	£	£	£	£
500	23000	4.0933	45.00	42.75	37.20	39.98	62.92
1000	14000	6.5848	90.00	85.50	74.40	79.95	101.33
1500	25000	11.0340	135.00	128.25	111.60	119.93	133.83
2000	39000	17.9747	180.00	171.00	148.80	159.90	166.42
2500	52000	27.2290	225.00	213.75	186.00	199.88	198.83
3000	62000	38.2630	270.00	260.82	223.20	239.85	231.24
3500	65000	49.8309	315.00	309.57	262.32	285.95	262.77
4000	60000	60.5090	360.00	358.32	304.32	331.32	294.27
4500	52000	69.7633	404.30	407.07	346.32	376.70	325.77
5000	43000	77.4159	444.80	455.82	388.32	422.07	357.27
5500	33000	83.2888	485.30	504.57	430.32	467.45	388.77
6000	25000	87.7380	525.80	553.32	472.32	512.82	420.27
6500	18000	90.9414	566.30	602.07	514.32	558.20	451.77
7000	13000	93.2550	606.80	650.82	556.32	603.57	483.27
7500	9000	94.8567	647.30	699.57	598.32	648.95	514.77
8000	7000	96.1025	687.80	748.32	640.32	694.32	546.27
8500	4500	96.9034	728.30	797.07	682.32	739.70	577.77
9000	3700	97.5618	768.80	845.82	724.32	785.07	609.27
9500	2500	98.0068	809.30	894.57	766.32	830.45	640.77
10000	2000	98.3627	849.80	943.32	808.32	875.82	672.27
10500	1500	98.6296	890.30	992.07	850.32	921.20	703.77
11000	1000	98.8076	930.80	1,040.82	892.32	966.57	735.27
11500	1000	98.9856	971.30	1,089.57	934.32	1,011.95	766.77
12000	750	99.1191	1,011.80	1,138.32	976.32	1,057.32	798.27
12500	750	99.2525	1,052.30	1,187.07	1,018.32	1,102.70	829.77
13000	750	99.3860	1,092.80	1,235.82	1,060.32	1,148.07	861.27
13500	500	99.4750	1,133.30	1,284.57	1,102.32	1,193.45	892.77
14000	400	99.5462	1,173.80	1,333.32	1,144.32	1,238.82	924.27
14500	400	99.6174	1,214.30	1,382.07	1,186.32	1,284.20	955.77
15000	300	99.6708	1,254.80	1,430.82	1,228.32	1,329.57	987.27
15500	300	99.7242	1,295.30	1,479.57	1,270.32	1,374.95	1,018.77
16000	300	99.7775	1,335.80	1,528.32	1,312.32	1,420.32	1,050.27
16500	250	99.8220	1,376.30	1,577.07	1,354.32	1,465.70	1,081.77
17000	200	99.8576	1,416.80	1,625.82	1,396.32	1,511.07	1,113.27
17500	200	99.8932	1,457.30	1,674.57	1,438.32	1,556.45	1,144.77
18000	200	99.9288	1,497.80	1,723.32	1,480.32	1,601.82	1,176.27
18500	100	99.9466	1,538.30	1,772.07	1,522.32	1,647.20	1,207.77
19000	100	99.9644	1,578.80	1,820.82	1,564.32	1,692.57	1,239.27
19500	100	99.9822	1,619.30	1,869.57	1,606.32	1,737.95	1,270.77
20000	100	100.0000	1,659.80	1,918.32	1,648.32	1,783.32	1,302.27

<b>TABLE 6: Comparison of present NI tariff with 2TT tariff</b>						
<b>No of units consumed per annum</b>	<b>No of customers</b>	<b>cumulative percentage in each category</b>	<b>New NI EE tariff (1.0)</b>	<b>Present NI Bill 1999/00</b>	<b>Difference per Bill (£) (+ve value means NI EE is less expensive than the current bill)</b>	<b>Difference per group (£)</b>
			<b>£</b>	<b>£</b>	<b>£</b>	<b>£</b>
500	23000	4.0933	42.75	45.00	2.25	51750.00
1000	14000	6.5848	85.50	90.00	4.50	63000.00
1500	25000	11.0340	128.25	135.00	6.75	168750.00
2000	39000	17.9747	171.00	180.00	9.00	351000.00
2500	52000	27.2290	213.75	225.00	11.25	585000.00
3000	62000	38.2630	260.82	270.00	9.18	569160.00
3500	65000	49.8309	309.57	315.00	5.43	352950.00
4000	60000	60.5090	358.32	360.00	1.68	100800.00
4500	52000	69.7633	407.07	404.30	-2.77	-144040.00
5000	43000	77.4159	455.82	444.80	-11.02	-473860.00
5500	33000	83.2888	504.57	485.30	-19.27	-635910.00
6000	25000	87.7380	553.32	525.80	-27.52	-688000.00
6500	18000	90.9414	602.07	566.30	-35.77	-643860.00
7000	13000	93.2550	650.82	606.80	-44.02	-572260.00
7500	9000	94.8567	699.57	647.30	-52.27	-470430.00
8000	7000	96.1025	748.32	687.80	-60.52	-423640.00
8500	4500	96.9034	797.07	728.30	-68.77	-309465.00
9000	3700	97.5618	845.82	768.80	-77.02	-284974.00
9500	2500	98.0068	894.57	809.30	-85.27	-213175.00
10000	2000	98.3627	943.32	849.80	-93.52	-187040.00
10500	1500	98.6296	992.07	890.30	-101.77	-152655.00
11000	1000	98.8076	1040.82	930.80	-110.02	-110020.00
11500	1000	98.9856	1089.57	971.30	-118.27	-118270.00
12000	750	99.1191	1138.32	1011.80	-126.52	-94890.00
12500	750	99.2525	1187.07	1052.30	-134.77	-101077.50
13000	750	99.3860	1235.82	1092.80	-143.02	-107265.00
13500	500	99.4750	1284.57	1133.30	-151.27	-75635.00
14000	400	99.5462	1333.32	1173.80	-159.52	-63808.00
14500	400	99.6174	1382.07	1214.30	-167.77	-67108.00
15000	300	99.6708	1430.82	1254.80	-176.02	-52806.00
15500	300	99.7242	1479.57	1295.30	-184.27	-55281.00
16000	300	99.7775	1528.32	1335.80	-192.52	-57756.00
16500	250	99.8220	1577.07	1376.30	-200.77	-50192.50
17000	200	99.8576	1625.82	1416.80	-209.02	-41804.00
17500	200	99.8932	1674.57	1457.30	-217.27	-43454.00
18000	200	99.9288	1723.32	1497.80	-225.52	-45104.00
18500	100	99.9466	1772.07	1538.30	-233.77	-23377.00
19000	100	99.9644	1820.82	1578.80	-242.02	-24202.00
19500	100	99.9822	1869.57	1619.30	-250.27	-25027.00
20000	100	100.0000	1918.32	1659.80	-258.52	-25852.00
	561900					-4139828.00

**Benefits (Costs) of the new EE tariffs compared to the current tariff would be (£4,139,828).**

**TABLE 7: Comparison of present NI tariff with 2TT tariff including 10% energy efficiency**

No of units consumed per annum	No of customers	cumulative percentage in each category	New NI E.E tariff (0.9) £	Present NI Bill 1999/00 £	Difference per Bill (£) (+ve value means NI EE is less expensive than the current bill) £	Difference per group(£) £
500	23000	4.0933	39.98	45.00	5.03	115575.00
1000	14000	6.5848	79.95	90.00	10.05	140700.00
1500	25000	11.0340	119.93	135.00	15.08	376875.00
2000	39000	17.9747	159.90	180.00	20.10	783900.00
2500	52000	27.2290	199.88	225.00	25.13	1306500.00
3000	62000	38.2630	239.85	270.00	30.15	1869300.00
3500	65000	49.8309	285.95	315.00	29.06	1888575.00
4000	60000	60.5090	331.32	360.00	28.68	1720800.00
4500	52000	69.7633	376.70	404.30	27.61	1435460.00
5000	43000	77.4159	422.07	444.80	22.73	977390.00
5500	33000	83.2888	467.45	485.30	17.86	589215.00
6000	25000	87.7380	512.82	525.80	12.98	324500.00
6500	18000	90.9414	558.20	566.30	8.10	145890.00
7000	13000	93.2550	603.57	606.80	3.23	41990.00
7500	9000	94.8567	648.95	647.30	-1.65	-14805.00
8000	7000	96.1025	694.32	687.80	-6.52	-45640.00
8500	4500	96.9034	739.70	728.30	-11.40	-51277.50
9000	3700	97.5618	785.07	768.80	-16.27	-60199.00
9500	2500	98.0068	830.45	809.30	-21.15	-52862.50
10000	2000	98.3627	875.82	849.80	-26.02	-52040.00
10500	1500	98.6296	921.20	890.30	-30.90	-46342.50
11000	1000	98.8076	966.57	930.80	-35.77	-35770.00
11500	1000	98.9856	1011.95	971.30	-40.65	-40645.00
12000	750	99.1191	1057.32	1011.80	-45.52	-34140.00
12500	750	99.2525	1102.70	1052.30	-50.40	-37796.25
13000	750	99.3860	1148.07	1092.80	-55.27	-41452.50
13500	500	99.4750	1193.45	1133.30	-60.15	-30072.50
14000	400	99.5462	1238.82	1173.80	-65.02	-26008.00
14500	400	99.6174	1284.20	1214.30	-69.90	-27958.00
15000	300	99.6708	1329.57	1254.80	-74.77	-22431.00
15500	300	99.7242	1374.95	1295.30	-79.65	-23893.50
16000	300	99.7775	1420.32	1335.80	-84.52	-25356.00
16500	250	99.8220	1465.70	1376.30	-89.40	-22348.75
17000	200	99.8576	1511.07	1416.80	-94.27	-18854.00
17500	200	99.8932	1556.45	1457.30	-99.15	-19829.00
18000	200	99.9288	1601.82	1497.80	-104.02	-20804.00
18500	100	99.9466	1647.20	1538.30	-108.90	-10889.50
19000	100	99.9644	1692.57	1578.80	-113.77	-11377.00
19500	100	99.9822	1737.95	1619.30	-118.65	-11864.50
20000	100	100.0000	1783.32	1659.80	-123.52	-12352.00
	561900					10919662.00

Benefits (Costs) of the new EE tariffs compared to the current tariff would be £10,919,662

**TABLE 8: Comparison of present NI tariff with 2TT tariff including 20% energy efficiency**

No of units consumed per annum	No of customers	cumulative percentage in each category	New E.E tariff (0.8) £	Present NI Bill 1999/00 £	Difference per Bill (£) (+ve value means NI EE is less expensive than the current bill) £	Difference per group (£) £
500	23000	4.0933	37.20	45.00	7.80	179,400.00
1000	14000	6.5848	74.40	90.00	15.60	218,400.00
1500	25000	11.0340	111.60	135.00	23.40	585,000.00
2000	39000	17.9747	148.80	180.00	31.20	1,216,800.00
2500	52000	27.2290	186.00	225.00	39.00	2,028,000.00
3000	62000	38.2630	223.20	270.00	46.80	2,901,600.00
3500	65000	49.8309	262.32	315.00	52.68	3,424,200.00
4000	60000	60.5090	304.32	360.00	55.68	3,340,800.00
4500	52000	69.7633	346.32	404.30	57.98	3,014,960.00
5000	43000	77.4159	388.32	444.80	56.48	2,428,640.00
5500	33000	83.2888	430.32	485.30	54.98	1,814,340.00
6000	25000	87.7380	472.32	525.80	53.48	1,337,000.00
6500	18000	90.9414	514.32	566.30	51.98	935,640.00
7000	13000	93.2550	556.32	606.80	50.48	656,240.00
7500	9000	94.8567	598.32	647.30	48.98	440,820.00
8000	7000	96.1025	640.32	687.80	47.48	332,360.00
8500	4500	96.9034	682.32	728.30	45.98	206,910.00
9000	3700	97.5618	724.32	768.80	44.48	164,576.00
9500	2500	98.0068	766.32	809.30	42.98	107,450.00
10000	2000	98.3627	808.32	849.80	41.48	82,960.00
10500	1500	98.6296	850.32	890.30	39.98	59,970.00
11000	1000	98.8076	892.32	930.80	38.48	38,480.00
11500	1000	98.9856	934.32	971.30	36.98	36,980.00
12000	750	99.1191	976.32	1,011.80	35.48	26,610.00
12500	750	99.2525	1,018.32	1,052.30	33.98	25,485.00
13000	750	99.3860	1,060.32	1,092.80	32.48	24,360.00
13500	500	99.4750	1,102.32	1,133.30	30.98	15,490.00
14000	400	99.5462	1,144.32	1,173.80	29.48	11,792.00
14500	400	99.6174	1,186.32	1,214.30	27.98	11,192.00
15000	300	99.6708	1,228.32	1,254.80	26.48	7,944.00
15500	300	99.7242	1,270.32	1,295.30	24.98	7,494.00
16000	300	99.7775	1,312.32	1,335.80	23.48	7,044.00
16500	250	99.8220	1,354.32	1,376.30	21.98	5,495.00
17000	200	99.8576	1,396.32	1,416.80	20.48	4,096.00
17500	200	99.8932	1,438.32	1,457.30	18.98	3,796.00
18000	200	99.9288	1,480.32	1,497.80	17.48	3,496.00
18500	100	99.9466	1,522.32	1,538.30	15.98	1,598.00
19000	100	99.9644	1,564.32	1,578.80	14.48	1,448.00
19500	100	99.9822	1,606.32	1,619.30	12.98	1,298.00
20000	100	100.0000	1,648.32	1,659.80	11.48	1,148.00
	561900					25,711,312.00

Benefits (Costs) of the new EE tariffs compared to the current tariff would be £25,711,312.