

STIMULATING RENEWABLE GENERATION IN NORTHERN IRELAND

**A Consultation Paper by the Director General of Electricity Supply
for Northern Ireland**

September 2000



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Purpose

The purpose of this paper is to encourage public debate on the options which are available for stimulating the use of renewable electricity in Northern Ireland. Its origins lie in the concern conveyed to me at my last meeting with the DETI committee about prospects for renewables in Northern Ireland. After the close of the consultation period I will organise a public seminar at which the ideas in this paper and others put forward might be discussed in depth. The organising of the seminar will however be contingent upon there being sufficient public interest.

Background

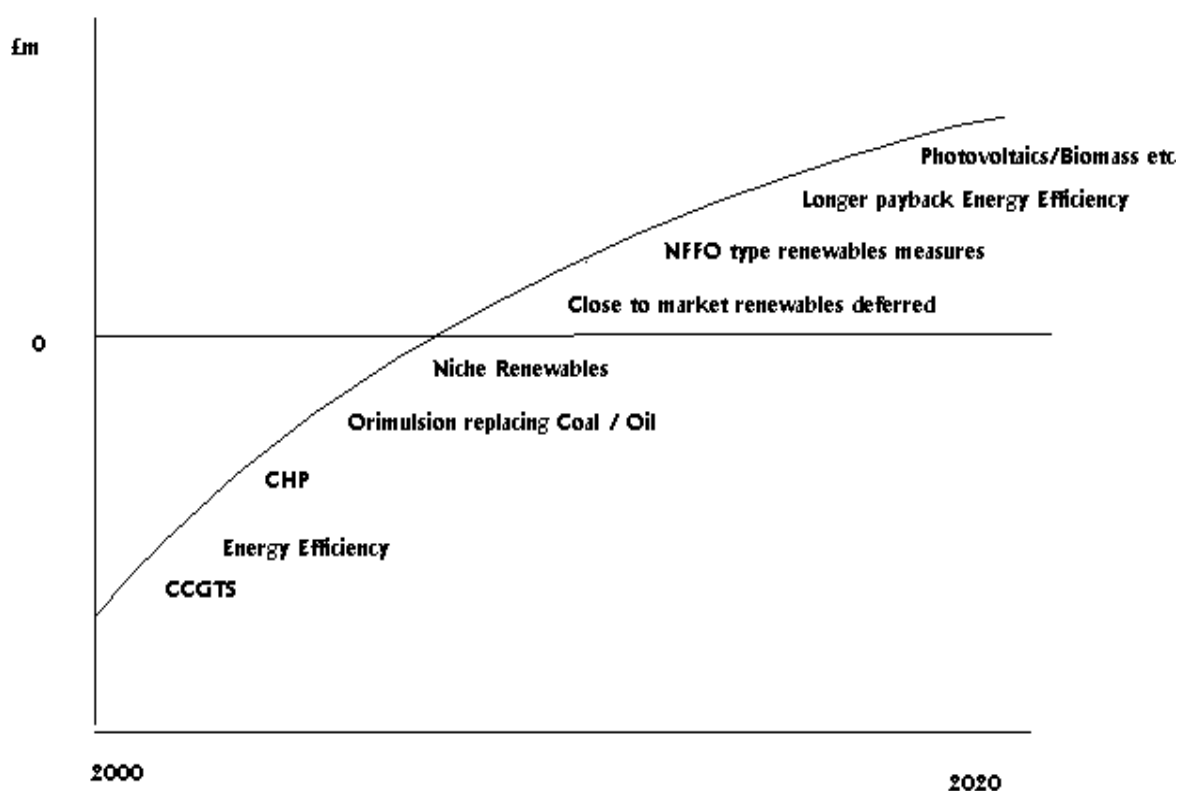
Renewable electricity is an important means of reducing the emission into the atmosphere of greenhouse gases. The increased use of renewables is supported by policy targets set by the European Union and by the British Government. These targets however have not been disaggregated to the Northern Ireland level and the only existing official Northern Ireland target is to secure 45MW_s by 2005. This would represent about 2% of Northern Ireland's generating capacity and about 3% of its electricity output. It thus falls well short of the target figures set elsewhere.

Apart from reducing greenhouse gas emissions there are other reasons for encouraging renewables. These include:

- S stimulating the market for renewable technology;
- S protecting diversity of fuel supply by reducing dependence on oil and gas imports;
- S raising rural incomes as farmers or other rural dwellers will be stakeholders as landowners, generation set owners, providers of services or fuel (in the case of biomass) and possibly privileged consumers.

Renewables and CO₂ savings

Policy on renewables and CO₂ savings are closely intertwined. There is however a need for greater clarity on policy objectives. Renewables are not in all circumstances the most cost-effective way of reducing Northern Ireland's CO₂ emissions. The cost of reducing CO₂ emissions should be considered as a curve of rising costs because the least cost ways of reducing CO₂ should be exhausted first. The diagram below shows in a schematic way the options which a CO₂ reduction policy would take first, moving on to the higher cost measures only after the lower cost measures have all been taken. The diagram deals only with the electricity industry and ignores other CO₂ reduction measures such as fuel switching to natural gas and the encouragement of cycling, public transport, gas powered, electric and hybrid vehicles, improved



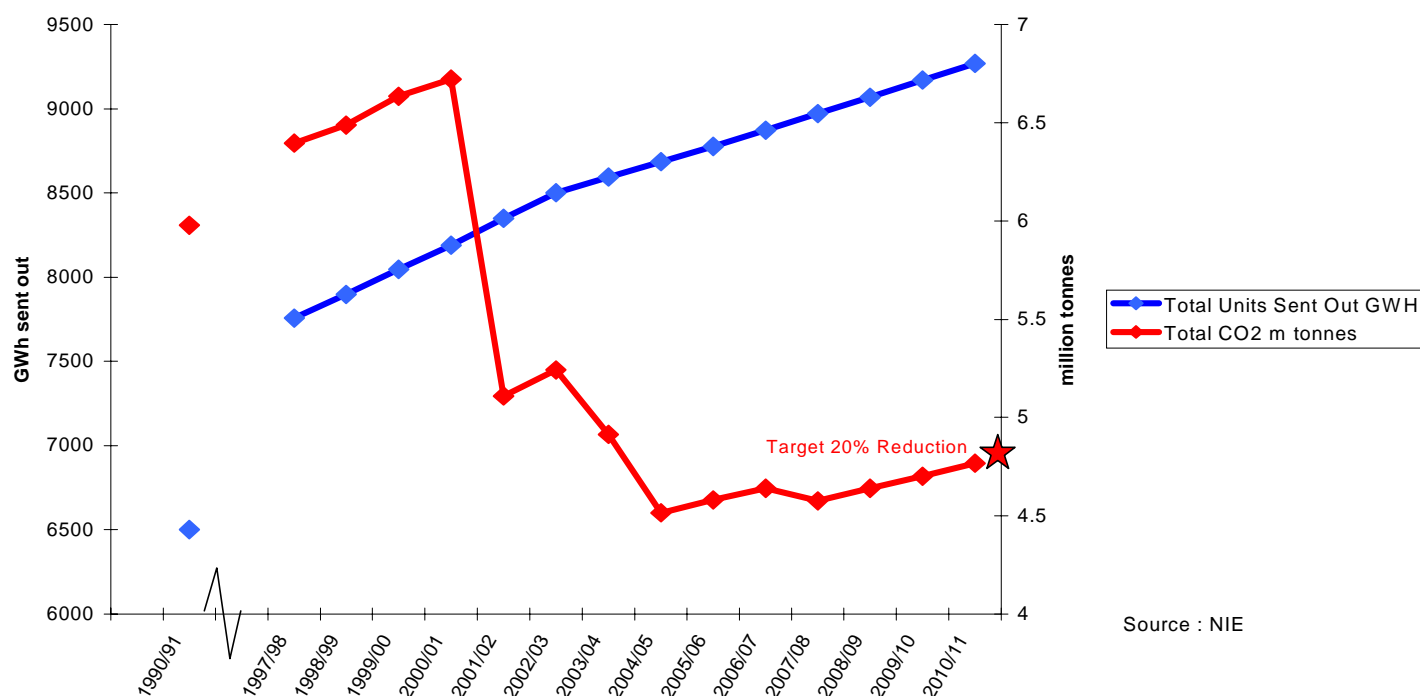
building insulation standards and increased use of public transport.

The cost of renewables technology is continuing to fall so it may be the case that by 2010 renewables, which if adopted today would impose a cost, will be much more attractive

economically. This point will arrive sooner and with greater certainty if the European Union or the Government adopt an explicit carbon based system of energy taxation. The UK's Climate Change Levy assists the economics of renewables in this respect but only for the non-domestic market.

However while there is a logical sequence of measures to maximise at least cost the electricity supply industry's CO₂ reduction strategy it must also be recognised that the effect of CO₂ build up in the atmosphere is cumulative. The earlier emissions are avoided the better the prognosis for the planet's climate. Moreover the challenge faced by the electricity industry in Northern Ireland if it is to achieve 80% of its 1990 level of CO₂ emission by 2010 is formidable. Faster economic growth than the trend line used by NIE would increase and accelerate the need for renewables to be a major contributor to CO₂ reduction strategy. The figure below illustrates the potential CO₂ savings that could be possible by replacing existing generation with CCGT technology.

Projection of Electricity Demand and CO₂ emissions with CCGT proposal



The Northern Ireland Renewables Market

Northern Ireland's market for renewables has been fully liberalised since 1998. Any electricity consumer in Northern Ireland irrespective of size can purchase renewables from any renewables generator anywhere in Northern Ireland or - since this year - from any generator in the Irish Republic. Similarly Northern Ireland's renewable generators can sell into the Irish Republic. With the construction of the Scottish Interconnector the renewables market will be extended to cover the whole of the British Isles. Renewable electricity is at present traded across the border.

A renewable generator is also entitled to construct - subject to any necessary statutory consents - a direct wire to a customer.

Liberalisation of the renewable market is therefore more advanced than the rest of the market where it is only the largest customers who have the right to buy from the supplier of their choice.

Early and full liberalisation of the renewable electricity market was introduced to give every citizen in Northern Ireland the power and authority to personally take charge of the pollution caused by his or her electricity consumption. The right not to pollute the environment seemed to me to be a fundamentally important human right if citizens were to be enabled to live according to their consciences.

At present approximately one thousand customers in Northern Ireland buy some renewable electricity. This is 6% of the UK's total number of renewable energy customers. Most are private citizens though some are public bodies - including Ofreg and Larne Borough Council. Most purchases of renewable electricity are from NIE's Eco-energy tariff. There are also at least two cases known to Ofreg of supply by direct sales and a much larger number of cases of self supply from renewables. Renewable electricity is at present being traded into the Republic to help meet the burgeoning growth in demand there.

The NFFO System

The most important mechanism used hitherto to stimulate renewable generation to date has been the Non Fossil Fuel Obligation (NFFO) system. The NFFO system requires NIE to secure a prescribed amount of renewable generation by competitive bidding.

The cost of NFFO generation across the UK has dropped dramatically since the first Northern Ireland NFFO Order in 1995. The first Northern Ireland NFFO round was successful in securing 15MWs of generation. The second round has secured to date only 2.94MWs.

The effect of the NFFO system is to impose a cost on all customers in Northern Ireland irrespective of whether they are franchise (NIE customers) or customers in the eligible customer market. The cost is high in relation to the total cost of efficient modern generation. In 1999/2000 the excess cost of NFFO was , 7.1m. This added about 0.1p to the final cost of every unit of electricity consumed in Northern Ireland. It therefore accounts for about 1.3% of the Northern Ireland industry's electricity bill. While this may not sound much it is about 10% of the price disadvantage which Northern Ireland companies face compared with their competitors in GB and the Irish Republic.

For the domestic customer the annual cost is on average , 3.10. This compares with an average of about 75p in England & Wales and the difference of about , 2.35 constitutes therefore about 5% of the price gap with Great Britain.

If it were decided to continue in Northern Ireland with a NFFO approach pro-rata, the burden of NFFO would undoubtedly fall as the quantity of NFFO electricity increased because the costs of the technology should fall. This of course presupposes that Government does not use NFFO to support higher cost technologies and that low cost wind sites remain available for exploitation. However even on assumptions of declining real costs a NFFO programme which delivered 10% of Northern Ireland's electricity by 2010 would - according to generation modelling carried out for me by London Economics - add about 10% to the total cost of generation in 2010. This

means - as the excess cost would be a levy collected from all customers - it would impose a 10% cost penalty on manufacturing industry. This might be offset by the avoidance of Climate Change Levy (CCL) on this 10% of their supply but it is by no means certain that this would be the case or indeed what form energy taxation will take in 2010.

Market based renewables

The advantage of market based renewable generation is that it does not impose any costs on those customers who do not wish to buy it. Since the renewables market was liberalised in 1998 there has been some success in bringing forward market based renewables. Indeed market based renewables have been more successful than NFFO II since the latter has to date only brought forward about 3MWs of capacity (with another 1.7MWs due to be operational this autumn), whereas the market has brought forward or has at planning stage about 28MWs of wind and hydro projects. It is however too soon to say if the market based supply of generation which this represents is the beginning of a period of autonomous growth or the full exploitation of the potential. At present though market pressures would appear to be moving in favour of renewables. The positive factors are:

- S the rising cost of fossil fuels;
- S the tentative emergence of energy taxation;
- S improving comfort of financial institutions with renewable generation;
- S falling costs of renewable technology;
- S growing public awareness of the need for combatting climate change.

It would certainly be prudent to see if these positive factors can be harnessed to facilitate a market led growth of renewable electricity. However the market could be assisted by other measures which would reduce the cost of renewable electricity customers.

Renewable Market Support Measures

The following measures are put forward for discussion as possible ways to reduce the delivered cost of renewables to electricity customers and thereby improve market penetration. They are all designed to avoid imposing costs on the generality of customers.

These measures are of three sorts:

- S reducing the cost of capital
- S increasing demand
- S improving trading mechanisms.

Reducing the cost of capital

The cost of financing a project is linked to the level of risk. The strength of the NFFO system was that it offered 15 year guaranteed contracts. While this bore heavily on customers it certainly facilitated financing the projects. Market based renewables face much greater risk and tend therefore to be financed at a higher cost and over a shorter period. This pushes up the cost of electricity, makes it harder to find customers and therefore makes the project less likely to succeed. It is a vicious circle. The only way to break this would be to offer longer term contracts but individual customers are unlikely to offer bankable long term commitments.

Purchaser of last resort

One way of overcoming this problem and to allow developers access to long term financing would be to require the Power Procurement Business (PPB) of NIE, or a similar successor body, to take over a contract which had lost its customer base and could not obtain another. PPB would be required to take over the remaining years of the financing obligations of the contract and would receive the benefit of the post amortisation revenues of the contract. PPB would manage

the contract in accordance with the terms of its economic purchasing obligations.

For this to work the PPB would have to approve the terms of the financing of the contract before it was put in place. PPB could not be required to accept responsibility for imprudent contracts.

This approach would be analogous to NFFO but would only operate as a contract rescue. At present it costs approximately , 700,000 to install 1MW capacity of windfarm. A 1% reduction in the cost of capital and the doubling of the amortisation period from 7 to 14 years would reduce the sent out cost of a kWh from around 3.5p to 2p.

Customers=Equity

A fund which enabled customers to purchase a slice of the equity in a renewable generating source would remove the problem of the cost of capital. An investment of , 1000 would enable a customer to pay for about 1.5kW of generating capacity in a wind farm. This investment should allow the customer sufficient units of Afree® electricity per annum for 15 years - say up to 4000 units - to run an average home. The annual saving to the customer would be , 200 per annum and would thus represent a very good return on the investment. Special savings schemes with payments on the electricity bill could put such a scheme within reach of low income households.

Alternatively credit unions might have a role here. NIE could be required to introduce such a product as a variation on their eco energy tariff though other entrepreneurs could also establish such schemes. As these customers would be buying electricity below the market price they would be unlikely to cease to be customers and the equity stake would be transferable by sale, gift or inheritance.

A credible customer base

The one credible customer base which exists in Northern Ireland on the appropriate scale for the renewables industry is the public sector. The public sector - government, education, local government, health - offer a customer base which will continue to exist, cannot migrate and which is creditworthy. It will pay the Climate Change Levy on its fossil fuel electricity and many of its installations are small and pay for electricity at relatively high cost tariffs.

Much of the public sector could benefit financially from purchasing renewable electricity. A bulk purchase by the public sector of renewable electricity could provide the critical mass for a long term low cost renewable sector in Northern Ireland. This might enable the renewable sector to offer more competitive prices to other customers.

The renewable industry need not wait for Government to take the initiative. Unlike public bodies which have no specialist expertise in energy it is the industry which is best placed to identify the potential for renewables supplying public bodies. Public bodies are normally subject to value for money tests for all their supplies and would presumably be glad to take up well considered proposals which lowered their electricity bills. Potentially the public sector represents a market five times larger than the existing renewable supply under NFFO contracts.

Changing the trading arrangements

Renewable electricity - particularly wind but also to a lesser extent hydro - is not predictable. Suppliers of renewable electricity have difficulties greater than those of fossil fuel generators matching supply and demand. Accordingly they rely to a greater extent on the ability to spill[@] excess electricity on to the grid and take top up[@] from the system when their output does not match the demand of their customers. If the marginal cost to the renewables generator is close to zero i.e. there is no fuel cost, this benefit is likely to be considerably outweighed by the marginal cost of top up when the renewable generator will buy electricity at a price which reflects not only its fuel cost but which also includes a contribution to O&M and capital.

If there were sufficient renewables in place it would be possible to explore mechanisms which allowed all renewable operators to trade their top up and spill arrangements between themselves so that they only had to approach the TSO for top up when the renewable sector as a whole was in deficit - for example when all wind turbines were not generating at the same time. Such an approach could operate also across one or both interconnectors to increase its effectiveness. This in turn would be facilitated if renewables had a guaranteed green corridor[@] within the interconnectors.

Since the net position in the course of a year with a renewable generator's top up and spill position could fluctuate dramatically with changing weather patterns from creating windfall gains to huge losses it might be worthwhile reducing the riskiness of top up and spill for renewable generators by reducing both the top up charges and the payments made for spill since both are based on charges relevant to the interaction between fossil fuel generators and the TSO. This would simply transfer the short term risk from the financially weaker party to the financially stronger party.

Green credits

Measures which reduce the costs of renewables in Northern Ireland place the industry in a better position to secure Agreen credits.[@] Green credits are payments which might be made by electricity consumers in a country with high costs for renewable generation to generators in countries with low cost renewable generation. A green credit would give a further twist to a virtuous circle enabling the low cost country to reduce its costs further and thereby enhance its capability. An alliance of renewable generators and Northern Ireland Energy Agencies should be able to source green credit partners in other EU member states.

A public debate

The above ideas are put forward as a contribution to the public debate on the future of renewables.

Any comments on this paper should be sent by 10 November 2000 to Alan Smith

Depending on the level of response I will organise a public seminar on this subject in late November / early December and I would be grateful if you would let me know if you or your organisation would either wish to attend or present a paper.