

Green Paper on Energy
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Below are a few comments on aspects of the Green Paper and on additional topics related to sustainable energy policy.

Overall

In terms of sustainability, the Green Paper is welcome as a step in the right direction, but in my view it does not go far enough. The climate change problem is so serious that we should be aiming to do better than our Kyoto targets, not struggling to approach them.

The international community is already talking about a successor to the Kyoto Protocol. I would like to see an Irish energy policy aimed at achieving substantial cuts in our greenhouse gas emissions, and furthermore exporting large amounts of green electricity to Britain and Europe.

Carbon tax

There is no mention in the Green Paper of carbon/energy taxes. I believe the single most essential measure required to effectively limit Ireland's greenhouse gas emissions is the introduction and progressive increase of a carbon/energy tax on non-renewable fuels. Such a tax can encourage energy conservation, efficiency and renewables in the most economically efficient manner.

Some of the revenue from the tax could be used to fund measures to promote renewables and efficiency, some to increase social welfare allowances to balance higher fuel prices for the less-well-off, and some could go into the government's general tax coffers, with corresponding reductions in other taxes. In addition, bearing in mind that the people who will suffer most from climate change – the poor in the Third World – have contributed little to it in terms of per-capita greenhouse gas emissions, a proportion of the revenue should be allocated to overseas development aid, as indirect compensation for our disproportionate contribution to the problem.

Excise tax on motor fuels

As the transport sector is the largest contributor to the increase in Ireland's greenhouse gas emissions, excise tax on motor fuels should be increased. The level of tax should be increased to that in Northern Ireland immediately.

As a means of reducing greenhouse gas emissions from cars, taxing the energy content of fuel consumed via a carbon/energy tax or excise duty is fairer and more effective than taxing engine size via VRT.

Aviation fuel tax

Air travel is becoming an increasingly important source of greenhouse gases, yet at present aviation fuel is untaxed. Ireland should support EU efforts to introduce an international tax on aviation fuel. Also, Ireland should immediately introduce a tax on aviation fuel for flights within Ireland (and promote the more environmentally-friendly option of train travel instead).

Bord Gais tariff

The Bord Gais Standard Rate domestic tariff has a relatively high standing charge and a relatively low per-unit (per kWh) charge. This tariff structure discourages energy efficiency, since if a householder implements energy-saving measures in a dwelling, the financial saving is limited to the per-unit portion of the charge. A lower standing charge and correspondingly higher per-unit charge would be better in this regard.

Since the recent gas price increase was driven mainly by increased international gas costs, one would have expected the per-unit charge to have increased by more than the standing charge, but they both increased by the same percentage. The ESB has much lower domestic standing charges, and I can't imagine their fixed costs being very different to Bord Gais's.

These points suggest that Bord Gais's standing charge may be higher than their fixed costs justify.

Perhaps it should be national policy to direct the Energy Regulator to require that standing charges set by energy utilities do not exceed their fixed billing costs, with all other costs being included in the per-unit charge.

Wind power research

Estimates of the percentage of Europe's electricity that can be met by wind continue to increase as the technology advances. Due to Ireland's large wind resource and our peripheral location in Europe, grid integration issues may be more challenging here than in other European countries, and the potential of wind power to reduce greenhouse gas emissions may be limited by what the grid can handle. Hence funding for research on grid integration issues should be increased, aimed at maximising the contribution of wind to Ireland's, and Europe's, energy needs.

In particular, one topic of research could be the use of excess wind power (i.e. at times when available wind power exceeds electricity demand) to charge hot water cylinders and storage heaters in buildings around the country. If suitably controlled, this could also be useful in maintaining grid stability. It would require remote switching and perhaps an innovative tariff structure.

Wave energy support

Wave energy has been in the research phase for many years, and is now close to becoming commercial, thanks mainly to research efforts in a small number of other countries. Ireland has one of the best wave energy resources in the world, and the sooner the technology becomes commercial, the sooner it can start contributing to improving Ireland's, and indeed Europe's, energy supply security and to reducing greenhouse gas emissions. Wave energy should receive substantial financial support to kickstart the industry. Given the current state of the technology, a guaranteed payment per kWh of electricity produced is probably more appropriate than capital grants.

Renewable heating in dwellings

In parts of Spain, a solar water heating system is required in all new houses. However, a problem with such a scheme in Ireland (and possibly Spain also) would be that during the life of a house, it may be occupied by a full family at one time, and a single occupant who is away a lot at another. Hence a solar system sized for an "average" household will only make a small contribution to hot water requirements in the former case, and will produce excess hot water which will go to waste in the latter case.

A group solar water heating system, serving several dwellings, would overcome this disadvantage, as hot water demand would tend to average out across the different households. Furthermore, if such a system is in place, it would be economic to include other renewables, e.g. a wood boiler as backup, and perhaps a heat pump powered by wind-generated electricity. A larger, better-controlled thermal store, which would make better use of intermittent renewables, would also be more economic in a group scheme. If renewables are to make a large contribution to heating in Irish dwellings, such group heating schemes should be promoted.

Combined heat and power schemes also have considerable potential to reduce fuel consumption in dwellings, and these also point to group heating schemes.

Regarding the question of who would own such group heating plant, a simple answer is the local authority, which would then supply metered heat to the dwellings along with water. The local authority could contract out the operation of such plant to private-sector companies if desired.

Solar with inter-seasonal heat storage

In common with other countries at similar latitudes, Ireland receives a lot of solar radiation in summer, but very little in mid-winter when heating is needed. Funding should be made

available for a few pilot solar projects with inter-seasonal heat storage, and for associated research.

Nuclear vs. solar - a long-term global view

In the longer term, gas and oil reserves will dwindle and become very expensive. Coal reserves will last longer, but concerns about climate change may prevent us from using much of them. In terms of energy sources, this leaves nuclear and renewables, and the more renewables we have, the less nuclear we'll need. Energy efficiency and conservation can also help to minimise the need for nuclear power.

Billions of euro have been spent on nuclear fusion research, with the ITER project set to consume billions more over the coming decade. If a similar amount had been spent on renewable and efficiency technologies, they could be making a far greater contribution than they are today.

Worldwide, the renewable source with the greatest potential is solar. The solar resource exceeds all of the other renewables derived from solar – wind, wave, biomass – many times over. Large area of the Sahara and other tropical deserts have the potential to meet all of the world's energy needs, provided appropriate technology exists to economically convert, store and transport the energy.

Currently solar energy can be converted to electricity in photovoltaic cells or solar thermal plant, and electricity can be used to produce hydrogen. But as hydrogen is a light gas, it is impractical to store in large quantities. If a technology could be developed to economically convert solar energy into a liquid fuel, e.g. methanol, ethanol or some other liquid, this fuel could then be transported and stored in much the same way as oil is today. Perhaps plants or organisms can be genetically engineered to photosynthesise at much higher efficiencies, perhaps a chemical process can be developed to convert sunlight directly into a liquid fuel, or perhaps a process related to electrolysis can be developed to produce a liquid fuel using solar-generated electricity. International research is needed to investigate these possibilities.

Energy supply security is a concern regarding oil and gas, which come mainly from just a few countries. Coal is more widely available, and does not pose such security concerns. Solar fuels produced in the tropics would likewise not pose security concerns, as there are many countries in the tropics, and in any case the technology could be operated at lower annual efficiencies at higher latitudes.

In terms of contributing to world energy requirements, the potential of solar is comparable to that of nuclear fusion, and so it should be receiving comparable research funding. As national energy policy is closely linked to global issues, Ireland's energy policy should include support for EU funding for this type of solar research, along with financial contribution commitments to it.