



Northern Ireland
Assembly

**COMMITTEE FOR
ENTERPRISE, TRADE AND
INVESTMENT**

**OFFICIAL REPORT
(Hansard)**

**Renewable Energy Inquiry: University of
Ulster Centre for Sustainable
Technologies**

4 November 2010

NORTHERN IRELAND ASSEMBLY

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INVESTMENT**

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Members present for all or part of the proceedings:

Mr Alban Maginness (Chairperson)
Mr Paul Butler (Deputy Chairperson)
Mr Paul Frew
Mr Paul Givan
Mr William Irwin
Ms Jennifer McCann
Dr Alasdair McDonnell
Mrs Claire McGill
Mr Gerry McHugh
Mr Sean Neeson

Witnesses:

Professor Neil Hewitt) University of Ulster

The Chairperson (Mr A Maginness):

Briefing the Committee today is Professor Neil Hewitt from the Centre for Sustainable Technologies at the University of Ulster. Professor Hewitt you are very welcome and the Committee is very pleased that you could come. Would you like to make a short opening statement?

Professor Neil Hewitt (University of Ulster):

The Centre for Sustainable Technologies, of which I am the director, is a research unit in the University of Ulster. Its primary focus is on energy, and it currently receives grant income for approximately £5 million worth of live projects, three quarters of which are funded from outside Northern Ireland. Our key areas are low-carbon buildings; renewable forms of energy, particularly biomass and solar; clean fossil fuel use, including carbon capture, storage and sequestration, which is a big EU project; and energy storage. We have laboratory facilities, with 10 academic staff, supported by 30 researchers and PhD students, working in the area of energy.

The Chairperson:

Thank you very much. I read your response to the Committee's inquiry and found it very clear. There were some blunt messages in it, and I thank you for the forthrightness of your answers.

It is critical of Government policy on energy, and that is disappointing. In your response, you referred to the fact that energy policy, and the responsibility for its implementation, is spread across eight Departments. You also stated there is no proper government centre for the dissemination of information to those who want to enter the market. That is pretty brutal stuff. Would you like to comment further on that?

Professor Hewitt:

Eight Departments have energy elements in their remits. Perhaps it is because of the nature of our emerging Assembly Government that it evolved like that, at a time when energy was not as high on the agenda as it may be now. There is room for change on that. A number of organisations offer support and advice on specific areas. For example, the Carbon Trust works with industry, the Energy Saving Trust works with householders and community projects, Action Renewables, representatives of which were here today before me, has an educational training remit, and I am sure that there are others that offer advice in specific areas. However, projects can fall between stools, and, therefore, they sometimes lack information from other areas that can transcribe into what they are doing.

The Chairperson:

You made an interesting observation that perhaps we should have one Department — perhaps a separate Department of energy — to deal with this area. Is that still your view?

Professor Hewitt:

That is my view. I recognise that it is liable to be impractical. However, it is my view that, if energy is so important and Northern Ireland continues to import something like 98% of its energy, we need to take the issue very seriously. Therefore, having a co-joined, top-down approach would be a very strong way to deal with it.

Mr Butler:

You mentioned barriers in government and disputes with the Planning Service. You said that the South of Ireland seems to be ahead of here. It is a competitor, but should we not be working together, rather than competing with each other?

Professor Hewitt:

Very much so. From my personal involvement in this area, I have noticed the competitiveness. We talked to Enterprise Ireland about concepts and so on. They have enacted them; we are still talking. That was two or three years ago. My exemplar would be setting up an industry/academia/energy group. They did that, and they utilised our ideas.

Mr Butler:

We are still talking about it.

Professor Hewitt:

We are still talking about it. We have batted proposals back and forth with Invest NI. They go through various groups and nothing happens. I think that the opportunity has gone, because people are already committed to other projects, and if it serves the industry need, it does not matter which side of the fence it is on. If something works for them, they will do it.

Mr Butler:

That approach has helped the industry in the South to move on, and that is why it is ahead of ours?

Professor Hewitt:

That is why it is ahead of ours.

Mr Neeson:

Professor, I know how various university departments rely on funding, and I note that most of your funding comes from outside Northern Ireland. What research is being carried out by your department at the moment in relation to renewables?

Professor Hewitt:

Specifically on renewables, we have two themes with four areas. The two themes are solar and biomass energy. Those are our key strengths. Believe it or not, we can make solar power work in our country with what are called concentrating devices. Therefore, for example, we work with Kingspan in developing new solar concentrators. Alternatively, we are working on new concentrating photovoltaics to develop both heat and electricity. On the biomass side, we work specifically on downdraft gasification, which, effectively, takes indigenous wood and creates a fuel gas cleanly, with very few emissions and particulates etc. It is a research topic because the process is touchy about the quality and moisture content of the wood that goes into it.

Our other biomass research area involves oils. We have been working on ways of enhancing simple mechanical presses for oilseed rape, and that has developed into an approach involving developing countries, using jatropha and various other oilseed varieties that grow in nice warm climates and not here, but which are seen to be beneficial to Third-World or emerging-economy farmers, as they give them added income. Those are developed into fuel oils, so we have been developing ways of enhancing those systems with, basically, good plant biology. It is a cross-disciplinary approach. We are now merging into seaweeds, both micro-algae and macro-algae — seaweed itself — for fuel oils. I am grateful to the Department of Enterprise, Trade and Investment (DETI), which helped fund it through the INTERREG project. That is what we do.

Mr Neeson:

The AES Corporation at Kilroot were looking at the whole question of biomass energy. Do you know whether AES will progress with that?

Professor Hewitt:

Co-firing introduces an alkaline component into the system, so the ash, which we understand well as coal ash, suddenly has a different chemistry, so there is a limitation to co-firing with traditional gear. There is then an additional issue because of the change in PH: the wear and tear on the system may be questionable over time. We are part of a new Engineering and Physical Sciences

Research Council (EPSRC) project called “Supergen”, and part of that is biomass co-firing. We are trying to assess the impacts of co-firing with wood and with crops such as miscanthus and other biomass crops that can potentially be grown.

Ms J McCann:

Thank you for coming along, and for your paper. I came in late to our last evidence session, but the Committee was talking about community buy-in. You said that 98% of all our energy is imported, and that keeps up the price. Cost is a big factor for people, particularly with the high levels of fuel poverty that we have in the North. It would take a Government policy or drive to sell renewables, and there would have to be a lot of Government buy-in.

The Committee visited a company — I think it was Airtricity — and its staff said that, because we live on an island, the potential wind and wave energy available to us cannot be stored for export. They said that the infrastructure here would not be sufficient to manage it, even if we were able to capture such energy. I think that, as this is a small island and we have that potential, we should have an all-island policy. Do you envisage such a conversation taking place? Do you agree that we are looking to the long term and seeking to promote renewable energy, and, after the investment is made, the cost of energy will come down for households? That is an important leverage. At the moment, people in social housing face high energy costs. However, there is no awareness of the long-term benefits of renewable energy. Do you see a sea change in that awareness?

Professor Hewitt:

The very fact that this Committee is talking about it shows that the conversations are happening. They are happening at many levels; I would not say at all levels. So people are talking about it. Perhaps that is all we are doing, unfortunately, but at least we are doing that.

First, let me begin with social housing and work upwards. There are many studies that show that you can retrofit a house for as little as £6,000 for insulation and bring it up to a better standard. However, to add renewable energy to that adds to the cost. Let us be honest, if people cannot afford energy, they cannot afford it. No matter how well-insulated the box in which they live is, it will become just a cold, insulated box, if they cannot afford to buy energy. We still find it prohibitively expensive to retrofit a house with renewable energy systems.

Secondly, renewables are no panacea. The sun does not always shine; the wind does not always blow and so on. There will be periods when we need to use something else. That might be using electricity from the network, but we will have reduced the cost because we will have used renewables or heat from other sources. Alternatively, you could build in some form of energy storage that can take the excess energy and give it back later, but that takes space and there is additional cost.

Coming up through the network in the wider renewable energy scheme, Ireland as a whole seems to be moving towards big renewables, such as big wind. Wave and tidal energy are a bit further behind; they are more at the development stage. The network currently cannot take that capacity. Crudely speaking, the resources are in the west and the population is in the east. There has to be east-west reinforcement.

In defence of Northern Ireland Electricity (NIE), for example, we have not really decided where we are going to put our renewables. It is done case by case, and, therefore, infrastructure follows behind. Perhaps we should take a more innovative approach by zoning areas and deciding on a good place for renewables such as wind, after which we could look at the cost of putting in the main infrastructure through some sort of public-private partnership. Then, at least, we will not be proceeding on a piecemeal basis, connection after connection, with all the environmental impact assessments that accompany that to ensure that we do not harm the birds and the beasties. Those are all good things that we have to do, but we will do it once for each area.

I will move on to the issue of poverty and, particularly, rural poverty. Big companies pay good money to individual farmers for placing wind turbines on hillsides, and, as far as I am aware, the sheep are not afraid of them. I have not seen any sheep running away from them. There are many positives in bringing money into the community. Perhaps a business mechanism to support that can be viewed as community empowerment. We can get rid of the Nimbyism — not in my back yard — if more of the community can benefit from the turbines that intrude on people's views through some sort of reduction in electricity tariffs, for example. Perhaps an integrated approach can be created that allows connection to be done quickly, the environment to be checked quite legitimately and issues to be overcome, so that communities can benefit from having wind turbines in their localities.

Dr McDonnell:

Thank you very much for your submission, Professor Hewitt, and for your robust and honest attitude. I like it, and I would like to hear a lot more of it as we go forward. If we were to appoint you as the guru of a renewable energy commission, what two or three steps could we take in the short to medium term to move things on? I share your frustrations and have done for 10 years. The difficulty that you have identified is that there is a quagmire; the vision is blurred and nothing is in focus. How can we give some hope to those who are engaged and, as others have said here, have become frustrated by failures and dysfunctional efforts in various directions?

Professor Hewitt:

I will reiterate what I said. For the big-scale stuff, we need some sort of zoning. We already have industrial zones. Invest NI has already vested land for such zones. That approach can be adapted towards biomass, bioenergy and other sorts of projects, with the correct environmental support. Equally, wind power, in the first instance, because it is the most advanced renewable that we currently have, can be zoned at the appropriate places. That zoned area should go through an environmental impact assessment once, after which the statutory bodies can be allowed a short period of time to challenge the project on specific issues so that local sensitivities are brought on board. There is no need to take a brutal stick to the process. When those zones are in place, the network has to connect to them. It will go to one area, and there will be lighter weight networks in between. Perhaps there can then be a joined-up approach from the community through to implementation and distribution. That is what I would try to do in the first instance.

Mr McHugh:

Welcome, Professor. I want to look at in a little more detail the whole possibility of using agricultural land for growing oil crops or any type of renewable energy, including biomass. It has been done quite successfully in Sweden and elsewhere for home/city situations, where anything from grass for silage to wood products to municipal waste are used, and everything was run off that power. It seems more sensible to do it that way than to put individual solar energy panels on some houses and not on others throughout the countryside. It seems to be a more organised approach. Is that an option for us? Given that countries such as Brazil are cutting down rainforest to create grass to feed cattle and trees take time to grow, perhaps we should start to grow them in Ireland, or else we should be told that that is not an option. We are almost told that it is not an option, but there are farmers who would like to get involved in some of that.

The grid is developed in the east, not in the west, yet some of the renewable energy would have to be developed in the west. That is a curious scenario. Is there anything that should be pursued as regards the development of the grid? If the grid is not going to be developed in the next 10 years, should we going in different directions?

Professor Hewitt:

You raised a number of points, and I shall start with the one on bioenergy. We have a limited land mass, and the issue brings on board the dreaded food-versus-fuel debate. We import a lot of food, and other protagonists say that we export a lot of food. Perhaps I should go back to eating my father's green cabbage that he used to grow every winter in his back garden. It was terrible stuff, and I still have an aversion to it, but you will know what I mean.

Dr McDonnell:

It is very good for you.

Professor Hewitt:

Yes, I know that it is very good for you.

The Chairperson:

You are looking well. It did you no harm.

Professor Hewitt:

It did me no harm, but I think that I prefer something more tropical. We have that issue, and there is a huge debate to be had on food versus fuel. We have a limited land mass, and the question has to be asked: what is the best value for the biomass that we can grow sustainably? Having posed the question, I do not know the answer. We have been trying to answer that question for some time, and it is difficult to get an answer to it.

You can grow grass and use anaerobic digestion to get fuel and gas for engines, electricity and heat without a problem. You can grow quick-growing wood crops such as willow in three years, but you get only between £60 and £80 a ton, whereas the price of wheat went up to £200 a ton last year. If you have grown those big wood crops, you cannot plough them into the ground and start again, whereas, if you decide that you have the appropriate land, you can grow wheat and

you get a quick response. This is a good year for it, especially with all the Russian fires and droughts.

You can change things. Wood, biomass and so on represent a longer-term commitment. Miscanthus — the big grasses that you see growing about the place — grow sort of well with us. Some of them grow better than others, and that takes us back into the food-versus-fuel debate, because you want to put the miscanthus on good land.

You touched on the community aspect of biomass and whether individual solar panels should be used versus community-based systems. Some of the UK Government policy for what energy might look like 20, 30 or 40 years ahead takes a scattergun approach. It includes every technology that you can think of. Either that is the result of someone quoting from a textbook and giving an arbitrary figure, or, as I believe, it is because there is no one single solution.

Solar will work for people because, in towns where housing is denser, there are no longer coal holes to turn into wood holes. In my parents' house, the area under the stairs where the coal went has been converted to part of a dining room or something. Wood, for example, is less dense than coal; therefore, we would need a wood man to deliver wood every week, and it would have to be a big delivery at that. The equipment is also still expensive, and so on.

When it comes to community systems, we do not have a positive experience of district heating. We had some negative experiences, which were the result of a design/operation/information issue. There was not too much wrong with the technology, if used correctly. District heating is used successfully on the continent, and our challenge would be to retrofit that infrastructure. Woodbrook, in Lisburn, has a wood-fired district heating system that works.

At a meeting that we attended in Newcastle upon Tyne yesterday, one of the big concerns raised by user groups was how people were locked in to using district heating. We have the idea that people should have flexibility in selecting their electricity and gas suppliers, but installing a district heating system locks them down to a particular provider. We have moved from being used to that type of arrangement — such as when we had just NIE — to having the choice of different companies. That has become the norm, so there will be fear about the uptake, price guarantee and so on. Therefore, there are lots of challenges in what you said. You went through

an awful lot, and I do not think that I have answered all of your points.

Mr McHugh:

That is fine.

The Chairperson:

Thank you very much. In conclusion, your submission touched on this, but the overall context in which we are developing indigenous businesses requires financial support, and there must be incentives. What is your view on the argument about renewables obligations certificates (ROCs) versus feed-in tariffs?

Professor Hewitt:

They are both supporting mechanisms, so I am not concerned about whether one or the other is used. I am concerned that we ensure that we do not benefit from certain situations. It is a crude example, but someone with a big, draughty old house may get a nice big, oversized biomass boiler to heat that big, draughty old house. That person then gets a heat ROC for doing that, whereas, had they first insulated the house, they would have got a lot fewer heat ROCs. To implement that approach without heat metering, which is expensive — I recently bought some heat meters at £400 a shot — people would need to be trained to assess the state of the building, the size of the equipment required and so on. That requires degree-level training in building services. We do not have enough people of that calibre. Therefore, are we creating an unnecessary industry to manage something for which we have not correctly legislated? Does the Committee understand my circular argument?

The Chairperson:

Yes.

Professor Hewitt:

It is about being able to implement the system and keeping its cost down, because cost is always an issue, and being able to rest assured that it is the correct approach, bearing in mind that renewables should be the last option; the first option being energy efficiency. In any building, that means first getting right the insulation, the glazing and so on, before deploying additional technologies.

The Chairperson:

OK. Thank you very much Professor Hewitt. That was very interesting. If the Committee has any further questions, perhaps you will respond in writing.

Professor Hewitt:

Thank you.