Feeling hot hot hot!

By Chris Osborne, Senior Policy Officer

Legislation was passed last week in the Assembly meaning that the Renewable Heat Incentive (NIRHI) is one step closer for non-domestic users with eligible installations in Northern Ireland. OFGEM will administer the NI RHI including dealing with applications, accrediting installations, making incentive payments and monitoring compliance with the rules and conditions of the scheme. DETI is responsible for developing the underpinning NIRHI policy including setting tariffs, establishing the legislative framework, and the introduction of further scheme elements in phase two.

This has been a long time in the making with the UFU being involved from the initial stages of its inception back in 2009 when the renewable heat market in NI was assessed as well as the needs of generators and customers. Following on from this DETI conducted a series of consultations to which the UFU responded. This concluded with the joint DETI/OFGEM consultation on the proposed guidance notes for the scheme which concluded on 12 October.

Background to the NIRHI

The RHI is a key policy measure in supporting the achievement of the NI Executive target of 10% renewable heat by 2020 and the wider UK target of 15% renewable energy by 2020 as required by the European Union.

NIRHI is a financial incentive scheme designed to increase the uptake of renewable heat technologies and reduce the UK's carbon emissions. Broadly speaking, the scheme provides a subsidy per kWhth of eligible renewable heat generated from accredited installations and a subsidy payable to producers of biomethane for injection.

Domestic Customers

Support for domestic customers will follow. Earlier this year DETI did announce an interim payment for domestic customers in the form of the NI Renewable Heat Premium Payment (NIRHPP), a separate, complementary grant scheme to the RHI.

NIRHI Scheme Eligibility

The following renewable heat technologies will be supported initially:

- solid biomass and solid biomass contained in municipal waste (including CHP)
- ground and water source heat pumps
- geothermal (including CHP)
- solar thermal (at capacities of less than 200 kWth)
- biogas combustion (except from landfill gas but inc CHP;(capacities of less than 200 kWth)
- biomethane injection.

Participants will also need to meet several other eligibility requirements, including demonstrating that the heat is used for an eligible purpose and metering arrangements are appropriate.

Participants will be able to apply via the Ofgem NIRHI website from the start of the scheme, expected to be before the end of 2012.

Ongoing obligations

Participants will need to comply with a number of ongoing obligations, such as regular submission of heat data, meter readings and fuel data for certain bioenergy installations. Participants will also be expected to maintain their heating equipment and meters, and report any significant changes to their installation/heat uses to OFGEM.

Initial Tariffs

Table One – Tariffs

The following tariffs apply to the period from the start of the scheme up until 31 March 2013.

Tariff Name	Sources of energy or Technology	Proposed Installation Capacity	Proposed Tariff (pence/kWh)
Small Heat Pumps	Ground source heat pump, water source heat pump, deep geothermal	<20kWth	8.4
Medium Heat Pumps		>20kWth<100kWth (but not including 100kWth)	4.3
Large Heat Pumps		>/ 100 kWth	1.3
Small Biomass	Solid Biomass; including solid biomass contained in municipal solid waste and CHP	Less than 20kWth	6.2
Medium Biomass		>20kWth<100kWth (but not including 100kWth)	5.9
Large Biomass		>/ 100 kWth	1.5
Biomethane	Biomethane injection and biogas combustion	Biomethane, Biogas Combustion <200 kWth	3.0
All Solar Collectors	All Solar collectors	"All solar collectors" <200 kWth	8.5

Key Questions

The following common questions have been asked since the NIRHI has been reached the public domain;

- **How will the payments be made?**

Payments will be made on a quarterly basis by OFGEM. The payments will be made by multiplying the actual metered heat output over the quarter with the designated tariff.

- **Metering**

All technologies installed under this phase of the RHI must have an appropriate heat meter installed. The UFU responded to the consultation citing instances where agricultural building have individual metres installed and how this would need be avoided due to extra cost.

- **What about Anaerobic Digestion?**

If you have an AD plant and you are receiving NIROCs you will not be able to claim the RHI. However, with moves to establish small on-farm AD plants, in the event that they don't receive ROCs DETI have confirmed that they will be eligible.

- **Will the tariffs change over time?**

Once accredited, they will receive a fixed level of support. To ensure cost effectiveness, the tariffs will be reviewed over time and new tariffs will be applied to new entrants. Tariff levels will be amended annually to reflect the Retail Prices Index.

- **How long will the incentive payments last?**

For this first phase, support is for the lifetime of the eligible technology, up to maximum of 20 years.

- **I already have a Renewable heat technology installed, am i eligible?**

Eligible equipment commissioned on or after 1 September 2010 can avail of the RHI, however a suitable metre must be installed.

Going Forward

The UFU believe that this is a crucial first step in developing a renewable heat market in Northern Ireland. DETI have informed the UFU that Phase Two will be consulted on in the New Year with probable implementation in Summer 2013.

As far as "other" heat technology is concerned, the UFU acknowledge that the cheaper-cost technologies were given priority, yet we will continue to urge that gasification and biomass CHP etc be included in the next phase of the NIRHI.

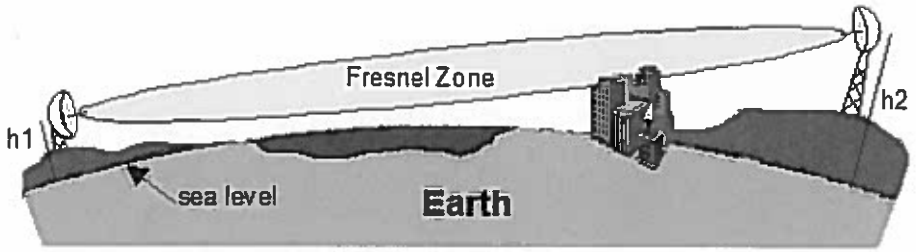
Are you affected by Microwave Links?

When installing small to medium-sized wind turbines, our members have encountered a variety of barriers and problems in terms of planning. Planners have objected on the basis of turbines proximity to other buildings, roads etc. These are physical entities and visible to the naked eye. In such as cases, the landowner is able to relocate a turbine, to counter the objection and the project can go ahead. However, from time to time, landowners come across objections from communication companies on account of barriers which are invisible to the naked eye.

This week, Commodity Watch will focus on the impact of such invisible barriers known as fixed-link transmission corridors or "microwave links". These are the signals created by communications lines, and not necessarily those created by mobile phone providers. Rather it is the PSNI, NIE, utility companies, BT, mobile phone companies, statutory bodies, operating fixed links transmission corridors across farmers land and property. Since the links are not visible, they offer no visual impact and many farmers and landowners are actually unaware that signals are being transmitted across their land.

There are two scenarios to consider. Firstly, consider where a landowner decides to fund the purchase of his own turbine with no third party involvement. Secondly, consider where the landowner is approached by a company wishing to install a wind turbine on the land and pay the landowner an annual rent. Currently neither landowner nor wind turbine company will know if there are any transmission corridors overhead until planning is submitted.

Without wishing to be too technical, the nature of the objection will often be based on the conclusion that the wind turbine is within the "Fresnal Zone", see below;



The problem is that the landowner will only be made aware of the existence of these links when an application is made for planning permission for a wind turbine they wish to have installed on their land and an objection is made by the communications company. The objection will be that the proposed wind turbine will interfere with the fixed link signals.

The UFU are concerned about the wider policy impact upon ALL Northern Ireland landowners. Matters are further complicated by the likelihood that there could be a criss-cross of different companies microwave links covering the airspace above the farm. In light of this and the other concerns mentioned, the UFU are planning to seek clarity with regard to fixed-link transmission corridors, namely;

- Is the landowner aware of the signals going over their ground?
- Is there a register of the location and mapping of these communication links?
- Is there a legal requirement to notify the farmer/landowner of their existence?
- Who owns the airspace over the farm?
- Are there grounds for compensation should signals affect a landowners ability to make a living?
- Are landowners consulted about the opening of new transmission corridors?

Should an objection be encountered due to the presence of these microwave links, landowners are advised to engage with the relevant authorities, providing grid references, so as to clarify the location of the proposed turbine.

The position of the turbine will be clarified in relation to the "fresnal zone", namely is it in close proximity to rather than causing interference with the fixed links overhead? If the former can be proved, then the objection may be withdrawn. But this will only be achieved by engaging with the objecting organisation and asking them to prove the grounds for objection.

Over the next couple of months the UFU will be engaging with DARD, DOE and OFCOM (and other Stakeholders) to get the above questions answered and ensure that landowners needs are catered for and not left at a disadvantage.

The UFU will be issuing advice and guidance in due course but in the meantime we will be calling for the communication companies to co-operate with landowners in clarifying why objections are being made and urge openness and flexibility where possible.

Are you earthed?

If the number of renewable generation units currently in planning are realised, wind turbines, biomass boilers and anaerobic digesters will become a common feature of many farms in Northern Ireland. However, when these are installed onto farms, they will have to be integrated with existing farm infrastructure buildings (cattle sheds, milking parlours etc).

As a part of the grid connection process, the generation unit will need to be connected with NIE 11kV overhead network, in the majority of on-farm renewables projects. This will often be facilitated through an NIE sub station located on the farm, usually located close to other farm buildings and the generation unit itself.

The message of this weeks Commodity Watch is, if you are about to embark on an on-farm renewables project, you should be mindful that an earthing study may have to be carried out by NIE in relation to the incorporation of substation.

Earthing ensures minimal damage to equipment and property should a fault occur. This extends to protect yourself, your family, your employees and your livestock from the risk of an electric shock. Earthing will ensure the electricity supply will disconnect under fault conditions by providing a path for the fault current to flow to the earth. In the simplest possible turns, consider a household appliance such as a fridge. Should it develop a fault, the fault current would flow to earth through the protective (earthing) conductors. A protective device in the consumer unit would detect the fault and isolate/disconnect the electrical supply to the fridge.

An earthing system defines the electrical potential of the conductors relative to the Earth's conductive surface. The choice of earthing system can affect safety and electromagnetic compatibility of the power supply and is therefore crucial but seen by many as an insurance policy in what is an infant-stage industry. Most electrical systems connect one supply conductor to earth (ground). If a fault within an electrical device connects a "hot" (unearthed) supply conductor to an exposed conductive surface, anyone touching it while electrically connected to the earth (e.g., by standing on it, or touching an earthed part) will complete a circuit back to the earthed supply conductor and receive an electric shock.

In the conext of farming, soil resistivity is central to any earthing study and findings would need to be incorporated. Soil Resistivity is the process of measuring a volume of soil to determine the conductivity of the soil. The resulting soil resistivity is expressed in ohm-metre (Ωm). It is a critical factor in design of systems that rely on passing current through the Earth's surface. Soils made up of gravel, sand or stone have the highest soil resistivity. Soil resistivity levels are dependant upon moisture content, temperature and geological/mineral content. Consider Table One below.

Table One – Ground resistivity p [Ω] for various kinds of soil

Type of ground	Ground resisitivity p[Ω]	
	Range of values	Average value
Boggy Ground	2-50	30
Abode Clay	2-200	40
Slit and sand-clay	20-260	100
Sandy ground	50-3,000	200
Peat	>1,200	200
Gravel	50-3,000	1,000
Stony and rocky ground	100-8,000	2,000

Table One shows the wide range in soil resistivity values and not one area of Northern Ireland is the same. The general rule of thumb is the higher the resistivity in the soil, the higher concentration in the ground, thereby causing potential problems for the site. A good earthing grid has low resistance (with respect to remote earth) to minimise ground potential rise (GPR) and consequently avoid dangerous touch and step voltages. Calculating the earthing grid resistance usually goes hand in hand with earthing grid design, that is, design the earthing grid to minimise grid resistance.

What can be done to minimise power system earthing issues on highly resistant land?

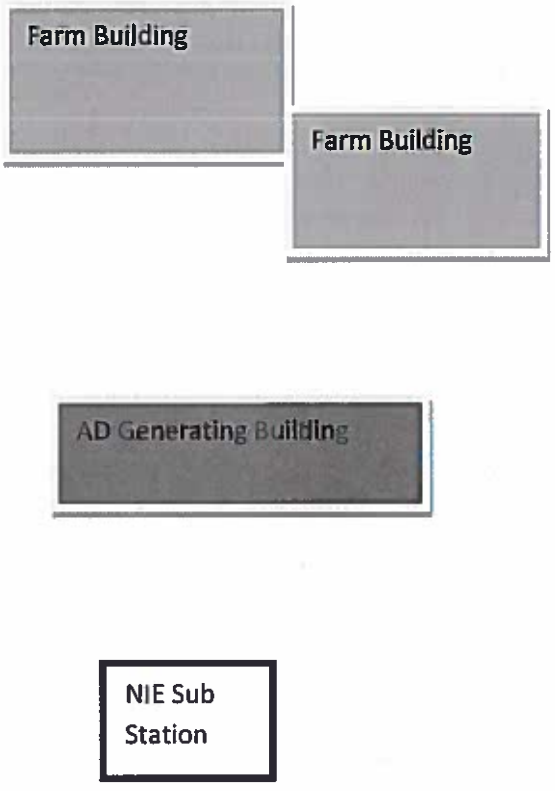
- Measure soil resistivity at an early stage and identify likely problems (see above).
- Identify proximity of sensitive locations (cattle sheds, farm outbuilding, dwelling houses etc)
- Generator location (at least 100m away from above buildings)
- Substation location (avoid proximity to above buildings)
- Dedicated NIE substation to supply the generator at least 100m away from above buildings.

Generator and NIE Substation Arrangements

Consider two siting scenarios for an Anaerobic Digestor located on an area of high soil resistivity;

Scenario One – Poor siting

Scenario Two – Good siting



Scenario One on the left shows the NIE substation being located in close proximity to the farm buildings, here there are potential earthing complications. Scenario Two, on the right shows a preferable example, where the NIE substation is 100m away from the farm buildings.

Conclusions and key message

If you have any concerns about earthing on your farm, speak to NIE at the very start of the grid connection/planning application process. Early identification and design of an earthing system should be installed at the start of the planning process and not left to the last minute.

The UFU advice is that investment in a decent earthing design system could be an insurance policy to compliment and protect a renewables project and should be considered to protect both you, your family, your equipment and your livestock.