15 November 2012

Renewables Delivery Team
Department of Energy and Climate Change
4th Floor Area A
3 Whitehall Place
London
SW1A 2AW

Ulster Farmers' Union Response to the Onshore Wind Call for Evidence

1. **Background to UFU response to Call for Evidence**
2. **Distinction made between large-scale and small-scale generation**
3. **NI Electricity Market and Grid Connection**
4. **Deployments – GB v NI**
5. **NI Planning Policy**
6. **Public perception of incentive payments**
7. **Financing**
8. **Methods of assessing Lifecycle Cost**
9. **Case Studies (1 to 5)**
10. **Conclusion of UFU Position**

1. Background to UFU response to Call for Evidence

The Ulster Farmers' Union (UFU) is the largest representative of farmers and landowners in Northern Ireland with over 12,000 members. We are the largest single representative of small scale wind generators (<250kW) in NI, with many of our member involved in a wide range of renewable projects. The UFU welcomes the opportunity to reply to DECC's call for evidence on onshore wind community engagement and benefits. However, since we represent small scale on-farm wind generators, our response to this call for evidence will focus on the cost of small scale onshore wind.

The main focus if the call for evidence is large scale (above 5MW) wind. Yes, as stated in the Call for Evidence, small scale wind is supported under the NIRO, and DETI are keen to receive data on small scale onshore wind costs and we with many of our members involved in small scale generation, we welcome the opportunity contribute to this call. The NIRO consultation response confirmed that Northern Ireland will need to introduce a small scale Feed-In Tariff before the NIRO closes to new generation in 2017. The work to introduce a FIT will include a review of ROC levels for small scale generation and this call for evidence will contribute to that work. The work to introduce a FIT here in 2017 will include a review of ROC levels for small scale generation and this call for evidence will contribute to that work. Hence the importance of this work from a small scale point of view.

Overview of UFU position – The cost of setting up a small scale onshore wind project is often underestimated. In March 2012, Bloomberg New Energy Price Index published a report suggesting that global onshore wind turbine prices were falling. In light of this, HM Treasury would appear to be preparing to reduce support for onshore wind from 1 to 0.9MW on the basis of a perceived drop in capital costs of 3.6% for onshore wind between 2011/12 and 2015/16. The UFU believes that this decision has been based upon large scale onshore projects and that the situation in the smaller scale turbines is the opposite, for the reasons set out in this response to the call for evidence;

1. Distinction between large-scale and small-scale wind generation

We recognise that this call for evidence was referred to in DETI's recent response to the consultation on changes to the Northern Ireland Renewables Obligation in 2013, yet the DECC Call for Evidence does need input from a Northern Ireland Perspective.

There needs to be a distinction made between the two scales of generation. The UFU does not represent large wind farms, rather Northern Ireland landowners and farmers are small scale generators of electricity utilising turbines up to c. 250kW.

Onshore is seen as the least expensive form of renewable energy that can be produced at source. It is imperative that small scale continues to receive support. This is on account of the very nature of the wind sector, namely its high capital/low marginal cost characteristic. Cost reduction in Northern Ireland small scale is a huge challenge and one which is proving frustratingly deceptive on account of the astronomic grid connection costs.

The public opinion is that is that large scale wind farms (onshore and offshore) are exporting the generating electricity out of Northern Ireland. Job creation in large scale development, operations and maintenance are viewed as advantageous to the NI economy but only if benefiting the local economy and not being outsourced by the multinational owners of the wind farms.

Smaller wind projects have a more obvious benefit to the local economy. You only have to consider the benefits such as community ownership which often result from single turbines being built in the countryside.

2. NI Electricity Market and Grid Connection

The DECC onshore wind call for evidence is written from a GB perspective. Speaking on behalf of a developed region, the UFU wishes to set out the situation in relation to grid connection of small scale wind turbines in Northern Ireland as it is markedly different from that in GB.

Currently NI has 478MW of wind generation connected to the grid and 1500MW in planning. Realistically we would imagine that 150MW of this would be attributed to small scale wind generation. Further uptake is limited by the barriers we highlight in this response, in particular the very high grid connection costs.

The stochastic and intermittent nature of wind makes generation difficult to predict for any Distribution Network Operator (DNO), which in our case is NIE (Northern Ireland Electricity).

Traditionally the NI network was a 'passive' system, providing electricity from bulk supply transformers in distribution sub-stations to customers on the low voltage (LV) network. The Northern Ireland rural community relies upon this network which travails throughout our countryside. The reliance upon these lines is illustrated by the fact that in Northern Ireland there is approximately 3.5 times more overhead line per customer than the average Distribution Network Operator on the UK mainland.

Now, with increased wind penetration, the supply points have changed. With generation becoming less centralized, there has been a shift in the voltage profile. We look at the 11kV network in greater detail on the next page.

NIE is the single DNO in Northern Ireland, whereas in GB there are Scottish and Southern Energy, SP Energy Networks, Electricity North West, Northern Powergrid, UK Power Networks, Western Power Distributions and two independent DNOs, GTC and Inexus. The breakdown is as follows per regions.

Table One – GB DNOs

Area	Company
North Scotland	Scottish & Southern Energy
South Scotland	Scottish Power
North East England	Northern Powergrid
North West	Electricity North West Ltd
Yorkshire	Northern Powergrid
East Midlands	Western Power Distribution
West Midlands	Western Power Distribution
Eastern England	UK Power Networks
South Wales	Western Power Distribution
Southern England	Scottish & Southern Energy
London	UK Power Networks
South East England	UK Power Networks
South West England	Western Power Distribution
North Wales, Merseyside and Cheshire	Scottish Power

Source - Energy Networks Association

Therefore, the choice is considerably more than in NI.

- **NI low-voltage 11kV Network -** The 11kV distribution network in Northern Ireland is over 50 years old and in need of substantial investment and upgrading. Four instances of severe weather in the last 2 years illustrated the need for an immediate upgrade. It is only by complete chance that 11kV network did not go down during this time and since the fact that rural NI depends upon this network the consequences of this would have been disastrous.

  Add to this the fact that Embedded generation (in the form of small scale generation) needs to be integrated onto the aching 11kV distribution network and you will be able to ascertain that the stress that the local lower voltage network is under.

  The Ulster Farmers' Union has been calling for investment in the upgrade of the 11kV network. The logical place for this investment was with the NIE submission for RP5 (2012-2017). In their submission NIE requested CAPEX of £127m in the low voltage line yet this was refused by the Utility Regulator. Trying to connect small scale turbines to an out-dated and not-fit-for-purpose electricity network is self defeating, yet this is what is expected of our members. At the time, the UFU did propose an alternative solution in our response to the Utility Regulator on RP5. This was a proposal on how to strengthen and improve the existing low voltage network at minimal cost in order to improve how small scale generators could connect with the grid.

  What this means is that NI small scale wind generators are facing massive grid connection bills, which are considerably more than those being faced by small scale generators in GB.

- **Lack of competition in the Power Purchase Market**

In GB, the power purchase market is a very competitive environment, unlike Northern Ireland, where generators have a very limited number of outlets to sell their surplus electricity to. A common complaint from small scale generators is that the Power Purchase companies retain a proportion of the ROCs in the PPA (Power Purchase Agreement) and they feel that this is inhibitive in the development of the renewable electricity market.

3. Deployments – GB v NI

NI is lagging behind their counterparts in GB and this should be taken into consideration. See below;

- **GB**

In 2011, the maximum demand was c. 63,000MW, with onshore wind providing 3% of UK electricity supply. There are currently around 7,500MW of wind capacity installed in GB. There is c.6GW of onshore wind are awaiting construction, with around a further 7GW in the planning system (3,063 turbines). 723 MW of new wind power capacity was brought online during 2011, a 40% increase on 2010. Many of these in planning are in Scotland. To meet the trajectory set out in the Renewable Energy Roadmap, GB expect to need up to 13GW of onshore wind by 2020.

- **Northern Ireland**

In August 2012, the Total Installed Generation in Northern Ireland was 3,264MW. The breakdown is shown in Table Two;

Table Two – Northern Ireland Total Installed Generation – August 2012

Conventional Generation	2,336MW
Interconnection (Moyle)	450MW
Total Installed Renewable Generation	478MW

The Total Installed Renewable Generation break down is shown in Table Three.

Table Three – Northern Ireland Renewable Generation

Large scale (>250kW)	448MW
Small scale (<250kW)	30 MW

Installed renewable capacity has risen in 12 months from 379MW to 478MW in August 2012. Both large and small-scale increased by 20% in a year, compared to the 40% recorded in GB over the same period it is clear to see that Northern Ireland is lagging behind.

The general consensus is that the drive towards wind-based electricity is getting powered along by Scotland who are aiming to have 100% of their electricity from renewable sources.

In summary, the above figures not only indicate that NI is lagging behind GB, but there is every likelihood that the DETI target of reaching 40% from renewable sources will be met by the large scale wind farms with smaller scale installations lagging behind their larger counterparts. The danger is that

any decision to reduce incentives will leave still-as-yet-to-be-built turbines at a disadvantage. The likelihood of small scale generation reaching the forecasted 120MW is very unlikely.

4. Planning Backlog

In Northern Ireland there is a significant backlog of outstanding planning applications for small scale wind turbines awaiting a decision.

These are set out in Table Four below;

Table Four – Planning Application for Wind Turbines <250kW

	4 April 2012	10 July 2012
Approved	315	337
Refused	68	73
Submitted	790	844
Withdrawn	86	107

The UFU have spoken with Planning Policy within the Department of the Environment and they have set themselves a target of clearing 20 small scale wind turbines a month since 10 July. Yet despite this, the backlog would still be standing at around 800 which is sizable to say the least.

Planning fees are not necessarily the problem here, rather it is the hidden cost created in the length of time it takes to get a turbine passed. The number of turbines awaiting a decision as identified in table Two clearly illustrates the phrase "time is money". As long as these applications are awaiting a decision, the turbine is not working earning ROCs, therefore seen as time wasted. Down-time is recognised by our members but a number of the cases in Table Two were submitted as long as 3 years ago and are still awaiting a decision.

5. Public perception of incentive payments

A common complaint about wind generation is that ROCs are seen as subsidy payments rather than as an incentive to produce renewable energy. In 2010/11, UK ROC issue was as follows;

Onshore	7,678,727
Offshore	5,016,832
Others	12,189,049

Yet it has been forecasted by the Renewable Energy Foundation that the total subsidy cost of the RO in 2020 could amount to £4.5 billion for offshore and £1.5billion for onshore. As far as the latter is concerned, small scale generation will account for a small proportion.

In terms of all renewable generation technologies, reports from Parson Brinkerhoff in 2011 and Arup/Ernst and Young showed that the cost estimates for selected electricity generation technologies was among the lowest, with £90MWh in 2011 and falling to £88MWh for projects starting in 2017. In terms of the additional cost to the consumer, onshore wind in 2011 added £4.68 to the average bill, approximately an extra 9p per week. However, such levelised cost estimate come with a margin of error.

The misconception is that the subsidy in the form of the ROC is the only cost imposed on the consumer by wind power. This is a criticism directed at the current "levelised" cost studies. According to industry experts the total cost to the consumer can only be achieved by carrying out Total System Studies. This involves using a time series daily load survey rather than a load duration curve and this will capture all the costs imposed on a consumer. The consumer costs normally excluded by levelised cost studies include;

- Extra cost of operational generation to control frequency and voltage
- Capital cost of new grid infrastructure
- Cost of constraint payments
- Transmission revenue costs and the cost of losses.
-

6. Financing

Or lack of it as is more likely the case, is adding to the lifecycle costs in NI. Obtaining finance is both difficult and expensive. On account of this, the majority of farmers in Northern Ireland do not have ample capital available to purchase a wind turbine and rather need to accept unfavourable credit agreements or accept approaches from third party companies wishing to lease land from the farmers offering them a percentage cut from the wind income generated, albeit at a vast reduced level. In the case studies below finance has been made available at 5% over 20 years from a high street bank. The alternative option is to seek funding from a Venture Capitalist, yet the rates of interest range from anything up to 12%.

7. Methods of assessing Lifecycle Cost

The cost of setting up a small scale onshore wind project is often underestimated. In March 2012, Bloomberg New Energy Price Index published a report suggesting that global onshore wind turbine prices were falling. In light of this, HM Treasury would appear to be preparing to reduce support for onshore wind from 1 to 0.9MW on the basis of a perceived drop in capital costs of 3.6% for onshore wind between 2011/12 and 2015/16.

In the first instance the UFU would query the headline reduction of 3.6%. If this is broken down, it will mean a per annum reduction of only 0.9%.

Yet it is the view of the UFU that policymakers have based this view upon cost of building and operating turbines rather than the significant "at-risk expenditure" incurred in the early stages of any project; namely grid connection and planning costs. The Chief Executive of Bloomberg New Energy Finance, Michael Liebrich, stated that their report was based on global prices and indicated that the average cost of onshore wind in the UK was still more expensive. Add to this the fact that within the UK, Northern Ireland has higher costs, with grid connection still significantly higher than that in GB.

8. Case Studies

The first three cases have been provided by a small scale wind turbine developer.

Case A – this is a case where the grid connection costs are £347,000. In terms of finance, the landowner needs to borrow 90% of the costs. After putting up 10% upfront and therefore needs to find £687,207. Assuming they can get a loan at 5%, over 20 years = £401,255. The total cost will be £687,207 + £401,240 = £1,088,447

Assume 4 ROCs therefore, forecasted income at expected wind speed is £90,000 per annum which is the industry average for a turbine of this size and based on an average wind speed. Income tax needs to be deducted from this; £18,000 per annum at 20%, as well as the monthly maintenance and running costs. Once these are all taken into consideration, the turbine will start paying for itself after 24 years.

In light of the substantial grid connection costs, the likelihood is that this project will be moth balled. The high grid connection costs are such that the pay-off/break even does not make this project financially viable. Since the pay-off is 4 years after the end of the life of the project.

Case B - This is a new build machine with a smaller grid connection charge. Farmer has provided a deposit payment of £54,856. The grid connection is £145,000, substantially less than Case A. The calculated costs are similar to above (including the ROC calculation), but the difference is the grid connection, meaning that the turbine will pay for itself after 14 years, but still a high risk investment.

Case C – This is a Reconditioned machine with reduced grid connection costs compared to A and B. The landowner in this instance the farmer needs to borrow 90% of the costs. The landowner is borrowing 90% again this time and a similar down payment to Cases A and B. The calculated costs are similar to above (including the ROC calculation). The attached spreadsheet shows that the payback will be 9 years, therefore the risk is less. Yet doubts remain as to whether reconditioned machines will be eligible for FITs in 2017.

The final two cases (D and E) are private land owners who have funded their own wind projects. It should be emphasised that grid connection cost were not so much of an issue in their case since they were fortunate to be close to a 3 phase line and little or no upgrades were needed.

Case D - this is a non-typical example as this is a wind development on a large farming estate, which had ample upfront capital to put towards a turbine, with no money borrowed. Please note that they wish to remain anonymous to the commercially sensitive nature of the data provided. However, it does highlight the grid connection costs once again, which were £68,000. These are among the lowest the UFU have come across and these low figures are another contributing factor the short pay back period.

Case E – Elliott Bell has installed a small scale turbine and it has been included to provide a case study at the opposite end of the scale. In part to show that despite a smaller size, many of the costs associated with the larger projects are similar. As far as grid connection is concerned this case study backs what we have said in our response. This farm business had no significant grid connection costs. The business up until recently milled grain on the farm and there was an existing 3 phase metre in a farm building which they connected directly to the wind turbine which is 150 metres away. Had there been any significant expenditure for grid connection, the project would not have been viable.

9. Conclusion

The race to meet the 40% target in NI will continue to be dominated by the large scale wind farms. If current incentive levels are not maintained, it will mean an opportunity missed for the local rural and wider economy.

It is clear that cost reduction for small scale wind generation in Northern Ireland has still not occurred. Unless the substantial grid connection costs are addressed, this significant element of the capital cost will inhibit the development of small scale wind generation in Northern Ireland.

In light of the information provided, the UFU would urge that the evidence provided in our response will contribute towards the case to ensure that subsidy levels are set at the correct levels from April 2014 onwards.

From the case studies provided, if the landowner does not have the upfront capital and with the sky high grid connection charges, the risks attached to such projects are significant since the payback periods are often unrealistic and unachievable meaning the projects may not been seen through to fruition.

The conclusion is that whilst the Government is of the view that the capital costs for onshore wind (including small scale wind) will be reduced, the reality for small scale is actually the opposite. The costs mentioned above mean that the "Return on Investment" is stretched to such a point that the pay-back for many small scale wind projects may never actually occur.

The UFU are asking that a separate review is undertaken for small scale wind generation in NI. This will indicate that break-even points are rising, and therefore any reduction in the incentive level will render many wind projects financially unviable.

If you have any queries about this report, do not hesitate to get in touch.

Yours sincerely,

Chris Osborne
Senior Policy Officer