

## [Draft] Submission for the Peatlands Council:

### Designing and Delivering a Home Energy Efficiency Programme

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*Summary: A home energy efficiency programme worth in excess of €16,280 could be delivered to each home currently extracting peat from protected bogs. This is based on €11,600 from NPWS (converting a €1,000 yearly outgoing for 15 years, index linked, to a present day sum) and combining it with the grants available from the Sustainable Energy Authority of Ireland (SEAI). The programme envisaged does not entail any outlay by the householder and it may be possible to increase the investment amount by accessing EU funding.*

*Dividends from this proposal include: employment creation, reduction in energy bills of householders, long-term financial benefit as more money circulates in local economies owing to local fuel supply, conversion of participating households to renewable energy (which has a lower long-term cost) and reduced greenhouse gas emissions.*

## **Exploring a Home Energy Efficiency Programme**

Two alternatives to continued turf extraction from protected bogs have been proposed to date, namely monetary compensation and relocation to other bogs. This document focuses on a third option – a home energy efficiency programme – and its addition to the menu of alternatives.

The government has stated a willingness to provide €1,000 per year to those extracting from protected bogs, and that this sum is index linked.

The liability to pay €1,000 per year, index linked, can be capitalised into a lump-sum liability today of €11,600.

Deriving the formula for Net Present Value (NPV) from the European Commission's guidance document on Impact Analysis, ("IA Tools: Supporting Impact Assessment in the European Commission", European Commission Joint Research Centre (ECJRC), 2011), we arrived at an NPV estimate of €11,563.13 for the liability described above.

Included in this calculation was a discount rate of 4% per annum. This rate was assumed as it *"broadly corresponds to the average real yield on longer-term government debt in the EU over a period since the early 1980s"* (ECJRC, 2011). The 4% discount rate applied also accounts for inflation (ECJRC, 2011).

The formula applied for year 1, for example, is  $1000/1.04 = €961.54$ , for year 2;  $1000/1.04^2 = €924.56$ , and so on. The sum of the 15 payments amounts to €11,563.13. Please see <http://iatools.jrc.ec.europa.eu/bin/view/IQTool/Annex12.html> for further information regarding this formula and calculation.

## **Advantages of Home Energy Efficiency**

Compared to compensation or relocation, home energy efficiency offers some distinct upsides. First, difficulties that will arise in the run up to the closing years of the 15-year annuity payments will be avoided. We must note that reliance on the €1,000 sum will not diminish in coming years (in fact, dependence upon it may grow), and future governments will likely come under pressure to extend it, even though such expenditure is not anticipated now.

Second, the €1,000 sum is likely to be spent largely on fossil fuels; yet this is expenditure (and emissions) that could be avoided if energy saving measures were taken in the first place.

Third, fuel poverty is best tackled at source – the building fabric of the home – to give residents a better level of thermal comfort and standard of living. For householders and government, this is a better approach than annual money.

Fourth, home energy enhancement measures will circulate a modest but nonetheless creditable amount of money in local economies.

There are also advantages compared to bog relocation:

- a) Many consents will be needed to intensify or begin cutting on other bogs. A previous attempt at relocation was abandoned at Kilballyskea, Shinrone, County Offaly, and a subsequent application to extract horticultural peat industrially on this bog was rejected by An Bord Pleanála because the proposed development would adversely affect an Annex I habitat, namely, degraded raised bog still capable of natural regeneration (see Appendix 2 for further details). Relocation will entail complex assessments, typically involving environment appraisal and planning application, and it is not the easy solution sometimes portrayed.
- b) In the relocation scenario it is not clear whether the party moved to another bog would only enjoy that right for 15 years, or until that particular section of peat bank is exhausted – or, if a right in perpetuity is being transferred (i.e. involving further re-transfer at a later date after the initial turf bank is exhausted). We are not aware of the legal arrangements proposed here, or if these issues have been considered.
- c) Extraction of turf still occasions the highest emissions per unit of heat generated compared to all other fossil fuels, i.e. the least friendly option in terms of climate pollution. In other words continued dependence on turf as a fuel will hinder Ireland's commitment to slow climate change which is set to affect future generations far more severely. (The extraction and burning of one tonne of peat produces 0.8 tonnes of CO<sub>2</sub>. Bog drainage to extract peat also results in methane emissions, meaning the overall climate impact is higher. See the report of the Planning Inspector, PL 19.225687.)

## **Reasons to offer a Home Energy Efficiency Programme**

Fuel poverty is likely to be acute in some, if not a great many, peat burning households. It is also possible that very large volumes of turf will still be required. These are poor outcomes economically and environmentally.

Employment will be generated by home energy efficiency improvements. More than 5,000 jobs are attributable to the current SEAI scheme, and government has noted significant capacity for expansion.

There is also the precedent value. As neighbouring residents see homes upgraded, they would be more likely to invest in energy-saving measures.

Enhanced home energy efficiency is something residents can pass on in their wills to future generations. This is because upgrades considerably increase the value of the home – and by much more than the value of the works undertaken as fuel prices rise.

## Better Energy – the SEAI Programme (launched 11 May 2011)

For the works shown on the left of the table below, the SEAI Better Energy programme offers the grant amount shown on the right.

*Table 1: Grant-aided Work and the Applicable Grant from SEAI*

Energy Efficient Works		Incentive Cash Grant
<b>Insulation</b>	Attic Insulation	€200
	Wall Insulation (Cavity)	€320
	Wall Insulation (External)	€4,000
	Wall Insulation (Internal Dry Lining)	€2,000
<b>Heating System</b>	High Efficiency Oil/Gas Boiler with Controls Upgrade	€560
	Heating Controls Upgrade only	€400
	Solar Heating	€800
<b>Building Energy Rating (BER)</b>	-	€80

The SEAI scheme works as follows. The household obtains one or more quotes for the work. Having weighed up the option/s based on approved suppliers, the householder makes financial arrangements with the contractor and pays for the work without assistance. The householder then reclaims the grant from SEAI. It takes approx. 6-8 weeks for the money to come through from SEAI to part-refund the household.

Because it would assume the upfront payment by the household, the pay-and-reclaim system will not likely be suitable for peat-dependent homes. The question then is how to organise the system.

## Combining Finance from SEAI and NPWS

In addition to the SEAI grant, a further sum is available from NPWS drawing on the €11,600 figure established earlier. (To recap, €11,600 is the Net Present Value of €1,000 paid

annually for 15 years, index linked). Hence, the table below shows what a typical householder can expect if it selects the “Home Energy” option.

*Table 2: Suggested Combined Finance NPWS/SEAI Home Energy Programme*

<b>Works</b>	<b>Home Energy Assessment incorporating BER</b>	<b>External Insulation</b>	<b>Attic Insulation</b>	<b>Heating Controls</b>	<b>Selected other measures to be advised by Home Energy Assessment: one or more options may be selected, including transfer of finance to work described in columns to the left, and/or solar water heating (which would come with an €800 SEAI grant), up to the full utilisation of the NPWS amount</b>			<b>Total</b>
<b>SEAI Grant (See Table 1)</b>	€80	€4,000	€200	€400	-			€4,680
<b>NPWS Contribution (Equalling Net Present Value)</b>	€100	€8,000	€450	€450	€2,600			€11,600
					With the exception of solar water heating, the full cost of the measures below would be paid by NPWS:	Wood burning stove	Heat pump	
<b>Total Value</b>	€180	€12,000	€650	€850	€2,600			€16,280

## **Potential Number of Households**

NPWS estimates that there are some 750 eligible plots on the 31 Sites of Community Importance (SCIs) 'closed' in 2010, 790 on the 24 SACs being closed in 2011 and 1,180 on the 75 NHAs (National Heritage Areas) to be closed in 2012 and 2013. While it may be that two or more households are extracting from one plot, the right was originally granted to one party and the NPWS has stated that it will only pay once (although hardship circumstances may be alleviated through the appeal mechanism proposed to be established).

However, working on the basis of one household per plot, it is possible, albeit unlikely, that up to 2,720 applications could be made over the course of the coming years.

However, our immediate priority must be the 1,540 households in the 55 raised bog SCIs, with attention then moving to households reliant on the raised bog NHAs.

## **SEAI as scheme administrator for an NPWS/SEAI programme**

Given its expertise, SEAI is best positioned to deliver this programme, guided by the NPWS on eligibility. As per the table above, no payment is requested or anticipated from the householder. This maintains the attractiveness of the programme.

The programme is different from the existing SEAI scheme in that the householder will not be seeking quotes and will not be paying upfront. This raises matters for consideration.

One option is for SEAI to tender house-by-house. As the contract sum exceeds €16,000 this may be a good option. Another option is to group two or more contracts together so as to gain economies of scale. This document does not offer a view on these matters. However, it is clear that there may be advantage in clustering for the purposes of undertaking a Home Energy Assessment incorporating Building Energy Rating (BER). This exercise would draw up the specification for each home. Put simply, the assessor calling to each home that has expressed interest in the energy programme would detail for that household the likely works which would be undertaken.

As table 2 (see above) shows, there is sufficient flexibility in the programme to adapt to individual circumstances and achieve value for money in each home.

## **Funding**

Turf extraction is an extractive activity linked to energy use in rural areas. The solution described in this document principally involves innovation and enterprise in rural areas. No assumptions are made here regarding the source funding (i.e. Government departments / funds). However, it is expected that the NPWS has an important role to play given it is

responsible for questions of eligibility, and hence NPWS is used above and referred to below even if the funding comes from another source.

*Table 3: Capital cost estimates for NPWS (frame of reference)*

Different levels of take-up (applicant households)	Outlay by NPWS (no. of applicants by €11,600)
250	€2.9m
500	€5.8m
2,500	€29m

It may be possible to defray this cost by accessing EU funding, and so the entire burden would not fall on Irish taxpayers.

Under the new Leader programme, “provision of basic services for the economy and rural population” is a priority area for action. With Leader, certain capital projects are eligible for matching funding (i.e. 50%), while training may be funded in its entirety. Applications must be made on a county-by-county basis and it is community groups that are eligible for the larger funding allocations (up to a ceiling of €500,000 per project). This may militate against a unified (nationally consistent) approach. However, Leader cannot co-fund with certain other State bodies and SEAI is one of the bodies with whom co-funding is expressly precluded.

Nonetheless, it will be important to develop local enterprise - supply chains for seasoned wood being the prime example (see next section) – and so Leader should not be discounted at this point. Further study of the Rural Development Programme should also be undertaken to investigate if there are other options.

If the matter is treated as a climate change issue, funding may be available under the EU action plan for climate change. This €50m fund was put in place to pursue the objectives set out at the Copenhagen conference in December 2009 (ref. 07 03 18; see further [www.ecas-citizens.eu](http://www.ecas-citizens.eu)).

Another potential avenue for EU funding is the European Social Fund (ESF), which aims to strengthen the capacity of public administrations for design and delivery of good policy and programmes. One of the objectives of Ireland’s programme, which includes an operational strand for the Border, Midlands and Western region, is “increasing energy efficiency and moving towards a low carbon economy”.

(Note also that EU funding for restoration of protected sites may be available through the European Agricultural Fund for Regional Development (EAFRD) for habitat conservation

management, the European Regional Development Fund for monitoring and surveying and the 7th Framework programme (FP7), for example.)

## **Supply of Wood**

Three issues are foremost: wood as the fuel source for stoves supplied under the programme; a secure supply of quality-assured wood, and third; furnishing householders with contacts of persons from whom quality-assured wood can be purchased.

Households that avail of the Home Energy Programme will be asked to commit to using only wood in a wood burning stove. At the same time, households must be assured of a secure, quality-assured, supply of wood. Quality-assured wood needs to be certified to be:

1. Free of toxic resins or other pollutants;
2. Suitable for the stoves supplied under the programme;
3. Dried to the correct moisture content (16 - 25%);
4. Sourced from authorised forests and;
5. The wood is certified to the Forest Stewardship Council (FSC) standard (or higher) and managed in accordance with FSC good practice (or higher).

Whether a dedicated programme officer is required to certify the quality assurance of wood, or whether the necessary work can be done through re-deployment of staff, or by existing SEAI expertise, is an issue to investigate.

Funded by Leader, and published by Teagasc, there is now a step-by-step guide for thinning small-scale forests. The work is based on plantations in Clare, where the average private forest (i.e. not owned by Coillte) is 9 hectares. These forests are now coming on-stream for thinning. Appendix 1 summarises this guidance document. The document also highlights the range of services needed to form a reliable supply chain - thinning, timber processing, marketing, forest maintenance and business management.

The work in Clare focuses on thinning softwood forests and drying the resulting timber to less than 30% moisture. Typically, sawn logs must be stacked outdoors for 18 months under a weatherproof, but breathable, cover to reduce moisture content to 30%. The cut ends should face southwest so the prevailing wind can permeate; see further Appendix 1. The Clare project had commercial boilers as the ultimate goal. But, for household stoves, wood should be drier again. According to Michael Stack of Waterford Stanley, moisture content should be brought down to 16% to 25%, with 20% being a good average, for domestic stoves. Because they tend to spark more, soft woods, such as sitka spruce thinnings, are better burned in a closed stove. Also, compared to hardwood, higher quantities of soft wood are needed to achieve the same heat output due to its lower value calorific value.

A project in Donegal is concerned with the output of saw logs which are sufficiently seasoned for domestic use, with 4.8 cubic metres of seasoned hardwood for €340 to members for example.

Contact details for persons from whom to order wood will need to be supplied to households where stoves are installed under the Home Energy Efficiency Programme. Such details must be clear and accessible or the programme will not succeed.

It is true that timber may have to travel considerable distances at the very outset of the programme. However, as expertise develops, and reliable, certified supply chains develop within each county, these distances can be shortened. In the immediate term a county-by-county analysis will be required, and with this and other data, establish secure supplies for those availing of the programme in 2011.

## **Appendix 1 - Step by Step Guide to Selling Your Timber for Wood Energy: Experiences from the County Clare Wood Energy Project – A Summary**

Reference: Clare Local Development Company and Teagasc Forestry Development Unit, “*Step by Step Guide to Selling Your Timber for Wood Energy: Experiences from the County Clare Wood Energy Project*”, Teagasc, Galway

This guide gives forest owners practical information on producing and selling their thinnings into the wood energy market. The wood energy market is local. This means there are fewer middlemen, lower transport costs and more local jobs created. The function of the Clare Wood Energy Project is to provide advice and information to forest owners on how to access the wood energy market and to help make connections with potential buyers, establishing links which are profitable for both owners and buyers.

Based on wood chip from farms in the area, the project aims to develop the demand for wood energy and establish a wood chip supply chain from local forests. The average farm plantation in Clare (i.e. excluding Coillte) is approximately 9 hectares in size. Involving several partners, the project places huge importance on creating the demand for wood energy in Clare through the installation of commercial scale wood biomass boilers. The project also involves the development of the wood chip supply chain by working with farmers and forestry contractors in conjunction with the local Teagasc Forestry Development Officer.

The initiative developed the term “heat entrepreneur”, namely a person involved in foresting for wood energy and who receives mentoring and training in this regard. Some of these schemes are eligible to receive LEADER grant aid. The project emphasises the benefits of “thinning clusters”, i.e. plantations that are close together and benefit from economies of scale. This document outlines eight steps that should be followed in thinning plantations.

### **Step 1: Inspection Paths**

These paths allow crop measurements to be taken which will determine the productivity of the site, the expected age of first thinning and the best location for a forest road. Branches are removed to head height on either side of a row of trees in order to create these paths. It is not necessary to remove any full trees.

### **Step 2: Inventory**

Using the inspection paths, the site is walked and divided into blocks, depending on species and growth rate. Data including Tree height; Age Diameter; and Stocking (per plot) is gathered. This is carried out at 12-15 years of age. Yield Class (YC) is a measure of how fast the timber is growing and establishes how much timber is available for thinning. It measures the average volume of timber produced in cubic metres per hectare per year. For example, a YC 20 site will produce on average 20m<sup>3</sup> of timber per hectare, per year. This inventory information is then used to develop a “management plan” for the site.

### **Step 3: Forest Roads**

It is illegal to stack timber on the side of a public road. Therefore, plantations must have a minimum of a wide bell-mouth entrance to facilitate off-road timber loading. Larger sites may require the construction of a “harvest road” which is designed to carry the heavy traffic associated with harvesting and is usually constructed within two years of when thinning is due to take place.

### **Step 4: Felling Licences**

Felling or up-rooting of any tree within the State is legislated by the 1946 Forestry Act and may be subject to a legal replanting obligation. The Act provides for two types of Felling Licences; a “General Felling Licence” and a “Limited Felling Licence”. The type of licence required depends on the forest operation being proposed.

### **Step 5: Joining a Thinning Cluster**

A thinning cluster is usually set up within a defined geographical area. The group share information, provide services related to the plantations and has a joint approach to harvesting and selling its timber. Harvesting contractors require a minimum volume of timber before they consider undertaking a harvesting contract. This clustering also allows for a joint approach to road development. New local markets for these low value products have emerged, which enable forest owners to harvest and sell these at a profit, or at worst break even.

### **Step 6: Thinning and Harvesting**

Thinning provides additional growing space, reduces root competition and concentrates the growth on fewer trees. Thinning commences between the years of 15-20, with thinning taking place every 5 years from then on. Thinning provides a regular income stream during the rotation and also improves the value of the final crop. There is, however, a risk that by opening up the crop, wind can cause trees to blow over. The decision of whether or not to thin should be based on economic viability. In Europe this tradition is long-established and currently 90% of the heat supplied by biomass comes from woodchips. Wood energy is sold locally, with the haulage cost minimised, making it more profitable for growers.

### **Step 7: Timber Marketing and Sales**

Timber should be put on the market before harvesting to ensure that the timber is harvested and cut to the lengths required by the market. The sale of timber should start with local processors to keep the haulage cost to a minimum. Prices of home-produced timber products compete with imported produce. The result is that the value of Irish timber is set by overseas markets, and prices increase and decrease rapidly in response to world prices. Despite these fluctuations, there has been a strong upward trend in timber prices over the last thirty years.

## **Step 8: Drying and Stacking Timber for Wood Energy**

It is essential that the timber is handled and stored correctly in order to produce good quality wood chips. The timber should be stacked in the most exposed location within the plantation or on secure adjoining lands. A well designed stack can promote better drying and also keep the logs free from dirt and splashing. The timber should be piled so that the cut ends face the prevailing wind; south westerly. The stacks should be covered with a breathable membrane, which allows moisture to evaporate through, but prevents rainfall dripping down through the pile. Before the timber can be used for fuel wood or wood chips the moisture content must be reduced to 30% or less (seasoning/conditioning).

## **Appendix 2 – Decision PL. 19.225687 / Kilballyskea bog, Shinrone, Co. Offaly (*extracts from the Inspector’s report*)**

The first stage of development is site preparation which involves removal of the vegetation by rotavator and bulldozing. This may require a number of passes. Some of the heather will be used to form the base for travel roads. Ditching and cleaning the existing drains, cambering the areas between drains, piping headland drains, excavation of silt and settlement ponds, is also [to be] carried out. The stockpiling areas are to be prepared and shelter belt planted. The first stage also includes construction of the junction, upgrading of the entrance roadway, construction of office facilities, etc.

Kilballyskea Bog is a small raised midland bog of an original area of about 80 ha. The bog developed over centuries in a waterlogged hollow surrounded mainly by fertile upland. Domestic turf cutting over many years has reduced the high bog area remaining to 38 ha leaving a cutover area of about 20 ha inside the current boundary. There has not been any turf cutting for many years.

In 2000 the bog was purchased by the Dúchas (now National Parks and Wildlife Service -NPWS), of the Department of Environment, Heritage and Local Government (DoEH&LG) with the intention, according to the first party, of using it to relocate displaced peat producers from bogs that were designated conservation areas in the locality. This did not happen. In 2004, the DoEH&LG offered the 29-year lease of the bog for sale for the purpose of commercial peat extraction by public advertisement, copy supplied. The successful bidder was the first party, who agreed to purchase subject to receiving the necessary consents and subject to conditions imposed by the DoEH&LG.

The greater part of Kilballyskea Bog is dominated by dry heath vegetation. The documentation submitted with the application states that the bog was originally a raised bog, however the comprehensive drainage programme initiated in the 1990s has altered the site area to an area dominated by tall ling heather (*Calluna vulgaris*), with a ground layer of typical heathland mosses. The heather is up to 1m tall and the mosses comprise *Hypnum jutlandicum*, *Eurhynchium praelongum* and *Rhytidiadelphus squarrosus* species. There is further evidence of drying out through the colonisation by birch and Scot’s pine across the open heathland. There are remnants of raised bog vegetation, which is typically characterised by *Sphagnum* and *Eriophorum* species and a suite of classic Atlantic raised bog characteristics. There is an extensive network of field drains that are up to 2 metres depth in places. There is some indication of *Sphagnum* regeneration in parts of the drains, but this feature is not widespread... There is little vegetation cover in either drain type. Evaluation of the ecological value of the site and surrounding area: The proposed development site and/or the surrounding area do not include any areas designated, or that will be potentially designated, for their ecological value. The site was owned by the NPWS and having considered the bog unworthy of

conservation, the NPWS sold the lease to Erin Horticulture Limited for peat extraction. The greater part of the site comprises degraded raised bog habitats that are not considered of conservation value, either at a national, regional or local context. One tonne of peat at 60% moisture content is estimated to produce 0.8 tonnes of CO<sub>2</sub>. Thus, in this proposed development the estimated annual production of 10,000 tonnes (40 – 45,000m<sup>3</sup>) will result in 8,000 tonnes of CO<sub>2</sub> released over time.

The bog was originally an active raised bog. This is a priority habitat under the EU Habitats Directive. This bog was drained in the 1990s, and the habitat and hydrology altered significantly. While the habitat present is classified as “Dry Heath HH1”, under the EU Habitats Directive the bog does qualify for inclusion under the Annex 1 Habitat 7210, “degraded raised bog still capable of natural regeneration”.

The European Union Council Directive 92/43/EEC of 21 May 1992, as amended, on the conservation of natural habitats and of wild fauna and flora, sets out to conserve habitats and species; in European territory of the Member States and in doing so refers to the fact that natural habitats are continuing to deteriorate and an increasing number of wild species are seriously threatened... In Annex I, the directive lists types of natural habitats of community interest whose conservation requires the designation of special areas of conservation. The original directive adopted in 1992 included ‘raised bogs’ as a listed habitat type but not ‘degraded raised bogs still capable of natural regeneration’, which has since been added to the list.

*7210 Degraded raised bogs still capable of natural regeneration:*

*“These are raised bogs where there has been disruption (usually anthropogenic) to the natural hydrology of the peat body, leading to surface desiccation and / of species change or loss. Vegetation on these sites usually contains species typical of active raised bog as the main component, but the relative abundance of individual species is different. Sites judged to be still capable of natural regeneration will include those areas where the hydrology can be repaired and where, with appropriate rehabilitation management, there is a reasonable expectation of re-establishing vegetation with peat-forming capability within 30 years. Sites unlikely to qualify as SACs are those that consist largely of bare peat, those that are dominated by agricultural grasses or other crops, or where components of bog vegetation have been eradicated by closed canopy woodlands.”*

Details of the flora species and their relative abundance in the survey are submitted. Sphagnum and other bog species occur in relatively small patches throughout, covering less than 5% of the total bog area. The “further information” states:

*“It is the opinion of the ecologist that Kilballyskea Bog, including cutover and the high bog area can be classified as 7210 ‘Degraded raised bog still capable of natural regeneration’. In order to restore peat-forming conditions, the site does require an extensive drain blocking programme within the bog area and also blocking of the main outfall. The time frame of regeneration is difficult to predict and may or may not be achieved within 30 years. The site will never return to its original condition, but peat-forming communities can be re-established with time.”*

In the absence of information on the conservation value of the site, in terms of evaluation of the current local and global situation regarding this habitat type and the priority habitat type ‘raised bog’ it is prudent not to permit a development which would involve the destruction of the natural heritage of the site.

The proposed development involves the destruction of a habitat which is of a type considered under Annex I of the Habitats Directive as of a type of community interest and this has not been adequately considered in the application.