Environmental Pillar
WORKING FOR A SUSTAINABLE FUTURE

Environmental Pillar

Submission on the

National Bioenergy Strategy

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Introduction

Although reductions in greenhouse gas emissions are the primary driver for bioenergy policies, the full life cycle emissions of forms of different bioenergy are not yet fully understood but are known to vary dramatically. Even where biofuels are grown on land already in cultivation, this can lead to the displacement of food crops and other land uses to natural habitats that are valuable carbon stores. Liquid biofuels for transport derived from annual crops have a less favourable CO2 balance and a higher overall environmental impact than solid biomass for electricity and heat generation from woody forestry products (WWF, 2007)1. Some dedicated bioenergy crops generate significant greenhouse gas emissions from the use of inputs such as fertilisers and pesticides, transport, processing, as well as direct or indirect land use change. As documented in the recent report, *Dirtier Than Coal2,* UK electricity generators are planning to switch coal-fired power plants to burning imported whole tree trunks in order to benefit from subsidies. While in the long run, biomass is considered to be carbon neutral, this use of trees releases carbon which requires many decades to be reabsorbed.
On the other hand, bioenergy produced from many kinds of wastes or harvested from sustainably managed woodlands is capable of delivering good greenhouse gas benefits (RSPB 2008)3.

Bioenergy has received strong political and financial support around the world. The theory behind this support was that bioenergy is “carbon neutral”, as growing crops absorb the carbon dioxide which they later release it back into the atmosphere as they are burnt.

However the reality is often different.

1. World Wildlife Fund, 2007, Position on Biofuels in the EU, July 2007, WWF European Policy Office, Brussels, Belgium.
2. RSPB, Friends of the Earth, Greenpeace, 2012, *Dirtier than Coal*
http://www.rspb.org.uk/Images/biomass_report_tcm9-326672.pdf
3. Royal Society for the Protection of Birds (RSPB) (2008) A Cool Approach to Biofuels, Making Transport Choices that Protect the Environment, Agriculture Policy Team, Bedfordshire, UK..

Bioenergy and Biodiversity

The most critical factor in terms of GHG impacts is how direct and indirect land use changes affect carbon stocks. This impact has been modelled by Wise et al4 comparing the impact of carbon taxation adequate to bring about a reduction in atmospheric greenhouse gas concentrations possibly consistent with a 2°C temperature rise. The results of the modelling demonstrate the enormity of the risk bioenergy could pose to global biodiversity; see Figure 1 below. The model compares:

- a reference scenario with no particular action to reduce fossil fuel consumption (Panel A) against
- two forms of carbon tax adequate to achieve a global CO2 concentration of 450ppm
    - one a universal carbon tax (UCT) which would cover emissions from biomass (Panel B) and the other
    - a fossil fuels and industrial carbon tax (FFICT) which would only cover fossil fuel and industrial emissions (cement, etc.) (Panel C).

It predicts that a universal carbon tax (Panel B) would have a positive protective effect on natural forests and ecosystems compared to a do-nothing scenario (Panel A). However, a carbon tax on fossil fuels alone, in the absence of other measures to protect natural ecosystems would drive the *complete destruction* of all natural forests and indeed all natural grasslands in favour of the production of bioenergy crops (Panel C).

While the model is based on assumptions that a carbon tax would be the mechanism to meet a 450ppm CO2 concentration target, logically biofuels targets and subsidies are capable of having the same effect on land use, but without the benefit of a global control on fossil fuel emissions.

Current experience demonstrates that these risks are not merely theoretical. The EU's biofuel targets are already driving the production of palm oil for which peat-land rainforests are being cleared in South-east Asia.

4. Wise *et al.,* 2009, *The Implications of Limiting CO2 Concentrations for Agriculture, Land Use, Land-use Change Emissions and Bioenergy,* Pacific Northwest National Laboratory
http://www.globalchange.umd.edu/data/publications/PNNL-18341.pdf

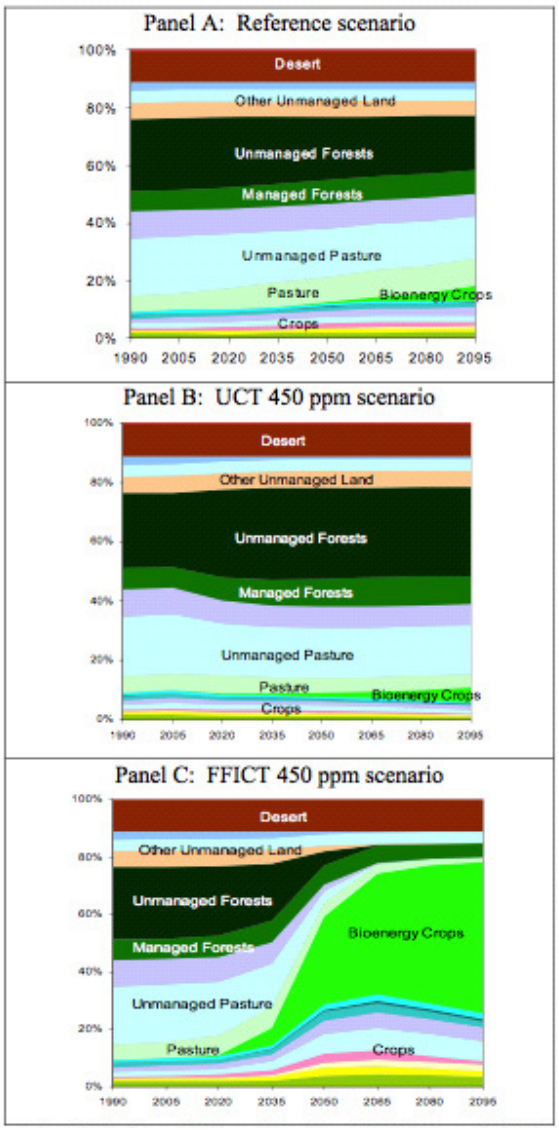

Figure 1 A comparison of the impacts of a Universal Carbon Tax (UCT) covering all emissions and a Fossil Fuel and Industrial Carbon Tax (FFICT) covering fossil fuel and industrial emissions only, demonstrating the risk to biodiversity and natural ecosystems posed by the demand for biomass to replace fossil fuels. (Wise et al., 2009)

A further potential impact of biofuel production is the removal of semi-natural connective habitats, such as hedgerows, due to intensified cultivation promoted by per hectare subsidies. In a very optimistic, best-case scenario, biofuels may play a minor role in reducing GHG emissions in some parts of the world. In a more realistic scenario, biofuels will accelerate ecosystem

breakdown on a massive scale through agricultural expansion and intensification and further drive biodiversity loss.

For generations, hedgerow management has provided domestic fuel for farmers through coppicing and other traditional practices. The biodiversity advantages of maintaining hedgerows as a domestic renewable energy source are far greater than that of annual biofuel crops. To understand the full value that hedgerows can play as an energy source and carbon sink, research is needed on the carbon sequestration potential of different hedgerow types and on the sustainable management of hedgerows.

Bioenergy policy should be developed within the context of Ireland's commitment to halting biodiversity loss in the Convention on Biodiversity. This commitment applies not only to biodiversity within Ireland but also to our impact on biodiversity in other countries.

Recommendations

1. **Protect natural ecosystems from displaced energy demand.**
2. **Develop an integrated approach to environmental assurance for all forms of bioenergy**
3. **Shift the Policy priority from bioenergy to energy efficiency**
4. **Take no action to drive biofuel production until sustainability can be demonstratedlife-cycle**
5. **Targets if any must be based on long-term sustainability criteria**
6. **Bioenergy must deliver greenhouse gas and carbon life-cycle benefits over conventional fuels**
7. **Policy and strategy on bioenergy must be subject to Strategic Environmental Assessment**
8. **Increased research into bioenergy**
    a. **to examine the consequences of an expansion of bioenergy and how to prevent negative impacts, including measures to prevent indirect land-use change**
    b. **to develop enhanced capacity and indicators to monitor: soil organic matter and above ground carbon stocks; and carbon sequestration of different hedgerow types**

Bioenergy and Air Quality

Wood-burning, especially at residential scale, emits significant levels of air pollution. Increased biomass combustion poses a threat to air quality and public health. A recent article of Acid News summarises the issue well5. Policy in relation to bioenergy must be integrated with air quality policy.

This leads to the following policy recommendations:

- **Energy efficiency and demand reduction must be prioritised over alternative combustion fuels and emphasised as the primary means of achieving goals such as:**
    - **Climate change mitigation and adaptation**
    - **Air pollution reduction**
    - **Achieving energy security**
    - **Eliminating energy poverty**
    - **Achieving economic targets**
- **Air pollution should be factored into an analysis as to whether policy should seek to drive heating demand in particular towards being met by electricity, district heating or combustion at the level of individual residences/ small workplaces.**
- **Wood pellets and other low-emissions forms of bioenergy must be prioritised over high-emissions forms of bioenergy. This is especially the case in urban areas.**
- **Strong emissions standards for wood-burning stoves, boilers etc. should be implemented as part of any bioenergy policy. In addition to strong minimum emissions standards, incentives should drive technology towards cleaner stoves and boilers.**

In addition, the differential impact of transport biofuels compared to the fossil fuels they replace needs to be considered. The Air Quality Expert Group in the UK published a report in 2011 entitled "Road Transport Biofuels: Impact on UK air quality" which is relevant in this regard.[6]

5 http://www.airclim.org/acidnews/small-chimneys-%E2%80%93-big-emissions

6. https://www.gov.uk/government/publications/road-transport-biofuels-impact-on-uk-air-quality

Bioenergy and Transport

Incentives to the use of biofuels in transport should be dropped. Ireland has declared its support for the Commission's proposal to limit to 5% the amount of food-based biofuel which can be used to meet the 10% transport renewable energy target.[7] We urge the Irish Government to hold firm with this support and to move further on it by supporting the introduction of mandatory ILUC accounting for biofuels.

The United Nations Special Rapporteur on the Right to Food, Olivier De Schutter has written to Ireland as Presidency of the European Council recommending that EU targets for renewable energy in transport should be dropped.[8] As the Special Rapporteur points out:

"The available arable land in the EU is insufficient to produce all the needed feedstocks for biofuels that compliance with the Renewable Energy Directive would require. Consequently, the EU Member States must outsource biofuels production to developing countries in order to meet the targets set. The impacts on these countries are overwhelmingly negative and are alleged to infringe on the realization of the human right to adequate food."

EU policy currently allows biofuels which result in net increases in greenhouse gas emissions to benefit from policies originally developed in order to reduce greenhouse gas emissions. This perverse outcome means that the policies must be changed.

Whatever happens at EU level with the proposed ILUC Directive, Irish national policy should be committed to sustainability, based on good science. Therefore the use of biofuels which do not achieve significant greenhouse gas emission reductions should be actively discouraged by Irish policy. Even if EU law does not require it, Irish law should specify that. In order to meet the standard required for blending obligations, subsidies, tax exemptions or any other form of support, only biofuels which actually result in significant greenhouse gas emissions reductions will be considered in Ireland. Our commitments under the United Nations Framework Convention on Climate Change (UNFCCC) require this.

These considerations, applicable to transport biofuels, apply equally to all forms of bioenergy.

Recommendation: **Incentives to the use of biofuels in transport should be dropped.**

7. Dáil debate, 28th March 2013
8. Note on the Impacts of the EU Biofuels Policy on the Right to Food, Statement based on letter sent to EU institutions on 16 April 2013, http://www.srfood.org/index.php/en/component/content/article/1-latest-news/2813-special-rapporteur-urges-phase-out-of-eu-biofuel-incentives

Bioenergy from Wood

There is considerable scope for local biomass energy production particularly for space heating and electricity production using Combined Heat and Power (CHP) boilers, as demonstrated by the RASLRES project.[9] RASLRES's main aim is to increase the use and uptake of locally produced renewable bio-energy solutions in rural areas in the (Northern Periphery Programme) NPP region. The RASLRES pilot models use different technologies and biomass fuels to support locally managed – and owned – supply systems and business models for producing and using renewable energy. This is be achieved with the development and implementation of 'MSMs' (targeted market stimulation models) for rural renewable energy biofuels. The potential of the models being developed here with European funding is to combine the growing of native hardwood trees, enhancing biodiversity, creating local employment both directly and indirectly, supporting innovation and providing local sustainable nearly carbon-neutral energy.

However the current Irish forestry model relies on heavy use of fossil fuels for harvesting, transportation and processing, as well as fertilisers and herbicides, all of which incur substantial economic burdens cause environmental harm and need to be eliminated. Close-to-nature systems can dramatically reduce such external inputs.

Smaller scale local coppicing of mixed native hardwoods should also be part of any Bioenergy strategy, providing energy locally and involving farmers and rural communities in providing thinnings etc.
Wood gasification, pyrolysis and other low emission technologies need to be adapted to localised energy production consumption cycles.

The calorific value of the wood of different tree species, combined with their biodiversity value should be a consideration in development of new woodlands for bioenergy. Conventional coniferous forestry thinnings are of poor calorific value - whereas native hardwoods are of good calorific value, as shown in figure 2 below.

Along with good hedgerow management, agroforestry offers an answer for local energy production - most farmers and growers could add value to their land by growing more trees and if they do it as a carefully designed agroforestry system they will improve the soil and increase the yield of their existing agricultural or horticultural enterprise whilst producing timber for a variety of uses. By growing native hardwoods, they can also use coppice management whereby cut stems give vigorous regrowth and a regime can be set up that provides regular timber supply. Broadleaf

9. Regional Approaches to Stimulating Local Renewable Energy Solutions http://www.raslres.eu/

coppicing is rapidly becoming a highly desirable, environmentally friendly and highly sustainable source of rural energy and also a source of economic value added, especially in disadvantaged areas where land may be poor and unsuitable for arable purposes. Agroforestry and coppice systems can be tailor made to site conditions and the specific requirements of the landowner.

Species	Green MC (wet basis)	kWh per Green tonne
Ash	32%	3448
Sycamore	41%	3044
Birch	43%	2668
Oak	47%	2635
European Larch	50%	2722
Douglas Fir	51%	2596
Japanese & hybrid Larch	51%	2653
Elm	58%	1915
Sitka Spruce	61%	1705
Western Hemlock	61%	2040
Silver Fir	62%	1855
Poplar	64%	1610
W Red Cedar & Lawson Cyprus	64%	1755
Norway Spruce	65%	1787

Figure 2 Biomass Energy Centre of the UK Forestry Commission: "Wood as fuel technical supplement" (2010), page 5.

Recommendation: **Promote closed cycle local Biomass projects nationally**

Recommendation: **Invest in decentralised provision of innovative power supplies from a wide range of sources to ensure greater energy security and thriving local economies.**

Recommendation: **A National Public Works programme should be implemented to convert the 50% of public forest estate not fit for commercial use[10] back to mixed native woodlands where appropriate. This would form part of a new National Forest Strategy that would provide thinnings for Bioenergy among other benefits.**

10 McCarthy C, Report of the Review Group on State Assets and Liabilities 2011, p 73 http://per.gov.ie/wp-content/uploads/Report-of-the-Review-Group-on-State-Assets-and-Liabilities.pdf

Anaerobic Digestion

Ireland has a large food-based economy ranging from production to manufacturing and as such, has a large amount of bio-waste e.g. slurry and food waste. The delivery of Food Harvest 2020 will see dramatic increases in several of these resource streams. The development of anaerobic digestion plants would take advantage of these resources, and at the same time would address four areas of concern for the government: Requirement under Kyoto to reduce greenhouse emissions; Renewable Energy Directive (2009/28/EC; EU Landfill Directive (1999/31/EC; and the Water Framework Directive.

1. The Renewable Energy Directive (2009/28 EC), which requires Ireland to derive 16% of its energy from renewable sources by 2020.
2. The Landfill Directive (1999/31/EC), which calls for the diversion of 35% of biodegradable waste produced in 1995 away from landfill disposal by 2016. This amounts to 1.8 million tonnes diverted by 2016. In addition, to comply with the Landfill Directive, Ireland has adopted Regulations to prevent the disposal of food waste into landfills and requires such to be composted. (The Waste Management (*Food Waste*). *Regulations 2009* and European Union (Household Food Waste and Bio -Waste) Regulations 2013 (S.I. No. 71 of 2013).
3. The Nitrates Directive (1991/676/EEC), which requires the reduction of water pollution caused by nitrates from agricultural sources with the primary emphasis being on the management of livestock manures Under the Nitrates Regulations (S.I. 610 of 2010) farmers must not apply more than 170kgs of nitrogen from livestock manure per hectare per year.

Currently, Ireland produces up to one million tonnes of food waste annually, which could be a substantial source of feedstock for AD plants. Additionally, the agriculture sector also produces around 40 million tonnes of slurry annually, which is another potential feedstock for AD plants.

Currently, there are only four AD plants in Ireland and very little food waste is currently being used as feedstock. As opposed to this, there are 6,800 large scale AD plants in Germany, 550 in Austria and new ones being developed in the UK continually. WRAP, which is an organisation funded by all four governments within the UK to reduce waste has developed The Anaerobic Digestion Loan Fund (ADLF), which is a £10m fund designed to support the development of new AD capacity in England. [11] The fund aims to support 300,000 tonnes of annual capacity to divert food waste from landfill by 2015. This progressive thinking will assist in the development of AD plants and provide needed capital to get projects up and running.

11 http://www.wrap.org.uk/content/ad-loan-fund

The Joint Oireachtas Committee on Communications, Energy and Natural Resources published its 4th Report on the Development of Anaerobic Digestion in Ireland in Jan 2011. It calls for the construction of 1,000 380kW AD plants within the next ten years. We call on the government to actively adopt measures to encourage the growth of this sector in order to achieve this target.

The REFIT rate for selling electricity produced by AD plants is very low, at €.15/kWh. In Northern Ireland, the Feed-in Tariff is 22p per kWh and in Germany it's €.215/kWh. There is no financial incentive for the development of a commercial AD culture in Ireland. If the Government cannot invest 'significant State capital investment', the Department should reconsider its REFIT rate to encourage the construction of AD plants.

As mentioned above, WRAP in the UK has developed an AD loan fund to assist individuals/businesses in constructing AD plants. A similar loan structure could be adopted here. Additionally, the government could provide a loan guarantee programme similar to the US Small Business Administration (SBA), which works with financial institutions to loan money to businesses. If the loan is approved, it is guaranteed by the SBA.

Recommendation: **Create a beneficial economic regime for the development of anaerobic digesters and increase the feed-in-tariffs in the current power purchase agreements to make it economically viable for electricity produced from anaerobic digesters to be sold onto the national grid.**

Recommendation: **Research into establishing local feedstock supply chains and into sustainable uses of digestate should be prioritised**.

Overview:

Bioenergy policy should have a long-term focus, not merely relating to 2020, and the strategy should be developed in that context. Climate change and biodiversity loss are long-term problems and therefore policy on bioenergy should be developed in the light of international legal commitments under the UNFCCC and the Convention on Biodiversity, as well as national policy frameworks such as that proposed in the Heads of the Climate Action and Low Carbon Development Bill. Additionally, bioenergy industry development and the growing of bioenergy feed-stocks are long-term propositions, not amenable to policy focussed only 6 years ahead.

Land grabs for bioenergy and the impact of biofuels incentives on food prices are having negative impacts on access to land and on food security in developing countries. Given Ireland's commitment to Policy Coherence for Development, bioenergy policy must be developed in a manner which supports and does not undermine sustainable development and the right to food.

Whilst this document was developed through the processes of the Environmental Pillar it does not necessarily represent the policies of all its members.

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