



---

## **Consultation**

---

# **Energy**

---

## **Bioenergy Action Plan for Northern Ireland 2009 – 2014**

---



Department of  
**Enterprise, Trade  
and Investment**  
[www.detini.gov.uk](http://www.detini.gov.uk)

Department of Enterprise,  
Trade and Investment

---

# **Consultation on a Bioenergy Action Plan for Northern Ireland 2009- 2014**

---

August 2009

# Contents

## **Ministerial Foreword**

Page 5

## **1**

### **Introduction**

Page 6

- Introduction
- Bioenergy Inter Departmental Group
- Development of the Action Plan
- How to respond to the consultation

## **2**

### **Aims and Objectives of the Action Plan**

Page 8

- Aims and Objectives of the Action Plan
- Judging Success

## **3**

### **What is bioenergy?**

Page 9

- What is bioenergy?
- Who is engaged in the bioenergy sector?

## **4**

### **Key findings of the AEA Bioenergy study**

Page 10

## **5**

### **Current and future availability of bioenergy feedstocks and market opportunities.**

Page 12

- Bioenergy feedstocks
- Bioenergy markets
- Market Opportunities

## **6**

### **Bioenergy Cross Departmental Action Plan 2009-2014**

Page 15

- Objectives and action points

## **7**

### **Reporting, Monitoring and Evaluation**

Page 33

## **8**

### **Next Steps**

Page 34

## **Annex A**

### **Key EU, national and local drivers for renewables, including bioenergy**

## **Annex B**

### **Potential Biomass Resources and pathways in Northern Ireland by 2020**

## **Annex C**

### **Framework of proposed actions**

[This page is intentionally blank]

# MINISTERIAL FOREWORD



Northern Ireland is blessed with a climate which supports an environment rich in natural resources. As a region, we are fortunate that we have good conditions for growing bioenergy feed-stocks. In addition, each one of us creates post-consumer waste that could be used for energy production rather than thrown away. This Bioenergy Action Plan is about how we can make the most of these resources for the sustainable production of energy.

I see many opportunities for government, businesses and energy users in Northern Ireland flowing from the increased use of bioenergy in our region:

- For Government, increasing the amounts of bioenergy produced and consumed within the region will help address security of supply issues, reduce our carbon emissions, help manage waste and create new local jobs.
- For businesses, there are opportunities to produce and sell bioenergy fuels and technologies, or meet carbon reduction targets and reduce energy costs;
- For agricultural businesses, there is a chance to diversify production and branch out into new energy supply businesses;
- For individuals, there is an opportunity to cut down on their carbon footprint, and, again, reduce energy costs and reliance on imported fossil fuels.

I recently published for consultation a revised Strategic Energy Framework which sets out the Department's views on the future energy priorities for Northern Ireland and provides the wider context to this Bioenergy Action Plan.

Bioenergy is a complex area because it covers so many different feed-stocks and technologies. It also cuts across the responsibilities of many Northern Ireland Departments. All these Departments recognise their responsibility to work in a joined-up way to provide a coherent policy response to the challenges of bioenergy. That is why my Department set up the Bioenergy Inter Departmental Working Group, and I am grateful to all the officials who have contributed so much to the work of this group and the wider work of the Sustainable Energy Inter-Departmental Working Group, which I chair.

On behalf of the Executive, therefore, I am very pleased to invite your views on this draft Bioenergy Action Plan and I would be glad to hear how you feel Government and those involved in the bioenergy sector can maximise the benefits of bioenergy for Northern Ireland.

A handwritten signature in dark ink, appearing to read 'Arlene Foster', written in a cursive style.

**ARLENE FOSTER MLA**  
**Minister of Enterprise, Trade and Investment**

# INTRODUCTION

# 1

- 1.1 The drivers for ensuring that our energy supply is sustainable have never been greater. The Department of Enterprise, Trade and Investment (DETI), as the Department responsible for energy in Northern Ireland, recognises the unsustainable nature of traditional energy generation and its usage.
- 1.2 In order to address this, DETI will seek to achieve energy efficiency goals as well as to increase the amount of energy we use from renewable sources at an ambitious rate. The Department's current target is for 12% of Northern Ireland's electricity to be supplied from indigenous renewable sources by 2012 and for 15% of that 12% to be from non-wind sources. The current level of renewable electricity stands at 7% and it is expected that the 2012 targets will be met, primarily from onshore wind. It is important, however, that other renewable sources, e.g. bioenergy are developed and it is hoped that the current proposed Energy from Waste projects will contribute towards the non-wind element of the 2012 targets.
- 1.3 Bioenergy is one of a number of renewable energy sources that can be further developed in Northern Ireland to capitalise on the area's natural resources and contribute to the region's security of energy supply, help to create jobs and support businesses and lead to reductions in greenhouse gas emissions.
- 1.4 Bioenergy has the potential to make a contribution to all three areas of energy: heat, electricity and transport. To ensure the most cost-effective interventions by Government across the renewable energy sector it is important for Northern Ireland to consider the most suitable options given the structure of its economy and the energy market.
- 1.5 This document sets out, for the first time, a Cross Departmental Action Plan for the co-ordinated development of bioenergy in Northern Ireland.

## **Bioenergy Inter Departmental Group**

- 1.6 In policy terms, biomass supply and bioenergy use impact across a range of key Executive subject areas including agriculture, environment, forestry, energy, industry, transport, rural development and climate change policy. Bioenergy can provide employment in these and other sectors such as waste management, manufacturing, building service installations and maintenance. Alongside these potential opportunities, there are also issues around bio-energy's own sustainability. Understanding and managing these risks is fundamental to maximising the benefits presented by bioenergy.
- 1.7 Recognising the need to address the development of bioenergy in a more strategic and co-ordinated manner than had been the case to date, DETI established a Bioenergy Inter Departmental Group (the IDG) in 2007 to pursue an integrated approach to the sustainable development of bioenergy in Northern Ireland. The IDG is comprised of representatives from DETI, the Department of Agriculture and Rural Development (DARD), Invest NI, the Department of Finance and Personnel (DFP), the Department of the Environment (DOE) and the Department for Regional Development (DRD).

## Development of the Action Plan

- 1.8 The IDG recognised that policy makers and potential investors in bioenergy in Northern Ireland needed to understand the broad issues involved in this area and have an authoritative reference to support their proposed actions. AEA Energy and Environment was appointed to undertake a study to assess the current and future potential of bioenergy in Northern Ireland. The findings and recommendations of this study have been used by the IDG to inform the development of this plan.
- 1.9 The Action Plan has also been developed against the back-drop of a wide number of international, national and local policy drivers and strategies encouraging the increased use of renewables, including bioenergy. The main documents influencing the Action Plan are listed at Annex A.

## How to respond to this consultation

- 1.10 The IDG is seeking your comments on the first cross Departmental Action Plan for the development of bioenergy in Northern Ireland and would welcome your views by **30 October 2009**. In particular, we would welcome your comments in relation to the proposed aims, objectives and associated actions to deliver this Plan.

You can email them or send them by post,

by e-mail to:

[bioenergy@detini.gov.uk](mailto:bioenergy@detini.gov.uk)

by post to:

Sandra McMillan  
Sustainable Energy  
Department of Enterprise, Trade and Investment  
Netherleigh  
Massey Avenue  
BELFAST  
BT4 2JP

## **Confidentiality & Data Protection**

- 1.11 Your response may be made public by DETI. If you do not want all or part of your response or name made public, please state this clearly in the response by marking your response as 'CONFIDENTIAL'. Any

confidentiality disclaimer that may be generated by your organisation's IT system or included as a general statement in your fax cover sheet will be taken to apply only to information in your response for which confidentiality has been specifically requested.

- 1.12 Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes (these are primarily the Freedom of Information Act 2000 (FOIA) and the Data Protection Act 1998 (DPA)). If you want other information that you provide to be treated as confidential, please be aware that, under the FOIA, there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

- 1.13 In view of this, it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

## **Copies of the Consultation**

- 1.14 This Consultation document is being produced primarily in electronic form and may be accessed on the DETI Energy website: [www.energy.detini.gov.uk](http://www.energy.detini.gov.uk) or may be obtained from the address above or by telephoning 028 9052 9240. If you require access to this Consultation document in a different format – eg Braille, disk, audio cassette – or in a minority ethnic language please contact the Department on 028 9052 9240 and appropriate arrangements will be made as soon as possible.

# AIMS AND OBJECTIVES OF THE ACTION PLAN

## 2

2.1 The overall aim of the five year plan is to increase the sustainable deployment of bioenergy in order to contribute to security of energy supply, deliver carbon emission reductions, produce economic and environmental benefits and contribute to NI's renewable energy targets, in particular on renewable heat and electricity.

2.2 The key objectives proposed by the IDG are as follows:

- To raise awareness and understanding of the benefits and opportunities of all forms of bioenergy within the public and private sector and the wider community;
- To create a supportive and encouraging policy and regulatory framework within which the bioenergy sector can develop and thrive;
- To encourage and support targeted investment in key areas of the overall bioenergy supply chain to stimulate growth; and
- To continue to undertake focussed and NI relevant research into bioenergy and further work to address gaps in knowledge and identify future research actions.

Chapter 6 sets out the range of proposed actions in support of these objectives.

### Judging Success

2.3 Successful implementation of this Plan will result in:

- the greater recognition and understanding of bioenergy's distinct and valuable contribution to Northern Ireland's energy mix and its wider benefits to social, economic, environmental and rural development;
- the translation of current key research/demonstration projects into commercial operation;
- increased levels of farm diversification through bioenergy;
- appropriate use of wastes for energy production;
- the significant increase in the number of bioenergy projects and their contribution to energy security, levels of renewable energy and carbon reduction in Northern Ireland;
- an increase in new businesses and jobs created through bioenergy production and deployment; and
- a contribution to meeting Northern Ireland's future Renewable Energy Targets of 40% for electricity and 10% for heat, as set out for consultation in the revised Strategic Energy Framework.

2.4 A number of the above measures to be used to judge the success and progress in implementing this Plan will be contained in other Government Strategies or Plans – e.g. the forthcoming outcome of the work of the Agriculture Stakeholders Forum on Renewable Energy for a revised DARD Renewable Energy Action Plan and the planned work of the Sustainable Energy Inter Departmental Working Group on the opportunities for renewable jobs in Northern Ireland. In light of this ongoing developmental work, the IDG will identify relevant measureable high level targets for this five year Plan and report on them within its first annual report.

# WHAT IS BIOENERGY?

## 3

3.1 The following definitions are used in this Plan:

- Biomass is organic based resource that is grown or collected eg forestry/wood products, energy crops such as Short Rotation Coppice willow, poplar or miscanthus, agricultural wastes, food/food processing wastes and the bio-degradable portion of municipal and industrial wastes.
- Biofuel is a fuel manufactured from biomass e.g. chips, pellets, biodiesel.
- Bioenergy is the use of the fuel to supply energy e.g. for heat, electricity or for the transport of people or goods.

3.2 Biomass can therefore include a wide range of products and by-products from forestry and agriculture as well as municipal and industrial waste. Based on these different feedstock sources, bioenergy can then be delivered by a chain of operations, or pathways, from the biomass resource to the energy consumer and this could also include an intermediate biofuel product such as a fuel pellet or wood chip.

### Who is engaged in the Bioenergy sector?

3.3 Those involved in the bioenergy sector come from a wide and varied

background and are involved in a number of agricultural, manufacturing and service sectors. Those who supply the feedstock may include farmers; foresters; those engaged in waste management, agricultural and forestry contractors; food processing companies; sawmills; wood processors. They may also be involved in the energy production along with Energy Services/Supply Companies (ESCOs); power generators; engineering contractors, plumbers/heating engineers and traders, fuel merchants and hauliers.

3.4 Individuals/companies are therefore involved at various points within the differing bioenergy supply chains and can provide local employment, often in rural areas, generating income for local communities with locally available natural and renewable energy resources. These resources can in turn make a contribution to the diversity and security of Northern Ireland's energy supply while reducing its high carbon footprint. In addition, the use of by-products/waste products to generate renewable energy can address increasingly stringent environmental requirements.

3.5 Given the relatively low visibility of the bioenergy sector to date and its diversity, no detailed information is available on its size and scale. Invest NI<sup>1</sup> and Carbon Trust<sup>2</sup> have recently undertaken some work to identify those involved in the various stages of the differing supply chains and it will be important to build on this work to identify the existing strengths and also areas where action is needed to develop the supply chain. More detail on the proposed actions is set out in Chapter 6.

---

<sup>1</sup> Maximising business opportunities from Sustainable Energy - Invest NI 2008

<sup>2</sup> NI Renewable Energy Supply Chain - Tym & Partners for Carbon Trust 2008

# KEY FINDINGS OF THE AEA BIOENERGY STUDY

## 4

4.1 The Executive Summary of the bioenergy study is available on the DETI website [www.detini.gov.uk](http://www.detini.gov.uk). It is not therefore intended to restate all of the analyses of the study here but the plan will draw on the study's findings, where appropriate, to set the context for proposed actions.

4.2 One of the major aims of this study was to understand and quantify how each of the forms of biomass could contribute to the heat, electricity and transport fuel markets and by how much. The approach taken included top-down supply and bottom-up demand analysis. The top-down analysis also defined the regional challenge in terms of the energy and greenhouse gas emission reduction targets. The bottom-up analysis stems from a detailed examination of the market and technology mixes best suited to the available biomass resources in Northern Ireland.

4.3 The study considered the current and future availability and possible use of a range of bioenergy feed stocks in the period to 2020. It also considered the value in terms of energy production, carbon reduction and associated benefits; supply chain issues; R & D activity; possible support levels and proposed a range of recommendations for IDG consideration.

4.4 The analyses provided by the study cannot offer a single definitive solution for bioenergy pathways in Northern Ireland but rather have identified

potential opportunities which the IDG has considered further in the development of this Action Plan. Some of the key high-level findings from the study which are the basis for the development and direction of this Action Plan are as follows:

- The energy market in Northern Ireland is more favourable to the use of biomass than in many other areas of the UK due to the limited penetration of natural gas and the high proportion of users dependent on heating oil, electricity and coal.
- Biomass energy is delivered by a chain of operations or pathways from the biomass resource to the energy consumer. The optimum resource technology combinations indicate that the current focus should be on the use of biomass for renewable heat and electricity rather than for transport.
- Waste resources should be converted to bioenergy whenever practicable. Sustainable waste management within the agricultural sector is an urgent priority in Northern Ireland due to legislative pressure to address nitrate contamination of water courses. However, this can be turned to its advantage by increased deployment of anaerobic digestion and similar technologies generating combined heat and power as part of a more sustainable waste management process.
- Northern Ireland has sources of biomass such as forestry, residues and farm waste and has the potential to grow a larger area of crops that would support the production of additional sustainable bioenergy.
- Despite the favourable conditions the current level of bioenergy exploitation is low at less than 1% of renewable electricity.
- The largest and most economic bioenergy use is the process heat demand within the industrial sector

and this should be further explored in the Northern Ireland context

- In the longer term the mail markets for bioenergy from wood and energy crops are likely to be commercial, domestic and process heating rather than electricity generation.
- Change will generate concerns for the public that can be expressed through opposition to developments, so efforts will be necessary to raise public awareness of the environmental, social and economic benefits of bioenergy.
- The study (see table below) ) points to the maximum potential of around 1,650 GWh hours of heat and 900 GWh hours of electricity from bioenergy sources; corresponding to around 6.4 % of heat and 7.8 % of electricity based on the predicted uses in 2020 but with significant Government funding required to reach this amount.

4.5 In arriving at these indicative estimates, the study considered potential feedstocks and markets and developed a number of scenarios. It also included consideration of whether grant support would be required as, in a number of cases, bioenergy is not currently competitive, in strict financial terms, under the current market conditions and increasing its exploitation would require public support.

## Resources

4.6 This Plan will further the development of the bioenergy sector. However, resources of the indicative levels referred to below are not available at this stage. Proposals for new support mechanisms or other grant schemes will need to be appraised and approved in line with Government procedures and will be subject to competing bids in line with the annual Comprehensive Spending Review requirements. This Plan and the performance against its objectives will be evaluated in 2013-2014 to assess progress by that date to inform appropriate actions and any associated funding required to continue the further development of the sector to 2020 and beyond.

	Heat GWh/year (% by 2020)	Electricity GWh/year (% by 2020)	Employment likely to be generated by 2020	GHG Abatement million tonnes CO <sub>2</sub> equivalent /year	GHG saving % of Northern Ireland 2020 total	Public support necessary (£ million) in period up to 2020
Basic scenario	377 (1.3%)	734 (5.8%)	250	1.023	6.1%	61
Higher scenario	1,641 (6.4%)	900 (7.8%)	580	1.949	11.6%	155

# CURRENT AND FUTURE AVAILABILITY OF BIOENERGY FEEDSTOCKS AND MARKET OPPORTUNITIES

## 5

- 5.1 The bioenergy study assessed the range of potential feedstocks which could be developed further within a Northern Ireland context and explored two scenarios to consider how bioenergy could develop in the period up to 2020:
- “Business as usual” or basic scenario that investigated how much biomass energy the current environmental and commercial drivers, including the Northern Ireland Renewable Obligation (NIRO) would deliver; and
  - A “Higher” biomass scenario that investigated what the impact could be if all the land based resources that were available, and not needed for other purposes, could be used for energy.
- 5.2 As part of the analysis, the study considered that the opportunities for large-scale transport biofuels production in Northern Ireland were limited due to a lack of appropriate biomass supply and the development of plants in GB by international/national companies which would service the NI market with pre-blended biofuels. Agriculture in Northern Ireland is predominantly grass-based with only a small percentage (circa 3% in 2006) devoted to cereal and oilseed crops. The area of wheat grown in Northern Ireland is relatively small, almost 9,000 ha in the June 2007 Agricultural Census. The fact that Northern Ireland is a grain deficient region and has to import large quantities of grains, as feedstuffs for the large local livestock sectors, makes it likely that there will be any significant scale manufacturing of bio-ethanol in the region.
- 5.3 In the absence of any significant change in land-use patterns, the quantities of cereals and oilseeds grown here could not support significant biodiesel/bio-ethanol production. The profit margin available for the production of bio-fuels from oilseeds and cereals is small and increases in the price of oilseeds and cereals makes the economic viability of them as an energy feedstock very marginal. Niche markets exist for higher value oil based products which may be of greater interest to the agricultural community. While small-scale production may continue this is unlikely to meet economic production requirements. There are also issues surrounding the overall sustainability of imported feedstocks for biofuels production. In addition, of the three possible end uses of biomass, transport fuel is the least carbon-efficient use of biomass.
- 5.4 The IDG has therefore agreed with the study’s recommendation that the priority focus for the development of bioenergy in Northern Ireland should be on biomass for heating and electricity. This view is confirmed by other recent work including, importantly, the Agriculture and Rural Development Committee in its investigation in 2008 into alternative land use and renewable energy. 2<sup>nd</sup>/3<sup>rd</sup> generation biofuels may offer greater opportunities for Northern Ireland and appropriate research can continue to investigate this potential.
- 5.5 The table listed at Annex B summarises the potential biomass pathways and availability of resources that the AEA study estimated to be the maximum available in Northern Ireland from which the key feedstock opportunities have been identified by the Bioenergy IDG for further consideration within this Action Plan. As noted above, the optimum technology combinations indicate that the focus should be on biomass for

renewable heat and electricity rather than for transport.

5.6 The potential development of a large scale biomass power generation plant was not included in the AEA study. Should such an opportunity arise, its needs would need to be met from imported biomass as well as any local supply.

### **Feedstock opportunities**

5.7 The key feedstock opportunities identified from these scenarios are as follows:

- Northern Ireland derives a large proportion of its income from agriculture – relatively more than other parts of the UK. Environmental legislation and the pressure to deal with farm residues could be as important a driver as any potential additional income available to farmers to diversify into bioenergy. Anaerobic Digestion is still relatively limited within the UK and in Northern Ireland: e.g. it is at demonstration stage at the Agri-Food and Bio-Sciences Institute (AFBI). The deployment of Anaerobic Digestion in Northern Ireland could be an important part of the solution to addressing farm and other organic residues.
- Forestry – at between 5% and 6% coverage, Northern Ireland has well below average levels of dense forest coverage in European terms. The development of this resource could present a significant opportunity for forestry residues to be used for energy products. It is also considered that there could be a significant increase in the use of sawmill residues for energy purposes.
- Energy crops currently make a small contribution to the energy market, however, they have the potential to offer a step change in the amount of energy that could sustainably be produced from biomass in the medium and long term. They require a low energy input compared with annual arable crops, thus maximising the net energy output.
- Given the size of the food processing sector in Northern Ireland and the increasing EU restrictions on waste disposal, there is significant further potential for food wastes to be used for energy purposes.
- Landfill gas can be extracted from the waste already deposited at landfill sites. While this gas has been extensively exploited in other parts of the UK, this has, to date, not been the case in Northern Ireland. However, a number of the Waste Management Groups of Local Authorities are in the process of developing facilities to use this resource for electricity generation.
- The handling of Municipal Solid Waste (MSW) has been addressed through the Waste Management Strategy 2006 to meet the legal requirements of e.g. the EU Waste and Landfill Directives: the bio-degradable portion of MSW is considered as a potential bioenergy feedstock. Northern Ireland's Local Authorities are grouped into three main units for the purposes of planning and implementing the strategy – Arc 21, the South West and North West regions. All three Groups' plans allow for energy recovery facilities as part of the overall residual waste treatment.
- Poultry litter has traditionally been disposed of through land spreading and landfill. However, restrictions have been introduced to this practice under the Nitrates Directive to reduce and prevent water pollution. If a current proposal to develop an electricity generation plant, which will utilise chicken litter as a primary feedstock, proceeds it could effectively use all of this resource, thereby meeting disposal requirements and generating up to 30MW of despatchable renewable electricity.

### **Bioenergy Markets**

5.8 Although the heat energy market in Northern Ireland is more favourable to the use of biomass than in many other areas of the UK (due to the limited penetration of natural gas and the high proportion of users dependent on heating oil, electricity

and coal) deployment levels to date are very limited. While the ongoing rollout of natural gas in Northern Ireland, itself a lower carbon option than oil, will continue to reduce our reliance on heating oil, there are areas, mainly rural, which will remain off the gas grid and therefore represent an opportunity for increased bioenergy usage.

- 5.9 Within the domestic sector, the recent DETI-led Reconnect scheme stimulated market demand for biomass boilers. In addition, an increasing number of commercial scale premises e.g. hotels, schools and leisure centres have been installing biomass boilers thereby increasing control over their security of supply and their fuel bills. At an industrial level, the Balcas operation is an excellent example of the use of wood residues to generate heat and also the production of wood pellets as a fuel to service the commercial and domestic heating market.

### **Market opportunities**

- 5.10 The key market opportunities identified from these scenarios are as follows;

#### **Domestic**

New build and, more significantly, existing homes installations. In addition there are opportunities for social housing and District Heating Networks.

#### **Commercial/public sector**

The introduction of the Carbon Reduction Commitment in 2010, which will require all organisations whose electricity consumption is 6000MWh or more, including public sector organisations (such as Government Departments, Universities, Local Authorities) to reduce emissions e.g. by saving energy deriving energy or heat from renewable energy sources, including bioenergy.

#### **Industrial sector**

The largest and most economic bioenergy use is in process heat across a number of sectors (in

particular the food and drink sector), where further work would identify where suitable sites could be developed based on farm and also food processing residues.

In addition to the Carbon Reduction Commitment, the EU Emissions Trading Scheme and Climate Change Agreements will also be drivers for reduction in energy usage and increased use of renewables, including bioenergy.

#### **Agricultural**

Use of renewables on-farm to generate heat or electricity for use within farm buildings/processes or for external consumption.

# BIOENERGY CROSS DEPARTMENTAL ACTION PLAN 2009 - 2014

## 6

Northern Ireland to ensure effective and co-ordinated delivery of the Plan.

6.3 A number of actions represent ongoing work, the results of which will not be apparent until later in the Plan. Some actions will be dependent on actions taken forward at a national or international level e.g. the implementation of the EU Renewable Energy Directive over the next few years. It is therefore expected that these initial actions will be refined in light of ongoing work or research and additional actions may be undertaken during the life of the Plan and will be included within the annual reporting regime (see Chapter 7).

6.1 Four key strategic objectives are proposed to support the overall aim of increasing the sustainable deployment of bioenergy. They are:

- To raise awareness and understanding of the benefits and opportunities of all forms of bioenergy within the public and private sector and the wider community;
- To create a supportive and encouraging policy and regulatory framework within which the bioenergy sector can develop and thrive;
- To facilitate and support targeted investment in key areas of the overall bioenergy supply chain to stimulate growth ; and
- To continue to undertake focussed and NI relevant research into bioenergy and further work to address gaps in knowledge and identify future research actions.

6.2 For each objective, specific actions have been developed along with a proposed timescale for implementation and completion over the five year period of the Plan. For each action, the lead or co-ordinating department is identified along with relevant partners, if any. Many of the actions will involve increased interaction by the IDG with the various parts of the bioenergy sector in

## Objective 1

### To raise awareness and understanding of the benefits and opportunities of all forms of bioenergy within the public and private sector and the wider community

1. In principle, the need to move away from our current high fossil fuel dependency to low carbon energy sources, as well as increasing levels of renewable energy in order to increase security and diversity of supply and reduce our carbon footprint is well accepted. There is relatively strong support for increasing levels of renewable energy but, moving beyond this high level acceptance, levels of knowledge and understanding of the various renewable technologies, in particular bioenergy, at operational level within the public sector, businesses, the rural community and the wider public needs to be improved.
2. Not all renewable technologies are equal in terms of economics, their energy value and operation: certain technologies are more suited than others to certain situations. A focus on capital costs alone may fail to identify more predictable and lower ongoing running costs. Decisions based on partial knowledge or poor advice can be costly, inefficient and can lead to poor publicity.
3. As regards bioenergy, its range of feedstocks and technologies is complex and often unfamiliar and the benefits it can offer may not be realised if low levels of knowledge and understanding continue. For example, this could lead to missed opportunities within the public sector to set an example and support the fledgling market; or businesses failing to address their energy costs and becoming uncompetitive. With the right information, more people could discover the benefits of biomass for heating as well as the market and employment opportunities within the supply chain for equipment and services. Architects, designers, bankers and other investors can all make a very positive contribution to the further deployment of bioenergy, if well-informed about the sector. The public may have its concerns with regard to certain technologies and the possible noise, increased traffic, visual impact, odours and emissions that they associate with them and these concerns need to be addressed.
4. In supporting the sustainable and appropriate expansion of bioenergy production and use, we need to ensure that a consistent evidence-based message, supported by a range of strong successful case studies, is available to help inform decisions at all stages. A number of organisations already provide advice on the range of renewables, including bioenergy, such as Action Renewables, the Carbon Trust, Invest Northern Ireland and the College for Agriculture and Rural Enterprise (CAFRE) - the IDG will wish to build on this existing work. For example, Invest NI has recently compiled a short DVD outlining the work done by Northern Ireland companies in the use of biomass as an energy supply.
5. The recently established Sustainable Energy Inter Departmental Working Group, led by the DETI Minister, will be developing a communications programme and this proposed bioenergy work will be integrated within that overall programme. A specific bioenergy communications programme might include customised or signposted advice packs for specific audiences, guidance leaflets/website materials relating to a series of issues, (constraints as well as opportunities) e.g. technical advice, planning, economic and financial considerations, environmental controls etc.

## ACTION

Action	By whom	By when
Develop and disseminate a targeted communications programme to raise awareness and understanding of bioenergy.	Integrated with the Sustainable Energy Communications Programme being developed by the Sustainable Energy Inter Departmental Working Group.	Programme to be operational by Spring 2010.

## Objective 2

### To create a supportive and encouraging policy and regulatory framework within which the bioenergy sector can develop and thrive.

1. The bioenergy sector in Northern Ireland will not reach its potential if there are legal, regulatory, operational or administrative factors which may act as an obstacle to growth.
2. As noted in Chapter One, bioenergy is relevant to a number of policy areas e.g. agriculture and rural development, forestry, waste, environment as well as energy. Given the nature and complexity of the sector and the need to ensure that its development is sustainable, there is a wide range of regulations and standards which will apply – Annex A includes some of the key regulations and policies which impact to bioenergy projects. In promoting the increased use of bioenergy, the IDG recognises the need for the range of policies from different Departments to be properly aligned to facilitate its development in a sustainable manner.
3. In addition to ensuring that the framework within which bioenergy operates is supportive, is the need to ensure that those involved or wishing to become involved in the sector are aware of the relevant policies and legislation which would apply. This information should be readily available and easily accessible from knowledgeable sources – this could form part of the Communications Programme proposed at Objective One.
4. As regards the overall regulatory framework, there are a number of issues which are being or will be addressed through this Plan to support the growth of the sector.

#### **Establishment of a renewable heat market**

5. The present level of renewable heat in the UK as a whole is very low; only 0.6% of the UK heat demand. The heat market is more complex and decentralised than the market for electricity. It is unusual for households or businesses to buy or sell heat in the same way that electricity is bought or sold from the grid, and unlike electricity, heat cannot be transported for long distances easily without significant

losses. As a result, heat consumers generally buy heating fuel (gas, oil, coal, wood or electricity) and convert this to heat on site in boilers or other forms of space and process heaters. At a UK level the heat demand is primarily met by gas piped directly to the customer and converted to heat on site. The majority, 81%, of household heat demand is met by gas with electricity providing 8% and heating oil 8%<sup>3</sup>. By contrast, Northern Ireland is heavily reliant on imported fossil fuels, e.g. figures for the domestic heat market are 70% oil, 15% gas, with coal and renewables making up the balance.

6. Action can be taken on two fronts to reduce Northern Ireland's reliance on imported fossil fuels for heating – increased efforts on energy efficiency measures to reduce consumption and actions to encourage the use of renewable energy, in particular biomass, which could deliver from industrial, through commercial to domestic heating markets.
7. Current statute limits DETI's and the Northern Ireland Authority for Utilities Regulator's (NIAUR) powers to the electricity and gas markets – the position is the same in the rest of the UK. In order to develop renewable heat, further work needs to take place to establish whether a regulatory framework for heat needs to be put in place to increase confidence in this emerging market.
8. Given the current status of renewable heat and the need to develop it as part of the overall energy mix for the future, it is likely that some forms of financial support e.g. grant support scheme, heat incentives or heat obligation would be required to pump prime it. The introduction of powers in the Energy Act 2008 to legislate for a Renewable Heat Incentive did not include Northern Ireland. DETI will undertake detailed work with stakeholders on renewable heat to identify what support mechanism would be best suited to Northern Ireland's heat markets, while monitoring the emerging development of the Renewable Heat Incentive in GB.
9. Initial action to scope and identify the key elements of this significant work

---

<sup>3</sup> BERR draft UK Renewable Energy Strategy 2008

programme to support the development of renewable heat is underway and further work will be taken forward during the life of this Action Plan. The establishment of renewable heat targets and an appropriate support structure will be an important driver to develop the market and bioenergy's contribution to it.

### **Planning**

10. In November 2007, DOE consulted on the draft Planning and Policy Statement 18 Renewable Energy which acknowledges the importance of renewable energy in facilitating Government's commitments on both climate change and renewable energy. DOE will therefore support renewable energy proposals unless they would have adverse environmental effects which are not outweighed by the local and wider environmental, economic and social benefits of the development. This policy is intended to apply to all renewable energy technologies and the document includes sections on biomass and energy from waste. DOE plan to issue the final version of PPS 18 in Summer 2009.

### **Building Regulations**

11. Current Building Regulations require designers to ensure that the carbon dioxide emissions from a proposed building do not exceed a target emissions level set for the building. The designer is free to meet the standards in a manner best suited to the specific circumstances of each building, which may include the use of low or zero carbon technologies, such as bioenergy. Although the regulations do not require renewable technologies in all new buildings, the targets set by these regulations, which are carbon based, are challenging and encourage the use of such technologies which are less carbon intensive than fossil fuels. The supporting documents to the regulations provide solutions that encourage and facilitate the integration of micro-generation technologies.
12. The UK Government issued a policy statement in 2007 – "Building a Greener Future" which advised of the aim to have all new buildings zero carbon. The statement also advised that the Building

Regulations in England and Wales (E&W) would be amended on a regular basis towards that aim with the intention that all new homes would be zero carbon from 2016 and for other buildings as soon as possible thereafter. The Northern Ireland Minister for Finance and Personnel, in a speech in the Assembly in March 2009, advised that the Northern Ireland Building Regulations would keep pace with the E & W proposed changes and would be amended to the same standard in a similar timescale. With each successive amendment, more onerous emissions standards will be set, therefore the inclusion of micro-generation technologies will become necessary and more commonplace.

### **Public Procurement**

13. Public procurement provides the opportunity for NI Departments, their Agencies, non-Departmental Public Bodies (NDPBs) and Public Corporations including, Local Authorities, Health Trusts and Education and Library Boards, to install renewable energy technologies to act as an exemplar to the wider community and to help drive the market for renewable energy, including bioenergy. DFP's Sustainable Procurement Action Plan 2008-2011 for Northern Ireland, as part of the Sustainable Development Strategy, (which sets a target of making the Government Estate carbon neutral by 2015), presents a number of overarching actions. These actions will assist in the delivery of the Programme for Government commitment to support the wider public sector in taking account of sustainable development principles when procuring works, supplies and services; one of these actions relates to Climate Change and Energy.
14. Central Procurement Directorate's (CPD) construction procurement practitioners are proactive in advising clients in the early stages of projects on the scope for incorporating low and zero carbon technologies (LZCT) which includes bio-energy. CPD subsequently include requirements in project briefs and technical specifications when initial appraisals have indicated that LZCT is economically and technically feasible.

15. CPD has introduced a proposal to the Sustainable Construction Group (SCG) for the issue of guidance on “sustainable design in the built environment” which is due to be published in the Autumn 2009. The guidance note will provide practical guidance to practitioners from the NI Centres of Procurement Expertise (CoPEs), which offer advice and guidance across the public sector, and will include a requirement to consider application of LZCT in projects. Some examples of CPD’s construction projects incorporating bioenergy are the AFBI Renewable Energy Centre at Hillsborough for DARD and DFP Properties Division’s on-going LZCT programme which includes installation of biomass heating boilers within the office estate. These latter systems are currently being trialled on a number of buildings in the Government estate to assess costs and other operational issues.

#### **Air Quality Issues**

16. It is important to ensure that increased use of biofuels to generate energy does not have a detrimental impact on air quality. Research is currently underway by DEFRA into the possible cumulative effect of high numbers of small scale biomass boilers, in restricted or built up urban areas, on levels of particulate emissions. Given that much of Northern Ireland could be described as rural or semi-rural, it is not considered that this issue would be of a similar scale as potentially in other parts of the UK. It will, however, be important to consider the results and recommendations of this DEFRA work, which showed that, where certain conditions are met, any impacts on air quality by increased uptake of biomass heat can be reduced to a manageable level to avoid any additional breaches of the EU Air Quality Directive.

#### **Definitional Issues for Waste**

17. In Northern Ireland, as in all other EU countries, the definition of waste is that applied by the Waste Framework Directive. One of the aims of the recently revised Directive is to encourage the creation of a Europe-wide recycling society. Indeed, some measures put in place via the revised Directive were designed to make it

easier for energy produced from the incineration of municipal waste (where it reaches a high level of energy efficiency) to be classified as recovery. The revised Waste Framework Directive also recognises the potential value of using biowaste as an energy source and to this end the European Commission is carrying out an assessment on the management of biowaste, including examining the opportunity of setting minimum requirements for biowaste management and quality criteria for compost and digestate from bio-waste treatments.

#### **Sustainability**

18. Sustainability in relation to bioenergy, in particular biofuels, has received considerable coverage in recent months. Sustainability as regards bioenergy can encompass the consideration of life cycle Green House Gases compared to fossil fuels; impacts on air, land, water and biodiversity; social and economic impacts and indirect impacts although the latter is a complex matter.

19. At a UK wide level, the Renewable Transport Fuel Obligation already involves sustainability reporting on transport biofuels, which will become a statutory requirement by 2010 and similar reporting will become a requirement within the revised Renewables Obligations across the UK, including the NIRO in relation to renewable electricity generation.

20. Through the Scottish and Northern Ireland Forum for Environmental Research (SNIFFER) programme, DOE and the Scottish Executive have recently commissioned joint work on environmental issues for bioenergy within the two countries. This programme will consider land use, water and soil quality issues, biodiversity and advise on guidance/best practice.

21. The DARD-commissioned Renewables Research Programme, being delivered through AFBI at their Renewable Energy Centre of Excellence, addresses the sustainability issues associated with the rollout of each individual research project. Consequently, the sustainability issues are then appropriately covered in the Technology Transfer aspects when such projects are taken forward at farm

level. Biodiversity issues are also handled in this manner.

#### **Access to the Electricity Grid**

22. Access to the electricity grid within a reasonable timeframe from application and at an appropriate cost is an essential element for the increased growth of renewables, including bioenergy. Used for electricity generation, bioenergy can provide a reliable and predictable renewable resource for grid management purposes. As distributed or decentralised energy, it can also reduce requirements on the grid; increase overall system efficiency as electricity consumed closer to the source of generation reduces losses in transmission; reduce a producer's electricity costs if consumed on site and can also provide limited financial return if excess is sold to the grid. Under the revised NIRO banding scheme (see Objective Three), microgeneration of all types is eligible for two ROCs per MWh.
23. A major programme is being planned to strengthen the Northern Ireland Electricity Grid which will also facilitate increased levels of renewable generation. In addition to this work, it may also be appropriate to consider current access, including costs to generators, to the grid for renewables such as bioenergy, both at large scale and decentralised levels and also the recompense for supplying to the Grid.

#### **Carbon Reduction Commitment (CRC) and other drivers**

24. The CRC is a proposed mandatory cap and trade scheme that will apply to large energy intensive business and public sector organisations. By putting a cost on their carbon emissions, organisations will be encouraged to reduce emissions by e.g. increasing their energy efficiency and deploying heat from renewable energy sources such as biomass. Similarly, the EU Emissions Trading Scheme and Climate Change Agreements will also be drivers for reduction in energy usage and increase use of renewables, including bioenergy.

#### **EU Renewable Energy Directive**

25. In addition to the headline targets for increased levels of renewables to be met by Member States, which in the case of the UK will be 15% renewable energy (ie electricity, heat and transport), the EU Renewable Energy Directive (EU RED) also requires a series of actions to be undertaken to facilitate this growth e.g.

#### **Administration, procedures, regulations and codes**

- consenting/licensing regimes should be proportionate and appropriate, with streamlining of administration procedures and clear guidelines for co-ordination between administrative bodies.
- Member States shall introduce in their building regulations and codes appropriate measures in order to increase the share of all kinds of energy from renewable sources in the building sector. In establishing such measures or in their regional support schemes, Member States may take into account national measures relating to substantial increases in energy efficiency and relating to cogeneration and to passive, low or zero-energy buildings. By December 2014, Member States shall, in their building regulations and codes or by other means with equivalent effect, where appropriate, require the use of minimum levels of energy from renewable sources in new buildings and in existing buildings that are subject to major renovation. Member States shall permit those minimum levels to be fulfilled, inter alia, through district heating and cooling produced using a significant proportion of renewable energy sources.

#### **Information and training**

- Provision of information on support measures; certification schemes for installers of small scale domestic renewables and guidance for planners and architects to consider properly the use of renewables and district heating/cooling systems when planning.

### **Access to the electricity grid**

- Member States shall take the necessary steps to develop grid infrastructure to accommodate further development of renewable electricity production.

### **Sustainability**

- The development of a sustainability scheme for biofuels for transport and for bioliquids for heating and electricity. This scheme may also extend to other energy uses of biomass for heating and electricity. DEFRA and DECC are currently considering how sustainability standards for biomass, within an EU and international framework, could be developed and the IDG will feed into this work, as appropriate, and consider its applicability to Northern Ireland.
26. The transposition of these requirements at local level in Northern Ireland will result in key actions which will strengthen the existing measures to facilitate and support the increase of renewables, including bioenergy, in Northern Ireland.

### **Matrix**

27. The Matrix, the NI Science Industry Panel, provides an opportunity for business to advise Government and academia on policies aimed at the development of NI R&D, innovations and the knowledge-based economy. To date the areas of research have been Advanced Engineering, Advanced Materials, Agri –Food, ICT and Life and Health Sciences. Energy, including bioenergy, may present an opportunity for future consideration by Matrix.

## **ACTIONS**

Action	By whom	By when
Consult on renewable heat policy proposals, including possible support mechanism	DETI, Stakeholders group and relevant SE IDWG members	Spring 2010
Issue Planning Policy Statement 18	DOE	Summer 2009
Building Regulations - amend conservation of fuel and power requirements	DFP	2010, 2013 and 2016
Monitor and assess Bioenergy usage at trialled Government estate sites	DFP	2010-2011
Issue guidance on "sustainable design in the built environment"	DFP/CPD	Autumn 2009
Consider revising the Clean Air Order to provide greater consistency between current Air Quality Objectives and biomass combustion	DOE	Spring 2010
Monitor progress of the European Commission's assessment into the management of biowaste	DOE	Ongoing
Complete and review the results of the SNIFFER work	DOE	Spring 2010
Clarify access arrangements to grid under new EU RED.	DETI/NIAUR	Autumn 2010
Introduce the Carbon Reduction Commitment within Northern Ireland	DOE	Spring 2010
Ensure the appropriate implementation of the EU RED within Northern Ireland	Led by DETI but working with other NI Departments	Transposition is likely to be required by Autumn 2010
Consider the opportunity for renewable energy, including bioenergy, for inclusion within the Matrix programme	DETI	Ongoing

### Objective 3

#### To encourage and support targeted investment in key areas of the overall bioenergy supply chain to stimulate growth.

1. The development of sustainably produced biomass resources is important for Northern Ireland and market stimulation through, e.g. the provision of loans and capital grant (where appropriate) could help create a demand for fuel. It is essential that there are no supply shortages as this could drive up prices and damage confidence. Therefore, there must be parallel measures in place to ensure that fuel availability increases in line with the market needs – i.e. the “push” and “pull” of supply and demand.
2. The production of bioenergy involves the interaction of different systems – a supply process that produces, collects and delivers a feedstock, a conversion process that turns the feedstock into a useful energy resource which is then delivered to the ultimate consumer. Each of these has a wide range of stakeholders with their own interests and supply chains.

##### *Feedstock supply*

Farmers, foresters, those engaged in waste management activities, those involved in the food industry, forestry contractors, tree surgeons, traders and merchants and sawmills etc.

##### *Energy production*

Power generators, engineering contractors, plumbers and heating engineers, traders and merchants.

##### *Energy consumption*

Industrial, commercial, agricultural and domestic level.

3. In some instances, the feedstock supplier and energy producer may be the same e.g. in the case of an Energy Supply/Services Company (ESCO). ESCOs can have a variety of forms and are more widely known in Austria and Scandinavian countries. ESCOs represent a culture change in the provision of heat, rather than a fuel, and there are already a few ESCOs operating within Northern Ireland. The

IDG believes that development of more ESCOs within Northern Ireland could present an important opportunity to develop the renewable heat market.

4. From a rural perspective, this could offer added value to the farmer who would become a “Heat Entrepreneur” rather than simply supplying the feedstock to a third party. For such an arrangement, the farmer would need advice and support with business formation issues and contract negotiation skills. In other instances, the feedstock supplier, the energy producer and the energy customer may be the same business, primarily meeting its own needs but with the potential to sell unused supply within a locality. The concept of District Heating Systems, whether domestic or commercial, is more widespread in parts of Europe and, potentially operated by an ESCO, does present a further opportunity in Northern Ireland as work progresses to develop a renewable heat sector.

#### **Current Bioenergy Supply Chain Support**

5. Invest NI has been active in helping to establish a number of renewable energy supply chain clusters in Northern Ireland and in scoping what further assistance can be given to local companies to enter these supply chains. It has established a Biomass Action Group, involving biomass growers, machinery suppliers and installers, to facilitate the increased use of biomass and development of supply chains. Invest NI will assist collaborative networks who wish to develop businesses in this area. As an example of what can be achieved, Invest NI has facilitated the formation of a collaborative network for the wind energy supply chain. The group is pursuing alliances with major suppliers world-wide to strengthen its bid to secure business in wind energy technologies. At a recent wind energy fair in Chicago, over 140 expressions of interest from international companies were recorded. In the same way, a bioenergy-based group will be facilitated to pursue opportunities in bioenergy supply chains.
6. Invest NI has recently launched its report “Maximising Business

- Opportunities from Sustainable Energy“ which highlights existing capabilities in the renewables sector and priorities areas for potential growth, including bioenergy. With the Carbon Trust, it has also supported the publication of a recent study on “NI Renewable Energy Supply Chain”. These two studies identify those already engaged in the sector and could be used as a basis for the development of a supply chain database of capabilities and capacities including ongoing feedstock usage/ market figures and generating capacity. Invest NI is currently investigating the possibility of extending its range of support programmes to encourage greater uptake and deployment of sustainable production/manufacturing technologies.
7. Under the sectoral element of the 2000-2006 Programme for Building Sustainable Prosperity (PBSP), DARD awarded significant funding for investment in the infrastructure associated with the processing of SRC Willow. Although this scheme is now ended, one important outcome was the establishment of Biomass Energy Northern Ireland (BENI) which was formed by farmers to promote the production and utilisation of biomass energy. The forestry processing and marketing grant scheme, administered by DARD through the NI Rural Development Plan provides support for capital investment to erect new buildings, refurbish old premises or buy new equipment for micro enterprises in the forestry sector in Northern Ireland.
  8. CAFRE, working in collaboration AFBI, delivers training to raise awareness of the SRC willow supply chain from production through to processing for the agricultural community.
  9. At a national level, the National Non Food Crops Centre (NNFCC) is a UK wide national centre for renewable fuels, materials and technologies which helps to introduce renewable fuels and materials into the marketplace and provides independent information and advice. Its work involves actions to build supply chains for products from growing the crops through manufacturing the products to selling them e.g. it recently published an economic assessment of Anaerobic Digestion and its suitability to UK farming and waste systems, including an interactive tool which can help determine the point at which an AD enterprise becomes profitable.
  10. Funded by DEFRA and BERR, NNFCC has a UK wide remit and stronger, more visible and beneficial links with DARD should be developed to ensure that Northern Ireland benefits fully from this resource both in terms of the dissemination of its research and supply chain work and also in relation to possible NI based projects.
  11. In addition, the web based Biomass Energy Centre ( BEC), operated by the UK Forestry Service draws together information from existing sources into a single site as a UK wide information service centre and offers a complementary service to NNFCC. As above there is an opportunity to develop closer links with BEC.
- Specific Actions**
12. In addition to the above activity to support the supply chain, a number of key areas have been identified where further action is underway or proposed to develop the sector, within the three main stages of the supply chain as noted above.
 

*Feedstock supply*

Forestry
  13. A developing bioenergy sector has the potential to strengthen the economic viability of the forestry sector by providing a market for increased growth of virgin wood, forestry brush, residues and thinnings. The current production is estimated at 5,000 cubic metres per year. The market could also stimulate active management of neglected woodland which would bring environmental benefits through woodland generation. DARD’s Forest Service has reviewed its Forestry Strategy and has identified a range of actions to increase significantly forestry/woodland levels both within the short, medium and longer term

across the public sector and the private sector to increase availability of wood/wood residues for bioenergy.

#### Sawmill residues

14. Balcas is currently the main producer in Northern Ireland of wood pellets from sawmill residues. It is considered that there is scope to expand the use of sawmill residues such as wood chips and pellets for the commercial and domestic markets. Further engagement with the sawmill sector is envisaged to obtain a more detailed analysis of the current and future output, market conditions and actions needed to encourage residue use for energy purposes. The Invest NI Construction Team has details of wood residues available from major Northern Ireland sawmills and where these residues are currently used. As outlined above at 5, if a company or group of companies wishes to develop manufacturing or supply chain opportunities in this area, Invest NI will facilitate this.

#### Energy Crops

15. The main energy crop grown in Northern Ireland is Short Rotation Coppice (SRC) Willow, of which currently 650 hectares are grown per annum with the capacity to produce in the region of 6,500 tonnes of dry fibre annually. DARD continues to support increased growth through the SRC Scheme which offers up to a maximum rate of grant of £1,000 per hectare.

#### Farm and food processing residues

16. Sustainable waste management from the agricultural sector is an urgent priority in Northern Ireland due to legislative pressure to address nitrate contamination of water courses. The large food and drink sector also needs to meet increasingly stringent disposal regulations. These requirements can be viewed as an opportunity through the use of AD to treat these organic residues to produce a gas with a high methane content which can be used to deliver heat or electricity or a combination of both. In addition to the generation of renewable energy, the avoidance of methane emissions from livestock slurries from a wide-scale take-up of AD would deliver a reduction

in GHG emissions in tonnes of CO<sub>2</sub> equivalent that is well in excess of what would be achieved by the simple substitution of renewable for fossil energy, because of the higher global warming potential of methane.

17. The commercial deployment of AD, whether on-farm or centralised, in other parts of the UK is increasing. DEFRA has established an AD Task Force who are responsible for taking forward the "AD - Shared Goals Strategy" published in April 2009. DARD has engaged with the Task Force on its activities and will consider how best the Task Force proposals can be implemented/adapted for appropriate use. Within the Northern Ireland context AFBI has already established a pilot project on its Hillsborough site using mainly the manure from its own dairy herd. It is planned that this pilot project should identify the local issues/economics for AD and lessons learned will be of considerable benefit to AD's increased on farm usage within Northern Ireland.
18. DARD is also considering the potential for a Biomass Challenge Fund to encourage the uptake of biomass fuelled technologies at Farm Level to assist primarily with the enhanced management of livestock residues.
19. It is also possible to use a mix of livestock and food processing wastes which could help the viability of centralised AD plants by providing a diverse feedstock and an additional income for the plant operator, although the requirement to address additional environmental regulations would need to be considered. It was envisaged within the AEA study that, based on predicted resource outputs, up to 50 such plants could be developed over the period to 2020.
20. The IDG believe that further work is needed to identify and match the distribution across Northern Ireland of livestock farming with food processing sites and the potential demand for process heat. The increased environmental regulations which would need to be addressed when combining farm and food processing residues would need to be fully considered. This work would also need to address the necessary supply chain logistics in

the collection, storage and distribution of feedstocks.

21. DARD and Invest NI will continue to facilitate joint agriculture and business investigation of AD projects e.g., joint visits to working technologies such as the May 2008 visit to an AD facility in Munich.

#### Landfill and Municipal Solid Waste

22. As noted in Chapter 4, arrangements for the recovery of renewable energy from Landfill and MSW are in the process of being developed by Local Authorities/ Waste Management Groups. Such technologies are well established elsewhere and there are few supply chain issues involved.

#### *Energy Production*

#### Northern Ireland Renewable Obligation (NIRO)

23. The main support mechanism for the production of renewable electricity in Northern Ireland is the NIRO. It operates in tandem with similar mechanisms in the rest of the UK and places an obligation on electricity suppliers to account for a specified and increasing proportion of their electricity from renewable sources. Evidence is by way of Renewable Obligation Certificates which are issued to the generators, and have a monetary value and are traded on a UK wide basis. The NIRO has been very successful in bringing forward the more economic renewable technologies, such as onshore wind.
24. However, to meet longer term needs and ensure greater diversity and security of electricity supply, it is critical to encourage the growth of other less well developed and currently more expensive technologies such as tidal, offshore wind and some forms of bioenergy.
25. Following revisions to all the UK mechanisms from 1 April 2009, the NIRO now offers different levels of ROC support depending on the status of technologies. Microgeneration i.e. under 50kW, will receive 2 ROCs, regardless of technology. As regards bioenergy related feedstocks, the

position is currently as set out overleaf. Landfill Gas is shown as 0.25 ROC pending the outcome of a request to the EU for State Aid approval to offer 1 ROC for Landfill Gas in Northern Ireland.

#### Renewable Heat Incentive

26. As noted above at Objective 2, DETI will be undertaking the necessary work on a renewable heat strategy including assessment of an appropriate support mechanism. Any support mechanism is likely to need new primary and subordinate legislation and the consent of the Northern Ireland Assembly.

#### Skills

27. The successful development of bioenergy will be dependent on the availability of the necessary knowledge and skills within the sector to advise potential customers of their needs with regard to the size of boiler, sources of feedstock, professional installation and ongoing maintenance requirements. Incorrect information, poor advice or quality of service will damage the sector.
28. The Cross border Renewable Energy Installers Academy, delivered by Action Renewables in NI and Sustainable Energy Ireland in RoI, has trained up several hundred installers of renewable energy systems. In addition, the UK wide Low Carbon Building Programme is open to NI applicants and installers wishing to work within this scheme and who can register with the Microgeneration Certification Scheme, the UK wide accreditation scheme, funded by the industry.

Technologies	ROC level
Landfill Gas	0.25
Sewage Gas Co-firing of non energy crop (regular biomass)	0.5
Co-firing of energy crops Energy from Waste with CHP Co-firing of biomass with CHP	1.0
Dedicated regular biomass Co-firing of energy crops with CHP	1.5
Microgeneration Dedicated biomass with CHP Dedicated energy crops with CHP Advanced conversion technologies Dedicated biomass with energy crops.	2

29. CAFRE's role in relation to renewable energy is that of education and knowledge transfer to the agricultural industry and wider rural community. Based on the work carried out by AFBI and other research findings, CAFRE deliver a tailored programme of training in both energy efficiency and renewable technologies. It will be important that this work can demonstrate the transition from increased knowledge of technological opportunities within the rural community to actual commercial uptake by farmers.

*Energy Consumption*

Reconnect

30. Reconnect, which was open between 2006 and 2008, provided financial support to householders to install a range of renewable energy devices. It exceeded its target of 4,000 installations and its budget was increased from £8m to £10.8m – around one third of applications were for wood fuel stoves and boilers. Decisions have not yet been taken on any possible future schemes.

Low Carbon Building Programme

31. This UK wide programme is managed by the Energy Savings Trust and provides grants for the installation of microgeneration technologies in a range of buildings to include households, community organisations, public, private and the non-profit sectors.

Invest NI /Carbon Trust support

32. Invest NI provides funding to the Carbon Trust in Northern Ireland to enable it to offer a wide programme of assistance to the business sector e.g. an Interest-free Loan Scheme which can provide up to £400,000 interest-free over four years for energy saving equipment; specific advice and help with feasibility studies; Technology Accelerator scheme, including biomass and technology reports on renewable energy technologies. In addition, Invest NI can assist with the development of renewable energy businesses which meet Invest NI client criteria in respect of job creation and export potential.

Central Energy Efficiency Fund

33. DFP manages an annual budget of £2m to promote energy efficiency measures in public sector buildings: this budget can also be used for renewable energy installations as appropriate. As demand for funding greatly exceeds the available budget, applications for funding are ranked

on a cost benefit ratio. In the last 5 years DFP has contributed funding to 15 bio-energy schemes to the value of £1,317,700 saving an estimated 17,430.67 tonnes of carbon dioxide emissions to date.

Action	By whom	By when
Facilitate a number of business led collaborative networks within the bioenergy sector, including ESCOs	Invest NI/DARD	Ongoing programme
Consider possible support programme to encourage greater uptake and deployment of sustainable energy within businesses	Invest NI	Spring 2010
Engage with the UK AD Task Force and develop appropriate NI actions	DARD	Spring 2010
Forge closer links with NNFFC and the Biomass Energy Centre	DARD/CAFRE	Spring 2010
Consider the introduction of a Biomass Challenge Fund to encourage the uptake of biomass fuelled technologies at Farm Level.	DARD	Decisions to be taken by Spring 2010
Continue to promote and implement the forestry processing and marketing grant scheme	DARD	2006 -2011
Continue to promote and implement the SRC Scheme	DARD	Ongoing
Consult on Renewable Heat Incentive for Northern Ireland	DETI	Spring 2010
Deliver targeted training and technology transfer support for the agricultural community	CAFRE/AFBI	Ongoing Programme
Ensure the promotion of the UK Low Carbon Building Programme	DETI/DECC/ SE IDWG Sub group on communication	Ongoing
Continue to provide support to businesses for renewable energy actions	Invest NI /Carbon Trust	Ongoing

Action	By whom	By when
Continue management of the Central Energy Efficiency Fund, including bioenergy proposals	DFP	Ongoing

## Objective 4

To continue to undertake focussed and NI relevant research into bioenergy and further work to address gaps in knowledge and identify future research actions.

1. Decisions on increased bioenergy usage need to be based on sound evidence in terms of emissions, sustainability, economic return and environmental impact, relevant to Northern Ireland's climatic and agricultural situation.
2. A significant level of relevant R&D is currently underway in Northern Ireland with funding available from a range of sources both locally and across the UK. It will be important that funders and researchers are aware of what is happening and that funding for research is focussed and co-ordinated to ensure best use of resources/avoidance of duplication and the identification of areas which would benefit from further work.
3. Over the period of the Plan, it will be important for research and applied research work to demonstrate its impact in terms of increased knowledge within the sector and the presentation of viable opportunities for more investors, including the farming and rural community, to take the next step and actively implement bioenergy projects which best suit their individual needs.

### DARD - AFBI and CAFRE

4. AFBI has a world renowned reputation for its research capability in agriculture, food, forestry and fisheries. It has recently opened an Environment and Renewable Energy Centre (EREC) at Hillsborough as a Centre for Excellence to provide a sound research base and knowledge resource for the ongoing development of the renewable sector in Northern Ireland. DARD has secured funding of £1.8m over the next three years to continue research into renewable technologies at AFBI by way of a dedicated Research Renewables Programme, including 2<sup>nd</sup> generation biofuels and bioremediation. A wide range of renewable energy schemes are incorporated into the infrastructure of the site providing facilities for an extensive research programme into aspects of renewable energy relevant to

the agriculture industry including biomass heating and district heating system, an AD facility and ongoing evaluation of Short Rotation Coppice from research through to commercial development stages.

5. This research is designed not only to inform the wider agricultural sector on the potential of on-farm scale AD and other renewable technologies, but also to provide evidence to government for the development of policies to support the development and adoption of the most appropriate renewable energy technologies for the agricultural sector.
6. DARD has also secured a further £450,000 for CAFRE to deliver technology transfer activities linked to this research programme. This has been particularly evident on the SRC Willow supply chain activities. To ensure that AFBI – DARD activities are aligned and coordinated, a Research/Technology Link group has been established.

### University of Ulster

7. The University has several centres that deal with R&D of bioenergy technologies e.g. the Built Environment Research Institute (BERI) that has research in areas of renewable energy, which includes biomass supply, bioenergy systems and sustainable energy systems; the Northern Ireland Centre for Energy Research and Technology (NICERT) undertakes R&D in the areas of technical, economic and environmental assessment of power generation systems, and is a partner in SUPERGEN Bioenergy Consortium funded by the Engineering and Physical Sciences Research Council. This consortium of a number of UK Universities carries out research into all steps in the bioenergy chain from production of biomass to delivery of power, heat, and transport fuels. Within the Centre for Sustainable Technologies work is underway on bioenergy topics that include the development of gasifier systems.

### Queen's University Belfast

8. Queen's University established the Questor Centre in 1989 which is Europe's only Industry/University Co-

operative research centre. It provides members with a world class environmental research programme and also acts as a medium to transfer technology and knowledge to members. Of particular interest to bioenergy is their work on energy from waste, including particularly waste separation technologies and AD of wastes.

9. QUB and UU have recently announced their involvement with the Scottish Association for Marine Sciences and the Institutes of Technology in Dundalk and Sligo in a significant 4 year project called "Biomara" which will research the feasibility and viability of producing ,within local seas, mari-fuels from marine biomass

derived from seaweed plant sources (algae) as an alternative to agri-fuel production from land based plants.

#### **Other Research Opportunities**

10. In addition to locally based research, the work and funding regimes of national organisations such as the Technology Strategy Board, Technology Programme, Low Carbon Energy Technologies, Environmental Transformation Fund are important and should be considered to identify possible funding /support/research opportunities for Northern Ireland.

#### **ACTIONS**

Action	By whom	By when
Organise a NI Bioenergy Research Funders Forum to take stock of the range of research, funding sources and possible further work programme	Bioenergy IDG	Spring 2010
Continue with the development of the Renewables Research Programme	DARD /AFBI /CAFRE	2009-2011
Participate in the Biomara research project, review findings on completion of the work and consider next steps with Scotland and ROI	DETI, ROI and Scotland	Completion of the Project by 2012

# REPORTING, MONITORING AND EVALUATION

## 7

1. It will be important to be able to identify to what extent the Action Plan's objectives and actions have been achieved and what impact this first plan has had on the Bioenergy sector. To achieve this, a review of the Plan will be carried out early in its final year 2013-2014 to inform decisions on future policy.
2. In the interim and in order to feed into the review, DETI will co-ordinate an annual report from Departments on progress against their agreed actions in the Plan and any revised proposals for the incoming year. This report will be considered by the Sustainable Energy Inter Departmental Working Group, chaired by the DETI Minister, and will be forwarded to the ETI Committee and the All Party Energy Group. It will also be placed on the DETI website.

# NEXT STEPS



1. Your comments are invited on the proposals set out in this consultation document, especially in relation to the aims, objectives and actions, (as set out in Chapters 2 and 6) which the IDG is proposing to support the development of a sustainable bioenergy sector.
2. The consultation will run until **30 October 2009** and your comments will help the IDG finalise the Action Plan and secure Executive approval for the range of cross cutting actions leading to finalisation and publication later in 2009-10.

### Key EU, national and local drivers for renewables, including bioenergy.

#### EU

EU Renewable Electricity Directive 2001 – to promote electricity from renewable energy sources with an overall EU target of 21% by 2010.

EU Biofuels Directive 2003 - to promote the increased use of biofuels or other renewable transport fuels to 5.75 % by 2010 and was followed by the EU Biofuels Strategy in 2006.

EU Biomass Action Plan 2005 - to increase the development of biomass energy from wood, wastes and agricultural crops by creating market based incentives to its use and removing barriers from its development.

EU Nitrates Directive 1991- to achieve improvements in water quality and introduced measures to restrict the amount of livestock manure to be applied to the land. Its implementation can be a driver for alternatives such as the use of manures for anaerobic digestion.

EU Water Framework Directive 2000– to develop an integrated approach to the protection and improvements of water quality - link to the EU Nitrates Directive above.

EU Air Quality Framework Directive– 1996 (and subsequent Directives) – to improve the quality of air and reduce air pollution.

EU Waste Framework Directive 2006- to establish a network of disposal facilities and competent authorities with responsibility for issuing waste management and licences. It includes the definition of waste.

Integrated Pollution and Prevention Control Directive - to minimise the pollution to air, water and soil from various industrial sources throughout the EU

EU Landfill Directive 1999 - to reduce the amount of biodegradable municipal waste ( BMW) that can be sent to landfill and will be a driver for alternatives to landfill including Anaerobic Digestion or other forms of energy from waste treatment.

EU Renewable Energy Directive 2009 (EU RED) – to introduce a binding target of 20% renewable energy across EU by 2020, including 10% for biofuels and administrative actions to support renewables.

EU Emissions Trading Scheme 2003 – an EU wide scheme to help meet EU greenhouse gas emissions reduction target of 8% below 1990 levels.

EU Energy End-Use Efficiency and Energy Services Directive 2006 – integrates suppliers of renewables fuels into its actions such as: delivering on the UK Energy Efficiency Action Plan, Voluntary Agreements to promote energy efficiency and reporting of energy services.

#### UK

UK Biomass Strategy 2007– to realise the expansion in supply and use of biomass but with main focus on actions in England.

UK Renewable Energy Strategy (draft) 2008 - published in response to the EU RED and to address the UK target of 15% renewable energy by 2020. Finalised strategy (as part of the UK Low Carbon Transition Plan suite of documents) just published July 2009.

Climate Change Act 2008– to improve carbon management and help the transition towards a low carbon economy in the UK. It includes targets, new specific carbon budgeting provisions and the establishment of the UK Committee on Climate Change.

The Climate Change Levy (CCL) and the related Climate Change Agreements with energy intensive sectors. The CCL enforces a tax on every KWh of energy purchased by non-domestic customers. Energy intensive sectors can obtain an 80% discount in exchange for meeting emission reduction targets.

Renewables Obligation – UK wide support mechanism, including the Northern Ireland Renewables Obligation to increase levels of renewable electricity, which has recently been revised to increase support levels for certain technologies including some forms of bioenergy.

Renewable Transport Fuel Obligation – UK wide mechanism to increase the levels of renewable transport fuels supplied in the UK.

Carbon Reduction Commitment – to be introduced in 2010, it will complement the EU Trading Emissions Scheme, and will require large energy intensive businesses to reduce their carbon emissions.

## **NI**

Strategic Energy Framework 2004–Current consultation on a revised overarching energy strategy (Strategic Energy Framework 2009) which features a much enhanced role for renewables, including bioenergy.

NI Sustainable Development Strategy 2006 – overarching strategy to address sustainable development, including climate change and energy actions. It is currently being reviewed and will be issued for public consultation late in 2009.

Northern Ireland Renewables Obligation (NIRO) - As above reference to the Renewables Obligation, the NIRO has recently been revised to increase support to less well developed technologies such as bioenergy.

NI Waste Management Strategy 2005– to maximise waste prevention, increase recycling and recovery of waste. Energy from waste is a component of the strategy.

DARD Renewable Energy Action Plan 2007 – Currently being reviewed by the Agriculture Stakeholders Forum on Renewable Energy - a revised Plan will be published late 2009.

Agriculture and Rural Development Committee Inquiry 2008– the work and findings of the review into renewable energy and alternative land use.

## Annex B

### Potential Biomass resources and pathways in Northern Ireland by 2020

Biomass resource	Estimated Current Usage	Potential pathways	Resource available in basic scenario	Resource Available in Higher Potential scenario
Forestry residues from harvesting and thinning operations	None	Chips or pellets for heat and electricity	21,000 ODT/year	30,000 ODT (including arboricultural waste)
Co-product from sawmills	40,000 ODT	Pellets, chips for heat and electricity	50,000 ODT/year	200,000 ODT/year
Short rotation coppice willow	Minimal	Chips or pellets for heat and electricity	1,000 ha nominally 10,000 ODT/year	8,000 ha nominally 80,000 ODT/y
Other perennial energy crops	None	Chips or pellets for heat and electricity	Similar to SRC	Similar to SRC
Conventional annual crops grown for energy use	None	Biodiesel Bioethanol	7,000 ha OSR* 6,500 ha wheat*	7,000 ha OSR* 6,500 ha wheat*
Arable crop residues	None	Bales or pellets for heat and electricity	0*	0*
Tallow from rendering	None	Transport biofuels Electricity	Largely exported to GB (Category 3 Tallow)	Largely exported to GB (Category 3 Tallow)
Poultry litter	None	Heat and electricity	150,000 ODT/year	One 30 Mwe combustion plant proposed
Meat and bone-meal from rendering	None	Heat and electricity	72,000 t/year	72,000 t/year
MSW total Commercial and industrial waste Food processing wastes	None	Heat and electricity by combustion and anaerobic digestion (AD)	800,000 t/year 1,560,000 t/year 195,000 t/year	1,000,000 t/year
Landfill gas	None	Mostly based on waste already deposited and ready for exploitation	83 GWh	Reducing
Farmyard manures	None	Heat and electricity by AD	150,000 – 200,000 ODT/year	Constant

\*Assuming all straw currently produced has existing uses. Some resource could become available if additional crops are grown for biofuels, but opportunities for biofuel production in Northern Ireland remain limited, as small-scale production is unlikely to meet economic production requirements.

ODT = Oven dry tonnes; OSR = Oil seed rape



## Framework of objectives and actions

### Objective 1

To raise awareness and understanding of the benefits and opportunities of all forms of bioenergy within the public and private sector and the wider community.

Action	By whom	By when
Develop and disseminate a targeted communications programme to raise awareness and understanding of bioenergy	Integrated with the Sustainable Energy Communications Programme being developed by the Sustainable Energy Inter Departmental Working Group	Programme to be operational by Spring 2010

### Objective 2

To create a supportive and encouraging policy and regulatory framework within which the bioenergy sector can develop and thrive.

Action	By whom	By when
Consult on renewable heat policy proposals, including possible support mechanism	DETI ,Stakeholders group and relevant SE IDWG members	Spring 2010
Issue Planning Policy Statement 18	DOE	Summer 2009
Building Regulations – amend conservation of fuel and power requirements	DFP	2010, 2013 and 2016
Issue guidance on “sustainable design in the built environment”	DFP/CPD	Autumn 2009
Monitor and assess Bioenergy usage at trialled Government estate sites	DFP	2010-2011
Consider revising the Clean Air Order to provide greater consistency between current Air Quality Objectives and biomass combustion	DOE	Spring 2010
Monitor progress of the European Commission’s assessment into the management of biowaste	DOE	Ongoing

Action	By whom	By when
Complete and review the results of the SNIFFER work	DOE	Spring 2010
Clarify access arrangements to grid under EU RED	DETI/NIAUR	Autumn 2010
Introduce the Carbon Reduction Commitment within Northern Ireland	DOE	Spring 2010
Ensure the appropriate implementation of the EU RED within Northern Ireland	Led by DETI but working with other NI Departments	Transposition is likely to be required by Autumn 2010
Consider the opportunity for renewable energy, including bioenergy for inclusion within the Matrix programme	DETI	Ongoing

### Objective 3

To encourage and support targeted investment in key areas of the overall bioenergy supply chain to stimulate growth.

Action	By whom	By when
Facilitate a number of business led collaborative networks within the bioenergy sector, including ESCOs	Invest NI/DARD	Ongoing programme
Consider possible support programme to encourage greater uptake and deployment of sustainable energy within businesses	Invest NI	Spring 2010
Engage with the UK AD Task Force and develop appropriate NI actions	DARD	Spring 2010
Forge closer links with NNFFC and the Biomass Energy Centre	DARD/CAFRE	Spring 2010
Consider the introduction of a Biomass Challenge Fund to encourage the uptake of biomass fuelled technologies at Farm Level	DARD	Decisions to be taken by Spring 2010
Continue to promote and implement the forestry processing and marketing grant scheme	DARD	2006 -2011

Action	By whom	By when
Continue to promote and implement the SRC Scheme	DARD	Ongoing
Consult on a Renewable Heat Incentive for Northern Ireland	DETI	Spring 2010
Deliver targeted training and technology transfer support for the agricultural community	CAFRE/AFBI	Ongoing Programme
Ensure the promotion of the UK Low Carbon Building Programme	DETI/DECC/ SE IDWG Sub group on communication	Ongoing
Continue to provide support to businesses for renewable energy actions	Invest NI /Carbon Trust	Ongoing
Continue management of the Central Energy Efficiency Fund, including bioenergy proposals	DFP	Ongoing

#### Objective 4

To continue to undertake focussed and NI relevant research into bioenergy and further work to address gaps in knowledge and identify future research actions.

Action	By whom	By when
Organise a NI Bioenergy Research Funders Forum to take stock of the range of research, funding sources and possible further work programme	Bioenergy IDG	Spring 2010
Continue with the development of the Renewables Research Programme	DARD /AFBI/CAFRE	2009-2011
Participate in the Biomara research project, review findings on completion of the work and consider next steps with Scotland and ROI	DETI, ROI and Scotland	Completion of the Project by 2012

Your views on this document are welcome

August 2009

Energy Division  
Department of Enterprise, Trade  
and Investment  
Netherleigh  
Massey Avenue  
BELFAST  
BT4 2JP

**Tel:** 028-9052-9240  
**Fax:** 028-9052-9549  
**Textphone:** 028-9052-9304

[www.energy.detini.gov.uk](http://www.energy.detini.gov.uk)

Alternative formats of  
this document  
including braille,  
large print, disc,  
audio cassette or in  
minority ethnic  
languages are  
available on request