



# BioPAD



Bioenergy Proliferation and Deployment





Disclaimer: All reasonable measures have been taken to ensure the quality, reliability, and accuracy of the information in this report. This report is intended to provide information and general guidance only. If you are seeking advice on any matters relating to information on this report, you should contact the ERI with your specific query or seek advice from a qualified professional expert.

## Preface

The BioPAD project aims to improve our understanding of the links between supply and demand by looking at supply chains for a variety of bioenergy fuels and different ways of converting these fuels into sustainable energy. Understanding the supply chains and the ways bioenergy moves from fuel source to energy provision will help the establishment of robust and efficient supply services which can match local demand.

BioPAD is led by the Western Development Commission [www.wdc.ie](http://www.wdc.ie) (Ireland) and is funded under the ERDF Interreg IVB Northern Periphery Programme (NPP) <http://www.northernperiphery.eu>. It has partners in Scotland (Environmental Research Institute, UHI <http://www.eri.ac.uk/>), Northern Ireland (Action Renewables <http://www.actionrenewables.org/>) and Finland (Finnish Forest Research Institute, Metla <http://www.metla.fi/>).



## Country Policy Analysis

### Finland



Finland is dependent on imported fuels and energy. Accordingly, the cornerstones of Finnish energy policy are a diversified and reliable supply of energy and improved self-sufficiency. The energy-intensive basic industries, cold climate and long distances underline the significance of energy for the country's competitiveness and the wellbeing of its inhabitants. Until the 1960s, Finland's energy policy relied on the electricity produced by hydro power stations and extensive use of wood. Due to the

limited hydro resources, the use of coal and oil started to increase rapidly, and the need to find new energy sources became clear. A gas pipeline from the Soviet Union to eastern Finland was completed in 1973 and later extended to the capital area and some other cities. The first nuclear power unit was taken into use in 1977, followed by three other units in 1979–1982. The 1970's also brought peat into the Finnish energy mix.

The role of renewable energy has changed essentially during last 50 years in Finland. In 1960 the gross consumption of energy was about 110 TWh/a or 25 PJ/a. Wood based energy was about half of the amount, mainly small scale uses of households, farms etc. After that the gross consumption of energy has increased all the time and was highest in the middle of the decennium of 2000, namely over 400 TWh (90 PJ/a). The downward trend after that is mainly a consequence of the economic slowdown in the forest industry. In year 2009 the whole gross consumption of energy was 370 TWh/a (84 PJ/a) of which wood based was about 1/5.

The main part of wood based energy came from forest industry's by-product. Finland's domestic energy sources are wood-based fuels, hydro power, wind power and peat. In 2007 domestic electricity generation was 77.8 TWh and mainly covered by hydro power, wind power, combined heat and power production in district heating and also by industry for its own use, nuclear power and conventional condensing power. Net imports from the Nordic market and Russia vary considerably from year to year, mainly due to variations in hydro power production in the Nordic countries. In 1990–2007, maximum net imports were 17.0 TWh (in 2005) and the minimum 3.7 TWh (1996). Electricity exports averaged only 0.7 TWh in 1990–2002, but were high in 2003 (7.0 TWh) and 2004 (6.8

TWh) because Sweden and Norway had very scarce hydro resources in those years. In 2007 electricity exports were 2.9 TWh.

Nowadays, an essential element of the Finnish energy system is a large share of combined heat and power production and district heating. In the end of 2010, there were 1.3 million dwellings connected to district heating systems in Finland with 2.6 million customers. The overall share of dwellings connected to district heating was 55 %, that of service buildings 35 % and industry buildings 10 %, respectively.

There are district heating grids in over 200 municipalities and total sales of district heat in Finland are 32.4 TWh. The share of district heating is still growing and a many new customers are shifting to it from oil heating. Even though district heat is used for heating almost half of the Finnish building stock, the market share of district heating continues to increase. Last year, about 4,000 new customers joined the district heating networks. One third of the new customers were those who had changed heating form, mostly from oil heating. The sales of district heating, adjusted with temperature data, and the subscription capacity of customers has increased 2 or 3 percent every year during the last five years. The increase in the number of customers and, consequently, the increase in the network construction is now at the same level as it was in the district heat boom years, in the late 1970s and early 1980s. According to studies conducted during the last few years, the increase in demand for district heat will continue at least until the 2020s. After this, the growth is estimated to level off, due to the significantly smaller demand for heat in new buildings and the increasing availability of solutions that increase energy efficiency.

About 75 % of district heating systems are based on combined heat and power production. Due to the efficiency of combined production, the consumption of fuel and, consequently, emissions to the environment are about 30 percent less than if the energy was produced in separate heat and electricity installations.

Emissions of carbon dioxide are estimated to be about 8 million tons lower compared to separate production of heat and power.

In 2012 09, 29 percent of district heat and CHP electricity was produced with natural gas. The share of coal was 21 percent. The share of peat was 14 percent. The share of renewable energy sources was 22 percent, of which wood accounted for 17 percentage units and other biofuels for 5 percentage units. Five percent was produced with oil, and the share of industrial secondary heat was 1.5 percent.

The share of renewable energy in district heating can essentially be increased by improving the availability of wood energy. District heating and combined heat and power production based on wood can be increased by 6 TWh/a from today, if enough wood will be available on functioning energy wood market.

## 2020 renewable energy targets

- **Overall target:** 38% of share of energy generated from renewable sources in gross final energy consumption;
- **Heating and cooling:** 47% of heat consumption met by renewable sources;
- **Electricity:** 33% of electricity demand met by electricity generated from renewable energy sources;
- **Transport:** 20% of energy demand met by renewable energy sources.

In order to achieve above enlisted targets Finland put in place following measures:

- [Feed-in tariff](#);
- [Long-term Climate and Energy Strategy](#);
- Biofuels promotion through number of different programmes;
- Actions to promote forestry and energy from wood chips;
- Renewable energy and energy efficiency requirements for buildings;

The Finnish government 2020 strategy seeks to increase the share of renewable energies in total final consumption from 28% in 2010 to 38% by 2020, and reach:

- 6TWh of wind power generation by 2020;
- 22 TWh of forest chips utilised as fuel by 2020;

## Feed-in tariff levels

The feed-in tariff for wind, biogas and wood fuel power plants comprises the target price less the three-month mean market price of electricity. The target price is EUR 83.50/MWh. However, wind power plants receive an increased target price of EUR 105.30/MWh until the end of 2015.

The feed-in tariff payable to timber chip power plants is determined according to the three-month mean price of emission rights and the energy tax on peat.

## Methane to Markets Partnership

Finland joined the Partnership in July 2008, seeking to expand its emissions reduction measures and to increase its cooperation with the private sector in areas such as the conversion of methane emissions into energy. Launched by the US Environmental Protection Agency in 2004, the Methane to Markets Partnership is an international initiative to advance cost-effective, near-term reductions of methane emissions. Signatory nations will collaborate with other governments and the private sector to reduce global methane emissions and enhance economic growth, promote energy

security, and improve the environment. Other Partnership aims include improving mine safety, reducing waste, and improving local air quality. The Partnership initially targets three major methane sources: landfills, underground coal mines, and natural gas and oil systems. The Partnership seeks to reduce aggregate annual methane emissions by 50 MtCO<sub>2</sub> equivalent by 2015. Finland is a member of the Partnerships Technical Sub-committees for the landfill and agricultural sectors.

## Biorefine Technology Programme

The Biorefine technology programme was launched in 2007, to target Biomass for power, Bioenergy, Biomass for heat, at both small and large scale. It has a total budget of €130 million.

### The BioRefine programme promotes businesses based on:

- Biomass and biomass refining;
- New value-added products, technologies and services;
- Energy production integrated within industrial processes or products;

### The Goals of the Biorefine Technology programme are:

- To develop innovative new products, technologies and services based on biomass refining and biorefineries;
- To strengthen and expand existing biomass expertise in energy and forest industry to new areas;
- To promote the cooperation between companies from different industrial clusters and sectors for innovation;
- To activate small and medium-sized enterprises to work on niche products and markets;
- To promote the commercialisation of developed biomass products and technologies;
- To build business competence;
- To support pilot projects and demonstrations.

## Energy Aid Scheme

The Energy Aid Scheme was first introduced in 1999, and now has an annual budget of €45 million. Subsidies from the Energy Aid Scheme have been used to steer choices in energy production and use towards reductions in carbon dioxide emissions. The subsidies are granted on a discretionary basis. Subsidies can be granted for both investment and study projects promoting the production and use of renewable energies and energy efficiency. High priority is given to projects promoting the introduction of

new technology, especially those initial commercial-scale installations based on the results of national energy research programmes. Companies and municipalities are eligible for subsidies, which are not granted to residential buildings, farms or projects receiving other state aid. Subsidies can be granted for investment and study projects that:

- increase the use of bioenergy, such as wood (district heating centres and power plants);
- increase the production and processing of indigenous fuels (chippers, pellets, recycled fuels, biogases);
- promote energy conservation or improve the efficiency of energy production or use;
- promote the production or use of other renewable energy (solar and wind power, small-scale hydropower, heat pumps);
- reduce the environmental hazards caused by energy production or use;
- other methods to enhance the security and versatility of energy supply.

In 2006, new policies were adopted with respect to granting energy aid. In accordance with these policies, other forms of investment support were discontinued in the emissions trading sector except for those granted for new technology projects. These are designed to help firms participating in the EU emissions trading scheme to meet their emissions reductions. Financing and provision of advice for start-ups and growing companies is provided, aiming to support the early stage of development in enterprises. However, outside the emissions trading sector, support is still being granted for investment projects in conventional technologies. For energy efficiency investments, in order to qualify for a subsidy, energy saving investments must be quantified, reported in audits, analyses or other comparable reporting tools. Priority is given to projects that conserve electricity. Subsidies for power conservation are considered only if the concurrent energy saving is significant or reduction of emissions is otherwise notable. Subsidies are not granted for alternative heating methods, except in cases where the upgrade is for renewable energy sources. It is also worth noting that support for wind power investments continues, but only for projects applying new technologies. Maximum percentages of energy aid Energy aids share of eligible costs may be no more than:

- 40% in energy audits, wind or solar energy, investment projects concerning renewable energy or energy conservation based on new energy technology
- 30% in other investment projects concerning renewable energy or energy conservation, or investment projects reducing environmental hazards
- 25% in investment projects promoting the security and versatility of energy supply.

For energy audits, a maximum subsidy amount of 50 % can be granted to those municipalities within the Voluntary Energy Conservation Agreement Scheme (1997-2007).

The Energy Aid Scheme is closely linked to the implementation of several energy policy action programmes. The key programmes are the new National Climate and Energy Strategy (submitted to the Parliament in 2008), Action Plan for Renewable Energy Sources (2003), Action Plan for Energy Efficiency (2003) and the Energy Efficiency Agreement Scheme (2008-2016).

## United Kingdom



Energy policy is now aimed at delivering the twin imperatives of security of energy supply and protection of the environment, particularly the deceleration of climate change by stabilising emissions of carbon dioxide (the major greenhouse gas) at levels which will restrict a global temperature rise to 2°Celsius or less.

The latest EU targets are for 20% renewable energy and a 20% reduction in greenhouse gas (GHG) emissions across the whole of the EU by 2020.<sup>22</sup> The UK's 15% renewable-energy target,<sup>23</sup> which implies a contribution of 40% renewable electricity<sup>24</sup> (as fossil fuels for transport and heating are harder to substitute), will be challenging. BERR's latest modelling for the UK, with banded ROC inputs included, gives an anticipated figure of 14% renewable electricity by 2020. This does not even approach the contribution to which the UK is legally committed. It emphasises the urgency of producing a robust energy strategy which has firm foundations in engineering, technical and fiscal probabilities. Uncertainty in energy policy has severely hindered progress.

Renewable-energy policy fares no better, than the other sectors. Developed in a piecemeal fashion, there is no overarching strategy for integrating renewable energy into total energy use. Particular sectors and technologies are being targeted by different policy instruments – the renewables obligation only targets technologies aimed at power generation, the renewable fuel obligation is aimed to encourage the use of biofuel in the transport sector, the Climate Change Levy targets use of fossil-fuel energy in the commercial sector (and large-scale hydro and nuclear power), the EU Emission Trading Scheme is aimed at capping and reducing carbon emissions from large organisations, while the forthcoming Carbon Reduction Commitment Scheme is aimed at improving energy efficiency across businesses not covered by the ETS and Climate Change Agreement.

Other countries have similar problems but have been more successful than the UK in promoting renewables, particularly Spain and Germany where feed-in tariffs have been applied. Without an all-embracing policy on renewable, over the entire energy spectrum

(heating, cooling, transport and electricity) the UK will struggle to get near the objectives on total energy use.

Policy vacillation is primarily responsible for leading the UK into the unenviable position of facing the multiple problems of ageing nuclear power plants, the premature closure of coal fired stations due to the EU Large Combustion Plant Directive (LCPD), and an under-performing renewables sector, all of which will accelerate the dependency on gas imports from unstable political regimes, all subject to volatile global markets.

The UK stands to lose 23GW<sup>29</sup>, a third of the generating capacity, by 2020. Yet CO<sub>2</sub> emissions are still rising.

It is now clear that renewable energy will have to play an increasingly important role in providing CO<sub>2</sub>-free electricity, but the best that can be hoped for by 2020 is 14% of UK electricity. The notion that the nuclear contribution to CO<sub>2</sub>-free electricity can be replaced by renewables, particularly wind, does not stand up to scrutiny. Renewable electricity currently contributes 8% of the total supply, of which hydro is 25.5%, landfill gas is 25.5%, wind 23% and 27% from other sources. The Renewables Advisory Board has pointed out that the UK will be lucky to get to 6% renewable electricity.

The progressive loss of the nuclear, CO<sub>2</sub>-free component, will present the additional challenge of simply replacing one CO<sub>2</sub>-free source with another, while making no inroads on gas and coal.

It would take 3,200 new 3MW turbines just to replace Scotland's two nuclear stations, which currently provide 40% of Scotland's electricity (and there are no plans to rebuild these stations). The unpredictable and intermittent nature of wind will create further problems associated with grid management.

To date there has been strong growth in using biofuels, landfill gas and co-fired biomass, in addition to onshore wind, to generate electricity. But growth rates lag well behind target obligation levels. The banding approach for ROCs, designed to allocate subsidy more efficiently to a wider range of technologies than the current system, is aimed at providing more support for emerging technologies such as marine renewables, tidal stream and wave power. These are as yet immature but are deemed to have potential.

Decarbonising heat remains a key long term priority for Government. Building on the 2012 publication *The Future of Heating: A Strategic Framework for Low Carbon Heat in the UK*<sup>121</sup>, DECC published in March 2013, a paper *The Future of Heating: Meeting the Challenge*<sup>122</sup>, setting out specific actions to support the long term transition to low carbon heating, including but not limited to renewable heating systems.

The Government remains committed to delivering a significant contribution to the 2020 target from renewable heat. Since September 2012, the Government has consulted on

new tariffs for both domestic and non-domestic heat consumers and committed budget for the renewable heat incentive to 2015/16, the last year of existing Spending Review commitments.

In 2013, around 17.6 TWh was generated from all renewable heat sources, an increase of 8% on the previous year. The sector is continuing to see some growth, following a decline that started more than 10 years ago as a result of tighter emission controls which discouraged on-site burning of biomass, especially wood waste. Since their 'low point' in 2005, bioenergy use has more than doubled to 14.2 TWh; the increase between 2011 and 2013 was 9%.

DECC analysis suggests that by 2014/15 the RHI is expected to add a further 3.5 TWh of renewable heat. This is expected to rise more quickly during the latter part of the decade and will continue to play a key part in the UK reaching its 2020 target.

The Renewable Heat Incentive is the primary tool for driving the transition to renewable heat. It is administered by Ofgem who published their first statutory report on the RHI in July 2013.

With the introduction of the domestic RHI in 2014, DECC expects to see double the number of new installations seen under the RHPP in the first year of the RHI scheme and by 2020/21 expects to support up to 750,000 renewable heating systems in homes. In the non-domestic sector, they are expecting the new tariffs to lead to a significant increase in uptake.

## The Domestic RHI

In July 2013 the Government published its response to the consultation on the domestic RHI – alongside the policy statement – '*Renewable Heat Incentive: the first step to transforming the way we heat our homes*'.

The policy statement outlined the design of the scheme, including details of eligible technologies and applicants, tariff payments and other qualifying criteria. The scheme links to DECC's Green Deal and applicants are required to complete a Green Deal Assessment before submitting their application. The tariffs have been set at a level that reflects the net cost of renewable heat generation over 20 years and are designed to compensate households for some of the risks of installing renewable heating systems, which may otherwise act as a barrier. It is intended that the scheme will open for applications in spring 2014 subject to Parliamentary and State Aid approval.

An additional 47 MW electrical capacity of new biomass and energy from waste CHP came online in 2012/13, supplying some 34 GWh of heat. This brings total operational UK capacity to 240 MW, supplying 1,410 GWh of heat per year. In addition, certifications to

the CHPQA programme show a further increase in biomass and energy from waste CHP in the pipeline.

## Scotland



Scotland is part of the UK and as such is subject to EU legislation and Directives. Whenever the EU issues a directive, on a subject for which Scotland has responsibility under devolution, it is up to the Scottish Government to transpose it. Energy is a devolved matter.

Scotland accounts for around nine per cent of the UK's total energy consumption, but is rich in energy resources. The great majority of the UK's oil production and around half of its gas production comes from fields based in the continental shelf around Scotland, and mines in Scotland are responsible for around a quarter of the UK's coal production.

Scotland's practical offshore renewables resource has been estimated at 206 GW. By harnessing around a third of this resource, installed offshore renewables capacity could reach 68 GW by 2050 - more than ten times our peak demand. In particular, Scotland's wind and seas hold some of the most concentrated potential in the world, with an estimated 25% of Europe's offshore wind and tidal potential and 10% of wave potential. Around 20 per cent of the electricity generated in Scotland is exported to the rest of the UK and our renewables capacity continues to rise. With nearly 7 gigawatts of renewable energy now either installed or in the pipeline, we are well on our way to meeting our baseline target - for renewables to generate the equivalent of 100 per cent of gross annual electricity demand by 2020.

### Biomass

Scotland has a potentially huge wood fuel resource arising from its forests and associated timber resource (more information can be found at the [Use Wood Fuel website](#) ). Biomass energy could be extremely valuable in Scotland, given its lack of intermittency, its ability to meet local and small-scale energy needs and its potential to provide and sustain jobs. Biomass has a big part to play in the [Renewable Heat Action Plan for Scotland](#) , published on 5 November 2009.

The Scottish Government strongly advocates the deployment of biomass in heat-only or combined heat and power schemes, generally prioritised in off gas-grid areas, at a scale appropriate to make best use of both the available heat, and of local supply.

Such siting and scaling of development is vital if we are to stand any chance of meeting our 2020 renewable heat target which depends heavily on biomass. Further reasoning on this is set out in the [Draft Electricity Generation Policy Statement](#).

The Scottish Government provides some free advice for the installation of biomass heating. Householders and small businesses can get help and information about finance options by calling the Energy Saving Scotland Advice Network on 0800 512 012. Not-for-profit community based organisations can get advice under the [Community And Renewable Energy Scheme](#) by calling 01349 860120.

In addition, the [results of the final round](#) of the [Scottish Biomass Heat Scheme](#) were announced on 23 December 2010. Future support for biomass heat projects will primarily be by way of the forthcoming [Renewable Heat Incentive](#), which is being introduced at a UK level.

## Grants for Biomass

### Scottish Biomass Heat Scheme

The Scottish Government aims to build a commercially viable, diverse renewable heat industry in Scotland in support of our 2020 renewable energy target of 11% of heat demand to come from renewable sources. With this in mind, the Scottish Biomass Heat Scheme was launched on 6 October 2008.

The £3.3 million Scottish Biomass Heat Scheme is Scotland-wide, funded by Scottish Government, Forestry Commission Scotland and the European Regional Development Fund (ERDF). Of this, £1.3 million is available in the Highlands & Islands area and £2 million in the Lowlands & Uplands Scotland area.

The successful projects under the [final round](#) of the Scottish Biomass Heat Scheme were announced on 23 December 2010. The results of the [first](#), [second](#) and [third](#) rounds are also available for viewing.

The projected capacity for projects awarded grant under the SBHS is about 14 MWth, with annual CO<sub>2</sub> savings of over 14,000 tonnes.

## Heat

### The Draft Heat Generation Policy Statement

A draft Heat Generation Policy Statement, [Towards decarbonising Heat: Maximising the Opportunities for Scotland](#), was published at the beginning of March 2014. It sets out

how low carbon heat can reach more householders, business and communities and a clear framework for investment in the future of heat in Scotland.

The draft Policy Statement discusses how Scotland might [reduce the amount of energy](#) used for heat, diversify sources of heat, provide increased security of heat supply, along with greater local control and reduce the pressure on household energy bills. It sets out the Scottish Government's heat hierarchy, a step phased approach, firstly reducing the need for heat through better insulated buildings; secondly by ensuring an efficient heat supply, such as development of the district heating sector and the use of unused excess heat through heat recovery, and lastly through the effective use of renewable or low carbon heat sources.

It also discusses how Scotland might stimulate potential investment to deliver decarbonised heat through growing and emerging sectors, such as district heating and geothermal. It proposes setting targets for district heating in Scotland (40,000 homes benefitting from District Heating by 2020 with an overall target of 1.5 TWh of district heating to be delivered to business, industry and domestic premises by 2020). Responses to the consultation will be analysed before finalising the Heat Generation Policy Statement in 2015.

To help inform the draft Heat Generation Policy Statement, the Scottish Government commissioned a [forward projection model](#) to explore possible scenarios for largely decarbonising the heat system in Scotland up to 2050. The model examines how different measures change the thermal performance of building stock and impact on the demand and supply of heat and subsequent greenhouse gas emissions.

## A Heat Vision for Scotland

In January 2013 the Scottish Government published a [Draft Outline Heat Vision and Draft Heat Deployment Options Guidance](#) alongside the Second Report on Policies and Proposals. The heat vision brings together policy on heat across government to contribute to the Scottish Government's Economic Strategy's strategic objective to make the Transition to a Low Carbon Economy. Further actions are included in the draft Heat Generation Policy Statement.

## Renewable Heat in Scotland

A [report](#) produced by the Energy Saving Trust on behalf of Scottish Government shows Scotland is continuing to make good progress towards its target for 11 per cent of heat to come from renewables. Using the original methodology, in 2012 Scotland produced enough heat from renewables to meet 4.1% of the forecast non-electrical heat demand in 2020.

Following consultation with stakeholders the Scottish Government recently improved the way it measures progress towards the renewable heat target. Using this improved methodology allows an estimate of progress based on the current level of heat demand as opposed to a projection for 2020. 2011 is the latest available estimate due to a lag in the final energy consumption data for Scotland published by the Department of Energy and Climate Change (DECC). Non-electrical heat demand in Scotland in 2011 was estimated to be 86,800GWh. Renewable heat output in 2011 was estimated to be 2,263GWh. Therefore, Scottish Government estimate that renewable heat generation in 2011 equated to 2.6% of Scotland's non-electrical heat demand in 2011. As heat demand in 2011 is higher than the forecast heat demand in 2020, this results in a lower percentage of renewable heat generation. To ensure transparency the Scottish Government will publish both measures in parallel, for a transitional period, as the evidence base regarding heat use in Scotland is continuously being improved.

The Climate Change (Scotland) Act 2009 requires Scottish Ministers to produce a plan for the use of renewable sources and to report regularly on progress. A [Renewable Heat Action Plan](#) was produced in November 2009 and [updated in 2010](#). It was [refreshed](#) again in 2011 with new actions and details. The draft Heat Generation Policy Statement published for consultation in March 2014 sets out the Scottish Government's proposed comprehensive framework to largely decarbonise the heat sector by 2050.

### District Heating Loan Fund

**The District Heating Loan Fund offers loans to support the development of district heating networks in Scotland.** The scheme is available to provide loans for both low carbon and renewable technologies in order to overcome a range of infrastructural issues and costs of developing these projects. Details of [successful projects](#) can be found here: [District heating loans](#) and [£2.5 million to boost district heating](#)

Further information on accessing the scheme is available from the [Energy Saving Trust](#).

### Expert Commission on District Heating

A report from the Expert Commission on District Heating has now been published, setting out their recommendations to the Scottish Government. The Commission was established earlier this year, with a remit to advise Scottish Government on the steps we need to take to ensure a major move to district heating in Scotland.

The £103m Renewable Energy Investment Fund and £50m Warm Homes Fund have set District heating as a funding priority, and we are developing a Sustainable District

Heating Partnership to achieve a coordinated approach to funding and support for district heating.

REIF has been specifically designed to complement the funding available through the Green Investment Bank (GIB). Capitalised with £3 billion, the GIB prioritises different areas of renewables to REIF and focuses on technologies closer to commercial realisation. 27% of the eligible heat under the non-domestic RHI has been generated in Scotland, which has received 20% of the value of RHI payments to date.

In 2010/11, £1.1m in loans was paid out to six district heating projects through the District Heating Loans Fund and a further £2.5m for 10 projects was announced on 1 October 2012. An additional £5m has been allocated to allow the district heating loan scheme to continue over the next two years.

In 2012/13, we awarded £2.67 million in Scottish Government grant funding to 3 demonstration projects which will accelerate the expansion of district heating in Scotland. Includes capital grants for the expansion of district heating networks in Glasgow - Wyndford Estate and the Commonwealth Games Village - both of which will help take social housing tenants and homeowners out of fuel poverty. Additionally, Fife Council were awarded funding to develop the proposed extension of the Dunfermline District Heating Scheme (including additional opportunities identified using the Fife heat map).

We recently announced a £5m boost to the Energy Saving Scotland Home Renewables Loan Scheme and an increase in the maximum loan for renewable heat technologies, for homeowners to install domestic renewables systems.

We announced a National Retrofit Programme of £65 million per year to improve the energy efficiency of Scotland's housing stock, address fuel poverty and reduce carbon emissions. Local authorities will have a central delivery role in this programme which will attract significant investment from the Energy Company Obligation creating total investment potential of around £200m per year

European Structural Funds, the Scottish Partnership for Regeneration in Urban Centres (SPRUCE) and the £50 million JESSICA investment fund are also helping to leverage in additional finance to energy efficiency and regeneration projects which can bring further growth to the heat sector.

Scottish Enterprise also has a range of innovation and research and development grants. These are available to businesses of all sizes for research and development, co-investment and technological innovations. Scottish Enterprise provides guidance on the most appropriate grant for businesses and supports them throughout the application process.

We recognise a supportive planning framework is essential to achieving our ambitions on heat. That is why we are currently preparing updates to our online planning advice on planning and heat, and are considering planning and heat in review of NPF and SPP.

## Northern Ireland



Northern Ireland is in a similar legislative position to Scotland, in that it is part of the UK, and bound by EU legislation, but energy responsibility is devolved to the Local administration.

The Department of Enterprise, Trade and Investment is working closely with the Scottish Government, as well as with the Department of Energy and Climate Change (DECC) and the Irish Government, to promote development of renewable energy resources wherever joint action can maximise their potential.

An example of this productive cooperation was agreement of the All-island Energy Market Framework with the Irish Government in 2004. The initial emphasis on market development within the European Union Internal Market has, in turn, led to joint action on marine energy and grid infrastructure. The latest collaboration on issues such as strategic environmental assessments, off-shore electricity grids and marine energy, clearly demonstrate the benefits of thinking strategically and regionally.

Within the island of Ireland, the most significant policy intervention on electricity matters, in recent years, has been the creation of the Single Electricity Market (SEM), which began cross-border trading in wholesale electricity in November 2007. It is already promoting greater competition; enhancing security and diversity of supply; and bringing efficiencies and economies of scale. As a result Northern Ireland is now seeing increased investment in power generation and a greater number of electricity suppliers entering the market.

Customer switching or “churn” among business consumers has been increasing steadily since 2007. The Single Electricity Market has also set a workable framework for cooperation between Member States and the development of regional markets in Europe.

There is general consensus that greater quantities of renewable energy are now an imperative for Northern Ireland. The position on the western periphery of Europe, with few fossil fuel resources, creates a near 100% dependence on imports to meet energy requirements.

## Ireland



The National Renewable Energy Action Plan (NREAP) sets out the Government's strategic approach and concrete measures to deliver on Ireland's 16% target under Directive 2009/28/EC. The development of renewable energy is central to overall energy policy in Ireland.

Renewable energy reduces dependence on fossil fuels, improves security of supply, and reduces greenhouse gas emissions creating environmental benefits while delivering green jobs to the economy, thus contributing to national competitiveness. The Government's commitment to accelerating the development of renewable energy is set out in the Government's Energy Policy *'Delivering a sustainable energy future for Ireland – The Energy Policy Framework 2007-2020'*; the Programme and in the Government's strategy *'Building Ireland's Smart Economy – A Framework for Sustainable Economic Renewal.'*

Climate change, energy security and competitiveness are inter-related challenges that will be addressed through the transforming of Ireland's economy from one based on fossil fuel dependence to a low carbon economy based around energy efficiency, renewable energy and smart networks.

The Government's ambitions for renewable energy and the related national targets are fully commensurate with the European Union's energy policy objectives and the targets addressed to Ireland under the Renewable Energy Directive. Ireland's energy efficiency ambitions (20% by 2020) as set out in the National Energy Efficiency Action Plan are duly reflected in the NREAP.

### Electricity

The Government has set a target of 40% electricity consumption from renewable sources by 2020. In the last 5 years in particular, Ireland has made big strides in accelerating renewable generation. In the 2001 European RES-E Directive, Ireland was set a target of moving from 3.6% RES-E to 13.2% RES-E by 2010. Ireland achieved 14.4% RES-E in 2009 and is on track to exceed the national target of 15% in 2010.

All key national entities, including the Energy Regulator, the distribution and transmission system operators and the renewable energy sector are working with the Government to deliver the 2020 target through grid connection and grid development strategies. The significant growth in electricity from renewable sources in recent years is largely attributable to onshore wind. As Ireland moves towards achieving circa 40% RES-E by

2020, the Irish grid is increasingly have to cope with the challenges posed by large amounts of intermittent power.

As outlined in the plan, the Irish Transmission System Operator, EirGrid, is involved in detailed examination of the issues and is pioneering several renewables facilitation studies with a view to ensuring the appropriate management of the grid and stability of the electricity system during this transition. The all-island Single Electricity Market, overseen by the regulatory authorities North and South, is evolving continuously to take account of the growth in renewable energy.

Together with the significant contribution of large scale generation, the introduction of a robust framework for the development of a vibrant microgeneration sector is an important component of building societal acceptance of energy infrastructure.

## Bioenergy Support Programmes

### SEAI Energy RD&D Programme 2014

SEAI invited proposals from business, academic and public sector organisations located in Ireland for carrying out sustainable energy research, development and demonstration (RD&D) projects in 2014. This programme supports technology RD&D, field research and feasibility studies that contribute to sustainable energy goals and objectives. SEAI, in this call for proposals, seeks to promote research into technologies and options best suited to Ireland's own resources and needs. Projects were required to be completed by 31st October 2014.

### Forestry Grants

Local Forestry Advisers provides private landowners with free, independent and objective advice and help answer the following questions about how a forest enterprise can improve farm and household income

- The [Afforestation Grant and Premium Scheme](#), the [Forest Environment Protection Scheme \(FEPS\)](#) and the [Native Woodland \(Establishment\) Scheme](#) are available from the [Forest Service](#) of the Department of Agriculture, Food and the Marine. The grants available in these schemes generally covers all of the costs associated with the establishment and early management of a forest. The rate of afforestation grant and annual forest premium available under these schemes depends on the quality of the land and the type of tree species it can grow.
- The Afforestation Grant and Premium Scheme provides planting and establishment grants as well as annual premiums for new afforestation projects that are compliant with national and EU legislation, operational and

environmental guidelines. The scheme is open to farmers and non-farmers. Forests established under this scheme must meet full silvicultural standards and must be managed as a commercial crop for the realisation of a profit.

The First Instalment of the grant (75%) is payable after the planting stage and includes operations such as ground preparation, drainage, fencing and planting.

The Second Instalment (the remaining 25% of the grant) is paid four years after planting, once the trees have become fully established and are free-growing. This payment covers maintenance works that will often be required (e.g. vegetation management, the replacement of failures). Annual forest premium payments are payable for a period of 20 years in the case of farmers, or 15 years for non-farmers.

Grants range from €2,400/ha to €5,500/ha dependent on tree species and soil type.

Annual forest premiums are available to compensate farmers and non-farmers for the loss in income earning potential from the afforestation of their land. New entrants are entitled to forestry premiums ranging from €126/ha to €515/ha dependent on tree species, soil type and farmer status. This premium is payable for a period of up to 20 years in the case of farmers or 15 years for non-farmers.

#### [Forest Environment Protection Scheme \(FEPS\)](#)

In order to receive a FEPS payment, the applicant must be in Rural Environmental Protection Scheme (REPS) at the time the FEPS payment is due. There is no link between FEPS and AEOS. REPS (Rural Environment Protection Scheme), is a Scheme designed to reward you for farming in an environmentally friendly manner. One of its aims is to improve the environment on existing farms. \*Glas Scheme will replace this in new RDP 2014-2020. Since July 2009, REPS has been closed to new entrants. However, all of the participants who entered in 2009 are due to remain in it for the full 5 years.

The [Agri-Environment Options Scheme \(AEOS\)](#) was set up in 2010 to replace REPS.

There is a different emphasis within the objectives of FEPS when compared to the Afforestation scheme, the main one being; 'to encourage farmers to establish and maintain high nature value forestry through measures such as increasing biodiversity and protecting water quality'. Producing commercial timber is also listed as an objective of FEPS but the strong emphasis is on the environment.

The FEPS premium is payable in addition to the existing Afforestation Scheme grants and premium. This means that the 20-year forestry premium will also apply together with the 100% grant for planting. A landowner will receive a FEPS premium of €200/ha of woodland planted, regardless of farm size, subject to a minimum of eight hectares being planted. Owners of REPS farms of 30 hectares and less will receive a FEPS premium of

€150/ha planted. A local Forestry Adviser provides private landowners with free, independent and objective advice and can help you answer the following questions:

How a forest enterprise can improve farm and household income

Timber and non-timber benefits

Applying for the higher “farmer” rate of premium

The effect on other farm schemes

How to get the job done right first time

- The [Afforestation Grant and Premium Scheme](#), the [Forest Environment Protection Scheme \(FEPS\)](#) and the [Native Woodland \(Establishment\) Scheme](#) are available from the [Forest Service](#) of the Department of Agriculture, Food and the Marine. The grants available in these schemes generally covers all of the costs associated with the establishment and early management of a forest. The rate of afforestation grant and annual forest premium available under these schemes depends on the quality of the land and the type of tree species it can grow.
- **The Afforestation Grant and Premium Scheme**
- This scheme provides planting and establishment grants as well as annual premiums for new afforestation projects that are compliant with national and EU legislation, operational and environmental guidelines. The scheme is open to farmers and non-farmers. Forests established under this scheme must meet full silvicultural standards and must be managed as a commercial crop for the realisation of a profit.

The First Instalment of the grant (75%) is payable after the planting stage and includes operations such as ground preparation, drainage, fencing and planting.

The Second Instalment (the remaining 25% of the grant) is paid four years after planting, once the trees have become fully established and are free-growing. This payment covers maintenance works that will often be required (e.g. vegetation management, the replacement of failures).

Annual forest premium payments are payable for a period of 20 years in the case of farmers, or 15 years for non-farmers.

Applications are submitted to the [Forest Service](#) (Department of Agriculture, Food and the Marine), and approval is issued following assessment. The first instalment is then paid after planting, subject to adherence to scheme conditions and various environmental guidelines.

Grants range from €2,400/ha to €5,500/ha dependent on tree species and soil type.

**Annual forest premiums** are available to compensate farmers and non-farmers for the loss in income earning potential from the afforestation of their land. New entrants are entitled to forestry premiums ranging from €126/ha to €515/ha dependent on tree species, soil type and farmer status. This premium is payable for a period of up to 20 years in the case of farmers or 15 years for non-farmers.

### [Forest Environment Protection Scheme \(FEPS\)](#)

In order to receive a FEPS payment, the applicant must be in Rural Environmental Protection Scheme (REPS) at the time the FEPS payment is due. There is no link between FEPS and AEOS.

REPS (Rural Environment Protection Scheme), is a Scheme designed to reward you for farming in an environmentally friendly manner. One of its aims is to improve the environment on existing farms. \*Glas Scheme will replace this in new RDP 2014-2020! Since July 2009, REPS has been closed to new entrants. However, all of the participants who entered in 2009 are due to remain in it for the full 5 years.

The [Agri-Environment Options Scheme \(AEOS\)](#) was set up in 2010 to replace REPS.

There is a different emphasis within the objectives of FEPS when compared to the Afforestation scheme, the main one being; 'to encourage farmers to establish and maintain high nature value forestry through measures such as increasing biodiversity and protecting water quality'. Producing commercial timber is also listed as an objective of FEPS but the strong emphasis is on the environment.

The FEPS premium is payable in addition to the existing Afforestation Scheme grants and premium. This means that the 20-year forestry premium will also apply together with the 100% grant for planting. A landowner will receive a FEPS premium of €200/ha of woodland planted, regardless of farm size, subject to a minimum of eight hectares being planted. Owners of REPS farms of 30 hectares and less will receive a FEPS premium of €150/ha for plantations between five and eight hectares in size.

### REFIT 3

REFIT 3 is designed to incentivise the addition of 310MW of renewable electricity capacity to the Irish grid. Of this, 150MW will be High Efficiency CHP (HE CHP), using both Anaerobic Digestion and the thermo-chemical conversion of solid biomass, while 160MW will be reserved for biomass combustion and biomass co-firing. Plants must be new plants in all cases, neither fully commissioned nor operational on 1/1/2010, except where biomass is co-fired with peat in an existing plant. Projects must be operational or substantially complete within 9 months of the end of 2015.

Up to 15 years or until 2030, Tarriff rates:

Biomass-CHP  $\leq 1500$  kW €140/MWh

Biomass-CHP  $> 1500$  kW €120/MWh

Biomass Combustion (including co-firing in existing plant\*[subject to a change in the Refit terms and conditions to permit this]):

For using energy crops €95/MWh

For all other biomass €85/MWh

Limits

Biomass CHP: 100MW

Biomass Combustion (including co-firing in existing plant\*subject to a change in REFIT terms and conditions to permit this): Until 31st December 2015 160MW



**Action Renewables**  
*the future of energy, today*



# BioPAD



Bioenergy Proliferation and Deployment

[www.BioPAD.eu](http://www.BioPAD.eu)

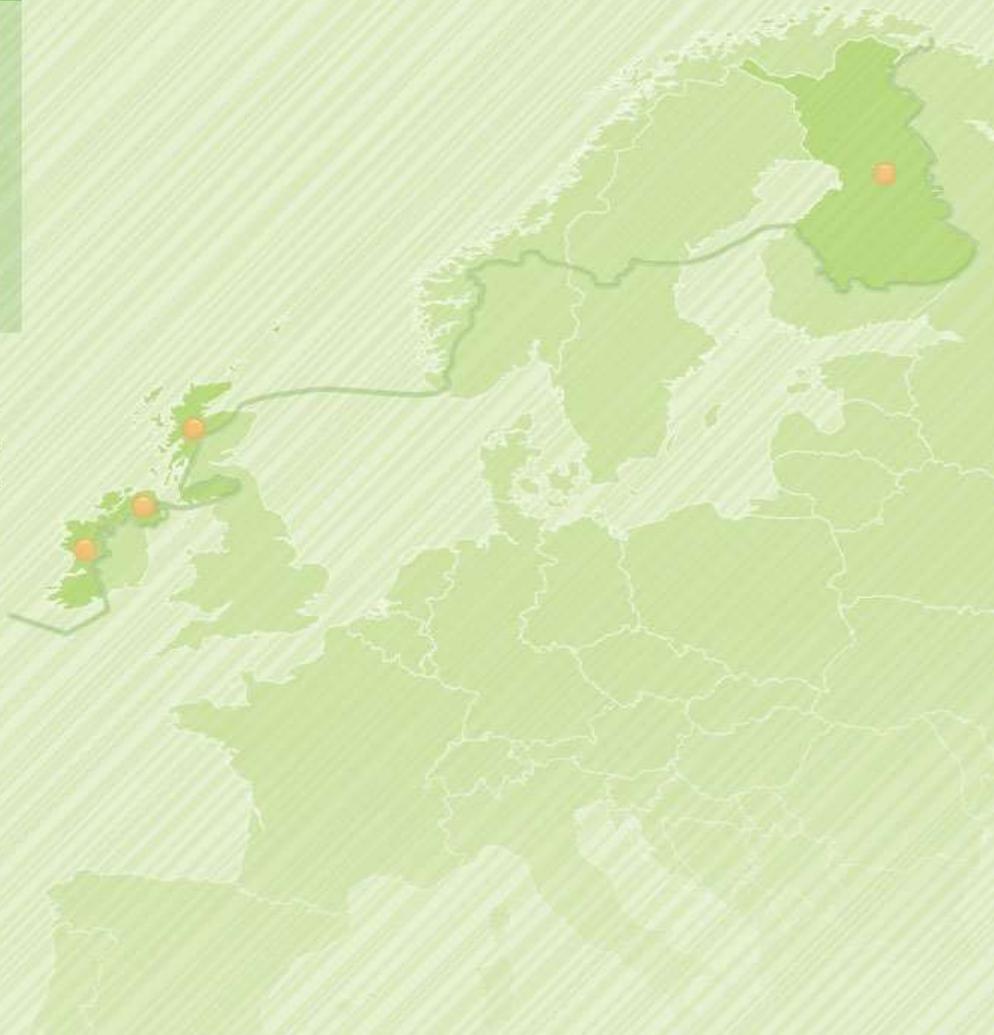
**Contact:**

Western Development Commission,  
Dillon House, Ballaghaderreen,  
Co. Roscommon.  
Tel: +353 (0)94 986 1441  
Email: [info@biopad.eu](mailto:info@biopad.eu)

BioPAD is promoting the wider use of bioenergy and developing applications targeting the whole process from supplying fuel to producing energy.

The project is led by the Western Development Commission (Republic of Ireland) and brings together partners from Northern Ireland (Action Renewables), Scotland (Environmental Research Institute) and Finland (Finnish Forest Research Institute, Metla).

BioPAD is funded by the Northern Periphery Programme [www.northernperiphery.eu](http://www.northernperiphery.eu) of the European Regional Development Fund (Interreg IVB).



**Northern  
Periphery  
Programme**  
2007–2013

Innovatively investing  
in Europe's Northern  
Periphery for a sustainable  
and prosperous future



European Union  
European Regional Development Fund



WESTERN DEVELOPMENT COMMISSION  
COORDINÓN POBODIATHA AN IMREATHA

**METLA**



**Action Renewables**  
the future of energy, today

