

The Voice of the Irish Bioenergy Industry, working towards a Sustainable Energy Future



The role of Bioenergy in a Programme for Economic Recovery through Sustainable Development

April 2020

...Climate Emergency.....Job Creation.....Fuel Savings.....Balance of Trade.....Rural Regeneration....

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1 Bioenergy: meeting the challenges of climate change & sustainable development

BioEnergy is a thriving industry across Europe, and one that Ireland needs to fully embrace. In challenging times it is vital to exploit all proven opportunities to tackle climate change, renew and expand well paid and secure employment and enable security of energy supply. Despite the fact that Ireland has a natural advantage in producing bioenergy due to our mild climate and fertile land, out of 28 member states Ireland is 27th in terms of its use of renewable heat (SEAI). We have a unique opportunity to build a significant industry with multiple benefits.

Climate emergency Biomass fuels that replace fossil fuels reduce greenhouse gasses (GHG) by as much as 96%, where forests are sustainably managed and regenerated.

Job creation Bioenergy requires input from the farmer/forester, harvester, processor and distributor. EU and SEAI studies have shown that bioenergy creates many times more local employment than fossil fuels.

Fuel cost savings Bioenergy, over the long run delivers up to 50% fuel cost savings when compared with fossil fuels.

Ireland's trade balance Ireland currently spends over €7.0 billion on imported oil, coal and gas. Replacing fossil fuels with indigenous energy enhances Irelands balance of trade.

Rural Regeneration A minimum of 80% of the spend on bioenergy stays within 100km of the consumer, leading to sustained rural populations and a sustained rural economy.

KEY POINT

Ireland currently derives 4% of its energy from bioenergy, this needs to rise to 15% by 2030 with further deployment beyond to meet Paris Agreement targets, the potential for economic recovery through quadrupling our bioenergy industry is a remarkable opportunity.

While this document is focused on using bioenergy in the transition away from fossil fuels we acknowledge that building a sustainable economic and social recovery should embrace related renewable technologies as well achieving the development of sustainable materials and the protection of our ecosystems. Essentially we need to marshal a wide range of technologies and renewable fuels to decarbonise the energy sector.

2 Summary of proposed Bioenergy measures

Bioenergy initiatives provide the new Government with a major opportunity to make progress on Climate Action in a relatively short timeframe, while stimulating the rural economy strongly in a post Covid19 world.

IrBEA strongly advocates that several bioenergy measures and supports be included in the new Programme for Government, specifically.

- A. We are calling for greater resources to be brought to bear to fully implement the SSRH, to expand the timescale, size and scope of the support scheme via a ring-fenced budget allocation, allied to aggressive promotion.**
- B. We are also advocating, mandatory renewable heating use to be in place by all public bodies by 2035.**
- C. We are calling for the statutory regulation of wood fuels in accordance with the international wood fuel standard - ISO 17225 – especially as it applies to moisture content, in order to deliver cleaner air and enhance public health.**
- D. We are calling for Government to re-establish the Energy Crops scheme as a matter of urgency to assist in meeting demand, to promote diversification of agriculture and to provide alternative income for farmers.**
- E. We are calling for the proposed Biogas support scheme detailed in the IrBEA/ Cré policy paper¹ to be implemented.**
- F. We are calling for the Renewable Electricity Support Scheme (RESS) to ringfence funding for modern bioenergy-based technologies such as combined heat and power, providing efficiencies up to and above 90%. Importantly these technologies have the added advantages of providing dispatchable power with grid stability benefits, community involvement and rural development in line with existing climate change policies.**
- G. We are calling for an immediate transition to E10 petrol, which comes at no extra cost to the consumer or the exchequer and requires no investment in or change to infrastructure or vehicles.**
- H. In line with Renewable Transport Targets we are calling for strong support for biomethane as a fuel for vehicles. This support is best placed in terms of a fuel price support to encourage the heaviest users of fuel to convert – thus maximising a proven environmental benefit.**

¹ IrBEA Biogas Policy Paper https://www.irbea.org/wp-content/uploads/2019/08/IrBEA-Cre-Biogas-Policy-Paper-Final_1.pdf

3 What is Bioenergy and what can it achieve?

Bioenergy is any biological material that is used to produce renewable energy, this includes wood and wood products at end of life, crops, liquid biofuels (ethanol, plant oils), and waste materials.

Biomass – Solid biological material such as wood, leaf, seeds, offal

Biofuel – a liquid or gas bio derived fuel. E.g. Bioethanol, biodiesel, biogas, biomethane

3.1 Sustainability controls & Recognition of Bioenergy's role in tackling Climate Change

3.1.1 Renewable Energy Directive – Recast to 2030 (RED II)

Under the EU RED II directive all bioenergy is subject to stringent controls on sourcing to ensure that bioenergy on the market is sustainably sourced. Governments across the EU can now have full confidence in using RED II compliant biomass and biofuels.

3.1.2 SEAI Sustainability Criteria Study²

SEAI issued a comprehensive study on the Sustainability Criteria required for bioenergy, this study forms a basis for ensuring sources of bioenergy meet RED II criteria for sustainability.

3.1.3 IPCC Land and Climate report 2019³

There is broad scientific consensus that meeting the Paris Agreement goals will require increased levels of forest cover and the use of bioenergy. This imperative is set out in the IPCC *Land and Climate report 2019* (p 22 Summary for Policy Makers), which says:

B.7 *Future land use depends, in part, on the desired climate outcome and the portfolio of response options deployed (high confidence). All assessed modelled pathways that limit warming to 1.5°C or well below 2°C require land-based mitigation and land-use change, with most including different combinations of reforestation, afforestation, reduced deforestation, and bioenergy (high confidence).*

3.1.4 Zero carbon energy system pathways for Ireland in line with the Paris Agreement⁴

This comprehensive report carried out by Glynn,J., Gargiulo,M., Chiodi,A., Deane,P., RoganF., ÓGallachóir,B., lays out the challenge of ZERO 2050, and how Ireland needs to go from 3.4 TWh bioenergy in 2010 to 55 TWh bioenergy in 2050, a 16 fold increase.

²<https://www.seai.ie/publications/Sustainability-Criteria-Options-and-Impacts-for-Irish-Bioenergy-Resources.pdf>

³<https://www.ipcc.ch/srccl/chapter/summary-for-policymakers/>

⁴<https://www.tandfonline.com/doi/full/10.1080/14693062.2018.1464893>

4 Biomass and Wood Fuels

Main uses of Biomass wood fuels

Heat

Biomass is an ideal renewable fuel for heating buildings and heat for commercial & industrial processes. It is the lowest carbon option available and returns significant funds to local forest owners and rural operatives.

Electricity

Biomass can be used effectively in Combined Heat and Power (CHP) plants to produce electricity and large scale heat for district heating – or large industrial processes. Co-Firing in peat plants has significantly supported the establishment of the supply chain in Ireland, and has resulted in significant investment and growth in our capacity to produce biomass fuels.

Greenhouse (GHG) emissions from biomass - 96% reduction

Wood fuel from Irish forest biomass, such as firewood and woodchip, are estimated by SEAI to have carbon emission levels of 3.2gCO₂eq/MJ, which compares very favourably with kerosene at 73.3gCO₂eq/MJ, Natural gas at 56.9gCO₂eq/MJ and heat pumps at 40.4gCO₂eq/MJ (assuming a COP of 3.0 using electricity from the Irish grid). Clearly the use of wood fuels from Irish forests have a significant role in reducing Ireland's overall GHG emissions.

4.1 Full implementation of the Support Scheme for Renewable Heat (SSRH)

The SSRH was launched in June 2019. This scheme supports businesses who move from fossil-based heating systems to biomass heating systems. Support for renewable heat must be ensured in the medium to long term to build installation capacity. Long term options to support development towards meeting 2050 targets must be examined.

- A. We are calling for greater resources to be brought to bear to fully implement the SSRH, to expand the timescale, size and scope of the support scheme via a ring-fenced budget allocation, allied to aggressive promotion.
- B. We are also advocating, mandatory renewable heating use to be in place by all public bodies by 2035.

4.2 Regulation of the moisture content of wood fuel

4.2.1 Proposal Submitted to DCCAE

IrBEA and its members submitted a detailed proposal to DCCAE in October 2020 asking for government to introduce regulation on the moisture content of wood fuels for sale in Ireland.

4.2.2 Why is regulation required

- The recent EPA report *Air Quality in Ireland 2019*⁵ points to the need for enhanced measures to reduce air pollution. Reducing moisture content of wood fuels is proven to reduce emissions of harmful particulate pollution.
- In the UK the Department of Environment recently announced⁶ that sales of bagged traditional house coal and wet wood in units under 2m³ will be phased out by February 2021.
- The SEAI funded IrBEA study *Biomass Combustion Emissions*⁷ details the technology available for clean burning of wood fuels. Bioenergy Europe's report describes four main methods to tackle emissions from residential wood heating⁸. Various EU reports⁹ ¹⁰ show that reducing moisture content can dramatically reduce particulates, and other harmful emissions.
- In order to fully utilize the potential of biomass we must ensure that biomass use does not have any negative effects on the environment. We therefore call for the regulation of the market for wood and biomass fuels and in time will be calling for tighter regulation of installers, designers and appliances in line with the Ecodesign regulations and other measures.

C. We are calling for the statutory regulation of wood fuels in accordance with the international wood fuel standard - ISO 17225 – especially as it applies to moisture content, in order to deliver cleaner air and enhance public health.

⁵ *Air Quality in Ireland*. 2019 EPA.

<https://www.epa.ie/pubs/reports/air/quality/Air%20Quality%20In%20Ireland%202018.pdf>

⁶ <https://deframedia.blog.gov.uk/2020/02/21/government-takes-bold-action-to-cut-pollution-from-household-burning/>

⁷ *Biomass Combustion Emissions* 2016. Irish Bioenergy Association. <https://www.irbea.org/emissions-biomass-study/>. 2016.

⁸ BIOENERGY EXPLAINED 6. *SLASHING EMISSIONS FROM RESIDENTIAL WOOD HEATING*. 2019. Bioenergy Europe.

⁹ Emission factors for SLCP emissions from residential wood combustion in the Nordic countries; <https://www.diva-portal.org/smash/get/diva2:1174670/FULLTEXT01.pdf>

¹⁰ Avis d'expert CERIC, 2017. Impact of the quality of firewood and the evolution of the wood burning appliances on the quality of air <http://www.leboisenergie.be/wp-content/uploads/2017/09/etude-ceric-chauffage-au-bois-et-qualite-de-l-air-juliet-2017-web.pdf>

4.3 Energy Crops

Agriculture is facing some significant challenges at this time, decades of sub economic practice in the beef sector, and environmental challenges are focusing a rethink of how we utilise our land.

Farm diversification into energy and materials provision is a natural step – while modern society considers farmers as just food providers it is worth noting that in times past farmers produced all food, all fibre for clothing and most energy for transport in the form of horses and feed for same.

Energy Crops such as willow or short rotation species such as poplar and eucalyptus are proven to provide good yielding high quality fuel crops.

Grant aid to establish energy crops need to be re-introduced, and should be refocused to ensure the crops are suitable for the emerging demand. 1 hectare of willow displaces up to 5000 litres of kerosene fuel per year, currently valued at €2500. The value to the economy of displacing 5000 litres of imported fuel with Irish grown renewable fuel cannot be underestimated.

While our forest by-products can meet today's demand and should cater for demand for some years, the bioeconomy is successfully developing new uses for wood fibre All forms of wood fibres are becoming more and more valuable in a greening economy, and the growing of such fibre needs stimulus.

The Department of Agriculture Food and Marine have in place an establishment grant that can be activated on an annual basis with little organisation required apart from funding.

- D. We are calling for Government to re-establish the Energy Crops scheme as a matter of urgency to assist in meeting demand, to promote diversification of agriculture and to provide alternative income for farmers.**

5 Biogas

What is biogas / biomethane?

Biogas is produced by breaking down organic material such as manure, animal slurry, grass, crops and food waste – into methane gas, which is a renewable fuel.

There are less than 20 biogas plants in Ireland, over 17,000 biogas plants in Europe, and estimated 2.5 million around the world.

Biogas is 60% methane and 40% carbon dioxide, it can be used for heating or to generate electricity.

Biomethane is biogas which has been concentrated to 95% methane, this can be used to power vehicles or to inject into the existing gas grid. Biomethane offers a unique opportunity to fuel our heavy transport fleet.

The environmental benefits of using biogas are considerable and are listed as follows

1. Climate action benefit of replacing fossil fuel with renewable fuel
2. Providing an environmentally sound method of dealing with organic waste such as brown bin and agricultural wastes
3. Substantially reducing emissions of methane and ammonia to atmosphere from slurry in storage.
4. Reducing agricultural emissions of nutrients to watercourses and ammonia to air

Biogas is seen as an essential component in achieving our Paris Agreement commitments, while providing alternative incomes for farmers, improving rural sustainability and creating thousands of largely rural based jobs.

A support scheme for biogas/biomethane deployment into the grid has been mooted by representatives of DCCA and is long overdue. This should be accelerated, and the IRBEA policy paper on 2019 indicates 25 substantial AD plants could be in place by 2025 as a result.

5.1 Biogas Support Scheme

Proposal: The production cost of biogas is significantly greater than the price of fossil gas available on the gas grid. A Biogas support scheme is necessary to bridge the gap between the price of fossil gas and the production cost of biogas. IrBEA and Cré set out a detailed policy paper¹⁰ in 2019 showing the costs and supports required.

This document addresses the Joint Oireachtas Committee on Climate Action call for a strategy to be developed for Anaerobic Digestion and the Government Climate Action Plan action on biomethane injection

- E. We are calling for the proposed Biogas support scheme detailed in the IrBEA/Cre policy paper¹¹ be implemented.**

5.2 Electricity Production Support

The AD plants already established in Ireland are here are a result of an earlier, now closed, support scheme, REFIT 3.

Ireland's preferred method of supporting renewable electricity to 2030 is via the Renewable Electricity Support Scheme (RESS). Ireland is committed to a 70% renewable electricity target for 2030¹², a target supported by Renewable Energy Ireland.

While the RESS model does deliver low cost renewable electricity, and will support large scale development of offshore and onshore wind, it disfavours other technologies that come at a higher cost per kWh while disregarding other benefits such as grid stability (dispatchability) and secondary environmental benefits. In order to support a wider range of technologies and future proof our electricity supply we are calling for ringfenced technology categories to be introduced into the RESS. DCCAE have already designed in such measures – we are calling for them to be enacted.

- F. We are calling for the Renewable Electricity Support Scheme (RESS) to ringfence funding for modern bioenergy-based technologies such as combined heat and power, providing efficiencies up to and above 90%. Importantly these technologies have the added advantages of providing dispatchable power with grid stability benefits, community involvement and rural development in line with existing climate change policies.**

¹¹ IrBEA Biogas Policy Paper https://www.irbea.org/wp-content/uploads/2019/08/IrBEA-Cre-Biogas-Policy-Paper-Final_1.pdf

¹² <https://www.dccae.gov.ie/en-ie/news-and-media/press-releases/Pages/Minister-Bruton-Announces-Scheme-to-Reach-70-Renewables.aspx>

6 Biofuels

What are biofuels?

Biofuels by definition are liquid or gas fuels used for transport (road, rail, marine, aviation).

Biofuels have the distinct advantage of being able to be used in conventional engines or engines with light modification.

Bioethanol	blended directly with petrol	e.g. E10 = 10% ethanol-petrol mix
Biodiesel	blended directly with diesel	e.g. B10 = 10% biodiesel-diesel mix
Biomethane	Produced from biogas (see section 5) biomethane is used to power cars, HGV's and public transport	

Everybody is in favour of more electric vehicles, but it is now considered impossible to meet the target of 1 million EV's on our roads by 2030. World production falls far short of achieving that sort of market penetration. EV technology is not suitable for heavy transport vehicles.

Biofuels must comprise 14.9% of transport energy in 2050 if global warming to be brought under 1.5C per IPCC forecast. This is a seven-fold increase on today's biofuel volumes.

6.1 What are our policy targets?

According to the best available science cited in the 2018 United Nations IPCC report on Climate Change, 15% replacement of fossil fuels is the optimum target for bioenergy in transport and maintaining temperature rise to below 1.5C

Ireland is under EU obligation to achieve cuts of 45-55% in carbon emissions by 2030, and a 32% share of renewable energy across the economy generally. Ireland's own Climate Action Plan seeks 45-50% emissions cuts in transport by that date.

Currently transport accounts for 40% of Ireland's energy related emissions, rising at 2-3% annually. The official 7.2% level of renewables in transport today equates to about 2.5% in real terms when adjusted for paper credits and disallowed cooking oil gains. The challenge for government is to turn the current 3% annual increase in fossil fuel into a 3% reduction, at least, starting immediately.

6.2 Bioethanol

E10 has been introduced in a dozen EU countries, with some going higher. B12 is also common. E15 is approved in the USA, E85 is widely available throughout France.

G. We are calling for an immediate transition to E10 petrol, which comes at no extra cost to the consumer or the exchequer and requires no investment in or change to infrastructure or vehicles.

European crop-based ethanol derived from grain and beet crops is fully sustainable, brings average greenhouse gas savings of over 70% and rising, comes with no adverse side effects and can be expanded to several times current volumes with full peace of mind. It also provides secure markets for EU tillage crop farmers, many millions of tonnes of high protein GMO-free animal feed, a 5 billion euro EU bioeconomy platform and an engine of economic development for the rural regions which host the biorefineries.

6.3 Biodiesel

Ireland currently deploys 7% biodiesel¹³ (B7) in the fuel supply. This can be increased to B12 and higher under the right conditions¹⁴ with significant cuts in greenhouse gas emissions.

¹³ *Much of Irelands blended biodiesel comes from double counting – an EU practice that double incentivises certain sources of biofuel, in practice less than 4% of the fuel is biodiesel, double counting should not be relied on as a means to meet targets as it does not truly reflect GHG reductions.*

¹⁴ *Biodiesel comes with caution – policy must ensure the biodiesel complies with the requirements of RED II. Most EU produced biodiesel is compliant, however a portion of the of the world's supply of biodiesel is coming from unsustainable practices.*

6.4 Biomethane - Decarbonising Heavy Transport

The greatest challenge in reducing greenhouse gasses in transport is how to reduce carbon emissions from heavy goods vehicles and busses. However, this challenge has already been well matched by biomethane. Truck manufacturers already produce off the shelf models of biomethane powered trucks and there are currently in excess of one million gas powered vehicles in the EU. Biomethane delivers over 70% GHG savings compared to oil – and has a relatively low-cost base compared with current road fuels.

Ireland should be aiming to have a fleet of 20-30,000 heavy duty biomethane powered vehicles in circulation by 2030. The IrBEA Cré Policy Paper on Biomethane¹⁵ outlines the policy support needed to place biomethane onto the gas grid. This support scheme can also support transition from conventional fossil fuels to biomethane.

H. In line with Renewable Transport Targets we are calling for strong support for biomethane as a fuel for vehicles. This support is best placed in terms of a fuel price support to encourage the heaviest users of fuel to convert – thus maximising the positive environmental impact.

¹⁵ IrBEA Biogas Policy Paper https://www.irbea.org/wp-content/uploads/2019/08/IrBEA-Cre-Biogas-Policy-Paper-Final_1.pdf

7 Addressing often raised concerns about bioenergy

7.1 Food vs Fuel

One of the main barriers to widespread adoption of bioenergy is the allegation that there is a food versus fuel issue. When first raised in the early 2000s some academic papers, using poor efficiency data for bioenergy installations, argued that using land for energy would negatively impact food production globally. This has not happened despite substantial deployment of bioenergy in many parts of the world! Food supply globally is adequate, and prices have not risen unacceptably in the intervening period. Furthermore, bioenergy production, as it has matured over the last 10 to 15 years, has demonstrated consistent improvement in efficiency and sustainability, as would be expected with experience. Today, there is no reason to believe that widespread adoption of energy crops, wood fuel and dedicated grass silage for energy production in Ireland will do anything other than greatly improve the resilience of farmers, reduce Ireland's GHG impact, and move Ireland up the EU sustainability league table.

The UN assumes bioenergy will play a very substantial role in meeting the 2 °C target by 2050. A review of the academic literature shows that accurately assessing the impact of bioenergy globally is enormously complex. This would lead any reasonable person to reject simplistic assertions from sources with no industry experience. Some obvious factors determining this complexity, quoting a very recent paper¹⁶, include for example varying projections for crop yields and uncertainty around future diets.

7.2 Cost Concerns

In assessing the cost of alternative renewable technologies in the context of agriculture, reference is often made to the MACC curve¹⁷, which shows bioenergy as one of the more expensive options, especially if compared with on-shore wind. Additional economic aspects must be considered in the wider framework of public policy formulation and investment, in order to capture of the multisectoral benefits of bioenergy, such as jobs created in rural Ireland, utilisation of available indigenous raw materials, very substantial reduction of GHG emissions, and provision of dispatchable, base-line energy. These benefits need to be quantified for every proposal and taken into account in any assessment or policy decision-making process.

¹⁶ <https://iopscience.iop.org/article/10.1088/1748-9326/ab6c2e>

¹⁷ <https://www.teagasc.ie/media/website/publications/2018/An-Analysis-of-Abatement-Potential-of-Greenhouse-Gas-Emissions-in-Irish-Agriculture-2021-2030.pdf>

7.3 Anti-Combustion agenda

Much focus has taken place in recent years on the electrification of heat, where this is seen as the answer to climate matters. Generally, the view is that heat pumps will be able to meet all the required demand. While heat pumps are able to deliver low grade heat (under 6 °C) with relatively good efficiency, they lose efficiency from 60 to 100 °C ; above 100 °C (industrial and commercial heat) they are unable to deliver at all. Five years ago, the thinking was that we need to reduce carbon emissions from heating by 50%, and heatpumps are capable of doing so, however the climate emergency now demands considerably greater reduction in carbon emissions. The only technologies capable of delivering greater than 80% reductions are building envelope (insulation), solar thermal, and biomass – indeed all three can achieve greater than 95% reductions. Simply stated, a wide range of cost-effective technologies need to be deployed – one size does not fit all.

Some concerns have been raised around emissions of particulate matter and NOx by solid and liquid fuel combustion, while these pollutants are released by combustion it must be understood that industry has developed significant technology to dramatically reduce such emissions, and that our policy measure above to regulate fuel supply can have an immediate effect on all existing appliances, domestic and industrial.

7.4 Forest policy

Ireland has invested heavily in forestry since the late 1980s. Having planted almost 300,000 ha over this time. This investment by the state and landowners has been coming on stream for the last decade and is now a substantial part of the annual woodflow, while Coillte continues to supply assured harvest which backbones the overall wood supply. Most Forests were planted to provide roundwood, some for mostly biodiversity conservation and enhancement, and some near towns and cities for recreational purposes. All combine to provide a range of ecosystem services from wood provision out to climate change mitigation. It is important to enable these mutually supporting services to continue to deliver economic, social, environmental benefits, not least a growing and sustainable supply of indigenous woodfuel.

About IrBEA

IrBEA was founded in 1999. Its role is to promote the bioenergy industry and to develop this important sector on the island of Ireland. The diverse membership includes farmers and foresters, fuel suppliers, energy development companies, equipment manufacturers and suppliers, engineers, financiers and tax advisers, legal firms, consultants, planners, research organisations, local authorities, education and advisory bodies – anyone with an interest in the bioenergy industry. IrBEA is recognized by Government and agencies as the voice of the bioenergy industry.

The association's main objectives are to influence policy makers to promote the development of bioenergy, and to promote the interests of members. Improving public awareness, networking and information sharing, and liaising with similar interest groups are other key areas of work in promoting bioenergy as an environmentally, economically and socially sustainable energy. The organisation is a self-governing association of voluntary members and is affiliated to Bioenergy Europe and the European Biogas Association (EBA). The organisations activities are managed by the CEO assisted by a small executive staff team and is governed by a board of Directors which includes an elected President and Vice President. Policy direction is provided by a Management Executive Committee and specific subcommittees. Further information on the association is available at www.irbea.org



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During the Programme for Government negotiations we will endeavour to assist with any technical queries with utmost priority