



PLANNING GUIDANCE RECOMMENDATIONS FOR BIOENERGY PROJECTS IN IRELAND



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Disclaimer: This report contains a set of planning policy and development guidance recommendations, which may contribute the evolution of any Section 281(S28) planning guidance (or Departmental Circulars on planning practice) relating for bioenergy development in Ireland. This document may also serve as a reference for project developers, planners and members of the community interested in bioenergy development.

Executive Summary

This report contains a set of planning policy and development guidance recommendations relating to the specific development implications associated with the development of bioenergy projects in the Republic of Ireland.

Bioenergy is a broad term which encapsulates a diverse range of technologies and feedstocks. Bioenergy sources are amongst the most important sources of renewable energy currently being provided throughout the EU. Illustrative of this point, biomass represents 60% of current renewable energy production in the Union¹. Previous research by the Irish Bioenergy Association (IrBEA) has indicated the potential of the bioenergy sector in Ireland. In 2012, the IrBEA commissioned an independent study by DKM Economic Consultants and RPS group². The study illustrated the substantial economic benefits which can be gained by the deployment of bioenergy infrastructure in Ireland. Some of these benefits include;

- The creation of 3,600 new permanent jobs in the bioenergy sector;
- Gaining €1.5 billion in direct investment into the sector;
- Generating over 8,000 work years during construction and installation;
- Securing family farm incomes in Irish agriculture through the diversification of income streams;
- Reducing Ireland's energy import bill by 7.5 per cent; and
- Providing a secure and competitive indigenous energy source for Irish homes and business.

The acquisition of planning permission for bioenergy infrastructure of all types has led to the need to assess the way decision makers in planning authorities, applicants as well as communities perceive each other's role in the consenting process. The impetus of this research is to draw upon the body of evidence which has accrued within the planning files of the bioenergy planning applications submitted to date, couple the insights arising with consultation with key stakeholders in order to devise planning guidance recommendations which may serve to 'de-risk' the planning process for applicants. In addition, this research draws together best consenting processes outlined in European research as well as planning and development practices from mature bioenergy markets overseas in order to serve as a reference for planners in national and local planning authorities.

The recommendations put forward below are categorised under the following headings;

- Forward Planning;
- Development Management; and
- Miscellaneous Recommendations.

Forward Planning

1. *It is recommended that bioenergy development is referenced explicitly within the National Planning Framework as well as the National Climate Change Mitigation Plan.*

¹ PricewaterhouseCoopers EU Services EESV's consortium (2017) 'Sustainable and optimal use of biomass for energy in the EU beyond 2020' Available via: https://ec.europa.eu/energy/sites/ener/files/documents/biosustain_report_final.pdf

² DKM & RPS Consulting Engineers (2012) 'The Economic Benefits from the Development of BioEnergy in Ireland to meet 2020 Targets' Available via: <http://www.irbea.org/wp-content/uploads/2017/06/socio-econ-study-Jan-12.pdf>

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2. It is recommended that the potential of bioenergy development to decarbonise the energy system utilising local sourced feedstocks is recognised in Regional Spatial and Economic Strategies. Particular reference should be made within Regional Waste Management Plans to the potential of bioenergy development.
3. *It is recommended that the concept of 'Integrated Bioenergy Planning'³ be utilised to frame forward planning activities in the field of bioenergy development in an Irish context.*
4. *It is vital that county development plans set out clear development policies which designate areas where bioenergy development is designated as either 'open to consideration' or 'not permitted'.*
5. *It is recommended that farm based bioenergy projects which draw their feedstocks (typically animal slurry/grasses) from a defined rural catchment, and subject to a maximum energy output of 1 Me (MW electrical equivalent = 3MW total), would be considered for development on unzoned lands.*
6. *Digitising the development of bioenergy developments within a county is recommended in order to guide subsequent iterations of development plan policy. As the sector develops, there will be a need to ensure that the cumulative effect of the wide-spread development of bioenergy projects can be managed.*
7. *It is recommended that further study be undertaken regarding the alignment of the various consenting processes (Environmental Protection Agency, Commission for Regulation of Utilities (formerly CER – Commission for Energy Regulation), Planning, and Department of Agriculture).*
8. *Reference material to aid local authorities in devising appropriate development contribution rates for bioenergy development should be compiled by the sector. This information can then be taken into account when development contribution schemes come up for renewal.*
9. *To incentivise the development of biogas schemes in agricultural settings, it is recommended that farm based biogas developments be considered agricultural and exempted from the payment of development contributions.*

Development Management

10. *is recommended that transport assessments relating to bioenergy projects take consideration of the matters below **reasonable** to the scale of the project;*
 - *Size and description of development*
 - *Description of existing road network*
 - *Details of extra data to be collected – particularly traffic surveys*
 - *Sources of information for travel / traffic generation (including modal split)*
 - *Geographic area of analysis (extent)*

³ ['Integrated Bioenergy Planning'](#) is defined as 'a spatially- or territorially-explicit method or approach designed to support strategic bioenergy planning and policy formulation, through the integration of existing biofuel demand and supply.'

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- *Proposed years of assessment*
 - *Key junctions and links accesses to be investigated – requires traffic modelling*
 - *Sustainable transport/development plan issues*
 - *Summary of discussion between applicant and Road Design Office / Planning Authority (Pre-planning) and how points raised have been addressed*
 - *Details of proposed improvements (if required)*
11. *Where appropriate as part of an EIA/AA it is recommended that applications for a bioenergy project are accompanied with a suitability detailed visual impact assessment. This assessment should contain details of the proposed steps which will be taken in order to mitigate any issues relating to visual impact which may arise.*
12. *In order to mitigate planning risk, it is recommended that bioenergy development proposals are sensitive to the following sites:*
- *Natura 2000 Sites;*
 - *Natural Heritage Area (proposed and designated);*
 - *Special Areas of Conservation;*
 - *Special Protection Areas;*
13. *It is recommended that any noise generating component of a proposed bioenergy project is acoustically insulated in order to mitigate any impact associated with the operation of the proposed scheme.*
14. *Any lighting which will be deployed on the site should be sited in a manner which precludes any detrimental impact on the amenity of a neighbouring site.*
15. *The siting of security cameras on a subject site should be undertaken in a manner which does not impact on the amenity of a neighbouring site.*

Miscellaneous

16. *It is recommended that IrBEA devise a best practice guide on preplanning meetings for developers so that the sector can extract the most benefit from any such meetings which take place.*
17. *It is recommended that project promoters consult with members of the community in proximity to the proposed site of a bioenergy development.*
18. *It is recommended that industry and government stakeholders collaborate to develop an educational programme targeted at communities which clearly outlines the benefits and characteristics of bioenergy technology, based on credible, objective sources of information.*

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- 19. Further study should be given over to the air quality implications associated with the cumulative impact of multiple bioenergy developments (particularly biomass) in a defined locality, where an exemption from planning permission applies to the individual developments.*
- 20. It is recommended that the gross floor area allocation set out in Class 18 (e) 1 and (i) 2 of S.I. No. 235/2008 - Planning and Development Regulations 2008, be increased to 100 metres.*

The rational for the recommendations listed above is set out in Section 5.0 of this report.

1.0 Introduction

This research has been funded by the Sustainable Energy Authority of Ireland (SEAI) under its Research, Development and Demonstration (RDD) 2017 research call.

The objective of this research is to aid the deployment of this type of technology by “de-risking” the planning process for developers (community or traditional), by facilitating consistency, clarity and transparency in the decision-making processes of planning authorities when considering applications for the development of bioenergy technologies in projects of all scales in urban and rural contexts in Ireland.

IrBEA is an industry association with over 180+ members representing the bioenergy industry on the island of Ireland. IrBEA seeks to increase understanding of issues related to biomass supply chains used to generate energy in the form of heat, electricity and transport. The main objectives of the association are to influence policy makers, to promote the development of bioenergy, and to promote the interests of its members. Improving public awareness, networking and information sharing, and liaising with similar interest groups are other key areas of work in promoting biomass as an environmentally, economically and socially sustainable energy resource. Overall direction is provided by the CEO together with the President and Vice President who work closely with the management committee which comprises 15 members from all parts of the bioenergy industry. IrBEA operates a group structure where different parts of the bioenergy industry collaborate on topics such as transport biofuels, wood energy, biogas/AD, domestic biomass fuels, energy crops and biomass power generation.

The bioenergy sector is dynamic in nature and covers a wide range of energy generating technologies which have been deployed at a variety of scales in urban and rural contexts in Ireland. The applications which have been submitted to date offer an opportunity to reflect on the issues which have arisen in relation to the assessment of projects

This research will address a number of areas focused on the manner in which the Irish planning system interacts with the proposition, assessment and development of bioenergy projects. The main areas considered in this research are set out below;

- Planning guidance recommendations for bioenergy projects in Ireland;
- Societal Acceptance; and
- Legislative alignment of bioenergy with pre-existing development classes as set out in primary planning legislation (Planning and Development Act 2000 [as amended] and the Planning and Development Regulations [as amended]).

The purpose of this project is to comprehensively assess the perception and passage of bioenergy projects through the Irish planning system. This research will seek to address the implications of the issues which influence the development of bioenergy projects in Ireland. This project addresses two key impediment/barriers to the wide spread sustainable development of bioenergy projects. This research will address these issues with reference to mature bioenergy markets in Europe further afield.

The impediments are;

- The **first impediment/barrier** this research contributes to removing is the lack of planning and development policy in respect of this form of renewable energy development.
- The **second impediment/barrier** that this research will seek to address relates to the improvement of societal and community acceptance of bioenergy projects by understanding and proposing solutions for the remediation of the misconceptions which exist in relation to bioenergy development

The core areas of this research project's focus resonate with the findings of a recently published Cost/Benefit Assessment⁴ of the Biogas and Biomethane sector's as being barriers for the deployment of bioenergy technologies at commercial/farm and utility scale in the Republic of Ireland.

This research is situated at the foundation of the process as it will detect and determine key issues and misconceptions which may exist and recommend measures for their mitigation through policy and practice led responses. It will also produce a code of practice for industry to build positive relation with communities.

This research will culminate in the publication of planning guidance recommendations for review and further consideration by the Department of Housing Planning and Local Government if Section 28 planning guidelines are developed for bioenergy development in an Irish context. In addition, this research may serve as a reference guide for planning practitioners in local and national planning authorities dealing with planning applications for bioenergy projects. It may also serve as a guide for project promoters/applicants given that it contains insights around the experiences of developers who have sought permission for projects in the past.

1.1 Bioenergy Technology

Bioenergy is broadly defined by the European Commission (EC) and the European Environmental Agency (EEA) as: *"a wide range of products and by-products from forestry and agriculture as well as municipal and industrial waste streams. It thus includes: trees, arable crops, algae and other plants, agricultural and forest residues, effluents, sewage sludge, manure, industrial by-products and the organic fraction of municipal solid waste. After a conversion process, the biomass can be used as a fuel to provide heat, electricity or as transport fuel, depending on the conversion technology and the type of primary biomass"* (EC, 2005; EEA, 2007)⁵.

According the SEAI's Local Authority Renewable Energy Strategies (LARES)⁶ methodology, bioenergy technologies may be broken down into three sub-groups:

- **Combustion** – both using biomass solely, and the co-firing of biomass with a fossil fuel (most commonly used for 'dry' resources)

⁴ Sustainable Energy Authority of Ireland (2017) 'Assessment of Cost and Benefits of Biogas and Biomethane in Ireland' Accessible via: https://www.seai.ie/News_Events/Press_Releases/2017/Assessment-of-Cost-and-Benefits-of-Biogas-and-Biomethane-in-Ireland.pdf

⁵ Intelligent Energy Europe (2010) 'Long list of relevant cases in integrated bioenergy planning' Available via: https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/make-it-be_best_practices_en.pdf

⁶ Sustainable Energy Authority of Ireland (2013) 'Methodology for Local Authority Renewable Energy Strategies' Available via: http://www.seai.ie/Publications/Renewables_Publications_/Wind_Power/Methodology-for-Local-Authority-Renewable-Energy-Strategies.pdf

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- **Biochemical** processes – including anaerobic digestion of organic residues and also fermentation and esterification in the production of biofuels
- **Thermochemical** processes still being developed: gasification and pyrolysis (these technologies are still maturing and may not contribute much to reaching energy targets in the short term).

The draft Bioenergy Action Plan (2014) outlined a series of potential pathways which outline the manner in which Bioenergy projects will contribute to the decarbonisation of the State's energy sources. These pathways are outlined in figure 1 below.

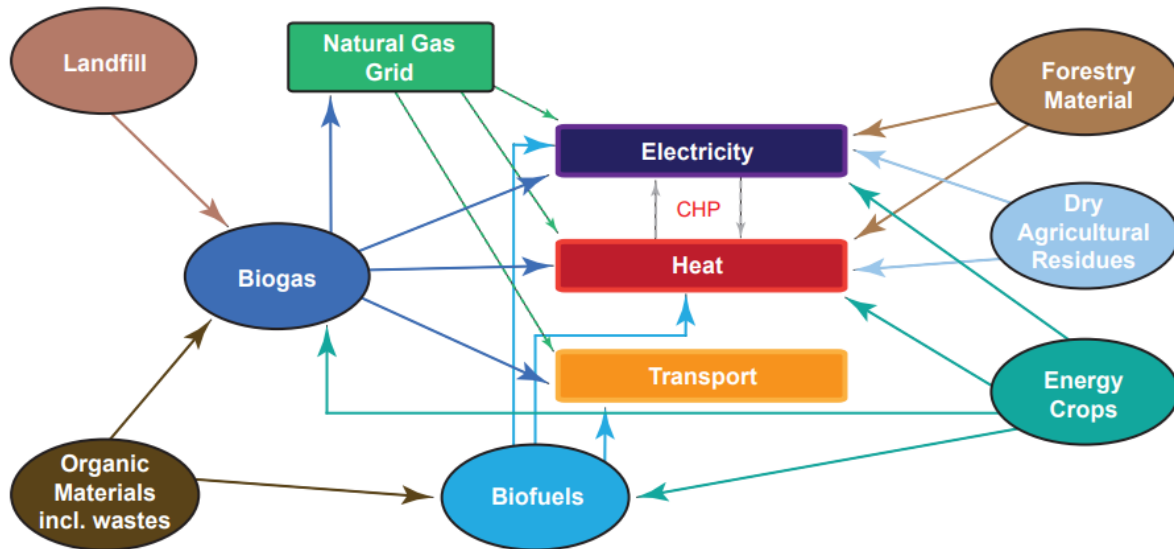


Figure 2 Potential BioEnergy Pathways (Source DCCAE, 2014)

This research will explore the manner in which planning applications for the infrastructure constituting the pathways above has travelled through the planning system at local and national level.

The benefits of bioenergy technology in terms of meeting the State's obligations for the reduction of emissions and the reuse of waste by-products from economic activities such as agriculture are set out in Al Seadi et al (p 12), and summarised below⁷;

- Reduced dependency on imported fossil fuels;
- Reduced GHG Emissions;
- Waste Reduction/avoidance of;
- Job Creation (in rural areas);
- Flexible end use of Biogas; and
- Low Water Input.

Biomass

Biomass is all organic material, an example being plant matter. It is either:

- the direct product of photosynthesis (for example plant matter – leaves, stems, etc.) or

⁷ Teodorita Al Seadi, Dominik Rutz, Heinz Prassl, Michael Köttner, Tobias Finsterwalder, Silke Volk, Rainer Janssen (2008) '*Biogas Handbook*' University of Southern Denmark, Esbjerg

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- the indirect product of photosynthesis (for example animal mass resulting from the consumption of plant matter).

'Biomass' shall mean the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste.

EU Directive 2001/77/EC (RES-E) - promotion of electricity produced from renewable energy sources

The SEAI outlines the types of biomass that are used to provide bioenergy include;

- wastes streams, including residues from forestry and related industries;
- recycled wood;
- agricultural residues and agri-food effluents;
- manures;
- the organic fraction of municipal solid waste;
- separated household waste and sewage sludge; and
- purpose grown energy crops including short rotation forestry, Miscanthus, grass, silage, maize etc.

A selection of BioEnergy technologies which have been deployed in the Irish context are set out below in table 1. A breakdown of feedstocks associated with these technologies is set out below in table 2.

Research produced for the European Commission indicates the primacy of biomass as a form of renewable energy production in the EU -28. Biomass represents 60% of current renewable energy production in the Union⁸. The research posits that *'final energy demand from biomass will stabilize to approximately 147 Mtoe by 2030, compared to 124 Mtoe in 2020'*.

Table 2 Biomass Technologies

Type	Feedstock	Output (Kilowatts)
Wood Stove	Wood Logs	5-15
Biomass Boiler (Residential)	Wood Logs/Pellets	15-50
Biomass Boiler (Commercial) Space/Water	Wood Pellets/woodchip	40-1000
Biomass Plant (Combined Heat/Power)	Wood Chips/forest residues, BioEnergy Crops	1,000-25,000+
Anaerobic Digestion	Grass, Animal Slurries, Food Waste	20-5000+
Biomass (Co Fired)	Peat, Wood, BioEnergy Crops	>100,000 (100MW)

⁸ PricewaterhouseCoopers EU Services EESV's consortium (2017) *'Sustainable and optimal use of biomass for energy in the EU beyond 2020'* Available via: https://ec.europa.eu/energy/sites/ener/files/documents/biosustain_report_final.pdf

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Table 3 Bioenergy Feedstocks Source: Tipperary County Council 2016

Resource	Description	End Use Category
Forest thinning	By product of forest management and harvesting	Direct Combustion to provide heat, power or combined Heat and Power (CHP)
Waste Wood	Recycled wood and waste from construction and demolition	Direct combustion in specialised combustion facilities for Heat and Power
Sawmill Residues	Byproduct of processing timber	Direct combustion or conversion to other fuel types (wood pellets)
Straw	By product of cereal production	Combustion for heat and /or power
Woody Crops i.e. Willow	Purpose grown energy crops including short rotation forestry, miscanthus, willow, etc.	Combustion for heat and /or power
Biodegradable Municipal Solid Waste (BMW)	BMW means the biodegradable component of municipal waste, not including bio-stabilised residual waste. Biodegradable municipal waste (Brown bin Waste) is typically composed of food and garden waste, wood, paper, cardboard and textiles.	Anaerobic digestion in biogas plants. Resulting methane to be utilised for heat, electricity or transport
Pig and Poultry Manure	Animal Waste	Anaerobic digestion in biogas plants. Resulting methane to be utilised for heat, electricity or transport
Cattle Manure	Animal Waste	Anaerobic digestion in biogas plants. Resulting methane to be utilised for heat, electricity or transport
Food and Garden Waste	Municipal Waste	Anaerobic digestion in biogas plants. Resulting methane to be utilised for heat, electricity or transport
Food processing wastes	Trimblings, offspec product, residues	Anaerobic digestion in biogas plants. Resulting methane to be utilised for heat, electricity or transport
cereals/maize/grass	Arable Crop	Anaerobic digestion in biogas plants. Resulting methane to be utilised for heat, electricity or transport. Conversion to biofuel (bio-ethanol)
Oilseed Rape	Arable Crop	Conversion into biofuel (biodiesel)
Tallow	Meat processing by-product	Conversion into biofuel (biodiesel)

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Recycled Vegetable Oil	Used Cooking Oil	Conversion into biofuel (biodiesel)
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The GHG emission saving potential of biomass energy sources is complex to determine. On the one hand the use of biomass material displaces fossil fuels, and in some cases has additional benefits of reducing other emissions (e.g. anaerobic digestion of cattle manures prevents these manures releasing methane and nitrous oxides in storage – both potent GHG's); while on the other hand there is some additional usage of fossil fuels for the harvesting, transport and processing of the biomass material (typically <3% for forest material).

Where biomass materials are combusted in poorly designed, operated or maintained combustion plant there is potential for significant emissions of the products of combustion. The principal emissions which may be released from poor biomass combustion according to research undertaken by Fehily Timoney and IrBEA with funding from the SEAI in 2016⁹ are set out below (note the report also details the principal control methods for same):

- Particulate Matter (PM) including; salts, soot, condensable organic compounds (COCs), volatile organic compounds (VOCs) & intermediate products – e.g. tars and polycyclic aromatic hydrocarbons (PAHs)
- Oxides of Nitrogen (NOx) including; nitric oxide (NO), nitrogen dioxide (NO2) & nitrous oxide (N2O)
- Oxides of Carbon (COx) including; carbon monoxide (CO) & carbon dioxide (CO2)
- Oxides of Sulphur (SOx) including; sulphur dioxide (SO2) & sulphur trioxide (SO3)
- Dioxins/Furans Of these, PM (and its intermediate products) and NOx are considered to be the most relevant emissions when considering biomass combustion.

The IrBEA/Fehily Timoney report articulated a series of recommendations for the management of biomass development in a way which mitigates the above and the contents of this report reiterate the recommendations advanced in that work as they relate to the planning process for bioenergy projects.

⁹ Irish BioEnergy Association & Fehily Timoney (2016) 'Project Report for Biomass Combustion Emissions Study' Available via: https://www.seai.ie/Renewables/Energy_Research_Portal/National-Energy-Research/RD-D-Projects/Biomass/2016-RDD-108-Biomass_Combustion_Emissions_Study-IrBEA.pdf

Biogas/Anaerobic Digestion

The SEAI outlines that Biogas is a mixture of methane (50-75%), carbon dioxide (25-45%) and small amounts of water (2-7%), as well as trace gases such as hydrogen sulphide, oxygen, nitrogen, ammonia and hydrogen.

Farm, municipal or industrial-based biogas plants convert waste material into biogas. Waste/feedstock is pumped into a closed vessel (digester) which has been inoculated with suitable bacteria. Anaerobic (0% oxygen) conditions are then maintained in the vessel and the temperature is held at a constant value. A schematic overview of farm scale AD is outlined below in figure 2

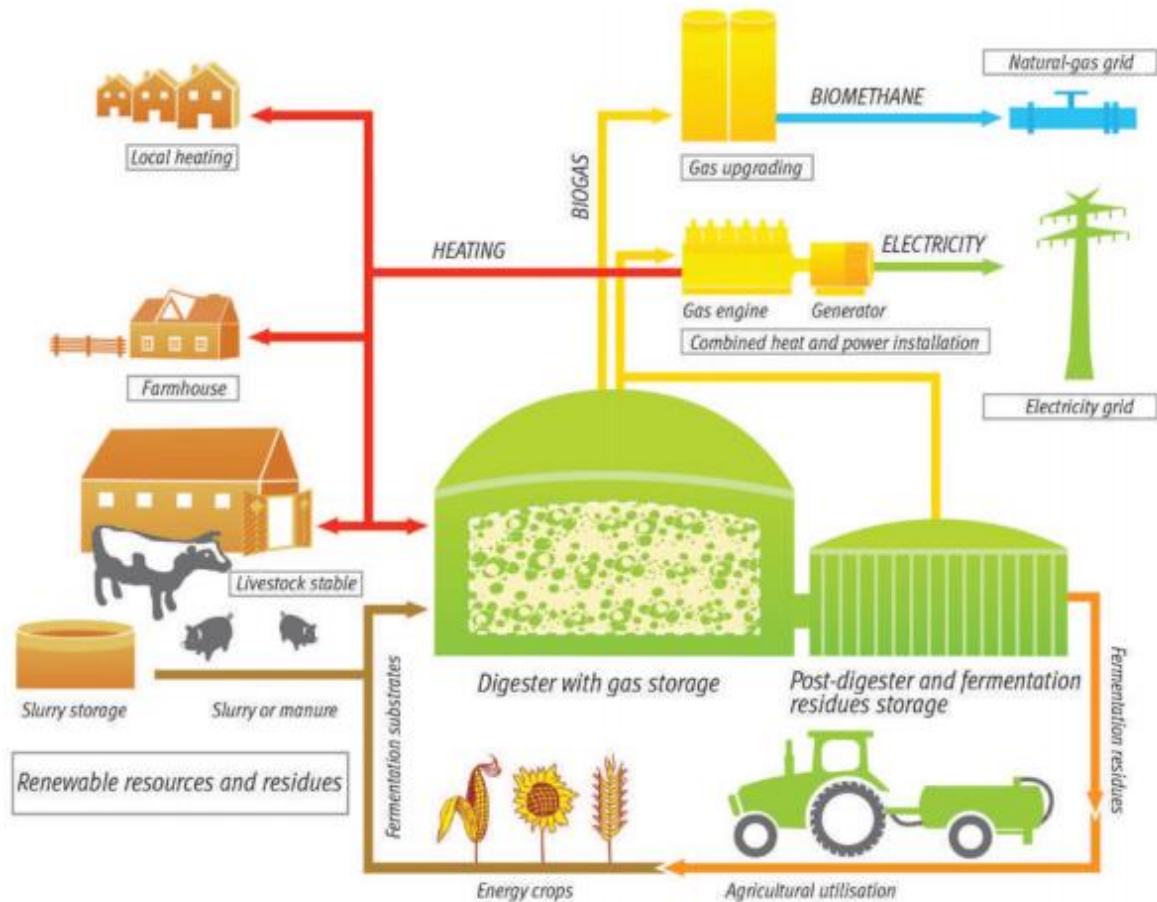


Figure 3 Schematic of Farm Scale Anaerobic Digestion (Source: FNR)

The resulting biogas produced can be upgraded to fossil ('natural') gas quality and added to the gas grid, or can be used on site to generate heat and power. The AD process residue (digestate) can be separated into a liquid fraction and a fibrous fraction. The liquid fraction can be returned to the land as a fertiliser and the solid fibre used as a soil conditioner. The process therefore offers the unique potential to return nutrients to agriculture from waste foodstuffs. The typical structures associated with an AD facility are set out below.

- **Main building** containing, containing pre-treatment area(s), digestate treatment, storage areas, administrative and staff areas.
- **Odour control system**, made up of bio-trickling filters, filter bed containers, a plasma injection and carbon filtration system the purpose of which is to treat air extracted from the

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main building. A stack will also form part of this system through which treated air is expelled.

- **Digestion Tank(s)** potentially consisting of pre pasteurisation tanks, digester feed buffer tanks, digestion tanks and post digestion tanks.

Depending on the scale, a wastewater treatment system may be included. The infrastructure contained therein may entail sequential batch reactors, process liquor systems, process water and sludge tanks. The processes typically associated with biogas based renewable energy generation are outlined below.

- **Pre-treatment:** after waste is delivered inside the main building, unsuitable feedstocks will be separated from digestible material. Inorganic materials (i.e. farm plastics, metallic objects) which may have become included with the feedstock will be exported off site for further treatment, recycling or disposal in line with the appropriate waste management regulations. The sorted feedstock is blended with recycled process liquid in order to create slurry which will have to be heated to 70 degrees celsius for at least 1 hour to comply with the Animal By-Product Regulations.
- **AD treatment:** following pasteurisation the slurry is pumped to the digestion tanks where the organic material is broken down in an oxygen free environment, in enclosed sealed tanks to produce both biogas and digestate.
- **Post treatment:** in the final phase the biogas will be captured and combusted in CHP engines to produce renewable heat and electricity. Depending on the scale, the electricity will be exported to the national grid or used to power an industrial/commercial user in proximity. Waste heat can be reused in the process and potentially be made available to neighbouring land uses, such as residential and/or commercial use. The digestate produced can be used as a fertiliser which is a positive economic byproduct of the digestion process. Water involved in the process is sent to the waste water treatment plant prior to reuse in the digestion process or discharge to a public sewer.

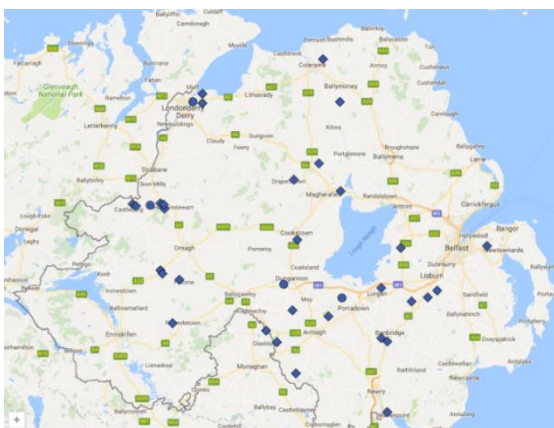


Figure 4 Farm Scale Anaerobic Digesters in Northern Ireland Source (NNFCC, 2015)

Farm scale anaerobic digestion is relatively limited in Ireland at present. A few schemes have been developed such as the McDonnell Farms Biogas scheme at Shanagolden, Co. Limerick, Green Generation Ltd's AD development at Nurney, Co. Kildare and the Glenmore Estate AD plant in Aghaveagh, Co Donegal. By contrast, Northern Ireland has seen a significant deployment of farm scale anaerobic digesters as can be seen in figure 3 below. Northern Ireland has an ambitious target for the use of renewable energy by 2020. BioEnergy, notably farm scale biogas is a key contributing sector to the attainment of 40% of energy needs from renewable sources by the 2020 deadline.

1.2 Bioenergy Market Potential in an Irish Context



Figure 5 Figure 4 BioEnergy Map of Ireland (Source: IrBEA, 2017)

Bioenergy has commenced playing a role in the decarbonisation of Ireland's energy mix. Figure 4 below, compiled by the Irish Bioenergy Association (IrBEA) outlines the location and extent of Bioenergy infrastructure in an Irish context.

Research undertaken for the Irish BioEnergy Association and the SEAI outlines the significant potential which the BioEnergy sector can realise should be requisite market conditions come about.

The research outlines that almost €1.5 billion in investment in biomass processing infrastructure and equipment will be required to deliver the output needed to meet Ireland's 2020 energy obligations. The study posited that the delivery of this investment would entail the saving of 3.14 million tonnes of CO₂ per annum by 2020.

Monetarily, the saved emissions could be worth €94 million per annum by 2020, based on the level of carbon tax envisaged in the Government's National Recovery Plan 2011-2014¹⁰. The 2014 Draft BioEnergy Plan published by SEAI estimated that Ireland could face fines of €120m for each %point that Ireland fails to reach its 2020 target.

Assessment of Cost and Benefits of Biogas and Biomethane in Ireland (2017)

In June 2017, the SEAI published a comprehensive Cost/Benefit Assessment on Ireland's Biogas and Biomethane resource as a contributor to the decarbonisation of the Irish economy. This body of work modelled four development scenarios for the deployment of biogas in an Irish context. The characteristics of each scenario are set out above in table 3¹¹. Ireland has a range of plentiful waste feedstocks (e.g., food wastes and cattle and pig manures or slurries) which could be used to produce biogas, that have a zero or low cost.

¹⁰ Irish BioEnergy Association (2012) "The Economic Benefits of the Development of Bioenergy in Ireland" Available via: <http://www.irbea.org/wp-content/uploads/2017/06/sum-socio-econ-study-Jan-12.pdf>

¹¹ SEAI (2017) 'Assessment of Cost and Benefits of Biogas and Biomethane in Ireland' Available via: https://www.seai.ie/News_Events/Press_Releases/2017/Assessment-of-Cost-and-Benefits-of-Biogas-and-Biomethane-in-Ireland.pdf

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Table 3 Bioenergy Modelling Scenarios (Source SEAI, 2017)

Scenario	Description
Waste based AD	Maximum use of waste streams (food wastes and slurries) as these are the lowest cost feedstocks and deliver the highest GHG savings
Increased biomethane	This builds on scenario the waste based AD scenario, and begins to make use of the large grass silage resource that Ireland has. The silage is predominantly used in large AD plants to produce biomethane, which it is assumed is injected into the gas grid at the 42 above ground installation points identified by GNI as the most accessible and least cost points of entry into the grid.
All AD feedstocks	Maximum use of grass silage and other resources. This scenario is designed to show the maximum biogas/biomethane production which could be achieved through anaerobic digestion. It assumes that additional biomethane injection points in the gas distribution network are identified.
Exploratory	Exploratory scenario designed to show how energy production could be increased by using gasification, a technology which is not yet mature, but could produce large quantities of biomethane from wood chips/pellets and energy crops.

The report outlines that it is possible the in some circumstances, an AD plant could receive a ‘gate fee’ for receiving waste feedstocks. The low cost feedstocks mentioned above have the potential to contribute 126 kilo tonnes of oil equivalent (ktoe) (5.3 PJ) of biogas per year, equivalent to just over 3% of natural gas supply in 2015. Beyond the feedstocks mentioned above, the exploitation of the State’s grass land could potentially yield additional feedstock in the form of grass silage. The report envisages a scenario where grass silage could produce up to 837 ktoe (35 PJ) of biogas, equivalent to 22% of natural gas supply in 2015.

Bioenergy Supply in Ireland 2015 – 2035 (2015)

This report was produced by the SEAI. It indicates that under favourable conditions – high market prices for bioenergy resources and mitigation of supply-side barriers – the total amount of solid, liquid and gaseous bioenergy produced in Ireland could reach 3,290 ktoe (138 PJ) by 2035. This compares to total primary energy demand of bioenergy, including imports, of 468 ktoe (19.6 PJ) in 2014. This potential domestic bioenergy production in 2035 would be equivalent to 10% of Ireland’s 2014 energy needs if it were used to produce electricity, or almost 30% if it were used to produce heat. Under less favourable conditions, the available potential in 2035 reduces to 10% of the total in line with the reduced availability of grass silage¹².

This report indicates that feedstock for bioenergy development is available at a roadside/farm gate price above current market prices for bioenergy. At the time of the report’s production, agricultural and municipal wastes, along with other by-products, are typically available at low or even negative

¹² SEAI (2015) ‘Bioenergy Supply in Ireland 2015 – 2035’ Available via: http://www.seai.ie/Publications/Renewables_Publications/Bioenergy/Bioenergy-Supply-in-Ireland-2015-2035.pdf

cost where disposal in landfill is avoided. The bioenergy potential for these resources represents 20% of the total potential estimated in 2035.

Resources typically used as solid fuel to produce heat and electricity (e.g. forest thinnings and residues; sawmill residues and energy crops) represent the majority of potential in all price bands. At low market prices, solid fuel represents 90% of the available potential. At high prices the share falls to 67% as more biogas resource potential becomes available.

The Economic Benefits from the Development of Bioenergy in Ireland to meet 2020 Targets (2012)

This report was undertaken by DKM Economic Consultants and RPS Consulting Engineers for the Irish Bioenergy Association (IrBEA) with the support of the SEAI. The findings of the report outline the economic benefits associated with the development of an expanded bioenergy sector in Ireland with a view toward achieving the State's '2020 Targets', as outlined in Section 1.2.

The key economic indicators of this report are set out below¹³.

- In total, it is estimated that almost €1.5 billion in direct investment in biomass processing infrastructure and equipment will be required over the period from 2011 to 2020 to deliver the output needed to meet the targets under RES-E, RES-H and RES-T.
- Of this, approximately 55% would be spent in the Irish economy (the balance being imported plant and equipment).
- In addition, once fully operational, almost €430 million (2011 money) would be spent annually on operating these facilities.
- In terms of employment, almost 8,300 work years would be generated throughout the domestic economy during the construction and installation of the various facilities required to deliver on the targets.
- Permanent ongoing employment generated by the sector would grow to over 3,600 FTEs by 2020. This includes employment in the facilities themselves, in supply industries and in the wider economy.
- These figures record the net or incremental employment impacts across the different sectors only. In some instances, for example, the net impacts may be relatively modest as they are to a large degree securing the employment associated with existing activities.

The purpose of this section is to briefly outline the energy policy context which frames the impetus behind Ireland's energy transition. It will also specify the role which bioenergy energy technology is envisaged to play in securing Ireland's transition to a low carbon economy.

¹³ Irish BioEnergy Association (2012) '*The Economic Benefits from the Development of BioEnergy in Ireland to meet 2020 Targets*' Available via: <https://www.teagasc.ie/media/website/crops/crops/summary-socio-economic-report.pdf>

1.3 Energy Policy Context

European Union '2030 Energy Strategy'

EU countries have agreed on a new 2030 Framework for climate and energy, including EU-wide targets and policy objectives for the period between 2020 and 2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet its long-term 2050 greenhouse gas reductions target.

The targets are based on a thorough economic analysis that measures how to cost-effectively achieve decarbonisation by 2050. The main financial effect of decarbonisation will be to shift spending away from fuel sources and towards low-carbon technologies, such as bioenergy. The targets for the 2030 Energy Strategy are set out below;

- a 40% cut in greenhouse gas emissions compared to 1990 levels;
 - at least a 27% share of renewable energy consumption; and
 - at least 27% energy savings compared with the business-as-usual scenario.
- To meet the targets, the European Commission has proposed:
- A reformed EU emissions trading scheme (ETS;)
 - New indicators for the competitiveness and security of the energy system, such as price differences with major trading partners, diversification of supply, and interconnection capacity between EU countries; and
 - First ideas for a new governance system based on national plans for competitive, secure, and sustainable energy.

These plans will follow a common EU approach. The policy is geared toward creating stronger investor certainty, greater transparency, enhanced policy coherence and improved coordination across the EU in terms of developing the generation of renewable energy from bio-renewable sources.

2015 Paris Climate Conference (COP 21)

In 2015, COP21, also known as the 2015 Paris Climate Conference, created a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C. The policy which will give effect to these targets in an Irish context is currently being devised by the European institutions.

The *“Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 for a resilient Energy Union and to meet commitments under the Paris Agreement and amending Regulation No 525/2013 of the European Parliament and the Council on a mechanism for monitoring and reporting greenhouse gas emissions and other information relevant to climate change”*, which was published on the 20th of July 2016, outlines the scope of Ireland’s emission reduction requirements going out to 2030. The time period of this proposal aligns with the envisaged duration of the policy provisions of the Energy White Paper, which recognises the role which Bioenergy can play in Ireland’s energy transition.

European Commission Circular Economy Package

In July 2014, the European Commission put forward an initial circular economy package. As part of a new circular economy package, in December 2015 the Commission presented an action plan for the circular economy, as well as four legislative proposals amending the following legal acts:

- Waste Framework Directive;
- Landfilling Directive;
- Packaging Waste Directive;
- Directives on end-of-life vehicles, on batteries and accumulators and waste batteries and accumulators, and on waste electrical and electronic equipment (WEEE).

The justification which underpins the implementation of circular economy systems is that they keep the added value in products for as long as possible and eliminate waste. This in turn keeps resources within the economy when a product reaches the end of its life. Transition to a more circular economy requires changes throughout value chains, from product design to new business and market models, from new ways of turning waste into a resource to new modes of consumer behaviour. This implies full systemic change, and innovation not only in technologies, but also in organisation, society, finance methods and policies. Even in a highly circular economy there will remain some element of linearity as virgin resources are required and residual waste is disposed of.

Bioenergy technologies can form an integral component of the drive to achieve the realisation of a circular economy. The generation of biogas through the digestion of food waste and animal slurries converts traditionally perceived wastes into resources capable of providing a valuable energy resource for the wider European Union and Ireland.

Directive 2009/28/EC of the European Parliament

Directive 2009/28/EC on the promotion of the use of energy from renewable sources establishes the basis for the achievement of the EU's 20% renewable energy target by 2020. Under the terms of the Directive, each Member State is set an individually binding renewable energy target, which will contribute to the achievement of the overall EU goal.

Under the EU's "20-20-20" Effort Sharing Decision, Ireland is required to meet the following targets by 2020;

- A 20% reduction in Final Energy Consumption (FEC), as compared to average energy use in the period 2001-2005;
- A 20% reduction in GHG emissions from 2005 levels in the Non-ETS sector; and
- An increase in the contribution of renewable energy to FEC to 16% by 2020 and an increase in the overall share of energy from renewable sources in transport to 10%.

At present, the State is not on track to meet its obligations under this directive and as such, is at risk of having fines imposed as well as being obligated to acquire Emissions Trading Scheme (ETS) credits to make up the shortfall in emissions reductions. One study of the costs associated with non-compliance estimated the cost of not meeting the set targets at €610 million. The risk which noncompliance poses is also outlined in the Department of Finance's '*Stability Programme Update*' (2016) sets out the impetus for the creation of low carbon communities based on the State's commitments to binding EU effort sharing in the area.

In order to marshal an effective response and to guide the development of innovative approaches to the creation of sustainable low carbon communities, Irish planning and design practice needs to expand its capacity to deliver technically and economically viable energy efficient solutions. The deployment of BioEnergy energy technology will be a key plank for the State's response in terms of generating more of its energy needs from renewable sources in advance of 2020.

State of Play on the Sustainability of Solid and Gaseous Biomass Used for Electricity, Heating and Cooling in the EU [SWD (2014)259]

This report sets out the importance of biomass as a source of renewable energy in the European Union. It sets out the advantages associated with the development of biomass projects for heating and cooling as well as in relation to the creation of employment in predominantly rural areas where the feedstocks are produced. The report outlines the effectiveness of biomass projects as a balancing generating technology which can be drawn upon to supplement energy generated from solar and wind when they enter troughs in their energy production cycle. In terms of contribution to the European economy, the report cites figures from 2013 which states that the turn over associated with solid biomass was €27,679 million with employment figures of 282,095 being involved through the solid biomass energy generation chain. In term of biogas, the turnover figure associated with this sector is €5,698 million with employment figures of 68,895¹⁴.

Programme for Partnership Government (2016)

The 'Programme for Partnership Government' published in 2016 outlines a role for the deployment of bioenergy technologies in terms of harnessing the ability of this subset of renewable energy technologies to capitalise on the by-products of agricultural and agri-industrial processes in order to generate energy in a sustainable manner. Specifically, the programme states;

*'Bioenergy can contribute to waste recovery and rural development, as is the case with anaerobic digestion, which not only generates energy, but also gives effect to national waste policy in terms of utilising waste as a resource. It will be highlighted in waste management plans as a technology suitable for development at a local and regional level and at varying scales. The REFIT schemes, which support the generation of electricity and CHP technologies, including anaerobic digestion, will support the use of waste as a renewable energy'*¹⁵[p 127].

Ireland's Transition to a Low Carbon Energy Future 2015-2030 (Energy White Paper)

The Energy White Paper outlines a role for the deployment of bioenergy technologies in order to achieve the central policy objective of progressing towards a low carbon economy by 2030.

Draft Bioenergy Action Plan for Ireland 2014

This draft plan articulates a vision for the bioenergy sector which encapsulates the important economic and social potential of the sector to provide clean energy and employment in rural and urban settings.

¹⁴ European Commission (2013) 'State of play on the sustainability of solid and gaseous biomass used for electricity, heating and cooling in the EU' Available via:

http://ec.europa.eu/energy/sites/ener/files/2014_biomass_state_of_play_.pdf

¹⁵ Government of Ireland (2016) 'Programme for Partnership Government' Available via:

http://www.merrionstreet.ie/MerrionStreet/en/ImageLibrary/Programme_for_Partnership_Government.pdf

1.4 Overview of the Irish Planning System

The Irish planning system was brought into being through the passing of the Local Government (Planning and Development) Act into law in 1963. Various forms of development consent had existed in an Irish context before that date however the 1963 Act effectively codified many of the processes and procedures around development management which have existed before. The Act aligned the management of development with the local government system and borrowed significantly from the manner in which the United Kingdom approached development management.

Between 1963 and the year 2000, a significant volume of subsequently amending legislation and case law necessitated a consolidation of the underpinning legislation and a regularisation of many of the responsibilities which became appended to the planning system from the time of Ireland's accession to the European Economic Community (EEC) and later, the European Union.

The resulting Planning and Development Act 2000 (as amended subsequently) clearly bases the operation of the Irish planning system in terms of development management with a hierarchy of spatial plans which start at a national level in terms of policy and progress towards the management of development as the plans become more local. At National level there is national strategic planning framework, in the form of the National Spatial Strategy (soon to become the National Planning Framework). The National Planning Framework is expected to be published in early 2018.

At a regional level, Regional Spatial and Economic Strategies have been developed in order to conceptually define the spatial vision laid down in national policy. This level bridges the gap between high level policy and City & County Development Plans which are prepared by local planning authorities. City and County Development Plans are the primary instrument by which development is guided at a local level.

The day to day operation of the planning system in terms of development management is carried out by the local planning authority. In the local planning authority responsibility for planning is divided between the elected representatives and the executive, the latter being comprised of managerial and technical staff.

Responsibility for preparing a recommendation on a planning application is carried out by the technical planning staff, but it is the responsibility of the City or County Manager who possesses the requisite 'executive power' to make the final decision on all planning applications.

Ireland is one of the few countries which possess an independent appeals mechanism facilitated by An Bord Pleanála. The Board also has functions to determine appeals under Water and Air Pollution Acts and the Building Control Act.

Appeals under section 37 of the 2000 Planning Act (as amended), usually referred to as normal planning appeals, constitute a significant proportion of the work of the Board and account for most of the decisions made by it. These appeals arise from decisions by planning authorities on applications for permission for the development of land (including applications for the retention of structures or the continuance of uses).

The three types of appeals typically heard by An Bord Pleanála are:

- **First party appeals against decision** of planning authorities to refuse permission;
- **First party appeals against conditions** proposed to be attached to permissions by planning authorities (typically associated with appeals against development contributions);

- **Third party appeals**, which are normally against decisions of planning authorities to grant permission

Applications for strategic infrastructure (as defined by the Planning and Development (Strategic Infrastructure) Act 2006) can be made directly to An Bord Pleanála. Local planning authorities do not determine if planning permission is granted or not, although they are consulted during the consenting process.

Decisions of the Board can be judicially reviewed however the judicial review process is constrained to examine the process of how the decision of the Board was arrived at and not the substance of the planning matters which constitute the case.

1.5 Additional Consenting Processes

In addition to planning permission, a range of additional consents and licenses are required to develop a bioenergy project. The licenses required depend on the technology and the feedstock which will be used in the operation of the development.

Animal By-Products Regulations

The use and disposal of animal by-products (ABP's) are strictly managed by European and National regulations, in these regulations ABP are defined as "bodies or parts of animals or products of animal origin...not intended for human consumption". The primary reason for ABP controls is to reduce and eliminate where possible the risk of spreading disease. Bioenergy projects such as Anaerobic Digestion, which may use animal by-products as feedstock to the process must obtain approval from the Department of Agriculture, Food and the Marine.

ABP's are broken down into:

- Category 1: Brain and spinal chord material
- Category 2: Fallen animals, manure, contaminated milk
- Category 3: Catering waste, former foodstuffs

ABP regulated sites are stringently controlled in terms of all handling, processing and disposal of the risk material. Biogas plants may only process Category 2 & 3 materials. Process requirements are detailed and are identical to or similar in effect to pasteurisation. Biogas plants may apply for and acquire an ABP licence under DAFM documents CN9 "Approval and operation of On Farm Biogas plants", and CN11 "Approval and Operation of Biogas plants transforming ABP".

The ABP licence determines how the resulting digestate can be utilised, in general CN11 plant material can be used anywhere in the country whereas CN9 must be used close to source.

Felling licencing

Forestry in Ireland operates within a legal and regulatory framework. This is necessary in order to protect forests and also to ensure that forestry operations and activities are carried out in compliance with the principles of sustainable forest management. A felling licence granted by the Minister for Agriculture, Food and the Marine provides authority under the Forestry Act 2014 to fell or otherwise remove a tree or trees and to thin a forest for silvicultural reasons.

Electricity Grid Access

In order to export electricity, including renewable electricity, a developer must obtain a grid connection offer. If the project involves 100% internal consumption of the electricity generated, it must be notified to ESB Networks. Larger projects (>40MW) apply to Eirgrid for connection to the transmission network. Projects below 40MW apply to ESB Networks, for connection to the distribution network. The grid connection process is regulated by the Commission for Regulation of Utilities (CRU).

The group processing approach (GPA), including the non-GPA application process for smaller exporters, is heavily overloaded in recent times mainly due to the large number of applications, resulting in long delays. As a result, the CRU is embarking on a new consultation process in Q3 2017 to develop a new connection offer process.

Gas Grid access

Gas Networks Ireland is the grid operator in Ireland. This process is regulated by the CRU, which conducted a consultation process on biogas connection to the grid in September 2013. No decision as to the final process has been published as yet.

Local Authority and Environmental Protection Agency Licencing For Waste Management Facilities

Where a bioenergy project involves processing of a waste material, for example, food waste as a feedstock for an AD plant, regard must be taken of the need to obtain a licence from the Environmental Protection Agency, or a permit, or a certificate of registration from the Local Authority. The EPA¹⁶ maintains a four-tier system of authorisation has been established for the regulation of such activities at a facility. A waste recovery or disposal activity at a facility is either:

- an exempted activity (no authorisation required), or
- requires a Waste (or IPPC) licence, or
- requires a Waste Facility Permit, or
- requires a Waste Certificate of Registration / Registration Certificate.

Depending on the authorisation required these activities are controlled either by the Environmental Protection Agency (EPA) or by Local Authorities within their own areas. The EPA regulates all non-exempted Local Authority waste facility activities.

¹⁶ EPA (2017) 'Who needs a Waste Licence, Permit or Cert of Registration' Available via: <http://www.epa.ie/licensing/licques/>

1.6 Research Methodology

This research project's research methodology has been devised to produce a coherent set of evidence based planning and development recommendations for the bioenergy sector in Ireland.

The first research task encompassed a comprehensive review of the planning pipeline for bioenergy projects in an Irish context. This review entailed the collation of a comprehensive list of planning schemes for bioenergy development which were submitted for consideration to local and national planning authorities (Appendix Two). Through this review, consistent planning and development matters were identified as recurring elements of local and national planning authority deliberations relating to the assessment of schemes submitted.

Subsequently, a thorough review of planning and development guidance in mature bioenergy markets was undertaken. The purpose of this review was to build a knowledge based on consenting regimes which may have insights to contribute in terms of devising planning and development guidance recommendations for the sustainable assessment of bioenergy projects applying for planning in an Irish context.

Through the study of the planning pipeline and the precedent set out in mature market's consenting processes for bioenergy facilities, a series of recommendation areas were devised for exploration through a consultation process which constituted the third stage of the project. Consultees (as set out in Section 4.0) drawn from the main sectors influenced by the planning process for bioenergy projects were questioned about the potential need for specific planning guidance recommendations to address the areas identified during the first two stages of the research project.

The final stage of this research project considered the outputs from the process above and arising from an evaluation of the primary research base which had been accumulated, posited a series of evidence based planning recommendations covering the deployment of bioenergy projects in an Irish context.

1.7 Conclusion

This section has framed this research with reference to the specific objectives which underpin the main deliverables of the project. In addition, it has set out the energy policy context which drives the impetus for the development of planning guidance recommendations for this form of renewable energy generation. This section also outlined the methodological process which has been selected to draft the planning guidance recommendations for the bioenergy sector.

2.0 Bioenergy Planning Pipeline Study

The purpose of this section is to explore the nature of the issues which have emerged within the planning pipeline in relation to the development of bioenergy technologies in an Irish context. In addition, this section will explore the societal acceptance related issues associated with bioenergy development in an Irish context.

2.1 Existing Bioenergy Planning Provisions

As bioenergy projects have come through the planning process and are currently in operation in the Republic of Ireland, some research into the planning and development issues which arose during the consenting process have been published. In 2013, the Sustainable Energy Authority of Ireland published the '*Methodology for Local Authority Energy Strategies*' which considered some of the planning and development impacts associated with the development and operation of renewable energy technologies, including bioenergy projects. Table 4 below outlines the 'Key Land Use Interactions' of bioenergy technology as outlined in the LARES methodology.

Table 4 Bioenergy Land Use Interactions (Source: SEAI, 2013)

	Impacts vary according to bioenergy resource/technology
Location and Land Use	Proximity to a sufficient supply of the raw materials necessary for energy production is usually desirable to remain efficient and sustainable; e.g. municipal solid-waste-to-energy facility or energy crop combustion plant.
	The proximity of the bioenergy facility to dwellings and other sensitive locations, such as schools and hospitals, should be assessed from a public safety perspective.
	For heat-producing or CHP facilities, the location is important regarding the availability of a local market; i.e. the plant's proximity to a high heat demand area/facility or whether it would be economical to provide a district heating (DH) scheme.
	Industries which use their residual resources to produce onsite space heating and some electricity, e.g. sawmills, will not necessarily need to locate beside a well-developed transport network.
Landscape and Visual Impact	A combustion facility such as that for biomass, CHP and energy from waste (EfW) will generally be of a large scale, with an industrial character and tall stacks/chimneys. This can be integrated into a more urban and industrial setting, however. (The Vienna Waste to Energy plant is located in the city beside a university and has been designed to integrate with the surrounding environment.)
	There are also variations in stack/chimney height, whether incineration, pyrolysis or gasification are used.
	The siting of a bioenergy facility with regard to the surrounding environment and the visual impact it would impose. If the bioenergy facility is located within an industrial development, it will have a different impact on the surrounding area than if it were located standalone on a greenfield site. For example: : • An anaerobic digestion plant situated on farms will not have a major influence on the visual character of the area, while a standalone centralised anaerobic digestion plant may alter the visual landscape. • Facilities such as landfill gas or sewage gas plants are more often than not located on site at a landfill or water treatment works, so visual impact may not be a major concern.

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Site Conditions and Operation	Feedstock: • Scale of a bioenergy facility – sufficient energy need and supply of feedstock • Maintenance of recycling levels for an EfW facility • Use of non-hazardous wastes • Separation or use of residual wastes
	Pollution: • Gas emissions from combustion • Noise pollution (potentially from operations/traffic) • Odour (potentially from combustion, anaerobic digestion storage and transport of wastes and feedstock) • Light pollution (e.g. a 24/7 operation) • Potential for contaminants to enter soil and groundwater
	Local authorities may need to consider provisions for: • Seepage from stored effluents (specifically biofuels and bioliquids) • Contamination of ground waters • Removal of cooling waters/agents and waters from gas cleaning • Disposal of hazardous end-products, e.g. fly-ash and gas residues
Infrastructure	Facilities where electricity on a large scale, is produced may need to consider proximity to the National Grid. Facilities where heat is produced will need either an onsite use for the heat or a distribution network associated with a DH scheme and a heat market, e.g. a new development or a heavy-industry area. Also of relevance to large scale generators, the potential round-the-clock operations of a bioenergy facility and the often high volumes of material needed, the continuous supply of feedstock and removal of end products from bioenergy facilities may result in additional traffic loading on local transport infrastructure. Transport considerations include: • Proximity to an adequate transport network • HGV accessibility for feedstock inputs and end-product removal • Road and junction capacity to cater for additional traffic • Road network condition and maintenance Freight movements by rail and by sea may also need to be considered.

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Planning Exemptions

An amendment¹⁷ to the Planning and Development Regulations 2001 set out planning exemptions for the deployment micro-renewable energy technologies in domestic and commercial sectors. The exemptions relating to BioEnergy technologies are set out table 5 below.

Table 5 Planning Exemptions for BioEnergy Development

Description of Development	Limitations and Conditions
CLASS 56 (a) The construction, erection or placing within the curtilage of an industrial building of a structure for the purposes of housing a (fully enclosed) Combined Heat and Power system.	1. The gross floor area of the structure shall not exceed 500 square meters.
	2. No such structure shall exceed 10 metres in height, or 50 metres in length.
	3. No such structure shall be within:
	(a) 10 metres of any public road.
	(b) 200 metres of the nearest habitable house or residential building or school, hospital, church or building used for public assembly (other than the house or building of the person providing the structure), save with the consent in writing of the owner, and, as appropriate, the occupier or person in charge thereof.
	4. No such structure within 100 metres of any public road shall exceed 8 metres in height.
	5. No such structure shall have more than 2 flues, neither of which shall exceed 20 metres in height from ground level.
	6. The diameter of any flue shall not exceed 1 metre.
	7. Noise levels must not exceed 43db(A) during normal operation, as measured at the nearest party boundary.
(b) The construction, erection, or placing within the curtilage of a business premises, or a light industrial building, of a structure for the purposes of housing a (fully enclosed) Combined Heat and Power system.	8. Not more than one such structure shall be erected.
	9. The structure shall be used for the purposes of housing a Combined Heat and Power unit only.
	1. The gross floor area of the structure shall not exceed 300 square metres.
	2. No such structure shall exceed 8 metres in height, or 40 metres in length.

¹⁷ S.I. No. 235/2008 - Planning and Development Regulations 2008

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	3. No such structure shall be within: (a) 10 metres of any public road. (b) 200 metres of the nearest habitable house or residential building or school, hospital, church or building used for public assembly (other than the house or building of the person providing the structure), save with the consent in writing of the owner, and, as appropriate, the occupier or person in charge thereof.
	4. No such structure shall have more than 2 flues, neither of which shall exceed 16 metres in height from ground level.
	5. The diameter of any flue shall not exceed 1 metre.
	6. Noise levels must not exceed 43db(A) during normal operation, as measured at the nearest party boundary.
	7. Not more than one such structure shall be erected within the curtilage of such a premises or building.
	8. The structure shall be used for the purposes of housing a Combined Heat and Power unit only.
(i) The provision as part of a heating system for an industrial building or light industrial building or business premises of a biomass boiler, including a boiler house, flues mounted on the boiler house, and over-ground fuel storage tank or structure.	1. The gross floor area of the boiler house shall not exceed 20 square metres.
	2. No such structure shall exceed 8 metres in height, or 40 metres in length.
	3. The height of a boiler house or such a fuel storage tank or structure shall not exceed 3 metres.
	4. The height of a flue mounted on a biomass unit shall not exceed 16 metres, measured from ground level.
	5. No more than 2 flues shall be erected.
	6. Not more than one such structure shall be erected within the curtilage of the site.
	7. The diameter of any flue shall not exceed 1 metre.
	8. The boiler house shall not be located within: (a) 10 metres of any public road. (b) 100 metres of the nearest habitable house or residential building or school, hospital, church or building used for public assembly (other than the house or building of the person providing the structure), save with the consent in writing of the owner, and, as appropriate, the occupier or person in charge thereof.
	9. Noise levels must not exceed 43db(A) during normal operation, as measured from the nearest party boundary.
	10. The fuel shall not include products derived from animal wastes or from wood containing dangerous substances.
CLASS 18 (a) The construction, erection or placing within an agricultural holding of a structure for the purposes of housing a (fully enclosed) Combined Heat and Power	1. The gross floor area of the structure shall not exceed 300 square metres.
	2. No such structure shall exceed 8 metres in height, or 40

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system.	metres in length.
	3. No such structure shall be within: (a) 10 metres of any public road. (b) 100 metres of the nearest habitable house (other than the house of the person providing the structure) or any other residential building or school, hospital, church or building used for public assembly, save with the consent in writing of the owner, and, as appropriate, the occupier or person in charge thereof.
	4. No such structure shall have more than 2 flues, neither of which shall exceed 16 metres in height from ground level.
	5. The diameter of any flue shall not exceed 1 metre.
	6. Noise levels must not exceed 43db(A) during normal operation, as measured at the party boundary.
	7. Not more than one such structure shall be erected within the agricultural holding.
	8. The structure shall be used for the purposes of housing a Combined Heat and Power unit only.
(e) The provision as part of a heating system for an agricultural building of a biomass boiler, including a boiler house, flues mounted on the boiler house, and over-ground fuel storage tank or structure.	1. The gross floor area of the boiler house shall not exceed 20 square metres.
	2. The capacity of the fuel storage tank or structure shall not exceed 75 cubic metres.
	3. The height of a boiler house or such a fuel storage tank or structure shall not exceed 3 metres.
	4. The height of a flue mounted on a biomass unit shall not exceed 20 metres, measured from ground level.
	5. No more than 2 flues shall be erected.
	6. Not more than one such structure shall be erected within the agricultural holding.
	7. The diameter of any flue shall not exceed 1 metre.
	8. The boiler house shall not be located within: (a) 10 metres of any public road. (b) 100 metres of the nearest habitable house or residential building or school, hospital, church or building used for public assembly (other than the house or building of the person providing the structure), save with the consent in writing of the owner, and, as appropriate, the occupier or person in charge thereof.
	9. Noise levels must not exceed 43db(A) during normal operation, as measured from the nearest party boundary.
	10. The fuel shall not include products derived from animal wastes or from wood dangerous substances.

2.2 Planning and Development Impacts of Bioenergy Development

The purpose of this section is to explore the lessons arising from the planning and development pipeline for bioenergy projects submitted to local and national planning authorities in Ireland. The contents of this section constitute the baseline evidence which supports the planning guidance recommendations outlined in Section 5.0 of this report as they reflect the planning and development impacts of bioenergy technologies as they have emerged through the consenting process. In terms of the applications reviewed for the purposes of this above assessment of the planning and development impacts of bioenergy projects submitted to date, these are set out in Appendix 2.0 of this report. The bioenergy technologies within the planning pipeline snapshot are outlined below.

- Biomass
- Biogas

The issues arising from the planning pipeline are dealt with thematically in the following sections. Through a review of the planning decisions relating to the applications cited in Appendix 2, combinations of the matters below result in applications for bioenergy projects being refused by local and national planning authorities. Matters relating to noise and emissions are not covered in this section, these will be explored in Section 2.3 which explores the grounds for third party appeals which have been submitted on the bioenergy projects outlined in Appendix 2.0.

Given the site-specific nature of the assessment process associated with bioenergy development, the high-level issues which have emerged in relation to the success or failure of planning applications will be considered under the headings below. In order to illustrate points, reference will be made to quotations from the reasoning advanced by planners from local and national planning authorities in respect of particular projects.

Development Plan Policy

This section explores the way County Development Plans (CDPs) as adopted by local planning authorities consider bioenergy technology. The purpose of this comparative analysis is to highlight the different approaches which local authorities take to the management of bioenergy development within their functional areas. As outlined in Section 1.4, the CDP is the primary public document setting out planning policies for a local authority area. The CDP sets out land use, amenity, economic and development related objectives and policies of the planning authority for a 6-year period.

The CDP also contains land use zonings which outline the envisioned use of lands in urban areas and their immediate rural hinterlands. When land is zoned for a particular type of development in the development plan, this is a clear indication that a planning permission for this form of development may be obtained. Zoning may also indicate restrictions on development (e.g. a low number of houses per hectare, certain types of industry only) and permitted development will be limited accordingly. CDPs are frequently augmented and supported by strategies which outline the local authority's alignment with wider government policy agendas in areas like housing and energy. The contents of these strategies and their intersection with the development types which will be

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permitted through the zoning designation attached to lands within a local authority's functional area are important as regards the permissibility of bioenergy development within a respective local authority's jurisdiction. A cross section of county development plans were reviewed in order to determine the scope of the development plan objectives which relate to bioenergy infrastructure. The objective of review was to determine the extent to which the respective plans are consistent with one another. The CDPs and their attendant strategies which were reviewed for the purposes of this research are set out below.

- Meath
- Kerry
- Cork
- Tipperary
- Waterford
- Wexford

The conclusions regarding the assessment of development policy with regard to the development of bioenergy projects is set out below.

Meath

The policy objectives with relevance to bioenergy development in the Meath County Council Development Plan 2013-2019, are set out below in table 6.

Table 6 Meath County Council Development Plan Objectives

ED POL 17 To promote rural economic development by recognising the need to advance the long term sustainable social and environmental development of rural areas and encouraging economic diversification and facilitating growth of rural enterprises.
ED POL 18 To recognise and develop the full potential of biomass for energy production and manufacturing including the export of green electricity to the national grid. The Development Plan acknowledges that such enterprises are more readily accommodated in rural areas due to the extent of lands required to ensure security of supply of raw materials and that proximity to the medium to high voltage national electricity transmission network for green electricity exportation is a key locational consideration for development proposers. All proposals for biomass energy production and manufacturing will require screening to determine if a full Appropriate Assessment of the likely significant effects on Natura 2000 sites, is required.
ED POL 19 To recognise the contribution of rural employment to the overall growth of the economy and to promote this growth by encouraging rural enterprise and diversification generally and to promote certain types of rural enterprise, especially those activities which are rural resource dependent, including renewable energy production, food production / processing and the extractive industries.
ED POL 20 To normally permit development proposals for the expansion of existing authorised industrial or business enterprises in the countryside where the resultant development does not negatively impact on the character and amenity of the surrounding area. In all instances, it should be demonstrated that the proposal would not generate traffic of a type and amount inappropriate for the standard of the access roads. This policy shall not apply to the National Road Network.

ED POL 21 To permit development proposals for industrial or business enterprises in the countryside where generally the following criteria are met:

- (i) the proposed use has locational requirements that can more readily be accommodated in a rural location than an urban setting and this has been demonstrated to the satisfaction of Meath County Council;
 - (ii) the development will enhance the strength of the local rural economy’;
 - (iii) the resultant development is of a size and scale which remains appropriate and which does not negatively impact on the character and amenity of the surrounding area;
 - (iv) the proposal demonstrates that it has taken into account traffic, public health, environmental and amenity considerations;
 - (v) the proposal is in accordance with the policies, requirements and guidance contained in this plan
 - (vi) it is demonstrated to the satisfaction of Meath County Council that the proposal would not generate traffic of a type and amount inappropriate for the character of the access roads or would require improvements which would affect the character of these roads.
- This policy shall not apply to the National Road Network.

ED POL 22 To support rural entrepreneurship and the development of micro businesses (generally less than 10 no. employees) in rural areas where environmental and landscape impact is minimal and such developments do not generate significant or undue traffic. This objective shall not apply to the National Road Network.

The policies outlined above have a degree of flexibility and can be interpreted as being conducive to the development of bioenergy schemes in locations which are deemed ‘appropriate’. The scale of the project being proposed and the site context in which it is proposed to be located are the key factors which have a bearing on the success or failure of a planning application. ED POL 22 above outlines a series of common factors which the planning applications’ supporting documentation will have to satisfy the local authority as to the compliance of the proposed scheme with the local authorities perspective on the appropriateness of a particular project in a given location. The perspective of the local authority is of particular importance therefore any opportunity to get the opinion of the local authority in advance of the submission of a planning application. The best mechanism for the determining a local authority’s perspective on a development is by means of a preplanning meeting which a local authority is obligated to provide under Section 247 of the Planning and Development Act 2000 (as amended). The quantification of traffic impacts as well as the proposal of measures for the mitigation of the potential impact are also key considerations outlined within the planning policy objectives above.

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Kerry

This section explores the approach to bioenergy developments as set out in Kerry County Council's County Development Plan 2015-2021. The content of the Kerry County Development Plan varies from that outlined in Meath County Council. Table 7 below sets out the location provisions outlined in the Kerry Renewable Energy Strategy.

Table 7 Kerry County Council Bioenergy Planning Policy

Location and Impacts
The generation of fuel from biomass, including anaerobic digestion, on a commercial scale is an industrial process potentially involving large structures and grid connections. Such plants should be located in brownfield sites, adjacent to industrial areas or co-located with other wood processing industries.
Proposals for bioenergy plants will be considered on lands which are reserved for industrial uses in any development plan.
To minimise traffic impacts, locations should be close to the point of demand and be served by public roads with sufficient capacity to absorb increased traffic flows and adjacent to transport corridors.
The Ballylongford Land bank on the Shannon Estuary is zoned for industrial development in the Kerry County Development Plan 2009-2015 (CDP). Objective ECO 5-25 in the CDP is to "promote and facilitate the development of the lands zoned for industrial development". As it is considered that bioenergy plants are a form of industry due to the processes involved, their location in the Ballylongford Land Bank would therefore be appropriate.
The Planning Authority will encourage the development of district heating schemes which are of an appropriate scale and where it can be demonstrated that the scheme will not adversely affect residential amenity. A district heating scheme has been successfully developed in the centre of a residential area in Moyderwell, Tralee. 1mw of thermal energy is being generated by a wood chip boiler. This boiler (90% efficient) generates 3mwh per tonne. The wood chip used having 25% moisture content.
Traffic considerations arise as biomass fuel must be delivered from the point at which it is produced to the plant itself. There is a need to ensure that the distances involved are not so great that carbon dioxide emissions from transportation significantly reduce any carbon benefit derived from the use of biomass. Issues related to the generation of traffic and the protection of the carrying capacity of roads will be a material consideration in the assessment of an application.
Noise (engines, boilers, handling equipment and traffic) may in some cases be sufficiently loud to affect the amenity of adjacent users, particularly in residential areas. Biomass plants may also have an adverse impact on visual amenity. Bioenergy installations will not be permitted in areas which may affect residential or visual amenity. Some types of biomass installations have the potential to generate odours and emissions to air. Proposals will be required to demonstrate that these factors

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have been considered and the scheme will not generate emissions and odours. In relation to location, on-site waste water treatment, emissions from burning of biomass fuel, flood risk water quality and grid/gas connection proposals will be required to comply with the development standards set out in Chapter 11 and the provisions of the Kerry County Development Plan 2009-2015. Applicants are advised to consult with the Council's Environment Department to identify and develop mitigation measures where they are deemed to be necessary.

The location policy is weighted toward the development of large schemes utilising biomass and biogas technology on industrial or brownfield lands proximate to urban areas. Noise, traffic and visual amenity are set out as matters which the local authority will have particular regard for. The plan does not identify the scale of energy production which would class an application as being 'large' in nature, either in terms of the site footprint of a project or the energy which it may generate. The absence of this definition does introduce an element of ambiguity for applicants who could in theory propose to develop a centralised anaerobic digester in a rural area. Objective B5 below in table 8 indicates that the local authority will consider 'small scale' developments yet an absence of a definition of the local authority's view of what constitutes a small scale development elevates the risk associated with the development of a project proposal.

Tied to the above, the specific objectives which relate to the development of bioenergy projects in County Kerry are set out below in Table 8.

Table 8 Kerry Renewable Energy Strategy 2015-2021 Bioenergy Objectives

Objective B1 Proposals for the development of a bioenergy plant shall be in compliance with the objectives of this strategy, the development management standards set out in Chapter 11, the provisions of the Kerry County Development Plan 2009-2015 and be in accordance with the proper planning and sustainable development of the County.
Objective B2 Proposals for grid connection lines will comply with the development management standards set out in Chapter 11.
Objective B3 Proposals for the development of a commercial bioenergy plant will be considered on brownfield sites which are adjacent to industrial areas or on lands which are reserved for industrial uses in any development plan. Brownfield sites in rural areas may also be considered subject to the development management standards set out in Chapter 11
Objective B4 Proposals for the development of a commercial bioenergy plant should be close to the point of demand and be served by public roads with sufficient capacity to absorb increased traffic flows and adjacent to transport corridors.
Objective B5 In rural areas the planning authority will consider proposals for small scale developments close to the source material and where roads have capacity to absorb increased traffic flows. Such plants should, where possible, be located in proximity to existing agricultural buildings.
Objective B6 Bioenergy developments will not be permitted in Natura 2000 sites or within designated and proposed National Natural Heritage Areas or, ex situ of these ecologically sensitive areas where proposals will adversely affect the integrity significantly affect the conservation objectives and qualifying interests of Natura 2000 sites, or impact on the ecological integrity of NHA/pNHAs, the habitats of protected species without appropriate licence protected habitats

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and/or species as designated under National and European National legislation.
Objective B7 Bioenergy installations shall not be permitted in areas where such developments may affect residential or visual amenity.
Objective B8 Kerry County Council shall investigate the feasibility of installing anaerobic digestion facilities at its various wastewater treatment plants in the County.
Objective B9 Kerry County Council will seek to promote the installation of district heating schemes powered by renewable fuel sources that are produced in a sustainable manner. Community groups will also be facilitated in any efforts to develop bioenergy projects.
Objective B10 Delivery of fuel to Bioenergy plants shall not use more carbon than is being saved by the use of bioenergy as a renewable fuel.
Objective B11 Bioenergy plants shall make every effort to utilise excess heat by contributing to district heating schemes or using the heat for other uses.
Objective B12 Kerry County Council will support the sustainable production of biomass material that follow Sustainable Forestry Management and follow best practices in the growing of energy crop

A broad spectrum of bioenergy considerations is reflected at a high level in the objectives highlighted above. Some consideration is afforded to smaller farm scale schemes in the objectives of the strategy and the contexts in which these will be permitted. Detail around scales of projects which may be permissible is limited which is an issue as an absence of this detail from the strategy may increase the planning risk associated with the acquisition permission for a scheme. The emphasis on large scale bioenergy developments overlooks the potential of centralised farm supported biogas project. An absence of consideration for this type of project and the industrial perception which is inferred from the planning policy outlined above would lead towards a high planning risk for the undertaking of centralised biogas scheme.

Cork

Cork County Council's planning policy in relation to bioenergy schemes is quite broad in nature. It supports the development of bioenergy projects with certain provisos in relation to the appropriateness of the sites selected for development about the technology and scale of the development being proposed.

Farm scale biogas is not mentioned within the planning policy. The absence of this form of development from the plan's policy framework creates an element of planning risks as the justification for the deployment of farm scale systems may have to rely on more general rural economic or sustainability related provision which infers an element of ambiguity in the way such a scheme may be assessed with reference to the planning policy framework of the county.

Similarly, to Meath and Kerry, the development impacts which the policy refers to are related to visual impact, traffic, noise and odour. The regulation of these impacts and the demonstration of the mitigation measures proposed by the applicant will be key to the acquisition of a successful grant of planning permission.

Table 9 below outlines Cork County Council's Development Plan (2014-2020) objectives for the delivery of bioenergy projects.

Table 9 Cork County Council Development Plan 2014-2020 Bioenergy Planning Objective/Policy

County Development Plan Objective ED 4-3: Bioenergy Support and encourage the development of the bioenergy sector and facilitate its development for energy production, heat storage and distribution. Encourage the development of commercial bioenergy plants; on brownfield sites which are adjacent to industrial areas or on lands which are reserved for industrial uses or on brownfield sites in rural areas. Commercial bioenergy plants should be located close to the energy source and the point of demand, where they can be served by public roads with sufficient capacity to absorb increased traffic flows and adjacent to transport corridors. Visual, noise and odour impacts on adjacent residential property will be key considerations when assessing any such proposals
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The management of demand for industrial and brownfield lands within the county is a matter which is not considered in depth in the contents of the development plan. In major urban centres in the county, the availability of such lands may be constrained if demand exists for traditional commercial/industrial activities and applications are submitted in response. The focus on lands zoned for those purposes and the absence of consideration for the development of bioenergy projects on lands zoned for other uses or unzoned lands may elevate the planning risk associated with the pursuit of planning permission for a bioenergy project.

Tipperary

Tipperary County Council's Renewable Energy Strategy (2015) have a comprehensive policy around the development of bioenergy technology. The planning policy put forward by the county outlines a comprehensive range of potential technologies which could be developed in the county in different contexts and at different scales.

Table 10 below outlines the planning policy considerations put forward by in the renewable energy strategy for the county.

Table 10 Tipperary County Council Planning Policy on Bioenergy

LOCATION OF BIOMASS RENEWABLE ENERGY FACILITIES

It is envisaged that a planning framework will be required for the following key types of facilities in Tipperary:

1. On-Farm AD/fermentation plants using slurries both produced on site and feedstock's imported from the surrounding area (mixed).
2. Imported mixed biomass processing (using a range of technologies) using feedstock (mixed) imported from the surrounding areas.
3. Wood biomass processing facilities to cater for local heat energy markets.

The Council recognises the need to support the development of biomass processing facilities to cater for demand for biomass fuel for heat users in the county. At present processing is limited to small-scale wood-chipping in the county.

- Complete an economic assessment of the potential for the development of biogas.
- Develop a policy framework to encourage the development of DH.
- Develop a policy framework to encourage the development of CHP.

Outside of on-farm AD facilities, it is likely that the most viable locations for mixed biomass facilities and facilities that produce biomass products for local heat markets will be proximate to head demand centres at locations where infrastructure, including transport infrastructure is capable of accommodating such development.

Specific Tipperary County Council Development Plan objectives which relate to bioenergy projects are set out below in table 11.

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Table 11 Tipperary County Council Development Plan Objectives

Policy RE4: On-Farm Anaerobic Digestion/Fermentation It is the policy of the Council to support the installation of on-farm AD/fermentation plants using slurries produced on site, and the importation and treatment of feedstock's imported from the surrounding local area to supplement the on-site treatment of agricultural waste. Such facilities shall be located within existing farm complexes, use excess heat on site and may be connected to the national electrical grid.
Policy RE5: Mixed Biomass Processing Installations It is the policy of the Council to support mixed biomass processing (using a range of technologies) and using mixed feedstock (including biological waste) imported from surrounding areas on suitable sites. (a) Mixed bioenergy plants should be located close to the energy source and the point of demand, where they can be served by a transport network with sufficient capacity to safely absorb increased traffic movements and where waste heat can be used. Such facilities will be assessed against the ability of the receiving environment to accommodate them without causing an adverse impact on residential or environmental amenity. (b) Proposals for bioenergy in Tipperary that will cater for regional energy demand or feedstocks imported from the region will be assessed for compliance with appropriate regional plans and strategies and Policy ED1: Strategic Employment of the County Development Plan (as varied).
Policy RE6: Local Wood biomass storage and chipping facilities It is the policy of the Council to support proposals for wood biomass storage and chipping facilities that identify biomass demand in the form of wood chip in Tipperary and put in place suitability located processing facilities that can cater for this local heat demand. Such facilities will be located in areas where both timber resources and final markets can be readily accessed. The Council will consider expansion of existing timber processing facilities and new facilities on suitable sites. Planning applications for all biomass processing facilities should as a minimum requirement, identify the following to assist in the determination of the planning application. (a) Tonnes per annum to be processed at the facility. (b) Details of the source of and nature of all feedstock to be processed at the facility. (c) Detailed technical specifications of the types of technologies proposed. (d) Detailed description traffic movements to and from the site. (e) Description of and location of proposed energy markets. (f) Details and specifications of proposed connection to the national energy networks. (g) Details for storage and stockpiling of biomass feedstock and biomass products on site.

The planning policy and development objectives contained in the tables above are quite detailed in terms of the development impacts which will be examined by the local authority with reference to different technologies. The development plan policies outlined above emphasise the location of bioenergy projects of scale near fuel and demand sources. Consideration is also afforded to the role which supporting infrastructure within the county would have to play in the provision of feedstocks

to bioenergy projects in the county. This level of detail is absent from the other plans and policies outlined in this section.

The level of detail provided enables an applicant and their project team to effectively assess potential sites as well as draft planning documents which address the key and ancillary issues highlighted by the local authority. In addition, it enables the applicant's design team to focus on these matters if a pre-planning meeting is undertaken, thereby adding value to the insights arising from such a meeting in terms of designing a project which complies with the policies of the local authority and militates against any development impacts associated with the project.

Waterford

The Waterford City and County Council Development Plan 2011-2017 envisages the role which bioenergy technology will play in the generation of renewable energy in the county. The relevant planning policy sections relating to bioenergy in the City and County Development Plan are outlined below in table 13.

Table 12 Waterford City and County Council Development Plan Bioenergy Policy

Combined Heat & Power can be powered by a number of resources, namely solid biomass, natural gas and biogas.

Solid biomass CHP installation powered by forestry and energy crops has significant potential for replication in Waterford where thermal energy in the form of steam or conventional heating can be used to heat buildings / processes.

The electricity generated on site can be exported to the national grid or can be used for an industrial process. Each CHP plant provides heat and electricity on site in a single process using waste timber and forestry thinnings as the main feed source. The use of forest-based biomass can improve the overall energy efficiency of industrial landuses. For example, Aurivo Milk Processing Plant in Ballaghaderreen, Co. Roscommon installed a biomass CHP plant in 2014 using forest based biomass. This has improved the overall energy efficiency of the plant and is a template that could be replicated at a number of locations in Waterford on a smaller scale. The most advantageous locations for biomass CHP are:

- Areas not linked to the national gas grid, e.g. Dungarvan, Lismore;
- Locations with high annual thermal energy demand, e.g. industrial estates, hospitals;
- Locations where biomass resource is readily available to be utilized, e.g. West Waterford.

There is potential within Waterford to develop a number of biomass CHP installations, which can be linked to district heating schemes (see Section 7.3). Large urban areas with industrial estates such as Dungarvan, Cappoquin are suited to biomass CHP as there is adequate space to accommodate such a facility and excess heat generated can be used to service adjoining industries or even hospitals. In the Nordic countries the presence of a biomass CHP plant is a beneficial piece of infrastructure that can be utilised to attract businesses and industry with the offer of the supply of a cheap source of heat and electricity. There is potential to replicate this model in Waterford.

Anaerobic Digestion facilities are common throughout the European Union and have many environmental benefits. AD facilities use bacteria to convert organic material such as sewerage sludge, industrial / houses hold waste, agricultural wastes and energy crops such as maize into biogas. AD offers potential for the generation of electricity and heat through the burning of biogas in a localized CHP plant.

There has been limited investment in AD facilities at a farm level in Waterford to date. However, Climate Change obligations and national energy targets could result in an increase of such facilities, as the burning of methane in an AD facility could significantly reduce greenhouse gas emissions from agriculture.

This Strategy considers that there are two types of AD facilities which have potential in Waterford in the future:

- Agricultural AD facility, whereby slurry is used as a feedstock for Anaerobic Digestion. Such an installation is likely to be farm based and is likely to progress where there is an abundant and constant supply of raw material (i.e. slurry) to feed the AD facility.
- Industrial AD facility, where the feed stock is likely to be a mixture of sewerage sludge, industrial / houses hold waste, agricultural wastes and energy crops such as maize. Such installations are likely to be based within an industrial estate or other strategic location.

The allocation of a strategic role of bioenergy for urban settlements not supplied by the gas grid or with high heat demand is in line with the use of resources to provide renewable forms of energy where demand or existing infrastructure is not in line to be expanded.

Wexford County Council

The planning policy objectives of Wexford County Council's County Development Plan 2013-2019 are set out below in table 5.

Table 13 Wexford County Council County Development Plan 2013-2019 Policy

Objective EN12 To support and encourage the development of the bioenergy sector and facilitate its development for energy production, heat storage and distribution, subject to compliance with normal planning and environmental criteria and the development management standards...
Objective EN13 To support and assist in the implementation of the South-East Region Bioenergy Implementation Plan 2008-2013 through the planning process, subject to compliance with Article 6 of the Habitats Directive.
Objective EN14 To encourage the development of anaerobic digesters and biofuel processing plants, subject to the criteria for renewable energies, energy crops and sustainable construction in Chapter 6 and compliance with normal planning and environmental criteria and the development management standards...
Objective EN15 To facilitate the development of Organic Waste to Energy/Combined Heat and Power schemes, subject to the criteria for location of waste management facilities contained in

Chapter 10 and compliance with normal planning and environmental criteria and the development management standards...

Objective EN16 To support and encourage the development of Biomass District Heating and facilitate its development for energy production, heat storage and distribution, subject to compliance with normal planning and environmental criteria and the development management standards...

The policy contained in the plan is quite broad and considers a variety of roles for bioenergy technologies within the county. The level of detail around the location of each type of technology is not as advanced as the contents of other development plans such as the approach which Tipperary County Council outlined. The comparison of bioenergy development in the county with other forms of development such as waste management infrastructure is questionable given that there is no provision for the scale and characteristics of bioenergy project for which this type of designation would apply.

Beyond the above, the policy contained within the plan does not align with the moves at a European level towards the attainment of a 'circular economy' approach which would consider the use of what are perceived to be waste products as a resource from which renewable energy can be generated.

Summary

While a number of development plans outline the role and proscriptions associated with the development of 'large' bioenergy schemes, the development plans reviewed above do not define which constitutes a large-scale scheme. This is an area which requires examination as precedent with the assessment of planning permissions may give rise to an informal categorisation of scheme size which does not relate to industry perspectives on the scale of a given scheme.

There is a degree of variance between the local authorities in terms of the bioenergy technologies which are cited in the development plans outlined above. Specific technologies are focused on, at the expense of others which may be more viable in terms of the supports which may be introduced over the life time of the developments plans considered above.

Standard matters which are cited as development impacts to which the local authority will have particular regard to are set out below. These are;

- Traffic & Transport
- Availability of Feedstock
- Visual Impact
- Residential Amenity
- Land Use Zoning
- Noise
- Odour

The items above are reflected in the follow sections as these matters are reflected in subsequent subsections as issues which emerge during the assessment of planning applications by national and local planning authorities.

Planning Application Review

The development plan policy outlined in the previous section frames the issues which have emerged for bioenergy projects in the planning pipeline. Specific applications are cited where the considerations by the assessing planner indicate the significance to the matter on their assessment of the planning application concerned. The planning applications set out in Appendix 2 are the primary source underpinning the analysis below.

Pre-application Consultation

Applicants seeking planning permission for bioenergy projects can request a pre-planning meeting with the local authority in whose jurisdiction the proposed project will be delivered. Section 247 of the Planning and Development Act 2000 (as amended) requires that local authorities should not unreasonably withhold a request for consultation from a prospective applicant. While a face to face meeting with a planner is the typical form of consultation which takes place, there is nothing within the primary legislation which prohibits the consultation taking place in an alternate form i.e. via email or over the phone.

In the sample of planning applications considered in this research, only 38% of the applicants availed of this opportunity to discuss the proposed project with the local authority. This is an issue as early engagement with a local planning authority may indicate areas of consideration on the part of the authority which an applicant should consider in the planning documents submitted alongside an application.

Land Use Zoning

Land use zoning and siting are matters which are interlinked in terms of the insights arising from the planning pipeline. Given the nature of the resources which constitute the feedstocks for bioenergy generation, consideration of the most appropriate location of the necessary infrastructure needs to take into account of the land uses around a specific site may commend it as a site for energy generation. If the site which has been selected is not on zoned lands and the development plan zoning matrix is not clear on the permissibility of bioenergy projects, then a planning risk arises for the developer.

Rural land uses in an Irish context in terms of production and service provision to the agricultural sector are long established. The diversification of agricultural activity poses a number of challenges to the manner in which development control intersects with the management of new uses. The development of centralised digesters drawing on rural catchment area of agricultural activities for feedstocks is one such example of this intersection. Depending on the size, scale and characteristics of the bioenergy technology concerned, land use zoning has emerged as a point of friction with the assessment of bioenergy projects. The reasoning set forth by an An Bord Pleanála planning inspector frames the above in terms of the reasoning applied by planners taking decisions on bioenergy projects.

Whilst an initial evaluation of the proposal would suggest that the digester should be located on the site where raw materials are generated in order to minimise both economic and environmental costs, I would suggest that such an approach is somewhat over-simplified.

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Consideration must be given to a number of contributory factors in respect of the appropriateness of the siting of such a facility including the overall feasibility of the project...The spatial distribution of farm waste available for anaerobic digestion such as from licensed intensive pig rearing operations is a consideration in the siting of any plant and should preferably be located within a 5-8-mile radius of the AD site.

In the context rurally situated bioenergy projects, the degree to which this area intersects with the assessment of bioenergy projects depends on the energy generating technology and the scale at which it will be applied. Farm scale (250-500kilowatt on average) have not encountered land use planning issues in terms of land use zoning. A review of development plans and policies indicate that there is a common understanding that farm scale biogas production is a use which is compatible with existing agricultural processes.

Bioenergy projects which are considered 'large' in nature by local and national planning authorities are frequently allocated to areas with industrial land use zoning designations. What constitutes a large-scale facility is ill defined within the planning policies which planners use to adjudicate on a grant or refusal of planning permission on policy grounds. There is a need to form a definition within land use zonings across the State which effectively categorises bioenergy development as either a waste management or energy generating activity.

Siting

Siting is a consideration which intersects with the matters outlined in this section. The development of a bioenergy project regardless of scale has development implications on the environs in which it will be situated. The development impacts which may be exacerbated by an improperly sited bioenergy project;

- Visual Impact;
 - External Finishes.
 - Sky lining.
- Residential Amenity;
- Transport;
 - Road Capacity
 - Site Entrance
- Light Pollution; and
- Noise Pollution.

The implications of siting change with reference to the scale of the project being proposed. In terms of farm scale biogas and biomass, the external appearance of this form of development can be assimilated more readily if the development is located in a farm yard as the infrastructure typically resembles farm buildings already on site. Through a review of the farm scale schemes outline in Appendix 2, visual impact does not arise a key consideration in instances of the form of the development outlined above. In terms of 'centralised' digestion taking feedstocks from a number of agricultural sources, an inspector considering an appeal lodged in respect of such a project articulated the reasoning below on considering the appropriateness of developing a centralised AD project.

It is also of relevance to note the siting criteria set out by the Draft EU Council Directive on the biological treatment of biowaste and the Animal By-products Directive (1774/2002/EC). The latter specifies that composting / biogas plants cannot be located within the confines of a premises / farm where farmed animals are kept and that there must be total physical separation between the plant and any surrounding farmlands, with a separate entrance and exit to the facility. Furthermore, such facilities are to be located a minimum of 50m from the nearest premises or location where farmed animals are kept. Such restrictions would inhibit the development of digesters on individual farms and therefore an increasingly 'centralised' approach to anaerobic digestion appears to be more appropriate.

Siting consistently features within planning policy, especially for larger scale bioenergy projects which are frequently directed towards sites which are zoned for industrial development. In one application, the principle of larger bioenergy projects was considered appropriate for development on an industrial site (in this case in the vicinity of port infrastructure). The inspector stated;

The site is located within a long established industrial area and is within the development boundaries of.... Access to the site is along a dedicated industrial route leading directly from the National Route (N69) and there is a second access point at the other end of the town, so little or no heavy goods vehicles should need to traverse the town and its residential areas. The site itself contains a long established industrial building which, however, is in poor condition and is currently unoccupied. I would conclude that the proposal conforms with plan policies to promote industrial/business and employment opportunities within the county and is well positioned in relation to residential development, the nearest houses being over 0.5 km away. Development here should not have a negative impact on the port or its facilities or curtail any future expansion.

Situating large scale developments in industrial settings has been considered positively in terms of the benefits of existing transport infrastructure serving such sites. In terms of developments in an agricultural setting, the siting of a biogas project will need to be agreed with the Department of Agriculture, Food and Marine per the stipulations of the Animal Byproducts Regulations.

Transport

The transportation of feedstocks to sites of bioenergy generation is a key consideration relating to the acquisition of planning permission for schemes. The scale of the development correlates to the volume of material required therefore the quality of transport infrastructure, most notably road capacity is a crucial determinant in terms of acquiring planning permission successfully.

The matters outlined below consistently emerge in the transport considerations related with the planning applications outlined in Appendix Two of this report. These considerations relate to projects which lead to an intensified use of a site entrance on a public road. The points below relate directly to both biogas and biomass projects. The considerations are;

- the designation of the public road (i.e. national primary, regional, local);
- the speed limit which is in force at the entrance;

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- the characteristics of the carriageway, i.e. width, condition of the road surface etc.;
- the nature, scale and layout of the proposed entrance (i.e. sightlines);
- the characteristics of traffic arising from the construction and operation of the proposed project;
- the number of entrances onto the public road within proximity;
- parking spaces required on site;
- Illumination of the project's entrance and any associated signage;
- passing bays or other
- traffic calming measures.

Transport considerations emerge from construction phase through to operation within the planning documentation reviewed during this research. This does not differ from most forms of development as transport before during and after development takes place is a material consideration for local and national planning authorities.

Beyond site specific transport considerations, the transport consideration associated with the movement of feedstock from its source to the site of energy generation. In the case of large sites of bioenergy generation, the transport of feedstocks from within a defined catchment will form a consideration on the part of the planning authority. Avoidance of urban centres in terms of heavy goods vehicles moving through town centres or other such areas is a key consideration on the part of planners evaluating the proposed development.

While infrequently applied, some local authorities have required applicants to put special bonds in place during the construction process. The purpose of this bond is to pay for any road repairs which may arise due to vehicle movements arising from construction of the facility. In instances where large schemes have been proposed in rural locations, the quality of the road network has featured as a ground for refusal of planning permission. When coupled with the land use policy and siting matters considered above, there is a pressure to place large schemes on lands proximate to urban areas by dint of planning policy and infrastructure availability.

Environmental Impact Assessment

The EIA Directive (85/337/EEC) applies to a wide range of defined public and private projects, which are defined in Annexes I and II of the directive. There are mandatory and discretionary provisions for the undertaking on an EIA, these are set out below.

- **Mandatory EIA:** *all projects listed in Annex I are considered as having significant effects on the environment and require an EIA (e.g. long-distance railway lines, motorways and express roads, airports with a basic runway length ≥ 2100 m, installations for the disposal of hazardous waste, installations for the disposal of non-hazardous waste > 100 tonnes/day, waste water treatment plants > 150.000 p.e.).*
- **Discretion of Member States (screening):** *for projects listed in Annex II, the national authorities have to decide whether an EIA is needed. This is done by the "screening procedure", which determines the effects of projects on the basis of thresholds/criteria or a case by case examination. However, the national authorities must take into account the criteria laid down in Annex III. The projects listed in Annex II are in general those not*

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*included in Annex I (railways, roads waste disposal installations, waste water treatment plants), but also other types such as urban development projects, flood-relief works, changes of Annex I and II existing projects...).*¹⁸

The relevant Annex I threshold which relates to bioenergy development is set out below. Arguably, on consideration of the content of the Annex I, the primary projects which relate to bioenergy development span the energy generation and waste management.

(a) Thermal power stations and other combustion installations with a heat output of 300 megawatts or more; and

(b) Waste disposal installations for the incineration or chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9, of nonhazardous waste with a capacity exceeding 100 tonnes per day.

In terms of Annex II, the relevant threshold is set out below.

(a) Industrial installations for the production of electricity, steam and hot water (projects not included in Annex I);

Bioenergy projects of scale outlined in Appendix 2 were required to prepare an Environmental Impact Assessment (EIA) on the basis of the that...*'installations for the disposal of waste with an annual in take greater than 25,000 tonnes not included in Part 1' of development for the purposes of Part 10 of the Planning and Development Regulations 2001 (as amended)*¹⁹.

The information which the applicant needs to provide to the consenting authority is set out below.

1. A description of the project, including in particular:

(a) a description of the physical characteristics of the whole project and, where relevant, of demolition works;

(b) a description of the location of the project, with particular regard to the environmental sensitivity of geographical areas likely to be affected.

2. A description of the aspects of the environment likely to be significantly affected by the project.

3. A description of any likely significant effects, to the extent of the information available on such effects, of the project on the environment resulting from: (a) the expected residues and emissions and the production of waste, where relevant; (b) the use of natural resources, in particular soil, land, water and biodiversity. The criteria of Annex III

¹⁸ European Commission (2017) 'Environmental Impact Assessment – EIA' Available via: <http://ec.europa.eu/environment/eia/eia-legalcontext.htm>

¹⁹ S.I. No. 349/1989: European Communities (Environmental Impact Assessment) Regulations, 1989

shall be taken into account, where relevant, when compiling the information in accordance with points 1 to 3.²⁰

In terms of bioenergy development, in a case of Edenderry, third party objectors to extension of the planning permission of the power station argued that the scope of the EIA should have considered the environmental implications associated with the harvesting the feedstock to be used in the plant's operation.

Appropriate Assessment

An Appropriate Assessment (AA) is required to be carried out if a plan or project is likely to have a significant impact on Natura 2000 sites. The legislative impetus for the undertaking of an AA arising from the Habitats Directive (Article 6(3)), which is codified in Irish law under European Communities (Birds and Natural Habitats) Regulations 2011. Article 42(1) of the 2011 Regulations requires public authorities to screen for Appropriate Assessment a plan or project, which is not directly connected with or necessary to the management of the site as a European Site. AA's have been carried out on applications for bioenergy development in the planning pipeline. Given the site-specific matters which arise in the AA's, there is little in terms of specific insights which can be outlined with relevance to the level at which this research is focused.

At site selection phase, a proposed location for the development of a bioenergy project should consider the potential impact which the development might have on a Natura 2000 site. Proximity to such a Natura 2000 site confers a high level of planning risk if the planning authority concerned considers that the development of a bioenergy project is likely to impact the area. Planning permission can on be granted if a planning authority is satisfied that there is **no reasonable doubt as to the absence of a negative impact on an area of special protection**. In instances of other applications which did not provide the requisite information to the planning authority concerned, planning permission has been refused as the planning authority could not issue a decision as to the absence of a negative impact on a environmentally designated site.

Strategic Infrastructure Development

The Planning and Development (Strategic Infrastructure Development) 2006 inserted a schedule of projects which constitute infrastructure of national significance into primary planning legislation. The 2006 Act also provided for a separate consenting process which enables applicants with strategic infrastructure projects to apply directly to An Bord Pleanála.

To qualify as strategic infrastructure development a proposed development must first come within the scope of one or more of the classes and comply with the thresholds contained in the 7th Schedule. Secondly, the Board must come to the opinion that the proposed development, would meet one or more of the following criteria:-

- is of strategic economic or social importance to the State or the region in which it would be situated,

²⁰ European Commission (2014) 'DIRECTIVE 2011/92/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification)', Available via: http://ec.europa.eu/environment/eia/pdf/EIA_Directive_informal.pdf

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- would contribute substantially to the fulfilment of any of the objectives of the National Spatial Strategy or in any regional spatial and economic strategy in respect of the area or areas in which the development would be situated,
- would have a significant effect on the area of more than one planning authority.²¹

This opinion is formally given by the Board at the conclusion of the pre-application consultation stage following a request for closure of the consultations from the prospective applicant.

Development comprising or for the purposes of any of the following are considered to be SID.

—A thermal power station or other combustion installation with a total energy output of 300 megawatts or more.

—An industrial installation for the production of electricity, steam or hot water with a heat output of 300 megawatts or more.

In terms of waste management, waste disposed of through incineration or chemical treatment of waste (in accordance with the meaning of Annex IIA to Council Directive 75/442/EEC. A number of planning applications for bioenergy projects have been submitted under the provisions of the Planning and Development (Strategic Infrastructure) Act 2006, most notable amongst them being the Poolbeg Incinerator which was commissioned in mid-2017. Matters pertaining to this development are outlined in Section 2.3 below. In terms of the SID process as it relates to bioenergy development, from the planning pipeline of projects, it is clear that the primary issues which relate to this form of development arise in relation to community acceptance of the proposed project.

Feedstock

In the case of co-firing combined heat and power (CHP) plants, local planning authorities, at 'Requests for Further Information' (RFI) stage, have asked applicants to provide details around the areas below;

- Breakdown of biomass vs other materials;
- Clarification on source of biomass to be used;
- Use of fossil fuels within proposed schemes; and
- Data on moisture content of timber to be used.

In addition to the above, 'standard' requests, one local authority requested that the applicant provide '*...a 10 year breakdown of feedstock including national and operated supplies, evidence of national suppliers ability to adequately meet feedstock, details of stage by stage process for harvesting and processing feedstock*'. Conditions attached to the application outlined proportions of feedstocks to be used within the scheme. This approach from An Bord Pleanála was subsequently applied in a few instances by local authorities in their decisions on co-fired developments.

²¹ An Bord Pleanála (2016) '7th Schedule: Strategic Infrastructure Development - Guidelines for Applicants.' Available via: <http://www.pleanala.ie/sid/sidapp.htm>

Summary

The planning issues outlined above have been extracted from an interpretation of the planning files associated with the applications in Appendix Two. The issues outlined above are varied. They relate to planning policy matters associated with the accommodation of a form of development which has not yet taken place on a large scale in Ireland. Consequently, this has led to a varied approach to the assessment of planning applications by local and national planning authorities.

Planning policy in terms of development plan objectives relating to bioenergy are quite varied. Some plans contain specific direction in terms of the technologies concerned and the matters which will be considered when an application is being assessed. Others are less developed in terms of guidance which they can give as regards the most appropriate location of bioenergy projects of any scale. Inconsistency between local authorities in terms of the planning policy treatment of bioenergy projects is a potential issue to the development of the sector. Given that the process to develop a bioenergy project entails the completion of a number of competing consenting processes, it is theoretically possible that a viable and environmentally sustainable scheme may be refused permission on the grounds of not complying with land use designations associated with the zoning of a proposed site while in a neighbouring county, the same application may be permitted.

In terms of other planning matters arising within the planning pipeline, the matters below recur across several of the applications;

- Transport
- Visual Impact
- Environmental Impact Assessment
- Feedstock
- Appropriate Assessment

The following section will deal with the grounds or third-party objections which have been submitted on bioenergy planning applications.

2.3 Third Party Objections to Bioenergy Projects

This section explores the perception of bioenergy technologies by communities where they have been proposed. This exploration is based on a categorisation of the third-party objections, submission and observations which have been gathered through an interrogation of the sample of planning applications outlined in Appendix 2.0 of this report. While this focus is narrow, it is appropriate to examine the nature of these contributions advanced during the planning process as they accurately reflect the nature of the sentiments which are frequently expressed by individual actors and community groups who have been mobilised to object against the development of Bioenergy projects on a specific site.

In addition, this section considers a selection of literature which explores the manner in which community acceptance of Bioenergy projects has evolved in other jurisdiction in order to frame the Irish experience as evidenced from the overview afforded by the examination of community participation in the planning process as outlined above.

Community Acceptance & Bioenergy Overview

Societal acceptance,) is emerging as a key policy consideration in terms of the formation of renewable energy policy in an Irish context²². Specifically, the manner in which communities engage with and benefit from the deployment of renewable energy infrastructure will influence the decarbonisation of Ireland's economy. It is likely that the establishment of the precedent of prior consultation with the community in advance of wind energy development schemes submitting a planning application will transfer across to other forms of renewable energy development over time.

The acceptance of climate change as a scientific fact by the general public and the recognition of the need to decarbonise Ireland's energy sources is generally reflected strongly in opinion polls and academic research²³. When it comes the development of the infrastructure required to secure an effective and just climate transition, research such as that undertaken by Bertsch et al. (2017) shows that at local level support for renewable energy infrastructure declines for a variety of reasons, largely due to 'landscape modification'. While these insights are based on German wind energy case studies, work by Geraint Ellis and others confirm the applicability of the concept to the Irish context. In particular, there is a strong correlation between negative local responses to windfarms and a sense of imposition arising from a lack of any appreciable benefits accruing to the community. A similar pattern is beginning to emerge in relation to solar energy technologies as Walsh, 2016²⁴ indicated the common categories of third party objections which have been lodged in relation to utility scale solar energy projects.

Community responses to the development of RE technology manifest in the form of objections lodged against RE infrastructure through the Irish planning system. Examining the means by which communities may actively participate in the energy transition as part owners of the infrastructure

²² In the recently published proposals arising from the review of the Wind Energy Development Guidelines (2006), pre-application community consultation and community benefit schemes for wind energy projects are proposed to become mandatory. Further information available via: <http://www.housing.gov.ie/planning/guidelines/wind-energy/coveney-and-naughten-announce-key-development-review-wind-energy-development-guidelines>

²³ Bertsch, V (2017) 'Irish residents' views of energy-related technologies' ESRI, Dublin

²⁴ Walsh, S (2016) "Emerging Issues in Planning: Objections to Solar Photovoltaic Scheme of Scale in Ireland" Future Analytics Consulting, Dublin

located in their environs may engender greater cooperation and enhance societal acceptance. Fostering community acceptance, or a 'Social License to Operate' (SLO) is therefore an important component of the acquiring a timely grant of planning permission.

A SLO is generally agreed as existing when a project or development has the broad acceptance and on-going approval of the local community in which it operates (Thomson & Boutilier, 2011; Joyce and Thomson 2000; Prno & Slocombe, 2012; Owen & Kemp, 2013; Social License Task Force, 2009).

There are many terms used in relation to community engagement which may, or may not, lead to societies acceptance of a development including terms such as public and community consultation, public participation, stakeholder engagement, and as part of Corporate Social Responsibility (CSR) models (UNECE 1998; NESF 2003; Social License Task Force 2009).

SLO is a relatively new concept – notably introduced in the context of natural resource extraction at the 1997 World Bank's conference on "Mining and Communities"¹ - whereby the proponent must gain the acceptance and on-going approval from its network of stakeholders (including the local community in which it operates) outside of mandatory legal, non-statutory requirement. In order for the proponent to gain a quality SLO, it must demonstrate to the community that it is a legitimate, credible and trustworthy operator. The SLO is rooted in the beliefs of the local community and Gunningham et al. note that the SLO:

Governs the extent to which a corporation is constrained to meet social expectations and avoid activities that societies (or influential elements within them) deem unacceptable, whether or not those expectations are embodied in law. (2004: 307)

SLO is intangible (unlike a legal or fiscal licence) and susceptible to change given beliefs and perceptions are subject to change as new information is acquired thus highlighting the need for the proponent to earn and maintain the SLO (Thomson and Boutilier 2011). It is granted on a site-by-site basis given communities, projects and companies operate differently depending on the location.

The list below is drawn from Eswarlal, 2014 which summarises the 'community concerns' which were articulated in a range of studies on SLO and bioenergy technology.

Related to the issue of siting

- (a) Location of the power plant
- (b) Disposal of by-products and their chemical effects
- (c) Growing of biomass crops near to residences
- (d) Close proximity to local residents

Related to the issue of emissions and health hazards

- (a) Emission of greenhouse gases and water vapour
- (b) Unpleasant odour
- (c) Emission of light at night
- (d) Nuisance/pollution from traffic
- (e) Vibration and noise from power plant
- (f) Fear of public health hazards
- (g) Local air pollution

Related to the issue of transport

- (a) Traffic is an issue (In general)
- (b) Increases in traffic movement and flow of high goods vehicles/Traffic congestion
- (c) Use of town trunk roads
- (d) Accident and noise due to traffic
- (e) Long distance of transport

Related to the issue of environmental/ecological effects

- (a) Fear of negative impacts on biodiversity
- (b) Negative effect on local weather system
- (c) Negative effects of dust residue to surrounding flora and fauna
- (d) Local environment is threatened
- (e) Other environmental impacts by energy crops
- (f) Loss of local forests
- (g) Soil depletion

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- (h) Depletion of water tables

Related to the issue of landscape and agriculture

- (a) Landscape and agricultural change
- (b) Undermining openness
- (c) Visual effects of relative height of buildings, chimney, plants and other associated structures
- (d) Negative effects on cultural heritage and archaeological significance
- (e) Doubts over local agriculture development

Related to the issue of economic effects

- (a) Low/no benefits to local community compared to associated social and environment costs
- (b) Doubt about continuity of SRC grant and its market assurance
- (c) Negative effect to tourism, business and livestock
- (d) Compensation dispute
- (e) Negative effect on property prices
- (f) No significant employment opportunity to local people
- (g) Cost of energy
- (h) No local energy production scheme
- (i) Low yields

Other concerns

- (a) Fear of residual risks
- (b) Fear that the plant will later be converted into a waste incinerator
- (c) Industrial precedent & large-scale infrastructure associated with production
- (d) Low public confidence about the technological reliability
- (e) Low public confidence about the wastes that may be used as a fuel
- (f) Credibility of developer
- (g) Increased competition for wood
- (h) Food Vs fuel
- (i) Interference with Rights of Way
- (j) Water runoff in the road

- (k) Mud on road during harvest
- (l) Doubts over sustainability
- (m) Size is too big
- (n) Likely to fail
- (o) Harm to quality of life

As will be outlined in Section 2.3.2 below, the common categories of objections in the planning pipeline broadly align with the nature of the community concerns' expressed by the research of Eswarlal.

Research by Bertsch et al 2017 outlines the manner in which bioenergy projects are perceived in an Irish context. Acceptance of bioenergy project is greater amongst certain socio-economic cohorts of the population than others. Biomass is the form of bioenergy which is considered in this research. In terms of the perception of the technology, the research found that '...

*"In contrast to wind, age does not seem to be a significant predictor of people's opinions of biomass. In terms of education, we find that people with post-secondary non-tertiary education are less likely to have negative or neutral views. Similar to what we found for wind, but less significantly pronounced, we find that people on higher incomes are less likely to have a negative opinion of biomass and people in the income bracket €30,000-€50,000 are more likely to have a positive view. In terms of gender, we find that male respondents are significantly less likely to have a positive opinion and more likely to have any other view. In terms of the national energy policy preferences, we find that the only significant predictor of people's opinions is the tradeoff of environmental sustainability vs. economic competitiveness. People who place a higher importance on environmental considerations are significantly more likely to have been positively disposed towards biomass. When looking at the impact of technology-specific perceptions on people's subjective opinions vis-à-vis biomass power generation, we find that people who ascribe a high importance on the visual landscape impact are significantly more likely to have a positive opinion of biomass and are less likely to express another opinion. The same holds true for people who place a high weight on concerns about the local economy. This may be driven by the perception of a positive impact of biomass generation on the local economy (p480-482)."*²⁵

In terms of overall perception, bioenergy (biomass) ranked lower than wind or solar energy. This would appear to be somewhat counterintuitive in comparison to other renewable energy technologies which are more perceptible within the landscape. This contrasts with the situation in the UK²⁶ where 80% of the respondents in a survey published in 2016 indicated a positive perception of the bioenergy sector.

²⁵ Bertsch, V, Hyland, M, Mahony, M "What drives people's opinions of electricity infrastructure? Empirical evidence from Ireland" Energy Policy 106 (2017) 472–497

²⁶ Evans, H (2016) 'Public Perceptions of Bioenergy in the UK' Energy Technologies Institute, Loughborough

Categorisation of Third Party Objections to Bioenergy Projects in an Irish Context

The purpose of this section is to explore the third-party objections which have been submitted against bioenergy projects (both biogas and biomass) in an Irish context. The objections have been consolidated under the subheadings below. The categories of the third-party objections broadly align with the grounds for 'community concerns' articulated by Eswarlal, 2014. Some of the issues raised by communities during the public consultation process relate to site specific matters. The most common of these issues relate to the past use of the site or evidence of previously strained relations within the community over the use of a site.

Site History

This category has relevance to the submission of third party objections given the legacy of a previous operation which may have taken place on the subject site. A key factor in gauging the potential of issues arising in terms of third party objections on a coherent, mobilised scale may be determined with reference to the past or ongoing activities which may have taken place on a particular site. The impacts of a site's past use may give rise to objections from individual actors and community groups as continued activity on a site, even though it may be materially different from the pre-existing use would be unacceptable on the part of the community as it would represent the continued operation of site in their mind which should be nearing the end of its operational lifespan.

An example of a bioenergy project which might encounter community acceptance issues of the type outlined above is biogas extraction from former landfill sites. In instances such as this, the use of the site as a landfill over time may have presented nuisances to the local community in terms of traffic volumes which are perceived by the community to be excessive given the characteristics of the road network. Odour and pest control are also typically flagged issues in third party objections in relation to the reuse of a site for bioenergy generation where the previous use was contentious.

The planning history of a site is also a consideration in terms of acquiring planning permission. If a site has unauthorised development located thereon, regularising the planning status of the site will add a layer of planning risk to the acquisition of planning for a proposed bioenergy project.

Feedstock/Emissions

Through an analysis of the objections, there is a lack of awareness around bioenergy technologies. This lack of awareness relates to several areas and varieties depending on the size, scale, technology and feedstock to be utilised to generate energy. In relation to sites which have a contentious pre-existing use, such as rendering plants, the utilisation of animal by products, such as meat and bone meal generates a significant level of opposition as evidenced by the quantity and content of third party objections which are advanced against the proposed development.

‘Waste to Energy’ is a category of bioenergy generation which has given rise to significant third-party objections stemming from numerous perceived issues associated with the feedstocks, the means of combustion employed and the development impacts associated with a facility’s operation in terms of traffic, noise and odour. The development process associated with the development of the Poolbeg incinerator is illustrative of this.

The emissions arising from the combustion process the case of ‘waste to energy’ developments figure prominently where combustion is the mechanism by which energy is generated. Health concerns relating to the emissions arising from the combustion of waste is primary concern of communities located within proximity to the proposed developments.

Visual Amenity

Regulating development which has the potential of interact negatively with the visual amenity of a landscape is a key consideration for local and national planning authorities. It is also a generator of third party objections on the part of actors within the community who oppose the development of a proposed project.

12/5313 related to an application for a bioenergy scheme on the outskirts of Killarney, Co. Kerry. While the location of the plant was found to be appropriate by the inspector however a reason advanced for recommending a refusal to the Board arose from the visual impact the proposed scheme would have on a scenic heritage landscape. While this matter for refusal accords with planning practices, a number of objections within community did not specify this visual impact on the landscape per se, instead focusing on the perceived visual impact which the scheme would have on the residential units proximate to the proposed site.

The visual amenity of the proposed development is frequently linked with concerns relating to property devaluation in objections. Individuals with residential units close to the proposed sites are frequently concerned that proximity to a bioenergy project will negatively on the value of their property due to the visual impact as well as through perceived fears associated with traffic, noise and odour arising from the operation of the proposed scheme.

Noise

Noise and vibration emissions arising from the operation of the proposed project is a frequent source of third party objections. Noise arising from transport is also a secondary consideration under this heading.

In terms of the management of noise through the Irish planning system, no planning guidelines (made under Section 28 of the Planning and Development Act 2000 as amended) exist. Instead, regard is had to the guidelines issued by the Environmental Protection Agency under the provisions of the Environmental Noise Regulations 2006 which give effect to EU Directive 2002/49/EC on the assessment and management of environmental noise. Noise objections arise

typically in relation to traffic coming to and from the site during its construction and operation. In addition, noise is cited as an issue from the site during energy generation.

Odour

Odour is a ground for objection which occurs across a range of bioenergy technologies both in urban and in rural contexts. The issue is typically associated with developments on sites which have a pre-existing use where odour may have figured as an issue in the past (i.e. landfills, rendering plants etc). There is limited knowledge apparent within the objections which indicates knowledge of the technical mitigating measures which can be applied to reduce odour. The same is apparent in relation to the odour related concerns which arise in relation to the bioenergy technology where odour may not be an issue (i.e anaerobic digestion).

2.5 Summary

This section has explored the main planning issues which have emerged in the sample of planning applications outlined in Appendix 2.0 of this report. The main insights arising from the planning issues section above is the importance of diligent site selection, especially regarding the influencing factors which may increase or decrease the likelihood of planning risk for a project.

In terms of the third-party objections, the instances of objections for smaller farm scale schemes are limited. In cases where these objections have arisen, the implications of the proposal in terms of residential amenity of dwellings located in proximity to the development. This aligns with the international research on societal acceptance of bioenergy projects. Larger bioenergy schemes attract third party objections relating to the visual impact, noise, traffic, odour and feedstocks.

3.0 Mature Bioenergy Market Planning and Development Precedent

The purpose of this section is to explore planning and development practices associated with bioenergy developments in mature where a substantial deployment of this technology has taken place. The structure of this section has been derived along the lines of the development impacts associated with this form of renewable energy technology, as outlined in Section 2.0. The prevalence of these considerations in the planning and development practices of mature markets

3.1 Existing Research

Several jurisdictions which have developed and mature markets have drafted and enacted consenting processes which efficiently consider Bioenergy projects. This section outlines a range of research into the obstacles which exist in the way of BioEnergy development from these jurisdictions. Existing planning processes and procedures will also be considered in Section 3.0 of this report.

The European Commission and its attendant programmes (such as Intelligent Energy Europe) have undertaken and funded a number of studies by BioEnergy subject matter experts into the issues which exist in terms of the deployment of Bioenergy projects consisting of different technologies and a variety of scales in a number of member states.

At a high level, the European Commission²⁷ has identified permitting procedures as being the largest impediment to the delivery of bioenergy development transnationally. The areas where this barrier can be most felt are set out below.

- too many process steps and permits issued by separate authorities
- permits are subject to a wide range of legislative acts
- a lack of clear timetables
- a lack of local knowledge and capacity to analyse complex bioenergy permit applications
- a lack of clear procedures to obtain energy grid access
- local resistance to bioenergy projects

The European Commission has also funded research into the concept of '*Integrated Bioenergy Planning*'. The MAKE-IT-BE project ('*Decision-MAking and Implementation Tools for delivery of local and regional BioEnergy chains*')²⁸ was a three-year project (2008-2011) which was funded by the Intelligent Energy Europe (IEE) programme.

The aim of the MAKE-IT-BE project was to '*support the development and implementation of integrated bioenergy chains across Europe, through the creation of enabling frameworks (decision-making tools and local partnerships) in four important EU regional contexts*'.

The insights arising from this project resonate with this research as the concept of Integrated Bioenergy Planning (IBP) align with the research objective of this report as a high level concept

²⁷ European Commission (2017) '*Energy: Biomass*' Available via: https://ec.europa.eu/research/energy/eu/index_en.cfm?pg=research-bioenergy

²⁸ MAKE-IT-BE (2011) '*Report on Good Practices on Integrated Bioenergy Planning*' Available via: <https://www.europeanlandowners.org/files/pdf/Report%20ENGLISH.pdf>

which steers the implementation of context specific planning and development guidance recommendations at project level for project promoters and planners.

IBP is defined within the context of the aforementioned project as being ‘a *spatially- or territorially-explicit method or approach designed to support strategic bioenergy planning and policy formulation, through the integration of existing biofuel demand and supply. The integration refers to:*

- *Different sectors involved, such as forestry, agriculture, agro-industry, rural development, energy, transport, buildings, and energy from waste.*
- *Involvement of different stakeholders, such as policy-makers, urban and energy planners, landowners, managers, administrators, traders, utilities, and end-users (e.g. fleet owners, district heating customers). Effective IBP aims at establishing cooperation and synergies among stakeholders and relevant institutions to make optimal use of available resources (natural, economic and human) for the generation of bioenergy’.*²⁹

The MAKE-IT-BE project cites the International Energy Association research which relates to best practice in relating to biomass feedstocks. The IEA (2007) summarises the main points of this practice as follows:

- The biomass feedstock needs to be available over the life of the plant and produced in a manner that is deemed to be sustainable as well as renewable. It can be in solid or liquid form.
- This feedstock has to be delivered to the conversion plant by road, rail or waterways as cheaply as possible in a form that is easy to store, handle and utilise. The low-bulk density and energy density of many forms of biomass highlights the need for effective logistical planning covering the transit of feedstocks from their source to the place of energy generation.
- The quality and moisture content of the feedstock need to be assessed on delivery to ensure efficient conversion and fair means of payment.
- Where the biomass is to be imported, certification of its source, verification of its sustainability and the identification of low-cost transport methods, in both financial and energy terms, need consideration.
- Selection of the energy conversion technology and size of plant should be based on the nature of the biomass, the volume available, the reliability and the risk of failure from immature technologies.
- Markets produced for the bioenergy carriers (such as heat, electricity, gaseous fuels, liquid biofuels, or solid fuels such as pellets) need to be assessed and purchase agreements sought where feasible.
- Design and construction of the bioenergy conversion plant, choosing its location, the proximity to power, gas and water supplies, and obtaining the necessary resources and planning consents can be major barriers, requiring solution by the project developer.

²⁹ Intelligent Energy Europe (Undated) ‘Report On Good Practices on Integrated Bioenergy Planning’ Available via: <https://www.europeanlandowners.org/files/pdf/Report%20ENGLISH.pdf>

A number of indicators were applied in the IEE research, which were used to assess aspects of good practice in the development of bioenergy projects considered by the MAKE-IT-BE research project in the drafting and refinement of the IBP concept. These indicators are outlined below.

- Geographical area
- Land use features and type of biomass resources
- Policy, juridical, administrative and socio-economic context
- Scale of the initiative
- Technical aspects
- Integration of different planning levels – spatial, rural, energy, etc.
- Involvement of local stakeholders
- Public consultation
- Quantitative indicators (e.g. production quality, use(s) of energy, number of final users/beneficiaries, jobs and revenues generated)³⁰

Permitting of Bioenergy Installations in the EU-27 (2009)

The Directorate General for Energy and Transport of the European Commission commissioned a study involving the benchmarking of planning and development permitting procedures for bio energy schemes across the EU-27 in 2009.

The report outlines the following recommendations for consenting authorities, nongovernmental organisations based on a study of 130 case studies from around the EU-27. The recommendations below were advanced as being suitable for application by consenting authorities processing applications for the development of bioenergy projects.

- *Bioenergy installations can make an important contribution to the local economy and to the accomplishment of regional, national and European CO2 emission and renewable energy targets. The bottlenecks for the construction of these kinds of installations should therefore be analysed, not only from a local perspective, but also taking regional and national policies into consideration.*
- *A catalogue of best practice examples with contact details should be created so that local, regional and national authorities can easily access the experience and lessons learned of other authorities when dealing with new or less known technologies and systems.*
- *Coordination of work within permitting authorities is needed to avoid excessive information exchange and the associated amount of repetitive work. This coordination could take the form of a "one-stopshop", where all relevant authorities and stakeholders responsible for issuing a permit meet to discuss an application and decide together on whether a bio-energy plant should get approval.*
- *In order to ensure transparency and to decrease the work load of authorities, the full set of criteria needed to gain permits should be published, listing all important requirements to obtain the authorisations needed and informing the applicants as early as possible about them. Thus, critical aspects may be included in the planning and the application stages.*

³⁰ Ibid

- *A preliminary meeting with the applicants for a screening of the requirements (contents of an eventual EIA, required protection and mitigation measures, etc) could also be very valuable to reduce any misunderstandings or errors in the application process and to accelerate the process.*
- *In order to increase the knowledge base inside the permitting authorities, it could be useful to set up an in-house pool of experienced employees, who have previously participated in former similar permitting procedures and can advise others during the process of new permitting applications. This could be complemented with regional or even national networks of experts within the permitting authorities. In that way, the necessary search for information, as well as the needed exchange of information, could be managed more efficiently.*
- *In case of a lack of experience with new technologies, external advice could be helpful to clarify questions related to the technologies, the possible impacts, the mitigation measures, etc.*
- **Identify suitable locations** which could be designated for **industrial activities** or for **small-scale bioenergy production**. It is also advised that authorities should consider how best to use local biomass waste-streams for local energy purposes (heating, electricity or transport).³¹

Through the insights arising from a review of Irish planning and development practice in Section 2.0 of this report, there is a significant degree of correlation between the issues outlined in the European research which has been undertaken to date.

3.2 Germany

This hierarchic system of spatial planning in Germany is governed by two basic principles, namely: “municipal planning autonomy” and “mutual influence”. The first principle means that the municipalities are independent and are responsible for spatial planning in their jurisdiction, albeit in line with the principles and guidelines defined by European and Federal spatial planning policy. This coordination of plans between national and regional level is comparable to Irish planning practice. This municipal autonomy is guaranteed by the federal constitution that emphasises the municipal self-government. Consequently, the Federation and the States cannot withdraw this right from the municipalities.

To illustrate the development management approach to bioenergy projects, an example of the process required is outlined below.

Overview of Planning Process

The granting of planning permission is a competence assigned to Mayor of the municipality in which the proposed development is sited if the municipality has a land use plan or a Local Urbanism Plan. Otherwise, the State grants the building permit. In terms of land use, the application can either be considered an agricultural or industrial land use, depending on the scale of the scheme and the characteristics of its feedstock.

³¹ European Commission (2009) ‘Permitting of Bioenergy Installations in the EU-27’ Available via: https://ec.europa.eu/energy/sites/ener/files/2009_ecofys_bioenergie_brochure.pdf

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There are particular incentives made for farmers who develop an AD plant which utilises more than 50% of its feedstock from the municipality in which it is situated. Such developments receive a dispensation in terms of their development in rural areas, whereas otherwise the development of a project might not be permitted. Development in rural areas in a German context is tightly controlled.

The deadline for the consideration of an application for development is 3 months, with a contingency for a further three months if there is a need to consult with a State department of regional commission. If no decision issues within the defined timeframe then permission is said to be tacitly granted. A third-party appeal system is possible via the German courts. The challenge can be submitted within two months of the notice appearing on display at the proposed site. The matters below are typically included with an application for planning permission.

With the planning application, the applicant usually hands in documents, maps and drafts concerning:

- general information outlining the proposed site and its owner;
- architectural drawing including site layout, views and sections of the biogas plant, etc;
- the feedstock for the biogas plant;
- calculations of the expected gas production rate;
- process description including the gas holder and the CHP unit;
- emission control;
- safety issues (fire safety, worker health and safety);
- disposal/use of digestate;
- decommissioning statement.

3.3 United Kingdom

The Department for Communities and Local Government is responsible for planning in England, while energy issues are the responsibility of the Department for Business, Energy and Industrial Strategy. At local government level, outside Northern Ireland, planning powers are exercised by a single tier of local authority in some areas, and through a two-tier system in others. Scotland and Wales have exclusively unitary systems.

In England, local planning authorities exercise most planning functions, as reflects the situation in Ireland. Across most of rural England, these are both county and district authorities, where planning responsibilities lie with district authorities. Responsibility for planning in Northern Ireland is split between 11 local councils and the Department for Infrastructure (the Department). The 11 councils are responsible for:

- Local Development Planning
- Development Management
- Planning Enforcement

Overview of Planning Process

The transition of a project through the planning systems of the UK's constituent countries is outlined below. The manner in which permission is acquired will vary depending on the size and scale of the development.

Pre-application consultation with the local authority which will be adjudicating on the application is typically undertaken. The meeting typically involves a senior planner from the planning authority, the applicant's agent as well as the local authority's economic office. Thereafter, contact between the local authority and the applicant can take place, especially if the scale of the scheme requires the compilation of an Environmental Assessment (EA). If an EA is required then the planning authority may scope the extent of the issues to be covered by consulting with statutory consultees ('proscribed bodies' is the term for the Irish equivalent).

The planning process begins with the submission of the planning application. The local authority publicises the receipt of the application and takes account of any submissions it receives in relation to the development. If the development requires an EA, the planning authority can take 16 weeks to deal with the application. If EA is not required, the local authority has up to 8 weeks. The developer has the right to appeal against the failure of the local authority to decide the application at the end of 8 or 16 weeks. Such an appeal must be made no later than 6 months from the statutory determination date.

The Secretary of State with responsibility for planning has the powers to 'call in' an application. This power is reserved for projects which may have more than a local effect (i.e. if they are strategic infrastructure projects).

If planning permission is granted, developers are obligated to confirm to any planning conditions attached to the permission as well as the payment of any development levies associated with the development.

If planning permission is refused, or conditions made with which there is disagreement, developers have a right to appeal within six months.

Northern Ireland

Planning for Bioenergy projects in Northern Ireland is governed under 'Planning Policy Statement 18 Renewable Energy'³². Planning Policy Statements (PPSs) outline the policies of the Department of the Environment (Northern Ireland) on particular aspects of land-use planning and apply to the whole jurisdiction.

The remit of PPS 18 establishes

'planning policy for development that generates energy from renewable resources and that requires the submission of a planning application. In addition, the PPS encourages the integration of renewable energy technology and greater application of the principles of Passive Solar Design in the design, siting and layout of new development.'

³² Department of the Environment (2009) 'Planning Policy Statement 18: Renewable Energy' Available via: https://www.planningni.gov.uk/index/policy/planning_statements/planning_policy_statement_18_renewable_energy-2.htm

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The PPS cites bioenergy technology as a key contributor to the decarbonisation of Northern Ireland's energy mix however provisions relating to the development of the technology are not outlined in detail. The primary focus of this document relates to wind energy development. On a high level, the PPS outlines the criteria below for consideration by planning authorities in general terms as regards the siting and development of renewable energy schemes (including bioenergy).

'Development that generates energy from renewable resources will be permitted provided the proposal, and any associated buildings and infrastructure, will not result in an unacceptable adverse impact on:

- (a) public safety, human health, or residential amenity;*
- (b) visual amenity and landscape character;*
- (c) biodiversity, nature conservation or built heritage interests;*
- (d) local natural resources, such as air quality or water quality; and*
- (e) public access to the countryside.'*

In terms of development management, the Planning (General Development) (Amendment No.2) Order (Northern Ireland) 2013 established 'permitted development' rights (the equivalent of 'exempted development' status in the Republic) to the erection, extension or alteration of a building or structure for the purpose of—

- a) the generation (including the cogeneration) of energy from anaerobic digestion of biomass; or
- b) the storing of digestate; including works for the installation, alteration or replacement of a flue forming part of the anaerobic digestion system.

A number of caveats apply to the operation of this exemption. These caveats relate primarily to site area, proximity to residential dwellings, source of the feedstock and generating capacity of the scheme in terms of electricity produced and heat generated. The capacity threshold are set out below.

- a) 200 kilowatts in relation to the generation of electricity; and
- b) 285 kilowatts thermal in relation to the production of heat.

3.4 United States

The planning system in the United States is guided by federal level regulation which establish minimum guidelines in a variety of areas (such as environment). State level competences extend to the management of development within their territories. A selection of federal level regulations as they apply bioenergy development is set out below.

Air

Onsite combustion devices used for energy generation may require federal permits if the devices trigger federal emissions thresholds and other federal regulatory permit requirements. Conversely, if air emissions from these devices are below federal thresholds they may be exempt from permit requirements.

Solid Waste

Waste processing facilities must meet Resource Conservation and Recovery Act (RCRA) Subtitle D requirements (which cover non-hazardous solid wastes) and 40 CFR Part 258 (which covers landfills). See Managing Non-Hazardous Municipal and Solid Waste.

Federal laws do not require solid waste permits for the anaerobic digestion of manure at farms. However, the acceptance of other organics may designate farms with anaerobic digesters as waste processing facilities in some states, this depends on the waste management policy of the State concerned.

Water

There are no national water-related permit requirements specifically triggered by the development of biogas facilities.

The sections below outline specific case studies of planning and development matters as they relate to bioenergy development in the United States.

California

Unless exempt, any facility that receives and processes waste needs to obtain a Renewable Energy Approval (REA) if generating electricity for the Feed-In Tariff (FIT) Program or an Environmental Compliance Approval (ECA) under Part V of the Environmental Protection Act, R.S.O. 1990, c. E. 19, as amended (EPA) and O. Reg. 347. In addition, sites where off-farm wastes are directly land applied will require a Non-Agricultural Source Material (NASM) Plan.

To promote the use of anaerobic digesters on farms, there are some exemptions for the need of a REA or ECA. These exemptions are for a facility that meets the standards set out in O. Reg. 267/03 for a regulated mixed anaerobic digestion facility (RMADF).

Note that an on-farm AD facility that uses only agricultural source material and not off-farm waste is currently exempt from approval requirements under Part V of the EPA, but will require REA approval if generating electricity for the FIT Program.

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Some mixed AD facilities incorporate off-farm waste but do not meet the criteria in O. Reg. 267/03 for an RMADF. These facilities would continue to have to meet the requirements of REA or an ECA for a waste management system or waste disposal site under Part V of the EPA and O. Reg. 347.

Michigan

In Michigan, an air permit is required for any activity that generates an air contaminant, unless that activity is specifically exempted from having to obtain an air permit in the Michigan Air Pollution Control Rules. ADs have the potential to generate air contaminants either directly via the digestion process, or indirectly via the combustion of the gas generated from the AD. Therefore, prior to constructing the AD, you will need to determine if an air permit will be required or if the activities are exempt from air permitting. Whether or not the AD requires a permit depends on what happens to the gas that is generated. Usually, gas from an AD is sent to a combustion device such as a flare, boiler, or generator. The gas may also be piped offsite. Below is a discussion of permitting requirements associated with each of these options:

- **Piping Off-site** - If the gas from the AD will be piped off-site, there are no air emissions so an air permit is not required for this activity.
- **Flare or Boiler** – If the gas from the AD is going to a flare or boiler, a permit will not be required if the actual emission rate of sulfur dioxide (SO₂) will not exceed 1 pound per hour [R 336.1282(g)]. If the emission rate of SO₂ is greater than 1 lb/hr, you will need to obtain a Permit to Install from the MDEQ, Air Quality Division, prior to installing the flare or boiler.
- **Generator** – If the gas will be used to power a generator, you will not need to obtain an air permit if the generator has a maximum heat input capacity of less than 10,000,000 Btu/hr [R 336.1285(g)]. If the generator's heat input capacity is greater than 10,000,000 Btu/hr, you will need to obtain a Permit to install from the MDEQ, Air Quality Division, prior to installing the generator. Note that 10,000,000 Btu/hr is equivalent to a 1,875 KW generator or a 1,320 brake-HP engine. If several generators will be installed, they may be excluded from the exemption due to the amount of emissions generated [R 336.1278].

Water Quality Regulations

The effluent from an AD has the potential to impact groundwater and surface water quality if improperly managed. Most farming operations will not be required to obtain any additional water discharge permits or authorizations for an AD if only manure is being managed in the AD. If the facility is currently operating under a permit issued by the MDEQ, then the AD should be included as part of the manure management system of the comprehensive nutrient management plan (CNMP). If an operation will be combining different types of material in the AD and then land applying the effluent, additional requirements may apply. For example, if a farming operation will add material other than manure to the AD, such as food processing residuals or other wastes, a permit or authorization may be required to land apply the effluent. If the AD will process combined materials, it is recommended that the MDEQ Water Bureau and the Waste and Hazardous Materials Division (WHMD) be contacted to discuss the requirements that may apply prior to land application.

3.5 Summary

In most cases such as Germany, UK, France, Italy and the US there are no zoning designations for a bioenergy project such as anaerobic digester for use internally such as on site electrical generation or in combined heat and power. There are zoning issues when the AD is a large project which utilizes feedstock coming from outside a farm such as other farms in the locality or food waste from commercial activity. To mitigate this, it is best practice to consult the local authority as early as possible in the development phase and to prepare an initial environmental impact statement. Issues to be dealt with in an environmental impact statement are as follows:

- Air pollution
- Traffic increase to the site
- Water pollution
- Odour
- Noise pollution
- Impact to landscape

If the AD is to be used for onsite electrical generation or for exporting electricity to the grid there needs to be a connection made to the grid for import/export.

- For onsite generation, connection is need to provide ancillary services for the pumps and devices used to run the AD.
- For electricity export there needs to be an import/ export meter to measure how much is exported to the grid.
- An electrical study may be needed depending on size of the project e.g. 50+ kW to assess impact to voltage constraints on local grid

In conclusion, there needs to be another application made to the relevant authorities for grid connection along with planning permission to the local authorities.

4.0 Consultation

4.1 Overview

Arising from a study of the Irish planning pipeline for bioenergy developments and planning and development practice in the case study jurisdictions, a series of recommendation areas were devised. The purpose of this exercise was to enable a frank and open consultation dialogue with representative of the developer sector, local authorities as well as key decision-making bodies within the framework of national energy and planning policy.

The objective of this consultation process was to define the areas which the consultees believe require attention in terms of the development of planning guidance recommendations for bioenergy energy developments in an Irish context.

The recommendations areas outlined below were pitched to the consultees and utilised to generate a discussion regarding planning guidance recommendations for bioenergy projects in an Irish context. These recommendation areas also directly informed the structure of an online questionnaire which was disseminated to member of the Irish Planning Institute and the Irish Bioenergy Association.

The consultees whose views have been summarised in this section are set out below.

- An Bord Pleanála
- An Taisce
- Southern Region Waste Management Office
- Tipperary County Council
- Teagasc
- Wexford County Council
- Limerick County Council
- Sustainable Energy Authority of Ireland
- John Toner
- David Hynes
- Biomass and Biogas (AD) industry representatives

4.2 Project Promoters/Applicants

Two private sector workshops were held, one covering biogas developers, and the second biomass developers. Both workshops took place on 27/07/2017. In addition, a series of phone conversations was completed with 10 key stakeholders, following the development of a stakeholder spreadsheet and sorting for relevance to planning issues, to tease out their experiences and suggestions for improvements. **The sections below summarise the feedback from the consultees, both from the workshops and from the telephone interviews which were undertaken.**

General Planning Process Comments

In the experience of the consultees, on submission of a planning application to a local planning authority, the file is typically referred to the Environmental Officer. While the file would also be submitted to other sections in a local authority, the applicants have found that the environment section of a local authority has a strong role in the assessment of a planning application. This necessitates a focus on environmental matters in planning documents submitted with a planning application.

In terms of pre-planning meetings, the consultees have indicated that availing of such meetings is beneficial for the progress of the planning application through the planning process. The benefit of these meetings is best felt in terms of drafting supporting documents which address the questions and concerns articulated by the planning authority's representatives. This has led to a reduction in the instances of requests for further information being issued and thereby reduced the period of time which an application spends being adjudicated upon by the authority.

Biomass combustion projects range over a very wide scale, with a small number of large projects, >10MW and a much bigger number of small scale projects, mostly in 1MW region. In terms of biomass projects, their development in pre-existing industrial areas has been less difficult than their acquiring planning permission for a new scheme on a 'greenfield' site. This reflects the zoning approach which is apparent in the Section 2.

A common point from both biomass and biogas workshops was the need for technical documents to be prepared in an accessible way in order to aid their comprehension by planners and members of the community who may not be subject matter experts in relation to bioenergy technology. One example which was given is a clear explanation of the need for flaring of gas to occur. Addressing these items in a clear manner in the submitted application reduces the risk of further information being sought at a later date.

The consultees outlined the need to clearly identify the construction related implications a project's development. Such information is necessary in order to assess the planning authority's decision-making process.

Siting

In terms of siting, proximity to residential dwellings is an issue which can emerge during the planning process. Applying a diligent approach to site selection and screening out the risk of situating a proposed bioenergy project close to residential dwellings is the optimum way of mitigating this issue. Precedent relating to set back distances for 'permitted development rights' for small scale bioenergy seemed appropriate. The consensus from the applicant's present was that set back

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distances in terms of proximity to residential dwellings should be determined on a case by case basis. It should be noted that siting a biogas project which also be guided by the Department of Agriculture, Food and the Marine during the first ABP licensing phase of a project's development.

Exemption

In terms of planning exemptions, the implications of viability should be considered as the market will not deliver unviable schemes regardless of the exemptions which may exist. In terms of biogas, small scale farm based AD schemes may not be able to bear significant planning costs. The preparation of technical documents to support planning applications coupled with rates and development levies may push viable small projects to become unviable for delivery. Incentives for the delivery of renewable energy infrastructure in farm/domestic settings need to be considered and a favourable treatment in terms of development contributions may encourage the delivery of small scale bioenergy projects. r exempted development, can't build unviable schemes.

Zoning

The consultees have found that development plan zonings are frequently vague in terms of the location and permissibility of bioenergy projects. If considerations related zonings are present in development plans, the definition of bioenergy project can be loose, with some plans considering one form of bioenergy generation disproportionately in comparison to other technologies. The consultees considered that bioenergy development is a form of agri-industrial enterprise therefore consideration should be afforded on a case by case basis for the development of schemes in area which are unzoned. Some of the outputs associated with the operation of a bioenergy project is the production of organic fertiliser which is a beneficial to rural communities.

Consultees in the biomass workshop indicated that site selection on their part considers the status of the proposed site in county and local development plans. The consultees indicated that the timeframe associated with the changing of zoning in the development plans is quite long given the duration of the plans.

Disposal of Digestate

The disposal of digestate needs to be undertaken in line with the Nitrates Directive. The applicant's content that the digestate produced during the bioenergy generation process is a valuable resource as a bioenergy fertiliser. The disposal of digestate is a matter which should be undertaken with best practice. This best practice should be updated frequently and in line with the requirements of the Department of Agriculture, Food and Marine. There is a need for an adequate land bank for spreading digestate must addressed, and the requirements can vary due to different soil geology in one area versus another. Developers should minimise on-site storage, and should avoid underground storage.

Odour

The consultees contended that odours occur naturally as a by-product of processes undertaken in rural contexts. AD has the potential to reduce odours related to animal slurries. The process of energy generation in the case of AD is undertaken in a sealed system. Negative pressure systems and scrubbers can also be used to reduce the impact of odour related emissions. Digestate is a less hazardous than raw slurry, because of the destruction of most of the bacteria in the manures in the process. In terms of additional steps, closed lagoons and covered tanks are essential to minimise

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odours and greenhouse gas release. In addition, it was the view of applicants that odour controls should be clearly established in advance for community acceptance.

Other Consents

The consultees also outlined their perspective on the intersection of additional consenting processes on the development of biogas relate development. Department of Agriculture, Animal By-Products (ABP) regulations may apply if ABP is part of the feedstock. In terms of the involvement of the Environmental Protection Agency, a licence from the EPA will be required for capacity over 50,000 tonnes/annum, otherwise local authority permitting. Rounding out the process, applications designed to export energy will need to secure a connection agreement with the gas/electricity grid. Consultees with knowledge of the UK biomass market indicated that the RHI (Renewable Heat Incentive) certificate is used as part of the planning process in that jurisdiction.

Transport

The consultees outlined that depending on the scale of the project, they could commission traffic management consultants in order to devise supporting documents outlining the proposed traffic impacts of proposed project. The need for technical services in this regard is based on the need to quantify the movement of feedstocks and outputs on and off a subject site. Commissioning such services is also diligent as the provision of traffic management plans for proposed projects.

Environment

The consultees indicated that the reduced environmental impact of digestate versus untreated slurry is a key environmental positive. The generation of this by-product offsets the need for artificial fertiliser and can result in reduced weed control. The use of digestate as a fertiliser can reduce the risk of E.coli and is capable of improving in soil quality, storage capacity, slows surface water run-off. In instances where biogas schemes have been developed there has been a corresponding decrease in the instances of complaints relating to odour from residents in proximity of a developed scheme in the experience of the consultees who've developed projects to date. The use of agricultural by-products for the generation of energy enhances the sustainability of agricultural processes in the view of the consultees. The environmental implications of large schemes require expert evaluation in the view of consultees.

In terms of the assessment of noise, the biomass consultees indicated that in their experience, the assessment of noise nuisance took place at site borders. In one instance, a consultee indicated that the an inspector in the case of a development which was being assessed by An Bord Pleanála considered the point of assessment for noise to be the nearest sensitive receptor.

An emissions model is a key piece of environmental data which should be submitted with application for a medium and large scale biomass plans. Reference should also be made to any steam plume arising from the operation of a biomass project. Where emissions arise, mitigation measures should be enacted accordingly and details of these should be clearly set out within planning documents.

Developers must take account of any nearby SACs (Special Areas of Conservation) and demonstrate that their project will not impact on their integrity beyond all scientific doubt. This assessment should consider the full gambit of activities associated with the development of a project in order to avoid the possibility of the project's AA/EIA being insufficient in terms of the quantification of the environmental impact of a proposed project.

Water Quality

The consideration of water quality impacts needs to be undertaken in by experts in the view of the consultees. For larger projects, if there are any discharges to the local waste water system, the system needs to the capacity to handle the volumes in the view of the consultees. The manner in which the proposed project will interface with the WWT system serving a proposed project will need to be clearly set out within the supporting documents accompanying the application.

Visual Impact

The consultees indicated that the development of bioenergy projects should be integrated into their urban and rural contexts. Preparation of supporting documents should have details of the visual impact of a proposed scheme in order to illustrate minimal visual impacts associated with the development of a project. Using existing buildings as screens to new development, planting appropriate boundary treatments as well as considering flue heights with regard to the context of the location in which the project is proposed are approaches which the consultees have applied and found to be adequate.

Waste as a feedstock

The points below outline the main views and considerations of the consultees regarding the use of different feedstock for the generation of biogas.

- Poultry litter is a resource, but must be categorised as waste as per the European Waste Catalogue.
- Food waste and brown bin material as feedstock is mainly suited to larger scale industrial AD operations.
- On-farm AD is ideal for processing agriculture based feedstocks.
- The value of the digestate may be affected by the type of feedstock used.
- Bord Bia restricts the use of sewage sludge on food producing land. Where sewage sludge is digested these restrictions will also apply. Waste materials need to be pasteurised.
- Nutrient management must include phosphorous as well as nitrogen.
- Planners in NI are reluctant to permit plants that received permission to run plants on agricultural feedstocks to then use waste feedstocks without a full re-application.
- Regional Waste Management plans can place limits on the amount of biological treatment. allowed in the region. This may be anti-competitive.

In terms of biomass, the consultees indicated that it is imperative to set out the characteristics of the biomass fuel which will be utilised. The information should include details such as the nature, source, moisture content, compliance status with EU standards (e.g. through the WFQA) and any other relevant details of the feedstock involved.

Grid Connections

The O’Grianna decision³³ is a source of concern for project promoters. Clarity as to the potential implications of this decision is required in order to mitigate against a potential adverse outcome for developers seeking to connect their project to the grid. The implications of the ruling for those seeking to export gas to the gas grid also need to be considered. Defining the scope of the matters to be included in the contents of the EIA is a crucial consideration if a project proposal finds itself being considered by the judiciary.

Economic Effects

Consultees outlined that there is no evidence which indicates that the development of bioenergy projects leads to property devaluation. They also indicated that there is a need to deliver more research which articulates the positive economic benefits of the bioenergy projects in rural and urban areas. The provision of low cost fertiliser to farmers as a by-product was flagged as a key economic benefit. The provision of waste heat to areas of demand is worth exploration however this requires more exploration to determine the viability of creating uses for waste heat generated as a by-product of bioenergy generation.

Community Acceptance

Consultees indicated that the involvement of communities in projects as investors would be inappropriate given the implications that this would pose for project viability in terms of the returns arising from project. Sponsorship of local activities is a potential source of community benefit arising from a project, depending on the scale of the development. The benefits of the development in terms of offsetting carbon from imported fuels and a corresponding enhancement of water and air quality should also be considered as a benefit to the community. Effective consultation with a community prior to the submission of a planning application may contribute to the acceptance of a project.

In the case of biomass, an educational programme is required in order to inform communities of the difference between biomass based energy generation and incineration. There is a common trend of objections arising in relation to biomass schemes where residents of the community in proximity to the project are fearful that the proposed project is a waste incinerator.

4.3 Public Sector Consultees

The outputs of the local and national planning authority consultation process are set out in the subsections below. The insights in these sections arise from consultation with Tipperary County Council, Wexford County Council, Limerick County Council and An Bord Pleanála. In addition, contributions from representatives of the Limerick Clare Energy Agency, Teagasc and the Southern Region Waste Management Office are also incorporated into the points raised below.

Bioenergy Technologies

The local planning authority planners require insights relating the likely bioenergy technologies which are on the deployment horizon in an Irish context. With this knowledge, the consultees contended that development plan zoning and policy can be developed in order to respond to this horizon and set out clear guidance around the location and development of such projects.

³³ O’Grianna & Ors -v- An Bord Pleanála [2014] IEHC 632

1. Development Control

Scale

The consultees indicated that scale is a key determining factor relating to the appropriate development of bioenergy infrastructure in the right setting. Farm scale AD on farms is not an issue in terms of deploying this technology on unzoned lands. A potential issue which emerged from the discussion around farm scale AD related to the proliferation of multiple units within a particular geographic location. The cumulative impact of developments in terms of emissions to air and water will need to be assessed as will any potential impact on environmentally sensitive sites.

In terms of large scale biomass/biogas plants, a consensus emerged that this form of infrastructure is most appropriately located on lands zoned for industrial uses. An issue which was flagged with this however relates to the competing demands for these lands. The quantum of industrially zoned lands available may be in demand for traditional industrial uses therefore planning authorities may focus on the maintenance of this land volume for those uses instead of permitting bioenergy infrastructure to be developed there on. There may therefore be a requirement to relax restrictions on bioenergy plant siting in unzoned land so as not to tie up zoned areas that would be more suited to more “industrial” uses.

Waste Heat

The consultees indicated that heat demand analyses are a missing link in urban areas in order to catalogue demand for waste heat in an urban area. Such information could inform the development of locational guidance for potential generators of waste heat to service this demand.

Setback (Residential)

Set back distances should be determined on a case by case basis, with reference to the scale of the proposed bioenergy scheme.

Visual Impact

Size and scale influence the manner in which a scheme intersects with the landscape in the receiving environment. Adequate site selection and effective screening should mitigate any visual impacts. Issues around visual impact may be raised by the planning authority during a preplanning meeting.

Environment

a. Light

Resolve by way of ordinary condition regarding residential amenity or proximity to an environmentally sensitive site.

b. Noise

Noise arising from plant operations would be considered in line with established procedures, such as commissioning baseline studies of noise levels within an area and regulating any activities which generate

c. Emissions

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Emissions and the manner in which land use policy intersects were discussed at length. The implications of fuel crops as a potential mitigation measure for carbon emission reduction should be considered in policy terms. The intersection of matters considered under the terms of any EPA license regulating a site's operation.

d. Water

Water services were not explored in detail as an issue.

e. Effluent/Digestate Disposal

The intersection of this area with Department of Agriculture regulations was flagged. It can be expected that controls placed by the Department will be effective in their own right.

f. Odour

Odour management was cited as a consideration. This environmental area is influenced by the nature of the feed stocks and the process utilised to generate energy from it.

g. AA/EIA

Given recent decisions relating to the scope to which and EIA should have in terms of the environmental assessment of plans and projects, it is critical that developers fully assess the environmental implications associated with the development of a project. This should include matters pertaining to the acquisition of feedstock, the operation of the proposed scheme as well as the disposal of any by-products, such as the disposal of digestate.

Transport

The nature of the roads in proximity to a proposed development is a critical consideration in assessing an application for a bioenergy scheme. Site selection on the part of the applicant should consider the road state if a significant number of vehicle movements are planned to bring feedstock on to the site.

In terms of removing feedstock (such as forestry) from its source and conveying it to a bioenergy scheme, discussions with the road section and planning section will determine routes to be used. A bond might be required to cover any damage or works required to upgrade the roads being utilised.

Community Acceptance

Community acceptance was discussed at length. The conversation centred around two elements, community ownership/involvement in bioenergy schemes and the role of the local authority planner. Community ownership as a model was not considered practical for bioenergy projects due to their small scale. Bioenergy projects tend to have overall capital requirements below €5m, at this "small" scale it is difficult to attract institutional investment, by diluting the requirement even further with community ownership requirements it is anticipated that entire projects would fail to attract the required institutional investment.

The role of planners was discussed also by the consultees. The evaluation and assessment of applications is their primary role. Promotion of community involvement is not within the remit of the planner.

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The consultees also indicated that there is a need for an information campaign in order to provide members of the community with knowledge on the forms of bioenergy development which will begin to emerge going forward.

Exemptions (SI 235 of 2008)

No issues regarding the application of the planning exemptions set out in the 2008 Act were advanced by the consultees.

Intersection of Consenting Processes

Consenting processes run relatively seamlessly in the opinion of the consultees present.

Decommissioning

Approaches to decommissioning vary. Some local authorities apply a bond for the restoration of a site back to its predevelopment state whereas others do not institute such a measure.

County Development Plan Objectives/Regional Waste Plans

Regional level planning guidelines were identified as being an important mechanism by which bioenergy resources can be managed. County development plans outline in more detail how bioenergy technology may be deployed and in what location. There was a consensus in relation to the need for an overlap between development plans and regional waste management plans. The intersection of policy at a regional level, between planning and waste management, is seen as a key prerequisite for the creation of a sustainable supply chain for feedstocks.

Economic Potential of the Sector – supporting rural economy jobs

Matters pertaining to the economic benefits associated with bioenergy development could be quantified within local government economic policies. These policies would be contained within the county development plan and in accompanying documents.

Renewable Energy Directive & Greenhouse Gas emission reductions

Local Authorities are increasingly drafting renewable energy strategies. Details of renewable energy infrastructure will also be set out in these strategies. Bioenergy infrastructure, intersecting with other strands of planning policy will be contained in the wider development plan document.

Meeting demands of Harvest 2020 while decoupling dependence on imported fertilisers and decoupling carbon emissions from agriculture.

Quantification of activities which generate potential feedstocks such as agriculture could be framed within planning policy. Such policy, with a supporting evidence base would assist planners in assessing the bioenergy potential of a county. This knowledge base would aid planners in deciding on planning permission for a bioenergy scheme, particularly in areas where a number of such developments may already be operational.

Maximisation of potential from the forestry sector, the establishment of which has been a longstanding policy of every successive government since the late 1980's

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This matter relates closely to land use planning and it is currently practiced and how it will need to have closer regard to the quantum of lands under forestry from a land use and rural character perspective and also from a mitigation perspective.

4.4 Nongovernmental Organisations

The views of An Taisce were sought during the consultation process in order to determine how their perspectives on the development of bioenergy technologies in an Irish context may be guided by the development of planning guidance recommendations.

Two main items emerged during the consultation interview with relevance to this research. While the planning system may be positioned to address these concerns, a wider public policy approach may be required in order to operationalise some of the matters set out below. The key points are set out below.

- Technological Process of Energy Generation

Inefficient energy generation through combustion is a concern of this consultee. In the case of co-firing, the consultee's view was that combustion as a form of energy generation is being perpetuated by the use of a renewable feedstock. The consultee contends that there is insufficient evaluation to establish that mass burning of biomass is the most carbon efficient way of utilising biomass feedstocks, especially in co-fired developments.

- Assessment of Impacts Associated with Feedstock

This consultee has a concern regarding the manner in which EIA for large schemes considers the abstraction of a feedstock as an environmental impact of the wider project. This view resonates with recent decisions regarding the totality of environmental assessment which needs to be undertaken in order to quantify the impacts of a proposed project or the adaption/extension of operation of an existing development.

In terms of the matters raised above, in the case of the former, it is likely that national policy regarding the technology mix to be applied in decarbonising Ireland's energy source is the optimum way. In relation to the latter, the assessment of the environmental impact of the feedstock is likely to be a matter which will be captured in EIA going forward given the increasing focus on capturing the entirety of the impacts associated with the development of a project in terms of its direct and indirect impacts.

4.5 Summary

Significant insights were gained through the consultation process on a broad range of issues related to the deployment of bioenergy technology in an Irish context. The outputs of the consultation process were considered in tandem with the planning pipeline review in Section 2.0 and the planning and development practices associated with bioenergy development in mature markets in Section 3.0 in order to devise the planning guidance recommendations outlined in Section 5.0.

5.0 Planning and Development Recommendations for Bioenergy Development in Ireland

5.1 Overview

This section contains planning and development recommendations for the deployment of bioenergy projects in an Irish context. These recommendations have been devised with regard to practice in mature bioenergy markets in tandem with a consideration of the issues arising from the planning pipeline of bioenergy projects as set out in Section 2.0. The recommendation areas below have been thoroughly explored with a representative sample of consultees from the public, private and 'not for profit' sector. In some instances, these recommendations accord with good practices for other forms of renewable energy development. While some project promoters may apply elements of the recommendations below as standard procedure, the planning files associated with the applications in Appendix 2 show that there is a need to clearly set out recommendations which are conducive to the mitigation of planning risk associated with the development of bioenergy infrastructure.

Where necessary, the recommendations below are codified by the bioenergy technologies to which they relate. In some instances, the recommendations apply to more than one technology.

5.2 Planning Guidance Recommendations

The recommendations set out in this section relate to specifically to the Irish planning process. The recommendations have been categorised under the following headings;

- Forward Planning;
- Development Management; and
- Miscellaneous Recommendations.

Forward Planning

Forward Planning

1. *It is recommended that bioenergy development is referenced explicitly within the National Planning Framework as well as the National Climate Mitigation Plan.*

The Irish planning system is based on a hierarchy of territorial plans. Local plans must have regard to the contents of plans at a regional and national level. Explicitly referencing bioenergy and the bioeconomy in the National Planning Framework would ensure the plans lower down the hierarchy address bioenergy as a consideration. This is important as it would facilitate the creation of a coherent policy baseline from which planning for bioenergy can be based.

2. It is recommended that the potential of bioenergy development to decarbonise the energy system utilising local sourced feedstocks is recognised in Regional Spatial and Economic Strategies. Particular reference should be made within Regional Waste Management Plans to the potential of bioenergy development.

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Linking regional economic and social plans, regional waste management plans with considerations relating to the bioeconomy is a key step. This level of policy formulation is key as it gives form to the more high-level contents of national level plans. At this spatial scale, the potential of feedstocks and infrastructurally strong areas to support large scale bioenergy development may be identified. Objectives focused on the delivery of regionally important bioenergy development can be addressed within county development plans.

3. *It is recommended that the concept of 'Integrated Bioenergy Planning'³⁴ be utilised to frame forward planning activities in the field of bioenergy development in an Irish context.*

The 'Integrated Bioenergy Planning' concept should be utilised as the foundation for the development of Irish planning practitioners understanding when it comes to assessing and planning for the exploitation of the bioenergy potential available in the county in which they are based. This approach fully encapsulates the necessity for the comprehensive inclusion of a range of relevant matters for bioenergy development into planning and development policy at a local level which has regard the specific territorial and spatial demands associated with the creation of a viable bioenergy sector with regard to the potential available from the resources in each county.

4. *It is vital that county development plans set out clear development policies which designate areas where bioenergy development is designated as either 'open to consideration' or 'not permitted'.*

Examples of sites which may be 'open to consideration' for large scale projects (1 MW+ thermal) are outlined below;

- Rural Brownfield sites (e.g. former creameries)
- Urban Brownfield sites (e.g. vacant industrial lands)

It is recommended that the following matters be considered as 'exclusionary factors' which may preclude the successful acquisition of planning permission for a bioenergy project. Consequently, these areas may be illustrative or areas where bioenergy development is 'not permitted'. Typical 'exclusionary factors' include proximity to:

- Proposed Natural Heritage Areas or Special Areas of Conservation
- Airport Exclusionary Areas
- Areas of High Amenity or Archaeological Interest
- Appropriate zoning based on the County Development Plans

Having identified areas which are not suitable to locate a facility, a more detailed assessment can be carried out having regard to the following criteria:

- General Planning and Environmental Considerations
- Site Size and Current Land Use
- Proximity to Residential Areas

³⁴ ['Integrated Bioenergy Planning'](#) is defined as 'a spatially- or territorially-explicit method or approach designed to support strategic bioenergy planning and policy formulation, through the integration of existing biofuel demand and supply.'

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- End-Market Use
- Road Access
- Proximity to sites suitable for the disposal/use of by products

Considerations relating to the location of a biogas development will need to have regard to the administration of the Animal By-products Regulations as applied by the Department of Agriculture, Food and Marine. If the location of a proposed biogas development changes during the planning process then this will have implications for the acquisition of an ABR license. Where a compelling reason exists (such as proximity to feedstock/a user of waste heat) exists, the development of such a scheme on unzoned lands should be open to consideration save in instances where the development of such a project would be contrary to 'proper planning and sustainable development'

5. *It is recommended that farm based bioenergy projects which draw their feedstocks (typically animal slurry/grasses) from a defined rural catchment, and subject to a maximum energy output of 1 MWe (MW electrical equivalent = 3MW total), would be considered for development on unzoned lands.*

This recommendation is based on the fact that viability in terms of project development may necessitate the development of bioenergy infrastructure in close proximity to the feedstocks which will be utilised to power the development. In addition, to facilitate economies of scale, the delivery of 'centralised' digesters in the case of biogas, operated co-operatively by a number of farmers may need to be facilitated. Development plan policies however need to consider the context which is attached to the proposed scale of a development. In the case of biogas, a 500kw scheme indicatively requires 500 acres to support it with feedstock. There are few farms in an Irish context which have 500 acres within their holding so the development of a scheme of scale will require a co-operative approach between farmers. Consequently, the development of centralised digesters may take place on unzoned lands in rural areas as this may be the most sustainable location for them, in terms of proximity to feedstocks and accessibility to the gas grid.

6. *Digitising the development of bioenergy developments within a county is recommended in order to guide subsequent iterations of development plan policy. As the sector develops, there will be a need to ensure that the cumulative effect of the wide-spread development of bioenergy projects can be managed.*

The availability of a dataset in a digital format is important as it may serve as a guide to project promoters around the capacity of an area to support bioenergy development of one form or other. In addition, it would assist planners in determining if issues relating to the cumulative impact of such developments in an area may pose an issue from an environmental/sustainability perspective.

7. *It is recommended that further study be undertaken regarding the alignment of the various consenting processes (Environmental Protection Agency, Commission for Regulation of Utilities (formerly CER – Commission for Energy Regulation), Planning, and Department of Agriculture).*

The assessment of bioenergy project proposals requires the intersection of a number of different consenting processes in order to proceed. The rationale for this recommendation is to pool the expertise and capacity of qualified decision makers together in order to militate against administrative duplications, the comprehensive assessment of project impacts and their mitigation

through measures proposed by subject matter experts through the respective conditions associated with the regulatory process by which the development will be managed. The collation of consenting processes may also reduce the costs associated with the acquisition of permission for a development. The applicability of this collation of regulatory processes would need to be adapted to the nature of the feedstocks utilised in the development and the bioenergy technology in question as well as the scale of the proposed facility.

8. *Reference material to aid local authorities in devising appropriate development contribution rates for bioenergy development should be compiled by the sector. This information can then be taken into account when development contribution schemes come up for renewal.*

Local authority development contributions schemes are predicated economic analyses of development on the services provided by the authority within its catchment area. Development contribution schemes frequently run for the duration of the development plans enacted by the local authority however they may also be revised more frequently than the 6-year term of a county development plan. It will be necessary for industry to produce clear economic data which indicates the appropriate level of development contributions which may be levied on bioenergy projects utilising differing technologies and feedstocks. This evidence base will be important as it will facilitate the implementation of development contributions schemes which are appropriate to the form of development to which they will apply.

9. *To incentivise the development of biogas schemes in agricultural settings, it is recommended that farm based biogas developments be considered agricultural and exempted from the payment of development contributions.*

Farm based bioenergy development is likely to be limited in terms of the scale of the development which will take place. Coupled with this, the cost of finance and the development costs associated with seeking planning permission as well as other development consent result in a scenario where it may be unviable to develop this form of sustainable energy infrastructure and reuse waste products from agricultural processes. This recommendation aligns with the spirit of the Development Contributions guidelines in so far as a '*...there is an important balance to be struck between the funding of public infrastructure and the need to encourage economic activity and promote sustainable development patterns. It is essential that development contribution schemes do not impede job creation or facilitate unsustainable development patterns*³⁵'. The implementation of an exemption of development contributions for farm based bioenergy development could be time based and applied for as long as the

³⁵ Department of Environment, Community and Local Government (2013) '*Development Contributions for Local Authorities*' Dublin, p.10

Development Management

10. *is recommended that transport assessments relating to bioenergy projects take consideration of the matters below reasonable to the scale of the project;*

- *Size and description of development*
- *Description of existing road network*
- *Details of extra data to be collected – particularly traffic surveys*
- *Sources of information for travel / traffic generation (including modal split)*
- *Geographic area of analysis (extent)*
- *Proposed years of assessment*
- *Key junctions and links accesses to be investigated – requires traffic modelling*
- *Sustainable transport/development plan issues*
- *Summary of discussion between applicant and Road Design Office / Planning Authority (Pre-planning) and how points raised have been addressed*
- *Details of proposed improvements (if required)*

The movement of waste materials is dealt with under many different consenting processes which relate to the characteristics of the materials involved. The Department of Agriculture, Food and the Marine enforce regulations pertaining to agricultural waste products while the Environmental Protection Agency has responsibility for other source of waste. Transport related recommendations for this sector consist of technical matters relating to site access as well as siting specific matters which should be considered in the cases of bioenergy projects in different settings.

Regardless of the location of the bioenergy scheme, the location(s) from which it will draw it will draw its feedstock and how it will be transported to the site of energy generation is a material consideration for planners accessing an application. While an absence of extended supply chains for bioenergy feedstocks is important for the applicant in terms of mitigating the operating cost of the proposed development, the more extended the supply chain, the more extensive the potential issues which may emerge from the assessment of the traffic impacts associated with the development of the bioenergy project. It is recommended that the development of a bioenergy projects should prioritise the sourcing of feedstock within a reasonable catchment of the proposed project.

- The capability of the roads network to accommodate the proposed development and to determine if the development is acceptable in travel / traffic terms.
- The need for lighting, footpaths, widening, Right Turning Lanes, Junction Improvement, Road Strengthening.

11. *Where appropriate as part of an EIA/AA it is recommended that applications for a bioenergy project are accompanied with a suitability detailed visual impact assessment. This assessment should contain details of the proposed steps which will be taken in order to mitigate any issues relating to visual impact which may arise.*

This recommendation relates to all bioenergy technologies. The mitigation of any visual impacts arising from the development of a bioenergy project should be considered seriously as a

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determining factor when it comes to successfully acquiring planning permission for a project. Different approaches to the mitigation of visual impact are outlined below.

- **Avoidance:** Moving a project (or its components) to take advantage of screening topography or vegetation.
- **Minimization:** Painting a structure to match its background to minimize visual contrast with the existing landscape.
- **Rectification:** Revegetation of an area disturbed during project construction.
- **Reducing or eliminating over time:** Continued removal of invasive plants species arising from site disturbance.

Larger projects with industrial visual characters should be accompanied by screening plans. The indicative matters which a screening plan should consider for a large bioenergy project are set out below;

- Measures to retain existing vegetation which exists within the site or at its boundary;
- Details of the species to be plants (i.e. native, seasonality etc)
- Any specialised works which may be required to mitigate visual impact (i.e. creation of embankments at site boundaries); and
- Restoration or maintenance of any pre-existing visual connectivity within a landscape.

12. In terms of farm based bioenergy system, while the aesthetic of the proposed development will likely be consistent with the visual signature of the existing farm buildings. It is recommended that the design and development of farm scale bioenergy projects have sufficient regard to the potential visibility of the proposed project. *In order to mitigate planning risk, it is recommended that bioenergy development proposals are sensitive to the following sites:*

- *Natura 2000 Sites;*
- *Natural Heritage Area (proposed and designated);*
- *Special Areas of Conservation; and*
- *Special Protection Areas.*

Projects proposed for development within areas bearing the designations above carry a significant element of planning risk given the standard against which impacts associated with a proposed development would be evaluated

Court judgements relating to how EIA/AA is applied to renewable energy projects and its supporting infrastructure has generated significant consequences implications for project planning and delivery. It is therefore recommended that project promoters fully insulate themselves from the implications of any existing or forthcoming adverse judgements arising from the interpretation of the directive's application by commissioning specialist environmental engineering consultancy services. Such practitioners are best equipped to render expertise and insights revolving around the comprehensive assessment of a planned project's environmental impact.

Measures for the containment, remediation, and abatement of any emissions from a proposed project should be clearly demonstrated within the documents submitted alongside an application for planning permission. In instances where the proposed development requires an EIA, the measures

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to be taken should be advanced in a nontechnical manner for members of the community resident in proximity to the site of the proposed development.

13. It is recommended that any noise generating component of a proposed bioenergy project is acoustically insulated in order to mitigate any impact associated with the operation of the proposed scheme.

The quantification of noise emissions should be considered while considering a site. Recommended noise mitigation measures which should be considered in tandem with the siting and other consideration outlined above include;

- Siting projects away from sensitive receptors (i.e. residential dwellings); and
- Using other noise tolerant buildings (i.e. farm out buildings) as noise breaks.

In terms of larger bioenergy schemes, the use of the mitigation measures below are recommended as a component of any mitigation plan submitted alongside a planning application. Where possible, it is recommended that any existing structures present on a subject site be utilised as noise barriers between the bioenergy project and any sensitive receptors which may be present on a particular site.

14. Any lighting which will be deployed on the site should be sited in a manner which precludes any detrimental impact on the amenity of a neighbouring site.

In terms of lighting, it is considered that lighting for bioenergy projects in a farm setting will already benefit from existing lighting in a farm setting. Additions required to service the project should be in keeping with the existing characteristics of the lighting systems employed within the farm holding. In cases where larger schemes are being development, lighting infrastructure should be configured to face into the site in order to mitigate the potential for errant light emissions injuring the residential amenity of any dwellings in proximity to the project.

15. The siting of security cameras on a subject site should be undertaken in a manner which does not impact on the amenity of a neighbouring site.

This recommendation is geared toward the mitigation of planning objections arising from residents proximate to a site proposed for the development of a bioenergy project.

Miscellaneous

16. It is recommended that IrBEA devise a best practice guide on preplanning meetings for developers so that the sector can extract the most benefit from any such meetings which take place.

This recommendation applies to all commercial bioenergy technologies. Potential applicants should avail of the opportunity to consult with the local planning authority prior to submitting a project for planning permission. It is recommended that applicants considering the development of projects of any scale and feedstock should fully determine the local authority's perspective on the proposed project. Determining the potential obstacles which may arise during the planning authority's assessment of an application should enable the applicant to instruct their consultants to prioritise design or other interventions which will mitigate any issues raised by a local authority, thereby

increasing the likelihood of a grant of planning permission. The information below is typically required for an effective pre-planning meeting with a local planning authority;

- Site location map outlining the site in red;
- Your name, address and phone number;
- Address and approximate size of site;
- Details of the ownership of the site; and
- Description of the proposed development.

17. It is recommended that project promoters consult with members of the community in proximity to the proposed site of a bioenergy development.

This recommendation applies to all commercial bioenergy technologies. Pre-consultation with members of the community resident in proximity to a proposed project is recommended as a measure which may ultimately reduce the instances of third party objections to a project. The nature of this pre-consultation may vary depending on the size of the project. Some pre-consultation levels are outlined below;

- **informing** the public about services and what you plan to do;
- **seeking views** on your policies and services, and more active; and
- **participation and partnership** where issues and needs are jointly discussed and assessed.

Practical means by which a community might be consulted prior to the submission of a planning application are outlined below;

- Exhibitions;
- Local press;
- Leaflets & Newsletters;
- Circulating project documents (information on proposed application);
- Public meetings;
- Conferences;
- Workshops;
- Focus groups; and
- Partnership approaches.

Regardless of the bioenergy project being considered, it is imperative that project documentation which is used to inform the community of a project's characteristics should be nontechnical in nature in order to facilitate understanding on the part of members of the community. While anecdotally, some consultees in the private sector have said that pre-application consultation has led to objections being lodged, from the planning pipeline, it is clear that the instances of objections on applications which have been pre-consulted upon have demonstrably lower levels of objections than applications where no pre-consultation has taken place. This recommendation also aligns with wider lessons learned from the deployment of other forms of renewable energy infrastructure, such as wind energy. Recently published proposals published by the Department of Housing, Planning and Local Government on the revised wind energy guidelines (updating the 2006 guidelines) outline a regime of pre-application consultation which may be implemented for wind energy projects. If such a scheme is implemented then it would likely create demands for it to be extended to other

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renewable energy infrastructure development. If the bioenergy sector, as it is starting to expand, were to implement a system of pre-application consultation which is appropriate to the bioenergy sector then it would be insulated from any changes in policy terms which change the manner which communities are engaged with going forward.

18. It is recommended that industry and government stakeholders collaborate to develop an educational programme targeted at communities which clearly outlines the benefits and characteristics of bioenergy technology, based on credible, objective sources of information.

This recommendation covers all bioenergy projects in urban and rural environments. Due to the expansive nature of bioenergy projects in terms of the mechanisms used to recover energy and the feedstocks utilised, it is clear from the third-party objections that there is an element of confusion regarding the nature and scale of bioenergy projects which may be located in their areas. This confusion is magnified by when residents in the community search internet sources for information on a scheme which may or may not accord with the characteristics of what is being proposed for development in their locality. An information campaign, targeting predominantly, but not exclusively, rural communities may serve to address some of the fears and misconceptions which influence the submission of objections to bioenergy projects.

19. Further study should be given over to the air quality implications associated with the cumulative impact of multiple bioenergy developments (particularly biomass) in a defined locality, where an exemption from planning permission applies to the individual developments.

This recommendation is proposed given the potential complications for air quality arising from the development of a number of exempted bioenergy (biomass) developments in close proximity to each other. As the deployment of micro bioenergy development is likely to increase as residential and commercial units retrofit their energy sources to lower carbon energy sources, there may implications associated with air quality and the impact of such an uptake in the use of bioenergy systems. This recommendation echoes previous research undertaken by IrBEA in relation to the study of emissions arising from bioenergy development.

20. It is recommended that the gross floor area allocation set out in Class 18 (e) 1 and (i) 2 of S.I. No. 235/2008 - Planning and Development Regulations 2008, be increased to 100 metres.

The gross floor areas outlined in the two exemptions relating to combined heat and power boiler houses outlined above have been identified as being overly restrictive. It is recommended that the gross floor area for CHP related boiler houses be increased from 20 metres to 100 metres. This floor area is more appropriate to provide the space to put in a viable bioenergy system.

6.0 Conclusion

The recommendations contained in this report have been developed through a comprehensive process which examined issues emerging within the planning pipeline, societal acceptance matters as well as through consultation with the key stakeholders involved with the planning system and the bioenergy sector. In terms of next steps, the purpose of this research has been to collate together these recommendations and its associated evidence base in order to form a comprehensive foundation for the drafting of Section 28 planning guidelines for bioenergy development in an Irish context.

The range of bioenergy technologies available for deployment varies significantly, in contrast to wind or solar energy technologies. This has implications for the assessment of individual projects given that they may possess different development impacts subject to their size and scale. The recommendations outlined herein have been devised with regard to the extent to which each form of bioenergy technology differs. It focuses on the core matters which should be considered in terms of instituting a planning framework by which planning policy and development management matters relating to bioenergy development may be considered. The categorisation of the recommendations below reflects this focus.

Beyond the forward planning and development management implications of bioenergy development, there are also a series of considerations which are classified as being miscellaneous in nature yet have significant capacity to shape the manner in which bioenergy projects are perceived by the communities in whose environs they will be located.

Forward Planning

1. *It is recommended that bioenergy development is referenced explicitly within the National Planning Framework as well as the National Climate Mitigation Plan.*
2. *It is recommended that the potential of bioenergy development to decarbonise the energy system utilising local sourced feedstocks is recognised in Regional Spatial and Economic Strategies. Particular reference should be made within Regional Waste Management Plans to the potential of bioenergy development.*
3. *It is recommended that the concept of 'Integrated Bioenergy Planning'³⁶ be utilised to frame forward planning activities in the field of bioenergy development in an Irish context.*
4. *It is vital that county development plans set out clear development policies which designate areas where bioenergy development is designated as either 'open to consideration' or 'not permitted'.*
5. *It is recommended that farm based bioenergy projects which draw their feedstocks (typically animal slurry/grasses) from a defined rural catchment, and subject to a maximum energy output*

³⁶ 'Integrated Bioenergy Planning' is defined as 'a spatially- or territorially-explicit method or approach designed to support strategic bioenergy planning and policy formulation, through the integration of existing biofuel demand and supply.'

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of 1 MWe (MW electrical equivalent = 3MW total), would be considered for development on unzoned lands.

- 6. Digitising the development of bioenergy developments within a county is recommended in order to guide subsequent iterations of development plan policy. As the sector develops, there will be a need to ensure that the cumulative effect of the wide-spread development of bioenergy projects can be managed.*
- 7. It is recommended that further study be undertaken regarding the alignment of the various consenting processes (Environmental Protection Agency, Commission for Regulation of Utilities (formerly CER – Commission for Energy Regulation), Planning, and Department of Agriculture).*
- 8. Reference material to aid local authorities in devising appropriate development contribution rates for bioenergy development should be compiled by the sector. This information can then be taken into account when development contribution schemes come up for renewal.*
- 9. To incentivise the development of biogas schemes in agricultural settings, it is recommended that farm based biogas developments be considered agricultural and exempted from the payment of development contributions.*

Development Management

- 10. is recommended that transport assessments relating to bioenergy projects take consideration of the matters below **reasonable** to the scale of the project;*
 - Size and description of development*
 - Description of existing road network*
 - Details of extra data to be collected – particularly traffic surveys*
 - Sources of information for travel / traffic generation (including modal split)*
 - Geographic area of analysis (extent)*
 - Proposed years of assessment*
 - Key junctions and links accesses to be investigated – requires traffic modelling*
 - Sustainable transport/development plan issues*
 - Summary of discussion between applicant and Road Design Office / Planning Authority (Pre-planning) and how points raised have been addressed*
 - Details of proposed improvements (if required)*
- 11. Where appropriate as part of an EIA/AA it is recommended that applications for a bioenergy project are accompanied with a suitability detailed visual impact assessment. This assessment should contain details of the proposed steps which will be taken in order to mitigate any issues relating to visual impact which may arise.*

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12. *In order to mitigate planning risk, it is recommended that bioenergy development proposals are sensitive to the following sites:*

- *Natura 2000 Sites;*
- *Natural Heritage Area (proposed and designated);*
- *Special Areas of Conservation;*
- *Special Protection Areas;*

13. *It is recommended that any noise generating component of a proposed bioenergy project is acoustically insulated in order to mitigate any impact associated with the operation of the proposed scheme.*

14. *Any lighting which will be deployed on the site should be sited in a manner which precludes any detrimental impact on the amenity of a neighbouring site.*

15. *The siting of security cameras on a subject site should be undertaken in a manner which does not impact on the amenity of a neighbouring site.*

Miscellaneous

16. *It is recommended that IrBEA devise a best practice guide on preplanning meetings for developers so that the sector can extract the most benefit from any such meetings which take place.*

17. *It is recommended that project promoters consult with members of the community in proximity to the proposed site of a bioenergy development.*

18. *It is recommended that industry and government stakeholders collaborate to develop an educational programme targeted at communities which clearly outlines the benefits and characteristics of bioenergy technology, based on credible, objective sources of information.*

19. *Further study should be given over to the air quality implications associated with the cumulative impact of multiple bioenergy developments (particularly biomass) in a defined locality, where an exemption from planning permission applies to the individual developments.*

20. *It is recommended that the gross floor area allocation set out in Class 18 (e) 1 and (i) 2 of S.I. No. 235/2008 - Planning and Development Regulations 2008, be increased to 100 square metres.*

Appendix One: References

- An Bord Pleanála (2016) *'7th Schedule: Strategic Infrastructure Development - Guidelines for Applicants.'* Available via: <http://www.pleanala.ie/sid/sidapp.htm>
- Bertsch, V (2017) *'Irish residents' views of energy-related technologies'* ESRI, Dublin
- Bertsch, V, Hyland, M, Mahony, M *"What drives people's opinions of electricity infrastructure? Empirical evidence from Ireland"* Energy Policy 106 (2017) 472–497
- Department of the Environment (2009) *'Planning Policy Statement 18: Renewable Energy'* Available via:
https://www.planningni.gov.uk/index/policy/planning_statements/planning_policy_statement_18_renewable_energy-2.htm
- Department of Communications, Energy and Natural Resources *'Ireland's Transition to a Low Carbon Energy Future 2015-2030'* Government of Ireland, Dublin
- Department of Communications, Energy and Natural Resources (2014) *'Draft Bioenergy Action Plan for Ireland'* Government of Ireland, Dublin
- Department of Environment, Community and Local Government (2013) *'Development Contributions for Local Authorities'* Dublin, p.10
- DKM & RPS Consulting Engineers (2012) *'The Economic Benefits from the Development of Bioenergy in Ireland to meet 2020 Targets'* Available via: <http://www.irbea.org/wp-content/uploads/2017/06/socio-econ-study-Jan-12.pdf>
- Environmental Protection Agency (2017) *'Who needs a Waste Licence, Permit or Cert of Registration'* Available via: <http://www.epa.ie/licensing/licques/>
- European Commission (2009) *'Permitting of Bioenergy Installations in the EU-27'* Available via: https://ec.europa.eu/energy/sites/ener/files/2009_ecofys_bioenergie_brochure.pdf
- European Commission (2013) *'State of play on the sustainability of solid and gaseous biomass used for electricity, heating and cooling in the EU'* Available via:
http://ec.europa.eu/energy/sites/ener/files/2014_biomass_state_of_play_.pdf
- European Commission (2014) *'DIRECTIVE 2011/92/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification)'*, Available via:
http://ec.europa.eu/environment/eia/pdf/EIA_Directive_informal.pdf
- European Commission (2017) *'Energy: Biomass'* Available via:
https://ec.europa.eu/research/energy/eu/index_en.cfm?pg=research-bioenergy
- European Commission (2017) *'2030 Energy Strategy'* Brussels
- European Commission (2017) *'Circular Economy Package'* Brussels
- European Parliament, (2009) *'Directive 2009/28/EC'* Brussels
- Evans, H (2016) *'Public Perceptions of Bioenergy in the UK'* Energy Technologies Institute, Loughborough
- Government of Ireland (2016) *'Programme for Partnership Government'* Available via:
http://www.merrionstreet.ie/MerrionStreet/en/ImageLibrary/Programme_for_Partnership_Government.pdf

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- Intelligent Energy Europe (2010) '*Long List of Relevant Cases in Integrated Bioenergy Planning*' Available via: https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/make-it-be_best_practices_en.pdf
- Intelligent Energy Europe (Undated) '*Report On Good Practices on Integrated Bioenergy Planning*' Available via: <https://www.europeanlandowners.org/files/pdf/Report%20ENGLISH.pdf>
- Irish Bioenergy Association & Fehily Timoney (2016) '*Project Report for Biomass Combustion Emissions Study*' Available via: https://www.seai.ie/Renewables/Energy_Research_Portal/National-Energy-Research/RD-D-Projects/Biomass/2016-RDD-108-Biomass_Combustion_Emissions_Study-IrBEA.pdf
- MAKE-IT-BE (2011) '*Report on Good Practices on Integrated Bioenergy Planning*' Available via: <https://www.europeanlandowners.org/files/pdf/Report%20ENGLISH.pdf>
- PricewaterhouseCoopers EU Services EESV's consortium (2017) '*Sustainable and optimal use of biomass for energy in the EU beyond 2020*' Available via: https://ec.europa.eu/energy/sites/ener/files/documents/biosustain_report_final.pdf
- S.I. No. 349/1989 '*European Communities (Environmental Impact Assessment) Regulations 1989*'
- SI. No. 235/2008 '*Planning and Development Regulations 2008*' Government of Ireland, Dublin
- Sustainable Energy Authority of Ireland (2013) '*Methodology for Local Authority Renewable Energy Strategies*' Available via: http://www.seai.ie/Publications/Renewables_Publications_/Wind_Power/Methodology-for-Local-Authority-Renewable-Energy-Strategies.pdf
- Sustainable Energy Authority of Ireland (2015) '*Bioenergy Supply in Ireland 2015 – 2035*' Available via: http://www.seai.ie/Publications/Renewables_Publications_/Bioenergy/Bioenergy-Supply-in-Ireland-2015-2035.pdf
- Sustainable Energy Authority of Ireland (2017) '*Assessment of Cost and Benefits of Biogas and Biomethane in Ireland*' Available via: https://www.seai.ie/News_Events/Press_Releases/2017/Assessment-of-Cost-and-Benefits-of-Biogas-and-Biomethane-in-Ireland.pdf
- Teodorita Al Seadi, Dominik Rutz, Heinz Prassl, Michael Köttner, Tobias Finsterwalder, Silke Volk, Rainer Janssen (2008) '*Biogas Handbook*' University of Southern Denmark, Esbjerg
- Walsh, S (2016) '*Emerging Issues in Planning: Objections to Solar Photovoltaic Scheme of Scale in Ireland*' Future Analytics Consulting, Dublin
- United Nations (2015) '*Paris Climate Conference (COP 21)*'

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Appendix Two Bioenergy Planning Pipeline Sample

A2.1 Large Scale Bioenergy projects

Planning	Local Authority	Applicant	Development Address	Application	Bioenergy Type	Planning Status	Comment
PA0013	An Bord Pleanala	College Proteins	Nobber, Co. Meath	04/03/2009	Biomass Combined Heat and Power (CHP)	Granted (An Bord Pleanala)	
16264	Cavan County Council	Andrew Fay	Lismagratty, Co. Carlow	01/06/2017	Biogas	On appeal	AD based on landfill side. Max capacity 13,000 tonnes of waste per annum. 10,000 tonnes of bio waste & 3,000 tonnes of 'green waste'
154926	Cork County Council	Stream BioEnergy Limited	Inchera, Little Island, Co.Cork	06/05/2016	Biogas	Granted (Local Authority)	90,000 tonnes of non-hazardous biodegradable waste per annum utilising anaerobic digestion (AD)
154335	Cork County Council	Pat Coffey	Lisnacunna, Enniskeane, Co. Cork	20/02/2017	Biogas	Refused (Local Authority)	
154926	Cork County Council	Stream BioEnergy Limited	Inchera, County Cork	05/06/2015	Biogas	Granted (Local Authority)	

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066651	Cork County Council	Valeco Ltd	Ballard, Kilworth, Co. Cork	20/04/2006	Biogas	Refused	The AD facility would be designed to receive c.190,000 tonnes per year liquid wastes and c.60,000 tonnes of dry waste per year
13/51141	Donegal County Council	Glenmore Estate Aghaveagh NW Ltd	Coxtown, Carrigans, Co. Donegal	20/08/2013	Biogas	Granted	
FW13A/0089	Fingal County Council	Stream Bioenergy	Roadstone Wood's Huntstown Quarry, Huntstown, North Rd, Finglas, Dublin 11	15/08/2015	Biogas	Granted (Local Authority)	
12/5313	Kerry County Council	Killarney Renewables Ltd.	Ballycasheen, Killarney, Co. Kerry	25/05/2012	Biomass	Refused (An Bord Pleánala)	
10/748	Kildare County Council	Organic Power Limited	Lewistown, Co. Kildare	16/06/2010	Biomass	Refused (An Bord Pleanala)	

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08/1668	Kildare County Council	Biopower Limited	Ballyraggan, Castledermot, Co. Kildare	23/08/2008	Multiple	Refused (An Bord Pleanála)	The proposed development consists of the development of an 'Agricultural BioPark' which comprises three principle elements, namely, an anaerobic digester, a rape seed processing facility and a fuel pellet production facility.
09/737	Limerick County Council	Greenport Environment Ltd.	Foynes, Co. Limerick	Durnish, Foynes, Co. Limerick	Biogas	Granted (An Bord Pleanála)	
109970	Mayo County Council	Mayo "Renewable Power Limited	Tawnaghmore Upper & Lower, Co. Mayo	11/05/2010	Biomass	Granted (Local Authority)	EXTENSION OF DURATION
11753	Mayo County Council	John Sheridan	Levally, Co. Mayo	17/11/2011	Biogas	Granted	AD tied to pig farm expansion. The Parasitic electrical load on the biogas plant is estimated at 200,000 units A 500 KVA CHP unit will be installed as part of the biogas facility and exporting electricity and returning heat to the pig farm substituting oil boilers.
07707	Mayo County Council	Mayo "Renewable Power Limited	Tawnaghmore Upper & Lower, Co. Mayo	30/03/2007	Biomass	Refused (An Bord Pleanála)	
KA110826	Meath County Council	Shamrock Renewable Fuels Ltd	Balrath Demesne, Co. Meath	27/10/2017	Biomass	Granted (Local Authority)	
KA901377	Meath County Council	Shamrock Renewable Fuels Ltd	Balrath Demesne, Co. Meath	01/09/2009	Biomass	Refused (An Bord Pleanála)	
15/129	Offaly County Council	Edenderry Power Limited.	Clonbullogue, Edenderry, Co. Offaly	19/05/2015	Biomass	Granted (An Bord Pleanála)	This application was for the extension of the Edenderry Power Plants operation life.

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16729	Waterford County Council	James McGrath	Ballynameelagh, Co. Waterford	07/11/2014	Biogas	Granted (Local Authority)	Piggery, waste from 8950 pigs as feedstock. Not appealed to ABP. Capacity not specified.
20160469	Wexford County Council	Melvin Rothwell	Moneydurtlow, Tombrack, Co. Wexford	06/05/2016	Biogas	Granted (Local Authority)	6,000 tonnes per annum.