Chapter 3

Planning Policy
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INTRODUCTION

3.1 This chapter sets out the statutory planning context for the proposed Renewable Bioenergy Plant (henceforth referred to as the proposed Plant) at Inchera, Little Island, Co. Cork. It examines the national, regional and local planning policy context established by the National Spatial Strategy (NSS) 2002-2020, the National Development Plan (NDP) 2007-2013, the South West Regional Planning Guidelines (SWRPGs) 2010-2022, the Cork Area Strategic Plan (CASP), the Cork County Development Plan (CCDP) 2014 and the Blarney Electoral Area LAP 2011. The proposed development is examined in the context of the policies and objectives set out within each of these plans.

3.2 Plans and strategies relating to waste management, renewable energy and climate change are set out within Chapter 4, Waste and Energy Policy.

3.3 The application site covers an area of circa 2 ha (5 acres) and is located within an industrialised area at the western end of Little Island, approximately 6km east of Cork City. This site is part of a larger landholding of approximately 20ha which was formerly occupied by Pfizer.

3.4 This section of the EIS should be read in conjunction with Chapter 2, Development Description, where the nature and extent of the proposed development is fully described.

NATIONAL PLANNING POLICY

3.5 It is Government policy to reduce dependence on landfill and to encourage biological treatment of organic waste. The delivery of such infrastructure is critical to supporting sustainable economic growth. The proposed development would be of major benefit in providing a reliable, renewable energy supply which will replace fossil fuel dependency, reduce greenhouse gas emissions, while producing a valuable biofertiliser product.

National Spatial Strategy 2002-2020

3.6 The NSS is defined as a ‘coherent national planning framework for Ireland for the next 20 years’ and aims to achieve a better balance of social, economic
and physical development across Ireland, supported by more effective planning. In order to drive development, the NSS proposes that areas of sufficient scale and critical mass will be built up through a network of gateways and hubs.

3.7 The contrast between rapid development in the east of the country and slower rates of development in other regions is emphasised. In order to redress the weaker urban structure of the South West, gateways and hubs are identified in order to support balanced regional development.

3.8 Gateways are considered to have a strategic location, nationally and relative to their surrounding areas, and provide national scale social and economic infrastructure and support services.

3.9 The subject site is located within the South West Region and within the Cork City gateway which is recognised as being the engine of economic development within the region.

3.10 The NSS considers that the South West will contribute to balanced regional development, acting as a national/international gateway and supported by the Mallow hub at a pivotal location between Cork and Limerick. The Strategy recognises that further investment in the region will be achieved through building on the established economic base that exists in Cork and realising the substantial capacity for growth identified in the Cork Area Strategic Plan (CASP).

3.11 Further development of Cork is a key component of the NSS and is seen to have the potential to offer a counterweight to the pull eastwards to the Greater Dublin Area (GDA). Of the regional cities, the NSS asserts that Cork has the most immediate potential to be developed to the national level scale required to complement Dublin.

3.12 The synergies that exist between Cork, Limerick and Waterford including the clustering of economic activity is recognised as an asset. It is considered that the best prospect for establishing critical mass of the type and scale capable of competing with that of the GDA is through developing these gateways as a
network of co-operating and complementary cities. However, for the shared strengths in their attractiveness for investment and enterprise to be realised, the NSS recognises that these areas need to plan and act in a complementary manner.

3.13 A number of specific elements are considered to be vital to fostering a wide range of enterprise activity and employment creation within the NSS, they include:

- **Reliable, secure and cost-competitive energy supply;** and,
- **Effective waste management structures and facilities.**

3.14 Section 3.7, addresses the infrastructural requirements necessary to deliver the strategy. In relation to waste management infrastructure, the NSS states that:

> ‘Waste management is a particular current priority. Efficient, effective and cost competitive waste management facilities are essential if industrial and enterprise activity is to thrive and develop in a balanced way across Ireland’.

3.15 With regard to energy, reliable and effective energy systems to power industry and services are deemed to be key prerequisites for effective regional development. Enhancing both the robustness and choice of energy supplies across the regions is considered to be a prime consideration in terms of spatial policies relating to energy.

3.16 In relation to the generation of electricity capacity the NSS states there will be a need for significant additional generating capacity in the future. The research undertaken for the NSS indicated that the Cork and Limerick City areas represent the most readily suitable points from a grid infrastructure perspective, to accommodate 100 MW of new generation capacity.

3.17 The NSS recognises the need to protect environmental quality and in this regard promotes the alternative use of agricultural wastes for electricity generation. Particular reference is made to wastes arising from the Golden Vale which encompasses areas of North Cork, Limerick and Tipperary. All of these areas will be served by the proposed Inchera Plant.
NSS Review, 2010

3.18 In recognition of the economic and environmental challenges facing Ireland, a review of the implementation of the NSS was undertaken in 2010 entitled ‘Implementing the National Spatial Strategy: 2010 Update and Outlook’.

3.19 This update to the NSS stresses that all regions of the country have a role to play in national economic recovery. Accordingly, strategic investments to realise the potential of the regions, together with the sustainable use of natural resources are considered to be vital in positioning the regions as key contributors to Ireland’s national recovery. Ensuring that the environment will be conducive to attracting foreign investment, stimulating entrepreneurship and enabling companies to develop and serve indigenous and global markets from an Irish base is seen as a critical element of national recovery.

3.20 Notwithstanding the current economic difficulties, the Review recognises that the drivers behind national and international competitiveness remain constant in relation to the quality of physical infrastructure including energy supply.

3.21 Section 1.7 asserts that to set the spatial development of Ireland on a more sustainable path in economic, social and environmental terms, the core objectives of the NSS need to be realised including:

- Achieving increased levels of development in the regions outside of the GDA; and,

- Accelerating the development and strengthening of Cork City as a key engine of economic activity to energise the development of its wider region.

3.22 With regard to future investment priorities the update to the NSS asserts that the promotion of sustained investment in energy efficiency should be a priority from a spatial planning and regional development perspective.

3.23 The proposed plant will promote the objectives of the NSS in so far as it will contribute to ensuring critical infrastructure (waste and energy) is in place that will ensure ongoing support for industrial, commercial and other development. It will also serve to augment and promote Cork City’s status as a gateway city.
National Development Plan 2007-2013

3.24 While it is recognised that the timeframe for the NDP has now expired, in the absence of a revised Plan, the provisions contained within the NDP are considered to be relevant to the proposed development.

3.25 The NDP is a blueprint for the economic and social development of Ireland until 2013. A key objective of the plan is to promote balanced regional development. Gateways and hubs have been designated to act as development growth areas that will be promoted in terms of infrastructure and investment to act as economic drivers for their region.

3.26 The NDP seeks to reach new economic and social goals, with emphasis placed on the protection of the environment. Increased prosperity and growth are recognised as having increased pressure on the environment through growth in consumption levels, energy demands and waste flows.

3.27 Waste management forms part of the Environmental Services Programme within the NDP. The Plan acknowledges that enhancing the availability of a range of high quality waste management solutions is important for national competitiveness and balanced regional development. It further recognises the role of the private sector in delivering the necessary infrastructure.

3.28 Achieving a comprehensive system of waste management is cited as being a significant environmental challenge for Ireland. The Plan states that:

- ‘There is a need to continue to reduce reliance on landfill as a method of waste disposal. From an environmental perspective, landfill has many disadvantages, and to reach the diversion from landfill targets required by the EU Landfill Directive’ (pg.145).

3.29 The challenge of meeting the Landfill Directive targets is considered to be significant. Maximising the production of high value compost through biological treatment of biodegradable waste is identified as a priority in seeking to achieve these targets.

3.30 In relation to energy infrastructure, the overall strategic objective of the NDP is to ensure security of energy supply nationally and regionally, which is
competitively priced, in the long term while meeting a high level of environmental standards. Security of supply is considered of vital importance to ensuring the economic development of the country. In this regard the bioenergy sector is recognised by the Plan as an area which will have increased policy focus over the lifetime of the Plan.

3.31 In addition to reducing the amount of waste being landfilled, thereby avoiding greenhouse gas emissions from such facilities, the proposed plant at Inchera will produce a consistent, reliable source of renewable energy thereby satisfying objectives contained within the NDP.

Infrastructure and Capital Investment 2012-2016

3.32 This Report presents the findings of a Government wide review of infrastructure and capital investment policy led by the Department of Public Expenditure and Reform. Within the context of tight fiscal constraints, the Government is committed to ensuring that the country’s stock of infrastructure is capable of facilitating economic growth.

3.33 The review assesses the existing capacity of Ireland's infrastructure and identifies remaining gaps which must be addressed to aid economic recovery, social cohesion and environmental sustainability.

3.34 It identifies four main components of the investment strategy, including:

- Economic infrastructure – encompassing energy provision.
- Environmental infrastructure – including waste management systems and investment for environmental sustainability.

3.35 Given the reduced level of resources available, sharp prioritisation of investment is considered to be paramount. In the solid waste sector, the bulk of the investment required in new waste treatment infrastructure is to be provided from private sources.

3.36 The proposed Plant will contribute towards providing a viable infrastructure base (energy and waste) and assist in achieving a modern competitive economy.
REGIONAL PLANNING POLICY

South West Regional Planning Guidelines 2010-2022

3.37 The SWRPGs are a key policy bridge between national development priorities and local planning in the South West. They provide a long-term strategic planning framework for the development of the region.

3.38 The Guidelines formulate public policy for the region, covering Cork and Kerry, integrating land-use, transport, economic growth and investment, to enable the region to continue to grow as a sustainable high quality location for investment and one in which to live, work and visit.

Economic Development Strategy

3.39 Chapter 3 sets out the Economic Development Strategy and identifies opportunities for development. A core principle of the SWRPG’s vision is that the region will be a major focus for economic growth and an attractive location for industry. Policies and objectives to steer progress up to 2022 are presented.

3.40 The Guidelines recognise that in order for growth to take place front loading of infrastructure development in the Cork City Gateway is essential. Furthermore, to safeguard the expansion of existing productive industries in the region, the SWRPGs support facilitating the sustainable generation of renewable energy at source in strategic industrial areas.

3.41 The proposed Plant will contribute toward the provision of essential waste management and energy infrastructure that will meet both existing and future business needs and in turn support the growth of the region’s economy.

Physical Infrastructure

3.42 Chapter 5 sets out the transport and infrastructure strategy for the region and asserts that the timely provision of infrastructure is the foundation on which the region will grow and develop. It recognises that the necessary sustainable infrastructure must be put in place to support growing levels of population and
economic activities. Energy and waste management are considered to be key areas requiring priority investment.

Energy

3.43 The Guidelines recognise that the region must respond to the significant challenges posed by declining fossil fuels and the harmful effects of greenhouse gas (GHG) emissions. In this regard the South West Regional Authority, through its Bioenergy Plan 2009-2020, supports the development of bioenergy resources as a means of displacing or substituting fossil fuel.

3.44 According to the Guidelines demand for electricity in the region is projected to increase by 60% by 2025 (pg.21). The need for robust electricity generating capacity to ensure consistent supply to consumers and all sectors of the economy is therefore recognised as being critical. The SWRPGs expect bioenergy to play a significant role in meeting this additional demand.

3.45 The following strategic objective is directly applicable to this proposal:

- **RTS-09**: It is an objective to promote the sustainable provision of renewable energy from tidal, wave, and pumped storage developments together with bioenergy resources, as critical elements of the long-term secure energy supply throughout the region.

3.46 The proposed Plant at Inchera will provide up to 4MW of renewable electricity to the region at a consistent frequency. This is enough electricity to power up to 7,500 homes locally.

Waste Management

3.47 The Guidelines consider that policies and objectives relating to waste management planning are best dealt with within the relevant Waste Management Plans.

3.48 However, they do consider that an important element relating to waste management is the need for biological treatment to be developed in a sustainable location, with good transportation links within the Cork Gateway (pg. 70).
3.49 A broad objective is presented as follows:

- **RTS-08**: It is an objective to encourage the delivery of an effective and efficient waste management service in line with the Waste Management Acts.

3.50 The location of the proposed Plant is considered to be appropriate for the proposal being within the Cork Gateway and adjacent to Dunkettle Interchange which acts as an intersection between a number of national roadways linking Cork to Dublin, Limerick, Waterford, West Cork and Kerry. These attributes were considered to be particular advantages during the site selection process.

**CORK AREA STRATEGIC PLAN, 2001-2020**

3.51 The CASP is a broad policy document identifying the nature and scale of growth required to allow the Cork region to prosper and compete on a national and international scale and to ensure quality of life for its citizens over a 20 year period. The CASP Update, dated July 2008, adheres to the key goals of the original CASP and takes account of revisions needed to reflect economic, market and policy developments since the original CASP was prepared and places particular emphasis on the implementation of policies to achieve the goals of the CASP.

3.52 In particular, CASP (pg. i) sets out a framework to enable the city region to:

- Attain critical mass;
- Make efficient use of investment in infrastructure; and,
- Provide a high quality environment.

3.53 CASP recognises that there is an opportunity for the region to demonstrate strong leadership in reducing emissions and in securing competitive advantage in the context of regional economic development. To achieve this the Plan states that there should be a focus on waste recycling, sustainable technologies and alternative energy (pg. 31).

3.54 With regard to future development the Plan recognises that redevelopment and intensification of existing lands will need to take place at Little Island in order for its development potential to be realised (pg. 57).
3.55 The proposed Plant is to be developed on a vacant site, formerly the location of the Pfizer pharmaceutical plant, at Inchera, Little Island. If consented, the Plant will result in the redevelopment of an unused brownfield site.

3.56 The diversion of biodegradable wastes to anaerobic digestion will reduce GHG emissions from landfill. According to DEFRA if digested, rather than sent to landfill, capturing the biogas from one tonne of food waste will save between 0.5 and 1 tonne of CO$_2$ equivalent. The proposed plant will deliver an efficient and cost competitive waste management facility which will assist in promoting further industrial and enterprise activity in the region.

THE DEVELOPMENT PLAN

Cork County Development Plan 2014

3.57 The CCDP 2014, is the key policy context for individual planning decisions within this area. The Development Plan, as the Councils’ principal policy statement on land use, has been drawn up to reflect sustainable development objectives.

3.58 All of the detailed policies and objectives contribute to the delivery of a number of key aims for the County as a whole including:

- The need to reduce greenhouse gas emissions and the use of non-renewable resources while taking account of the need to plan for the effects of climate change; and

- The need for sustainable and balanced economic investment in services; and the provision of effective physical infrastructure.

3.59 Cork County is divided into four main strategic planning areas and the proposed application site at Inchera is located within the County Metropolitan Cork Strategic Planning Area. This area is considered to be the engine of both population and employment growth given its gateway status under the NSS.

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1 UK Department of Environment, Food and Rural Affairs (2009), *Anaerobic Digestion – Shared Goals*
3.60 The Plan sets out a vision and supporting strategy that directs future growth into the Metropolitan Cork Area. It recognises that critical infrastructure must be provided in a timely manner to support the growth targets set out in the Plan. However, it is recognised that Cork County Council cannot deliver this vision in isolation and the implementation of the Plan will require a combined effort.

**Land Use Zoning**

3.61 The CCDP sets out various zoning designations for the County. The aim of zoning is to promote orderly development by removing potential conflicts between incompatible land uses and to establish an efficient basis for investment in public infrastructure and facilities. Each land use zoning objective is accompanied by supporting text which elaborates on the zoning objective and sets the context for the type of development which would be acceptable.

3.62 The zoning objectives and maps for all the settlements in the County are set out in the relevant Local Area Plans (LAPs), in this instance the Blarney Electoral Area Local Area Plan 2011. Objectives set out in the CCDP are the general principles that should be followed in LAPs.

3.63 The application area is zoned ‘Existing Built Up Area’ within the Blarney Electoral Area LAP, i.e. the proposed site lies within an area of existing development. These are areas of existing development where opportunities are present for in-fill development, redevelopment, refurbishment or change of use and do not have a specific zoning objective. It is considered that further development of such areas is more sustainable than continually encouraging growth in undeveloped areas. Indeed, the redevelopment of brownfield sites is deemed to be inherently more sustainable than the development of greenfield sites and is to be encouraged as set out in objective ZU 4-1 of the CCDP, which states:

‘Recognise the employment opportunities of brownfield sites in both urban and rural areas of the county and their contribution to a more sustainable pattern of development.’
3.64 Appropriate uses are not set out for the ‘Existing Built Up Area’ classification but rather proposals for development will be considered on the following basis:

- The objectives of the CCDP;
- Any general or other relevant objectives of the relevant local area plan;
- The character of the surrounding area; and
- Other planning and sustainable development considerations relevant to the proposal and its surroundings.

3.65 Objective **(ZU 3-1)** for Existing Built Up Area as set out in the CCDP states:

> ‘Normally encourage through the Local Area Plan’s development that supports in general the primary land use of the surrounding existing built up area. Development that does not support, or threatens the vitality or integrity of, the primary use of these existing built up areas will be resisted’.

3.66 The proposed Plant is an industrial development and will be set within an industrial context. The process will utilise best available techniques and will operate under a licence issued by the EPA.

3.67 The proposed site is located within an area of existing large scale industrial development within Little Island. It is a designated Strategic Employment Area. Objective **ZU 3-7** puts forward appropriate uses in such areas and is therefore directly applicable; it states:

a) **Promote the development of industrial areas as the primary location for uses that include manufacturing, repairs, medium to large scale warehousing and distribution, bioenergy plants, open storage, waste materials treatment, and recovery and transport operating centres…’**

b) **Industrial areas that are not used for small to medium sized industry, warehousing or distribution are considered generally acceptable to be suitable for waste management activities (including the treatment and recovery of waste material…)**
c) The provision of strategic large scale waste treatment facilities will be considered in 'Industrial Areas' designated as Strategic Employment Areas’ in the Local Area Plans subject to the requirements of, National Policy, future Regional Waste Management Plans and the objectives set out in Local Area Plans’.

3.68 The Zoning and Land Use Chapter sets out considerations with regard to the Seveso II Directive 96/82/EC as amended by Directive 105/2003/EC. There are four industries listed within Little Island as being affected by the Seveso II Directive as follows:

- BASF Ireland Ltd;
- BOC Gases Ireland Ltd;
- Janssen Ireland; and
- Pfizer Ireland Pharmaceuticals.

3.69 Proposals lying within established consultation distances as defined by the Health and Safety Authority must comply with the requirements of Seveso II. The proposed application site is within the defined consultation distance for BASF Ireland and Pfizer Ireland. A Land Use Planning Assessment has been prepared by AWN and accompanies this planning application as a separately bound report.

**Economy and Employment**

3.70 Little Island is recognised as an area that has contributed to Cork’s economic success. Modernisation of this location and advance provision of infrastructure is considered to be vital in the evolution of Cork’s overall employment offering.

3.71 The CCDP presents an overarching objective for economic development as follows:

- **EE 2-1:** Support the national economic development strategy by creating conditions that will attract sustainable economic investment as the priority in the Cork Gateway, Mallow Hub and the other principal locations identified for employment and economic development in the plan’
Renewable Energy

3.72 The Plan seeks to ensure that Cork fulfils its role in contributing to the diversity and security of energy supply and to harness the potential of the county to assist in meeting renewable energy targets. This is included as a specific objective (ED1-1) within the Plan.

3.73 With regard to renewable energy, the CCDP accepts the requirement for Cork to contribute to the 16% target of national gross final consumption of energy being derived from renewable sources by 2020. Indeed the Plan asserts that the county is well positioned to become self-sufficient in renewable energy.

3.74 Section 9.2.4 of the plan requires that in order to highlight the benefits of a move towards reduced greenhouse gas (GHG) emissions all renewable energy developments must indicate clearly the overall net carbon benefit arising from their proposed development. As stated above capturing the biogas from one tonne of food waste will save between 0.5 and 1 tonne of CO$_2$ equivalent (Defra, 2009). The proposed plant at Inchera will have the capacity to process up to 90,000 tonnes per annum of food waste and thus could realise a CO$_2$ saving of an equivalent figure. It will realise an overall net carbon benefit as the facility will export 21,202 MWh of renewable electricity, enough to power 7,500 homes locally.

3.75 The National Roads Authority (NRA)$^2$ estimates that one car emits approximately 3 tonnes of CO$_2$ per annum. The proposed plant would thus realise a CO$_2$ saving of the equivalent of 30,000 cars per annum. According to the Central Statistics Office (CSO) approximately 10,000 cars are registered in Cork each year on average.

3.76 The CCDP envisages that the bioenergy sector will grow considerably within the county and acknowledges that such sources including biomass offers a real alternative to meeting energy needs. It recognises a range of new technologies, and specifically Anaerobic Digestion, that can contribute to minimising greenhouse gas emissions and to securing a greater proportion of

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the County’s energy needs from renewable sources such as organic residues and waste.

3.77 The promotion of the use of bioenergy as a renewable energy source is supported through Objective ED 4-3 as follows:

‘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 such proposals’.

Waste Management

3.78 Chapter 11 of the CCDP sets out the council’s policy with regard to waste management. This is guided by International, European and National Guidelines as well as the Cork Waste Management Plan (CWMP), 2004, until the adoption of new Regional Waste Management Plans.

3.79 With regard to waste management facilities the Plan points to the infrastructure requirements set out within the CWMP and asserts that Local Area Plans will facilitate their development where appropriate.

3.80 It specifically notes that the provision of strategic large scale waste treatment facilities will be considered in ‘Industrial Areas’ designated as Strategic Employment Areas. The proposed location of the site at Inchera is designated as such an area.
3.81 The Plan’s objective for waste management is set out under WS 7-1, and the aspects relevant to the proposed development are:


b) Encourage the delivery of an effective and efficient waste management service in line with the Waste Management Acts and Relevant Waste Management Plan for the County/Region.

3.82 The aims and objectives of the CCDP centre on the principles and practice of sustainable development by embracing concepts such as becoming more self-sufficient in waste management and favouring the use of renewable energy sources to support economic development within the region.

3.83 The Inchera proposal is closely aligned to the objectives and policies contained within the Plan. The proposed site is brownfield and appropriately zoned and the immediately surrounding area is characterised by established industrial uses. It will considerably augment waste management infrastructure within the County. Biogas will be recovered in an efficient manner for the sustainable production of renewable energy (electricity and heat) and this will contribute towards providing energy security of supply benefits.

Blarney Electoral Area Local Area Plan, 2011

3.84 The proposed development site at Inchera is located within the Little Island Strategic Employment Centre. The LAP considers that providing for mixed employment development is key to the future growth of Little Island.

3.85 It is recognised that the area’s proximity to the national road network is critical to attracting industry into Little Island.

3.86 With regard to access to land for development, the plan recognises the shortage of land available within Little Island. The most appropriate means of providing additional development land is considered to be through encouraging the redevelopment of brownfield sites particularly on the western side of Little Island.
3.87 The subject site is zoned ‘Existing Built Up Area’ and this zoning designation was assigned to allow a more positive and flexible response to proposals for the re-use or redevelopment of underused or derelict land or buildings.

3.88 The proposed development at Inchera is in keeping with the objectives set out in the LAP. It will provide critical infrastructure which will support the continued growth of Little Island. The site is located at the western end of Little Island and will bring a strategically located brownfield site into productive use.

CONFORMANCE OF THE PROPOSAL WITH POLICY OBJECTIVES

3.89 The potential for the renewable energy and waste management industries to help Ireland meet some of its most challenging goals in terms of growth, carbon reduction, resource recovery and the emerging green economy is substantial. The timely provision of services and utilities including waste management and security of energy supply are essential in meeting both business and residential needs.

3.90 The majority of the electricity generated in Ireland uses imported fossil fuels. International fuel prices which are outside of Ireland’s control are the key driver of the cost of generation and therefore consumer electricity prices. At a time when the demand for alternative energy supplies is higher than ever, energy recovered from waste could help make Ireland more self-sufficient and provide a source of reliable green energy supply.

3.91 In order for Ireland to remain competitive and to attract inward investment it is necessary to ensure that an integrated waste management infrastructure is in place. The proposed plant will be a modern facility using best available techniques and will considerably augment waste management infrastructure within the region.

3.92 The plant will make a significant contribution to the management of organic waste in Ireland in an environmentally sustainable manner. It will provide an outlet for the increasing volumes of source separated biowaste as well as helping divert organic wastes from landfill.
3.93 Biogas will be recovered in an efficient manner for the sustainable production of renewable energy (electricity and heat). This will contribute towards providing energy security of supply benefits. The proposed plant will provide a consistent supply of up to 4MW of renewable electricity for export to the national grid, enough electricity to power approximately 7,500 local homes annually and will thus have an overall net carbon benefit.

3.94 Anaerobic Digestion (AD) has an important role to play in tackling climate change as it can be used to reduce the emissions of greenhouse gases to the atmosphere, which Ireland has international commitments to decrease. This is both due to its replacement of fossil fuels through the production of renewable electricity, and because the organic materials are processed in an entirely enclosed system which prevents the uncontrolled release of methane, nitrous oxide and other gases which can occur when organic waste degrades in landfill.

3.95 As part of an integrated waste management system, AD has the potential to deliver environmental benefits including the improvement of air quality through odour reduction and reduced emissions of ammonia and oxides of nitrogen from organic waste. It also has water quality benefits as it reduces organic pollution potential and destroys pathogenic and faecal micro-organisms.

3.96 AD recovers the energy from organic waste and produces a material, termed ‘digestate’ that, if derived from source segregated feedstock, is suitable for use as a soil conditioner or biofertiliser for agricultural and horticultural purposes. The digestate produced from the process is free from contaminants, pathogens and odour and has a nutrient rich content, and it can be used to replace artificial fertilisers.

3.97 A key characteristic of the proposed Plant in terms of its potential socio-economic impact, relates to its capital value, of which a significant portion will be for the purchase of Irish sourced goods and services. The construction phase will provide a boost for the local construction sector in terms of employment generation and capital spend on materials and construction labour costs. The plant will provide permanent employment opportunities...
PLANNING POLICY 3

during the operational phase, and further jobs associated with supplying goods and services to the Plant.

3.98 Access is provided from the site onto the R623, which in turn has direct access to the northern entrance to the Jack Lynch Tunnel (N40) and the Dunkettle Roundabout which forms the junction between the N25 Cork-Waterford (east) national primary route and the M8 Cork-Dublin (north) motorway. The Plant’s location within close proximity to the strategic road network means that it well located to serve all areas of the Southern Region.

3.99 In line with policies contained within both the SWRPGs and the CCDP 2014, a Stage 1 Screening and Stage 2 Appropriate Assessment of the impact of the proposed development on the integrity of the Natura 2000 network of sites was carried out in accordance with Article 6 of the Habitats Directive. Further details of this assessment are included in the ‘Natura Impact Statement: Provision of Information to Inform an Appropriate Assessment’ which has been provided as a separately bound document accompanying this application. The assessment found that the proposed development will not adversely affect the integrity of the Natura 2000 network.

3.100 A report entitled ‘Assessment of Land Use Planning Implications for the Development of a Renewable Bioenergy Plant at Inchera, Little Island, Co.Cork’ accompanies this application as a separate report. The assessment found that the proposed development satisfies the HSAs criteria for Land Use Planning matters.

3.101 The proposed development accords with the relevant policies, objectives and recommendations presented in the statutory plans. Subject to complying with the suite of mitigation measures outlined within this EIS, the facility will be constructed and operated with no unacceptable impact on the environment.

3.102 It is reasonable to conclude that the proposed Renewable Bioenergy Plant at Inchera, being located on a brownfield site, recovering energy from waste and diverting biodegradable materials away from landfill, accords with the relevant planning policies. The proposed development has been designed with due consideration to the requirements of all applicable plans.
3.103 Furthermore, the Plant will underpin future economic growth by ensuring that the necessary waste management infrastructure is in place to facilitate existing and new development in the region.
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INTRODUCTION

4.1 This chapter of the Environmental Impact Statement (EIS) outlines the waste and energy policy context for the proposed Renewable Bioenergy Plant at Inchera, Little Island, Co. Cork. This section should be read in conjunction with Chapter 3 for details on supporting planning policy.

4.2 The long-term goal for the European Union (EU) is to become a recycling society that seeks to use waste as a resource. Drivers such as climate change, energy security, carbon foot-printing and waste recycling are at the forefront of the EU’s legislative agenda.

4.3 While progress has been made on lessening dependence on imported fossil fuels (from 98% in 1990), the State is still importing almost 90 per cent of its energy requirements at a cost of 6.7 billion euros\(^1\). This is one of the highest rates in Europe. The UK, by contrast, imports only around a third of the energy it uses.

4.4 The mix of energy has changed, with substantially less coal and peat and far more natural gas, see Plate 4-1. However, the State is still heavily dependent on oil as an energy source. This is clearly not a sustainable situation and leaves Ireland exposed to conflicts in Russia and the Middle East. Should a crisis occur in one of these states, Ireland only has a 90-day stockpile for essential services.

4.5 Electricity generated from renewable energy (normalised) reached 20.9% of gross electricity consumption (RES-E) in 2013. Ireland’s target for 2020 is 40%.

4.6 Despite international obligations to limit and reduce greenhouse gas (GHG), Ireland has the fourth highest level of greenhouse gas emissions per person in the EU\(^2\) and according to the EPA is off-track to meet its EU 2020 target of

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\(^1\) SEAI (2014) Energy in Ireland, Key Statistics 2014

reducing greenhouse gas emissions by 20%\textsuperscript{3}. It is noteworthy that on current trends, Ireland’s emissions would actually rise by 12% in the period up to 2030\textsuperscript{4}.

4.7 Organic material is a source of recoverable energy. The Best Available Technology (BAT) for such recovery is through an anaerobic digestion (AD) process due to the considerable benefits it offers including production of renewable electricity and heat, along with a stabilised digestate product which can be recycled to land as a soil conditioner and natural fertiliser when derived from source separated waste. These combined benefits give AD a considerable advantage over alternative biological technologies such as composting, which is a net user of energy rather than a net producer, and incineration, which does not recycle the organic matter.

\textsuperscript{4} ibid
4.8 Drivers for the development of AD and Combined Heat and Power (CHP) on a European, national and regional level are presented below.

**EUROPEAN UNION DIRECTIVES AND GUIDANCE**

4.9 The Directives of the European Union (EU) set the context for the management of waste in Ireland. These are guided by the principles of sustainability and environmental protection. EU policy regarding the protection of the environment and natural resources has increased steadily in importance since the mid-1980s with the 1989 Community Strategy for Waste Management enshrining the principle of sustainable development and a high level of environmental protection as a priority.


4.11 The revised Framework is aimed at encouraging the prevention, re-use and recycling of waste. By promoting the use of waste as a secondary resource, the Directive is intended to reduce the landfill of waste as well as greenhouse gases (GHGs) arising from landfill sites. Biodegradable waste, when sent to landfill for disposal, breaks down to release methane (CH₄), a powerful GHG.

4.12 The Directive introduced a new approach to waste management which requires Member States (MSs) to:
   - Ensure proper recovery and disposal of waste without damage to human health or the environment;
   - Ensure that the cost of disposal is borne by the waste holder in accordance with the polluter pays principles;
   - Prepare and adhere to waste management plans; and
   - Ensure that waste carriers are registered.

4.13 Article 4 requires the management of waste in accordance with the Waste Hierarchy as presented on Plate 4-2. This hierarchy applies as a priority order in waste prevention and management legislation and policy.
4.14 Article 16 requires MS’s to take appropriate measures to establish an integrated and adequate network of installations for the recovery of mixed municipal waste in accordance with the proximity principle and principles of self-sufficiency.

4.15 Measures to encourage the separate collection of biowaste with a view to composting and digestion in a way that fulfils a high level of environmental protection and uses environmentally safe materials produced from biowaste is a requirement under Article 22.

4.16 The 2008 directive has been implemented in Ireland through the European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011).

4.17 The Department for Environmental Food and Rural Affairs (DEFRA) in the UK has demonstrated through scientific evidence, based on life-cycle analysis, that anaerobic digestion is environmentally better than composting (recycling) and other recovery options for food. AD is therefore considered as recycling when the feedstock is derived from source separated waste.

**Landfill Directive (1999/31/EC)**

4.18 The Landfill Directive supplements the Waste Framework Directive (WFD) and impacts on both the management of waste and on specific waste streams. Its overall objective is to ‘to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater,
soil and air, and on the global environment, including the greenhouse effect, as well as any resulting risk to human health, from the landfilling of waste, during the whole life-cycle of the landfill’ (Article 1).

4.19 In addition to setting demanding new standards for all landfills in order to improve environmental protection, the Directive requires MS’s to reduce their dependence on the landfilling of municipal waste in favour of more environmentally sound alternatives. It includes a requirement for the pre-treatment of waste prior to disposal to landfill and imposes restrictions on the consignment of certain waste materials to landfill, including a gradual reduction in the quantity of biodegradable municipal waste (BMW) that may be deposited in landfills.

4.20 Article 5 of the Landfill Directive sets the following targets for diversion of BMW from landfill by MS’s:

• No later than 16th July 2006, BMW going to landfills must be reduced to 75% of the total amount (by weight) of BMW produced in 1995.
• No later than 16th July 2009, BMW going to landfills must be reduced to 50% of the total amount (by weight) of BMW produced in 1995.
• No later than 16th July 2016, BMW going to landfills must be reduced to 35% of the total amount (by weight) of BMW produced in 1995.

4.21 Ireland as a Member State with a high dependency on landfill (consigned more than 80% of collected municipal waste to landfill in 1995) negotiated a four year derogation on the first two compliance dates specified in Article 5.

4.22 Each MS was obliged under the Directive to complete and submit to the Commission a National Strategy on the proposed actions that will implement the BMW landfill diversion targets. To this end the ‘National Strategy on Biodegradable Waste’ was published by the Department of the Environment, Heritage and Local Government (DoEHLG) in 2006 (discussed later in this Chapter of the EIS).
4.23 The proposed plant at Inchera will help achieve the targets set out under Article 5, through providing much needed infrastructure for diversion of BMW away from landfill.


4.24 The Strategy identifies that EU waste policy is based on the waste hierarchy (see Plate 4-2) which aims to move waste up the hierarchy away from landfill and towards recycling and recovery. As waste moves away from landfill it will be channelled into a variety of treatment options, all of which will be better for the environment.

4.25 Significant emphasis is placed on the importance of managing biowastes and the Strategy in this regard seeks to promote more composting (including anaerobic digestion) and energy recovery from waste.


4.26 Following the publication of the *Thematic Strategy on Prevention and Recycling of Waste*, the Commission started preparatory work on a dedicated legislative proposal on biowaste. The Green Paper was used to promote debate on whether existing legislation (the Landfill Directive) was effective in terms of the management of biowaste, and if not what steps could be taken to improve it.

4.27 The next significant stage in this process was the publication of the *Commission Communication on Future Steps in Biowaste Management in the EU* (COM 2010 (235) Final) in 2010. Generally, the Communication asserted that the focus should be on ‘rigorous enforcement of the targets on diverting biowaste away from landfills’.

4.28 Article 8 states ‘that improved management of biowaste in the EU holds an untapped potential for significant environmental and economic benefits’. It asserts that approximately 2% of the EU’s overall renewable energy target could be met if all biowaste was turned into energy (Article 5).
4.29 Increased anaerobic digestion of biowaste is identified as an option where potential benefits appear to be significant.

4.30 The Communication details that additional supporting action at EU level, together with more incentives at national level and proper application of the waste hierarchy, would be of value in creating significant economic and environmental advantages in the management of biowastes.

4.31 To date there is no single Directive dealing with the management of biowaste. However, core objectives of mandatory separate collection and continued diversion of biowaste from landfill is contained within existing Directives.

4.32 The proposed Plant will provide an outlet for the management of biowaste thus assisting in its diversion from landfill.

EU Industrial Emissions Directive (IED) (2010/75/EU)

4.33 The Industrial Emissions Directive (IED) consolidates seven existing EU Directives into a single legislative instrument. The aim of the Directive is to reduce emissions from industrial processes.

4.34 The IED Directive has been implemented in Ireland through the European Union (Industrial Emissions) Regulations 2013, S.I. 138 of 2013.

4.35 The IED and corresponding Irish Regulations have an activity specifically for waste treatment via anaerobic digestion as follows; ‘when the only waste treatment activity being carried out is anaerobic digestion, the capacity threshold for this activity will be 100 tonnes per day’.

4.36 In line with the IED Directive, an application will be made to the Environmental Protection Agency (EPA) for a licence to operate the plant. The IED’s primary objective of reducing emissions from industrial processes has been addressed as part of the design of the proposed plant. For instance, the main building will be fully enclosed with the reception and pre-treatment areas continuously aerated using mechanical fans such that a negative pressure is maintained within these areas. The captured air will pass through an odour control system prior to being vented to atmosphere through a 28m high stack. Furthermore,
emissions from the combined heat and power (CHP) and standby gas flare will be within applicable EU and Irish limits, which will ensure that the impact of the plant’s operations on human health and the environment are minimised.

Roadmap to a Resource Efficient Europe (COM (2011) 571)

4.37 The Roadmap presents initiatives which aim to shift Europe towards a resource-efficient, low-carbon economy in order to realise sustainable growth for the Region. It proposes ways to increase resource productivity and decouple economic growth from resource use and its environmental impact. The aim is to increase certainty for investment and innovation, and to ensure that all relevant policies factor in resource efficiency in a balanced manner.

4.38 Section 3 of the Roadmap, entitled ‘Transforming the Economy’ asserts that increased competitiveness and new sources of growth and jobs through cost savings from improved efficiency can be achieved through putting the economy on a resource efficient path.

4.39 Turning waste into a resource forms a subsection of ‘Transforming the Economy’. It is recognised that improving waste management results in better use of resources and can open up new markets and jobs, as well as encouraging less dependence on imports of raw materials and lower impacts on the environment.

4.40 Public investment in modern facilities for waste treatment and high quality recycling are deemed to be critical if Europe is to realise a full recycling economy.

4.41 The Roadmap (pg.8) sets a milestone for waste management as follows:

‘By 2020, waste is managed as a resource. Waste generated per capita is in absolute decline. Recycling and re-use of waste are economically attractive options for public and private actors due to widespread separate collection and the development of functional markets for secondary raw materials. More materials, including materials having a significant impact on the environment and critical raw materials, are recycled. Waste legislation is fully implemented. Illegal shipments of waste have been eradicated. Energy recovery is limited to
non-recyclable materials, landfilling is virtually eliminated and high quality recycling is ensured’.

4.42 In order to achieve this milestone, the Commission sets out a number of measures that they will undertake including:

- Stimulating the secondary materials market and demand for recycled materials through economic incentives and developing end-of-waste criteria;

- Reviewing existing prevention, re-use, recycling, recovery and landfill diversion targets to move towards an economy based on re-use and recycling, with residual waste close to zero;

- Assessing areas where legislation on the various waste streams could be aligned to improve coherence; and

- Ensuring that public funding from the EU budget gives priority to activities higher up the waste hierarchy as defined in the Waste Framework Directive (e.g. priority to recycling plants over waste disposal).

4.43 Member States are required to ensure full implementation of the EU waste acquis including minimum targets through respective national waste prevention and management strategies.

4.44 The proposed AD process will convert organic wastes into biogas. The biogas will be used to generate renewable electricity and heat. The remaining material termed digestate can be used as a soil conditioner to replace finite natural resources. In this way the proposed Plant will help Ireland contribute to achieving the milestones set out within a Roadmap to a Resource Efficient Europe.
Towards a Circular Economy: A Zero Waste Programme for Europe (SWD 2014, 211 Final)

4.45 The European Commission adopted in July 2014 the Communication ‘Towards a circular economy: a zero waste programme for Europe’ in order to establish a common and coherent EU framework to promote the circular economy.

4.46 Turning Europe into a circular economy means:

- Boosting recycling and preventing the loss of valuable materials;
- Creating jobs and economic growth;
- Showing how new business models, eco-design and industrial symbiosis can move us towards zero-waste; and
- Reducing greenhouse emissions and environmental impacts.

4.47 Turning waste into a resource is recognised as being part of ‘closing the loop’ in circular economy systems. Separate collection at source is promoted to ensure high quality recycling and to contribute to the development of markets for the supply of high quality secondary raw materials.

4.48 Among the proposals to boost the economic, social and environmental benefits gained from the better management of waste are:

- An increase in the target municipal waste preparing for reuse and recycling rate from 50% by 2020 to 70% by 2030; and
- A ban on the landfill of recyclables such as biodegradable material by 2025 with a view to near elimination of landfill by 2030.
- Promote the development of markets for high quality secondary raw materials, including through evaluating the added value of end-of-waste criteria for specific materials.

4.49 While an announcement from the Commission in late 2014 signalled the withdrawal of the Circular Economy package, a modified package is being developed during 2015. The EU Commission claims that the modified package will be even more ambitious than the previous package, so we expect that the use of food waste as a feedstock to produce renewable energy and an organic fertiliser in AD plants will be equally supported in the new package.
The proposed Plant at Inchera will contribute toward diverting organic wastes from landfill and increasing recycling. It will produce valuable resources including renewable energy and heat and an organic fertiliser product which if derived from source separated waste can be used as a soil improver on agricultural and other lands. In this way the Plant will play a role in moving Ireland toward a circular economy.

The 7th Environment Action Programme (EAP)

The 7th EAP builds on existing policy initiatives, such as the Resource Efficiency Roadmap and the Europe 2020 Strategy and further prioritises low carbon growth, resource efficiency and innovation. It has been formally adopted by the European Parliament and Council and will be guiding the implementation of environment policy for Member States until 2020.

The Programme focuses on the importance of treating waste as a resource with increased prevention, re-use and recycling and also on the importance of phasing out damaging methods of waste management such as landfilling.

In order to achieve the aims of the Programme by 2020 the following measures must be undertaken:

- Waste will be safely managed as a resource and to prevent harm to health and the environment;
- Landfilling will be limited to residual (i.e. non-recyclable and non-recoverable) waste; and
- Energy recovery will be limited to non-recyclable materials.

The proposed Plant will meet these objectives by providing an outlet for waste to be managed as a resource.


The CHP Directive promotes the use of cogeneration in order to increase energy efficiency and improve security of energy supply within the EU. The Directive entered into force in February 2004 and MSs have been obliged to begin its implementation since 2006 (however due to delays, MSs had to adopt
the first obligations of the Directive by 6th August 2007). It is intended that the Directive will have a significant impact on the legislation and the diffusion of CHP/cogeneration within Member States.

4.56 In summary, MSs are obliged to produce reports covering their analysis of the state of CHP, to promote CHP and show what is being done to promote it, to report on and remove barriers, and to track progress of high-efficiency cogeneration within the energy market.

4.57 The proposed plant will assist in achieving Ireland’s obligations under this Directive.


4.59 European leaders have set a target to source 20% of the EU’s energy needs from renewables by 2020. To achieve this objective, all MSs are required to increase their share of renewables by 5.5% from 2005 levels, with the remaining increase calculated on the basis of per capita gross domestic product (GDP). Ireland is required under this Directive to ensure that 16% of total final energy consumption comes from renewable energy sources by 2020 based on a 3.1% share in 1995.

4.60 AD provides a consistent and secure source of renewable energy production, which will help Ireland achieve a more secure renewable energy supply, and allow for the attainment of the 2020 targets set by this Directive.
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4.61 There has been a significant shift in National Waste Management Policy from an initial focus on the development of modern, engineered landfill capacity and the promotion of recycling, to fiscal measures to influence environmental performance as well as policies promoting the development of biological treatment facilities.


4.62 In 1998, the then Department of the Environment and Local Government (DoELG) issued the policy statement, ‘Waste Management: Changing our Ways’, which highlighted the need for a new national approach to the delivery of waste infrastructure and services.

4.63 The goals presented in this document were firmly grounded in the internationally recognised waste management hierarchy of options: prevention, minimisation, reuse, recycling, recovery and disposal, where prevention is the most preferred option and disposal the least preferred. Though primarily directed at Local Authorities (LAs), ‘Changing our Ways’ envisaged greater participation by the private sector in the provision of waste management services and infrastructure.

4.64 It states that an adequate, national infrastructure to meet waste management needs would be needed to facilitate the achievement of the following targets over a fifteen-year timescale, by 2013:

• A diversion of 50% of overall household waste away from landfill.

• The percentage of household waste sent to landfill during 1998 was calculated at approximately 92%, as stated in the National Waste Report for that year published by Environmental Protection Agency (EPA).

• A minimum 65% reduction in biodegradable wastes consigned to landfill. The EPA’s National Waste Report for 1998 states that during that year approximately 1,003,053 tonnes of biodegradable waste was consigned to landfill. 65% of this figure equates to approximately 652,000 tonnes.

• The development of waste recovery facilities employing environmentally beneficial technologies, as alternatives to landfill, including the development
of composting and other feasible biological treatment facilities capable of treating up to 300,000 tonnes of biodegradable waste per annum. The National Strategy on Biodegradable Waste 2006, states that in 2004 the figure for total biological treatment capacity in Ireland then stood at approximately 100,000 tonnes per annum.

- Recycling of 35% of municipal waste.
- Rationalisation of municipal waste landfills, with progressive and sustained reductions in numbers, leading to an integrated network of some 20 state of the art facilities incorporating energy recovery and high standards of environmental protection.
- An 80% reduction in methane emissions from landfill, which will make a useful contribution to meeting Ireland’s international obligations.

**Preventing and Recycling Waste: Delivering Change (2002)**

4.65 The DoELG policy statement ‘Preventing and Recycling Waste: Delivering Change’ was published in 2002. This document evolved from and was grounded in the 1998 ‘Changing Our Ways’ policy statement and stated that while that document generated much good will, this now had to be translated into action. It addressed the factors and practical considerations that are relevant to the achievement of Government policy objectives and to the prevention and recovery of waste.

4.66 Chapter 7 of the policy statement deals with the promotion of biological treatment of organic waste, which encompasses both composting (aerobic) and anaerobic digestion. The document estimates that at the time of preparing the report, biodegradable municipal waste (BMW) amounted to some 60% of total municipal waste arisings, virtually all of which were then being landfilled.

4.67 The EPA’s National Waste Report for 2001 details that total municipal waste arisings for that year was 2,704,035 tonnes. 60% of this figure provides for 1,622,421 tonnes of BMW available. The report also refers to regional and local waste management plans that provide generally for the development of a network of centralised biological treatment facilities for organic municipal waste.
The generation of electricity from the biogas that is produced in the AD process has, according to the policy statement, the potential to replace non-renewable power sources such as fossil fuels.

Taking Stock and Moving Forward (2004)

During 2004 the DoEHLG published ‘Taking Stock and Moving Forward’ in order to provide a review of progress made on waste management modernisation since the publication of ‘Changing Our Ways’ in 1998 and to set out a programme of key points that would underpin future progress.

The document states that the recovery of biodegradable waste is a key element of the waste recovery dimension to national waste management policy ‘given that it accounts for some 65% of the municipal waste stream and can be readily recovered, it is an area for priority attention. The diversion of this waste stream from landfill is the subject of ambitious EU and national targets and will also reduce methane emissions from landfill facilities, with consequential benefits from a climate change perspective’.


The ‘National Overview of Waste Management Plans’ was published by the DoEHLG in tandem with ‘Taking Stock and Moving Forward’. It set out on a region by region basis the progress made (up to end-2003) in providing the principal pieces of waste infrastructure envisaged in local authority waste management plans.

In terms of the Cork Region, the ‘National Overview’ concludes that clearer provision for biological treatment is needed within the Plan as a result of the growing rate of waste arisings, population trends and the potential for waste segregation to be rolled out.


This Strategy addresses EU waste management requirements such as that for biodegradable waste management. It sets out measures to progressively
divert BMW from landfill in accordance with the targets set out in the Landfill Directive.

4.74 It states that Ireland proposes to avail of the four year derogation for the first two phases of the BMW diversion targets from landfill, as allowed by the directive. Accordingly, the Strategy is based on a first phase target date of 2010 (deferred from 2006) and a second phase target date of 2013 (deferred from 2009).

4.75 Based on data produced in the 1995 National Waste Report, which was subsequently refined through additional information acquired by the EPA since the publication of that report, the baseline figure for generation of BMW in Ireland during 1995 was calculated as being 1,220,840 tonnes\(^5\). This baseline figure allowed specific figures for the amount of BMW that will be allowed to go to landfill by each of the target years to be calculated, see Table 4-1.

Table 4-1 National Obligations for BMW Diversion from Landfill

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
<th>Tonnes of BMW allowed to Landfill</th>
<th>Current Progress to Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>75% of quantity generated in 1995</td>
<td>916,000</td>
<td>Achieved</td>
</tr>
<tr>
<td>2013</td>
<td>50% of quantity generated in 1995</td>
<td>610,000</td>
<td>589,000(^1)</td>
</tr>
<tr>
<td>2016</td>
<td>35% of quantity generated in 1995</td>
<td>427,000</td>
<td>380,000(^2)</td>
</tr>
</tbody>
</table>


1. 2012 BMW tonnage disposed to landfill.
2. 2013 BMW tonnage disposed to landfill. This is a preliminary figure and is liable to change.

4.76 While Ireland is on course to meet the 2013 and 2016 Landfill Directive targets, the EPA cautions against complacency. Since the local authorities’ role in the provision of waste management infrastructure has reduced significantly in recent years, the additional non-landfill capacity required by these targets needs to be provided by the private sector. This can be done by ensuring new

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waste management infrastructure such as that proposed at Inchera is put in place.

4.77 The Strategy sets specific objectives for the contributions of recycling, biological treatment and residual treatment to the achievement of the targets for diversion of BMW from landfill. The targets for each process for 2010, 2013 and 2016 are shown in Table 4-2 below. It proposes that by 2016 the biological treatment of BMW (mainly food and garden waste) will divert over 440,000 tonnes of this waste stream from landfill.

Table 4-2 BMW Diversion Targets for 2010, 2013 and 2016

<table>
<thead>
<tr>
<th>Treatment</th>
<th>2010</th>
<th>2013</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% BMW</td>
<td>Tonnes Diverted</td>
<td>% BMW</td>
</tr>
<tr>
<td>Recycled</td>
<td>32.2%</td>
<td>765,050</td>
<td>36.9%</td>
</tr>
<tr>
<td>Biological Treatment*</td>
<td>14.2%</td>
<td>338,129</td>
<td>17.5%</td>
</tr>
<tr>
<td>Residual Treatment</td>
<td>13%</td>
<td>308,904</td>
<td>18.5%</td>
</tr>
<tr>
<td>Total Diversion</td>
<td>59.4%</td>
<td>1,142,083</td>
<td>72.9%</td>
</tr>
<tr>
<td>Landfilled</td>
<td>40.6%</td>
<td>967,433</td>
<td>27.1%</td>
</tr>
</tbody>
</table>

* Biological treatment is defined in the strategy as composting, anaerobic digestion, mechanical-biological treatment or any other process for stabilising and sanitising biodegradable waste.

4.78 The National Strategy on Biodegradable Waste approach is provided below.

Plate 4-3 Summary of National Biodegradable Waste Strategy Approach

Source: Municipal Solid Waste – Pre-treatment & Residuals Management (EPA, 2009)

4.79 Circular WPPR 17/08 was circulated by the DoEHLG to City and County Managers on the 31st July 2008. In the Circular the Minister for the Environment assigned urgency to:

- The implementation of source segregation and separate collection services ("brown bin") in urban areas for the organic fraction BMW;
- Subsequent submission to appropriate biological treatment technologies (composting/anaerobic digestion); and
- Increased participation in home composting, particularly in rural and suitable suburban areas.

4.80 The following important points are included in the Circular:

- The overall capacity for centralised treatment of source-separated food and garden waste must increase substantially to meet the targets set out in the National Strategy on Biodegradable Waste.
- Local authorities will need to gain access to suitable biological treatment facilities to which the source separated and separately collected biowaste may be transferred.
- The provision of these capacities represents a challenge to the industry in providing compliant infrastructure, which is capable of processing the diverted biodegradable municipal waste. Local authorities should make provision for the availability of suitable biological treatment facilities to which the source separated and separately collected biowaste can be transferred. While local authorities do not have to directly provide such facilities, they should be able to identify suitable biological treatment capacity at county or regional or national level in circumstances where source segregation and separate biowaste collection services are to be introduced.

Food Waste Regulations (2009)

4.81 The Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) came into force on the 1st January 2010. The new Regulations are...
designed to promote the segregation and beneficial use of food waste arising in the commercial sector.

4.82 The Regulations impose obligations on major producers of food waste such as State buildings where food is prepared, restaurants and cafes, hot food outlets, canteens, hotels and larger guest houses, hospitals, universities, airports, supermarkets and other food retailers. Under the Regulations the commercial sector will have to segregate food waste and either:

- Avail of a separate collection service or direct transfer for authorised treatment; or
- Treat materials on site.

4.83 The main operational aspects applied from 1st July 2010 (segregating of food waste, use of brown bin service/treating on-site), however, premises producing less than 50kg per week were exempt until 1st July 2011.

4.84 The implementation of the Regulations will increase the amount of food waste recovered and will facilitate the achievement of the landfill diversion targets by directing source separated food waste to composting and biogas plants and to other forms of treatment (other than incineration). This is increasing the need for biological treatment facilities such as that proposed within this application.


4.86 The new policy document sets out a number of actions, including:

- An evaluation of the existing Waste Management Plans in 2012 with development of new Plans in 2013 which must reflect National Policy and the requirements of WFD 2008/98/EC. This policy document states that ‘a key objective of the new waste management plans will be to ensure a sufficiency of waste management infrastructure within the State to manage municipal waste’.
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- A move away from landfill, to its virtual elimination and replacement through prevention, reuse, recycling and recovery;
- Placing responsibility on householders to prove they use an authorised waste collection service or manage their waste in an environmentally acceptable manner;
- A brown bin roll-out diverting organic waste from landfill towards more productive uses as a resource opportunity; and
- Significant reduction of Waste Management Regions from ten to three, allowing for greater efficiency in the delivery of planning while still recognising geographical variations.

4.87 With regard to the application of the ‘proximity principle’ the policy document makes explicit that this does not entail interpreting administrative waste management planning boundaries in such a manner as to inhibit the development of waste infrastructure which will support the attainment of national waste management policy objectives through the rational development and use of such infrastructure.

4.88 A Resource Opportunity is the current waste policy in force in Ireland and clearly supports the development of biological treatment plants such as that being proposed within this application.

Landfill Levy (Amendment) Regulations (2013)

4.89 The levy is an economic instrument to encourage the diversion of waste away from landfill and to support the development and implementation of alternatives to the disposal of waste. Revenues from the levy are remitted to the Environment Fund and can be applied in support of waste minimisation and recycling activities.

4.90 The Minister for the Environment, Community and Local Government increased the landfill levy to €50, €65 and €75 euro per tonne during the period 2011 to 2013. The landfill levy increases have contributed significantly to the diversion of more than 1 million tonnes of waste from landfill in the last 5 years. Organic waste diverted from landfill can be processed by AD.
The Regulations (S.I. No. 71 of 2013) came into effect on the 1st July 2013, and are designed to promote the segregation and recovery of household food waste. They will increase the amount of food waste that is recovered and the production of energy, compost and digestate, thereby creating opportunities for added jobs and value.

The Household Food Waste Regulations impose obligations on:

- Waste collectors – who must provide a separate collection service for household food waste and must transfer such food waste to an authorised facility for the purpose of an authorised treatment process (including anaerobic digestion),
- Households that produce food waste – who must segregate such waste and keep it separate from other non-biodegradable waste, and have it separately collected by an authorised waste collector.

Householders may alternatively:

- Compost the food waste at home, or
- Bring the food waste to an authorised facility with a view to its composting or anaerobic digestion or treatment in a way which fulfils a high level of environmental protection.

Households are not allowed to:

- Macerate waste and dispose of food waste in a drain or sewer, or
- Dispose of food waste in the residual waste collection (the black bin).

In accordance with the regulatory impact assessment prepared for these regulations, the roll-out of the brown bin is currently being phased in over the following timetable:

- 1st July 2013 for agglomerations > 25,000 persons;
- 31st December 2013 for agglomerations > 20,000 persons;
- 1st July 2014 for agglomerations > 10,000 persons;
- 1st July 2015 for agglomerations > 1,500 persons, and
• 1st July 2016 for agglomerations > 500 persons.

4.96 In particular, the Regulations will facilitate the achievement of the targets set out in Directive 99/31/EC on the landfill of waste for the diversion of biodegradable municipal waste from landfill sites, by directing source-segregated household food waste to biological treatment facilities such as the proposed development.

4.97 The introduction of the Commercial and Household Food Waste Regulations combined with the Landfill Directive are increasing demand for biological treatment in order to facilitate the diversion of organic waste away from landfill and process the increasing volumes of source separated material in a sustainable manner. The need for the Inchera plant is therefore urgent in order to help meet the targets and objectives set out within these Regulations.

Proposed Household Waste Legislation


4.99 The proposed Regulations will impose an obligation on all Irish households to demonstrate that they manage their waste in compliance with legal requirements. In addition, the Regulations will also seek to address areas of customer service and importantly the pricing structure for municipal waste collection.

4.100 The existing practice of charging a flat rate fee or a pay per lift for waste collection services is not the best way to incentivise the segregation of waste by householders. In the case of organic bins the pay per lift approach encourages consumers to wait until their bin is full and the waste within it is well compacted before having the bin collected. This results in much of the resource value of the material being diminished by the time it is collected.

4.101 In order to address this, the DECLG will set the minimum rate per kilo for all 3 bins (organic (brown bin), dry recyclables and residual) and refuse...
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Collectors will be allowed to set individual standing charges in addition to the minimum charge. A lower charge per kilogramme will be applied to organic bins, with a higher rate applied to residual bins in order to incentivise use of the brown bin.

4.102 The introduction of a mandatory pricing structure for waste collection will provide a clear financial incentive to the householder to prevent and recycle waste. This will encourage increased usage and a more frequent collection of organic material.

4.103 Domestic Refuse Collectors must have in place by July 1st 2016:

- A regulated means of weighing all household waste (to facilitate charging per Kilo); and
- Should provide households with notified weights along with their bills of all waste collected, to encourage proper separation of their waste prior to introduction of Pay by Weight charges on July 1st 2016.

4.104 Pay-by-weight charging will become mandatory in July 2016 and is expected to lead to increased tonnages of source separated organic waste presented for collection. Other elements of the regulations will be mandatory from 1st July 2015.

4.105 Waste collectors will not be permitted to collect household waste after July 1st 2015 unless all household bins are weighed in accordance with the regulations.

4.106 As part of the strengthening of regulations in the waste industry a new 1 strike / 3 strike system will be introduced from this date to ensure compliance with waste collection permit conditions.

4.107 A breach of a specified offence within a permit by a waste collector will be deemed as a breach of a 1 strike offence and the permit will immediately be put under review. For less serious conditions 3 strikes will be required before entering review.

4.108 Failure to implement the mandatory pay by weight charging system with a minimum per kilogramme charge that should cover the cost of bulking,
processing, transfer and treatment of the waste across all waste streams will be considered as a 1 strike offence. Any collector who is found to have not implemented this change will be subject to an automatic permit review with the possibility that the authorisation to collect household waste will be removed or the entire permit will be revoked for non-compliance.

4.109 The introduction and enforcement of the new charging structure for household waste collection will incentivise the householder to source segregate waste more efficiently which will lead to an increase in the volumes of organic waste collected that will require treatment in plants such as the proposed Inchera facility.

4.110 Currently, waste collectors can charge an additional charge for provision of a brown bin to a customer and that results in many customers opting out of the brown bin service. Under the new regulations, waste collectors will be prohibited from charging a higher service charge to households that avail of a brown bin service, so households will be incentivised to take brown bins and will inevitably use them as the per kilo charge will be lower than that allowed for the residual (black) bin. We expect that this will result in a significant increase in the presentation and collection of food waste.
REGIONAL WASTE MANAGEMENT POLICY


4.111 The Plan emphasises the importance of regionalisation of waste management planning, and cooperation between neighbouring local authorities for the good of the environment and for economies of scale.

4.112 It proposes a dramatic reduction in reliance on landfill in favour of an integrated waste management approach, utilising a range of treatment options to deliver ambitious recycling and recovery targets. It recognises that there will be an increased participation by the private sector in the provision of waste management services.

4.113 The Plan supports the provision of biological treatment in the region. It provides for a facility to process 60,000 – 65,000 tonnes per annum of separated wet organic fraction and states that the plant should incorporate the flexibility to process a further 35,000 tonnes per annum of separately collected biowaste. The proposed facility should be modular in design to allow for a future 50% increase in capacity.


4.114 As part of the Waste Directive Regulations 2011 all local authorities were required to evaluate existing waste management plans by 31 December 2012. The evaluation of the waste management plan for Cork County considered that the following actions need to be taken in order to meet the requirements of the Landfill Directive:

- Accelerate the implementation of the National Strategy on Biodegradable Waste and in particular the roll-out of the ‘brown bin’ source-segregated collection systems for organic waste for households in order to drive the diversion of biodegradable municipal waste from landfill.
- Support the development of adequate infrastructure to treat organic waste and green waste and support the development of outlets for products arising from the treatment of such waste.
- Support the development of end markets for compost and digestate.
• Continue to enforce the Waste Management (Food Waste) Regulations SI 508 of 2009 and the Household Food Waste Collection Regulations.

4.115 This evaluation highlights the urgent need for additional biological treatment capacity that the proposed development at Inchera would provide.

**Draft Southern Region Waste Management Plan (SRWMP) 2014**

4.116 In the Policy statement *A Resource Opportunity- Waste Management Policy in Ireland* issued in July 2012, the Minister for the Environment indicated that:- ‘local authorities undertaking their waste management planning responsibilities, guided by the programme of reform of local government structures which is currently underway, will significantly reduce the number of regional formations, (currently 10) to no more than 3’.

4.117 The impetus behind the Rationalisation of regions is that it allows for greater concentration of resources whilst also considering geographical differences.

4.118 The new regions comprise the Eastern and Midlands Region, the Southern Region and the Connaught and Ulster Region and each is required to make a new Waste Management Plan.

4.119 The Southern Region includes the administrative areas of the following local authorities – Carlow County Council, Clare County Council, Cork City Council, Cork County Council, Kerry County Council, Kilkenny County Council, Limerick City & County Council, Tipperary County Council, Waterford City & County Council and Wexford County Council.

4.120 The County and City Management Association (CCMA) invited Local Authorities in the Southern Region to express an interest in becoming Lead Authority for the region and following a selection process the Limerick and Tipperary Authorities were selected.

4.121 The draft SRWMP was published in November 2014 for public consultation and the closing date for receipt of comments was the 30th January 2015.
4.122 The strategy of moving towards a recycling and recovery society is emphasised in the draft SRWMP. Managing waste in a sustainable and self-sufficient manner is considered to be one of the key challenges for the Southern Region.

4.123 The draft SRWMP recognises that the need for biological treatment in the region and nationally has grown during the period of the existing Plan. Given the requirement to divert increasing quantities of biowaste from the residual waste stream, a shortage of capacity would be of concern to the region. The ability to capture energy from biological treatment facilities is considered advantageous in supporting sustainability. The draft Plan asserts that technologies such as anaerobic digestion configured to treat agricultural and other organic wastes are preferable.

4.124 The proposed Plant will promote the objectives of both the existing CWMP and the draft SRWMP. This facility will be an essential part of an effective waste management infrastructure, which the Plans regard as central to sustainable development. The plant will be flexible in its design and will significantly reduce the volume of waste going to landfill. Energy will be recovered from the process thus moving the management of waste up the Waste Hierarchy.

4.125 Section 16.4.6 of the draft SRWMP promotes AD technologies as follows:

‘The ability to capture energy from biological treatment facilities will certainly support the sustainability and viability of a facility. Technologies which are configured to treat biowaste, agricultural waste and other organic wastes are preferable. Anaerobic digestion has long been identified as a suitable solution for treating this type of feedstock but the market has not developed as expected. While there is potential for investment and growth, the existing price configuration in the energy market, in particular the price return for energy generated from biomass facilities, is not adequately incentivising compared to the development of such facilities in Northern Ireland. There needs to be greater recognition from energy policy of the contribution made by waste facilities in the renewable energy sector and Ireland’s achievement of mandatory targets.’
4.126 Policy E17 of the Draft SRWMP issued in November 2014 stated the following:

‘The waste plan supports the development in the region of up to 40,000 tonnes of additional biological treatment capacity for the treatment of bio-wastes (food waste and green wastes) primarily from the region to ensure there is adequate active and competitive treatment in the market. The development of such treatment facilities needs to comply with the relevant siting criteria in the plan.’

4.127 Various stakeholders expressed concern during the public consultation period for the draft Waste Plan that this policy could restrict or limit the development of much needed new biological treatment infrastructure in the region to 40,000 t/a. The Regional Co-ordinators and authors of the draft Plans stated that the wording of Policy E17 was not intended to restrict or limit the development of biological treatment capacity. To clarify this the proposed Policy E17 has been re-drafted and will appear in the final version of the SRWMP as follows:

‘The waste plan supports the development at least 40,000 tonnes of additional capacity in the Region for the treatment of bio-wastes (food waste and green waste) primarily from the region to ensure there is adequate active and competitive treatment in the market. The development of such treatment facilities needs to comply with the relevant siting criteria in the plan.’

This revised wording ‘up to’ is replaced by ‘at least’ to ensure that the estimated figure of 40,000 tonnes should not be viewed as a capacity restriction.

**Likely Future Quantities of Organic (Food) Waste**

4.128 The AD plant has been designed to process a range of organic materials, but the principle feedstock is intended to be municipal (both household and commercial) organic\(^6\) waste for both commercial and environmental reasons.

4.129 The quantity of municipal food waste separately collected in brown bins is increasing and will continue to rise in response to the regulations and plans detailed above. A Statement of Regulatory Impact Analysis (RIA) was prepared by Indecon in 2011 in advance of the introduction of the Household

\(^6\) Primarily food waste, but some garden waste is expected.
Food Waste and Bio-Waste Regulations (2013). The RIA expects the following:

- A total of 1,119,178 houses in Ireland to be obligated to have a brown bin for food waste by 2017;
- An effective presentation rate (participation x presentation) of the brown bin is expected to be 80% by 2018 in obligated areas; and
- An effective weight per household of 259kg per annum is expected.

This would result in a total kerbside household food waste arising of 231,893 tonnes per annum in Ireland by 2018\(^7\). The EPA National Waste Report indicates that 80,046 tonnes of household brown bin waste was collected at kerbside in 2012, so an increase of 151,847 tonnes is expected nationally.

4.130 The draft SRWMP states in Section 6.2 that “the total number of permanent private households in the Region is 558,405 which equates to 34% of all households nationally (CSO Census 2011)”. The equivalent figure in the Eastern-Midlands Region was reported as 793,402 households and in the Connaught-Ulster Region, this was 303,141 households.

4.131 The rural / urban split in population was reported to be 49.5% / 50.5% in the Southern Region. The equivalent figure in the Eastern-Midlands Region was reported as 19% / 81% and in the Connaught-Ulster Region, this was 66% / 34%.

4.132 Using the household numbers for each region and the rural / urban split, it is calculated that the Southern Region will have an estimated 29.17% of the 231,893 tonnes of household food waste expected to be collected at kerbside after the full implementation of the Household Food Waste regulations and the new regulations on waste collection. This equates to 67,645 tonnes of household food waste per annum expected to be collected at kerbside in the Southern Region from 2017 onwards.

\(^7\) based on obligated houses x effective presentation rate x effective weight per household.
4.133 Allowing for 1% growth per annum from 2011 to 2017, this figure should rise to 71,806 tonnes per annum and continue to increase thereafter. The number of households in the Region increased by 12% from 2006 to 2011, so using a figure of 1% increase per annum is considered to be conservative.

4.134 The 2012 EPA National Waste Report reported that just 15,045 tonnes of food waste was collected at kerbside in the Southern Region that year, so an additional 56,761 tonnes per annum is forecast in the region by 2017.

4.135 The draft SRWMP indicates that an estimated 390,403 tonnes per annum of commercial waste is currently produced in the Southern Region. The EPA estimates that 27.5% of commercial waste is comprised of organic (food and garden) waste. It is therefore estimated that 107,361 tonnes of food waste is generated in the Southern Region.

4.136 The capture rate for commercial food waste nationally is currently quite low at c.15%, based on the 2012 EPA figures and the waste characterisation mentioned above. This equates to 16,104 tonnes per annum of commercial food waste. It is reasonable to assume that this capture rate will be significantly improved with increased awareness and enforcement of the Food Waste Regulations (2009). An increase from 15% to 50% capture rate in the Southern Region would result in an additional capture of an estimated 37,576 tonnes per annum of commercial food waste.

4.137 Combining the potential increase in household food waste and commercial food waste, detailed above, an additional 94,337 tonnes per annum of food/organic waste will arise in the Southern Region by 2017. The proposed plant at Little Island is therefore appropriately sized to meet future demand.

4.138 This figure will continue to grow into the future and the draft SRWMP forecasts a growth in household waste arisings between 2017 and 2021 ranging from c.2.7% to c.11.6% in different prediction scenarios, and an 11.4% growth in commercial waste arisings between 2017 and 2021.
4.139 In reality, it is unlikely that the proposed facility will capture all of this additional feedstock, so other organic waste streams will be sourced to make up any shortfall. These feedstocks are likely to be sourced from industrial and agricultural operations and there is a wide scope of such activities in the vicinity of the plant and the wider Southern Region.

4.140 The draft SRWMP indicates that c.155,000 tonnes of industrial and sewage sludges are generated per annum in the Southern Region\textsuperscript{10}. The draft Plan also reports that an estimated 1.6 million tonnes per annum of natural agricultural waste is produced in the Region\textsuperscript{11}. These figures are projected to grow into the future.

4.141 On the basis of the above it is envisaged that the proposed plant will process in the order of 60,000 to 75,000 tonnes per annum of organic waste from domestic and commercial sources, with the balance of 15,000 to 30,000 tonnes per annum sourced from the industrial and agricultural sectors in an approximate 75:25 split.

4.142 If the domestic and commercial organic waste is not transferred from the residual waste stream to the brown bins at source as projected in accordance with legislative requirements and enforcement measures, the organic material will instead arrive at the proposed plant in the form of organic fines derived from the processing of the residual waste stream at mechanical waste treatment facilities. The plant has been designed with the flexibility to process organic fines separately from source separated organics, and it is well located in easy reach of several waste processing plants in the Cork area.

\textsuperscript{10} Table 7-1.
\textsuperscript{11} Table 7-3.
GUIDANCE FROM OTHER RELEVANT BODIES

4.143 In addition to European, national and regional policy documents, the proposed development has also been considered in light of relevant guidance issued by other bodies including the Environmental Protection Agency (EPA) and Forfás.

Municipal Solid Waste – Pre-treatment & Residuals Management (EPA, 2009)

4.144 This technical guidance document was published by the EPA in June 2009, the purpose of this document is to establish the minimum pre-treatment requirement for waste disposed to landfill or destined to incineration.

4.145 The guidance requires operators of landfill and incineration facilities to demonstrate, via their waste acceptance policy, that waste accepted at these facilities has been subjected to appropriate pre-treatment. Landfill operators (of facilities operational in and since July 2001) must demonstrate from 16th July 2009 that all waste delivered to the site for disposal has been adequately pre-treated.

4.146 The minimum pre-treatment for landfill is a 2-bin system. A ‘brown bin’ is also expected in urban areas. Pre-treated organic waste must meet a stability standard to be considered recovered.

4.147 The Pre-treatment document proposes restrictions on the deposition of BMW in landfill to meet the requirements of the Landfill Directive.

4.148 Following publication of the Pre-treatment Document the EPA initiated a review of waste licences of operational landfills to adjust conditions therein in respect of waste acceptance criteria. New conditions came into force in July 2010 restricting the quantity of biodegradable household and commercial waste that can be accepted by landfill operators and these figures are regularly reviewed and revised based on the latest available waste data.

4.149 A key conclusion of the EPA’s document is that more needs to be done to ensure that less waste is sent directly to landfill through making greater use of other waste treatment facilities. The concluding comments to the document
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state ‘Ireland will not meet its National Strategy on Biodegradable Waste and EU obligations in relation to pre-treatment of municipal solid waste prior to landfilling or incineration if action is not taken to provide the waste source-separation and treatment infrastructure necessary. Accordingly, any new landfill or incinerator proposal will have to be planned in the context of the availability of appropriate waste pre-treatment facilities (including diversion infrastructure).

Forfás Waste Management in Ireland (2010)

4.150 The report presents the findings of an updated waste management benchmarking assessment and highlights that Irish enterprises have more limited waste management infrastructure options than international competitors. It asserts that a key reason for the traditional high use of landfill in Ireland relates to the lack of suitable alternative waste solutions through our failure to progress the building of required waste infrastructure as evidenced by the limited biological treatment facilities.

4.151 It sets out the policy actions that need to be prioritised to ensure that Ireland meets the waste management needs of enterprise now and in the future which includes the need for the delivery of a range of infrastructure along the waste hierarchy to include biological treatment capacity (composting and anaerobic digestion).

Towards a Resource Efficient Ireland (EPA, 2014)

4.152 The overarching objective of this report is to implement EU and national policy on resource efficiency and to break the link between economic growth and environmental impact.

4.153 It is recognised that significant savings can be made across the economy and society if people use water, energy and raw materials in a better way – through efficient production processes and less wasteful consumption. The core message of this sustainability strategy is ‘if we want our society to be competitive and sustainable we need to live better while using less’.
The EPA sets out the priorities for Ireland to move away from a ‘take-make-use-dispose’ economic model to an economy and society where:

- We consume less and more efficiently;
- Our natural resources and raw materials are sustainably managed;
- Products are kept in use for longer;
- End-of-life goods are up-cycled & re-used; and
- Wastes are recovered for use as raw materials.

Actions which Ireland needs to follow include:

- Reduce wasteful consumption of material, water and energy resources by changing behaviours in businesses, households and the public sector;
- Enhance competitiveness and reduce costs by stimulating resource efficiency;
- Support employment in the green economy;
- Publish data on consumption and waste generation to track the sustainability of our society.
- Work effectively with other State bodies such as Enterprise Ireland, IDA, SEAI, Bord Bia, HSE, to deliver on national resource efficiency targets.

The proposed Plant at Inchera will assist in realising the priorities and actions of Towards a Resource Efficient Ireland.


The EPA National Waste Report for 2012 indicates that Ireland is on track to meet the 2013 and 2016 Landfill Directive target but in order to ensure compliance with future EU targets (particularly as the economy recovers), efforts in waste prevention, diversion to recovery and the development of necessary supporting infrastructure must continue.

Since a peak in 2007 there has been an overall decline of 21% in municipal waste generation in Ireland. Although the population has increased since 2007, the recession and a decrease in personal consumption have impacted on household waste generation, which is a key contributing factor to the overall.
decrease of municipal waste generation. In 2012, 41% of municipal waste in Ireland was landfilled and 59% was recovered (including 17% incineration).

4.159 The report considers that source separated collections of biodegradable waste in themselves will not ensure that Ireland meets the diversion targets set out in the EU Landfill Directive. It asserts that the residual bin from a three-bin household collection service can contain up to 47% biodegradables (by weight) and the treatment of this biodegradable component of the residual waste is therefore essential.
4.160 Ireland is facing significant challenges in meeting its EU future emissions targets for greenhouse gases under the EU Climate and Energy package for 2020 and anticipated longer term targets up to 2050. Effective action by all economic sectors is required for the transition to a low emissions economy.

4.161 The Government’s renewable energy strategy is set firmly in the global and European context. All objectives accord with the policy ambitions for renewable energy set by the EU. These are grounded in the economic, environmental and supply security imperatives to decarbonise energy systems and diversify energy sources.

National Climate Change Strategy 2007-2012

4.162 Under the Kyoto Protocol Ireland agreed to a target of limiting its GHG emissions to 13% above 1990 levels by the first commitment period 2008-2012 as part of its contribution to the overall EU target. Ireland ratified the Kyoto Protocol on the 31 May 2002, and was internationally legally bound to meet the challenging GHG emissions reduction target.

4.163 The first National Climate Change Strategy (NCCS) published in 2000, was reviewed in 2006 resulting in the publication of the NCCS 2007-2012 which provided details on how Ireland would meet its Kyoto 2008-2012 commitment. The Strategy (pg. 20) states that: ‘electricity generation from renewable sources provides the most effective way of reducing the contribution of power generation to Ireland’s greenhouse gas emissions’. The NCCS provided a framework for action to reduce Ireland’s GHG emissions.

4.164 The Government’s ambition for CHP within this Strategy is supported by a target to achieve an installed capacity of 400MW by 2010 and 800MW by 2020 within the Industrial, Commercial and Services sectors. The installed capacity of CHP in Ireland at the end of 2013 was 334MW of which 308MW was operational\(^2\).

\(^2\) SEAI, Combined Heat and Power in Ireland (2014 Update)
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4.165 Ireland met its target under the Kyoto Protocol but this was primarily due to the allowance for forest sinks, the purchase of carbon credits by the National Treasury Management Agency (NTMA) coupled with the operation of the Emissions Trading Scheme (ETS).

Post 2012 Agenda

4.166 A second, and different, set of legally binding targets applies under the EU Commission’s ‘Energy and Climate Package’ which was agreed by the European Parliament and Council in December 2008 and became law in June 2009.

4.167 Under this package Ireland’s target is to reduce greenhouse gas emissions from transport, agriculture, residential, waste and non-energy intensive industry by 20 per cent by 2020 (relative to 2005 levels). In addition, Ireland also has annual binding annual targets over the period 2013-2020 to ensure a gradual move towards agreed 2020 targets.

4.168 EPA projections show that:
   • Under the best case scenario, greenhouse gas emissions will remain relatively static up to 2020;
   • As a result, emissions in 2020 will be 5-12% below 2005 levels and will not meet the 20% reduction target.

4.169 The EPA concludes that achieving the significant emission reductions that will underpin a competitive, low-carbon, climate-resilient and environmentally sustainable economy poses significant challenges for Ireland.

4.170 The agricultural sector and burning of fossil fuels to generate electricity are two of the primary contributors of GHG emissions in Ireland.

4.171 The proposed plant at Inchera will assist Ireland in achieving emission reductions in the following ways:

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Organic materials are processed in a totally enclosed system which prevents the uncontrolled release of methane, nitrous oxide and other gases which can occur when organic waste degrades in landfill;

Methane will be captured and converted in combined heat and power engines to produce renewable electricity, thereby replacing fossil fuels; and

The digestate can be used to replace inorganic fertiliser, the manufacturing of which results in considerable emissions of GHGs.


4.172 The Government’s Energy White Paper 2007: Delivering a Sustainable Energy Future for Ireland defines a national target for the contribution of renewable energy to gross electricity consumption at 15% by 2010 rising to 33% by 2020. In addition to setting these targets, the White Paper describes the actions for the energy policy framework out to 2020 to support economic growth and meet the needs of all consumers.

4.173 The Paper sets a clear path for meeting the Government’s goals of ensuring safe and secure energy supplies, promoting a sustainable energy future, and supporting competitiveness.

4.174 The 2020 target for renewable energy set out in the Energy White Paper has more recently been increased to 40% as part of the new strategy by Government to make the ‘green economy’ a core component of its recovery plan.

4.175 The proposed Inchera Plant will contribute toward achieving this National renewable energy target.

Energy Policy Review

4.176 The energy policy green paper was launched in May 2014 and lays the foundations for a new strategic policy for the sector. It focuses on six priority themes including empowering citizens, markets, regulation and prices, delivering infrastructure, sustainability, and driving economic opportunity.
Security of supply is at the centre of Ireland’s energy policy discourse and the green paper includes references to modelled scenarios showing that Ireland’s total primary energy requirement (TPER) is set to increase in the coming years following a sharp decline since the economic crash in 2007. The green paper asks directly how Ireland can reduce its dependency on imported oil and gas.

Sustainability is noted as another major pillar of energy policy, including the need to ensure that the overall contribution from renewables is maximised. The green paper has noted that there are major challenges remaining in achieving greater cost-effectiveness in investing in renewables and sustainable technologies.

The green paper wants to re-envision the energy sector from its traditional role as a facilitator of job creation elsewhere, to a world-beating sector which, through technology and innovation, can drive the economy and grow jobs itself.

The review will lead to a new White Paper on Energy to be published later in 2015, which will in turn inform Ireland’s input into the European Union’s forthcoming 2030 framework for climate and energy policies and the United Nations COP21 conference on climate change.

National Renewable Energy Action Plan (NREAP)

The Renewable Energy Directive established the basis for MSs achieving a target of 20% of energy consumption being from renewable sources. One of the obligations contained in the Directive was that each MS was to adopt and submit to the European Commission an action plan setting out national renewable energy targets and how those targets would be achieved. Ireland’s NREAP was submitted to the Commission in July 2010.

Ireland’s individual target as set by the Directive is 16% of its electricity generation to be from renewable sources by 2020. The NREAP sets out a clear and ambitious plan for Ireland’s renewable energy sector.

In energy planning terms, 2020 is rapidly approaching. In order to achieve the 16% electricity generation target a range of technologies will need to be in place.
provides a consistent, reliable source of renewable electricity and can therefore play a pivotal role in helping Ireland meet this target.

Strategy for Renewable Energy 2012-2020

4.184 The Government’s overriding energy policy objective is to ensure competitive, secure and sustainable energy for the economy and for society. This energy imperative is determined to be fundamental to economic recovery and wellbeing. The strategy (pg.1) states that ‘the development of renewable energy is central to overall energy policy in Ireland. Renewable energy reduces dependence on fossil fuels, improves security of supply, and reduces greenhouse gas emissions creating environmental benefits while delivering green jobs to the economy, thus contributing to national competitiveness and the jobs and growth agenda’.

4.185 The strategy sets out five strategic goals for renewable energy which underpin the Government’s energy and economic policy. Of direct relevance to the proposed plant at Inchera is Strategic Goal 2 which advocates ‘a sustainable Bioenergy sector supporting renewable heat and power generation’.

4.186 In this regard the strategy recognises the importance of the REFIT 3 scheme which is designed to support for the first time a range of technologies including AD and CHP. The scheme aims to incentivise the addition of 310MW of renewable electricity biomass capacity to the Irish grid, with a total of 200MW of this being reserved for high efficiency CHP technologies using AD and solid biomass.

4.187 The strategy acknowledges that the generation of electricity generation from bioenergy offers the additional advantage of being available on demand and is not an intermittent source of energy.

Draft Bioenergy Plan, (DCENR, 2014)

4.188 The Draft Bioenergy Plan was published in October 2014. It sets out a vision of Ireland’s bioenergy resources contributing to economic development and sustainable growth, generating jobs for citizens, supported by coherent policy, planning and regulation, and managed in an integrated manner.
Three high level goals, of equal importance, based on the concept of sustainable development have been identified:

- To harness the market opportunities presented by bioenergy in order to achieve economic development, growth and jobs;
- To increase awareness of the value, opportunities and societal benefits of developing bioenergy;
- To ensure that bioenergy developments do not adversely impact the environment and its living and non-living resources.

The Plan consists of two sections. Section 1 sets out the broader context for the development of Ireland’s bioenergy sector. Section 2 identifies the next steps that must be taken to support the sustainable realisation of the economic potential of Ireland’s bioenergy resources.

On the demand side, the Government plans to introduce an Exchequer-funded renewable heat incentive in 2016. The scheme will focus on large commercial and industrial installations which fall outside the emissions trading system, such as the proposed Renewable Bioenergy Plant at Inchera.

Existing support mechanisms such as REFIT 3 will continue to reward biomass-based electricity generation including CHP and AD.

Following public consultation, the finalised Bioenergy Plan will provide a clear framework for the sustainable development of Ireland’s bioenergy resources and the delivery of real economic benefits to Ireland.

Climate Action and Low Carbon Development Bill 2015

The Climate Action and Low Carbon Development Bill 2015 provides the legal framework for establishing sustainable environment policy focusing on lowered carbon emission levels on a national level in the period up to and including the year 2050.

The Bill sets out that the manner in which the transition towards a low carbon economy will be achieved will be through a National Mitigation Plan (to lower Ireland’s level of greenhouse emissions) and a National Adaptation
Framework (to provide for responses to changes caused by climate change). These two plans will be renewed every five years, and will also be required to include tailored sectoral plans.

4.196 While there are no explicit targets set out, the legislation obliges the State to ‘take into account any existing obligation of the State under the law of the European Union or any international agreement’.

4.197 In order to achieve a low carbon economy, the use of fossil fuels will need to be substantially reduced if not eliminated. The Government’s official policy direction will be announced in its White Paper on Energy, to be published later in 2015.

4.198 The proposed Plant at Inchera will convert organic waste into renewable energy (electricity and heat) thereby assisting in reducing fossil fuel consumption.
CONFORMANCE OF PROPOSED PLANT

4.199 Anaerobic digestion is a proven, efficient and environmentally sustainable technology that will deliver multiple benefits. The proposed Inchera Renewable Bioenergy Plant will help Ireland meet a number of important EU commitments, as well as contributing towards achieving national waste management, renewable energy and climate change targets as described throughout this Chapter of the EIS.

4.200 The proposed Plant accords with the Waste Hierarchy as it seeks to maximise the recycling and recovery of biodegradable waste through the production of renewable electricity and heat and a stabilised digestate, which may be used as an alternative to chemical fertilisers.

4.201 The proposed Plant will be capable of processing both source separated organic waste and organic fines as well as industrial and agricultural biodegradable waste. Treatment of these feedstocks will contribute to Ireland’s efforts to reduce GHG emissions, efforts to generate more renewable energy, as well as efforts to reduce the quantities of biodegradable municipal waste deposited in landfills.

4.202 The proximity of the subject site to Cork City and to the strategic road network makes it an ideal location to serve the entire Southern Region.

4.203 The primary purpose of the plant will be to generate renewable energy. It will be capable of processing a range of organic wastes including food waste, industrial waste, agricultural wastes and organic fines derived from mixed municipal waste. The mix of feedstock to the plant will depend on the availability of each of these waste types. Food waste will be the primary target, but if there is insufficient food waste available as feedstock, other organic wastes will be sourced within the region.

4.204 The location of the facility is well suited to source industrial and agricultural organic wastes from the Southern Region.

4.205 The location of the facility, within easy reach of waste facilities such as Starrus Eco Holdings Ltd. (Greenstar) in Sarsfield Court, Glanmire, Country Clean
Recycling Ltd in Churchfield Industrial Estate at John F. Connolly Road, Waste Recovery Services Ltd. in Fermoy and Wiser Recycling Ltd. in Middleton ensures that food waste and organic fines (if required) can be sourced locally to feed the plant.

4.206 The proposal will effect a reduction not only in the total amount of waste sent to landfill, but will also reduce the percentage of landfilled waste that is biodegradable. It will therefore promote the objectives of the EU Directive on the landfill of waste and will assist in achieving the target of diverting 65% of the total amount (by weight) of BMW produced in 1995 away from landfill by 2016.

4.207 It will contribute toward recycling by providing additional capacity to treat growing volumes of domestic and commercial source separated waste due to the implementation of the Food Waste Regulations (2009) and the Household Food Waste and Bio-Waste Regulations (2013).

4.208 The plant will be a net generator of energy to the national grid. It will generate renewable energy from organic material by means of anaerobic digestion thereby displacing the need to use fossil fuels for the generation of electricity. In this way it will assist Ireland in the transition to a low carbon economy.

4.209 The facility will have a net electrical export of up to 21,202 MWh/annum. This will serve to enhance security of supply as a locally produced energy resource that provides an alternative to fossil fuels, contributing to the diversification of fuels and reducing the need to import energy products. Furthermore, by displacing the proportion of energy generated by fossil fuel power plants, the facility will help to reduce GHGs.

4.210 The development will form part of the investment in strategic infrastructure required to treat biodegradable waste and will form part of an integrated network of facilities in the Southern region, delivering much needed additional biological treatment capacity.
Chapter 5

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Figure 5-1 Location of Shortlisted Sites
INTRODUCTION

5.1 This chapter outlines the site selection process and the main alternative design layouts and technologies considered for the proposed Renewable Bioenergy Plant at Inchera, Little Island, Co. Cork.

5.2 The avoidance of significant environmental effects through the consideration of alternatives is a fundamental principle of Environmental Impact Assessment (EIA). Schedule 6 of the Planning and Development Regulations (2001) specify that the EIS should include ‘An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice, taking into account the effects on the environment’.

SITE SELECTION

5.3 The site for the proposed Renewable Bioenergy Plant covers approximately 2 ha (c.5 acres) and is zoned as ‘Existing Built Up Area’. It is a previously developed site located adjacent to Hoffman Business Park and BASF Ireland at the western end of Little Island.

5.4 The application area is situated circa 6kms east of Cork City. Access to the subject site is provided from the R623 Regional Road. The site is near to the northern entrance to the Jack Lynch Tunnel (N40 – South Ring Road) and the Dunkettle Interchange which forms the junction between the N25 Cork-Waterford (east) National Primary Route and the M8 Cork-Dublin (north) Motorway.

5.5 A detailed site selection process was undertaken, the main details of which are provided below. In choosing this site cognisance has been paid to the relevant guidelines on siting of such plants.

Siting Guidelines

5.6 With the exception of the Environmental Protection Agency (EPA) Manual on Landfill Site Selection, Draft for Consultation (2006), no formal siting guidelines for waste facilities have been issued by either the EPA or The Department of the Environment, Community and Local Government (DECLG).
CONSIDERATION OF ALTERNATIVES 5

5.7 The recently published draft Southern Region Waste Management Plan (SRWMP) includes overarching siting criteria for locating waste management facilities. Further details are provided in sections 5.23-5.25 below.

5.8 Consideration of the requirements for the siting of biological treatment facilities as contained within the following documents was included in the site selection process:

- Draft EU Council Directive on the Biological Treatment of Biowaste (Annex V);
- Animal By-products Regulations (1774/2002/EC), (now replaced by 1069/2009/EC);
- The Prohibition on the Use of Swill Order, 2001 (S.I. 597 of 2001); and


5.9 This Working Document was issued as a result of work on a dedicated legislative proposal on biowaste. The EU Commission has since indicated that a separate Biowaste Directive is not considered necessary as there are no gaps in policy which would prevent a Member State taking appropriate action to deal with its biowaste. The recommendation has been to strengthen existing legislation and conform to more stringent enforcement of the Waste Framework Directive.

5.10 Nonetheless, recommendations outlined in Annex V of the Second Draft Working Document on the Biological Treatment of Biowaste with regard to siting of biological treatment facilities were helpful in selecting a suitable site and were included in the site selection process.

5.11 The general requirements set out in Annex V are as follows:

- The distance from the boundary of the site to residential and recreation areas, waterways, water bodies and other agricultural and urban sites;
- The existence of surface water, groundwater, coastal water or nature protection zones in the area;
CONSIDERATION OF ALTERNATIVES

- The protection of the nature or cultural patrimony area;
- Appropriate measures shall be taken, to collect any contaminated water from the site that, if released into surface water, shall be suitably treated to comply with the relevant requirements of Directive 91/271/EEC;
- Measures shall be taken to control odour emissions from biological treatment plants located near dwellings; and
- Measures shall be taken to minimise nuisances and hazards arising from the treatment plant through:
  - Emissions of dust,
  - Wind-blown materials,
  - Noise and traffic, and
  - Birds, vermin and insects.

5.12 The nearest residence to the proposed site is located over 600m from the centre of the site. There are no known recorded archaeological, architectural or other cultural sites within the application area. There will be no discharge of process effluent directly to surface water or groundwater. A number of mitigation measures have been incorporated into the design of the plant including engineered drainage systems, a three stage odour control system and acoustic containment of the combined heat and power (CHP) engines. In addition, the proposed Plant at Inchera will operate under licence from the Environmental Protection Agency.

Animal By-Product Regulations

5.13 Annex V of the Animal By-Product Regulations (ABPR) 1069/2009/EC makes reference to siting of biogas plants and states that 'if the biogas plant is located on or next to premises where farmed animals are kept and the biogas plant does not only use manure, milk or colostrum which accrues from those animals, the plant shall be located at a distance from the area where such animals are kept. That distance shall be determined in a manner which ensures that there is no unacceptable risk for the transmission of a disease communicable to humans or animals from the biogas plant. In all cases, there
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must be total physical separation between that biogas plant and the animals and their feed and bedding, with fencing where necessary.

5.14 The proposed site is located within an industrial area and the plant will not be located on or adjacent to lands where farmed animals are kept.

5.15 Siting guidelines set out in ABPR 1774/2002/EC (now superseded), were considered to be applicable to the site selection process and include the following:

- Site exclusionary factors:
  - European and National proposed, candidate and designated sites;
  - Areas of high amenity or high archaeological interest;
  - Proximity of waterways and water bodies; and
  - Proximity to residential, recreational areas and sensitive sites (schools, hospitals).
  - If development zoning exists an area zoned as industrial is preferable; particular regard to be had to traffic considerations; brownfield sites are preferable if available.

5.16 The application area is not subject to any statutory nature conservation designation and there are no protected archaeological or architectural heritage sites within the proposed development site.

5.17 The nearest residence is located over 600m north of the centre of the site and there are no recreational areas or sensitive sites within the application area.

5.18 This site is zoned ‘Existing Built Up Area’ in the Blarney Electoral Area Local Area Plan (LAP) 2011 and the immediately surrounding area is characterised by established industrial uses including BASF Ireland (a large chemical manufacturing company) and pharmaceutical companies including Cara Partners and Pfizer Ireland.

5.19 The subject site has excellent accessibility being located approximately 300m south of the N25 (Cork-Waterford) national primary route and circa 600m southeast of the Dunkettle Roundabout which provides direct access to the N8 (Cork-Dublin) and N40 (Jack Lynch Tunnel).
The Prohibition on the Use of Swill Order, 2001 (S.I. 597 of 2001) 

5.20 The Prohibition on the Use of Swill Order, 2001 (S.I. 597 of 2001) as amended by S.I. 12 of 2009 states that a person shall not collect, assemble, process, store, keep or otherwise have in his possession or under his control swill:
   a. For the purpose of feeding it to an animal;
   b. On any land or premises where an animal is fed, farmed, reared, bred or fattened or has access.

5.21 The definition of swill in Ireland includes:
   a. Any broken or waste foodstuff (including table or kitchen refuse, scraps or waste) whether or not such foodstuff contains, or has been in contact with, any carcase or part thereof.

5.22 The proposed Renewable Bioenergy Plant at Inchera will involve the processing of waste foodstuff, however, the plant is not located on or adjacent to a farm.

Draft Southern Region Waste Management Plan 

5.23 The draft SRWMP was published in November 2015. Chapter 16 of the Plan sets out overarching siting criteria for locating waste management facilities to assist project developers. While the site selection process was complete at the time of publishing, an analysis of the proposed site against the criteria set out was undertaken and the results are presented in Table 5-1.

5.24 The Plan states that in general the location of waste facilities should consider the following criteria:
   - Avoidance of areas protected for landscape and visual amenity, geology, heritage or cultural value, Natura 2000 sites, Natural Heritage Areas (NHAs/pNHAs), Statutory Nature Reserves and Refuges for Fauna and Annex I habitats;
   - Undertake Appropriate Assessment (AA) screening and where a project is likely to have a significant impact on a Natura 2000 site undertake full AA;
   - Undertake an Invasive Alien Species survey of the application site;
   - Avoid the loss or disruption of habitats;
CONSIDERATION OF ALTERNATIVES

- Maintain a distance of 10-15m from the banks of watercourses;
- Incorporate Sustainable Drainage Systems (SuDS) and develop site specific surface water drainage systems which meet the requirements of the Water Framework Directive and associated River Basin Management Plan;
- Avoid development of infrastructure in areas at risk of flooding;
- To mitigate against flood risk, ensure a riparian buffer zone is created between all watercourses and any development for a minimum of 15m.
- Avoid geologically unsuitable areas and areas susceptible to subsidence or landslides. Due consideration should be given to the primary water source of the area and the degree of surface water/groundwater interaction including tidal influences;
- Impacts from a transport perspective to be assessed including road access, network, safety and traffic patterns to and from the facility;
- Landfills and suitably zoned brownfield sites should be considered for waste activities; and
- Sites that offer opportunities to integrate differing aspects of waste processing will be preferred choices.

5.25 Each of the recommendations contained within the SRWMP are met at the proposed Inchera Renewable Bioenergy site.

Previously Consented Biogas Facility

5.26 In addition to the above guidelines, a review of a similar proposal for the development of an anaerobic digestion facility in County Limerick (Ref. PL13 .235518) provided the following details with regard to the siting of such facilities. An Bord Pleanala’s (ABP) Inspector’s Report refers to the suitability of location and notes that the site is located within a long established industrial area, accessed by a dedicated industrial route which leads directly from a National Route.

5.27 The Inspector concludes that the proposal conforms with policies in the development plan to promote industrial/business and employment opportunities within the county and is well positioned in relation to residential
CONSIDERATION OF ALTERNATIVES

development. With regard to the facilities proximity to a Seveso II (upper tier) site, ABP considered the proposal to be acceptable both in terms of land use and location. This conclusion was supported by the Health and Safety Authorities (HSAs) initial response to the planning application stage.

5.28 The application area at Inchera is located within an area of established industrial uses close to the national primary road network and it shares many of the favourable site selection characteristics of the proposal in County Limerick. Furthermore, the subject site is remote from residential properties with the nearest located in excess of 600m from the centre of the subject site. With regard to proximity to a Seveso II site, in this instance, BASF Ireland (upper tier) and Pfizer (lower tier), a report prepared by AWN Consulting which accompanies this application considers the proposal to be acceptable using the Health and Safety Authority’s criteria in terms of land use and location.

Selection of the Preferred Site

5.29 The identification and selection of a suitable site for a plant such as that proposed involves the interaction of many disciplines. It should be noted with regard to the consideration of alternatives, the Environmental Protection Agency’s (EPA) Guidelines on information to be contained in Environmental Impact Statements (2002), states ‘EIA is confined to the environmental effects which influence the consideration of alternatives. It is important to acknowledge that other non-environmental factors may have equal or overriding importance to the developer, e.g. project economics, land availability, engineering feasibility, planning considerations’. The initial stage of the selection process involved a desk based study to identify areas within the county which may be suitable to accommodate the proposed Plant.

5.30 Due to the scale and complexity of Cork, the County Development Plan (CDP), is focussed mainly at the strategic level setting out the framework for the County in terms of its population, economy, housing, transport, infrastructure, environment and community facilities etc. Local Area Plans (LAP) for each Electoral Area, and Special LAPs (SLAP) for the areas where the most rapid or far-reaching change is anticipated, set out the land use zoning objectives and other objectives relevant at a local level.
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5.31 Zoning is the primary land use planning consideration, so a review of the zoning objectives and maps for all the settlements in the County as set out in relevant LAP/SLAP was conducted.

5.32 It was apparent from the review process that those lands zoned within the ‘industry’ and ‘existing built up area’ categories were the most suitable zoning designations for the proposed development.

5.33 The ‘industry’ category is intended to focus on medium or larger scale development and includes waste management activities but excludes landfill or incineration.

5.34 Development proposals on lands zoned ‘existing built up area’ are not covered by a specific objective and are considered in relation to the objectives of the CDP, the character of the surrounding area and other planning and sustainable development considerations. It was considered that these areas offered the greatest potential to source redevelopment sites.

5.35 The Bottlehill Landfill site was included for consideration in the first stage of the site selection process. As described in section 5.67-5.84 below, ‘wet’ AD was selected as the preferred technology for the proposed plant based upon a number of criteria including process robustness, flexibility, gas yield, gas quality and digestate stability. Wet AD generates a process effluent that must be discharged from the facility to a wastewater treatment plant. The most efficient and economic way to achieve this is to connect the anaerobic digestion plant to an existing municipal foul sewer network. There is no foul sewer infrastructure available at Bottlehill. Process effluent arising from the proposed plant would thus have to be tankered off site by road for treatment which would generate additional vehicle movements. Furthermore, there was uncertainty regarding the capacity of local wastewater treatment plants to accept the daily volume of effluent that would be generated at the plant (up to 200m$^3$/day) meaning that the effluent could be tankered greater distances. This would be environmentally unsustainable and economically unviable for the proposed development. Bottlehill was thus screened out of site selection process.
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5.36 Twenty eight sites were selected from the chosen zoning categories and are identified here by the relevant LAPs, as follows:

- Blarney Electoral Area Local Area Plan 2011 x 3 Sites;
- Carrigaline Electoral Area Local Area Plan 2011 x 11 Sites;
- Kanturk Electoral Area Local Area Plan 2011 x 1 Site;
- Mallow Electoral Area Local Area Plan 2011 and Mallow Special Local Area Plan 2007 x 3 Sites; and
- Midleton Electoral Area Local Area Plan 2011 x 10 Sites.

5.37 In addition, disused and worked-out quarries and associated lands can often present sustainable redevelopment opportunities. There are many examples of resource-depleted quarries being successfully transformed to accommodate a variety of commercial and industrial uses.

5.38 A search of the Geological Survey of Ireland (GSI) National Quarry Database identified seven quarries as being potentially suitable for redevelopment. For commercial reasons the locations of these quarries are not identified here.

5.39 Site visits were conducted to each of the thirty five sites and at this stage of the process twenty seven sites were screened out of the selection process, for a variety of reasons including the following:

- Insufficient land availability;
- Proximity to residential receptors;
- Poor access arrangements;
- Landscape and visual sensitivities;
- Proximity to flood prone areas;
- Nature of adjacent industry; and
- Remoteness from municipal sewer connection.

5.40 The eight remaining sites are identified only by the area in which they are located and are not in any particular order (see Figure 5-1):

1. Ringaskiddy
2. Mallow
3. Midleton  
4. Carrigtwohill x 2  
5. Little Island x 2  
6. Dripsey

5.41 The eight sites were carried forward for a more detailed appraisal against a number of planning and environmental criteria as follows:

- Zoning allocation within the LAP;
- Distance from residential receptors, a minimum offset distance of 250m required;
- Access to national primary route;
- Distance from designated sites including Special Area of Conservation (SAC), Special Protection Area (SPA), Natural Heritage Area (NHA) or Ramsar site;
- Importance of landscape character type;
- Distance from cultural heritage sites;
- The presence of Groundwater Source Protection Zones; and
- Proximity to flood prone areas.

5.42 A weighting factor as detailed in Table 5-1 was applied to each of the aspects and shortlisted sites were assessed against each of the weighting criteria. The results of this process are presented in Table 5-2 below.
### CONSIDERATION OF ALTERNATIVES

#### Table 5-1 Site Selection Environmental Scoring Criteria

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<th>Aspect</th>
<th>Scoring Criteria</th>
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<td>Zoning</td>
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<td>Residential Receptors (m)</td>
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<td>National Primary Road (km)</td>
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<tr>
<td>Designated Sites (m)</td>
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<tr>
<td>Landscape Character Importance</td>
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<td>Cultural Heritage (m)</td>
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<tr>
<td>Groundwater Source Protection Zone (m)</td>
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<td>Flood Risk (m)</td>
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#### Table 5-2 Environmental Site Selection Matrix

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<th>Site Ref</th>
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<th>Zoning</th>
<th>Residential Receptors</th>
<th>National Primary Road</th>
<th>Designated Sites</th>
<th>Landscape Character Importance</th>
<th>Cultural Heritage</th>
<th>Groundwater Source Protection</th>
<th>Flood Zone</th>
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<td>5</td>
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<td>30</td>
</tr>
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<td>2</td>
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<td>4*</td>
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<td>31</td>
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<td>8</td>
<td>Dripsey</td>
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<td>0</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>21</td>
</tr>
</tbody>
</table>
5.43 The sites were ranked in order of environmental preference as follows:

1. Site 3 Midleton and Site 7 Little Island
2. Site 1 Ringaskiddy
3. Site 4 Carrigtwohill
4. Site 6 Little Island
5. Site 2 Mallow
6. Site 5 Carrigtwohill
7. Site 6 Dripsey

5.44 On completion of the assessment, a search was undertaken of Land Registry details to ascertain the owners of those sites ranked first and second. Whereas local authorities enjoy compulsory powers to acquire lands, private sector interests can only purchase lands through agreement with the landowner.

5.45 Contact was made with the relevant landholders. Following consultation with the landholders, Site No. 3 Midleton and Site No. 1 Ringaskiddy were eliminated from the site selection process as the subject lands were not available for lease or purchase. Successful negotiations proceeded with Tapella Limited for Site No. 7 at Little Island.

5.46 The site lies within a landholding of approximately 20ha much of which is occupied by Hoffmann Business Park. To the north and immediately south of the N25 there is an area of undeveloped land. This land is identified as susceptible to flooding within the Blarney Electoral Area Local Area Plan 2011. Furthermore, the Dunkettle Shore (pNHA) occupies a portion of these lands. For these reasons this part of the landholding was ruled out as being suitable for the proposed development.

5.47 The site selection process demonstrates that the Inchera site represents a suitable site satisfying a number of environmental criteria, namely:

- The application area has a favourable zoning designation and offers the opportunity to bring a previously developed industrial site back into productive use;
CONSIDERATION OF ALTERNATIVES

- The site is remote from residential properties with the nearest located in excess of 600m from the centre of the subject site;

- The subject site is located within close proximity of the N25 (Cork-Waterford), the N8 (Cork-Dublin) and the N40 (Jack Lynch Tunnel) which provide excellent accessibility to all areas of the Southern Waste Management Region which the proposed Plant is intended to serve;

- It is not subject to any statutory nature conservation designation;

- The site is located within the City Harbour and Estuary Landscape Area which is of national importance and is assigned a high value in terms of landscape character and sensitivity. However, given the site’s industrial context and the previous use of the site as an industrial facility, the proposed development will not result in a significant effect on this landscape character area;

- There are no known recorded archaeological, architectural or other cultural heritage sites within the application area;

- It is not located within an area identified as a Groundwater Source Protection Zone; and

- The site is not located within an area identified as susceptible to flooding.

5.48 Prior to the completion of the site selection process a review of the compatibility of the subject site with the Guidelines presented in section 5.6 to 5.25 above was undertaken and the results of the review are presented in Table 5-3 below.

5.49 The review clearly demonstrates that the proposed site is an appropriate site that satisfies the relevant siting criteria set out within each of the guidelines.
## Table 5-3 Compatibility of Selected Site with Applicable Guidelines

<table>
<thead>
<tr>
<th>Guidance on Siting</th>
<th>Siting Criteria</th>
<th>Does proposed facility meet criteria?</th>
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<tbody>
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<td>Draft Southern Region Waste Management Guidelines</td>
<td>Avoidance of areas protected for landscape and visual amenity, geology, heritage or cultural value, Natura 2000 sites, Natural Heritage Areas (NHAs/pNHAs), Statutory Nature Reserves and Refuges for Fauna and Annex I habitats.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Undertake Appropriate Assessment (AA) screening and where a project is likely to have a significant impact on a Natura 2000 site undertake full AA</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Undertake an Invasive Alien Species survey of the application site.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Avoid the loss or disruption of habitats.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Maintain a distance of 10-15m from the banks of watercourses.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Incorporate Sustainable Drainage Systems (SuDS).</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Avoid development of infrastructure in areas at risk of flooding.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>To mitigate against flood risk, ensure a riparian buffer zone is created between all watercourses and any development for a minimum of 15m.</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Avoid geologically unsuitable areas and areas susceptible to subsidence or landslides. Due consideration should be given to the primary water source of the area and the degree of surface water/groundwater interaction including tidal influences.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Impacts from a transport perspective to be assessed including road access, network, safety and traffic patterns to and from the facility.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Landfills and suitably zoned brownfield sites should be considered for waste activities.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Sites that offer opportunities to integrate differing aspects of waste processing will be preferred choices.</td>
<td>✓</td>
</tr>
<tr>
<td>Annex V of the European</td>
<td>Location of a treatment plant must take into consideration requirements relating to the feedstock waste and the treatment technology used.</td>
<td>✓</td>
</tr>
</tbody>
</table>
## CONSIDERATION OF ALTERNATIVES

<table>
<thead>
<tr>
<th>Guidance on Siting</th>
<th>Siting Criteria</th>
<th>Does proposed facility meet criteria?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commission’s (EC) Working Document on the Biological Treatment of Biowaste (2nd Draft)</td>
<td>The distance from the boundary of the site to residential and recreation areas, waterways, water bodies and other agricultural and urban sites.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>The existence of surface water, groundwater, coastal water or nature protection zones in the area.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>The protection of the nature or cultural patrimony area.</td>
<td>✓</td>
</tr>
<tr>
<td>Prohibition on the Use of Swill Order</td>
<td>A person shall not collect, assemble, process, store, keep or otherwise have in his possession or under his control swill:</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>a) For the purpose of feeding it to an animal or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) On any premise where an animal is fed, farmed, reared, bred or fattened or has access.</td>
<td></td>
</tr>
<tr>
<td>Animal By-Products Regulations</td>
<td>If the biogas plant is located on or next to premises where farmed animals are kept and the biogas plant does not only use manure, milk or colostrum which accrues from those animals, the plant shall be located at a distance from the area where such animals are kept. That distance shall be determined in a manner which ensures that there is no unacceptable risk for the transmission of a disease communicable to humans or animals from the biogas plant. In all cases, there must be total physical separation between that biogas plant and the animals and their feed and bedding, with fencing where necessary.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Regard should be had to the following site exclusionary factors: European and National proposed, candidate and designated sites; areas of high amenity or high archaeological interest; proximity of waterways and water bodies; proximity to residential, recreational areas and sensitive sites (schools, hospitals).</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>If development zoning exists an area zoned as industrial is preferable.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Particular regard should be had to traffic considerations.</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Brownfield sites are preferable if available.</td>
<td>✓</td>
</tr>
</tbody>
</table>
CONSIDERATION OF ALTERNATIVES

5.50 As stated earlier while EIA is confined to the environmental effects which influence the consideration of alternatives, the EPA Guidelines (2002) acknowledge that other non-environmental factors may have equal or overriding importance to the developer. In this regard it was concluded that the Inchera site is a suitable location for the proposed plant and offers the following key attributes to the developer:

- The proximity of the subject site to the major population centre of Cork City and to the strategic road network makes it an ideal location to serve the entire Southern Region. The Inchera site is considered to be the best location in this regard of all the sites assessed during the site selection exercise;
- Access to the R623, which in turn provides direct access to the Dunkettle Roundabout junction and a number of national primary routes (N25, N8 and N40) and the M8 motorway;
- The site’s location within easy reach of waste treatment and transfer facilities allowing integration with plants such as Starrus Eco Holdings Ltd. (Greenstar) in Sarsfield Court, Glanmire, Country Clean Recycling Ltd in Churchfield Industrial Estate at John F. Connolly Road, Waste Recovery Services Ltd. in Fermoy and Wiser Recycling Ltd. in Midleton;
- Access to the municipal wastewater and storm sewer network;
- Redevelopment of a brownfield site; and
- Clustering with the adjacent BASF Ireland chemical company which will aid in visual integration of the proposed plant.

ON-SITE CONFIGURATION

Design Configuration

5.51 The final design evolved through a number of iterations. Mitigation measures recommended by the individual experts which form part of the Environmental Impact Assessment are incorporated into the final design.

5.52 There is an existing decommissioned wastewater treatment plant (WwTP) on site. SBE commissioned a review of the plant to assess the possibility of
CONSIDERATION OF ALTERNATIVES

incorporating the WwTP into the design of the proposed Renewable Bioenergy Plant. The outcome of the review indicated that technical challenges combined with projected operational costs meant that the WwTP is unviable for the proposed Plant. As a result an alternative wastewater treatment technology is incorporated into the Plant’s design.

5.53 Modelling undertaken as part of the Air Quality assessment informed the final height of the combined heat and power stack as 28m, the boiler stack as 10m and the odour control system stack as 25m which are considered the appropriate levels to ensure optimum environmental performance. The modelling established that at these heights no air quality standards or guidelines will be exceeded. The assessment concludes that the controls built into the proposed plant mean that emissions to air will have no significant adverse effects on air quality or the health of local people.

5.54 The design has sought as far as practicable to minimise visual intrusion. An appropriate colour palette has been selected based on adjacent buildings and views from sensitive locations to assist in visually receding the structures.

5.55 The location of the biogas flare at the north-eastern boundary of the subject site was informed by the assessment of land use planning implications which accompanies this planning application. This location has been chosen in order to maximise the distance between the enclosed flare and the adjacent BASF Plant which is an upper-tier Seveso site.

5.56 The final design configuration is optimal from a process engineering, civil engineering and environmental and planning perspective.

ALTERNATIVE TECHNOLOGY

5.57 The following section provides a commentary on how anaerobic digestion (AD) provides a more suitable choice of technology for processing organic waste over other treatment options. European and Government policy to divert waste away from landfill, along with the growing debate over Ireland’s energy needs sets the background to these proposals, see Chapters 3 and 4 for further details.
CONSIDERATION OF ALTERNATIVES

In Vessel Composting (IVC)

5.58 IVC describes a range of designs for aerobic treatment (composting) technologies that are designed and engineered to control and optimise the biological stabilisation and sanitisation of organic materials. As IVC is a controlled technology the process takes place within specifically designed vessels and the techniques used to control the process include temperature regulation and controlling the supply of oxygen. This allows a more rapid and efficient breakdown of the biological material to form compost, than the more traditional open composting technology. The IVC process is aerobic and so produces water, CO\(_2\) and heat.

5.59 In contrast, the biogas produced in AD provides a fuel for the generation of electricity and/or heat, displacing the use of fossil fuels. AD is a net producer of energy. This is in contrast to composting, which requires the consumption of energy to provide aeration for microbial activity. The AD process generates enough heat and power both to maintain itself and to export surplus electricity to the national grid.

5.60 Greenhouse gas emissions are reduced by the processing of waste by anaerobic digestion, both by the displacement of fossil fuel emissions and the capture of carbon in the waste, which would otherwise have been released to the atmosphere as CO\(_2\) (composting).

Energy from Waste (EfW)

5.61 EfW is the process by which waste is combusted within a controlled process to provide heat that is used to generate electricity and/or used to provide heat to other users locally.

5.62 EfW, in common with AD, is a waste treatment technology that is also used to produce renewable electricity from waste. However, AD offers the environmental advantage of producing a compost-like material (termed digestate), rather than just energy generation.
5.63 The high water content within food wastes means that a comparable level of energy recovery would not normally be achieved from this waste stream through EfW.

Landfill

5.64 The disposal of biodegradable waste in landfills can result in negative effects on the environment, as well as risks to human health. The disposal of waste can produce emissions of several greenhouse gases (GHGs), which contribute to global climate change. The most significant GHG gas produced from waste is methane. It is released during the breakdown of organic matter in landfills. GHG emissions from the waste sector accounted for 2.5% of total national GHG emissions in 2013. Methane emissions at landfill sites increased substantially in 2013 by 19.7% due to a reduction of 15.0% in landfill gas utilised or flared¹.

5.65 Sustainable management of biodegradable organic waste is therefore important, and is emphasised in several pieces of EU and Irish legislation (see Chapter 4). One such piece of legislation is the Landfill Directive, which requires the diversion of biodegradable waste from landfills. This regulatory driver is therefore promoting other waste management options for this waste stream including anaerobic digestion.

5.66 By capturing and combusting biogas in an enclosed system, AD prevents fugitive methane emissions. Methane is a potent GHG with a global warming potential 25 times that of CO₂. When the captured biogas is combusted, methane is converted into CO₂ and water, resulting in a net GHG emissions reduction.

Anaerobic Digestion

5.67 Several different types of Anaerobic Digestion (AD) technologies are available for processing biodegradable wastes. These can be broken into three general types: wet, dry continuous and dry batch. Each type can be configured in a

¹ EPA (2014) Ireland's Provisional Greenhouse Gas Emissions in 2013 – Key Highlights
CONSIDERATION OF ALTERNATIVES

number of ways; the most common configurations are shown in the Table 5-4 below.

Table 5-4 Anaerobic Digestion Configurations

<table>
<thead>
<tr>
<th>Wet</th>
<th>Dry Continuous</th>
<th>Dry Batch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single stage</td>
<td>Vertical plug flow</td>
<td>Single-stage batch</td>
</tr>
<tr>
<td>Multi stage</td>
<td>Horizontal plug flow</td>
<td>Sequential Batch</td>
</tr>
</tbody>
</table>

5.68 Each configuration can be operated under either mesophilic or thermophilic conditions. Mesophilic and thermophilic microbes are adapted to roughly 30-40°C and 50-60°C respectively and therefore require the process to be kept at different temperatures. Thermophilic conditions result in faster reaction kinetics which, in practice, translates to smaller digesters needed to process a given waste stream.

5.69 Wet and dry systems differ in the total solids (TS) concentration in the digesters with wet systems typically working in the 6% to 20% dry solids range and dry systems between 20 and 40%. In wet systems feedstock is typically diluted with process water to achieve the desirable solids content during the preparation stages.

5.70 Dry systems can be further classified into continuous and batch systems. As with wet systems dry continuous systems continually introduce feedstock into the process whereas batch systems fill all or part of the system with feedstock and leave the material in place until the digestion process is complete.

Wet System

5.71 Single-stage digesters are simple to design, build, and operate and are generally less expensive than multi-stage digesters. The organic loading rate (OLR) of a single-stage digester is limited by the ability of methanogenic organisms to tolerate the sudden decline in pH that results from rapid acid production during hydrolysis.
CONSIDERATION OF ALTERNATIVES

5.72 Two-stage digesters separate the initial hydrolysis and acid-producing fermentation from methanogenesis, which allows for higher loading rates but requires additional digestion tanks and handling systems.

5.73 Multi-stage systems are designed to take advantage of the fact that different portions of the overall biochemical process have different optimal conditions. By optimising each stage separately, the overall rate can be increased. Typically, two-stage processes attempt to optimise the hydrolysis and fermentative acidification reactions in the first stage where the rate is limited by hydrolysis of complex carbohydrates. The second stage is optimised for methanogenesis where the rate in this stage is limited by microbial growth kinetics. Since methanogenic archaean prefer pH in the range of 7–8.5 while acidogenic bacteria prefer lower pH, the organic acids are diluted into the second stage at a controlled rate. Process flexibility is one of the advantages of multi-stage systems. However, this flexibility also increases cost and complexity by requiring additional digestion tanks, material handling and process control systems.

**Dry Continuous**

5.74 Dry continuous digesters treat waste streams with 20-40% TS without adding dilution water. However, these systems may retain some process water or add some water either as liquid or in the form of steam used to heat the incoming feedstock. Nonetheless, heavy duty pumps, conveyors, and augers are required for handling the waste, which adds to the systems' capital costs. Some of this additional cost is offset by the reduction in pre-treatment equipment required.

5.75 Due to their high viscosity, loading rate, and rapid hydrolysis, materials in dry reactors move via plug flow (materials added on one end of the digester push previously placed materials toward the opposite end), and the incoming feedstock needs to be inoculated or mixed to avoid localised acid build-up. Two of the most commonly used commercial-scale designs inoculate the feedstock by mixing it with a portion of the digested material, while another incorporates mixing via high-pressure biogas injection.
CONSIDERATION OF ALTERNATIVES

5.76 Handling material at high solids concentration requires different pre-treatment and transfer equipment (i.e. conveyor belts, screws, and special pumps for the highly viscous streams). The challenge of dry systems is handling, mixing, and pumping the high-solids streams rather than maintaining the biochemical reactions.

5.77 Although some of the handling equipment (such as pumps capable of handling high-solids slurries) may be more expensive than those for wet systems, the dry systems are more robust and flexible regarding acceptance of inorganics such as glass, metals and plastics in the digestion tanks. These materials are not biodegradable and will not contribute to biogas production but they can generally pass through the digestion tanks without affecting conversion of the biomass components. The only pre-treatment required is removal of the larger pieces (greater than 50mm), and the addition of some dilution with water to keep the solids content in the desired range.

Dry Batch

5.78 Batch or sequential batch systems aim to reduce complexity and material handling requirements. As opposed to continuous wet and dry systems, the feedstock does not need to be carefully metered into a batch reactor, thereby eliminating the need for complex material handling equipment. The primary disadvantage of batch digesters is uneven gas production and lack of stability in the microbial population. Sequential and phased batch digesters attempt to surmount these disadvantages.

5.79 Some of the first dry digesters were envisioned as modified landfills. This resulted in the creation of batch systems that recycled leachate in a manner similar to landfill bioreactors. However, unlike landfill bioreactors the batch digester conditions were more carefully controlled and as a result biogas production rates were higher and retention times were lower.

Advantages and Disadvantages of Each System

5.80 Each possible configuration was examined and the advantages and disadvantages assessed in the context of subject site and the likely feedstock
composition. A summary of the advantages and disadvantages of each system is provided in Table 5-5 below.

Table 5-5 Advantages and Disadvantages of Anaerobic Digestion Technologies

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wet Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>Extensive experience throughout Europe; and Simplified material handling and mixing.</td>
<td>While most of the effluent is recycled back into the process to dilute incoming feedstock there is a need to dispose of excess effluent.</td>
</tr>
<tr>
<td><strong>Continuous Dry Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>Robust (inert material and plastics need not be removed).</td>
<td>Not appropriate for wet waste streams.</td>
</tr>
<tr>
<td>Biological</td>
<td>Less organics loss in pre-treatment; and Limited dispersion of transient peak concentrations of inhibitors.</td>
<td>Low dilution of inhibitors; and Less contact between microorganisms and substrate leading to lower biogas yields.</td>
</tr>
<tr>
<td>Economic &amp; Environmental</td>
<td>Cheaper pre-treatment and smaller reactors; Small water usage; and Smaller heat requirement.</td>
<td>Robust and expensive waste handling equipment required.</td>
</tr>
<tr>
<td><strong>Dry Batch Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>Simplified material handling; Reduced pre-sorting and treatment; and Robust system.</td>
<td>Compaction prevents percolation and leachate recycling; Large footprint; Need for bulking agent; and Risk explosion during emptying of reactors.</td>
</tr>
<tr>
<td>Biological</td>
<td>Separation of hydrolysis and methanogenesis; problem batches can be removed easily.</td>
<td>Variable gas production in single-reactor systems; Poor biogas yield due to channelling of percolate.</td>
</tr>
<tr>
<td>Economic &amp; Environmental</td>
<td>Low cost for small systems; and low water requirement.</td>
<td>Less complete degradation of organics means a maturation phase post digestion is typically required. Few commercial scale systems in operation.</td>
</tr>
</tbody>
</table>

5.81 Dry batch systems were eliminated from the selection process as the site was not large enough to accommodate the significant footprint of the technology.
CONSIDERATION OF ALTERNATIVES

5.82 Both the wet and dry continuous systems were deemed suitable for the site and there is considerable operating experience processing similar feedstocks to those envisaged at the proposed facility.

5.83 A high-level economic analysis of the wet and dry continuous systems was carried out. The operating costs of the wet system were found to be slightly higher than the dry continuous system due to the requirement for greater process water removal; however, this was more than offset by the lower capital costs of the wet system and the increased energy production.

5.84 Wet AD was selected as the preferred technology option for the proposed plant based upon a number of process engineering criteria including; process robustness, flexibility, gas yield, gas quality and digestate stability. It was decided to design the plant to be run at either mesophilic or thermophilic temperatures to allow for process optimisation depending on the feedstock mix.

GAS UTILISATION TECHNOLOGY

5.85 There are five possible solutions for dealing with the on-site combustion of biogas generated by the anaerobic digestion process, as follows:

- Flaring;
- Generating electricity in a spark ignition engine, with no heat recovery
- Generating electricity in a gas turbine, with no heat recovery;
- Combusting in a spark ignition based, combined heat and power plant (CHP); and
- Combusting in a gas turbine based CHP.

5.86 Direct grid injection is also a possibility but in the absence of a renewable price support it is not economically feasible at present.

Flare

5.87 Modern gas flares burn gas in a vertical, cylindrical, or rectilinear enclosure. They are well insulated, achieving a controlled combustion and burnout, with low emissions, no visible flame and no odour. Gas flares produce the lowest...
direct emissions and the lowest rates for deposition from air to land; however no energy is harnessed.

Spark Ignition Engine

5.88 A spark ignition engine is a type of reciprocating engine. Spark ignition engines use a high intensity spark as well as compression to instigate combustion of the input gas (fuel).

5.89 To reduce NOx emissions, modern spark engines use a pre-chamber to create a near stoichiometric mixture of fuel and air (an exact ratio with no excess of reactants). Whilst more efficient than the gas turbine, energy is lost as heat.

5.90 The spark ignition engine produces the highest direct emissions of the available solutions and therefore also has the highest rates for deposition to land. Full combustion is achieved so there are no odorous emissions.

Gas Turbine

5.91 A gas turbine is an engine where fuel is continuously burnt with compressed air to produce a stream of hot, fast moving gas. The expanded gases are fed through a turbine, producing power. A portion of the power produced will feed the air compressor.

5.92 With no heat recovery, gas turbines produce a high temperature exhaust (typically 500°C) and lose considerable energy as heat. As a result of the high pressure used, a gas compressor increases the danger of an environmental incident/accident.

Combined Heat and Power

5.93 Combined Heat and Power (CHP) is the simultaneous generation of usable heat and power, in a single process. In its simplest form, it employs a gas turbine, engine or steam turbine, to drive an alternator to produce electricity, with the heat recovered, often via a heat recovery boiler, utilised to raise steam for industrial processing, or to heat buildings.
CONSIDERATION OF ALTERNATIVES

5.94 CHP plants deliver a range of environmental benefits, due to the high efficiency of fuel use and heat recovery. The utilisation of waste heat increases thermal efficiency, whilst reducing emissions per unit of useful energy produced.

5.95 The Government’s Strategy for Renewable Energy 2012-2020 refers to REFIT III which is designed to support CHP and Anaerobic Digestion. The scheme aims to incentivise the addition of 150MW of high efficiency CHP using AD and other technologies.

5.96 The use of CHP is an effective way to reduce indirect greenhouse gas emissions and maximise energy recovery from waste. It is a better option than a flare or either type of gas engine with no heat recovery.

**Spark Ignition Engine CHP Plant**

5.97 Where it is possible to recover both high and low grade heat, a CHP based on a spark ignition engine may achieve an efficiency of up to 90%. At the proposed plant heat will be recovered from the gas engines and utilised to heat water, which will then be used to raise and maintain the temperature of the pasteurisation tanks. This will improve the efficiency of the site and enable it to comply with the Animal By-products Regulations requirements, which require treatment of the biomass slurry at a particular temperature for a specified period of time.

**Gas Turbine CHP Plant**

5.98 A gas turbine, with CHP, can achieve an overall thermal efficiency of up to 85%. A supplement of natural gas is necessary when utilising a gas turbine CHP plant, as the engine cannot cope as well with variations in gas quality often associated with biogas. The supplement of natural gas will not only increase raw material use, but will increase greenhouse gas emissions.

**Preferred Gas Utilisation Technology**

5.99 It was concluded that the Best Available Technique (BAT) for the use of gas from the proposed Renewable Bioenergy Plant, is a spark ignition engine based CHP. Air quality modelling undertaken as part of this EIS and presented
CONSIDERATION OF ALTERNATIVES

in Chapter 8 determines that the impact of the CHP will be acceptable and that no air quality standards or guidelines will be exceeded.

5.100 The advantages are that the plant will:

- Be better able to adapt to any variations in composition of the gas supply as a result of changes in the incoming waste or in the digestion process;
- Provide the most effective means of energy recovery, supplying a high proportion of the generated renewable electricity to the National Grid; and
- Utilise the heat from the CHP plant in the pasteurisation, digestion and other ancillary processes such as drying of the digestate.

5.101 These factors will substantially reduce greenhouse gas emissions from the proposed plant and will offset greenhouse gas emissions by providing renewable energy to the National Grid.

5.102 In addition, the proposed plant at Inchera will also utilise a standby gas flare, which can be used to combust excess biogas when combustion by the CHP or storage in the gas holder is unavailable. It is estimated that the flare will be active for 1% of an operational year which would be the scheduled downtime for maintenance of the gas utilisation engines.

5.103 The proposed flare will have safety features built in to minimise the risks of fire and explosion. The flare will be operated in accordance with the manufacturer’s recommendations.
CONSIDERATION OF ALTERNATIVES

FIGURES

Figure 5-1 Location of Shortlisted Sites