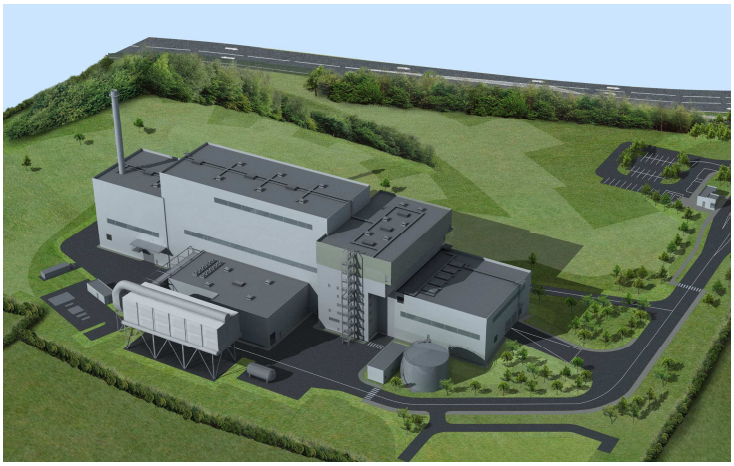
Response to the SEM Consultation Paper

"Principles of Dispatch and the Design of the Market Schedule in the Trading & Settlement Code"

SEM-09-073



Submission by Indaver

18/09/2009

Summary

As a new player in the electricity market, with a new type of generating unit for which the rules are currently unclear, Indaver appreciates the opportunity to comment on dispatch and market schedule principles.

Indaver is developing two waste-to-energy facilities in Ireland, which are designed to recover energy from waste under the controlled conditions of the Waste Incineration Directive. These facilities operate in a similar manner to conventional thermal or biomass plants. However, rather than being driven primarily by the generation of electricity, they are driven by the treatment of the main fuel source (residual waste) and to meet waste policy goals. In our opinion these drivers, combined with a renewable electricity output, should qualify waste-to-energy facilities for either must-run or priority in dispatch status.

The key focus area of this response is the dispatch prinples which at present determine whether or not a renewable plant can produce metered generation and claim REFIT support. It is submitted that, rather than changing the dispatch rules to facilitate renewables, the REFIT calculation methodology should be changed. This would reduce the driver for competition between renewable plant in the dispatch schedule and would ensure that any status assigned to waste-to-energy facilities would not put other renewables at a financial disadvantage.

1.0 Introduction

1.1 Indaver

Indaver was established in Ireland in 1999 to develop waste infrastructure. The company is developing two waste management projects in Ireland. A 200,000 tonnes per annum (tpa) municipal waste-to-energy plant in Co. Meath is currently under construction. The facility is expected to be operational by mid 2011 when it will generate 15MW electricity for export to the distribution system. The second 240,000tpa waste-to-energy plant for industrial and hazardous waste in Co. Cork is currently in the planning process. This facility will have the potential to export up to 20MW electricity.

Indaver's core expertise lies in the waste management business. The company employs over 1,400 people, has operations in seven European countries where it treats over 3.2 million tonnes of waste annually. Its operations generate over 270,000MWh electricity and 1,181,000 GJ process steam per year for export or distribution.

Any comments included in this paper are from the perspective of a new entrant to the Irish electricity sector. Electricity is an important revenue source for waste-to-energy plants, so we are grateful for the opportunity to submit our comments and hope that this response provides some useful feedback to the consultation paper.

1.2 Waste-to-energy Facilities

Waste-to-energy facilities are designed to thermally treat residual waste[1], reducing the volume of waste by over 90% and rendering it inert. Energy is recovered from the process as steam and is subsequently converted in a steam turbine to electricity or is directly exported to customers where such outlets are available. In 2007, waste-to-energy plants throughout Europe generated enough energy to supply 12 million people with electricity and 58 million people with heat.

1.2.1 Operating Principles

Predictability

Since the primary function of a waste-to-energy plant is to thermally treat waste, the plants operate on a continuous basis for an average of 7,800 hours per year. They can in theory continue operating even where there is no electricity export capacity, by diverting the recovered steam (in the case of Indaver's Meath facility) to air cooled condensers where it is dispersed to atmosphere. In other words, waste-to-energy plants are similar operationally to a predictable thermal plant, except that the fuel (waste) is the primary revenue source for the plant instead of being a variable cost and that a portion of the electrical output is renewable.

Energy Efficiency Criteria

Access to the dispatch schedule is critical for waste-to-energy plants to comply with their operational licences.

classification of the waste facility as a recovery plant rather than a disposal operation. The recently revised Waste Framework Directive 2008/98/EC sets out an efficiency criteria that waste-to-energy facilities must meet in order to be a recovery operation. New facilities must have a minimum efficiency factor (R1) of 0.65 in order to be considered recovery, according to a formula included in Annex II of the Directive. This formula describes all energy flows to, from and within the plant and ascribes energy conversion factors to electricity and steam to reflect their relative usefulness.

[1] Waste remaining after recycling and prevention options have been exhausted

The formula is as follows:

$$\text{R1-factor} = \frac{Ep - (Ef + Ei)}{0{,}97 * (Ew + Ef)}$$

Where:

- **Ep** means annual energy produced as heat or electricity. It is calculated with energy in the form of electricity being multiplied by 2,6 and heat produced for commercial use multiplied by 1,1 (GJ/year)
- **Ef** means annual energy input to the system from fuels contributing to the production of steam (GJ/year)
- **Ew** means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year)
- **Ei** means annual energy imported excluding **Ew** and **Ef** (GJ/year)
- 0,97 is a factor accounting for energy losses due to bottom ash and radiation.

It will be a requirement of waste-to-energy plant operating licenses issued by the EPA that they operate to the minimum energy efficiency standard of 0.65 according to the R1 formula. The Indaver waste-to-energy plant waste licence is currently under review. However, the Dublin waste-to-energy facility waste licence (W0232-01) stipulates that:

> *"The licensee shall build and operate the facility to achieve an energy efficiency of, as a minimum, 0.65 using the formula to calculate Energy Efficiency"*

where this formula is repeated as the R1 calculation above.

Where a waste-to-energy plant cannot export electricity, Ep is reduced significantly (to cover houseload only) which reduces the efficiency according to the R1 formula to less than 0.2. This would imply a breach of the waste licence which is an offence under Sections 39(1) and 39(9) of the Waste Management Acts 1996 to 2007.

It is therefore an operational imperative to generate and export electricity. If the facility is prevented from exporting, to avoid a breach of the facility's operational licence it would be required to shutdown.

Because of the specific operational conditions that govern the incineration of waste in line with the Waste Incineration Directive, a plant shutdown is more onerous for a waste-to-energy plant than for conventional generating units. For example, no waste fuel can be introduced to the furnace during startup until a minimum temperature of 850^{o}C is met. This means that the furnace must be pre-heated using imported fossil fuels[2] that are not used during the normal operation of the plant.

The minimum shutdown period for a waste-to-energy plant is approximately 8 hours. A plant shutdown would not only incur operational costs to the plant but would also incur the variable costs of fuel, which are in effect the cost of making alternative arrangements for its management. It can therefore be expected that the startup costs could be very high, due to this licence condition, even though the variable cost during normal operations is minimal[3].

Indaver is not aware of any examples from other Member States where waste-to-energy plants are shutdown due to electrical export constraints.

[2] i.e. compared with waste, which is a local energy resource.
[3] Insofar as the variable cost of fuel is normally assigned to the treatment of waste rather than electricity production except in case of shutdown.

Waste Policy Drivers

In their capacity as waste recovery facilities, waste-to-energy facilities are also driven by the imperative to divert waste away from disposal options like landfill.

Ireland is under obligation from the EU to divert a proportion of biodegradable waste, which makes up approximately 64% of MSW, from landfill in line with the Landfill Directive (1999/31/EC). The first diversion target in less than 12 months will require over 500,000 tonnes MSW or 28% of the waste currently going to landfill to be diverted elsewhere. It is widely agreed that this poses a huge challenge to the waste sector. By 2013 (by which time the Indaver facility in Meath will be operational) this diversion target will be increased to over 50% of the waste currently being sent to landfill. Failing to meet these targets could result in fines for Ireland of up to €500,000 per day.

In current waste policy, waste-to-energy technology is the preferred alternative to landfill for residual waste. The size and nature of facility required is typically specified per waste management region[4], and is designed to ensure that the region meets its landfill diversion targets. If the principal residual waste option is shutdown in a region, it is unlikely that there will be other alternatives other than landfill for the untreated waste. A shutdown would therefore compromise the achievement of diversion targets and go against EU waste policy which requires that waste is treated higher in the waste hierarchy than disposal.

The two waste-to-energy facilities in Meath and Dublin will contribute[5] significantly towards the landfill diversion capacity required to meet the targets. To this end, waste-to-energy facilities are an important part of the Irish waste management system.

An overview of waste management policy and drivers is provided in Annex 1.

1.2.2 Renewable Energy Output

As noted, approximately 64% of Irish municipal waste[6] is made up of biomass or biodegradable materials like food waste, cardboard, textiles and wood. This is inseparable from and cross-contaminated by the other non-biomass components of MSW like plastics, metals and inert materials. The relative proportion of biomass and other components of MSW can vary per delivery, season and source of waste.

In the definitions set out in Directive 2001/77/EC, this biomass produces renewable energy. Therefore, a portion of energy generated by a waste-to-energy plant is renewable. In line with waste and energy policy, the *Bioenergy Action Plan for Ireland*:

> *"seeks to maximise the recovery of useful materials and energy from residual waste and accordingly suggests thermal treatment with energy recovery as the preferred option …".*

The Plan also saw the introduction of REFIT for the renewable portion of electricity generated:

> *"to assist in the development of waste to energy projects…"*.

It finds this is:

> *" ... fully consistent with the overall 'hierarchy of waste' treatment approach".*

As noted, this is discussed in more detail in Annex 1.

[4] Ireland's waste management system is divided up into regions which must make plans that aim to meet national waste policy targets.
[5] The two waste-to-energy facilities in Meath and Dublin can provide at least 64% of the diversion capacity required
[6] Mixed waste from households and similar wastes from commercial and industrial sources

Indaver has been advised that the Meath facility has been allocated REFIT, but the methodology for measuring the renewable output must be clarified before proceeding. The facility was included in a draft SI preceding SI 284 of 2008, but was not included in the latter because a supplier had not been identified.

1.2.3 Short Run Marginal Cost

Waste-to-energy plants are likely to have a low to negative SRMC since operational costs of the plant are associated with waste treatment and not with electricity production. In normal circumstances, the cost associated with bypassing the turbine (i.e. in case of an export constraint) is minimal. However, where an export constraint means that the facility cannot meet its licence condition to operate as an R1 facility, the plant would have to shutdown. In this case, startup and shutdown costs, as well as costs associated with finding alternative arrangements for the residual MSW, would be significant.

2.0 Response to Consultation

2.1 Infra-Marginal Rent

The current system ensures that the market schedule does not take into commercial issues like firm or non-firm access. It helps to ensure that low cost and efficient plant are incentivised to connect to the system, driving down the SMP in the long term. It also maintains momentum in the renewable energy sector where plant can connect in advance of the firm connection date. Modifying this system only to cater for transmission constraints that are temporary in nature would unnecessarily increase investment risk.

Adjusting the current principles to account for firmness would impact negatively on the position of and potential revenue for waste-to-energy plants. Plants that are located behind import constraints are unlikely to be affected, since waste-to-energy plants are unlikely to be in a position to be constrained onto the system[7]. Plants located behind export constraints would be negatively affected where their output is limited by the constraint, and may be restricted through licence conditions to shutdown.

In summary, the market scheduling principle currently in place should be retained. The treatment of generators behind export or import constraints may be better tackled through other mechanisms rather than by distorting market scheduling.

2.2 Treatment of Hybrid Plant

2.2.1 Definition

In order to enter into the discussion as to where hybrid plant should sit in the dispatch schedule, there is a requirement to define “hybrid plant”. This definition should be clear and transparent enough to avoid a situation in which non-renewable plants substitute a small fraction of the input fuel with renewable fuels to obtain priority dispatch status.

It has been suggested that a minimum renewable proportion of generation should be considered as part of the definition of hybrid plant. Based on the composition of Irish MSW, it is currently anticipated that the renewable output from waste-to-energy plants will be upwards of 50%. However, the variability of waste composition can be high, and it would follow that the status of the facility as a priority dispatch unit would have to be re-evaluated on a regular basis. This may overcomplicate the issue insofar as priority dispatch should be a clear and defined operating principle.

[7] Assuming they will typically be included in the market schedule due to low variable costs

Furthermore, setting a minimum qualifying level for hybrid may provide the wrong signals to the market. It may be possible for a group of units behind a metering point to combine to provide a minimum fraction of renewable energy in order to ensure priority dispatch status for a 100% fossil plant forming part of that group. Therefore, another method other than defining a minimum % renewable may be preferable.

As previously noted, the biomass fraction of MSW is inseparable from the other components as received at waste-to-energy plants. This is a function of the waste management system and is therefore not responsive to inappropriate market signals or gaming.

In this context, hybrid plants could be defined as:

> *"any plant processing fuel wherein the renewable content is inseparable from the non-renewable content".*

2.2.2 Dispatch

The consultation paper seeks feedback on whether the priority dispatch principles should be extended to hybrid plant.

It is submitted that waste-to-energy plants have an imperative to operate and to export electricity. In addition to this, waste-to-energy plants share all of the attributes of generating units that have priority dispatch status, including:

- improving the sustainability of electricity supply by contributing to renewable electricity targets
- being allocated REFIT support (for the portion of renewable electricity generated)
- improving security of supply by using a local fuel source
- improving competitiveness of supply by operating at low to no variable cost

with the additional benefit of being predictable and fulfilling waste and climate change policy objectives[8].

Providing waste-to-energy plants with some form of priority in dispatch would align with these operational obligations and policies and would avoid any inconsistencies that may arise due to the allocation of REFIT but not priority dispatch status.

Given the operational restrictions of the plant relating to energy efficiency, waste-to-energy plants are effectively must-run. To facilitate this, some alternative form of dispatch may be more appropriate outside of the priority dispatch principles like for example defining waste-to-energy facilities as "must-run" plants in the Trading & Settlement Code. Although this would effectively place waste-to-energy first in the dispatch hierarchy, it can be argued that no other generating units are subject to similarly restrictive operational conditions. The number of generating units falling in this category would be small, consisting only of waste-to-energy plants, of which it is unlikely there will be more than four exporting a total of 100 – 120MW[9]. Furthermore, where the dispatch hierarchy does not determine commercial outcomes (i.e. REFIT support), but only technical or physical dispatch outcomes, this would not place other renewable plant at any disadvantage. This is discussed in more detail below.

[8] See Annex I

[9] Including Indaver's planned facilities in Meath (15MW) and Cork (20MW), and two other facilities in Dublin (50 - 60MW) and the South East (est. 10 – 15MW)

2.3 Dispatch Principles

2.3.1 REFIT and priority dispatch

From a waste-to-energy generator perspective, the main incentive for priority in the dispatch schedule appears to be the ability to register metered generation and thereby obtain support under the REFIT system.

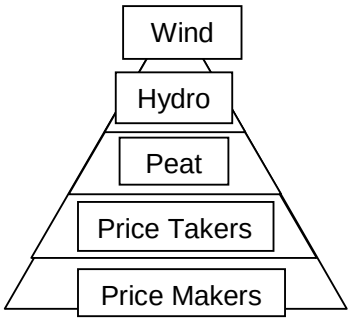
It is understood that another response to this consultation from the Irish Wind Energy Association suggests that REFIT calculations should not be tied to metered generation but to availability. If this were the case, the issue of any dispatch constraints or a dispatch hierarchy would become less contentious. Effectively, the question of whether priority dispatch plant should be considered in the same economic merit order as conventional plant for dispatch, or how the TSO should decide on the relative merit order of priority dispatch, would become decoupled from financial compensation.

Indaver would support this move, since it would ensure that renewable units are incentivised to connect to the system, and would not face the uncertainty associated with the current and proposed dispatch principles. It would also allow for more transparent decision-making in dispatch and would avoid a situation in which renewable plant is competing with other renewable plant and with conventional generation to ensure the plant's viability.

Furthermore, in this scenario waste-to-energy could be more easily facilitated as a dispatch priority (in light of operational constraints) without impacting on the viability of other renewable plant[10]. In terms of the PSO, there would be no additional cost other than the cost associated with changing the REFIT calculation to reflect availability rather than metered generation. It is understood that an assessment of these costs is being submitted by the Irish Wind Energy Association.

2.3.2 Dispatch as an Operational Decision

To facilitate waste-to-energy as a dispatch priority, it could either be treated as a "must-run" facility or could be added to the current dispatch hierarchy which is as follows:



where the highest in the list receives first priority or is constrained off last. Biomass and hybrid plant are not currently catered for in this hierarchy. As outlined above, there are valid reasons for the treatment of waste-to-energy as a priority in dispatch and therefore for its inclusion in the hierarchy.

The form of decision making with respect to a dispatch hierarchy is likely to be influenced by the method of allocating REFIT support. First of all, where REFIT support is provided for availability, conventional plant no longer needs to be displaced "at any cost" since renewable

[10] It is noted that even where the proportion of renewable output from hybrid plant is lower than other renewable plant, the run hours per annum may be higher and therefore the gross renewable energy output may be as high or higher for the same size of unit.

plants are sufficiently compensated for any constraints. Waste-to-energy plants, constrained by operating licence conditions, could also be positioned high in the dispatch hierarchy without impacting on the viability of other renewable plant.

Both of these dispatch priorities could be achieved through dispatch on economic merit order where waste-to-energy plants include startup costs and the cost of finding alternative outlets for residual waste incurred during a shutdown.

It is submitted that economic merit order should not factor in subsidies, particularly where REFIT is adjusted to support all availability. It is our understanding that factoring in subsidies would not align with the SEM principles given that it effectively takes into account bilateral contracts between suppliers and generators which are designed to remain external to the market.

2.3.3 Conclusion

Indaver would support REFIT calculations based on availability rather than metered generation. This would remove the emphasis on the dispatch hierarchy and would avoid a situation in which renewable plant must compete with conventional plant on an effective cost basis (economic merit order).

Waste-to-energy should be treated either as a “must-run” type plant in the T&SC or as a hybrid plant with priority dispatch status. Hybrid plants could be defined as any plant operating on a fuel in which the renewable component is inseparable from the non-renewable component. Where waste-to-energy is included as priority dispatch, dispatch based on economic merit would ensure that it is treated as a high priority to reflect operational constraints. Where REFIT is determined on availability rather than metered generation, this would not place other renewable generation at any financial disadvantage.

Annex 1: Policy Drivers for Waste-to-Energy

This Annex provides a summary of policy drivers for the development of waste-to-energy plants at an EU and national level.

Overall EU Objectives

The basic objectives of EU waste policy are to minimize the negative effects of the generation and management of waste on human health and the environment. They also include reducing the use of resources and favouring the practical application of the waste hierarchy. In the long term, the EU aims to become a recycling society that seeks to avoid waste or to use waste as a resource.

In the short term, these goals are to be practically implemented through the Waste Framework Directive (2008/98/EC), which provides the overall structure for waste management within the EU. This is supported by the Landfill Directive (99/33/EC).

1 Waste Framework Directive

The recently revised Waste Framework Directive (2008/98/EC) seeks to promote the alternatives to landfill by (amongst other things) strengthening the role of the waste hierarchy. The five-step hierarchy, shown in Figure 1, is to be a priority order in Member State policy and legislation.

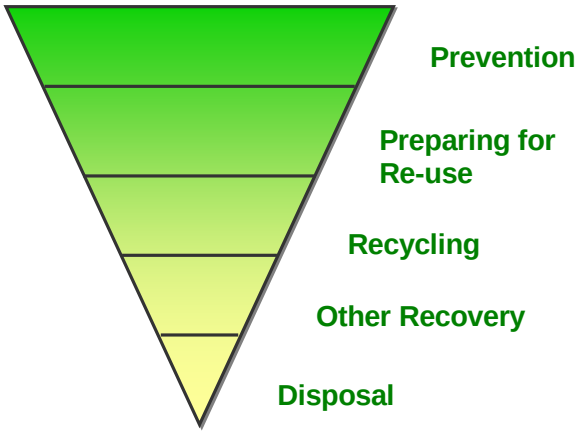


Figure 1: EU Waste Hierarchy

The revised Directive classifies energy efficient incineration as a recovery operation (under the heading “other recovery”) where it meets a minimum energy efficiency criteria. This means that efficient waste-to-energy plants are a priority ahead of landfill disposal for residual waste treatment.

2 Landfill Directive

The Landfill Directive sets out the most pressing and challenging targets currently facing the Irish waste sector. It requires that, by 2010, Ireland must reduce the amount of Biodegradable Municipal Waste (BMW) going to landfill to 75% of the total amount (by weight) produced in 1995. Subsequently, the amount of BMW going to landfill must not exceed

- 50% of the total amount (by weight) of BMW produced in 1995 by 2013; and

- 35% of the total amount (by weight) of BMW produced in 1995 by 2016.

Due to its historical reliance on landfill, Ireland obtained a four year extension on the first two targets, which were to be met by other Member States in 2006 and 2009. It is generally understood that Ireland will miss its first target next year. For example:

- The EPA's *2020 Vision* finds that Ireland is *"… a long way from meeting EU targets for diverting biodegradable waste from landfill"*
- The EPA's *National Waste Report 2006*, warned that *"Urgent action is required in 2008 on diverting waste from landfill…"* and that *"new policy intervention is recommended to divert waste, and biodegradable waste in particular, from landfill in the short term"*
- The Economic and Social Research Institute (ESRI)'s *Medium Term Review 2008-2015*[11], warned that without a substantial shift to recycling or large-scale use of incineration, it is unlikely that Ireland will meet its EU Landfill Diversion obligations

If Member States exceed their target under the Landfill Directive, the EU Commission can bring the State to the European Court of Justice (ECJ) for breach of European Community law. If the ECJ judgement is not complied with, the Commission can refer the matter back to the Court, and propose that a penalty and a lump sum fine be imposed by the Court on the State. Estimates for the scale of this penalty vary widely from €1,884[12] to €750,000[13] per day in addition to a lump sum fine.

Irish targets & policies

1 General Waste Policy

General waste policy was first outlined in the statement *Changing Our Ways*, which described waste management targets to be achieved within a 15 year timescale including:

- recycling of 35% of municipal waste;
- diversion of 50% of household waste from landfill;
- 65% reduction in biodegradable waste consigned to landfill;
- the development of waste recovery facilities employing environmentally beneficial technologies as an alternative to landfill;
- rationalisation of municipal waste landfills.

This and later policy documents indicate the State's recognition that, as a critical part of national waste policy, the necessity of eliminating reliance upon landfill, diverting waste away from landfill and developing prevention and minimisation initiatives together with recycling, biological treatment and waste-to-energy facilities.

2 National Strategy for Biodegradable Waste

The *National Strategy for Biodegradable Waste* set out Ireland's response to the Landfill Directive, and provides an outline of how Ireland can meet its targets.

[11] Fitzgerald, J. et al, *Medium-Term Review 2008-2015*, ESRI, 2008

[12] http://ec.europa.eu/fisheries/press_corner/press_releases/archives/com05/com05_82_en.htm; A&L Goodbody Solicitors; DKM Economic Consultants

[13] Eunomia Research & Consulting Ltd et al, *Waste Policy, Planning and Regulation in Ireland*, Final Report for Greenstar, 2007, available at http://www.greenstar.ie

The plan recognises that an amount of BMW will have to be diverted away from landfill towards residual waste treatment options. It found that:

> *"…all countries with high landfill diversion rates use thermal treatment for a considerable portion of traditional, "mixed waste" collection of BMW".*

and that:

> *"Thermal treatment with energy recovery in accordance with the internationally-accepted waste management hierarchy is a key element of Irish waste management policy."*

The first major step towards achieving these targets was made by the EPA, who set out minimum treatment obligations for waste to be accepted at landfill. The proposals would effectively make it illegal for landfill operators to receive over a certain amount of untreated residual biological waste to landfill from 2010 onwards.

Alternative treatment options will be critical for the success of this diversion policy.

3 Regional Planning

Ireland's waste management policy and targets are implemented through Regional Waste Management Plans. There are 10 waste management regions overall of which eight currently envisage developing or using waste-to-energy capacity in neighbouring regions in order to meet landfill diversion obligations.

The Meath waste-to-energy plant is located in the North East Region, which includes the counties of Meath, Louth, Cavan and Monaghan with a total population of about 390,000. The regional plan has the following targets for 2015:

- 43% recycling
- 39% thermal treatment
- 18% landfill

A specific objective of the plan is to develop a waste-to-energy plant with a capacity of 150,000 to 200,000 tonnes per annum by 2007. The Indaver waste-to-energy facility is a means of delivering this objective and meeting the region's targets. The plan does not include other residual waste treatment technologies and therefore, and within reason, relies on the continuous operation of the Meath facility to meet residual waste treatment requirements.

4 National Climate Change Strategy

The benefits of waste-to-energy are recognized by well respected research bodies, including the expert panel for climate change, the Intergovernmental Panel for Climate Change (IPCC), the European Environment Agency and others. The IPCC found that waste-to-energy *"… can provide significant mitigation potential for the waste sector, especially in the short term"* by replacing landfill. It also ranks waste-to-energy as the most energy efficient technology ahead of landfill, composting, mechanical biological treatment (MBT) or anaerobic digestion.

According to a study commissioned by the Confederation of European Waste to Energy Plants (CEWEP), 821,000 tonnes per annum (the equivalent of removing 200,000 cars from the road) could be saved in Ireland alone by diverting waste away from landfill and towards waste-to-energy. This is because diverting waste away from landfill would eliminate the largest contributor to greenhouse gas emissions from the waste sector and because waste-to-energy plants produce renewable energy which will also help reduce greenhouse gas emissions.

Ireland's *National Climate Change Strategy* recognises these benefits and links in with waste policy. Referring to the reclassification of waste-to-energy as a recovery operation in the revised Waste Framework Directive, the strategy states that:

> *"The Government supports this approach, in the context of the waste hierarchy, which will minimise climate impacts through the sustainable management of waste".*

There is a clear emphasis on energy recovery, with reference to Ireland's *Bioenergy Action Plan*:

> *"To assist in the development of waste-to-energy projects, the Government is extending REFIT to allow support for the renewable portion of mixed renewable and non-renewable generation".*

The Strategy notes that this type of support mechanism is fully consistent with the waste hierarchy.

5 Energy Policy

Bioenergy is increasingly recognised as a valuable renewable resource that can contribute to Ireland's energy policy targets as well as security of energy supply, fuel diversity, climate change mitigation policies, agricultural policies and, notably, waste policies as outlined in the *Bioenergy Action Plan*.

It has been estimated that waste-to-energy plants processing MSW could be the second largest source of bioenergy in Ireland after wood residue energy. This is shown in Figure 2 below.

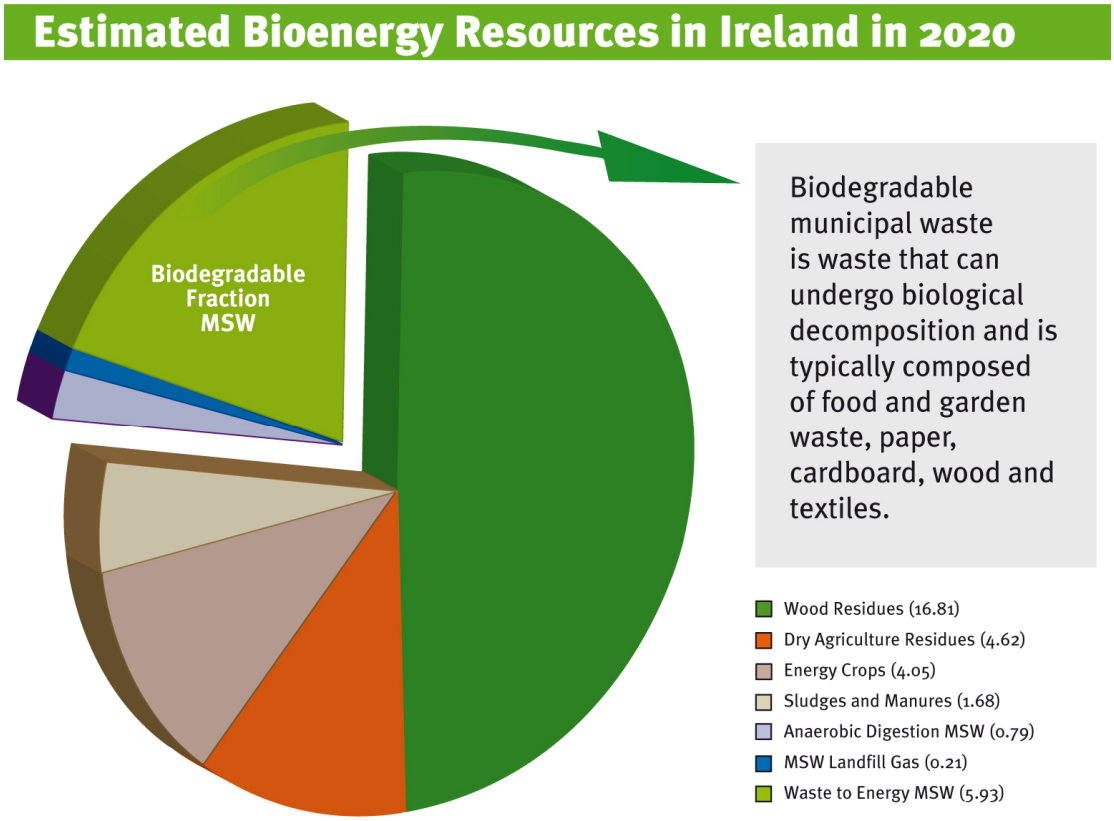


Figure 2: Estimated Irish Bioenergy Resource in 2020

Ireland's *Bioenergy Action Plan* emphasises the importance of energy recovery over the landfill of residues, and refers to the *National Strategy on Biodegradable Waste* intent to:

> *"… maximise the recovery of useful materials and energy from residual waste, and accordingly suggests thermal treatment with energy recovery as the preferred option followed by mechanical biological treatment with energy recovery and with mechanical biological treatment of fully stabilised residue to landfill as a last resort".*

More importantly, the Action Plan introduced financial support for the renewable portion of energy from waste-to-energy plants via the Renewable Energy Feed-In Tariff (REFIT) scheme, to assist the development of waste-to-energy projects.