

Municipal Solid Waste Policy



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1. Summary & Key Points

Ireland is behind the curve with regard to how it handles its Municipal Solid Waste (MSW). This policy document provides an outline plan to address the key issues that Ireland faces with regards to its management, capture and disposal of MSW. Currently Ireland landfills more waste and recycles less than the EU average. There is insufficient infrastructure to deal with the waste which is not landfilled. Subsequently, much of Ireland's waste is exported for recycling or energy recovery (incineration) overseas, which wastes Irish material and economic resources as well as the potential for new jobs. There are a range of measures which can be implemented, across all stages of the Waste Hierarchy, which prevent waste from being disposed of in landfill. The Green Party will ensure that Ireland's MSW industry becomes a byword for innovation, cutting edge technology and environmentally friendly solutions.

- At present Ireland sends over 700,000 tonnes of waste to landfill each year. Throughout the developed world landfill is now being recognised as 'last resort' option for waste disposal. Landfill not only results in the medium term loss of otherwise available land, but also promotes the burial of a product in an unsustainable manner for future generations to deal with. Much of this waste could be prevented, reused, recycled or composted. Landfill must be reduced to as close to zero as possible;
- There are a wide range of changes which need to be made to the methods in which Ireland handles MSW. Regional waste plans are not the right mechanism to deal with this. This approach results in a lack of national continuity and promotes confusion between regions. Many of the required changes must be implemented on a national basis, in a governing policy which specifies operational methods, not just regulations. Furthermore, regional entities do not have the resources or power to implement many of the changes in this policy document, particularly those which focus on financial instruments such as levies;
- The disposable society which has developed in Ireland is not sustainable. Ireland shall move towards a Circular Economy model;
- It is the intention of the Green Party to periodically reduce the amount of waste not only generated in Ireland, but also increase the percentage of waste diverted from landfill, eventually reaching Zero Waste To Landfill by 2030. It is felt that if the below points are implemented a periodic reduction could be achieved. These are noted in Table 1;
- Ireland must implement at least a 75% recycling and composting target by 2030. Austria has already achieved 63% and Germany has achieved 62%. The Green Party estimates there is the potential to create 4,500 jobs through increased recycling;
- Ireland shall invest in the development of facilities to promote a self-sufficient waste infrastructure;

- Ireland shall aim to reduce biodegradable waste to landfill to 0% by the year 2035. A carbon budget shall be included in all energy recovery projects to prove that the proposed installations will reduce greenhouse gas emissions. A carbon tax shall be applied to these projects to encourage low carbon solutions;
- The landfill levy should continue to increase. It has been effective at diverting waste from Ireland's landfills;
- An incineration levy, based on GHG and non-GHG pollutant emissions, should be implemented. This also applies to technologies such as MBT, pyrolysis, gasification and other waste treatment processes;
- With regard to incineration, waste management legislation should be amended forthwith to prohibit and criminalise the intentional incineration of household and commercial waste which is suitable for recycling and has been separated with this intention, implicit or explicit.
- The waste sector is one with insufficient investment, both in technology and education. The Green Party want Ireland to become a leader in this sector, so that this major environmental problem can be addressed and so that Ireland can export its expertise to help other countries combat this issue. Steps should be taken to build expertise in this field, both by sponsoring post-graduate programmes and by incentivising the construction of public private partnership waste processing facilities, particularly those with innovative technologies;
- As well as high level ideas for Ireland's waste sector, a range of specific ideas are included to improve the efficacy of each step of the EU Waste Hierarchy in the discursive section of this document. There are too many ideas to list in this summary;
- Waste exports shall be minimised;
- A ban shall be introduced to prevent supermarkets from wasting edible food;
- Introduce a ban on the sale of products containing plastic microbeads;
- A National Battery Association shall be developed to ensure battery and accumulator targets are met. These targets are currently on course to be breached;
- Ensure that all households pay by weight on black bin waste (residual waste which is not placed in the compost or recycling bin). This payment structure must link to family size, so that large families are not unfairly impacted;

- Entry to civic amenity sites for separated waste disposal should be free;
- A task force shall be set up to establish what infrastructure needs to be set up and what changes manufacturers must make in order to meet EU End of Life Vehicle legislation. These targets are currently on course to be breached;
- The Green Party has long stated its opposition to the Poolbeg Incinerator. Since this project seems to be going ahead regardless, the Green Party has the following recommendations:
 - The proposed incinerator is too large and will either run under capacity or will encourage the transport of MSW from a very wide catchment area to Dublin city. Green Party calculations conclude that the incinerator is at least twice as large as it should be and recommend that the facility capacity is revisited.
 - District heating must be part of the incinerator project design. The government are responsible for ensuring that this distribution network is developed and anchor users are signed up.
 - The current proposals are that there is no separation of the waste prior to incineration. Green Party calculations conclude that it would be economically viable and more efficient to separate metals from the waste before it is incinerated.
 - The bottom ash produced from the incinerator should be reused for construction or other activities, rather than landfilled.
 - It must be shown that the incinerator project will lead to an overall reduction in greenhouse gas emissions, in comparison to a modern landfill complete with gas capture.
 - Transport of waste to and from the incinerator must not have a deleterious effect on the local residents. Dedicated roads should be considered.
- A new incinerator is proposed in Ringaskiddy. This project should be cancelled immediately. Another incinerator does not fit into a progressive approach to Ireland's waste. The ESRI predicted in 2012 that there would be a 33% increase in MSW generation by 2030. The Green Party goal is to achieve 75% recycling by 2030. Even if recycling levels only reach 70% by 2030, that would leave approximately 830,000 tonnes of waste which is not recycled. The Poolbeg Incinerator has a capacity of 600,000 tonnes of waste per annum. Carranstown Incinerator has had its capacity increased to 220,000 tonnes of waste per annum, giving a national incineration capacity of 820,000 tonnes per annum. These figures lead the Green Party to conclude that the Ringaskiddy incinerator would either be fed with imported waste or with waste which would otherwise be recycled;

Table 1: Key Performance Indicators (KPI's) for Ireland Waste Management

| Key Performance Indicator | 2012 Baseline | 2025 Target | 2030 Target | 2030 Stretch Target |
|------------------------------------|----------------------|--------------------|--------------------|----------------------------|
| Organic Waste Diversion | 6% | 50% | 70% | 100% |
| Recycling Waste Captured | 33% | 70% | 75% | 90% |
| Recycling Reprocessed in Ireland | Unknown | 20% | 50% | 60% |
| Total Waste Diverted From Landfill | 60%* | 60% | 100% | N/A |

*currently this figure includes waste exported

Ireland must set out a national goal to reach Zero Waste to Landfill, with periodic and realistic targets. At present the rest of Europe and a number of other countries are moving ahead of Ireland by setting out measurable diversion rates. Ireland must act fast to catch up with the environmental standards of our European neighbours and to ensure that we develop a cutting edge waste infrastructure. Furthermore, with Europe gradually closing its landfills, overseas disposal for Ireland will increase in cost. This in turn will compound our economic troubles rather than embrace opportunities.

2. Policy

This section describes the structure for published policy and the administrative information that should be maintained. This should be composed of four major sections as follows:-

2.1. Introduction

A fundamental part of our Green way of thinking is that we can't throw away our rubbish. This is firstly because, in nature, there is no such thing as rubbish - all the "waste products" from one process are actually the resources needed for another. The second reason is that there is no such place as "away" - if we want to get rid of something, the only place we can put it is our own home planet.

In our industrially based society, however, we have achieved the feat (or made the mistake) of producing things that really are useless, or become useless after having been used once, and have created a whole industry out of dealing with this unnatural situation. We call it the "waste management industry".

Conventional waste management policies concern themselves with the regulation of the waste management industry, and with ways to make its operation more compatible with environmental protection and less damaging to human health.

A Green strategy on waste needs to be far broader than this. We need to consider all stages beginning with consumption and the design of products, and ending with the non-creation of "residual waste".

Consumption and design: The best way to deal with waste is not to create it in the first place, so the first point of a Green waste strategy needs to deal with the avoidance of waste, by reduced consumption, and by intelligent design of products so that after use they remain useful (by being easy to re-use or recycle). Packaging needs to be avoided or minimised, and also designed for easy re-use or recycling.

Re-sale, re-use and recycling: Once items have been used and "thrown away" (i.e. made available for re-use or recycling), we need efficient ways to manage re-sale, re-use and recycling so that as little as possible is wasted, and that minimal amounts of energy and natural resources are used in order to make new products or materials from old ones. Examples here would include development of a second-hand economy, use of returnable and re-usable containers, thorough separation of what is "thrown away" so that material is available in its pure form (e.g. we don't mix polythene with PET), recycling of everything that can be recycled (where feasible, in Ireland, or overseas where that is genuinely a better choice), and the development of markets for recycled products.

Recovery: When it is impossible to re-sell, re-use or recycle items or materials that are "thrown away", we need to recover as much as possible that is useful from them, with as little environmental

damage as possible. Examples include anaerobic digestion of “organic waste” with methane recovery, or aerobic/worm composting (at home where possible) to avoid generating methane; both of these preserve the value of the organic material and are superior to burning it.

Residual waste: A Green waste strategy would have a target of zero residual waste. If residual waste exists, it indicates that something is not working and a problem needs to be solved.

The present policy is a practical interim stage in achieving a Green waste strategy. We will not dissolve the widespread addiction to consumerism overnight. We will not be able to immediately change the design of all the things we use in our daily lives: many of these are imported and can only be changed by working on an international level. Packaging of indigenous products, or those produced for the Irish market, will be an easier nut to crack. We can't create in a single step the re-sale, re-use and recycling economy that we need. And so on. Achieving zero residual waste is a process for decades.

To begin with, we need to work with the existing waste management industry in rigorously minimising the creation of residual waste, and in dealing with it in the least damaging ways that are possible. The present policy is a thoroughly worked out and evidence-based approach to achieving that initial goal, as a step on the way towards our long-term aim of creating the kind of Green waste strategy outlined above.

2.1.1. Vision Statement

One of the world's great environmental problems is the production and subsequent disposal of solid waste. The majority of this waste in Ireland is landfilled or exported for recycling and recovery. This landfilled waste creates a terrible legacy for our children, with hundreds of thousands of tonnes of waste buried indefinitely each year. That landfilled waste forms a toxic cocktail of substances and is an environmental problem that will someday have to be addressed. The Green Party do not accept that this problem is left for future generations to solve. Similarly, exporting our waste for recycling and recovery means that we are exporting potential resources as well as jobs. The Green Party's goal is to bring Ireland away from the current destructive linear society towards a sustainable circular economy.

2.1.2. Principles

- The core principle is sustainability. Ireland needs to manage its waste in a manner which does not leave an environmental problem for future generations to solve.
- Ireland must be self-sufficient in managing its waste. Waste exports for recycling and recovery must be minimised.
- The Waste Hierarchy shall be adhered to. This hierarchy prioritises waste management solutions in the following order:
 - Prevention

- Reuse
- Recycling
- Recovery
- Disposal
- MSW is a source of greenhouse gases, both in its production and in its subsequent disposal. Greenhouse gases must be mitigated.
- MSW is a source of numerous pollutants to our soil, water and air, which pose risks to human health and our natural environment. These must be mitigated.

2.2. Policy Details

2.2.1. Self-sufficiency

Self-sufficiency is a term often used with no real explanation of its meaning, implementation or actual implications. Regarding MSW in Ireland, self-sufficiency is quite easy to explain. Currently we are exporting a product at cost and importing other products at cost. This results in a loss of industrial investors, job opportunities and overall market development. Self-sufficiency in Ireland can be achieved through breaking this practice, reducing the amount of recycling we export and investing in known methods to recover, process and develop a material into product. Table 1 sets out targets to follow, and below are examples of how to achieve them. It is envisaged that if this policy is implemented a number of tenders will be developed to support the understanding of the current waste market, its downfalls and potential areas of investment.

34% of Irish MSW was exported for recycling and energy recovery (incineration) in 2012 [1]. Through capturing materials in Ireland there are numerous opportunities to create jobs not only in the waste sector, but also through the development of industry. The Green Party estimates there is the potential to create 4,500 jobs through increased recycling.

Ireland must work to develop recycling and reuse facilities to reduce waste exports and landfill to the lowest feasible levels. This will subsequently reduce Ireland's imports of recycled material as product and imports of fossil fuels. Over half of the MSW that Ireland recycles and recovers is exported because Ireland does not have the infrastructure to deal with it. It should be noted that as per the open access policy details section, there is already more than enough incineration capacity in Ireland.

2.2.2. Innovation

The production of MSW poses a major environmental problem worldwide. Ireland alone landfills over 700,000 tonnes of MSW each year. The biodegradable portion of this waste will mostly degrade anaerobically, producing the greenhouse gas methane, and the non-biodegradable portion of this waste such as plastics, ceramics and metals will simply stay buried in the soil. The burial of this waste has been and still is the solution many countries have chosen, leaving a terrible environmental legacy for future generations to solve.

The EU approach to this was to establish the following waste hierarchy:

- Prevention
- Preparing for re-use
- Recycling
- Other Recovery
- Disposal

Irish waste management approaches and applied technologies do not satisfactorily address any of the steps in the EU waste hierarchy. Prevention is stymied by our increasingly disposable consumer society. Ireland's recycling is below the EU average despite being a country known for its high technology sector.

The solution to Ireland's (and the world's) MSW crisis will encompass hundreds of changes in how we live today. That will include what materials we manufacture products from, how we collect waste, how we recover energy and a range of other changes big and small. Ireland must invest in research and technologies to ensure that the waste hierarchy is properly applied. Masters and PhD level students will be sponsored to ensure that students and universities develop expertise in the MSW field across all steps of the waste hierarchy, as well as other aspects of waste management.

Similarly, the private industry will be incentivised to build recycling, material sorting and alternative waste processing facilities such as bio-refinery plants, by means of economic instruments such as low interest government loans and tax relief for innovative MSW facilities. By encouraging technological development in this sector, jobs will be created and the Irish companies, engineers and scientists will develop expertise which will be in demand across the globe.

Combined with an innovative approach will be the application of legislation, benchmarked against countries which are environmental leaders. Innovation can only work if we ensure it is managed in the correct manner. This will see the maintenance, enforcement and development of legislation to support the changing waste management sector in Ireland.

The Green Party proposes that our generation is the one to solve this problem and that work begins now.

2.2.3. Circular Economy

At present in Ireland we operate in a predominantly linear manner regarding waste management, and the waste economy. There are aspects of the market that are not entirely linear, but as a whole, Ireland operates with the concept of 'make, use, destroy'. This is a counter-active approach to the formation of a sustainable economy. The path that goods take from cradle to grave is littered with opportunities for financial gains, which Ireland is currently not exploiting. These financial gains could be used to drive the market to become more environmentally sustainable.

The Green Party strive to gradually move Ireland from a linear economy to a circular one. This will be done by developing a stronger recovery industry, reducing imported goods, and developing an associated manufacturing industry. The materials industry needs to develop products from what we call waste, which we currently export, burn or bury. Figure 1 below gives more detail of the opportunities in a circular economy. The current linear economy can be seen down the centre of the image (credit: Ellen MacArthur Foundation).

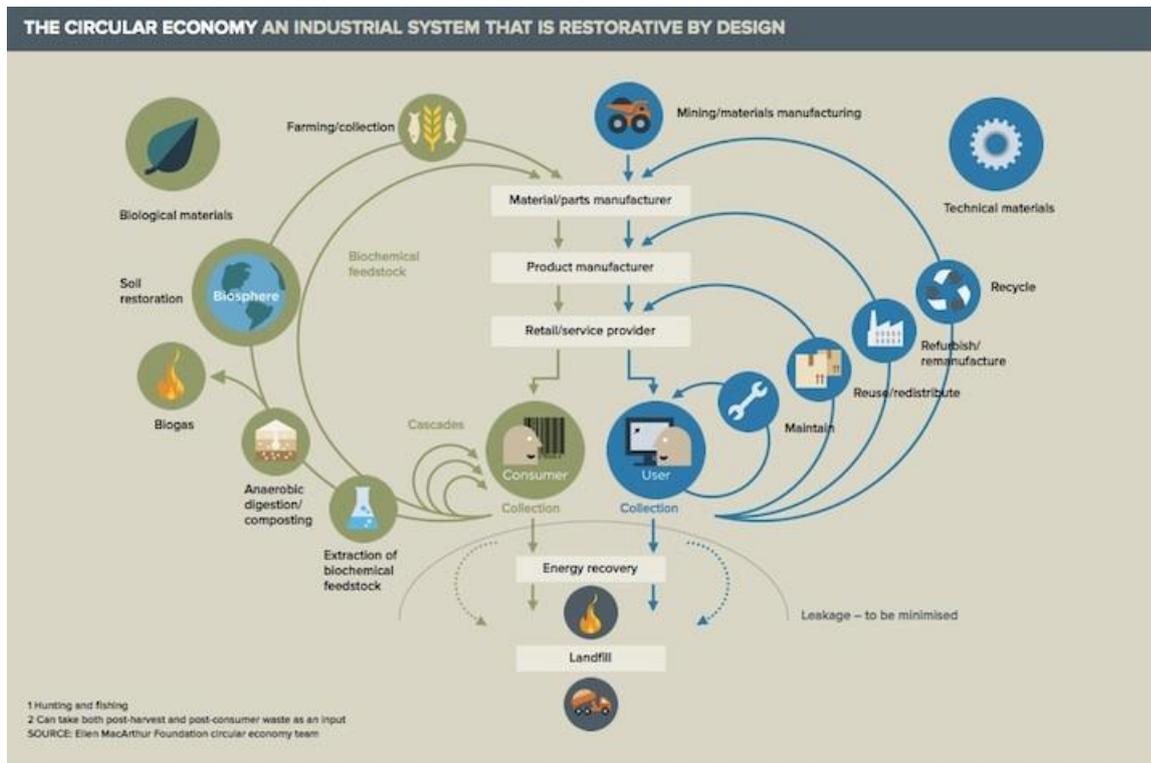


Figure 1 Circular Economy

2.2.4. Landfill Reclamation

Decades of burying waste has resulted in a significant environmental problem across the world. Aside from the short and medium term problems of GHG emissions, leachate contamination of groundwater and waste of land, there is a longer term problem: large quantities of waste which is at best not going to degrade over any realistic time frame and at worst waste which is highly toxic. One solution to this problem is landfill reclamation (also known as landfill mining), where the contents of existing landfills are extracted for resources, such as metals. This approach is fraught with difficulties, not least the health and environmental hazards associated with disturbing existing landfills and the impact on those living near them. While the Green Party favours landfill mining in principle, the present state of the art is not at a stage where it can be done without serious adverse consequences. We therefore propose support for the development of landfill mining technologies that may in future allow it to be done safely, and for the full range of resources contained in landfills to be extracted for use.

As part of the Green Party's innovation initiative, students and universities will be supported so as to develop expertise in the area of landfill reclamation. Landfill Reclamation is an area where Ireland will later export its expertise, as this is a global sustainability issue. The Green Party advocates beginning with small scale reclamation projects. One of the goals of these projects is to ascertain the potential impacts of landfill reclamation on surrounding inhabitants in terms of noise, traffic, labour, equipment required, etc. Landfill reclamation must be implemented with minimal impact on local residents.

Note that landfill reclamation is considered a remediation measure for existing landfills. It should not be factored in to support a decision to build a new landfill. The Green Party's goal is to reduce landfill use to Zero by 2030.

2.2.5. The Waste Hierarchy

The above approaches are expected to drive innovation at all steps of the waste hierarchy. The Green Party will do whatever they can to help in this process. Some specific ideas for each level in the waste hierarchy are listed below. The below proposals should be continually reviewed against the Key Performance Indicators, to confirm that they are effective in meeting the KPIs.

Prevention

Prevention shall be built into the product manufacturing life cycle. The Green Party will seek to ensure procurement of materials in construction projects is done so in a manner to reduce waste generation, whereby a percentage of all material is from a recycled source or from a sustainable initiative. This would see the need for Site Waste Management Plans in any development over €300,000. Furthermore, the Green Party will seek to include Operational Procurement Plans in all planning application for large retail units. This will reduce put the onus on the producer to reduce onsite waste generation, and not the consumer. Some specific waste prevention proposals are listed below:

- The plastic bag levy is one of Ireland's environmental success stories. This approach should be broadened to levies on a range of disposable items such as coffee cups and plastic bottles. Many disposable items could be replaced by reusable versions, but consumers currently have no incentive to do this.
- Consideration should be given also to incentives that reward positive behaviour beyond simple levies, which may be perceived negatively as yet another 'green tax'
- The landfill levy has clearly been successful at driving down landfill rates and encouraging processing by other methods higher up the waste hierarchy. The Green Party recommend that the levy continues to rise so that this positive trend continues.
- Public water dispensing stations shall provide low cost water to users who bring their own bottles. This water will be sold for a fraction of the price of bottled water.

- Customers shall be given the option of getting a receipt for small purchases (e.g. < €15). Many of these small purchases are for items which would never be returned, so the receipts are merely waste paper.
- The feasibility of an electronic receipts card shall be assessed, so that consumers can log their receipts on a database using a card, rather than receiving a paper version. This will help reduce paper waste while helping consumers to avoid losing receipts.
- One third of food produced is wasted. Information programmes shall be introduced to help consumers and businesses to reduce food wastage. A ban shall be introduced to prevent supermarkets from wasting edible food.

Preparation for Re-Use

Encouraging re-use is a challenge in modern society which is increasingly disposable, where high cost, complex items like computers, smartphones and tablets become obsolete within years. The Green Party will take several measures to encourage re-use:

- Support movements like Repair Café which help people to repair broken or damaged items rather than discard them, both with pop-up café events and internet resources.
- The UK based Restart Project seeks to reduce the tendency of consumers to dispose of electronic equipment rather than repair it. The project arranges events where consumers can learn how to repair maintain electronic equipment.
- Developing and promoting incentives online to re-use unwanted equipment on a national and regional basis.
- Ensure that appliances can be repaired (e.g. by a levy on appliances that don't meet reparability standards), and that spare parts are made available (which could easily be made obligatory).
- Obligation on the retailer to facilitate repair for appliances that they sell (possibly by organising transport to the company's repair centre), which could be charged to the customer at a reasonable cost price.

Recycling

Ireland's recycling rate of 40% is below the EU average of 42%. Ireland must target at least a 65% recycling rate by 2030 in line with EU targets announced in 2016, although the Green Party recommends a 75% target with a 90% stretch target. As of 2012, 34% of Irish MSW was being exported for recycling and energy recovery. Unless reuse and recycling infrastructure are put in place now, these exports will only increase.

Closing The Gate: The Green Party will investigate the current import costs for recycled material and compare these against the financial and environmental gains of developing a local industry for these goods. In cases where clear gains can be made an implementation plan will be developed to reduce the imported goods over a period of time while developing industry to produce these goods in Ireland (e.g. plastic piping, packaging material, white goods, casing, etc.)

A focus must be put on separation at source. One of the most high value forms of waste which is currently sent to landfill is metals. Over 38,000 tonnes of metals were landfilled in 2012 [1]. This is a waste of a valuable resource, is a form of waste which will not properly degrade over any timeframe in a landfill and provides little calorific value in energy recovery [3]. Green Party calculations show that this metal would have a value of over €30M even after allowing for the cost of reprocessing. Like with many other waste materials, the issue with metals is that it is difficult for consumers to recycle them, unless they travel to a waste recycling facility and pay to access the facility. This is unlikely to happen except for large quantities of waste metals, which are not frequently generated by consumers. Metal bring banks shall be rolled out across the country and a feasibility study shall be prepared in conjunction with waste collection companies to establish the potential for capturing metals with other recyclables.

- A major barrier to recycling is the time householders spend separating materials, rinsing out packaging, etc. Studies have shown that information campaigns which communicate the benefit of recycling lead to much greater recycling levels by consumers. Paper based communication campaigns shall be avoided with preference given to social media, TV, radio and similar communication avenues.
- The effort and intention of consumers in recycling their waste should be respected. Therefore, waste management legislation should be amended forthwith to prohibit and criminalise the intentional incineration of household and commercial waste which is suitable for recycling and has been separated with this intention, implicit or explicit.
- As per the EPA's 2012 National Waste Report, Ireland is at risk of missing the 45% 2016 collection target for batteries, as this figure was at 28% in 2012. The 45% target is mandated in EU directive 2006/66/EC. The battery collection rate fell from 29% in 2011. Batteries contain extremely toxic substances such as lead which contaminates the wider landfill and inhibits reuse, so they should be diverted from landfill as much as possible. A National Battery Association shall be formed to ensure that battery producing and using industries work together to meet and exceed EU targets. Some approaches this association could implement include:
 - Random inspections shall be made to confirm that consumers are putting the right waste in the right bins (black, green or brown).
 - Fines shall be associated with disposing of batteries in any bin other than a specific battery recycling bin.

- Batteries shall include a deposit in their retail price. This deposit can be recovered when the batteries are brought to a retailer such as an electrical goods retailer.
- Implement pay by weight on all black bin waste and ensure consumers have a 3 bin collection service.
- Approximately 5% of waste sent to landfill is glass. This will not degrade in landfill, has little calorific value in energy recovery and is a material which can be recycled. Glass bottles shall include a deposit charge (propose € 0.05) to encourage consumers to return these. Automated glass bottle recycling machines are used for this purpose (e.g. for crates of beer bottles in supermarkets in The Netherlands).
- Plastics make up about 15% of waste sent to landfill and take hundreds of years to degrade. These materials should be either recycled or recovered for energy (either directly or by conversion to bio-oils and biogas). Plastics are useful, but poor disposal leads to a huge environmental problem. This problem is particularly affecting our seas and oceans. The Green Party maintain that the government should set up a task force to ensure that waste plastics released to the environment are minimised. This team will ensure that the full plastic life cycle is addressed by all manufacturers. For example beauty product manufacturers are free to use products containing plastic beads, which are then flushed down the drain and end up in the sea. Similarly manufacturers can use plastic materials which are very hard to recycle without any thought to the downstream consequences.
- Approximately 18% of waste sent to landfill is paper and cardboard. Most of this could be recycled or home composted.
- Textiles are partly biodegradable and partly non-biodegradable. So like nappies, they pose a particular problem in that landfilling them will lead to methane emissions, whereas composting them will result in contaminated compost. Approximately 10% of MSW sent to landfill is composed of textiles. Charity campaigns for clothing and textile recycling should be supported by government with respect to awareness. Not all textiles or clothing are suitable for resale by charity, so this alternative bring bank would allow consumers to dispose of these items. They could then be processed by a means other than landfill such as recycling or waste to energy. Waste collection services should also allow for monthly collection of waste textiles.
- Approximately 40% of the waste from street bins could be placed in a green recycling bin (this increases to over 50% if there are bins to place glass and metals in). At a minimum, street bins shall be accompanied by a recycling bin, similar to the black (residual waste) and green bins (recyclables) for home collection.

Recovery

Recovery is less preferable than prevention, reuse or recycling, but it is far preferable over disposal to landfill. Recovery is where waste serves a useful purpose by replacing another material which would have otherwise been used. Recovery options do not include incineration, because the evidence that incinerators with energy recovery reach their efficiency targets is lacking¹.

- Biodegradable waste is responsible for a large proportion of the emissions from landfill sites due to associated methane emissions. Biodegradable waste to landfill must be minimised.
- Approximately 20% of MSW sent to landfill is composed of garden waste and organics. There is sufficient demand in Ireland for overall compost production to triple on a national basis, so any moves to increase compost production are welcome [8]. Multiple drives shall aim to reduce garden and organic wastes to landfill.
 - To encourage home composting: Free composting classes will be offered in communities and home composting literature shall be freely available from government sources. Existing government programmes are not well publicised.
 - Many apartment complexes do not have a brown bin (compostables) collection service. This forces apartment dwellers to put their compostable waste in the black bin. Communal composting facilities shall be developed and brown bin collections rolled out to apartment complexes.
 - Businesses will be encouraged to transition from a two bin to a three bin collection. Companies which produce a lot of biodegradable waste will be encouraged to develop their own composting facilities. Proposed mechanism is grants for composting, anaerobic digestion or other similar technologies.
- Approximately 5% of the MSW sent to landfill is composed of nappies. A levy (similar to plastic bag levy) will be applied to non-compostable nappies, so as to encourage consumer behaviour. Compostable nappies will be allowed in brown bin collections. This levy will also encourage the use of reusable nappies. Additionally, a subsidy should be offered to collection/washing services for reusable cloth nappies. Such services have operated successfully in Germany, offering equivalent convenience to disposable nappies without generating waste.

¹ Report on the impact of R1 climate correction factor on the Waste-to-Energy (WtE) plants based on data provided by Member States, European Commission Joint Research Centre, Institute for Energy and Transport, Ispra, Italy, 2014. Available at: http://iet.jrc.ec.europa.eu/renea/sites/renea/files/r1reportfinal_online.pdf

Technical Briefing for EEB. The energy efficiency formula of annex II of the Waste Framework Directive: a critical review, C. Tebert, Ökopoll GmbH, 2005, Available at: <http://www.eeb.org/?LinkServID=80CE77AB-FFB6-C8ED-2F6C6D3367416C09&showMeta=0>

- Almost 10% of MSW sent to landfill is composed of fines. Much of this could be processed differently. For example, the contents of a home vacuum bag could be emptied into a compost heap rather than into the black bin.
- Composting facilities shall be designed to minimise the release of short lived climate pollutants such as nitrous oxide and methane. The Irish Government joined the UN Climate and Clean Air Coalition in 2013, but there has been little sign of measures to reduce short lived climate pollutants (SLCPs). The measures in this policy document would have to reduce SLCPs.
- All possible recovery technologies must be considered: Mechanical and Biological Treatment (MBT), bio-refineries, anaerobic digestion, composting and any other innovative technologies.
- Traffic management must be considered. Many proposed energy recovery systems such as incinerators are far too large, which leads to transport greenhouse gas emissions for waste transported from across the country and overburdens roads for local residents.

Disposal

Disposal is the last resort option for solid waste. It is used as a solution only where it is not practical to process the waste by a method higher up in the waste hierarchy.

- All new landfills must be fitted with gas capture to catch escaping methane, as per Statutory Instrument 185/2000. The Waste Operator is given the option of flaring or recovery of the landfill gas. Ideally the combusted methane will be used to generate electricity rather than flared, so the operator shall be incentivised accordingly, by feed in tariffs or similar.
- Landfill gas control is considered with respect to methane, a GHG about 20 times more potent than carbon dioxide. Little consideration is given to nitrous oxide, a GHG about 300 times more potent than carbon dioxide. All landfills will be required to monitor and log nitrous oxide emissions within two years. This information will be collected and used to establish nitrous oxide emission limits, so that measures are taken to reduce these emissions.
- Existing landfills are to have gas capture technologies installed, unless it is determined that there is little environmental benefit (e.g. an old landfill where most of the waste has biostabilised with little remaining methane to be generated).

2.2.6. Other Waste Streams

Hazardous Waste

Almost half (48%) of the hazardous waste generated in Ireland is exported for recovery. Ireland must work to reduce the amount of hazardous waste generated (e.g. by increased solvent recovery) and work to manage its own hazardous waste. Hazardous waste exports shall be given a national target of as close to zero as reasonably practicable. Hazardous waste generation should be minimised. Where hazardous waste is generated, it should be reprocessed or destroyed at the generation site, where possible. The construction of processing facilities to deal with residual hazardous waste shall be supported, rather than have this waste exported.

End of Life Vehicles

Ireland has struggled to comply with End of Life Vehicles Directive 2000/53/EC and only met 2006 targets in 2012. More stringent targets are being implemented from January 2015, which Ireland is unlikely to meet. An action plan is required to meet these more stringent targets, especially since the EU Persistent Organic Pollutants Regulation will prevent some ELV materials (such as foams or plastics) from being recycled in the future [15]. It is recommended that a task force is established to determine what infrastructure is required to meet these targets and what changes are required from car manufacturers.

Waste Tyres

Almost 10,000 tonnes of waste tyres were exported for energy recovery, recycling or reuse in 2012. These exports should be reduced to zero. Where required, new infrastructure shall be developed. As per the waste hierarchy, preference shall be given to reuse and recycling. Waste tyres which cannot be recycled or reused shall be used as Refuse Derived Fuel (RDF) in a cement facility or similar, where such tyres can typically be used to displace up to 30% of the fossil fuels used [11].

ENDS

3. References / Bibliography

- [1] F. McCoolle, I. Kurz, J. Reilly, H. Searson, E. Cotter and D. O'Neill, "National waste report 2012," EPA, Ireland, 2014.
- [2] F. McCoolle, I. Kurz, M. McDonagh, D. O'Neill and J. Derham, "National waste report 2011," EPA, Ireland, 2013.
- [3] A. Damgaard, A. W. Larsen and T. H. Christensen, "Recycling of metals: accounting of greenhouse gases and global warming contributions," *Waste Management & Research*, vol. 27, pp. 773-780, November 01, 2009.
- [4] S. Mühle, I. Balsam and C. R. Cheeseman, "Comparison of carbon emissions associated with municipal solid waste management in Germany and the UK," *Resour. Conserv. Recycling*, vol. 54, pp. 793-801, 9, 2010.
- [5] T. Jamsb and R. Nepal, "Issues and options in waste management: A social cost-benefit analysis of waste-to-energy in the UK," *Resour. Conserv. Recycling*, vol. 54, pp. 1341-1352, 10, 2010.
- [6] A. Papageorgiou, J. R. Barton and A. Karagiannidis, "Assessment of the greenhouse effect impact of technologies used for energy recovery from municipal waste: A case for England," *J. Environ. Manage.*, vol. 90, pp. 2999-3012, 7, 2009.
- [7] M. Herczeg, "Municipal waste management in Austria," European Environment Agency, 2013.
- [8] "Market report on irish organic waste management and compost use," rx3, Ireland, 2012.
- [9] D. J. Hayes, S. Fitzpatrick, M. H. B. Hayes and J. R. H. Ross, *Biorefineries - Industrial Processes and Products*. Germany: Wiley-VCH, 2010.
- [10] N. H. M. Yasin, T. Mumtaz, M. A. Hassan and N. Abd Rahman, "Food waste and food processing waste for biohydrogen production: A review," *J. Environ. Manage.*, vol. 130, pp. 375-385, 11/30, 2013.
- [11] A. Corti and L. Lombardi, "End life tyres: Alternative final disposal processes compared by LCA," *Energy*, vol. 29, pp. 2089-2108, 0, 2004.
- [12] R. Campbell, J. Moriarty, J. Derham, O. Gaillot and U. Fitzgerald, "Protocol for the evaluation of biodegradable municipal waste sent to landfill," EPA, Ireland, 2011.
- [13] F. Amlinger, S. Peyr and C. Cuhls, "Green house gas emissions from composting and mechanical biological treatment," *Waste Management & Research*, vol. 26, pp. 47-60, February 01, 2008.
- [14] "Technical report for end-of-waste criteria on biodegradable waste subject to biological treatment (draft - work in progress)," IPTS, JRC, Seville, Spain, 11 Oct 2011.
- [15] "National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants," EPA, Ireland, 2012.
- [16] Eunomia (2009) International Review of Waste Management Policy, UK.
- [17] ESRI (2010) An Economic Approach to Waste Management in Ireland.