



**NUI MAYNOOTH**  
Ollscoil na hÉireann Mí Bhaile

**'Incineration: A burning issue or a load of rubbish?'**

**Examining public attitudes to municipal solid waste  
incineration**

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## ***Abstract***

*The author set out to investigate public attitudes to municipal solid waste (MSW) incineration. The area chosen for the study was Carlow town, a regional town in County Carlow, Ireland. A public questionnaire survey was carried out among local residents. Interviews were also carried out with local councillors to provide a different perspective on the matter. The aims were to investigate local attitudes towards MSW incineration. The author investigated the public's acceptance of this method of waste disposal for the region in the future, and highlighted the public's preferences for waste management strategies for the region. The author also wanted to investigate the role of the media in shaping people's perceptions about incineration. Results showed that there was a general acceptance of the introduction of incineration as a method of waste disposal among respondents. There were significant differences in attitudes depending on gender and age. Men were more likely to opt for incineration than women were. Older respondents were more likely to choose incineration over other forms of waste disposal options. The youngest age group people in general were more likely to opt for recycling than any other age group. Most respondents preferred incineration to landfill as a method of waste disposal. Of the respondents who suggested disadvantages many thought the negative aspects were to do with smell and dioxins. Of those that mentioned advantages to incineration, many thought it would require less space than landfill and would be cleaner. The media it seems provided too much negative information on the topic. Although many respondents thought incineration was a good idea, a large proportion of respondents could not decide if they would agree to the construction of an incinerator in the town.*

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## Introduction

The introduction of thermal treatment marks the next step in Irelands attempts to tackle the waste crisis. Traditionally, Ireland relied on landfill as its main method of waste disposal. It is one of the only Countries in Europe to send over 80% of municipal waste to landfill every year. Ireland currently produces 777kg of waste per person, which is one of the highest levels in Europe (Forfas, 2006,). The lack of available land and the rising cost of land filling, is partly due to the privatisation of waste management, and partly due to the introduction of levies applied per tonne of waste. Rising costs and lack of available land has meant that it is no longer an economically viable option in Ireland. The number of landfills in Ireland has also reduced from 130 to 50 due to increasing waste volumes and pressure to move away from landfill, which has resulted in the creation of so called '*superdumps*', in an attempt to regionalise waste management. Local authorities have all produced regional waste management plans, which aim to take an integrated approach to waste management planning into action. The *integrated approach* is considered to be the most sustainable approach to waste management by most local authorities as it utilizes many different approaches to waste management, rather than relying on one method (such as landfill). Most of Irelands regional waste management plans, aim to increase recycling rates, reduce the reliance on landfill, and divert a higher proportion of biodegradable waste away from landfill. The integrated approach also includes plans to adopt thermal treatment as a method of waste disposal.

The introduction of thermal treatment into future waste management plans is already a politically contentious issue, and has received much opposition from the public in

areas where locations for thermal treatment plants have already been identified. Most people would be familiar with public protests, which occurred in Ringaskiddy Co. Cork, Duleek, Co. Meath, and in Galway where plans to construct a municipal solid waste incinerator were halted after it sparked outrage among local residents who revolted by organising large public demonstrations. Public opposition to unwanted land uses such as a thermal treatment plant is typically termed *NIMBYism* (not in my back yard ism). This refers to the person or persons who are opposed to what is often called a *LULU* (locally unwanted land use), which may affect their community. Other terms have recently been developed including *NOTE* (not over there either), which refers to people who oppose developments that are not in proximity to their home or community but who choose to protest against a development for other reasons. Active 'nimbyists' can obstruct developments such as the construction of a thermal treatment plant, and halt development plans altogether in some cases. What drives 'nimbyists' to oppose the building of an incinerator are beliefs about the dangers associated with dioxin and furin emissions, health fears, possibility of falling house prices, and environmental damage. Most of the fears displayed by 'nimbyists' are greatly exaggerated and do not stand up to scientific evidence in many cases. The underlying issue is the location of the development and the effects it may have on the immediate community. The NIMBY concept is alive in Ireland at the moment due to the planned construction of thermal treatment plants.

There are many other terms, which are used in the language of waste management. 'Thermal treatment' describes the physically controlled process of treating waste using different methods of burning. There are many different types of thermal treatment technology available, including waste to energy, which generates electricity.

'Municipal' waste refers to non-hazardous waste, which is produced commercially (by businesses) and by householders. *Hazardous waste* is waste, which results from processes carried out in the chemical and industrial sectors and will not be dealt with in this study.

'MSW (municipal solid waste) incineration' describes the thermal treatment of household and commercial waste. Waste to energy is the preferred path, which Ireland is choosing to take, to ensure that resources can be used to their full potential and to ensure the availability of renewable energy sources for the future. The word 'incineration' generally describes burning of any kind of waste but the public generally uses this term to describe MSW incineration. The term 'incineration' will be used throughout this study, although the term 'thermal treatment' may also be used in certain areas, but both refer to the same process.

The attitude to incineration in Ireland has bordered on hysteria in some cases. The author set out to examine local attitudes to and local perceptions of incineration. The main aim was to discover what the public's main attitudes to incineration are, what factors (if any) shape these attitudes (ie the role of the media), and how these issues are shaped by factors such as gender, age and length of residence in the area. The author wanted to gain an insight both from the public and from public representatives on the subject of incineration from a regional Irish town, which is dealing with its own waste crisis and may indeed present a location in the future for a thermal treatment plant.

Chapter one includes a literature review, which contains a section dealing with background to incineration, part two deals with National policies, which have shaped contemporary Irish waste management strategies. Chapter two presents the

methodology used in conducting the primary research and the methods used to analyse the data. Chapter three presents the main findings of the primary research. The main findings from qualitative interviews are reviewed in part one. In part two the main findings of the quantitative questionnaire surveys are discussed. Chapter four concludes with a discussion of the main findings and recommendations for the study area with regards to public attitudes to incineration.

## Chapter One



## **Chapter One**

### **Literature review**

#### **Part I: Background to incineration and EU policies**

Thermal treatment (or incineration as it is more widely known) has been a major feature of European waste management for decades. It is the preferred option for waste management by the EU as it is more easily regulated than landfill and causes less damage to the environment as a result. Incineration involves the thermal oxidation of waste at temperatures over 800 degrees centigrade. (Health research Board, 2006). Industrial waste incineration is already used by the chemical and manufacturing industries in Ireland and is highly regulated, although much of the hazardous waste generated in Ireland is incinerated abroad. Different types of incineration technology exist including gasification, pyrolysis and liquefaction, which work at different temperatures with or without air being present (DoELG, 2005). As with all methods of waste disposal there are pros and cons. Incinerators in the past were a major source of dioxins in Europe, but with the introduction of strict EU regulations incorporated in the EU *Directive on the incineration of waste* the levels have significantly reduced by 99% since the mid 1990's. Incineration reduces the

waste down to approximately 25 to 30% of the original solid waste input and produces two types of resultant ash-bottom ash and fly ash. Although some of the ash can be used in building materials, generally the ash is land filled, especially the fly ash which contains hazardous particles. A small quantity of dioxins may be released into the atmosphere but is minute compared to the levels of dioxins caused by other combustion technologies such as vehicle emissions. Fears regarding dioxins are greatly exaggerated and according to the EPA- if all planned incinerators were used to full capacity in Ireland by 2010, the total dioxin load released into the atmosphere would amount to 2% of the total load compared to the estimated 84% that would be released due to uncontrolled backyard burning (Epa, 2004). Other concerns relate to aesthetic impacts and incinerator can have, but considering a typical incinerator like the one in picture 1 below it clear that incinerators have the potential to fit into any urban landscape. Thermal treatment of wastes also reduces the reliance on landfill and pressure to acquire land for landfill space. Although they are a high cost facility to construct, incinerators can supply regions with a vast amount of electricity due to modern energy recovery technology.



Picture 1: Incinerator in the heart of Vienna. Source: (<http://www.f1onlin.eg>)

## Waste management in the EU

The *EU waste framework directive* introduced the concept of the waste management hierarchy, which formed the basis of waste management in Europe” (Mullally & Quinlivan, 2004, 124). The waste management hierarchy figure (1.1) illustrates the EU prioritises prevention, minimisation, reuse and recycle.

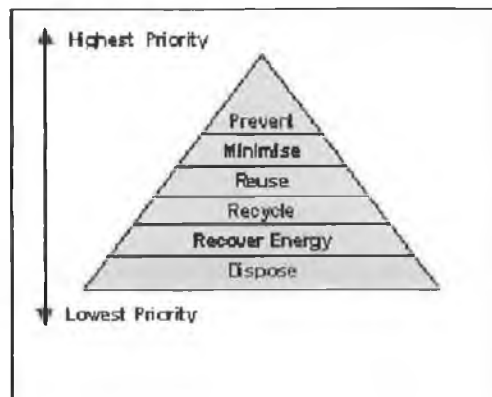


Figure 1.1 Waste Management Hierarchy

Where this is not possible, energy recovery and finally disposal is the last resort. The actual reality in Ireland is the opposite: landfill has been the preferred option in Ireland.

The waste management situation in Ireland is unique towards the rest of Europe. Denmark, Luxembourg and the Netherlands have the highest incineration rates in Europe coupled with high recycling rates. Denmark's success can be attributed to key strategies and economic instruments such as: a waste tax on both landfill and

incineration to encourage recycling and recovery and a ban on the landfill of wastes that are suitable for incineration (South East Waste Management plan, 2003,33). Incineration is successful at European level, but Ireland and Greece, who were once Europe's economic laggards, are now becoming waste management laggards, being the only EU countries **not** to incinerate. The next section deals with Ireland's attempts to deal with waste and the policy's which shaped today's waste management strategies.

## **Part II: Waste management policies in Ireland to date**

Ireland is currently in the midst of a waste crisis, but is incineration a quick fix solution for the problem? In the late 1990's there was increased pressure to move away from a reliance on landfill as a major waste disposal method due EU directives and regulations, now there are plans for the construction of six thermal treatment plants in the country. Our current waste problem can be directly attributed to the so-called 'Celtic Tiger' era, which saw rapid economic expansion, growth of a consumerist economy accompanied by a hike in the population due to immigration and natural population growth. The nation's population is currently the highest it has been since the 1880's, which bring with it, increased volumes of municipal waste. All of the economic and social changes that have occurred in Ireland over the last decade coupled with the problem of reduced landfill space has resulted in a move away from landfill to more sustainable integrated approach to waste management. By 1996, Boyle argued, "it had become obvious that Ireland's antiquated waste management infrastructure was ready to collapse under the roar of the Celtic Tiger"(Boyle,

2002,176). During the period 1984 and 1998, before and during the Celtic Tiger era, the quantity of waste produced in Ireland doubled, and since then there has been an 80% increase of which only 13% is recovered (EPA, 2004). Landfill was an economically viable option in the 1990s due to the availability of land and cheap disposal costs, but with the introduction of landfill levies and pressure on available land, landfill is no longer economically feasible.

The Earth Summit took place in Rio de Janeiro in 1992, the main focus was on sustainability. Agenda 21, known more commonly as local agenda 21 (LA21) specified that local area plans should be produced for sustainable development. In this same year Ireland established the *Environmental Protection Agency Act*, which founded the EPA to act as an environmental monitoring and licensing authority to deal with issues such as air pollution, water pollution and resource management and waste management. Following this was the introduction of the *1996 Waste Management Act*, which ultimately acted as a framework for the implementation of EU directives, some of which had not already been implemented at national level. The main objectives of the 1996 act were to provide a regulatory framework for the application of higher environmental standards and to improve performance in relation to the prevention and recovery of waste. Part two of the Act included a plan for hazardous waste and also required local authorities to produce a waste management plan. The Act was a pivotal moment in planning waste management in Ireland (Davies, 2003, 77). Regional waste management plans were developed to foster the EU ideals of locally sustainable development and minimisation of damage to the environment by treating waste as close to the source as possible. Local authorities were given authority to develop plans and allowed counties to merge with

neighbouring counties. Difficulties emerged while developing regional plans due to pressure to comply with EU regulations on a local scale as well as increasing opposition from councillors and the general public regarding the dreaded term 'thermal treatment facilities'. Many councillors were outraged at the thought of a waste guzzling monstrosities ending up in their constituencies. Construction of incinerators were to be put on the back burner until the Minister for the environment at the time, Noel Dempsey released the policy document *Changing our ways* in 1998. This outlined specific national targets for waste management in the following years. Of these targets included a diversion of 50% of waste away from landfill, a minimum reduction of 65% in biodegradable waste, development of recovery facilities employing environmental beneficial technologies and to recycle 35% of municipal waste (Dempsey.1998, 7). He also outlined the importance of the regionalisation of waste management plans and the important role public-private partnerships had to play in the investment of these plans. This investment was to be crucial if Ireland was to succeed in constructing high cost thermal treatment facilities. Regionalisation served to create sufficient markets for large-scale waste management and allowed incineration to become economically viable (Davies 2002,5). This era marked the closure of many smaller landfills and the creation of 'super dumps' to service larger areas. It was hoped that the creation of regional waste management plans would be well underway at this stage but some counties were to reject plans, mainly due to the inclusion of thermal treatment in the integrated approach, which sought to include many different options to tackle the waste management crisis.

A total of seven regional waste management groups were formed, with Kildare, Donegal and Wicklow staying independent. Donegal was to form a cross-border plan

as well as producing own plans, while Wicklow and Kildare hoped to buy into the Dublin waste management plan at a later date (Boyle, 2002,183). Carlow is part of the Southeast waste management plan.

Local opposition proved to be the main restriction for the implementation of the plans. In areas where incineration was planned local opposition groups formed such as CHASE (Cork harbour for a safe environment), which protested against the construction of a hazardous waste plant in Ringaskiddy. The Irish government were forced to take action when proceedings began by the European commission to take Ireland to the European court of justice for its failure to put waste management plans into place. By 2001 some counties such as Galway were still rejecting plans included in the Connaught regional waste plan. The rejection by some councillors followed widespread local opposition to plans to construct a thermal treatment facility inside Galway City boundaries. Consequently many councillors who had already agreed to plans were now rejecting them. The government saw no option but to push local authorities to make unpopular decisions. Following this was the introduction of the 2001 *Waste Management Amendment Act*; this was a major turning point in relation to the introduction of incineration in Ireland. The main function of the Act was to remove power from locally elected councillors regarding decisions pertaining to waste management plans. County and City managers now had the authority to override decisions councillors made and adopt plans even if they were rejected by elected representatives. Many saw this an undemocratic move, but ultimately it helped to speed up the process of adopting waste management plans. The Act also included measures other measures to deal with waste including the plastic bag levy, a landfill levy and the establishment of an environment fund. The levies that were collected

were aimed at financing environmental initiatives such as environmental awareness campaigns.

Since 2001, all local authorities have adopted waste management plans. Included in these plans are the establishment of 6 thermal treatment plants. The 2004 policy framework *Waste management-taking stock and moving forward*, reiterates previous plans and updates waste management plans in Ireland. In relation to thermal treatment it states that it still has an important role to play as part of the integrated approach to waste management in Ireland and ensures the public that “ facilities will be subject to stringent controls through licenses issued by the EPA and through subsequent license enforcement and facility monitoring”(EPA, 2004). However, the document does stress the need for increased recycling rates in the country. Since then the *National Infrastructure Bill* was released which aims to fast track developments of national infrastructure projects such as incinerators and roads.

### **Part III: ‘Jeers for fears’: Public attitudes to incineration**

As mentioned previously opposition from local councillors and the general public formed a major barrier for the introduction integrated waste management plans in the late 1990’s. Localism in Irish politics meant that councillors are unwilling to make descisions which local constituents are opposed to.

As Coleman puts it: to “the two great certainties in life-death and taxes-can now be added a third: politicians will always and everywhere oppose the building of incinerators”(Coleman 2004).



A vast range of research has been conducted into public attitudes to waste management. In Ireland research has mainly focussed on attitudes to recycling, but with the dawn of a new era in Irelands' waste management strategies, research now includes the attitudes to incineration. Major elements of this research include the aforementioned NIMBY and LULU concepts. A description of the NIMBY concept is a "general opposition to the siting of a variety of noxious facilities or activities" (Luloff, Albrecht & Bourke, 1998).

### **An international perspective**

Research conducted in Helsinki, Finland investigated whether households would choose large scale recycling or incineration. Results showed that high-income household were less likely to choose recycling and, the more children there were in a household the less likely that the household would recycle. Recycling was the preferred option for more women than men and younger people were more likely to choose recycling than older respondents. 72% of respondents in the younger age group preferred recycling. (Huhtala, 1999, 32). The main reasons given for choosing recycling was a concern over air pollution and wasting re-usable resources. On the other hand, those who chose incineration were concerned about the inconvenience sorting would cause.

When respondents of a study carried out in Charlotte, NC USA were given the choice between landfill and incineration however, results showed a more positive reaction to incineration over landfill although the respondents were wary of living near a thermal treatment facility (Furuseth & O'Callaghan, 2002). This research suggests contradictory attitudes to waste management. Recycling is preferred over incineration,

incineration is preferred over landfill, but people aren't willing to live near a landfill, sort their waste, and fear the effects incineration have on their health.

### **Irish attitudes to waste incineration**

Irish household attitudes to incineration so far have bordered on hysteria to some extent. In certain areas NIMBY groups have formed as soon as plans for the construction of an incinerator were put forward including in Cork, Galway and Meath. Fears protestors had included, mainly effects dioxins would have on health, and effects on house prices and that incineration would detract from recycling schemes. There exists a significant value action gap in Ireland. The value-action gap relates to levels of concern for the environment and whether actions reflect these concerns. Research suggests Irish people do have a high level of concern for the environment but when it comes to taking action to prevent environmental degradation (for example recycling) the reaction is poor.

A concern should be raised in relation to research conducted into attitudes to incineration in Ireland so far. One has to consider whether research is biased due to the types of questions asked and the lack of information available to the public on the issue. Misleading or negative questions could yield obvious results. Questions such as do you prefer incineration or recycling could also yield obvious results and may lead people to the conclusion that Irish people don't want incineration. Another concern is the perception Irish people have about incineration may be exaggerated due to what they observe in the media. Many reports regarding incineration are negative and a large-scale information campaign on the subject of incineration has yet to be undertaken by the Irish government. The Irish public are greatly under informed and

misinformed about the issue of incineration, therefore the effectiveness of much of the research in this area-both quantitative and qualitative-has to be questioned. It is casually assumed that because of the formation of anti-incineration groups in Ireland that Irish people do not like incineration. Even reports in national newspapers assume this. Rumours such as this are tantamount to scaremongering tactics of radical environmentalists and international pressure groups. Although many refuse to don the NIMBY label and hide their issues with incineration under the environmentalist cloth, the NIMBY label is well and truly frayed in Meath, Galway and Cork at this point. If Irish people were genuinely concerned with the release of toxic dioxins into the atmosphere, cancer clusters and the rest, why do we smoke dioxin-laden cigarettes, have one of the highest car-ownership rates in Europe and allow DIY incineration (backyard burning) to go unreported all over the country? To put it into perspective, the chance of dying from dioxins from living near an incinerator is about 1 in 100,000 and 1,000,000, the chance of dying from smoking ten cigarettes a day is 1 in 200, and dying from driving a car is 1 in 8000 (Reville, 2004). People may oppose incineration merely because they don't know enough about incineration or because they feel they should to support their community.

### Environmental activism in Ireland

A public participation process may or may not be successful. In Ireland a formal process was put into place so people could object to unwanted land uses. A low response rate in the formal process of creating Connaughts' waste management plan was in stark contrast to the reaction of the public when a site was actually decided upon (Davies, 2003,84). This demonstrates the importance of the sense of place and locale in implementing waste management plan such as these. The public were not quite perturbed by the thought of incineration but when a site was actually chosen the public were overwhelmed. Perhaps the issue is not whether people fear incineration, but it is location of an incinerator, and proximity away from homes that is the key issue. The aforementioned concepts of NIMBYism and the value-action gap come to mind in relation to the Galway case. Little action was taken in the formal process of developing plans, but after a location was decided over 22,000 signatures and 2000 individual submissions were made to Galway County Council opposing the development. However research conducted after the site had been located showed a significantly higher proportion of Galway respondents (15%) were supportive of the introduction of incineration compared to respondents in Fingal (10%) and Kerry (8%) (Davies, 2005,2). This could be due to available information and increased awareness regarding incineration in the region.

The acceptance of incineration as a method of waste disposal was shown to vary spatially, according to age group and according to gender. Older respondents and male respondents were more likely to be predisposed towards incineration than younger respondents and female respondents. In the study undertaken in Galway, Kerry and Fingal, 30% of respondents in the 70+-age bracket ranked incineration highest over other methods of waste disposal, while only 5% of respondents in the 18-29 year old age group chose incineration as their preferred method (Davies, 2005). In the Fingal area 43% of respondents in the 70+ age group chose incineration compared to 5% of respondents in the 18-29 year old age group. This may reflect different risk perceptions of the older and younger age groups, or perhaps an increased level of environmental awareness among young people. Perhaps the increased awareness or irrational fear brought about by the media?

Male respondents were more likely to accept incineration than females. In Fingal twice as many males (14%) than females (7%) favoured incineration. It is argued that this could be due an increased level of technological knowledge among men, or more likely due to a greater perception of hazards among women and greater level of environmental awareness.

60% of Fingal respondents reported they had too little information regarding the environment. Most requested a greater knowledge of recycling information and only 7% wanted to know more about incineration compared to 61% who wanted to know more about recycling. The low number wanting more information about incineration could be due to the fact that the Fingal administrative area is so large that most people will be unaffected by the construction of an incinerator planned for Ringsend.

Overall it seems that there is a general lack of information pertaining to incineration in Ireland even though six plants are to be constructed over the coming years. This may affect the outcome of research into attitudes to incineration

## Chapter two

## Chapter two: Methodology

### Part one: Study Area

The study area chosen for research is Carlow town, Co. Carlow. The area was chosen partly because of the researchers' familiarity with the area but the area is quite suitable for a study such as this. The population is large enough to carry out a quantitative questionnaire survey but not large enough to create any difficulties when choosing the sample population to be surveyed. Therefore a good cross section of the population of Carlow is easily attainable. Carlow is quite an urbanised County with a large proportion of the population residing in Carlow town.

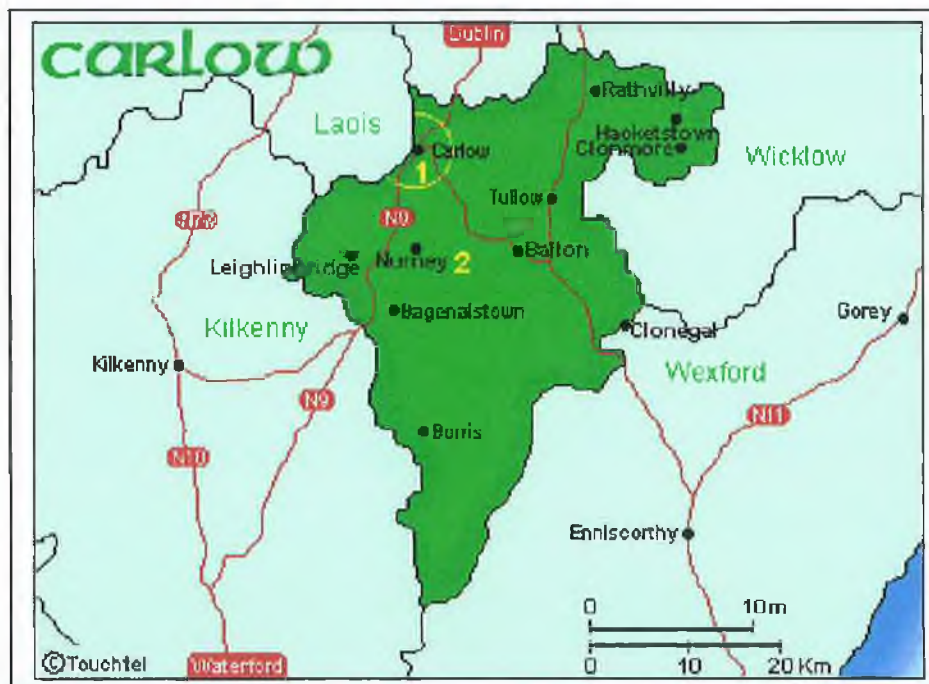


Figure 2.1: County Carlow , Source: [www.countycarlow.com](http://www.countycarlow.com)

The centralised position of County Carlow (shown above in figure 2.1) means it may prove to be quite a significant location in relation to the South East Waste Management Plan, and possibly a useful location for a regional thermal treatment



plant. Map 2 illustrates the strategic position Carlow has in Leinster, it lies approximately 70km South West of Dublin and borders with Kildare, Wicklow, Kilkenny, Wexford and Laois. The population of Carlow has incurred both economic and social changes over the last ten years. Although quite a small County at just 890km<sup>2</sup>, according to the Census 2006 the population of the County has a population of 50, 471, which is an overall increase of 4,457 people (or 9.7% increase) since the last census was carried out in 2002. Carlow town itself has a population of 13,898, which has risen by 5.1% since the last census in 2002 (CSO, 2006), although the rural areas of Carlow are seeing a greater increase in population figures since 2002. The town of Tullow witnessed an increase in population of 20.9% in the last four years alone(CSO,2006) This rise in population means that the waste issue will only get worse before it gets better. The population is large enough to carry out a quantitative questionnaire survey but not large enough to create any difficulties when choosing the sample population to be surveyed. Therefore a good cross section of the population of Carlow is easily attainable. It was decided to focus the study on Carlow town, firstly due to the difficulty in conducting quantitative research in rural areas. Secondly, incinerators are traditionally located in urban areas, especially in Europe where many are located in large cities such as Vienna and Monaco. It is likely that if a municipal waste incinerator were to be constructed in the urban Carlow region it more than likely would affect the urban population more than the rural population.

### **(b) Time period**

The primary data collection was not restricted to a certain time period. The public questionnaire surveys were carried out between Monday 19<sup>th</sup> of June and Friday 23<sup>rd</sup> of June. The interviews were not restricted to a certain time period but were carried out when the interviewees were available. The first survey was carried out in February and the rest were carried out in June.

## **Part two: Primary data collection**

### **(I) Questionnaire Survey**

#### **Choosing a sample**

A public questionnaire survey was carried out to collect quantitative data regarding public attitudes to municipal solid waste incineration (MSW). A sample population is generally required where the target population is over one hundred, therefore a sample had to be acquired for the purpose of this study. There are many ways to choose a sample population but for this case to ensure an even sample was collected, a systematic approach was adopted. This entails that an even number of subjects be selected (for example every tenth person on a register). For the purpose of this study

the 2004 electoral register for Carlow urban area was used to identify a sample population of one hundred and fifty households. People that were residing in nursing homes and hospitals were omitted from the sample for obvious reasons, and some households, which had no house number or were not easily located, were omitted also. Due to the level of new housing developments in the area a number of households in newer estates were surveyed also. In total 102 surveys were carried out.

### **Conducting the surveys**

A door-to-door approach was adopted when carrying out the surveys. This 'face to face' approach had many benefits: it was less costly than posting surveys but also allowed a level of interaction between the researcher and the respondents, so that questions could be explained more clearly and respondents views outside the realm of questioning could also be noted to enrich the analysis of the data. As the majority of the questionnaires were conducted during the daytime, some of the households were vacant. When this happened, the nearest occupied household to the one in question was surveyed. The main aim was to survey an even cross section of Carlow households in different estates and areas, ensuring each socio-economic group were targeted. The only downside to conducting the surveys is that they were quite time consuming. Time taken to carry out a survey depended on each individual's interest in the general topic and older people generally gave more time for the survey than younger respondents.

In answering the questions, some respondents preferred to fill out the survey themselves with guidance. Others respondents, due to time constraints, preferred to

fill out the survey in their own time, therefore a small number were collected at a later date. This may have affected the outcome only slightly. Generally, surveys collected at a later date had more in depth comments following the open-ended questions.

## **The questions**

A range of question types including a Likert style rating scale, a normal rating scale, tick the box, rank order and open ended questions were used in the questionnaire survey (see appendix one for a sample of the survey). A range of question types were utilised to ensure the questions did not become monotonous and kept the respondent alert. Using a range of questions types would enrich data analysis also. The use of a quantitative survey allowed numerical coding of the questionnaires at a later date explained in the part three of the methodology. An explanation of the questions now follows.

### Question one

Question one was related to information about the respondent, which was important in analysing data but also to ensure a cross section of the target population was surveyed. Q1 (a) required respondent gender: As previous research has shown there appears to be a correlation between gender and risk perception specifically towards MSW incineration. It was important to identify if a similar pattern exists in Carlow in relation to MSW incineration. In part (b) respondents were asked how long they had lived in Carlow: this was to ascertain whether the length of residence in the town

would affect the acceptance of an incinerator and its proximity. Long-term residents may be less predisposed towards incineration in their community as they may have a greater sense of community and concern for the locale. Part (c) of question one related to whether the respondent was a parent and if so, how many children they had in each age group. This question would discover whether parents in the area were more likely to disagree or fear the introduction of incineration. Parents may have a higher level of concern for the environment and the health of future generations. It would also demonstrate whether the parents would opt for cheaper and more convenient waste disposal methods. Ages were identified to find out whether a pattern would emerge where parents of young children were more wary about the introduction of incineration than those with older and grown up children. Part (d) requires which age bracket the respondent falls into. This would prove whether people from different age groups had different attitudes to MSW in Carlow as they did in other parts of the Country. Finally, part (e) regarding marital status was asked to determine whether married or single people had different environmental values towards the environment and incineration.

#### Question two

Part (a) asked respondents to tick the current waste disposal methods they use. They would help to discover whether a sense of environmental awareness and action was already alive in the town or whether there was a general apathy towards proper waste management. Part (b) asked respondents if the cost of waste disposal determined the methods they used to ascertain whether cost is an important factor in the introduction of waste management facilities such as MSW incinerators.

### Question three

In part (a) using a rating scale, respondents were asked to tick a box most appropriate to their feeling about the introduction of incineration as part of the South East's waste management plan. This would help give an overall view of whether a thermal treatment plant would be accepted in the region. In part (b) respondents were asked whether they feared incineration. This was to discover if locals actually fear incineration or if they have other reasons to reject its introduction. Using bipolar adjectives in part (c) respondents were asked to tick whether they would choose landfill or incineration and whether they agreed or totally agreed with the option. The aim of this question was to discover if Carlow people had a preference over these two types of waste disposal facility, as there is less opposition to the construction of new landfills than there has been over planned thermal treatment plant in Ireland over the past few years.

### Question four

Four (a)(i) asked whether the respondents thought there were any advantages to incineration and if answered 'yes' the respondent in part (ii) had give some examples of what they thought were the advantages. Part (b)(i) asked whether the respondents thought there were disadvantages to incineration, and as with part (a), the respondents in part (ii) were asked to give some examples of the disadvantages if answered 'yes' to part (i). The reasoning behind the entire question was to gauge how the public perceive incineration and what they think are the advantages and/or disadvantages are. The language used was made as unbiased as possible so as not to lead the respondent by portraying any of the researchers views on the topic.

#### Question five

Respondents were asked to tick the options, where their knowledge on the subject of incineration had come from and if the information that they had received (if any) was positive, negative, or both. This question would help in understanding whether the public are misinformed about the subject matter and whether the issue of information dissemination needs to be addressed in relation to incineration.

#### Question six

This question took the form of ranked alternatives, which enabled estimates to be made of the importance of possible types of waste disposal methods for the Carlow area. Respondents were asked to rank from 1 to 6 in order of importance, from the waste disposal options listed, which they would prefer for the area. It must be noted that for some of the surveys, either those that the respondents filled out themselves or were collected, there was slight confusion with the question, which resulted in many only identifying their first choice for waste disposal instead of ranking them one to six. From results of this question it was hoped to discover which methods of waste disposal the Carlow public would prefer out of a range of identified options including an added tax on recycling.

#### Question seven

Respondents in this question were asked if they had the choice, would they incinerate their waste if it were cheaper than the alternative measures. This would show whether people's original choice would be affected if incineration were a cheaper alternative.

### Question eight

Part (a) related to the acceptance of an incinerator located at different proximities from the respondents' home. Individuals' were asked to tick whether they would say 'yes', 'no', 'maybe' or 'don't know' to four different distances away from their home if an incinerator were to be located here. The main reason behind this question was to find out what an acceptable distance would be for an incinerator in relation to residential housing. At first glance this question would seem like the result would be quite obvious-people would pick the furthest distance away from their homes-or is this the case? If respondents answered 'maybe' to closer proximities, perhaps incentives (such as reduced waste charges) could be put in place to persuade residents of a particular area to change their mind. It is apparent in some cases for example, where a development is opposed by local residents-such as a shopping centre or football stadium-that the residents benefit by means of providing incentives such as improved infrastructure in the adjoining areas of development or free football tickets in the case of the development of a stadium.

Part (b) asked if the respondents could suggest a location for an incinerator in Carlow. The purpose was to identify where locals would suggest a location for an incinerator in Carlow, to see whether they would choose urban or rural areas or specific areas. This would also indicate a certain acceptance if a plan were to go ahead for the construction of an incinerator in Carlow.

The survey was purposely structured so that background information was gathered first. Easier questions were asked at the beginning, more complex questions were answered in the middle and what would probably be the least popular questions (ie.



those relating to incinerator proximity) were asked at the end. A copy of the survey can be viewed in the appendix section.

### **Survey Analysis**

After surveys were carried out, they had to be coded in order to undertake statistical analysis. A codebook was formulated in order numerically code answers given by the respondents.

After coding, data was inputted into the statistical software package SPSS which is used as a predictive analytics tool.

### **Spss**

The package allows the user to manipulate data in order to represent quantitative data. A number of operations were carried out including cross tabulation; multiple response tables were formulated as well as frequency tables. The author accessed these functions in the spss data view in the 'analyze' menu. Cross tabulation was carried out for a number of questions. This created contingency tables between pairs of variables, to show how responses for one set of variables would relate to another set of variables. For example to show whether age was correlated with attitude to incineration responses from the question related to age of respondent were cross-tabulated with responses related to feelings about incineration.

Multiple response tables were formulated to combine related variables for question six for example, where respondents were asked to rank their choice of waste disposal methods for the future. This enabled the user to count the number of people that chose incineration as their first choice, landfill for their second choice and so on.

Frequency tables were used to show how often a particular reply was recorded. This was useful in analysing certain questions such as question three where respondents were asked to tick whether they agreed or disagreed with incineration. From the output viewer, tables and graphs formulated were copied into Microsoft Word, and data was also transferred to Microsoft Excel in order to formulate better graphs.

## **Interviews**

Five interviews were conducted with Carlow councillors. These were representatives from both the County Council and the town council committee. The interviews were conducted for two main reasons: in order to gather information that the councillors had themselves on the broad issue of waste management in the southeast and their own attitudes towards the introduction of incineration in the Southeast. Conducting the interviews would be a good way to gather data that was not easily available and they would also help to clarify any question, which the author had in relation to waste management in the region. The author chose to interview the councillors due to their knowledge of local area plans and waste management.

A total of ten councillors were contacted and five were available for interview. The councillors interviewed were Cllr. Mary White (Green Party), Cllr. Micheal Abbey (Fine Gael), Cllr. Ann (Nee Long) Ahern (Fianna Fail), Cllr. Jennifer Murnane O' Connor (Fianna Fail) and finally Cllr. Rody Kelly (Fianna Fail). The interviews depended on the availability of the councillors, the first interview was conducted in February, and the rest were conducted in June.

The interviews followed a structured open-ended format. Questions were decided before the interviews. This method was thought to be the best for the study as it allowed the interviewees introduce new topics to the conversation while answering the predetermined questions. The questions used in each interview were similar, but not exactly the same. The structure of the interview allowed the author to adapt the questions if the interviewees had already answered certain questions throughout the discussion.

It was hoped the interviews could be recorded using a Dictaphone so that the researcher could focus on the questions rather than writing. However, only two of the interviews were recorded, two were conducted over the phone so recording was difficult and one interviewee preferred not to be recorded.

### **Main outline of interview schedules**

The following gives an outline to each issue discussed during interviews, not that the sequence of questioning was not the same for each interview although many of the questions were the same. Most of the questions would yield opinionated answers

- Interviewees were asked about their opinions on the integrated approach to waste management in Ireland that involves recycling, landfill, and incineration. This was to gauge the general opinions towards the approach, and to find out whether the Councillors agree with the introduction of incineration.

- Interviewees were asked on their opinions towards waste management policies in Ireland, particularly towards the 2001 *Waste Management Amendment Act*, and what they thought the effects of this act were if any. Again this would possibly demonstrate the personal opinions of the councillors regarding the issue.
- Interviewees were asked what they thought were the main advantages and disadvantages to incineration both to obtain information on the subject area and to gauge what the councillor's perceptions of incineration are.
- Interviewees were asked if they thought a large scale-recycling scheme could work instead of the introduction of incineration. It was hoped that answers from this question would demonstrate the councillor's preference for either of the waste management disposal methods.
- Councillors were questioned on the issue of the media's role in informing the public and whether they thought a government education campaign would be necessary to educate people about thermal treatment.
- Councillors were asked specifically about the future of Carlow's waste management plans in the long term and the best options for the region. This would possibly provide extra information on the issue and give interviewees opinions on what they thought should happen.

- Interviewees were also asked how long they thought it would take to reverse the trend of using landfills in the Country/region. This would also provide a possible time frame on the introduction of thermal treatment.
- One interviewee was asked about the introduction of a green tax to divert waste away from landfills and what the impacts of constructing an incinerator in Carlow town would be. This particular interviewee had a detailed knowledge regarding incineration and a particular interest in environmental issues.

### **Interview Analysis**

Interviews were analysed qualitatively, by separating particular factual answers from more opinionated answers. Both answers are important to the study especially relating to attitudes towards waste management and incineration. Many of the quotes were used to give a descriptive account of local political attitudes towards incineration and quotes were used to enrich the analysis.

### **Part three: Secondary Information**

Secondary information was used to supplement and support the primary data collected. For a study such as this, which was performed on a small area, it was unlikely that there would be much available data related to the Carlow area in terms of attitudes to waste incineration.

- A meeting of the Committee of the Environment Strategic Policy meeting was attended on the 23<sup>rd</sup> of June 2006 in the hope that information on the issue of waste incineration and waste management could be gathered.
- The CSO website was used to gather information relating to the population structure of Carlow.

The analysis and findings section follow. Firstly an analysis of interview data was undertaken, followed by the main body of analysis relating to public attitudes to incineration.

## Chapter Three

*"We are at a point where we have to make very hard decisions, because we cannot ignore or think we can landfill forever" (Abbey, 2006)*

## **Interview Analysis**

### **Summary of findings**

The interviews allowed the author to get an insight into attitudes to the waste management issue among Carlow's local councillors. The overall argument by four of the five councillors was that there is an urgent need to address the situation of waste management in the South East and apart from one councillor; councillors argued that incineration was the only way forward for the Southeast.

### **Integrated approach to waste management**

When asked about their opinions on the integrated approach to waste management in Ireland interviewee one totally disagreed with the move, thought that it was a waste of resources. She added there was a great potential for recycling to developed as an industry for the future and would provide jobs. She also expressed concern for the third world countries dealing with exported waste from Ireland. The second interviewee remarked that the emphasis should be on recycling, but thought that incineration was the 'ultimate answer'. On the issue of landfill:



“Landfill is both a contentious issue on one hand and environmentally it is the worst possible way to dispose of material...(but) it is more of a political football than an environmental football (Abbey, 2006)”.

Although interviewee three completely agreed with the approach, interviewees four and five were not completely sure but commented on the positive economic aspects of incineration. Interviewee four remarked that waste management is very privatised which made it especially expensive for people to recycle, but said that ‘we have to keep up with Europeans’ and hoped the plan would not make things worse for the consumer.

#### **On the 2001 Waste Management Amendment Act**

Overall the majority were in disagreement with the 2001 Amendment Act. Four out of the five interviewees objected to the removal of power away from councillors, regarding it as an erosion of public democracy. It is difficult for the public to understand the system of licensing waste permits, one respondent pointed out, and commented on the difficulty in explaining to locals that they had no power to do anything about waste management problems. An advantage of the amendment was also pointed out by interviewee two, who commented that councillors were unlikely to make these kinds of decisions (on incineration) that would fit in with the direction waste management was going in Ireland.

### Councillor attitudes to incineration

	Negative					Positive			
Cllr. No.	Waste of resources	Dioxins	Waste left over	Needs large volumes of waste	Last resort	Commercially viable option	Reduces need for landfill	Modern Incineration is safe	Energy source
1	●	●	●	●					
2				●	●	●			
3						●	●		
4								●	●
5					●			●	●

- The most commonly noted advantage to incineration is that it is a commercially viable option for the future. Two out of five respondents mentioned this as an advantage. Other advantages included were it reduces need for landfill, it's a cheaper in the long run, and if done correctly it would be a positive step. One respondent mentioned that €5 million had been spent on upgrading the present landfill that would only last five years anyway.

The main disadvantage was said to be the need for large volumes of waste. Other disadvantages included that it was a waste of resources, damaging effects of dioxins and waste (bottom and fly ash) left over after the process.

### **Recycling and Green taxes as an alternative**

Respondents were asked if they thought a large scale-recycling scheme would work as an alternative to incineration. Only two respondents agreed that it could work. Interviewee one was asked about introducing a Green tax as an incentive to recycle. She thought it was a great idea but that taxing overall takes away personal liberty. She also commented that the green party had shamed the government into adopting previous green policies. Interviewee five stated that it could possible work but a major issue is trying to reduce waste and increasing the level of recyclable materials.

Three of the other respondents said that recycling was only part of the option and mentioned that trying to get people to recycle was very difficult as it was expensive, but there was a good system already in operation in the town. Respondent four recycling raised the problem of illegal dumping and said the whole system needed to be revamped in order to educate people about the importance of recycling.

“There is a huge push required to get people or even educate people to the point where you are going to get anything even near 50% or 60% recycling rates” (Respondent four)

### **Public awareness, the role of the media and education**

Overall, opinions emerged regarding the success of past campaigns, the need for new campaigns and the portrayal of incineration in the media. Those who were asked about previous campaigns said that they were 'hugely positive' and 'worked extremely well'. In relation to incineration respondent two explained that on one side of the argument there were a lot of scare-tactics, and, on the other hand there is readily available, scientific data telling us what is actually the case. Respondent four said the government need to discuss with other countries how they approached the issue and remarked that incineration was regarded as positive in other European countries. Respondent five said the bad reputation incineration has in this country is probably because dioxins were 'detrimental' to the environment in the past but have been cleaned up considerably. But, in Ireland the perceptions surrounding incineration haven't changed.

### **The future of waste management in the region**

Respondent one thought that that a good recycling system would work and outlined the Green Party commitment to a zero waste strategy. For the Carlow region she

thought that the introduction of incineration would have disastrous effects on the town and when asked about the sugar factory as a possible location for an incinerator she remarked that the site would be excellent for a bio fuel plant. Overall she regretted the introduction of incineration and remarked that it is “yesterdays technology brought here too late” (White, 2006)

Respondent two thought that overall, we were doing well with recycling, but didn't think it was feasible to rely on this only. He had little hope for recycling with landfill as he thought people wouldn't recycle if they thought waste was going to be dumped anyway. The lack of available landfill space was an issue he suggested that was forcing the decision on incineration.

Respondent four thought serious alternatives were needed and thermal treatment is probably going to be necessary.

Respondent four thought the existing landfill works well and suggested for the future, waste to energy could provide homes in the area with electricity. She suggested the available grant scheme for environmentally friendly home heating should be extended to include energy from thermal treatment. The main issue for the respondent was cost. She thought waste management was too expensive and that incineration was needed to change this.

Respondent five thought it was impossible how long it would take to rectify the current situation as it would depend on amount of waste generated and how long other counties would need to use Powers town landfill.

## Chapter Four

## **Chapter Four:**

### **Results of questionnaire survey**

The chapter gives a list of the main findings from the public questionnaire survey.

#### **Respondent background**

**Gender:** In total 102 households were surveyed. Of the 102 subjects surveyed, 52.9% were female and 47.1% were male. The ratio of male to female respondents is not significantly large enough to have affected the outcome of the study.

**Length of residency:** Overall 71.3% of the population surveyed have lived there for over fifteen years, 9.9% have lived in Carlow between six and fifteen years, 8.9% have lived in Carlow between one and five years and the same percentage have lived in Carlow less than a year. It was hoped that newer residents would be surveyed so as to provide an insights to a range of opinions about incineration and avoid NIMBYist response from longer-term residents.

**Children:** A total of 53.9% of respondents had children; this again may only affect the results slightly if it proves to be the case that people with children show more concern for the environment.

**Age:** With regards to age structure of the respondents surveyed, 26.5% were between 18 and 25, 37.3% were between 25 and 40, 24.5% were between 40 and 55 and 11.8% were between 55 and 69. No respondents were over the age of seventy. It was hoped to gather data from all age groups but none were in the older age bracket. This may affect expected results as older people as discussed previously, accept incineration quicker than younger people would, who are more likely to choose recycling as a waste disposal method.

**Marital Status:** 51.5% of the population surveyed was married. This would not affect the analysis as an in depth study about whether married people have a different attitude to the environment was not being undertaken in this case.

#### **Methods of waste disposal currently used by households**

As shown on the chart below, according to results, 72.3% of respondents recycle, 75.2% use private operator whereby waste is sent to landfill, 14.9% of respondents compost and 3% used backyard burning as a method of waste disposal. Recycling rates are high which shows a high level of environmental awareness among respondents, but the researcher did not go into detail about what was recycled, it could be quite a little or a lot, therefore, it didn't provide a thoroughly clear picture of levels of environmental awareness in the town. Composting rates were higher than expected. Many commented that the two-bin system was the only reason why they recycled, as it was quite convenient. Although a small percentage of respondents claimed to burn their waste, it is possible that the figure would have been higher if the interviews were



not carried out face to face. A poll carried out by the six local authorities in the region showed that 37% of people in the Southeast region claimed to burn their waste (The Nationalist, 2002). This raised concerns about the actual level of dioxins already in the air



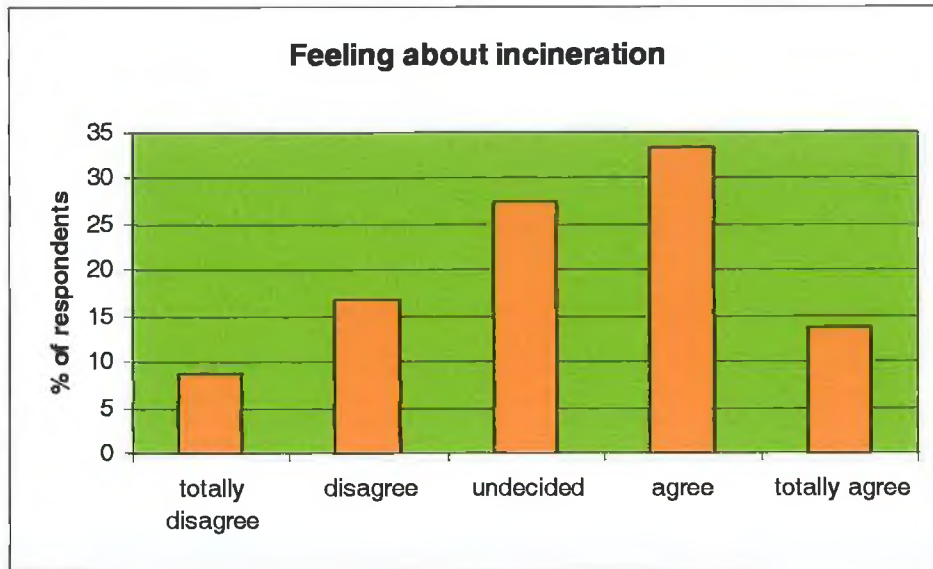
Figure 4.1 Methods of waste disposal

### Cost of waste disposal

54.5% of respondents said that the cost of waste disposal would affect the choices that they would use, 31% said that cost did not affect the methods that they chose and 13.9% didn't know whether cost was a factor in their decision. This may have implications for future waste management strategies especially because of the privatized nature of waste management in the South East. The high cost of constructing thermal treatment plants requires both government and private

investment, which may be reverted back to the consumer in the form of waste charges.

### Feelings about the introduction of incineration to Ireland



**Figure 4.2 'Feelings about incineration'**

As shown in figure 5.2 most people would agree with the introduction of incineration. Exactly a third of respondents agreed with its introduction, while 13.7% totally agreed with the introduction and 27.5% were undecided. A cumulative percentage of 25.5% either totally disagreed or disagreed with the introduction of incineration. A cumulative percentage of those that agreed and totally agreed amounted to 47%. Overall the majority of respondents were in agreement with the introduction of incineration although the high percentage of respondents who were undecided would need some persuasion. Many said it was they had a lack of knowledge on the subject and were not prepared to agree or disagree because of contradictory information or lack of information available. One respondent refused to answer the question at all because they were 'not sure of the full facts'.

**According to gender:** A cross tabulation of feelings about incineration and gender showed that of those that agreed with the introduction of incineration 71.4% were male and 28.6% were female. Of those that agreed with the introduction of incineration 41.2% were women and 58.8% were men. Of those that totally disagreed with incineration 77.8% were male and 22.2% were female. The figures are clearly displayed below in figure 5.1

**Figure 4.3: Crosstabulation of gender with attitude to incineration**

<b>Gender</b>	<b>% Totally Disagree</b>	<b>% Disagree</b>	<b>% Undecided</b>	<b>% Agree</b>	<b>% Totally Agree</b>
<b>Male</b>	<b>13.0</b>	<b>9.3</b>	<b>22.2</b>	<b>37.0</b>	<b>18.5</b>
<b>Female</b>	<b>4.2</b>	<b>25.0</b>	<b>33.3</b>	<b>29.2</b>	<b>8.3</b>

Overall it seems, males are more decisive on the subject with significantly more males than females totally agreeing or totally disagreeing with the introduction. Females are more likely to be undecided about the introduction of incineration. This may suggest that there is a correlation between risk perceptions regarding environmental health and gender.

### **According to Age:**

The table 1 in the appendix illustrates a significant correlation between age and feelings about the introduction of incineration.

Overall, older respondents were more likely to totally agree with the introduction of incineration than younger respondents. 58.3% of respondents in the 55-69 year old age bracket totally agreed, whereas 0% of 18-25 totally agreed. Just 5.3% of 25-40 year olds and 20% of 40-55 year olds totally agreed with it.

44% of 40-55 year olds just agreed with the introduction, almost 30% of 18-25 year olds agreed, 31.6% of 25-40 year olds and 25% of 55-69 year olds. The youngest respondents were over four times more likely to be undecided about the introduction than oldest respondents, over 40% of 18-25 year olds could not make up their mind compared to just 8.3%. Younger respondents were more likely to disagree with the introduction of incineration than older respondents. 22.2% of 18-25 year olds and 21.1% of 25-40 year olds disagreed compared to 12% of 40-55 year olds and 0% of 55-69 year olds. 8.8% of the total sample totally disagreed with the introduction; over two-thirds of these respondents were between 25-40 years old

This proves that younger people in Carlow would opt for more environmentally friendlier methods of waste disposal. Respondents in the older age groups were also more likely to be more decisive, with a significantly smaller percentage choosing

‘undecided’ as their answer. It would suggest that younger respondents are possibly more influenced by the media’s perception of incineration. In the future younger people should possibly be targeted in awareness campaigns surrounding the introduction of incineration.

### Introduction of incineration and parenthood

**Figure 4.4**

Children	Totally disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Totally agree (%)
Yes	9.1	14.5	20.0	30.9	25.5
No	8.7	19.6	34.8	37.0	0

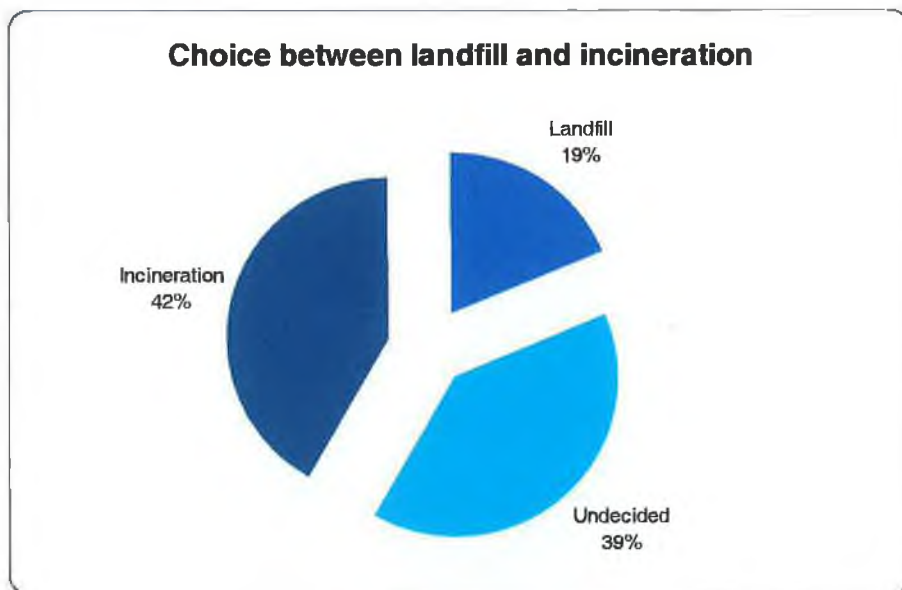
On analysis of the cross tabulation it seems that there is no significant correlation between parenthood and negative attitude towards. In fact people with children were more likely to totally agree with the introduction than respondents who had no children.

This suggests that parents may opt for more convenient methods of waste disposal over recycling perhaps.

### Fear of incineration

Only 23.5% of respondents said that they were afraid of incineration, 56.9% said they didn't fear incineration and the remainder, 19.6% said they didn't know. The same percentage of males and females said yes, more males than females said no (63%) and more females than males said that they didn't know if they feared incineration. This reiterates the idea that males are more likely to be decisive about their acceptance of the introduction of incineration. It would reiterate the point made earlier that females have different risk perceptions concerning natural hazards.

**Figure 4.5: Landfill vs. incineration**



It is obvious from the pie chart above (figure) that over twice as respondents chose incineration over landfill. 23% of people totally agreed with landfill over incineration, 19% agreed. Only 13% of people agreed with landfill over incineration and just 6% totally agreed with landfill over incineration. Results should be seen as a positive step towards the introduction of thermal treatment as it is clear that it is not the preferred option as would be expected considering national opposition to planned thermal treatment plants in the Country. However, the large proportion who were undecided over landfill and incineration would suggest there are many who don't have much knowledge on either of the methods.

#### **Advantages and disadvantages to incineration**

Most respondents (56.4%) suggested advantages to incineration. A multiple response table was produced and showed that the most commonly suggested advantages were 'uses less space' (11.6%); 'heat or energy recovery' (8.5%); 'cleaner' (7.3%) and that it 'solves waste problem'. Other suggestions included that incineration 'costs less', its 'cleaner' and it 'reduces reliance on landfill', and with one respondent claiming there 'would be more land for potatoes'. A positive suggestion was that it 'minimises people burning waste privately'.

Less respondents (48%) suggested disadvantages to incineration. The most commonly suggested disadvantages were the emissions-'fumes or dioxins' (32.5%), 'air pollution or environmental damage' (19.6%), and 'smell' (17.5%). Other suggested disadvantages included 'bad location', the 'effects it would have on people' (in surrounding areas), and that it would be an 'eyesore'. One respondent thought that it would decrease employment opportunities for those in the recycling industry.

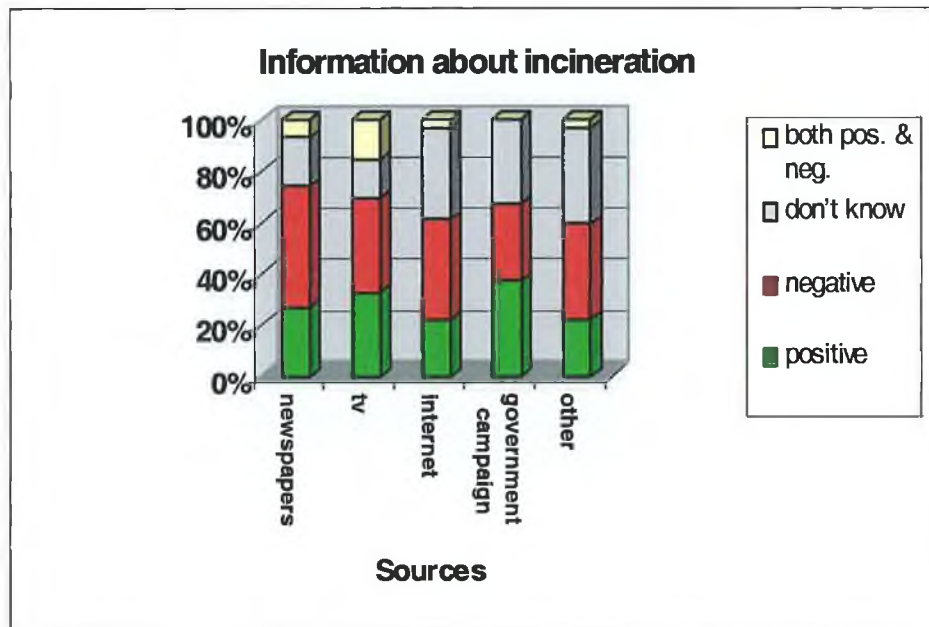
Overall, more respondents could suggest advantages than disadvantages. This could suggest the local population are aware of the problems surrounding waste management in the region and see the positive aspects of incineration.

### **Information received about incineration**

Of the information people had received about incineration most of it was negative. Out of all responses a total of 39.6% of information from all sources was negative, 29.4% was positive, 7.4% said the sources had both positive and negative information and 23.5% didn't know or had not heard anything about the topic.

Of those who heard from newspapers 46.7% said it was negative information and 26.7% said it was positive. Of those who had heard about it from television 36.7% was negative and 32.9% said it was positive, 15.2% said it was both positive and negative. 38.9% of those who heard about incineration via the Internet said it was negative and 22.2% said it was positive information.





**Figure 4.6: Information sources**

Most people (77.5%) said they received information from television, 73.5% from newspapers compared to just 42% from Government campaigns and 35.3% from Internet sources.

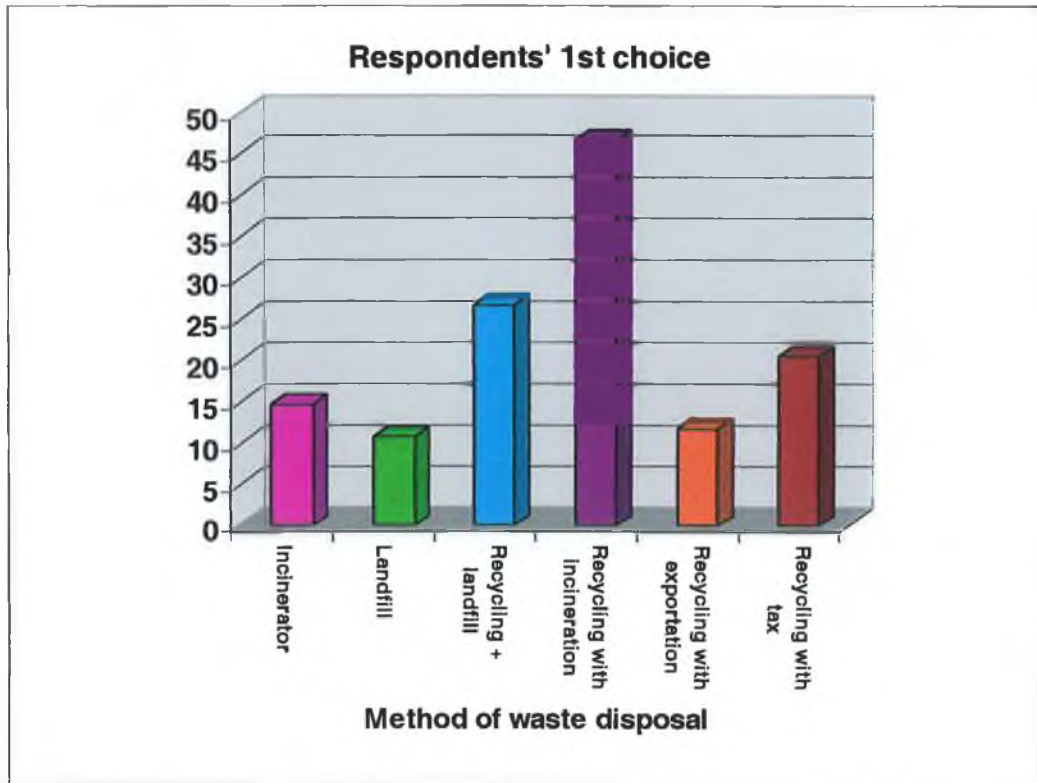
Overall it appears that newspapers and television are a major source of negative information regarding incineration. This is likely due to the coverage of the anti-incineration protests over the last few years emanating from Counties Meath, Galway and Cork. There appears to be a lack of a government campaign to promote Thermal treatment even though sites are being earmarked for their construction in the near future. The author decided to find out how hard it was to find readily available information by visiting a number of places in Carlow including, the County library and County Council offices. Just one leaflet was found in the library pertaining to

incineration. The Department of the Environment and local Government under the Race Against Waste Campaign produced this fact sheet, which was quite useful. On entering the County Council buildings it was clear there was no information leaflets concerning incineration. When asked if there was any information to take away, the author was told there was none, but persistence paid off when the author was sent to the Environment section of the department. Although the civil servants were quite friendly, the only information offer-despite a couple of civil servants searching- was a map showing locations of recycling facilities in the town and some information on recycling. The overall result of the 'mini survey' was quite disappointing and demonstrated the complete lack of information available to the public even when one made an effort to search.

### **Waste management preferences for Carlow in the future**

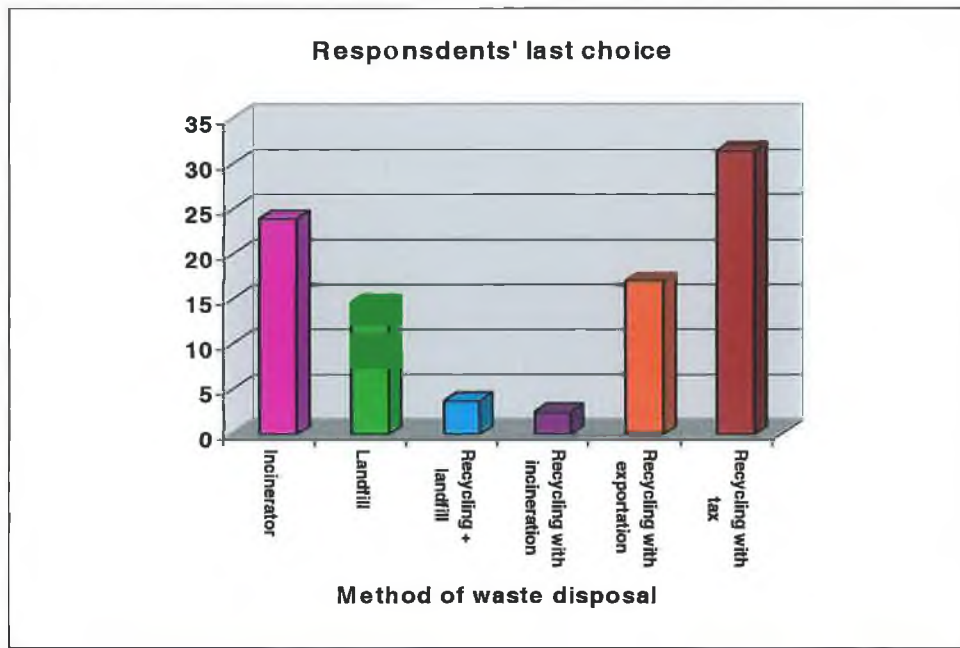
Respondents were asked to rank their preferred choices for waste management for the Carlow area.

The majority of respondents (46.8%) chose incineration as their first choice. The least preferred option was recycling with an added tax, with 31.5% of people choosing this as their last option.



**Figure 4.7: Respondents 1<sup>st</sup> choice**

In relation to incineration 24% of respondents put this as their least preferred option and 14% said this was their first preferred choice. For 'landfill' 28% of people said it was their fourth choice and just 10.7% said it was their last choice. For the option 'recycling plus landfill' 26.8% said it was their first choice. In relation to recycling with incineration 64.5% of respondents put this as their first, second or third choice. Just 11.8% chose recycling with exportation as their first choice and 20.5% of people chose 'recycle plus tax' as their first choice.



**Figure 4.8 Respondents 6<sup>th</sup> choice**

The least favoured options as can be seen in the chart above (figure 4.8) was recycling plus tax and a new incinerator on its own. This shows that the public are aware of the importance of recycling but are not prepared to pay 'Green taxes' or turn the burden of waste on to other countries. It displays that would prefer to recycle their waste with other methods rather than just using thermal treatment.

### **Cost of incineration**

When respondents were asked if they would send their waste to an incinerator if it were cheaper than the alternatives, 60.8% of respondents said yes, 18.6% said no and 20.6% said that they didn't know. This finding shows us that people's attitudes to waste management and incineration can be largely shaped by cost.

### Location of an incinerator

When respondents were asked if they would agree to an incinerator located under 1km away from their home, 40.9% of people said no, 36.6% didn't know, 14% said maybe and the remainder 8.6% said maybe. A large percentage that said they didn't is quite interesting, as it is commonly assumed that most people would automatically say no to an incinerator this close to their homes. Perhaps education and incentives could persuade local residents to agree to the construction of an incinerator this close.

When asked if they would accept an incinerator 1-5km away 29.3% said no, the same percentage didn't know, 21.7% said maybe and 19.6% said yes.

For the distance 5-10km away. A third of respondents said yes, 21.9% said no, 20.8% said maybe and the remainder 24% said they didn't know.

The respondents were asked if they would agree to the location of an incinerator over 20km away but still in the Carlow region, 53.1% said they would agree, 25% were unsure, 13.5% said maybe and just 7.3% said no.

A cross-tabulation was carried out to see if respondents with children would agree to certain proximities. Results showed that people with children were less likely to select the closest proximity and more likely than people without children to accept longer distances away. 5.9% of people with children said they would agree to an incinerator under 1km away compared to 12.2% of people that don't have children. It is hard to tell whether parenthood does effect risk perceptions regarding incineration, but from this it appears in Carlow anyway that those with children would be more wary of a closely sited incinerator than does who don't.

The overall result would be that people wouldn't agree to an incinerator directly beside their homes but would agree if it were located a few kilometers away. A large

amount of people were not sure about the closer locations which suggest there could be room for persuasion if an incinerator were to be sited in Carlow town.

### **Site for an incinerator**

When asked to suggest a site for an incinerator in the County, 43% didn't know or didn't want to name a place. The suggestions are illustrated in the chart below. Some of the locations were grouped into 'rural area' for example. The most popular suggestions were the sugar factory site (16%), rural areas of Carlow County (14%), areas just outside the town (14%) and the area where the existing powers town landfill is located (7%).

Other suggestions included Mt. Leinster, which would be totally inappropriate, a bog, with many jokingly suggesting 'put it in Laois', 'Dr. Cullen Park' (Carlow's football grounds) and 'Tullow'. Many could not answer the question or refused to answer it. Many comments were made their opinions clear when asked this question. One respondent commented that they felt "a more extreme recycling programme should be explored before such an action as this thank you".

Suggestions of location were cross tabulated with the length of residency in the town. Results showed that the greatest majority that 'didn't know (66.7%) were residents for over fifteen years. 75% of those that suggested the sugar factory were also residents for over fifteen years. Of those who suggested Powers town landfill area 71.4% were

the long-term residents. This trend continued for the other suggestions also. Residents of the town for under a year were most likely not to know where a site would be suitable, although 22% suggested locations just outside the town.

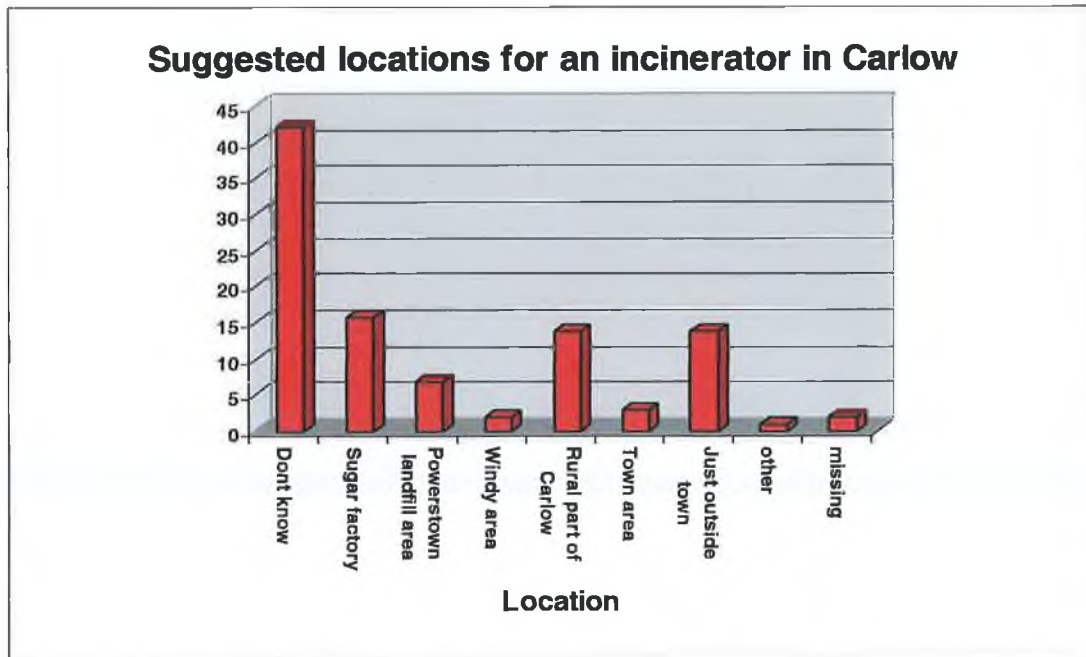


Figure 4.9 Site for an incinerator

Overall the results from the last set of questions revealed that locals were prepared to suggest places including sites in the town such as the sugar factory, which was quite interesting, but most did not say they would agree to construction of an incinerator within one kilometre radius of their home even though many were already within this location in relation to the sugar factory. Longer-term residents were more likely to suggest specific places than people who had been living here less than a few years. This was not surprising as many would not be aware of locations, however, many

residents that were only here a few years did agree that an incinerator could be located just outside the town.



## Chapter Five

## **Chapter 5:**

### **Conclusion and recommendations**

Although Carlow has a relatively high recycling rate, the Powerstown landfill is nearing the end of its life. At a meeting of the Environmental Strategic Policy Committee in June, the issue of the landfill was brought up. It was said that there was a maximum of five to six years of space in the landfill, even though it had recently been extended at the cost of €5 million euro. This problem is compounded by the fact that other Counties in the Southeast are using Carlow as a dumping ground due to the lack of facilities and the closure of smaller landfills. Therefore, decisions have to be made, and they have to be made fast, as time is running.

It is clear that the local Councilors are well informed about the subject of incineration and are quite willing to push the issue. Most are enthusiastic about the introduction of incineration and see it as a positive step in solving the 'waste crisis'. Some are over more enthusiastic than others however.

As Cllr. PJ Kavanagh put it:

“We as a council should be men and women rather than mice, grab the bull by the horns and get on with the introduction of incineration...this recycling is a farce”(Kavanagh, 2005).

Apart from one Councilor, the rest agreed with the integrated approach to waste management and thought it was the only way forward for Ireland, the negative aspects

be a major issue for most people. Although many did suggest possible locations for an incinerator in the town, it seemed to contradict their thoughts about the proximity of an incinerator, since many of the suggested locations were in or surrounding the town.

Recommendations for the Carlow area would include an unbiased large-scale awareness campaign relating to incineration, whether in the form of information leaflets, public meetings or both which should provide substantial information, including valid scientific information presented in a fashion that the public could understand. The target group should be the younger age groups, as they are the most likely to disagree with incineration. Public consultation is a vital process, which needs to be examined. The Carlow public and indeed the people of the Southeast should be fully informed about the construction and siting of an incinerator. Where objections are made to the proposed siting of a thermal treatment plant, efforts should be made to avoid major protests, which can cause major disruptions during the construction stages. This could be done using incentives such as providing reduced waste charges. Residents would need to be assured about the minimal risks associated with incineration, both in terms of health and the environment.

Although this study proved to an extent, that the Carlow publics are indeed accepting of incineration as an option for the future, the fact that there are no formal plans for the construction of an incinerator in Carlow town or the County for that matter could be totally different if there were plans in the pipeline. The main issue it seems is location and proximity to homes. While the public in this case was positive about thermal treatment for the future, for the most part did not want an incinerator within a ten-kilometer radius of their homes. This attitude screams 'NIMBYism', and

unfortunately it is probably a term we are going to have to deal with more in the future.

## *Appendix*

**Public attitudes to municipal solid waste incineration in Carlow  
-Citizen questionnaire survey-**

- Office Use Only**
1. (a) Are you male  or female  ?
- (b) How long have you lived in Carlow?
- >1 year  1 -5 years  6-15 years  more than 15 years
- (c) (i) Do you have any children?
- Yes  No
- (ii) If yes what ages are they?      No. of children
- |       |  |  |
|-------|--|--|
| 0-4   |  |  |
| 5-11  |  |  |
| 11-17 |  |  |
- (d) What age group do you belong to?
- 18-25  25-40  40-55  55-69  70+
- (e) Are you married or  single?

2. (a) Please tick which of the following methods of waste disposal you currently use:

Recycling (private or other)	
Private operator (Landfill)	
Composting	
Burning	
Other: Please State	

(b) Does the cost of waste disposal determine the methods you use?

Yes  No  Don't Know

3. Incineration is currently being introduced as part of Irelands waste management plan to cope with Irelands waste crisis.

(a) How do you feel about the introduction of incineration?

(Please tick one box only)

Totally Disagree	Disagree	No Opinion	Agree	Totally Agree

(b) Do you fear incineration?

Yes  No  Don't know

(c) On a rating scale which would choose:

Landfill	Totally agree	Agree	Undecided	Agree	Totally Agree	Incineration
-						-

4. (a) (i) In your opinion are there any advantages to incineration?

Yes  No  Don't know

(ii) If yes what are these?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_


(b) (i) In your opinion are there any disadvantages to incineration?

Yes  No  Don't know

(ii) If yes what are these?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_


5. Have you heard about incineration from any of the following and state whether it was positive or negative information:

Positive Negative Don't Know

Newspapers  
 Television  
 Radio  
 Internet  
 Government campaigns (leaflets etc.)  
 Other


6. Which of these waste management options would you be most in favour of for the Carlow (after next 5 years)?  
(Rank 1-6 in order of importance)

(i) Building of an incinerator	
(ii) Building of a new landfill	
(iii) Mass recycling scheme with landfill	
(iv) Mass recycling scheme with incineration	
(v) Mass recycling scheme with increased exportation of waste	
(vi) Mass recycling scheme with added tax on non-recyclable materials	


7. In terms of cost of waste disposal in the future, if given the choice, would you send your waste to an incinerator if it were cheaper than the alternatives?

Yes  No  Don't Know

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8. (a) As part of the South East waste management plan, incineration is an option in the coming years which we need to look at, in terms of proximity to your home what would you deem an acceptable location to be? (Please tick for each distance away from home)

Distance away	yes	no	maybe	dont know
<1 km				
1-5km				
5-10km				
>20km				


- (b) Finally, Would you suggest any possible locations for an incinerator in Carlow town or County?

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This is the end of the questionnaire survey, thank you for your time.