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CARBON TRUST

Carbon Management Energy Efficiency Report

Northern Ireland Organic Energy Study

Summary Report

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Product ID	P-0134345
PO Reference	PO023489
Country	Northern Ireland
Date	5/8/2010
Version	1.0 FINAL

CONTENTS

EXECUTIVE SUMMARY

This report presents the results of a study into the magnitude of organic waste in Northern Ireland carried out by Intra Consulting Ltd. This survey and report are provided by the Carbon Trust, who receive funding from the Department Energy and Climate Change, the Department of Transport, the Scottish Government, the Welsh Assembly Government and Invest Northern Ireland.

In Northern Ireland Carbon Trust activities are part financed by the European Regional Development Fund under the European Sustainable Competitiveness Programme for Northern Ireland.

The agreed scope of work was to review the magnitude and extent of organic & food waste in Northern Ireland. This has been achieved using a combination of methods including engagement with range of public & private sector organisations, interviews and a survey of all companies of significant magnitude operating in the range of commercial and industrial sectors encountered in the region.

On the basis of survey information, a set of benchmarks for organic and food waste were developed and applied to determine the overall magnitude of waste being generated in each sector.

It will be noted that this is a dynamic and changing situation in the region, with private & public sector organisations engaged in a range of initiatives to reduce, recycle or beneficially utilise the amount of organic and food waste created.

To facilitate the study, data collection and analysis was grouped into a number of sectors on a pragmatic basis generally as outlined below.

In most instances each sector is a clearly defined grouping of industry or organisation types, with the exception of the food sector which encompasses a relatively diverse group of companies.

The sectors are as generally described below, and are addressed in detail in the main body of this report;

- Household Sector
- Education Sector
- Healthcare Sector
- Retail Food Sector
- Bakery Sector
- Meat Processing Sector
- Dairy Sector
- Poultry Sector
- Fish Sector
- Food Sector

- Fruit and Vegetable Sector
- Drinks and Distillery Sector
- Animal Feed Sector
- Hotel Sector
- Public Sector

The main findings of our study were as follows;

- The total magnitude of organic & food waste in Northern Ireland is estimated to be 457,270 tonnes per annum.

- Household collected waste is the most significant factor at 32.89% of the total (150,400 tonnes per annum). The addition of estimated waste to drain (8.22% / 37,600 tonnes per annum) raises this figure to 41.11% of the total.

- The Meat Processing Sector is significant, accounting for 22.04% of the total (100,800 tonnes per annum).

- The Poultry Sector is significant, accounting for 16.84% of the total (77,000 tonnes per annum).

- Grouping the Meat Processing & Poultry Sectors together accounts for a total tonnage of 177,800 tonnes per annum and 38.88% of the total.

- The Retail Food Sector accounts for 5.58% of the total (25,500 tonnes per annum).

- The Food Processing Sector accounts for 5.69% of the total (26,000 tonnes per annum), although it will be noted that most of this waste is attributable to egg processing.

- With over 91% of the total magnitude of waste attributable to the 5 sectors outlined above, all of the remaining sectors are relatively insignificant in terms of their individual contribution to the levels of organic & food waste in the region.

A summary table of the magnitude of organic & food waste in Northern Ireland, presented on a sector by sector basis is given overleaf.

Summary table: magnitude of organic & food waste by sector in Northern Ireland

Sector	Tonnes of organic & food waste per annum	Percentage of total
Household (collected)	150,400	32.89%
Household (to drain)	37,600	8.22%
Education	2,000	0.44%
Healthcare	690	0.15%
Retail Food	25,500	5.58%
Bakery	640	0.14%
Meat Processing	100,800	22.04%
Dairy	13,200	2.89%
Poultry	77,000	16.84%
Fish	430	0.09%
Food Processing	26,000	5.69%
Fruit & Vegetables	10,200	2.23%
Drinks & Distillery	12,000	2.62%
Animal Feed	0	0%
Hotel (collected)	390	0.09%
Hotel (to drain)	100	0.02%
Public Sector (collected)	270	0.06%
Public Sector (to drain)	50	0.01%
TOTAL (tonnes)	**457,270**	

1. INTRODUCTION

1.1. General

This report presents the results of a study into the magnitude of organic waste in Northern Ireland carried out by Intra Consulting Ltd. This survey and report are provided by the Carbon Trust, whose activities are grant funded by the Department for Environment, Food and Rural Affairs, the Department for Business, Enterprise and Regulatory Reform, the Scottish Government, the Welsh Assembly Government and Invest Northern Ireland.

In Northern Ireland Carbon Trust activities are part financed by the European Regional Development Fund under the European Sustainable Competitiveness Programme for Northern Ireland.

The agreed scope of work was to review the magnitude and extent of organic & food waste in Northern Ireland. This has been achieved using a combination of methods including engagement with range of public & private sector organisations, interviews and a survey of all companies of significant magnitude operating in the range of commercial and industrial sectors encountered in the region.

On the basis of survey information, a set of benchmarks for organic and food waste were developed and applied to determine the overall magnitude of waste being generated in each sector.

It will be noted that this is a dynamic and changing situation in the region, with private & public sector organisations engaged in a range of initiatives to reduce, recycle or beneficially utilise the amount of organic and food waste created.

This report is based upon survey data and publicly available information obtained between December 2009 & March 2010, and represent our best estimates of the magnitude of organic and food waste in Northern Ireland during this time period.

2. SECTOR OVERVIEW

2.1 General

This report addresses the magnitude of available organic waste in Northern Ireland.

To facilitate the study, data collection and analysis was grouped into a number of sectors on a pragmatic basis generally as outlined below.

In most instances each sector is a clearly defined grouping of industry or organisation types, with the exception of the food sector which encompasses a relatively diverse group of companies.

The sectors are as generally described below, and are addressed in detail in subsequent sections of this report.

Household Sector

This sector encompasses the collection and disposal of general household waste throughout Northern Ireland.

Whilst this sector is described as "household" it also includes much of the commercial waste collection from small businesses in the region. This is not accounted for on a separate basis from household waste, being collected at the same time and in the same refuse vehicles (with the exception of city and town centres). This small business commercial waste includes offices, stand-alone restaurants & cafes and a significant number of public sector buildings including offices, community healthcare sites, schools, etc.

This reflects the strong position of the Local Council's waste collection services throughout the region.

Education Sector

This sector encompasses schools, universities and colleges throughout Northern Ireland.

There are 5 Regional Education & Library Boards and 2 Universities in the region, and the data is presented on this basis.

Healthcare Sector

This sector encompasses hospitals, healthcare centres, elderly people's homes, day centres & general healthcare facilities throughout Northern Ireland.

The sector is structured on a geographic basis, with 5 Health & Social Care Trusts managing and administering the facilities in their respective areas.

Retail Food Sector

This sector encompasses supermarkets and independent food retail stores throughout Northern Ireland.

The sector encompasses 6 major retail chains, and a thriving independent retail sector, generally supplied on a franchise basis by two food wholesaling and marketing groups in the region.

Bakery Sector

This sector encompasses the preparation & baking of bread and bakery products throughout Northern Ireland.

There has been much consolidation in large scale bakeries, and there are 6 companies of magnitude in the sector, with approximately 15 smaller companies producing for niche and specialist markets. Other than these organisations, the sector falls into the small or "craft" bakery classification.

Meat Processing Sector

This sector encompasses the slaughter, boning and retail packing of beef and sheep.

5 large companies account for over 90% of the market for processing of meat in Northern Ireland.

Dairy Sector

This sector encompasses the processing and manufacture of milk, cheese and dairy products.

This sector is dominated by a number of Co-operative organisations who have a long history both in the sector and in the region. There has been consolidation of smaller Co-operatives leading to the centralisation of production on larger scale sites, with 3 major Co-operatives have the great majority of market share in the region.

Poultry Sector

This sector encompasses the processing of poultry and preparation of poultry based foods throughout Northern Ireland.

There are 10 companies that account for the great majority of the market for processing of poultry in the region, with most undertaking the full range of activities from processing & preparation and retail packaging, to tertiary processing and cooking.

Fish Sector

This sector encompasses the processing and farming of fish and related products in Northern Ireland.

Food Sector

This sector encompasses the preparation of food products, including agri-foods in Northern Ireland. For the purposes of this study the sector encompasses eggs, frozen food, catering, coffee & tea, confectionery, food ingredients, ready-made meals, sandwiches & savoury goods.

Four major companies dominate the egg sector in Northern Ireland, and other than these organisations the sector generally comprises small niche companies.

Fruit and Vegetable Sector

This sector encompasses the growing and processing of fruit and vegetables in Northern Ireland.

These fall into 4 main categories of vegetables, vegetable processing, fruit and salads.

5 companies account for the great majority of the market for processing of fruit and vegetables in Northern Ireland.

Drinks and Distillery Sector

This sector encompasses the manufacture & distribution of alcoholic and carbonated drinks in Northern Ireland.

This sector has been subject to rationalisation in the past decade and is developing into a predominantly distribution based business in the region.

Animal Feed Sector

This sector encompasses the manufacture of animal feeds and pet foods in Northern Ireland.

Hotel Sector

This sector encompasses hotel accommodation throughout Northern Ireland.

The sector encompasses 51 hotels of varying sizes and standards, with each being a reflection of the catchment area in which it operates.

Premises vary from city centre establishments focussing on business clientele to small rural or holiday resort based premises, where business is more seasonal in nature, and where business turnover is supplemented by bar & restaurant sales, wedding functions, etc.

Public Sector

This sector encompasses Departments, Agencies, Trusts, Local Councils and other Government Bodies in Northern Ireland.

For the purposes of this study, much of this sector is included in other sectors of the study, including healthcare, education and the general household sector which encompasses much of the waste collected from public sector sites.

2.2 Magnitude of waste in all sectors.

A summary of the magnitude of waste for all sectors is given in tabular & graphical form in Appendix "A" of this report.

In summary, the following will be observed;

- The total magnitude of organic & food waste in Northern Ireland is estimated to be 457,270 tonnes per annum.

- Household collected waste is the most significant factor at 32.89% of the total (150,400 tonnes per annum). The addition of estimated waste to drain (8.22% / 37,600 tonnes per annum) raises this figure to 41.11% of the total.

- The Meat Processing Sector is significant, accounting for 22.04% of the total (100,800 tonnes per annum).

- The Poultry Sector is significant, accounting for 16.84% of the total (77,000 tonnes per annum).

- Grouping the Meat Processing & Poultry Sectors together accounts for a total tonnage of 177,800 tonnes per annum and 38.88% of the total.

- The Retail Food Sector accounts for 5.58% of the total (25,500 tonnes per annum).

- The Food Processing Sector accounts for 5.69% of the total (26,000 tonnes per annum), although it will be noted that most of this waste is attributable to egg processing.

- With over 91% of the total magnitude of waste attributable to the 5 sectors outlined above, all of the remaining sectors are relatively insignificant in terms of their individual contribution to the levels of organic & food waste in the region.

3. HOUSEHOLD SECTOR

3.1 Outline description of sector

This sector encompasses the collection and disposal of general household waste throughout Northern Ireland

Whilst this sector is described as "household" it also includes much of the commercial waste collection from small businesses in the region. This is not accounted for on a separate basis from household waste, being collected at the same time and in the same refuse vehicles (with the exception of city and town centres). This small business commercial waste includes offices, stand-alone restaurants & cafes and a significant number of public sector buildings including offices, community healthcare sites, schools, etc.

It will be noted that publicly available statistics on the weight of household waste disposed of by each local council includes this commercial waste. This waste is accounted for in overall municipal waste figures, but records do not permit the segregation of the small commercial waste.

3.2 Number of organisations of magnitude in the sector

Household waste is collected by the 26 Local Councils in Northern Ireland, generally as follows (approximate population shown in brackets);

Belfast City Council	(260,300)
Lisburn City Council	(114,800)
Derry City Council	(109,100)
Newry and Mourne City & District Council	(97,300)
Craigavon Borough Council	(90,800)
Newtownabbey Borough Council	(82,700)
North Down Borough Council	(78,900)
Ards Borough Council	(77,600)
Down District Council	(69,800)
Castlereagh Borough Council	(66,200)
Ballymena Borough Council	(62,700)
Fermanagh District Council	(62,000)
Armagh City & District Council	(58,200)
Coleraine Borough Council	(57,000)
Dungannon & South Tyrone Borough Council	(55,400)
Antrim Borough Council	(53,200)
Omagh District Council	(52,100)
Banbridge District Council	(47,000)
Magherafelt District Council	(43,800)
Carrickfergus Borough Council	(40,000)
Strabane District Council	(39,600)
Cookstown District Council	(35,900)
Limavady Borough Council	(34,100)
Larne Borough Council	(31,300)
Ballymoney Borough Council	(30,100)
Moyle District Council	(16,900)

This data is further expressed in terms of number of households on an electoral ward & postal district basis in the appendices.

The councils have formed a number regional management committees to liaise and co-ordinate on waste management issues in general and to work towards meeting national targets for the reduction of waste going to landfill.

It will be noted that the number of local councils is under review and the above list is current at the date of this report.

3.3 Ownership

The ownership of the Local Councils is public; however they maintain a number of commercial arrangements with companies in the private sector collect & dispose of specialist waste on their behalf, including organic and compostable arisings.

3.4 Regional geography

This sector covers the whole of Northern Ireland, although the main influencing factor in the magnitude of waste arisings is the number of households in each council area.

3.5 Nature of waste arisings

The nature of organic & food waste arisings in this sector are generally as follows;

- Waste arising from food preparation
- Cooked (uneaten) food
- "Out of date" discarded food

3.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 150,400 tonnes per annum.

This is the figure for collected municipal waste.

We estimate that a further 37,600 tonnes per annum of organic & food waste arisings per annum are disposed of to drain in this sector. The potential for recovery of this waste stream would require further review.

3.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Disposal to landfill site (estimated to be in the region of 80-90% of the total)

- recycling for composting (estimated to be in the region of 10-20% of the total)

There is also an amount of household food waste that is discharged to drain.

3.8 Basis of estimates

These estimates are based upon the following sources;

- Liaison with Representatives of the Waste Management groups of the Local Councils in Northern Ireland.
- Published information by the Waste Management groups of the Local Councils in Northern Ireland.
- The Municipal Waste Management Report (published by the Northern Ireland Environment Authority)
- The Landfill Allowance Scheme Regulations (2004) N.I. (NILAS)
- Food Waste Report: "The food we waste" Published by WRAP. ISBN: 1-84405-383-0 (version 2) April 2008 (revised July 2008)
- Food Waste Report: "Down the drain" Published by WRAP ISBN: 1-84405-431-4: November 2009.

3.9 Sector outlook

This sector will be subject to change on the basis of the number of Local Councils being rationalised and reorganised at sometime in the future.

This will not affect gross waste arising in this sector since this is driven by the level of population in Northern Ireland.

The local councils through their respective waste management committees (ARC21, etc) are making ongoing progress to segregate the various components of household waste in order to increase the level of recycling. As a function of this, commercial arrangements are already in place with waste disposal companies in the private sector for the handling of this

Therefore, available organic food waste arisings from this sector may already be committed in the medium term to competing demands other than energy from waste projects.

4. EDUCATION SECTOR

4.1 Outline description of sector

This sector encompasses schools, universities and colleges throughout Northern Ireland.

4.2 Number of organisations of magnitude in the sector

There are 5 Regional Education & Library Boards and 2 Universities in Northern Ireland, generally as follows;

• Belfast Education & Library Board	60 catering centres
• South Eastern Education & Library Board	100 catering centres
• Southern Education & Library Board	209 catering centres
• North Eastern Education & Library Board	254 catering centres
• Western Education & Library Board	131 catering centres
• Queen's University of Belfast	13 sites in Belfast (all with catering)
• The Ulster University	4 Campuses in Jordanstown, Belfast, Londonderry & Coleraine (all with catering)

The above information for schools is expressed in terms of number of catering centres rather than number of schools as it has been a certain level of rationalisation in the management of schooling meals, particularly in rural areas.

The Education & Library Boards cover the following Local Council areas;

Board	Council Areas covered
Belfast	Belfast
North Eastern	Antrim, Ballymena, Ballymoney, Carrickfergus, Coleraine, Larne, Magherafelt, Moyle, Newtownabbey
South Eastern	Ards, Castlereagh, Down, Lisburn and North Down
Southern	Armagh, Banbridge, Cookstown, Craigavon, Dungannon and South Tyrone, Newry and Mourne
Western	Derry, Fermanagh, Limavady, Omagh, Strabane

A number of Regional Colleges also operate under the auspices of the Education & Library Boards. From our discussions with these organisations, on site catering on these institutions is at modest levels, and in decline.

4.3 Ownership

The ownership of the Education Sector is public; however they maintain a number of commercial arrangements with companies in the private sector to dispose of specialist waste on their behalf, including organic and compostable arisings.

4.4 Regional geography

This sector covers the whole of Northern Ireland, although the main influencing factor in the location of schools is the density & level of population in each area.

4.5 Nature of waste arisings

The nature of waste arisings in this sector are generally as follows;

- Waste arising from food preparation
- Cooked (uneaten) food
- "Out of date" discarded food

4.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 2,000 tonnes per annum.

This is the figure for collected municipal waste and waste disposed to drain for this sector.

4.7 Present uses / destination of waste

At the time of the preparation of this report, the destinations of the waste arisings in this sector are as follows;

- Discharge to drain
- Disposal to landfill site
- Recycling for composting

Unlike other small scale commercial waste, our study indicates that the great majority of organic food waste on these sites is not being collected by Local Councils.

4.8 Basis of estimates

These estimates are based upon the following sources;

- Liaison with each of the Education & Library Boards & Universities as to the number of meals prepared on a "site by site" basis.

- Estimates of meal weight, uneaten meals and preparation losses as advised by Catering Management within the Education & Library Boards & Universities.

4.9 Sector outlook

The school sector will be subject to change on the basis of the changing demographic in the region, with falling pupil numbers and a continued trend to centralisation and a reduction in the number of schools, particularly in rural areas.

The overall management structure of the Education & Library Boards is being brought under the auspices of a single Education Authority for Northern Ireland.

Organic food waste arisings from the school sector may be available in the short term for potential energy from waste projects, although we understand that a group strategy for the disposal of food waste is under consideration on a group basis by the Boards.

The University Sector in Northern Ireland is enjoying a sustained period of growth, and both of these organisations have firm plans in place for further expansion in student numbers.

Both of the Universities have commercial arrangements in place for catering and for the disposal of waste.

5. HEALTHCARE SECTOR

5.1 Outline description of sector

This sector encompasses hospitals, healthcare centres, elderly people's homes, day centres & general healthcare facilities throughout Northern Ireland.

The sector is structured on a geographic basis, with 5 Health & Social Care Trusts managing and administering the facilities in their respective areas.

5.2 Number of organisations of magnitude in the sector

The 5 Health Trusts in Northern Ireland are as follows;

- Belfast Health & Social Care Trust
- Northern Health & Social Care Trust
- Western Health & Social Care Trust
- South Eastern Health & Social Care Trust
- Southern Health & Social Care Trust

The Local Council areas serviced by the Health Trusts mirrors those of the Education & Library Boards detailed elsewhere in this report.

5.3 Ownership

The ownership of the Healthcare Sector is public; however they maintain a number of commercial arrangements with companies in the private sector to dispose of specialist waste on their behalf, although this is predominantly clinical waste.

5.4 Regional geography

This sector covers the whole of Northern Ireland, although the scale of the sector is very much based around the Greater Belfast Region, both on the basis of density of population and the location of the two major hospital sites in the country.

5.5 Nature of waste arisings

The nature of waste arisings in this sector are generally as follows;

- Waste arising from food preparation
- Cooked (uneaten) food
- "Out of date" discarded food

5.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 690 tonnes per annum.

This is the figure for collected municipal waste and waste disposed to drain for this sector.

5.7 Present uses / destination of waste

At the time of the preparation of this report, the destinations of the waste arisings in this sector are as follows;

- Discharge to drain
- Disposal to landfill site
- Recycling for composting

Our research indicates that on outlying small scale healthcare sites such as healthcare centres, elderly people's homes and day centres organic food waste (mixed with general site waste) is being collected by Local Councils, and hence is within the "household" waste figures elsewhere in this report.

This leaves the major hospital sites which are not serviced by the Council collection system in terms of organic food waste.

5.8 Basis of estimates

These estimates are based upon the following sources;

- Information sought directly from the Health & Social Care Trusts.
- Meetings with Catering Managers in the Trusts to ascertain the level of food waste in relation to preparation and management.

5.9 Sector outlook

This sector has been subject to marked change & rationalisation in recent years, as the extent of community care is reduced. As a result, the number of outlying properties such as elderly people's homes and day centres is in decline. This trend is expected to continue.

Organic food waste arisings from the Healthcare sector may be available in the short term for potential energy from waste projects, although we understand that a group strategy for the disposal of food waste is under consideration on a group basis by the Health & Social Care Trusts.

The level of food waste in the sector has been the focus of recent media reports, and a short-term initiative to reduce this wastage appears to be in hand.

The present trend of centralising catering facilities and distributing food on a "cooked & chilled" basis would be expected to continue. From our visits to a large central catering facility, the level of organic food waste is relatively low as fruit and vegetables are procured on a pre-preparing basis. Also, unlike hospitals kitchens, uneaten food is not returned to the central catering centre, and thus the key to securing this waste stream will still be at the hospital or other healthcare facility as before.

Our contracts with catering management within the Health Trusts suggest that there is a reluctance to store organic food waste on a site for any period of time, and this may be a barrier to commercial collection on a meaningful scale. This is due to infection and pest control standards set by the Trusts themselves.

6. RETAIL FOOD SECTOR

6.1 Outline description of sector

This sector encompasses supermarkets and independent food retail stores throughout Northern Ireland.

6.2 Number of organisations of magnitude in the sector

The sector encompasses 6 major retail chains, generally as follows;

- Tesco (44 Stores)
- Sainsburys (11 Stores)
- ASDA (18 Stores)
- Marks & Spencer (9 Stores)
- Lidl (32 Stores)
- Dunnes Stores (11 Stores)

There is also a thriving independent retail sector, the great majority of which is supplied on a franchise basis by two food wholesaling and marketing groups; namely Henderson Group and Musgrave Group. The independent sector has developed to focus upon the convenience store sector, which features stores with a retail floor area of under 200m². There are approximately 1,200 of such retail stores in Northern Ireland.

There are a very modest number of independent small supermarkets (500 – 1,000m² retail floor area) in a number of market towns in Northern Ireland, and this sector is in decline.

6.3 Ownership

The ownership of the Retail Food Sector is private, on either a public limited company or limited company basis.

6.4 Regional geography

This sector covers the whole of Northern Ireland, with density and location of stores mirroring areas of population in the region.

The large UK multiples (Tesco, Asda, etc) have focused in recent years on larger retail stores on standalone sites, and many of these sites are expected to be extended (in terms of retail floor area) due to difficulties in obtaining planning consent for additional new stores.

6.5 Nature of waste arisings

The nature of organic & food waste arisings in this sector are generally as follows;

- "Out of date" discarded cooked food
- "Out of date" discarded raw and un-cooked food
- Spoiled fruit & vegetables

6.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the order of 25,000 tonnes per annum.

6.7 Present uses / destination of waste

At the time of the preparation of this report, the destinations of the waste arisings in this sector are as follows;

- Collection by commercial waste companies (for composting or other use)
- Collection for use in pet food or other similar products.
- Returned to original supplier

In the case of the small independent sector, the two large wholesale distribution groups have waste arisings on the central basis that are managed in a similar fashion to the large retail chains.

6.8 Basis of estimates

These estimates are based upon the following sources;

- Actual volumes & weights of waste given on a confidential basis by 2 companies in the sector. On the basis of this data, benchmarks have been developed and allocated across the sector. The benchmarks are relatively robust.

Engagement with this sector was complicated by the sensitivity of releasing information on a store by store basis. Where data was obtained this was on a group basis across all stores.

Due to the commercial sensitivity of the information provided, actual data received has been converted into aggregated benchmark data for the sector as a whole.

The quality of benchmarks in this sector are only judged as being "fair", and due the initiatives being undertaken by the large supermarket groups at the time of this report to reduce the level of food waste in these businesses, these figures would require to be reviewed on a regular basis.

6.9 Sector outlook

The volume of food waste available in this sector will be subject to change. The companies in the sector operate in a very competitive market, and have identified environmental issues as being of importance, both in terms of profitability and their public image.

Hence, these companies already have initiatives in place in Great Britain, many of which centre on the processing of food waste to anaerobic digester plants. These are either owned by the company, or owned by a third party with whom the company has a commercial arrangement.

A barrier to the transport of this food waste in retail stores located in Northern Ireland to these plants based in Great Britain in the long term may be the physical distance and transport costs involved.

Therefore there may be an opportunity for securing this waste stream on a local basis.

At present one of the retail chains is known to be transporting its food waste to a company in the Republic of Ireland for use in pet food manufacturer, whilst another group transports all food waste to Great Britain for recycling and other uses, under the auspices of a commercial arrangement with a specialist company.

This sector is well established and stable.

7. BAKERY SECTOR

7.1 Outline description of sector

This sector encompasses the preparation & baking of bread and bakery products throughout Northern Ireland.

7.2 Number of organisations of magnitude in the sector

There has been much consolidation in large scale bakeries, and there are 6 companies of magnitude in the sector, with approximately 15 smaller companies producing for niche and specialist markets.

Other than these organisations, the sector falls into the small or "craft" bakery classification, although this type of business has come under pressure from the supermarket and independent retail sector that have significantly encroached into their traditional business.

7.3 Ownership

The ownership of the Bakery Sector is private, either public limited company or limited company.

7.4 Regional geography

The 6 large producers in Northern Ireland are concentrated in the mid counties of the region and Belfast & Portadown.

The smaller companies are distributed across the region, although historically these are located in market towns.

7.5 Nature of waste arisings

The nature of waste arisings in this sector are generally as follows;

- Waste bread & bakery ingredients
- Spoiled product / process waste
- Returned / unsold product

7.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 640 tonnes per annum.

7.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Disposal to landfill site.

- Disposal to farmers for use as animal feed.

7.8 Basis of estimates

These estimates are based upon the following sources;

- Actual volumes & weights of waste given on a confidential basis by a number of companies in the sector. On the basis of this data, benchmarks have been developed and allocated across the sector. The benchmarks are judged to be sound as there was a moderate response from the company's survey had aligned a degree of correlation across the data analysed.

7.9 Sector outlook

This sector is robust, albeit one subject to commercial pressures and competition from abroad, along with the main driver of consumer demand.

This sector has already undergone significant consolidation over the past decade.

Given the nature of the waste in this sector, bakeries have little difficulty in disposing of what is an inert and safe waste stream.

All companies in this sector have commercial or casual arrangements already in place with waste disposal companies, farmers and others for the disposal of this waste.

Available organic food waste arisings from this sector may already be committed in the short & medium term to competing demands other than energy from waste projects.

8. MEAT PROCESSING SECTOR

8.1 Outline description of sector

This sector encompasses the slaughter, boning and retail packing of beef and sheep.

8.2 Number of organisations of magnitude in the sector

The 5 largest companies account for over 90% of the market for processing of meat in Northern Ireland.

These are;

- ABP
- Dunbia
- Foyle Food Group
- Linden Foods
- WD Meats

Generally the largest companies undertake the food range of processing from slaughter to boning & preparation and retail packaging.

8.3 Ownership

The ownership of the companies in this sector is private, with the exception of Linden Foods which is part of a co-operative.

8.4 Regional geography

This sector is predominantly based in proximity to the location of agricultural livestock, with all of the main processors being located in market towns in rural areas of Northern Ireland.

8.5 Nature of waste arisings

The nature of waste arisings in this sector are generally as follows;

- Blood
- Gut contents of slaughtered animals
- Animal tissue waste
- Sludge cake (from effluent treatment)

8.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 100,800 tonnes per annum.

The approximate breakdown by weight of this total is as follows; Category 1,2&3 waste (52%); Blood (9%); Paunch / Sludge (30%); Bones (9%); Food (negligible).

8.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Land spreading
- Rendering
- Reprocessing for pet food or other similar uses.

8.8 Basis of estimates

These estimates are based upon the following sources;

- Actual volumes & weights of waste given on a confidential basis by a number of processors in the sector. On the basis of this data, benchmarks have been developed and allocated across the sector. The benchmarks are relatively robust, since the amount of waste is a function of the weight of the livestock being processed. Also a high level of co-operation was received from the dominant companies active in the market, generally as listed above.

8.9 Sector outlook

This sector is robust and thriving one, albeit one subject to commercial pressures and competition from abroad, along with the main driver of consumer demand.

Given the nature of the waste in this sector, meat processors have had to face the challenge of economically viable and environmentally acceptable methods of waste disposal some time ago.

All companies in this sector have commercial arrangements already in place with waste disposal companies and others for the disposal of this waste.

Available organic food waste arisings from this sector may already be committed in the short & medium term to competing demands other than energy from waste projects.

9. DAIRY SECTOR

9.1 Outline description of sector

This sector encompasses the processing and manufacture of milk, cheese and dairy products.

9.2 Number of organisations of magnitude in the sector

This sector is dominated by a number of Co-operative organisations who have a long history both in the sector and in the region. There has been consolidation of smaller Co-operatives leading to the centralisation of production on larger scale sites.

There are approximately 15 organisations of magnitude in the sector, although 3 major Co-operatives have the great majority of market share in Northern Ireland (Fane Valley, United Dairy Farmers and Kerry Group).

9.3 Ownership

The ownership of the Dairy Sector is generally co-operative; however they maintain a number of commercial arrangements with companies in the private sector to dispose of specialist waste on their behalf, including organic and compostable arisings.

9.4 Regional geography

This sector is predominantly based in proximity to the location of dairy livestock, with all of the main processors being located in market towns in rural areas of Northern Ireland.

9.5 Nature of waste arisings

The nature of waste arisings in this sector are generally as follows;

- effluent sludge
- waste fat
- waste milk
- food waste

9.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 13,200 tonnes per annum.

9.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Land spreading on agricultural land.
- Other agricultural use (animal feed).
- Disposal to landfill (minor volumes).

9.8 Basis of estimates

These estimates are based upon the following sources;

- Actual volumes & weights of waste given on a confidential basis by a number of dairy processors in the sector. On the basis of this data, benchmarks have been developed and allocated across the sector. The benchmarks are relatively robust, since the amount of waste is a function of the production volumes of similar and generic processes. Also a high level of co-operation was received from the major co-operatives active in the market, generally as listed above.

9.9 Sector outlook

This sector has already undergone significant consolidation over the past decade.

Given the nature of the waste in this sector, there is little difficulty in disposing of what is an inert and safe waste stream.

All companies in this sector have commercial or casual arrangements already in place with waste disposal companies, farmers and others for the disposal of this waste.

Available organic food waste arisings from this sector may already be committed in the short & medium term to competing demands other than energy from waste projects.

10. POULTRY SECTOR

10.1 Outline description of sector

This sector encompasses the processing of poultry and preparation of poultry based foods throughout Northern Ireland.

10.2 Number of organisations of magnitude in the sector

There are 10 companies that account for the great majority of the market for processing of poultry in the region.

Generally the largest companies undertake the full range of activities from processing & preparation and retail packaging, to tertiary processing and cooking.

10.3 Ownership

The ownership of the Poultry Sector is private, either public limited company or limited company.

10.4 Regional geography

This sector is predominantly based in proximity to the location of poultry breeders, with the majority of the main processors being located in market towns in rural areas of Northern Ireland.

10.5 Nature of waste arisings

The nature of organic & food waste arisings in this sector are generally as follows;

- Blood
- Feathers
- Poultry tissue waste
- Sludge cake (from effluent treatment)

10.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 77,000 tonnes per annum.

This is the figure for collected municipal waste and waste disposed to drain for this sector.

The approximate breakdown by weight of this total is as follows; Category 2 Waste (15%); Sludge / Effluent (52%); Offal (9%); Blood (9%); Feathers (15%).

10.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Land spreading
- Rendering
- Reprocessing for pet food or other similar uses.

10.8 Basis of estimates

These estimates are based upon the following sources;

- Actual volumes & weights of waste given on a confidential basis by a number of processors in the sector. On the basis of this data, benchmarks have been developed and allocated across the sector. The benchmarks are moderately sound, as only a proportion of the companies active in the market were willing to engage with the study. However, since the amount of waste is a function of the volume of the poultry being processed, this is a relatively elemental and predictable industry.

10.9 Sector outlook

This sector encompasses a small number of large companies who are key players in the supermarket supply chain in the UK.

Given the nature of the waste in this sector, poultry processors have had to face the challenge of economically viable and environmentally acceptable methods of waste disposal some time ago.

All companies in this sector have commercial arrangements already in place with waste disposal companies and others for the disposal of this waste.

Available organic food waste arisings from this sector may already be committed in the short & medium term to competing demands other than energy from waste projects.

11. FISH SECTOR

11.1 Outline description of sector

This sector encompasses the processing and farming of fish and related products in Northern Ireland.

11.2 Number of organisations of magnitude in the sector

There are 8 companies that account for the great majority of the market for processing of fish in Northern Ireland.

11.3 Ownership

The ownership of the companies in this sector is private, with generally family owned concerns.

11.4 Regional geography

The industry is predominantly centred along the eastern coastal area of County Down, although there are isolated companies elsewhere.

11.5 Nature of waste arisings

The nature of waste arisings in this sector are generally as follows;

- Shells (prawns & shellfish)
- Fish bones
- Fish entrails and associated waste

It is important to note that there is a significant proportion of fish which is landed having been processed at sea. Therefore this processing has virtually negligible landed waste.

11.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 430 tonnes per annum.

Generally the companies fall into two market segments, either dealing with fish or shellfish. Whilst the waste arisings from the processing activities of fish are negligible, the processing of shellfish is considerable with around 40% of the total weight of product being waste.

11.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Landfill
- Rendering

11.8 Basis of estimates

These estimates are based upon the following sources;

- Actual volumes & weights of waste given on a confidential basis by a number of processors in the sector. On the basis of this data it is clear that other than the processing of shellfish there is negligible waste in this sector.

11.9 Sector outlook

This sector has been subject to significant reductions in scale and structural change, is subject to commercial pressures and competition from abroad, along with legislative and regulatory pressures.

Whilst the level of waste in the fish processing sector in NI is negligible, shellfish processors have had to face the challenge of economically viable and environmentally acceptable methods of waste disposal some time ago.

All companies in this sector have commercial arrangements already in place with waste disposal companies and others for the disposal of this waste.

12. FOOD SECTOR

12.1 Outline description of sector

This sector encompasses the preparation of food products, including agri-foods in Northern Ireland.

The sector encompasses the following;

- Eggs
- Frozen food including ice cream
- Catering
- Coffee & tea
- Confectionery
- Food ingredients
- Ready-made meals
- Sandwiches
- Savoury goods

Other than those in the egg sector, this sector generally comprises small niche companies.

Four major companies dominate the egg sector in Northern Ireland.

12.2 Number of organisations of magnitude in the sector

In terms of turnover there are 6 organisations of magnitude in the sector, out of a total number of 53 companies identified. The scope of this group is wide and disparate.

12.3 Ownership

The ownership of the companies in this sector is private, with generally small and medium sized family owned concerns.

12.4 Regional geography

This sector covers the whole of Northern Ireland, with companies located in all counties.

12.5 Nature of waste arisings

The nature of waste arisings in this sector are generally as follows;

- Waste food ingredients arising from production processes
- Spoiled product / process waste
- Returned / unsold product
- Egg shells
- Poultry manure
- Vegetable peelings and associated waste

12.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 26,000 tonnes per annum.

It is important to note that 25,850 tonnes of this total is attributable to the egg processors in this sector.

12.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Land spreading
- Rendering
- Disposal to landfill site
- Recycling for composting

From our survey of the small niche food companies, most appear to be utilising the Local Council for waste disposal.

12.8 Basis of estimates

These estimates are based upon the following sources;

- Actual volumes & weights of waste given on a confidential basis by a number of the major egg processors. On the basis of this data, benchmarks have been developed and allocated across the sector. The quality of benchmarks in this sector are relatively robust.

The weight of waste for the small niche companies is based upon an informal liaison with a selection of companies. Whilst this is an estimate of total waste the sector ass a whole is judged to be insignificant when compared to other sectors addressed in this report.

12.9 Sector outlook

The egg producers in this sector all appear to be well established companies with a good profile in their market.

Available organic food waste arisings from the egg sector may already be committed in the short & medium term to competing demands other than energy from waste projects.

It is difficult to state any outlook for the small niche companies in this sector, due to their diversity.

13. FRUIT AND VEGETABLE SECTOR

13.1 Outline description of sector

This sector encompasses the growing and processing of fruit and vegetables in Northern Ireland.

These fall into 4 main categories;

- Vegetables
- Vegetable processing
- Fruit
- Salads

13.2 Number of organisations of magnitude in the sector

There are 5 companies that account for the great majority of the market for processing of fruit and vegetables in Northern Ireland.

13.3 Ownership

The ownership of the companies in this sector is private, with generally family owned concerns.

13.4 Regional geography

This sector is either based in proximity to the location of farmland where the product is grown (for instance apples & fruit in Armagh), or in the case of processors being located close to the distribution hubs of the supermarket chains in Northern Ireland.

13.5 Nature of waste arisings

The nature of organic & food waste arisings in this sector are generally as follows;

- Waste arising from fruit & vegetable preparation
- Spoiled or damaged fruit & vegetables.

13.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 10,200 tonnes per annum.

13.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Disposal to landfill site
- recycling for composting
- use as animal feed

13.8 Basis of estimates

These estimates are based upon the following sources;

- Actual volumes & weights of waste given on a confidential basis by a number of processors in the sector. On the basis of this data, estimates have been developed and allocated across the sector. The estimates are judged to be "fair", and based upon an amount of waste as a function company size.

13.9 Sector outlook

This sector is subject to commercial pressures and competition from abroad, along with the main driver of consumer demand & downward pressure on prices by the large retail buyers.

Given the nature of the waste in this sector, processors have little difficulty in disposing of what is an inert and safe waste stream.

All companies in this sector have commercial or casual arrangements already in place with waste disposal companies and others for the disposal of this waste.

Available organic food waste arisings from this sector may already be committed in the short & medium term to competing demands other than energy from waste projects.

14. DRINKS & DISTILLERY SECTOR

14.1 Outline description of sector

This sector encompasses the manufacture & distribution of alcoholic and carbonated drinks in Northern Ireland.

This sector has been subject to rationalisation in the past decade and is developing into a predominantly distribution based business in the region.

14.2 Number of organisations of magnitude in the sector

There has been much consolidation in the drinks sector, and there are 3 companies of magnitude in the sector, with approximately 6 small companies producing for niche and specialist markets.

14.3 Ownership

The ownership of the Sector is private, either public limited company or limited company.

14.4 Regional geography

This sector is predominantly located in the Greater Belfast Area, although there are isolated sites outside of this area, with Bushmills Distillery and Maine Soft Drinks in the north of County Antrim.

14.5 Nature of waste arisings

The nature of waste arisings in this sector are generally as follows;

- Spoiled product
- Barley & pot ale waste from distillery process

14.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 12,000 tonnes per annum.

14.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Animal feed

14.8 Basis of estimates

These estimates are based upon the following sources;

- Firm and up-to-date information provided by companies in the sector.

14.9 Sector outlook

Since the great majority of the sector has no organic waste arisings of any magnitude, we have no particular comments in this instance.

15. ANIMAL FEED SECTOR

15.1 Outline description of sector

This sector encompasses the manufacture of animal feeds and pet foods in Northern Ireland.

15.2 Number of organisations of magnitude in the sector

There are four companies who dominate the animal feed sector in Northern Ireland.

There are a further 10 companies who are active in the market place and who fall into this small or medium sized company category.

15.3 Ownership

Ownership of companies in this sector is a mix of private and co-operative.

15.4 Regional geography

This sector covers the whole of Northern Ireland, although the main influencing factor in the locating of manufacturing plants is the proximity to other food manufacturing processes that has a usable waste stream, or proximity to bulk storage and delivery of grains (at docks, etc).

15.5 Nature of waste arisings

The very nature of this industry is such that it is a receiver of food waste from other manufacturers, and hence waste arisings are negligible.

Any process production waste can usually be readily reprocessed, and hence waste from this source is also negligible.

15.6 Magnitude of waste arisings

Waste arisings are negligible in this sector.

15.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are as follows;

- Waste is reprocessed within the manufacturing plant.

15.8 Basis of estimates

Not applicable.

15.9 Sector outlook

This sector will continue to utilise waste arisings from other food manufacturing industries, unless other competing uses or demands supplant it as a cost effective and convenient destination.

As this sector supplies the agricultural sector with livestock feeds, the outlook of the animal feeds industry is inextricably linked to it.

16. HOTEL SECTOR

16.1 Outline description of sector

This sector encompasses hotel accommodation throughout Northern Ireland.

The sector encompasses 51 hotels of varying sizes and standards, with each being a reflection of the catchment area in which it operates.

Premises vary from city centre establishments focussing on business clientele to small rural or holiday resort based premises, where business is more seasonal in nature, and where business turnover is supplemented by bar & restaurant sales, wedding functions, etc.

The average size of hotel in Northern Ireland is a 65 bedroom property, with rural properties typically being in the 25-45 bedroom range to Large 4 star sites in the range 100-170 bedrooms.

16.2 Number of organisations of magnitude in the sector

There are 51 organisations of magnitude in the sector.

Most hotels are independently owned and operated, although there are three locally based companies who operate a number of properties on a group basis.

16.3 Ownership

The ownership of the Hotel Sector is private, being largely family owned and operated businesses.

16.4 Regional geography

This sector covers the whole of Northern Ireland, although the greatest number of hotels follows the density of population being located around Greater Belfast, and in the eastern counties.

16.5 Nature of waste arisings

The nature of organic & food waste arisings in this sector are generally as follows;

- Waste arising from food preparation
- Cooked (uneaten) food
- "Out of date" discarded food
- Alcoholic drinks, carbonated drinks and liquid food waste dumped to drain.

16.6 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 390 tonnes per annum.

This is the figure for collected municipal waste.

We estimate that a further 100 tonnes per annum of organic & food waste arisings per annum are disposed of to drain in this sector. This is based on the same relative proportions as observed in the household sector, and may be a conservative figure.

16.7 Present uses / destination of waste

At the time of the preparation of this report, the destination of the waste arisings in this sector are thought to mirror those of the household sector, as follows;

- Disposal to landfill site
- recycling for composting

In this sector, outside of the three hotel local hotel groups, our study revealed that the great majority of the premises utilise the Local Council to remove waste.

The hotel groups generally have arrangements in place with commercial waste contractors, although the priority for this type of site is the volume of packaging materials, glass, etc which arise in the course of business.

A number of hotel premises have on-site composting of waste, and although these sites are few, many of the managers contacted mentioned the potential for this waste management facility at some time in the future.

A number of hotels (estimated to be 15-20%) segregate food waste to varying extents, and this data is used on some sites for general management information, including over ordering of food, portion control and as a measure of quality.

There is also an unmeasured amount of food & drink waste that is discharged to drain. To put some preliminary magnitude on this waste, household waste to drain is estimated to be in the region of 25% by weight of the binned waste.

Utilising this figure gives a total weight of food & drink waste that is discharged to drain of approximately 100 tonnes per annum. Further research would be required to validate data for this particular waste stream; however the estimate provides a valuable insight into the likely order of magnitude of this waste.

17. PUBLIC SECTOR

17.1 Outline description of sector & magnitude of waste arisings

This sector encompasses Departments, Agencies, Trusts, Local Councils and other Government Bodies in Northern Ireland.

For the purposes of this study, the following data is employed;

Sector	Approximate number of persons engaged in sector	% of total	Estimated weight of waste per annum (Tonnes)
Education and Library Boards	51,000	34.6%	Included elsewhere
Local Councils	10,000	6.8%	Included elsewhere
Health & Social Care Trusts	46,500	31.5%	Included elsewhere
Police	10,000	6.8%	80
Prisons	1,500	1.0%	60
Other	28,500	19.3%	130
Totals	**147,500**		**270**

Note that the total number of persons engaged in the Prison Sector includes prisoners, and the catering service provided for both inmates and prison staff.

This data is based on census figures and an estimate of magnitude of the workforce based in fixed locations such as offices for the purposes of their work.

In this sector we are concerned with food waste arisings from catering facilities serving staff & employees.

Due to the structure of this study, a significant number of total employees have been captured within a number of other sectors in this study.

The great numbers of employees in the Education & Library Boards have been captured in the Education Sector elsewhere in this report.

Employees in Health and Social Care Trusts are either based in large hospital sites (which normally include administrative functions for the Trust), or in outlying healthcare sites such as elderly people's homes, day centres or clinics. Therefore we are still raising is our either captured under the healthcare section of the study, or in the case of small, the volume of waste collected is included within overall municipal waste collection (as described in the household sector of this report).

In local council work locations, the Councils themselves collect the waste arising from these sites. Therefore as with small commercial businesses in the community, the volume of waste collected is included within overall municipal waste collection (as described in the household sector of this report).

Based on the above figures 74% of employees are in the Health, Education & Local Council Sectors, whose waste is captured elsewhere in this study.

From our informal contact with the sector, we understand that waste removal services across the region (and in particular for sites outside Greater Belfast) are generally provided by the Local Councils. Therefore, the volume of waste collected is included within overall municipal waste collection.

17.2 Nature of waste arisings

The nature of organic & food waste arisings in this sector are generally as follows;

- Waste arising from food preparation
- Cooked (uneaten) food
- "Out of date" discarded food

17.3 Magnitude of waste arisings

The magnitude of organic & food waste arisings per annum in this sector estimated to be in the region of 270 tonnes per annum.

This is an estimate based on survey data from a number of Government Departments, and excludes the Health, Education & Local Council Sectors.

This is the figure for collected waste, and it is thought that the majority of this is encompassed within the reported figures for municipal waste (as reported elsewhere).

To avoid double accounting, and since this figure is relatively modest in scale, this waste is assumed to be included elsewhere.

There is also an unmeasured amount of food & drink waste that is discharged to drain. To put some preliminary magnitude on this waste, household waste to drain is estimated to be in the region of 25% by weight of the binned waste.

Utilising this figure gives a total weight of food & drink waste that is discharged to drain of approximately 50 tonnes per annum. Further research would be required to validate data for this particular waste stream; however the estimate provides an insight into the likely order of magnitude of this waste.

17.4 Sector outlook

This sector will be subject to significant structural and organisational change in the forthcoming years.

This will inevitably result in the rationalisation of the number of employees and operational sites in the sector, and in the long term the geographic location of employment within the region.

APPENDICES

“A” Overview data

APPENDIX “A”

Overview data

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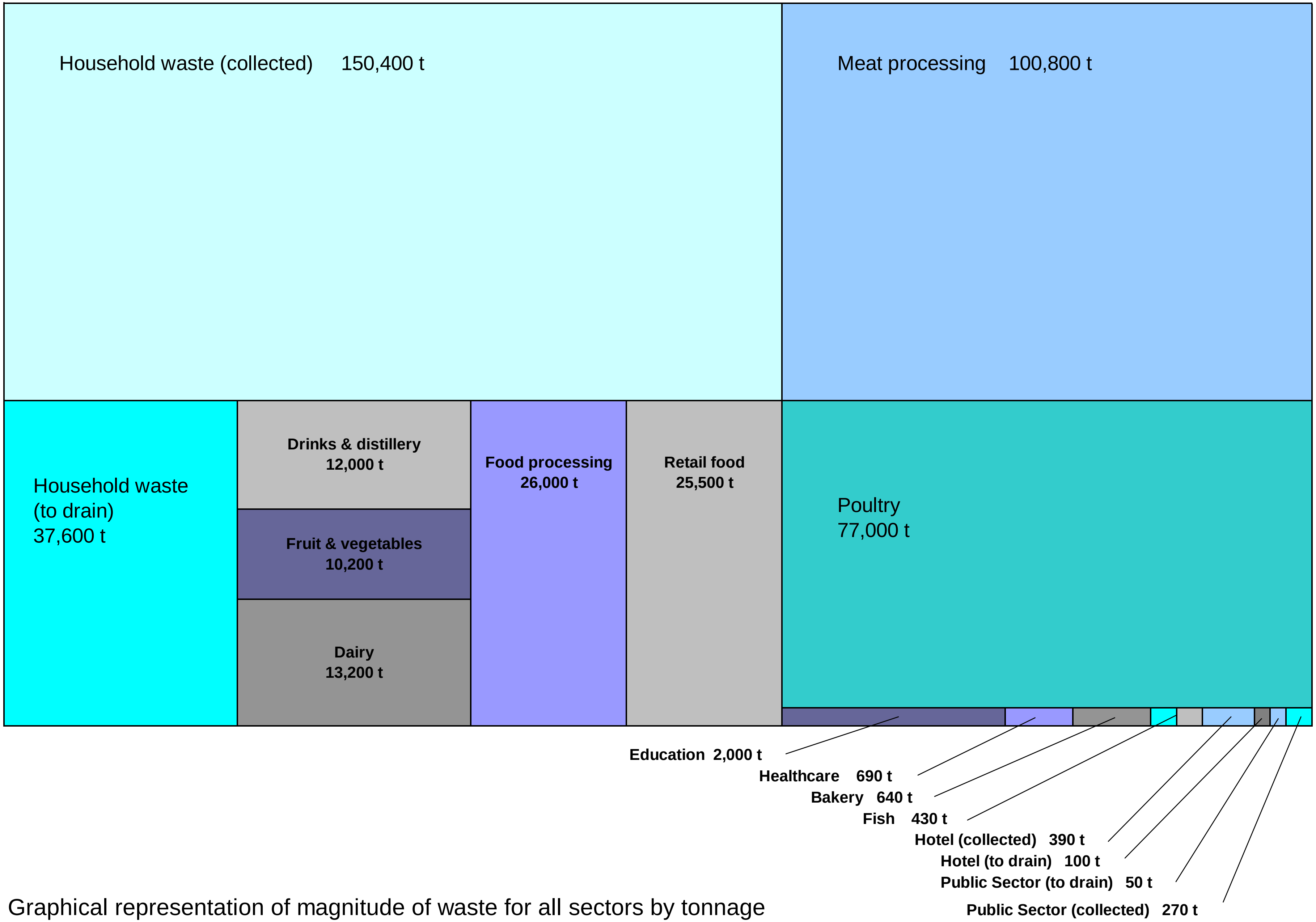
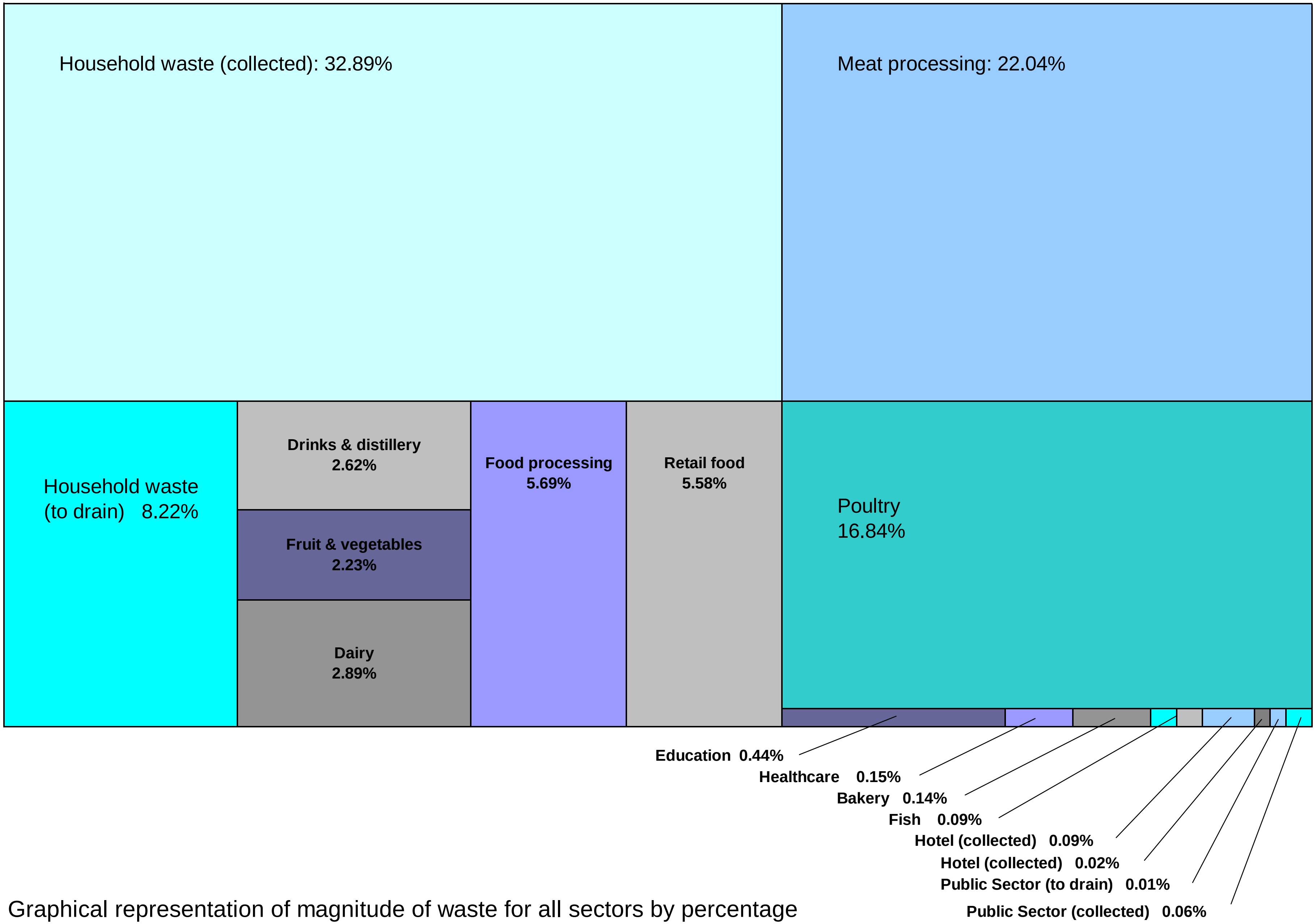
Summary table: magnitude of organic & food waste by sector in Northern Ireland

Sector	Tonnes of organic & food waste per annum	Percentage of total
Household (collected)	150,400	32.89%
Household (to drain)	37,600	8.22%
Education	2,000	0.44%
Healthcare	690	0.15%
Retail Food	25,500	5.58%
Bakery	640	0.14%
Meat Processing	100,800	22.04%
Dairy	13,200	2.89%
Poultry	77,000	16.84%
Fish	430	0.09%
Food Processing	26,000	5.69%
Fruit & Vegetables	10,200	2.23%
Drinks & Distillery	12,000	2.62%
Animal Feed	0	0%
Hotel (collected)	390	0.09%
Hotel (to drain)	100	0.02%
Public Sector (collected)	270	0.06%
Public Sector (to drain)	50	0.01%
TOTAL (tonnes)	**457,270**	



Graphical representation of magnitude of waste for all sectors by tonnage



Graphical representation of magnitude of waste for all sectors by percentage