

CHAPTER 5 - BASELINE WASTE MANAGEMENT REVIEW

This chapter summarises the current pattern of waste arisings for all waste types within the arc21 Region and also provides a description of council owned and privately owned waste management facilities. The chapter also contains information on projected waste arisings for the arc21 Region.

INTRODUCTION

- 5.1 In planning for the future, information is needed on the types and amounts of waste produced, treated, transported and disposed of. This information is necessary to establish the scale and nature of waste management in the arc21 Region so that informed decisions can be made about the realistic provision of future facilities.
- 5.2 This chapter assesses the following key areas of baseline information:
- The pattern and amount of different types of waste currently generated;
 - The projected quantity of future waste arisings; and
 - The location, use and capacity of existing facilities in the arc21 Region.

Hazardous and packaging waste baseline information is addressed in Chapters 8 and 9.

WASTE STREAMS AND DEFINITIONS

- 5.3 The need for a common definition of waste was recognised in the EC Framework Directive on Waste in order to improve the efficiency of waste management within the European Community. Article 1 of the 1991 amendment¹ of the 1975 Framework Directive defines waste as “*any substance or object which the holder discards or intends or is required to discard.*”
- 5.4 The Waste and Contaminated Land (Northern Ireland) Order 1997 provides definitions for the types of waste arising. **Controlled** waste means household, industrial and commercial waste or any such waste, where:
- Household waste arises from a domestic property, caravan, residential home, premises forming part of a university or school or other educational establishment and premises forming part of a hospital or nursing home;
 - Commercial waste is from premises used wholly or mainly for the purposes of a trade or business or the purposes of sport, recreation or entertainment; and
 - Industrial waste is from a factory (within the meaning of the Factories Act

¹ Directive 91/156/EEC

(Northern Ireland) 1965) and from premises connected to the supply of public facilities.

- 5.5 The DOE has prepared draft Waste Management (NI) Regulations (2005) that will bring agricultural wastes and certain mining and quarrying wastes within the definition of controlled wastes so that these will be considered as an extension of industrial wastes.
- 5.6 Waste materials arising within the arc21 Region are referred to in the Plan by the categories and waste types listed in Table 5.1. An explanation and definition of the waste categories and types referred to in this document is also given in Table 5.1.

The relationship to formal Directive definitions of waste is outlined in Appendix 5A.

- 5.7 Although this Plan concentrates on the management of controlled wastes, information is provided on non-controlled wastes such as agricultural and mining and quarrying wastes, as they are produced in significant quantities and may share facilities or provide opportunities for cost-effective processing with other waste streams. The definition of controlled waste is likely to change in the near future to include agricultural waste and non-mineral mining and quarry wastes. Baseline information on agricultural and mining wastes is included in this chapter and an indication of management options, as appropriate, is provided. Summary information on sewage sludge is also provided due to its potential impact of waste management facility requirements in the arc21 Region.
- 5.8 Within the municipal, commercial and industrial waste streams, certain “priority waste streams” have been identified in European and UK legislation for particular action. These include:
- Batteries
 - Electrical and Electronic Equipment
 - Packaging and packaging waste
 - Tyres
 - End of Life Vehicles.
- 5.9 The arc21 Councils hold accurate data on household waste as they are responsible for its collection and disposal. However, information on most of the remaining waste streams is not readily available. Therefore, the Plan is based on the best estimates of the amounts of other wastes being generated, and their disposal patterns and reuse and recycling, where available.

Table 5.1 Controlled Waste Categories and Classifications

Waste Category	Waste Classification	Description
Municipal	Non-hazardous	These include household and commercial wastes that are collected by or on behalf of a local council. The category also includes waste from various local council operations such as street cleaning, gully emptying, litter collection and some construction and demolition waste arising. It further includes civic amenity waste (household and garden waste taken to civic amenity sites by the general public).
Commercial & Industrial	Mixture of Hazardous and Non-hazardous	These wastes arise from premises used mainly for the purpose of a trade or business or for the purposes of sport, recreation or entertainment, in accordance with the definition in Article 3 of the Waste and Contaminated Land (NI) Order 1997 and Schedules 3 and 4 of the Controlled Waste Regulations (Northern Ireland) 2002. Some commercial wastes also arise from industrial sites. Industrial wastes largely cover waste arisings from industrial processes including factories, construction and dredging operations.
Construction Demolition & Excavation	Generally inert	These wastes arise from construction, demolition and excavation activities or from improvement, repair or alteration of buildings. They essentially form a sub-group of industrial waste and can consist of soil, hardcore, brickwork, masonry, pipework, timber and rubble. Whilst these wastes are mostly classified as inert waste under the formal definitions above, they may be contaminated with materials such as paints, oils etc, or by previous land use history, in which case they would fall under the definition of non-hazardous waste. Where a site is licensed to accept only inert wastes, contaminating materials would need to be separated out before disposal.
Hazardous	Hazardous	These wastes comprise controlled waste that is or may be so dangerous or difficult to treat, keep or dispose of that the DOE considers special provision is required for dealing with it. These are defined by the Hazardous Waste Regulations (Northern Ireland) 2005 which provide a regulatory system requiring pre-notification to the EHS of the movement and disposal of such wastes.
Healthcare	Generally Hazardous	These wastes include human and animal tissue, blood and other body fluids, swabs or dressings, syringes or needles and pharmaceutical products which may prove hazardous to any person coming into contact with it, and other waste arising from medical, nursing, dental, veterinary or similar practices which may cause infection to any person coming into contact with it. They are defined as clinical waste in the Controlled Waste Regulations (NI) 2002 and are to be treated as industrial waste. It also includes non infectious wastes arising at hospitals and other healthcare facilities which are defined as household waste in Article 2 of the Waste and Contaminated Land (NI) Order 1997.

Table 5.1 (Continued) Controlled Waste Categories and Classifications

Waste Category	Waste Classification	Description
Sewage Sludge	Generally Non-hazardous	This includes the residue produced at sewage treatment works which is not discharged with the treated effluent. Sewage sludge applied to land is non-hazardous. Other sludges may contain contaminants in proportions that would render them hazardous and therefore require special treatment prior to their disposal.
Agriculture ²	Generally Non-hazardous	This comprises waste arising from premises used for agriculture within the meaning of Agriculture (NI) Act 1949 and includes horticulture, fruit growing, seed growing, dairy farming and livestock breeding and keeping as well as the use of land as amongst others grazing land or market gardens.
Certain Mining and Quarrying Waste ³	Generally Non-hazardous	This includes wastes generated by mineral extraction and by the processing of minerals into saleable products such as colliery spoil, china clay wastes and slate wastes. Most of these wastes are generally inert within the definition provided in the Landfill Regulations (Northern Ireland) 2003.

PATTERN OF WASTE ARISING

5.10 Table 5.2 provides a summary of the estimated controlled waste arisings in 2004 for the arc21 Region. The derivation of these figures is given in paragraphs 5.11 to 5.40.

Table 5.2 Estimated Waste Arisings

Waste Category	Estimated Controlled Waste Arisings 2004 (Tonnes)
Municipal	579,493
Commercial & Industrial	402,453
Construction, Demolition & Excavation	1,868,064
TOTAL	2,850,010

Municipal Waste

5.11 Municipal waste arisings include Household waste and other wastes comprising the following;

² Agriculture wastes are expected to become controlled wastes under the Waste Management (NI) 2005 which are currently in draft form.

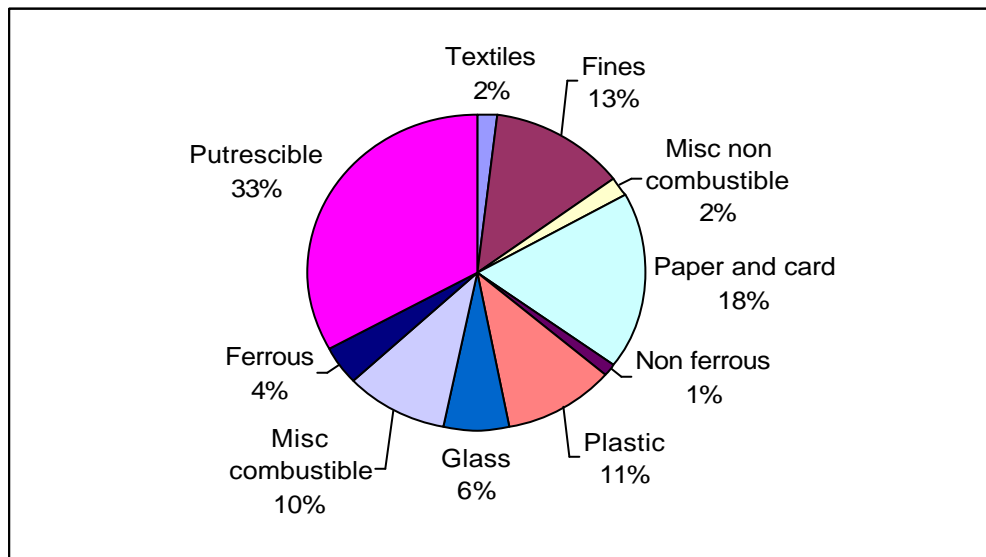
³ The DOE has indicated that 2005 Regulations are to apply waste management controls to **non-mineral** mines and quarries waste in Northern Ireland.

Table 5.3 Municipal Waste Breakdown

Household Waste	Other Municipal Wastes
Mixed waste collected from domestic premises	Council collected trade waste
Recycled household waste collected from domestic premises	Construction and demolition wastes collected from CAS/HWRC
Civic amenity waste	End of Life Vehicles (ELVs)
Bring site wastes	Fly tipped wastes
Bulky uplift wastes from domestic premises (for example mattresses)	Litter and street cleansing wastes
	Parks and public garden wastes

5.12 A Northern Ireland Household Waste Characterisation study, conducted in 2000, generated the following waste composition data⁴ (Figure 5.1).

Figure 5.1: NI Household Waste Composition



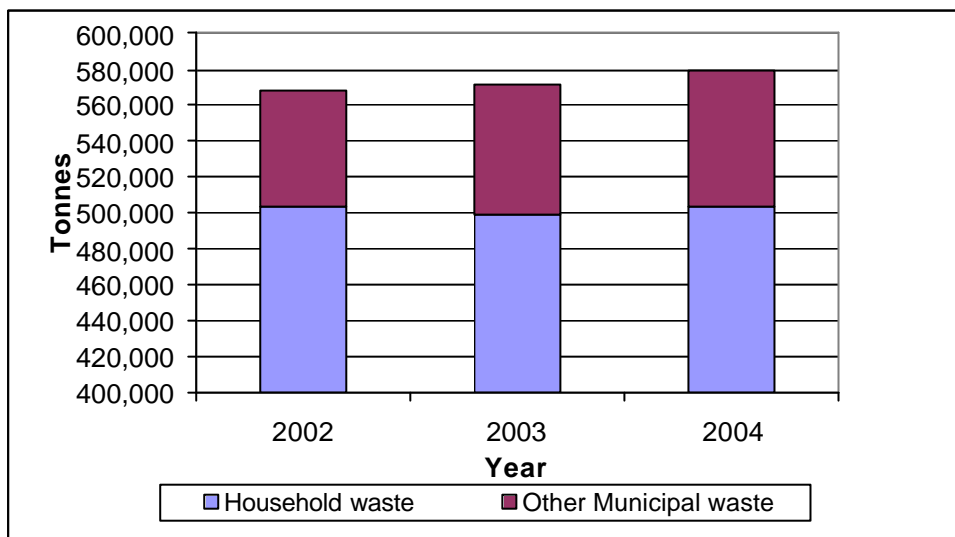
⁴ The Northern Ireland Household Waste Characterisation Study 2000, NI200 and Kirk, McClure, Morton (January 2001)

5.13 Key Performance Indicator (KPI's) Data provided by each of the Councils to the DOE were reviewed for 2002-2004. This data indicated that;

- Total municipal waste arisings in 2002 were 568,182 tonnes;
- In 2003 these increased to 571,250 tonnes;
- In 2004 these increased to 579,493 tonnes.

This represents a 1% average increase. Figure 5.2 identifies the tonnages of household waste and other municipal waste arisings from 2002 - 2004,

Figure 5.2 Breakdown of Municipal Waste Arisings 2002-2004



5.14 A summary of baseline information provided by each of the arc21 Councils is outlined in Table 5.4. This indicates the general relationship between the number of households, quantity of municipal waste arisings and average quantity of household waste generated per household.

Table 5.4 Summary of Municipal Waste Baseline Information

Council	No. Households			Municipal Waste Arisings (tonnes)			Household Waste Arisings (tonnes)			Household Waste Generated per Household		
	2002*	2003*	2004*	2002	2003	2004	2002	2003	2004	2002	2003	2004
Antrim Borough Council												
Totals	17,518	17,858	18,318	31,327	29,759	34,834	26,984	21,523	26,487	1.54	1.21	1.45
% change	-	1.9%	2.6%	-	-5.0%	17.1%	-	-20.2%	23.1%	-	-	20.0%
Ards Borough Council												
Totals	29,545	30,094	30,657	47,112	46,804	49,847	44,127	43,829	47,517	1.49	1.46	1.55
% change	-	1.9%	1.9%	-	-0.7%	6.5%	-	-0.7%	8.4%	-	-2.5%	6.4%
Ballymena Borough Council												
Totals	22,449	22,948	23,372	32,907	35,007	35,680	30,707	33,203	32,826	1.37	1.45	1.40
% change	-	2.2%	1.8%	-	6.4%	1.9%	-	8.1%	-1.1%	-	5.8%	-2.9%
Belfast City Council												
Total	115,174	116,193	117,677	163,800	163,750	168,201	139,967	139,624	144,347	1.22	1.20	1.23
% change	-	0.9%	1.3%	-	0.0%	2.7%	-	-0.2%	3.4%	-	-1.1%	2.1%
Carrickfergus Borough Council												
Total	15,016	15,255	15,400	25,484	25,249	25,828	23,492	21,042	21,852	1.56	1.38	1.42
% change	-	1.6%	1.0%	-	-0.9%	2.3%	-	-10.4%	3.8%	-	-	2.9%
Castlereagh Borough Council												
Totals	26,980	27,193	27,349	36,550	35,566	32,991	34,146	32,349	30,144	1.27	1.19	1.10
% change	-	0.8%	0.6%	-	-2.7%	-7.2%	-	-5.3%	-6.8%	-	-6.0%	-7.3%
Down District Council												
Totals	23,518	24,234	24,817	38,276	39,962	38,073	33,174	37,231	31,216	1.41	1.54	1.26
% change	-	-	-	-	-	-	-	-	-	-	-	-
Lame Borough Council												
Totals	12,633	12,859	13,080	20,100	19,940	21,206	16,777	15,677	17,461	1.33	1.22	1.33
% change	-	1.8%	1.7%	-	-0.8%	6.4%	-	-6.6%	11.4%	-	-8.2%	9.5%
Lisburn Borough Council												
Totals	40,633	41,477	42,660	70,840	71,644	70,968	64,359	65,375	63,985	1.58	1.58	1.50
% change	-	2.1%	2.9%	-	1.1%	-0.9%	-	1.6%	-2.1%	-	-0.5%	-4.8%
Newtownabbey Borough Council												
Totals	31,523	31,508	32,310	49,226	49,606	46,574	44,755	44,889	41,626	1.42	1.42	1.29
% change	-	0.0%	2.5%	-	0.8%	-6.1%	-	0.3%	-7.3%	-	0.3%	-9.6%
North Down Borough Council												
Totals	30,787	31,943	32,566	52,560	53,965	55,291	44,299	43,965	45,827	1.44	1.38	1.41
% change	-	3.8%	2.0%	-	2.7%	2.5%	-	-0.8%	4.2%	-	-4.3%	2.2%
TOTAL												
Totals	365,776	371,562	378,206	568,182	571,250	579,493	502,787	498,706	503,288	1.37	1.34	1.33
% change	-	1.6%	1.8%	-	0.5%	1.4%	-	-0.8%	0.9%	-	-2.4%	-0.9%
Average change	1.68%			0.99%			0.05%			-1.61%		

Note:

1. Waste arisings and household figures taken from Key Performance Indicators (KPI) annual returns. Source: EHS MSW Database

- 5.15 The trend in municipal waste arisings over the last three available years has been evaluated based on complete data sets in each year. The total municipal waste arisings have increased by an average of 1% for the last two years.
- 5.16 The household waste has increased by an average of 0.05%. The amount of household waste generated by each household over the last three years has decreased by an average of -1.6%. It is contended that the slowing in growth rate is due in large part to various measures introduced by arc21 Councils since 2002. These include:
- General awareness raising;
 - Targeted campaigns; and
 - Changes to collection infrastructure and arrangements.
- 5.17 The MSW diversion from landfill from 2002-2004 has been achieved through composting of segregated garden wastes and segregated recyclables. Table 5.5 identifies the percentage of MSW diverted, recycled and composted from 2002 to 2004.

Table 5.5 MSW and Household Waste Diversion 2002-2004

	MSW			Household Waste		
	2002	2003	2004	2002	2003	2004
Recycled	5%	6%	9%	5%	6%	9%
Composted	4%	4%	6%	5%	5%	7%
Landfilled	91%	90%	85%	90%	89%	85%
TOTAL	100%	100%	100%	100%	100%	100%

Commercial and Industrial Wastes

- 5.18 Commercial waste comes from shops, offices, pubs, restaurants and other services and is composed of similar materials to household waste. Industrial waste comes from factories and other businesses. It includes many different sorts of waste because of the wide range of industries in the area. Separate headings are provided in the text below for certain priority, or specific, waste streams which have been selected for action at the European and UK level.
- 5.19 The majority of the Commercial and Industrial (C&I) waste is collected by private sector waste management companies but part of it is collected by District Councils. The latter is counted as municipal waste (non-household waste component of MSW) and must comply with statutory targets such as the EC Landfill Directive targets for biodegradable waste.

- 5.20 District Councils have a duty to arrange the collection of commercial waste when requested to do so and can apply a reasonable charge for the collection and disposal of such.
- 5.21 For the provision of these services it is customary practice to levy a charge that recovers their costs in terms of collection and disposal of such wastes. District Councils do not have a monopoly on the collection of Commercial Waste within their areas and effectively operate in the 'open market'. As such they are subject to the vagaries of the open market. Charges are usually made on a cost per container per occasion basis, (which means that some estimate on the relationship between volume and weight requires to be made) although the introduction of container chipping and on board weighing of containers will enable the more accurate billing of customers in terms of disposal costs. The amount collected therefore is related to the demand made upon the service by the traders within the District Council's area. Demand in turn is a function of the price levied for the provision of the service. Any incentive for traders to engage in the separation of commercial waste requires to be based on a price differential for the recycled material (e.g. cardboard). Given the above this price differential can only be based on the income that a District Council can obtain for the segregated material which in itself can vary with demand for the recycled product.
- 5.22 Councils will continue to develop cost effective approaches to the segregation of commercial waste with an aim to increasing commercial waste recycling and landfill diversion.
- 5.23 The collection of Commercial Waste by Councils does present an opportunity to reuse and recycle wastes. Councils will review the level of service at least on an annual basis and will further develop approaches to Commercial Waste recycling and reuse as the opportunities present themselves in view of the prevailing circumstances.
- 5.24 Figures 5.3, 5.4 and 5.5 (below) give a breakdown of the amounts of Commercial Waste collected by the arc21 Councils in terms of proportional tonnages to MSW, overall tonnages and as a proportion of the total MSW collected.

Figure 5.3: arc 21 Commercial and Household Waste Arisings 2004-2005

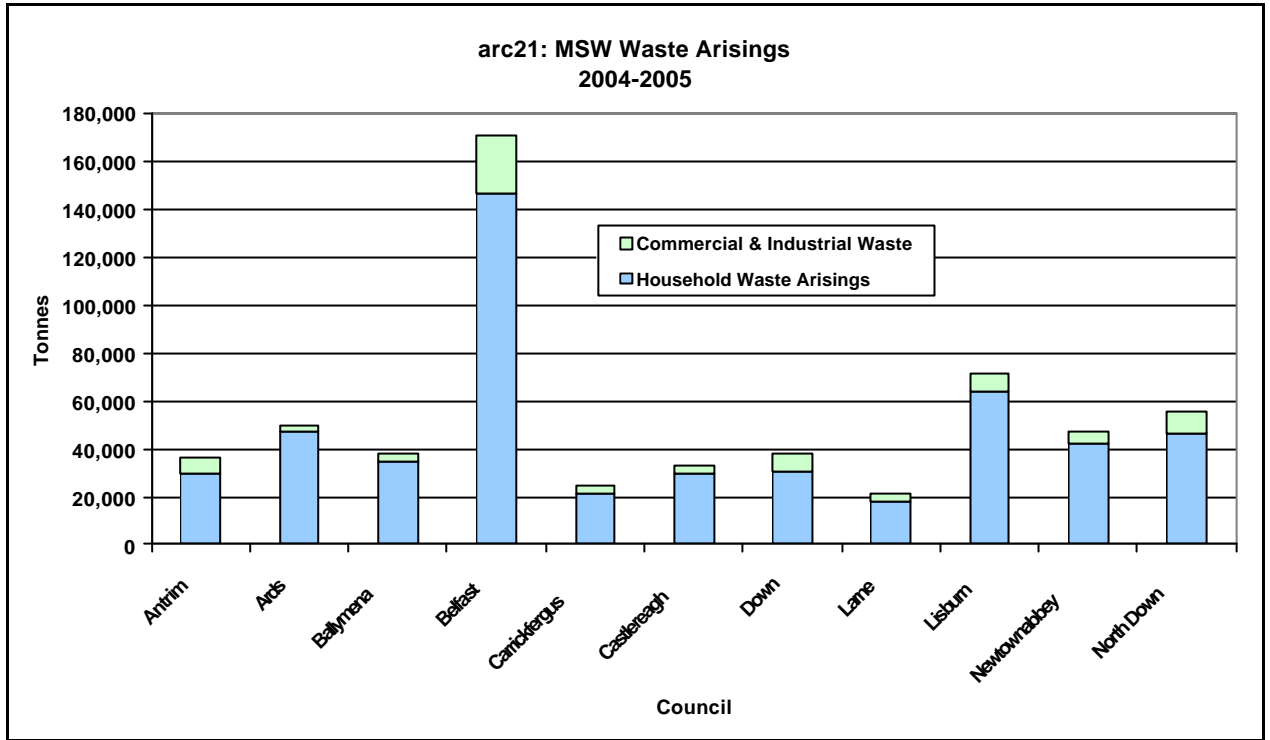


Figure 5.4: arc21 Commercial and industrial Waste Collected 2004-2005

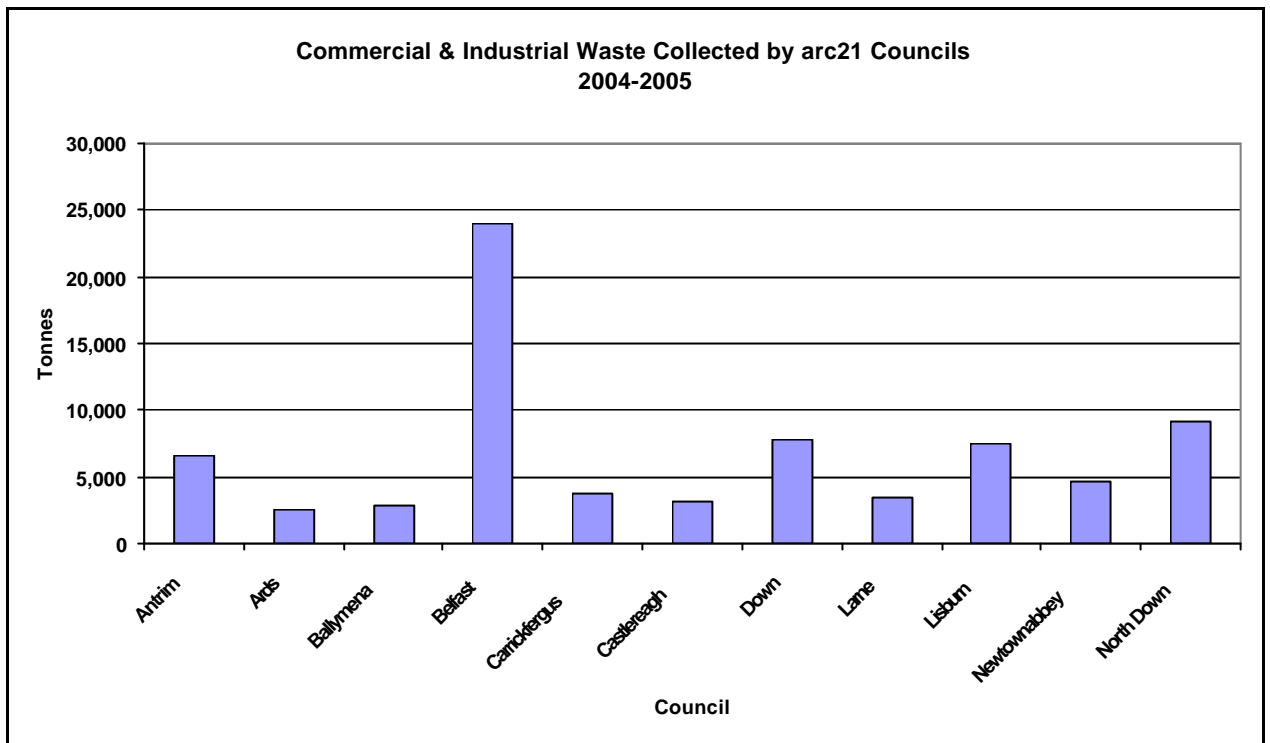
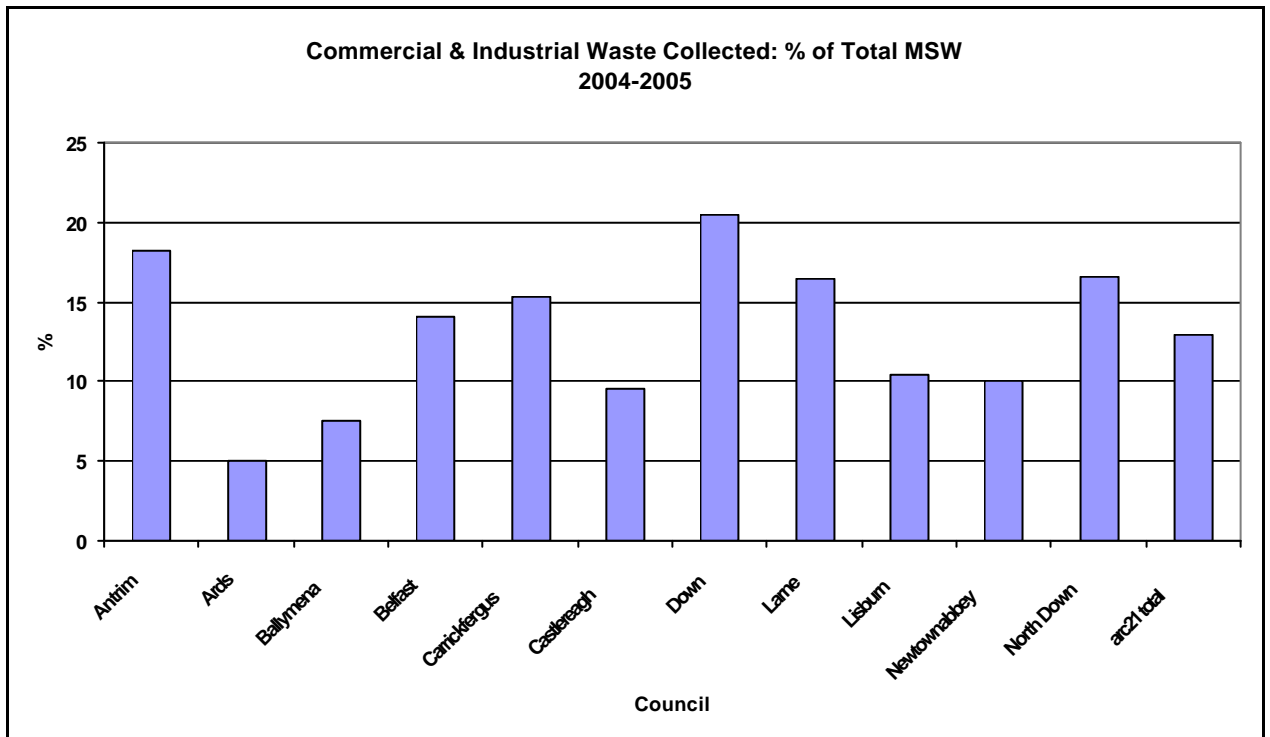
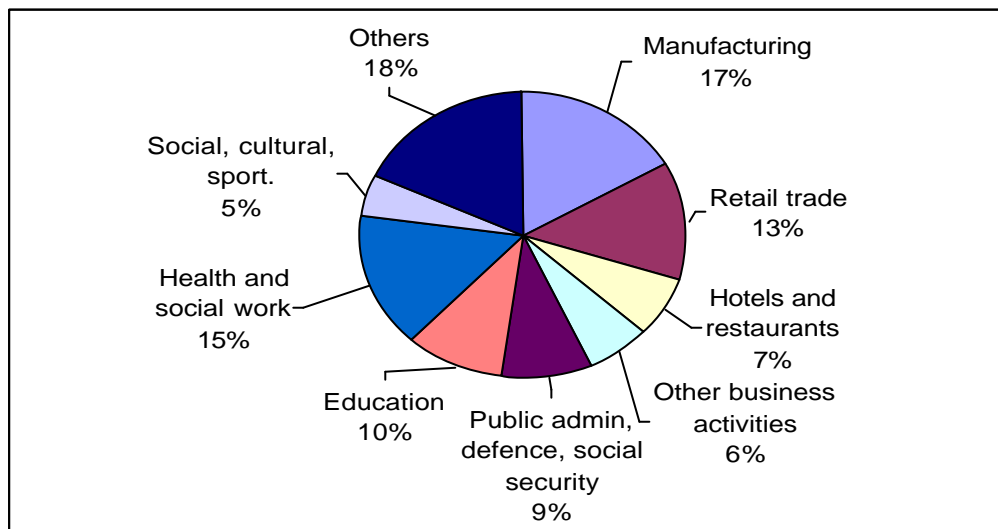


Figure 5.5: arc21 Commercial and Industrial Waste Collected as a % of MSW



5.25 Detailed information on C&I waste composition is difficult to obtain with over 40% classed as 'mixed waste' in the 2002 Industrial and Commercial Waste Production survey⁵. However, the survey did indicate that nearly 100,000 tonnes of C&I waste is separated as paper, cardboard and paper/card packaging materials. Overall packaging waste is estimated at nearly 200,000 tonnes, this being about a third of all C&I waste. The 2002 survey also identified that the majority of businesses in Northern Ireland are small or medium sized enterprises (SMEs) while there are a few large companies in the manufacturing sector. The breakdown of waste per economic sector is illustrated in Figure 5.6.

Figure 5.6: Waste per Economic Sector in NI



5.26 Waste operators tend to treat commercial and (non-hazardous) industrial wastes similarly. At present there is no requirement for businesses to make formal returns on the amount of waste they produce, so it is not possible to estimate quantities and trends in the same way as used for municipal waste arisings. Instead, the quantities are estimated based on a survey of businesses.

⁵ Industrial and Commercial Waste Production in Northern Ireland, EHS, 2002
www.ehsni.gov.uk/pubs/publications/Indandcommwastesurvey_execsumm.pdf

- 5.27 The types and quantities of commercial/industrial waste generated are dependent on the nature and size of businesses within the Region. The EHS carried out a pilot survey in 1999⁶ to estimate the commercial/industrial waste arisings based on the waste generated per employee for different types of industry (as described by the Standard Industrial Classification 1992 (SIC1992)). The sample size for the pilot study was small, using some 250 companies. This is a fairly small sample to base a survey on.
- 5.28 The pilot survey was followed up by a full survey to elicit responses from 2,500 companies on waste arisings data for the year 2000. The findings of this larger survey were reported in the Industrial and Commercial Waste Arisings Survey for Northern Ireland (August 2001)⁷. An estimate of the commercial and industrial waste produced within the arc21 Region has been made based on the results of this survey.
- 5.29 Total commercial and industrial waste arisings in Northern Ireland were estimated to be 532,000 tonnes in 2000. This represents the average for a data set for which the confidence limit for all sectors was calculated at 27%. This indicates a highly variable data set and therefore for planning purposes for the arc21 Region the upper confidence limit for quantities of waste produced has been assumed. This gives the total commercial and industrial waste arising in Northern Ireland at 676,000 tonnes as shown in Table 5.6 by industrial sector. The survey estimated that 61%, or 412,000 tonnes is produced in the arc21 Region.
- 5.30 In March 2002, M-E-L Research in association with EnviroCentre Belfast were commissioned by the Environment and Heritage Service to carry out a second survey of industrial and commercial waste Producers⁵. This second survey used identical methods to the previous year but with a larger sample size. A response rate of 16.7% was achieved, a small improvement over the previous year's survey.
- 5.31 The 2002 survey identify that in 2002 industry and commerce in Northern Ireland produced around 635,000 tonnes of waste as shown in Table 5.6 by industrial sector. No significant increase over the amount produced in 2000 could be detected. The amount of waste estimated for arc21 was 61.6% which equates to 391,160 tonnes per annum.
- 5.32 A new survey of C&I waste arisings is being conducted by EHS to be published in 2006. The objective is to further improve the accuracy of data on waste arisings, waste composition, and current management routes.

⁶ DOE Northern Ireland Pilot Waste Arisings Survey, Envirospine 1999

⁷ EHS Industrial and Commercial Waste Arisings Survey for Northern Ireland, Kirk McClure Morton, June 2001

Table 5.6: Estimated Commercial/Industrial Arisings (excluding C, D&E waste) in 2000 and 2002

INDUSTRY SECTOR	SIC code	2000*		2002**	
		FTE employees in Northern Ireland	Estimated waste arising (tonnes per annum)	FTE employees in Northern Ireland	Estimated waste arising (tonnes per annum)
Manufacture of Food, drink and tobacco	15-16	17,425	22,000	19,623	21,300
Manufacture of textiles	17	8,205	11,000	8,033	8,600
Manufacture of clothes, leather and leather products	18-19	7,695	12,000	6,394	6,800
Manufacture of wood, paper and wood and paper products	20-21	5,000	8,000	5,265	6,100
Publishing and printing	22	4,275	7,000	4,620	5,700
Manufacture of chemicals and chemical products	24	3,300	21,000	3,136	3,200
Manufacture of rubber and rubber products	25	6,820	10,000	6,613	7,100
Manufacture of non-metallic mineral products	26	5,535	8,000	5,575	6,000
Manufacture of basic metals and metal products	27-28	6,335	9,000	6,508	7,800
Manufacture of other machinery and equipment	29	6,600	10,000	6,173	6,800
Manufacture of electrical and optical equipment	30-33	12,325	16,000	12,031	12,300
Manufacture of transport equipment	34-35	12,615	20,000	10,838	10,900
Other Manufacturing	36	3,620	5,000	3,874	4,800
Recycling, electricity, gas, water, sewage, waste	37-41 & 90	6,040	9,000	6,252	6,500

Sale, maintenance, repair of motor vehicles, sale of fuel	50	12,645	19,000	14,883	18,100
Wholesale trade	51	21,140	29,000	23,812	25,900
Retail trade and repair of personal goods	52	45,915	60,000	70,928	79,300
Hotels and restaurants	55	25,625	36,000	40,040	45,900
Land transport	60	10,355	15,000	11,354	12,400
Water and air transport	61-63	5,550	10,000	6,734	7,500
Post and telecommunications	64	7,880	13,000	8,805	10,100
Financial intermediation	65-67	14,180	22,000	15,477	16,500
Real estate, renting and computer-related activities	70-72	8,760	12,000	13,353	14,000
Research and development	73	1,590	3,000	2,059	2,200
Other business activities	74	30,490	38,000	38,524	39,700
Public administration, defense, social security	75	55,185	70,000	58,301	59,600
Education	80	49,595	63,000	63,518	65,300
Health and social work	85	71,365	92,000	93,579	95,500
Social, cultural, sporting activities, other services	91-93	19,960	26,000	26,142	28,700
Totals		486,025	676,000	592,444	634,700

Source: *EHS Industrial and Commercial Waste Arisings Survey for Northern Ireland, 2001⁶

**Industrial and Commercial Waste Production in Northern Ireland, EHS, 2002⁴

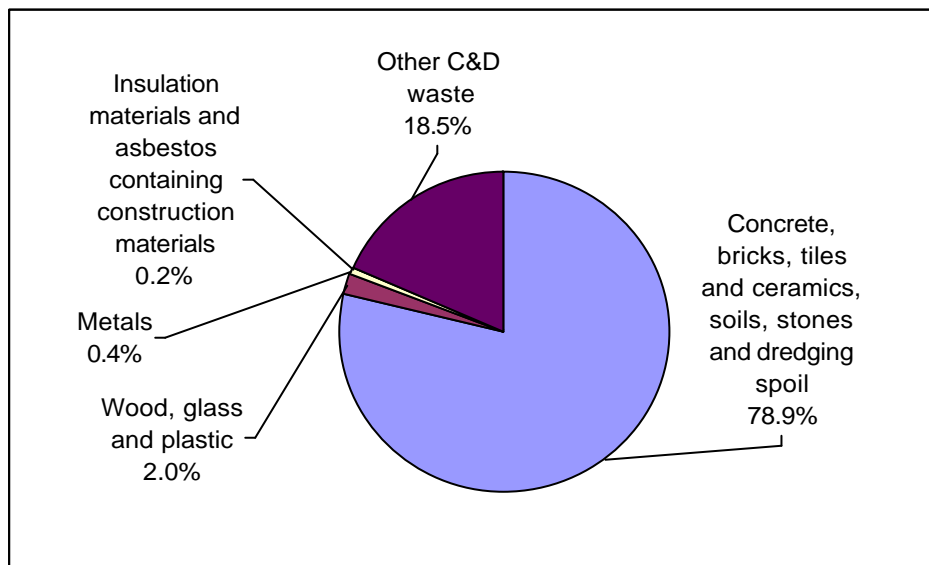
- 5.33 The 2002 survey⁵ indicated that approximately 40% of C&I waste was landfilled, while 33% was recovered by reuse, recycling or composting. The remainder went to a variety of disposal routes including land application, combustion and other treatment facilities (e.g. combustion, land spreading, etc).
- 5.34 The NI BPEO recommends a progressive increase in the level of re-use and recycling up to a target of 60% by 2020. In addition, landfilling of waste should be minimised and a balanced combination of alternative technologies such as thermal treatment, anaerobic digestion and mechanical biological treatment should be used to treat residual waste. A significant quantity of C&I waste is packaging. Obligated business must comply with Packaging Waste Directive recycling and recovery targets (Chapter 9).

Construction, Demolition and Excavation Wastes

- 5.35 The C, D & E (Construction, Demolition and Excavation) waste stream mainly comprises the following:
- **Construction waste** – Waste arisings from construction site operational practices, e.g. excess materials.
 - **Demolition waste** – Waste generated from the demolition of redundant buildings.
 - **Excavation waste** - Consists of materials removed from the excavation of the natural landscape.

- 5.36 C, D & E waste arisings consist of a number of different materials including concrete, bricks, soils, stones, wood, glass, plastic metals, insulation, asbestos contaminated materials and tiles and ceramics. Figure 5.7 shows the breakdown of these material types.
- 5.37 Until recently, the information concerning arisings of C, D & E wastes in Northern Ireland was not readily available. In 2003 it was estimated that C, D & E waste arisings in Northern Ireland was around 3.75 million tonnes per annum⁸. This is the equivalent to around 2 tonnes per person of the population. Using this assumption it is possible to estimate the amount of C, D & E waste generated in the arc21 Region. The population of the arc21 Region of Northern Ireland is estimated at 923,179 people⁹. It is therefore estimated that the amount of C, D & E waste generated in 2003 in the arc21 Region was 1.85 million tonnes. This is around 49% of the total C, D & E waste arisings in Northern Ireland for 2003.

Figure 5.7: Breakdown of C, D and E materials



Source: BPEO for Waste Management in Northern Ireland: Guidance Document June 2005¹⁰.

- 5.38 Based on the survey carried out in Northern Ireland in 2001, it is estimated that approximately 34% of the C, D & E wastes are reused or recycled in some form,

⁸ EHS report – ‘Towards Resource Management – A consultation on proposals for a new Waste Management Strategy’ Annex 2

⁹ Local Government Home Populations Total 2002-2017. NISRA

¹⁰ EHS report – Best Practicable Environmental Option for Waste Management in Northern Ireland: Guidance Document, June 2005

whilst the remaining 66% is mainly disposed to land¹¹. The latter will include non-hazardous landfills, inert waste landfills and exempt sites.

5.39 Table 5.7 identifies the C, D & E arising figures estimated for Northern Ireland and arc21 Region for 2003 and their associated treatment methods.

Table 5.7 C, D & E Arisings by Treatment Route in 2003

Key parameter	NI Tonnage*	Estimated arc21 Region Tonnage**
Total C, D&E waste	3,750,000	1,846,342
Reuse and Recycle (34%)	1,285,000	627,756
Landfill (66%)	2,465,000	1,218,586

Source: * Assessment of the Best Practicable Environmental Option for Waste Management in Northern Ireland: Development and Analysis Final Report June 2005

** See paragraph 5.32

¹¹ EHS report – Construction and Demolition Waste Arisings Survey 2001

- 5.40 The use of inert waste as a substitute for virgin stone is to be encouraged with one potential application being as an engineering material in landfill sites that are being restored and in active landfill sites for purposes such as road building. It is of a concern to arc21 that such material is disposed of in inert landfill sites without the full exploration of reuse opportunities.
- 5.41 Arc21 is aware that that there are currently a large number of planning applications for inert waste sites pending determination by the Planning Service. Whilst arc21 is not mandated to provide such facilities for the private sector it recognises that the current level of such planning applications has the potential to absorb resources that should be addressing the more strategic and regional facilities.

Priority Waste Streams

- 5.42 In the last few years, data on priority waste streams in Northern Ireland has improved, however for certain waste types there is still limited data and therefore estimates have been based on data available. A summary of these figures is shown in Table 5.8 and described in detail below. Packaging waste is specifically dealt with in Chapter 9. These figures can be described as a subset of the total commercial and industrial waste arisings.

Table 5.8 Estimated Priority Wastes Streams Arisings in 2004

Waste Category	Estimated Controlled Waste Arisings (Tonnes)
Batteries	2,249
Waste Electrical and Electronic Equipment	15,260
End of Life Vehicles	38,721
Tyres	9,354

Batteries

- 5.43 Batteries can be classified into three main types:
- **Industrial batteries** - used for standby power (e.g. emergency lighting, computer backup) or traction (e.g. electrical vehicles). These are mainly lead acid or nickel cadmium (NiCd).
 - **Automotive batteries** - almost exclusively lead acid type batteries.
 - **Consumer batteries** (rechargeable and non-rechargeable) – These have a wide variety of uses such as personal stereos, radios, cameras, watches, torches, toys,

mobile phones, power tools and laptops and have several different types of chemistry e.g. silver oxide, lithium, zinc- carbon.

- 5.44 To date there has been no specific survey of battery waste arisings carried out for Northern Ireland. The Department of Trade and Industry (DTI) have developed estimates of battery waste arisings in the UK as a whole for 2000¹². The battery arisings are identified in table 5.9.

Table 5.9: UK Battery Waste Arisings 2000

Category	Battery Type	Waste Arisings (tonnes)
Consumer	General Purpose	16,500
	Button Cells	60
	Other Non-rechargeable	70
	NiCd, NiMH, Li ion	1,990
	Lead Acid	300
Total		18,900
Automotive*		112,600
Total		112,600
Industrial	Lead Acid Standby	18,000
	Lead Acid Traction	22,400
	Nickel Cadmium	910
Total		41,300
Overall Total	All Battery Types	172,800

* Includes cars, lorries, vans etc

Source: DTI Factsheet 2002¹²

- 5.45 The UK data quoted above, indicates an annual rate of consumer battery arisings of 0.3 kg per person, which based on an arc21 Region population of 924,268¹⁰ in 2000, would translate into an arc21 Region figure of 277 tonnes per year.

- 5.46 The UK data in table 5.10 identified that 112,600 tonnes of automotive batteries waste was produced in the UK. The arc21 Region contains 1.1% of the total vehicles licensed in the UK. Based on these figures an estimated 1,239 tonnes of waste lead acid (automotive) batteries were produced in the arc21 Region in 2000.

- 5.47 The UK data in table 5.10 identified that 41,300 tonnes of industrial batteries waste was produced in the UK. The arc21 Region contains 1.4% of the total VAT registered

¹² Battery Waste Arisings and Recycling Rates, Department of Trade and Industry Factsheet 2002.

business in the UK¹³. Based on these figures an estimated 578 tonnes of industrial batteries were produced in the arc21 Region in 2000.

5.48 Therefore, the total estimated battery arisings in arc21 Region in 2000 is 2,094 tonnes and comprises:

- Industrial batteries – 578 tonnes
- Automotive batteries – 1,239 tonnes
- Consumer batteries – 277 tonnes

5.49 The estimated rates of recycling of UK batteries in 1999, were as follows:

- Industrial batteries – 90%;
- Automotive batteries – 90%;
- Consumer batteries – 2%

All the District Councils in the arc21 Region provide facilities for the collection of batteries at their civic amenity sites (primarily automotive batteries but also some consumer battery collection). Through this network, 244 tonnes of car batteries were collected in 2004. There is no separate data available on the collection of consumer batteries by councils.

5.50 A new EU Batteries Directive is being developed which is intended to maximise the separate collection of all types of batteries and implement specific collection and recycling targets. The DTI anticipate that the new Batteries Directive will be adopted in mid-2006. Member States will have two years to implement the Directive once it has been adopted. The draft EU Batteries Directive includes the following proposed targets:

- Collection targets for spent portable batteries of 25% of average annual sales 4 years after the Directive is implemented, increasing to 45% after 8 years.
- 50%-75% of collected batteries to be recycled depending on battery type.
- Ban on the disposal of untreated automotive or industrial batteries in landfill or by incineration.
- A partial ban on portable NiCd batteries with some limited exceptions e.g. medical equipment.

¹³ DET&I, Statistics and economy research <http://www.detini.gov.uk/cgi-bin/downdoc?id=1775> and National Statistics, Size analysis of UK business 2001. http://www.statistics.gov.uk/downloads/theme_commerce/PA1003_2001/PA1003_2001.pdf and

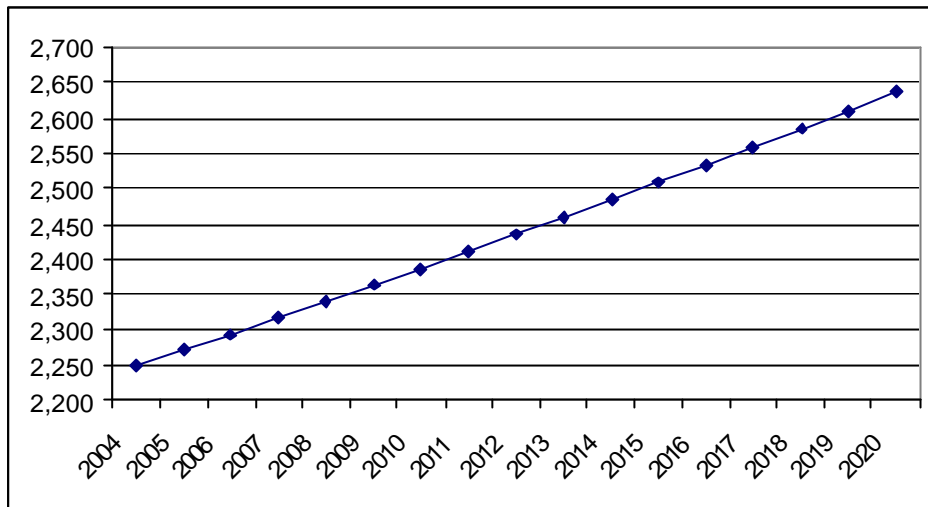
- 5.51 In order to estimate the battery waste arisings in 2004, the following assumptions were undertaken:
- The number of cars licensed in Northern Ireland rose by an average of 3% per annum from 1996 to 2000. Assuming that this growth was maintained from 2000 to 2004 gives an automotive battery arisings in 2004 of 1,395 tonnes
 - The UK data quoted in table 5.10, indicates an annual rate of consumer battery arisings of 0.3 kg per person, which based on a population of 924,210⁹ in 2004 in the arc21 Region would translate into a figure of 277 tonnes per year (same as in 2000)
 - The growth in number of VAT registered business in the UK decrease an average of -0.2% from 2001 to 2004¹⁴, assuming the waste from industrial batteries in 2004 decreased at the same rate gives a tonnage on industrial batteries arisings of 577 tonnes
- 5.52 Based on the figures identified in 5.51 the total battery arisings in 2004 is 2,249 tonnes which indicates an average battery growth per year of 1%. Assuming this growth will be maintained during this plan period will result on battery waste arisings of 2,637 tonnes by 2020 in the arc21 Region. The breakdown of this is shown in table 5.10 and the trend is shown in figure 5.8.

Table 5.10: Batteries Estimated Projections – arc21 Region

Year	Batteries Generated (tonnes)
2000	2,094
2004	2,249
2010	2,387
2015	2,509
2020	2,637

¹⁴ National Statistics, UK business: Activity, Size and Location 2004.
http://www.statistics.gov.uk/downloads/theme_commerce/PA1003_2004/PA1003_2004.pdf

Figure 5.8: Batteries Estimated Trend (tonnes per year) – arc21 Region



Electrical and Electronic Waste Arising

5.53 Waste Electrical and Electronic Equipment (or WEEE) is the waste derived from redundant electronic and electrical goods. It includes equipment such as radios, televisions, fridges and toys. The Waste Electrical and Electronic Equipment Directive (‘the WEEE Directive’) published in the Official Journal of the European Union on 13 February 2003¹⁵ breaks down electronic and electrical equipment into 10 categories, which are identified in table 5.11 below.

Table 5.11: WEEE Categories

Category	Type
1	Large household appliances
2	Small household appliances
3	IT and telecommunications equipment
4	Consumer equipment
5	Lighting equipment
6	Electrical and electronic tools
7	Toys, leisure and sports equipment
8	Medical devices
9	Monitoring and control instruments
10	Automatic dispensers

¹⁵ The WEEE Directive (2002/96/EC)

- 5.54 Scottish Waste Statistics for 1997 and 1998 reported an estimated 650,000 tonnes of electronic and electrical waste in the UK in 1996. The expected growth rate for this stream is 3-4% per annum giving an estimated 746,000 tonnes arising in 2000. On a pro rata basis based on population this equates to an estimated 8,950 tonnes of electronic and electrical waste arising in the arc21 Region in 2000.
- 5.55 An EHS survey of WEEE for 2001¹⁶ estimated total arisings for Northern Ireland to be in the range 25,000 to 30,000 tonnes per year, equivalent to 14.4 to 17.7 kg per person. The survey noted significant uncertainties with these estimates due to a lack of data. Based on a population of 923,107¹⁰ in the arc21 Region in 2001, the estimated annual tonnage of WEEE generated was between 13,293 tonnes and 16,339 tonnes, which represents an average of 14,816 tonnes.
- 5.56 More recently an 8-month WEEE pilot collection scheme¹⁷ was initiated by EHS in June 2004 to determine and analyse household WEEE arisings at both an urban and a rural recycling centre. WEEE was separated into four categories: white goods, fridges/freezers, WEEE containing cathode ray tubes and small WEEE. Based on the pilot scheme data, the annual collection rate has been estimated in the range 3.8 kg to 11.9 kg per person. On this basis, the annual household WEEE separated in the arc21 Region based on a population of 924,210¹⁰ in 2004, is estimated to be in the range 3,512 tonnes to 10,998 tonnes. Based on the pilot scheme data, WEEE hazardous waste arisings (fridges/freezers and cathode ray tubes) are estimated to represent about 40% of WEEE arisings (Note these figures will not include commercial & industrial WEEE arisings).
- 5.57 A further source of information on WEEE are annual municipal waste data returns provided by District Councils. In 2004, the following amounts of WEEE were separately collected in the arc21 Region: white goods (including fridges/freezers) 1,368 tonnes; fluorescent tubes 1 tonnes; other WEEE 450 tonnes which represents a total WEEE separated of 1,819 tonnes.
- 5.58 A detailed timetable for the implementation of the WEEE Directive is not available as yet, although the DTI are planning to consult on revised regulations in Spring 2006. The main objectives of the WEEE Directive include implementing producer responsibility, increasing recovery/recycling and improving the environmental performance of the life cycle. The WEEE directive also introduces a target of 4kg per person to be recovered by 31 December 2006, with new targets expected for

¹⁶ Waste Electronic and Electrical Equipment (WEEE) Survey 2001, EHS
www.ehsni.gov.uk/pubs/publications/ExecutiveSummary_WEEESurvey.pdf

¹⁷ Waste Electrical and Electronic Equipment (WEEE) Pilot Scheme Report, EHS, May 2005
www.ehsni.gov.uk/pubs/publications/WEEEPilotRep.pdf

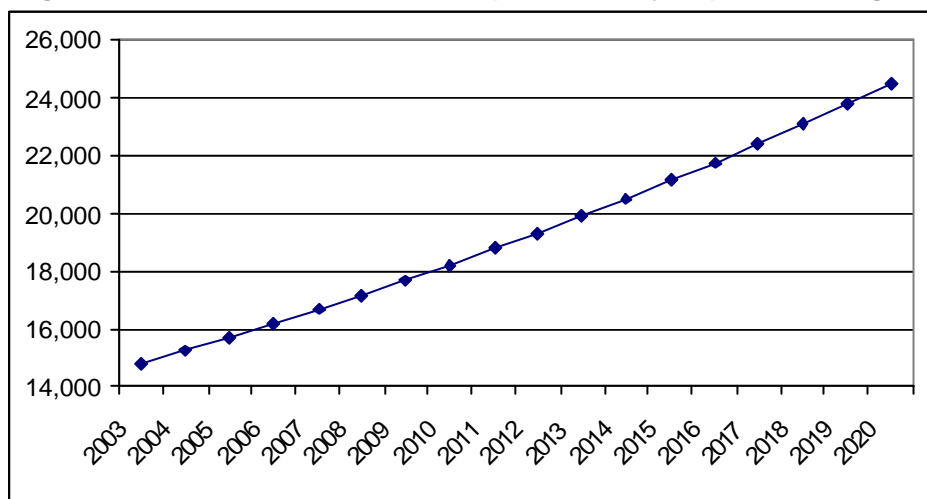
December 2008¹⁸. This indicates that recycling and recovery of WEEE equipment will have to increase sufficiently in order to meet these targets.

5.59 WEEE is considered to have an annual growth rate of 3-4% per annum¹⁹ in the UK, primarily due to the high rate of technological change in the sector and the high rate of replacement of electrical and electronic goods. Based on the most up to date data available for WEEE arisings i.e. EHS WEEE survey for 2001¹⁶ and a waste growth rate of 3% for future projections, we can estimate that by 2020, Northern Ireland will be producing 24,489 tonnes of WEEE per annum, which is nearly double that of the figure in 2003. The breakdown of this is shown in table 5.12 and the trend is shown in figure 5.9.

Table 5.12: WEEE Estimated Projections – arc21 Region

Year	WEEE Generated (tonnes)
2000	8,950
2003	14,816
2004	15,260
2010	18,222
2015	21,124
2020	24,489

Figure 5.9: WEEE Estimated Trend (tonnes per year) – arc21 Region



End of Life Vehicles

¹⁸ http://www.ehsni.gov.uk/environment/wasteManage/regulations_ weee.shtml

¹⁹ Status Report on Waste Electrical & Electronic Equipment in the UK, Interim report: January 2005, Industry Council for Electronic Equipment Recycling (ICER). www.icer.org.uk/InterimStatusReport2005FinalWeb.pdf

5.60 The End of Life Vehicles (ELV) Directive (2000/53/EC) originated from the work of a priority waste stream working group set up in 1991 to look at ways of reducing the amount of waste from end of life vehicles.

5.61 In the UK the End of Life Vehicles Regulations 2003 (Statutory Instrument 2003/2635) came into effect on 3 November 2003. These Regulations transpose most of the Directive's provisions into Northern Ireland law.

Key Elements of the Directive include the following:

- Producers (vehicle manufacturers and importers) must pay 'all or a significant part' of the costs of take back and treatment of ELVs;
- Adequate systems for the collection of ELVs must be established;
- ELVs can only be scrapped ('treated') by authorised facilities;
- A Certificate of Destruction must be produced which triggers the removal of a vehicle from the national register;
- Manufacturers must provide information to facilitate vehicle dismantling and mark certain components to aid recovery and recycling;
- Vehicle owners must be able to have their ELVs accepted by collection systems free of charge from 1 January 2007; and
- The Directive sets rising mandatory targets for reuse, recycling and recover.

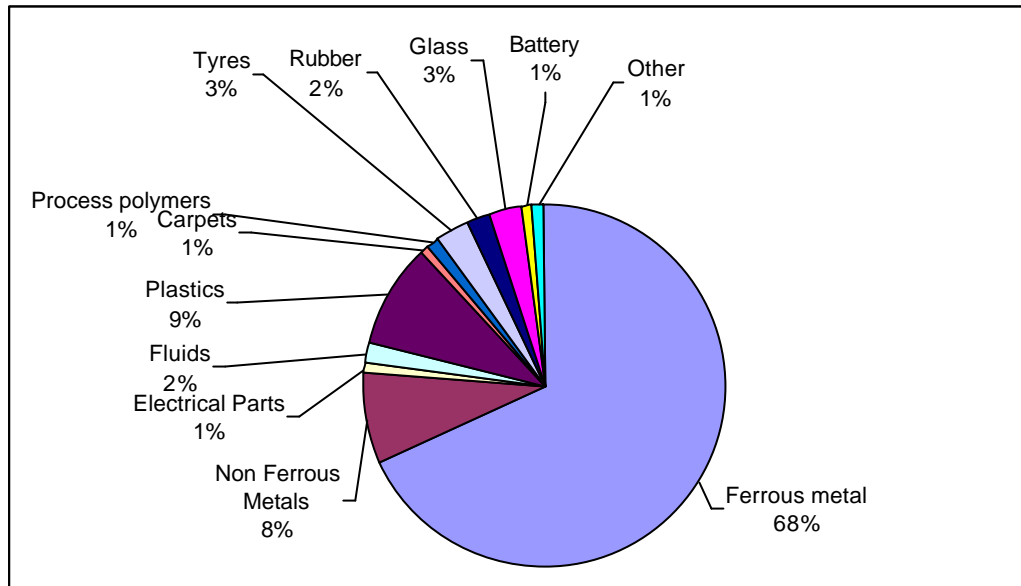
5.62 To implement articles 5 and 7 of the ELV Directive the government included solutions in the End of Life Vehicles (Producer Responsibility) Regulations 2005, which came into force on 3rd March 2005.

5.63 The full implementation of the Directive will be dependent on adequate improvements in infrastructure being put in place. The key infrastructure requirement is the provision of sufficient numbers of Approved Treatment Facilities (ATFs) and collection points to ensure an adequate network is available which is accessible to anyone who wishes to deliver an ELV.

5.64 UK Study conducted in 2000²⁰ on the composition of ELV reported that the average car weight was 1142kg and was composed of the following materials, as detailed in figure 5.10 below.

²⁰ End of Life Vehicle Waste Arisings and Recycling Rates, Department of Trade and Industry Factsheet, 2002.

Figure 5.10 Composition of ELV's



Source: Towards Resource Management A Consultation on Proposals for a New Waste Management Strategy. October 2005

5.65 A survey conducted in Northern Ireland for 2000²¹ estimated that the total number of ELV arisings was around 69,800, equating to 56,900 tonnes of ELV material. For comparison, ELV arisings in the UK have been estimated at 2 million per year. Applying these data to Northern Ireland on a pro rata basis, would suggest arisings of around 60,000 per year. The Northern Ireland waste survey for 2002 identifies that the ELV arisings in the arc21 Region was 39,292, equating to 32,034 tonnes.

5.66 The Northern Ireland waste survey for 2002, also reported the following data on the fate of ELV materials:

- 31,200 tonnes of metal recovered at the main ELV shredder facility in Belfast;
- 8,800 tonnes non-metallic shredder waste landfilled; and
- 2,664 tonnes of material recovered at dismantlers and scrap yards.

5.67 The key targets set for the UK (including N.I.) in the ELV Directive are as follows:

- By 2006, vehicle producers must plan and establish an adequate network of Authorised Treatment Facilities (ATF's) and collection points to take back their own brands of vehicles.

²¹ Northern Ireland End-of-Life Vehicles Survey 2000, EHS
www.ehsni.gov.uk/pubs/publications/ELVSurvey_ExecutiveSummaryReport.pdf

- From 1 January 2007, vehicle producers must provide free take-back of their own brand ELVs when the last owner presents a vehicle at one of their designated collection points.
- From 2006 up to 2014, each producer must achieve 85% reuse and recovery of ELVs (80% to be achieved by reuse and recycling).
- From 2015 onwards, each producer must achieve 95% reuse and recovery of ELVs (85% to be achieved by reuse and recycling).
- For vehicles that were marketed before 1 January 1980, the targets are 75% reuse and recovery (70% to be achieved by reuse and recycling).

5.68 The type and number of facilities required to deal with the anticipated increase in ELV Waste up to 2020 is given within Table 10.13: Summary of Capacity and Facility Requirements in Chapter 10.

5.69 Assuming that the growth of ELVs is proportional to the growth in new registered vehicles in Northern Ireland, this will result in the growth identified in table 5.13.

5.70 Based on a trend of a 5% increase in vehicles per annum for the future, according to the average waste growth identified from 2001 to 2004, then the arisings of ELV will increase as detailed in figure 5.8.

5.71 Based on the average growth of 5% identified between 2001 and 2004 (Table 5.13), the total ELV arisings estimated for arc21 Region in 2004 (38,721) will grow to 44,078 tonnes by 2020. The breakdown of this is shown in table 5.14 and the trend is shown in figure 5.11.

Table 5.13 Growth of New Registered Vehicles in NI

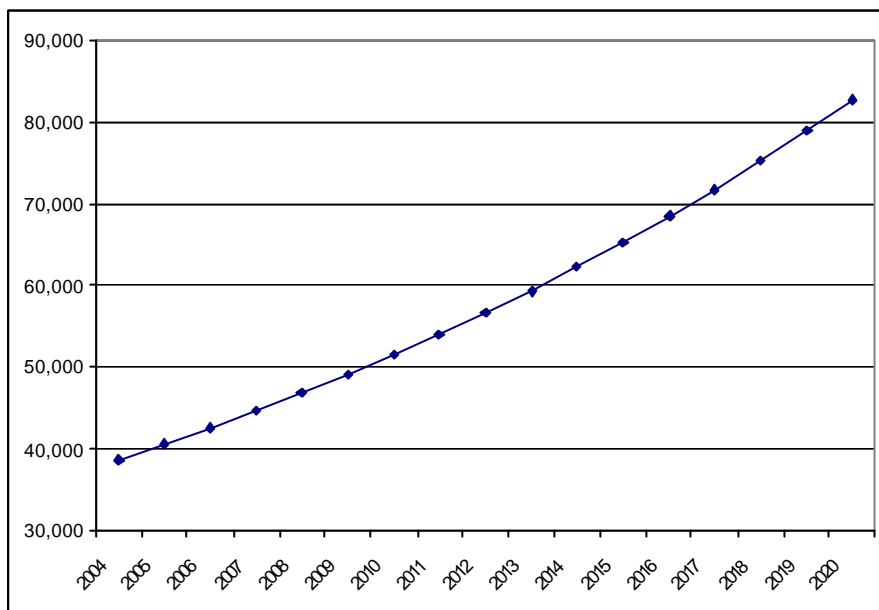
Year	Number of Registered Vehicles	% Change	arc21 Region Predicted ELV Arisings
2000	730,730	-	32,034
2001	767,305	5%	33,638
2002	794,477	4%	34,829
2003	852,742	7%	37,383
2004	883,261	4%	38,721
Average		5%	

Source: Northern Ireland Transport Statistics September 2005 – Department for regional development

Table 5.14: ELV Estimated Projections – arc21 Region

Year	ELV Generated (tonnes)
2004	38,721
2010	51,491
2015	65,294
2020	82,799

Figure 5.11: ELV Estimated Projections (tonnes per year) – arc21 Region



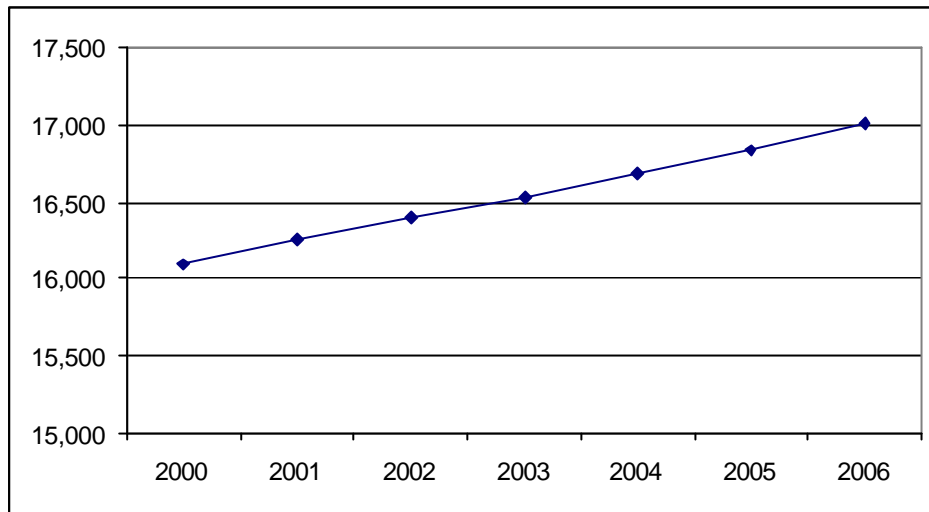
Tyres

- 5.72 Tyre waste consists of redundant tyres that are deposited at various collection points including scrap yards, garages and specialist tyre retailers. These are treated in a variety of ways including, re-treading, re-using, material recycling and energy recovery. The introduction of the Landfill Directive (99/31/EC) which is implemented in Northern Ireland through the Landfill Regulations (Northern Ireland) 2003 and the Landfill (Amendment) Regulations (Northern Ireland) 2004, has banned the disposal of whole tyres at landfill sites and shredded tyres will be prohibited from 2006 (excluding the use of used tyres for landfill engineering purposes).
- 5.73 The Government/Industry Scrap Tyre Working Group estimated waste tyre arisings for the UK of 339,000 tonnes in 1997. Assuming the number of tyres to be proportional to the number of vehicles on the road this would give 3,729 tonnes of waste tyres in the arc21 Region in 1997²².
- 5.74 A used tyres survey for Northern Ireland carried out in 2000²³ noted some significant data gaps but using a predictive model estimated the total quantity of used tyres as 16,100 tonnes (equivalent of 1,738,100 units) in 2000. The used tyres arisings in arc21 Region by the same survey were 8,986 tonnes (56% of the total used tyres arisings in Northern Ireland).
- 5.75 The 2000 Northern Ireland survey²³ also gathered information on the fate of used tyres. The main destinations for used tyres were retread manufacture (32%) and use on farms (16%). The survey noted that in many cases there was no information available on the fate of used tyres, e.g. vehicle dismantlers who do not remove tyres before passing on their vehicles. Therefore it is the destination of approximately 30% of tyres was classed as "Unknown".
- 5.76 The End of Life Vehicle (ELV) Directive sets a target of 85% recovery of ELVs by 2006. Around 5% of the weight of an ELV is rubber, of which 3.5% comes from tyres. Since the reuse and recovery of tyres is relatively well developed in the UK, tyres are expected to play an important role in achieving ELV targets.
- 5.77 The 2000 Northern Ireland survey²³ estimated an increase in future used tyres arisings from 16,100 tonnes in 2000 to 17,000 tonnes in 2006 which represents an annual increase of 1% as illustrated in figure 5.12.

²² Eastern Region Waste Management Plan. January 2003

²³ Northern Ireland Used Tyre Survey (2000) Environment and Heritage Service

Figure 5.12: Estimated Increase in Used Tyres Arisings (tonnes per year) in NI

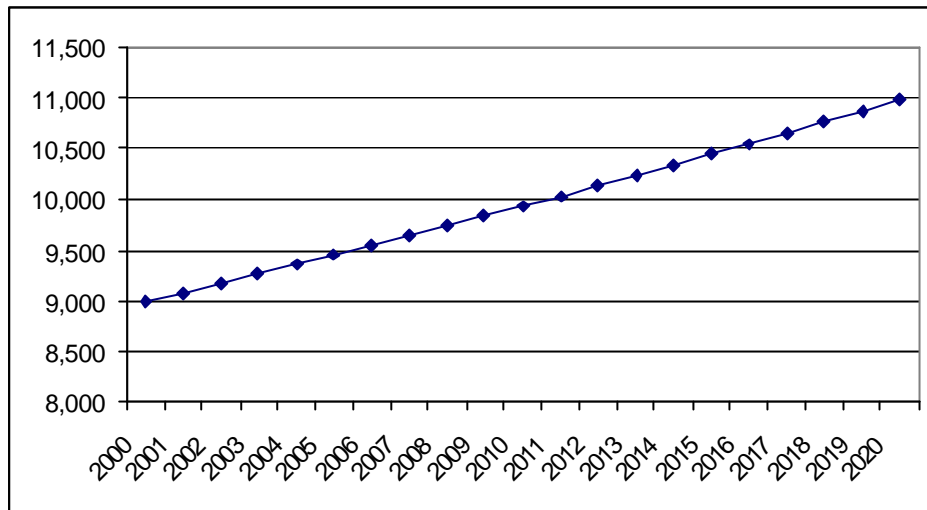


5.78 Based on an annual increase of 1% identified in the 2002 used tyres survey, the increase in future used tyres arisings in the arc21 Region is estimated to be from 8,986 tonnes in 2000 to 10,984 tonnes in 2020. From this, we can create the data shown in figure 5.13. The breakdown of this is shown in table 5.15 and the trend is shown in figure 5.13.

Table 5.15: Used Tyres Estimated Projections – arc21 Region

Year	Waste Arising (tonnes)
1997	3,729
2000	8,986
2005	9,448
2010	9,935
2015	10,449
2020	10,984

Figure 5.13: Used Tyres Estimated Trend (tonnes per year) – arc21 Region



Other Controlled Waste Streams

5.79 These wastes are included within the arisings of controlled waste discussed earlier in Chapter 5. However, due to the significant quantities of these wastes they are discussed in more detail here to provide an indication of current and where possible future arisings in the arc21 Region.

Healthcare Waste

5.80 Healthcare waste consists of materials from a number of clinical related sources. This includes hospitals, nursing homes, health centres, veterinary clinics, dental surgeries, GP surgeries, blood transfusion centres and research laboratories. The two sources where the majority of this waste comes from are hospitals and community healthcare. It is an important waste stream to consider because of its risks of infection and toxicity which can cause harm to both the environment and people.

5.81 In recent years, there has been an increase in healthcare waste generated from households. This is due to various reasons, such as home care for the elderly, more patients receiving early discharge, self injecting diabetics and home change by colostomy bag users.

5.82 Healthcare and research and development waste is considered to make up 9% of the commercial and industrial waste stream in Northern Ireland²⁴. Healthcare waste is

²⁴ http://www.ehsni.gov.uk/pubs/publications/Waste_Arisings_Survey_NI_Screen.pdf - NI waste arising survey 1999- 2000

also thought to make up around 0.15% of the municipal waste stream²⁵. This is a result of small, home medical items being distributed into general household waste. In 2005, Northern Ireland created 660,000 tonnes of commercial and industrial waste, of which 9% is equivalent to 59,400 tonnes. In 2004, Municipal waste in Northern Ireland was estimated at 1,150,000 tonnes²⁶ of which 0.15% is an additional 1,725 tonnes of healthcare waste. The estimated total amount of healthcare waste (from C&I and MSW sources) in 2005 is therefore 61,125 tonnes per annum.

5.83 Future trends for healthcare waste are considered to be affected by the following factors.

- Enhanced separation of non-infectious hospital wastes such as paper, magazines and flowers. It is anticipated that this will reduce the amount of healthcare waste generated as the separated materials can be disposed by similar methods to MSW.
- Increased concentration of community care will alter the sources of waste. The amount of waste coming from hospitals will decrease but waste coming from community care centres will increase.
- Alterations of infection control policies – including the introduction of single use equipment to reduce the risk of spreading infection will increase overall levels of healthcare waste arisings.
- Increasing age of the population will require more healthcare for the dependant elderly and therefore a rise in the amount of healthcare waste generated can be expected.

5.84 As healthcare waste arising figures are currently unclear and difficult to obtain, they are estimated as a percentage of other waste streams. It is anticipated that healthcare waste arisings will increase in the future based on the potential trends identified in 5.74. This is assumed to be consistent with the projected increases in commercial and industrial wastes (26% over the period 2002 to 2020) and MSW arisings (Scenario 2 – 1.68%), see sections 5.112 and 5.103. The proportion of healthcare wastes is therefore considered to remain at 9% of commercial and industrial waste arisings and 0.15% of municipal waste arisings for future projections. Based on these percentages, the total arisings of healthcare waste were projected and are summarised in table 5.16 and figure 5.14.

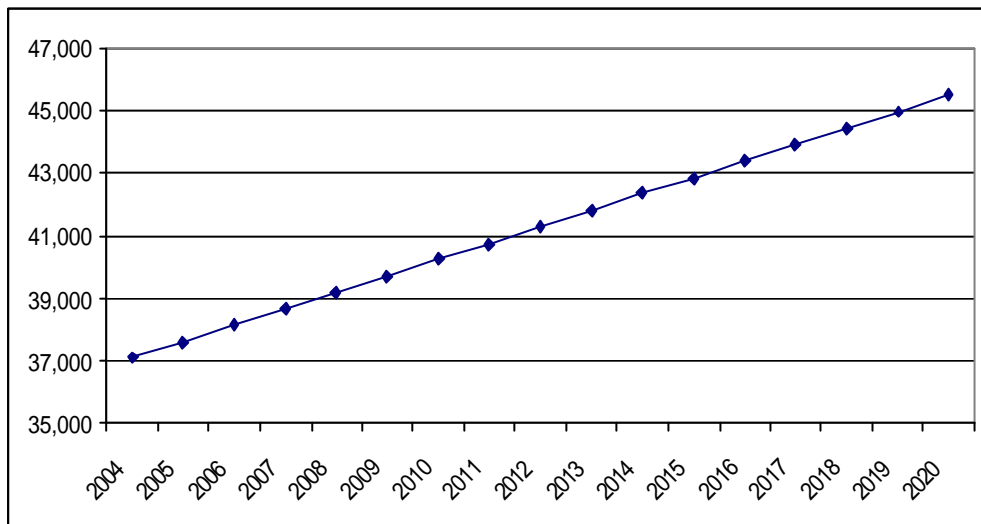
²⁵ http://www.wasteonline.org.uk/respources/Wasteguide/mn_wastetypes_clinical.html

²⁶ Source: Biodegradable waste strategy for Northern Ireland (2003)
<http://www.ehsni.gov.uk/pubs/publications/draftBiodegradableWasteStrategy.pdf>

Table 5.16 - Future trends for Healthcare Waste in arc21 Region (tonnes)

Year	Municipal Waste	Healthcare Waste (as 0.15% of municipal)	C&I Waste	Healthcare Waste (as 9% of C&I)	Total Healthcare Waste
2004	579,493	869	402,453	36,221	37,090
2005	589,257	884	408,100	36,729	37,613
2010	640,603	961	436,333	39,270	40,231
2015	696,423	1,045	464,567	41,811	42,856
2020	757,107	1,136	492,800	44,352	45,488

Figure 5.14 – Healthcare Estimated Trend (tonnes per year) – arc21 Region



5.85 This illustrates that by 2020, the amount of healthcare waste generated is estimated to have risen to over 45,000 tonnes, which shows an increase of around 8,000 tonnes in 15 years. This equates to a percentage increase of 18% over the period 2000 – 2020 in the arc21 Region.

Sewage Sludge

5.86 Sewage sludge arises from the processing and treating of sewage and other waste from the sewerage network managed by the Water Service Northern Ireland, an Agency of the Department for Regional Development which has responsibility for the operation and maintenance of sewage systems.

- 5.87 The Urban Waste Water Treatment Directive (91/271/EEC) provides the legal framework for managing sewage from which sewage sludge arises. The Directive is implemented in Northern Ireland through the Urban Waste Water Treatment (UWWT) Regulations (Northern Ireland) 1995. The Directive was amended in 2003 and this amendment came into force in Northern Ireland on 30th May 2003. The Regulations lay down uniform emission standards, or percentage reductions in pollutant concentrations, for discharges from sewage treatment works (STWs) serving a population equivalent (p.e.) of 2,000 or more.
- 5.88 The principal requirements of the 1995 Regulations with regards sewage sludge are as follows:
- Sludge arising from waste water treatment shall be re-used whenever appropriate. Disposal routes shall minimise the adverse effects on the environment.
 - Competent authorities or appropriate bodies shall ensure that before 31 December 1998 the disposal of sludge from urban waste water treatment plants is subject to general rules or registration or authorisation.
 - Member States shall ensure that by 31 December 1998 the disposal of sludge to surface waters by dumping from ships, by discharge from pipelines or by other means is phased out.
 - Member States shall ensure that the total amount of toxic, persistent or bioaccumulable materials in sludge disposed of to surface waters is licensed for disposal and progressively reduced.
- 5.89 Sewage sludge is a generally homogenised material characterised by its chemical composition (i.e. it contains compounds of agricultural value including organic matter, nitrogen, phosphorus, potassium and to a lesser extent calcium, sulphur and magnesium). As a result there is no data available to compare to the composition of other waste streams.
- 5.90 Approximately 35,000 tonnes of dry sewage sludge was produced in Northern Ireland in 2001. Of this around 22,000 tonnes was disposed of at the Water Service's sewage sludge incinerator at Dargan Road, Belfast, which is located within arc21 Region. The remainder, including incinerator ash was landfilled, the bulk going to a private landfill outside the arc21 Region. Small amounts, typically less than 10%, may be periodically disposed of at arc21 Region landfills.
- 5.91 Data from the Northern Ireland sludge strategy review shows a significant increase between 1997 and 2005, largely due to the additional waste water treatment capacity coming on stream to comply with the Urban Waste Water Directive. This review has taken account of the increase in sludge production that arises from the

implementation of the Urban Waste Water Directive and the discharge standards, set by EHS, based on the environmental needs of the receiving waters.

Table 5.17 Summary of Sewage Sludge Production

Year	Quantity
1997	30,076
2005	52,860
2015	53,356

Notes: 1. Source: Table 8.1, Northern Ireland Sludge Strategy Review, Water Service, 2002 reproduced in the Draft Biodegradable Waste Management Strategy 2003.

- 5.92 There are no specific targets that apply to the disposal of sewage sludge to landfill. However, Water Service’s objective, in line with the Review of the Sewage Sludge Strategy, is to have adequate capacity to process all sewage sludge produced within Northern Ireland, thereby effectively removing the need to dispose of sewage sludge to landfill.

Non-Controlled Wastes

- 5.93 In addition to the controlled wastes listed above there are also waste arisings from agricultural, mining and quarrying activities in the arc21 Region. Information on these waste types is outlined below.

Agricultural Wastes

- 5.94 Agricultural waste arises from activities and works that are conducted on various farms throughout Northern Ireland (i.e. dairy, livestock breeding, seed growing, fruit growing, market garden etc). The main wastes that are generated are primarily from the keeping and housing of livestock animals. In the arc21 Region in 2004, there was an estimated 10,000 farms²⁷. Waste from cattle, sheep and dairy activities are thought to make up 75% of the total amount of farm types. Other farm types include pig, poultry, horticulture, cereal, general crops and mixed.

- 5.95 The DOE has consulted on the introduction of the Waste Management Regulations (Northern Ireland) 2005 which will bring waste arising from the agricultural sector in line with the legal controls on the management of household, commercial & industrial, and construction waste (i.e. controlled wastes).

²⁷ <http://www.dardni.gov.uk/econs/file/agcen04/Complete.pdf> - DARDNI - agricultural census 2004

Initial estimates at the time of the first Waste Management Strategy indicated that this would substantially increase the quantity of farm waste which may potentially require new management controls and a separate Agricultural Waste Strategy was proposed. Waste from intensive livestock rearing has also been addressed through the Pollution Prevention and Control Regulations (Northern Ireland) 2003.

- 5.96 The disposal of non-organic agricultural waste requires to be treated in a similar way to that of commercial waste in terms of the provision of facilities. Accordingly, Councils generally will not accept non organic agricultural waste into Household Waste Recycling Centres. However in terms of the provision of advice to the farming community, particularly with respect to waste minimisation and recycling, arc21 and its constituent Councils are committed to supporting the agricultural sector both proactively and reactively through the normal communication channels.
- 5.97 In 1998 it was estimated that 5.55 million tonnes per annum of organic agricultural waste was generated from poultry, pigs, sheep and cattle alone. Table 5.18 illustrates the breakdown of this.

Table 5.18 – Organic Waste Generated in arc21 Region (1998)

Animal	Number	Waste Generated (tonnes)
Cattle	428,000	4,645,900
Sheep	660,000	626,100
Pigs	80,000	151,700
Poultry	4,900,000	123,300
Total	6,068,000	5,547,000

Source: Appendix IV MAFF Code of Good Agricultural Practice for the Protection of Water 1998.

- 5.98 More recent data has highlighted arisings of non-organic agricultural waste. This includes the following materials shown in Table 5.19. It is estimated that non-organic arisings total approximately 41,000 tonnes.

Table 5.19 – Non-organic Waste Generated in Northern Ireland – (2003)

Waste Type	Waste Generated (tonnes)
Packaging	4,592
Non- packaging	11,999
Non- packaging cardboard	118
Agrochemical packaging	4,189
Animal health products	8,365
Machinery Waste	9,427
Construction and Demolition waste	2,122
Total	40,812

Source: EHS report – 'Towards Resource Management – A consultation on proposals for a new Waste Management Strategy' Annex 2

- 5.99 It is assumed that the quantities of organic agricultural wastes have remained constant over the period 1998 - 2003. As the present number of farms in the arc21 Region represents 37% of the overall in NI, it is assumed that this will be directly proportional to the non-organic waste arisings. On this basis the estimated agricultural waste arisings in 2003 are detailed in Table 5.20.

Table 5.20 Total Estimated Agricultural Waste Arisings in arc21 Region

Waste type	Waste Generated (tonnes)
Organic Waste	5,547,000
Non Organic Waste	15,100
Total	5,562,100

- 5.100 In 2005 it is estimated that there are 20 million cubic metres of farm waste created, of which most is disposed of by land spreading²⁸. Unfortunately, it is difficult to determine the quantities of waste arising from less intensive farming sectors such as beef, dairy and sheep because of the forthcoming Nitrates Directive. It is anticipated that almost all manures and slurries arising from intensive pig and poultry enterprises will need to be removed off the farm and hence will be classed as waste. In most cases this waste will be removed for land spreading on other farms within the Nitrates and Phosphates Action Programme. This is because some wastes generated on farms

²⁸ http://www.ruralni.gov.uk/environment/countryside/farm_waste_management/index.htm - DOENI agricultural waste

can become pollutants. This includes silage effluent, slurry and dirty yard water²⁹. This had led to the introduction of new legislation. New regulations were introduced at the end of 2005 but will not be operational until the 1st January 2007. These regulations will mean all substances or objects from premises used for agriculture which are discarded by the holder, will be subject to control and waste. This will include much of the non-organic waste and some of the organic.

Mining Waste

- 5.101 Mining waste arises from the process of extracting materials from the ground that are then used as a saleable product. Commonly mining and quarrying waste arise from mined materials including clay, coal, precious stones, precious metals, metal ores and sand and shingle materials. The actual waste that is generated from the mining process generally consists of solid lumps of rock that the minerals were contained in. There can also be a large amount of sludge like material due to the seepage of groundwater into the mined materials and the application of waste water to cool drilling equipment. Although most of this material will be harmless and inert, some of the waste will need to be deposited carefully as it could contain a large amount of metals³⁰.
- 5.102 Recent advances in technology have meant that greater volumes of material can be extracted and areas can be mined that would have been previously inaccessible. An example of this would be mining the side of a steep mountain.
- 5.103 In 2003, total waste generated in the UK was estimated at around 330 million tonnes³¹. Mining and Quarrying waste was considered to make up 29% of this total. This equates to 95.7 million tonnes of mining and quarrying waste generated in the UK in 2003.
- 5.104 Currently only 5% of this material is recycled due to the nature of its composition³². Its main purpose is as a filler aggregate material that is used within the construction industry. The remainder of the waste is either tipped locally or used for backfilling prior to restoration.
- 5.105 Table 5.21 indicates a reduction in the amount of waste being generated between 1990 and 2002. This is considered to be due to a reduction in the levels of mining and

²⁹ http://www.ruralni.gov.uk/environment/countryside/farm_waste_management/index.htm - DOENI agricultural waste

³⁰ http://www.wasteonline.org.uk/resources/Wasteguide/mn_wastetypes_miningquarrying.html

³¹ <http://www.defra.gov.uk/environment/statistics/waste/kf/wrkf02.htm>

³² http://www.wasteonline.org.uk/resources/Wasteguide/mn_wastetypes_miningquarrying.html

quarrying activities within the UK over this period. In total, mining and quarrying wastes decreased by 47.46 million tonnes which equates to 33% over the period.

Table 5.21 – Mining Waste Generated in the UK 1990 – 2002 (tonnes)

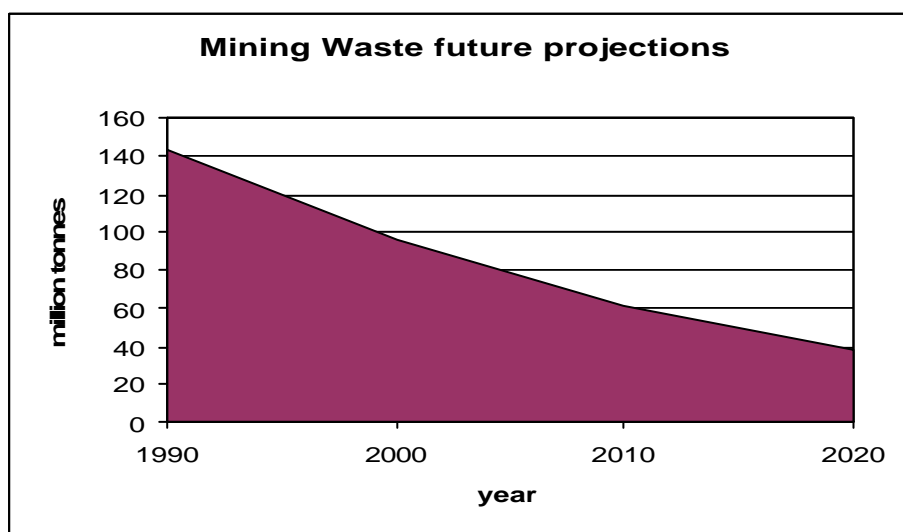
United Kingdom Waste Arisings							
Category	Year						
	1990	1992	1994	1996	1998	2000	2002
Colliery	36,450	32,900	15,927	16,112	12,543	8,594	8,196
Coal	9,932	9,347	8,559	9,292	8,094	7,005	6,799
China							
Clay	27,339	22,526	22,778	20,537	21,608	21,388	19,469
Clay	19,756	15,172	15,174	14,507	14,110	13,096	12,114
Slate	7,180	6,520	8,040	8,180	9,000	9,580	14,840
Quarrying	42,413	38,525	42,115	39,039	25,602	36,223	34,190
TOTAL	143,070	124,990	112,593	107,667	90,957	95,886	95,608

Source: DEFRA waste statistics -

<http://www.defra.gov.uk/environment/statistics/waste/download/xls/wrtb09.xls>

5.106 Using the data in Table 5.21, it is possible to project the future arisings of mining and quarrying waste assuming that the observed percentage decrease in arisings continues in the future. This is considered possible as a result of the impact of new legislation regulating the activities of the mining industry. On this basis a 36% decrease over the next 20 years results in estimated arisings of 61.19 million tonnes in 2010 and 38.58 million tonnes in 2020. This is illustrated in Figure 5.15

Figure 5.15 – Mining Waste Future Projections



- 5.107 This figure shows that over the next 20 years we can expect to see a decrease in mining and quarrying waste of around 100 million tonnes for the U.K.
- 5.108 There is limited data available for Mining and Quarrying waste figures for Northern Ireland as it is an uncontrolled waste stream. Some data has been identified which indicates 4.4 million tonnes has been estimated for Mining and Quarrying waste arisings in Northern Ireland for 2002³³. This figure is based on the apportioning of the total UK arisings, on a per capita basis, to derive a value for Northern Ireland. Based on data available, this is the current estimate for Mining and Quarrying waste within Northern Ireland.

PROJECTED CONTROLLED WASTE ARISING

- 5.109 Predicting future waste arisings is vital to determining future waste management requirements. In considering projections, account must be taken of the accuracy of the base data, likely projections of household numbers and economic growth and the effects of extrapolating data over a 20 year period. For some waste streams, a range is indicated based on the best estimate of current arisings and predicted future trends.
- 5.110 Table 5.22 provides a summary of the predicted waste arisings for the key waste types over the Plan period. The projections are described in paragraphs 5.101 to 5.116.

Table 5.22 Summary of Controlled Waste Projections 2000 to 2020 in arc21 Region

	1999	2004	2010	2015	2020
Municipal	529,500	579,500	641,295	689,958	729,899
Commercial/industrial	412,000	402,500	436,400	464,600	492,800
Construction, Demolition & Excavation	800,000	1,868,100	1,998,400	2,107,000	2,215,600
Note: All values in tonnes (rounded to nearest 250 tonnes)					

Municipal Waste

³³ Northern Limits a resource flow analysis and ecological footprint for Northern Ireland

5.111 The municipal waste arisings data is considered to be the most accurate because it is generally based on weighbridge data. The split into household and commercial waste data is considered to be less accurate because the quantity of commercial waste that is co-collected with the household waste is often estimated. Therefore the waste projections are based on trends in municipal waste arisings.

5.112 It is considered that the main two factors driving municipal waste growth are:

- Number of households – it is generally considered that the number of households will directly influence the arisings of waste, therefore if housing numbers are increasing so waste arisings will increase.
- Municipal waste per household – it is considered that independent of the number of households, the underlying municipal waste produced by each household will change due to factors such as behaviour, socio-demographic factors, education initiatives, affluence and Gross Domestic Product.

Table 5.4 identifies the general relationship between the number of households, quantity of municipal waste arisings and average quantity of municipal waste generated per household.

5.113 The amount of household waste generated by each household over the last two years has decreased to an average of -0.68%.

5.114 Future municipal waste arisings have been projected via five scenarios to provide a range of projections of potential arisings (low and high) and a working estimate for forward planning purposes:

- **Low Growth – Scenario 1:** This assumes the average percentage growth of municipal waste per household will decrease at the same rate as identified within the last two years (-0.68%) from KPI data. Scenario 1 also assumes that the household growth trend will increase at the same rate as identified for the last two years (1.68%) from KPI data.
- **Medium Growth (1) – Scenario 2:** This assumes that the waste growth per household identified from 2003 to 2004 (0.7%) will be reduced to 0% by 2009. This scenario also assumes that the household growth will gradually decrease to 1.5% by 2009. Therefore the waste growth obtained in 2009 will be the same as the growth targeted by the new NI Waste Management Strategy³⁴ (i.e. 2.4%).

³⁴ Towards Resource Management. A Consultation on Proposals for a New Waste Management Strategy. EHS. October 2005

- **Medium Growth (2) – Scenario 3:** This assumes that the average quantity of municipal waste per household will remain constant with 2004 and therefore a rate of 0% is applied. Scenario 2 also assumes that the household growth trend will increase at the same rate as identified for the last two years (1.68%).
- **Medium Growth (3) – Scenario 4:** This assumes that the waste growth per household identified from 2003 to 2004 (0.7%) will be reduced to 0% by 2009. This scenario also assumes that the household growth will be the same as the growth identified between 2003 and 2004 (1.8%)
- **High Growth - Scenario 5:** This assumes that the average percentage growth of municipal waste produced per household within the last two years (-0.68%), will be influenced by the GDP growth in Northern Ireland which has increased 3% in 2004 and 2005³⁵. The overall rate of increase in municipal waste per household is therefore 2.32% per annum. Scenario 5 also assumes that the household growth trend will increase at the same rate as identified for the last two years (1.68%).
- **Working Estimate:** The working estimate is proposed taking due regard to the waste growth in the NI Waste Management Strategy and NI BPEO as a baseline and factoring in Council efforts and measures over the plan period to address waste prevention. Waste growth per household is assumed to account for the decrease in arisings identified by KPI data for 2004. It is then projected to decrease in the longer term as a result of the positive effect of waste prevention programmes and projected changes in average household size. The overall rate of increase in municipal waste growth is assumed to be 1.8% in 2005 decreasing to 1% by 2020. Details of household projections (number) are provided in Appendix 5B.

5.115 The working estimate generally reflects the slowing of the growth rate for municipal wastes to 1.5% per annum by 2010 that is identified in the NI Waste Management Strategy Consultation Document, *Towards Resource Management*. This is derived following an assessment of the contribution of specific waste prevention initiatives.

5.116 Figure 5.16 and Table 5.23 highlight the likely changes in municipal waste based on the three growth estimates, with the full projection provided in Appendix 5D.

³⁵ Source: Office for National Statistics. <http://www.statistics.gov.uk/StatBase/Expodata/Spreadsheets/D6051.csv>

Figure 5.16 Municipal Waste Projections 2000-2020

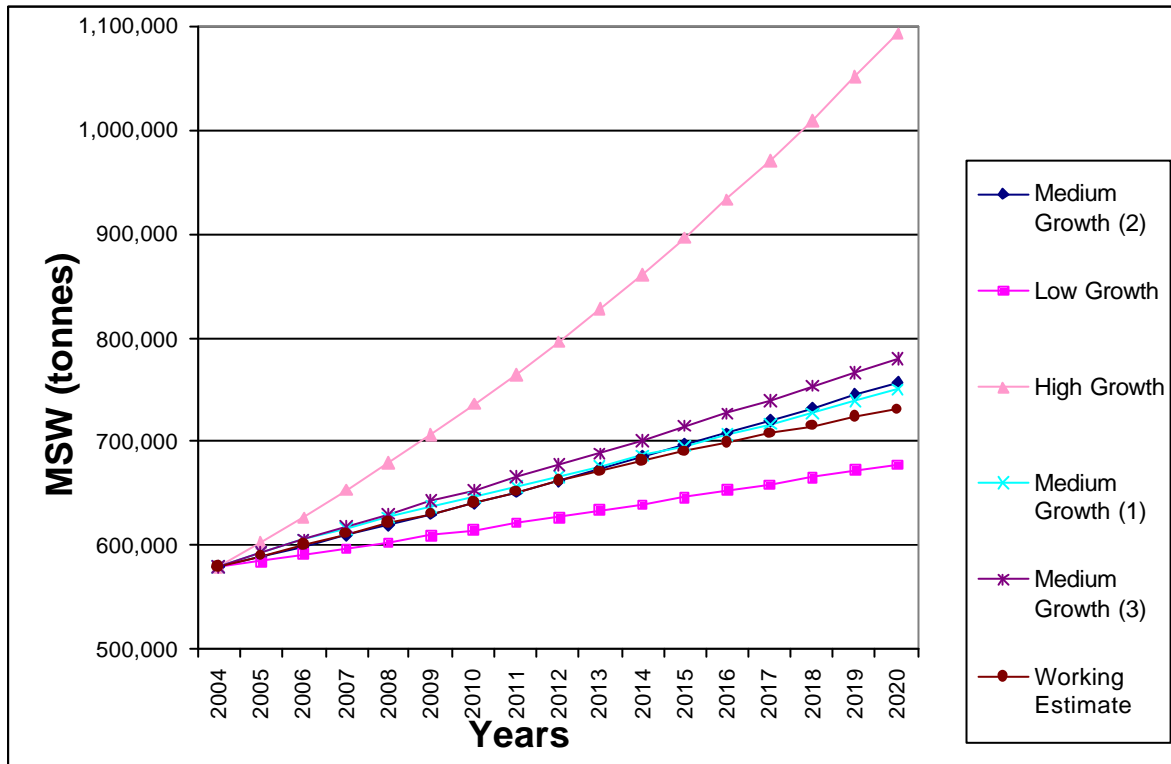


Table 5.23 Municipal Waste Projections in Key Years (tonnes)

Scenario	2004	2005	2010	2015	2020
Scenario 1 – Low Growth	579,493	585,236	614,819	645,896	678,545
Scenario 2 – Medium Growth (1)	579,493	592,759	646,041	695,969	749,757
Scenario 3 – Medium Growth (2)	579,493	589,257	640,603	696,423	757,107
Scenario 4 – Medium Growth (3)	579,493	593,095	653,405	713,951	780,107
Scenario 5 – High Growth	579,493	602,914	735,007	896,041	1,092,356
Working Estimate	579,493	589,855	641,295	689,958	729,899

5.117 The projections in the low growth scenario indicate there will still be a significant increase in waste arisings by 2020 (an increase of 99,052 tonnes between 2004 and 2020 see Table 5.23) which equates to an annual growth rate of 0.99%

5.118 The medium growth scenarios indicate the following:

- **Scenario 2** identifies an increase of 170,264 tonnes between 2004 and 2020. This equates to an annual growth rate of 2.29% decreasing to 1.5% from 2009 onwards.
- **Scenario 3** identifies an increase of 177,614 tonnes between 2004 and 2020. This equates to an annual growth rate of 1.68%.
- **Scenario 4** identifies an increase of 200,614 tonnes between 2004 and 2020. This equates to an annual growth rate of 2.35% decreasing to 1.8% from 2009 onwards.
- **Working Estimate** identifies an increase of 150,406 tonnes between 2004 and 2020. This equates to an annual growth rate of 1.8% decreasing to 1% by 2020.

5.119 The high growth scenario (5) indicates an increase of 512, 863 tonnes between 2004 and 2020. This equates to an annual growth of 4.04%.

5.120 The working estimate is to be used in this update of the Waste Management Plan. This is considered the best available estimate of the growth rate which takes into account actual decreases in waste growth per household due to the positive effects of waste prevention initiatives and data relating to household estimates (Appendix 5B).

Commercial and Industrial Wastes

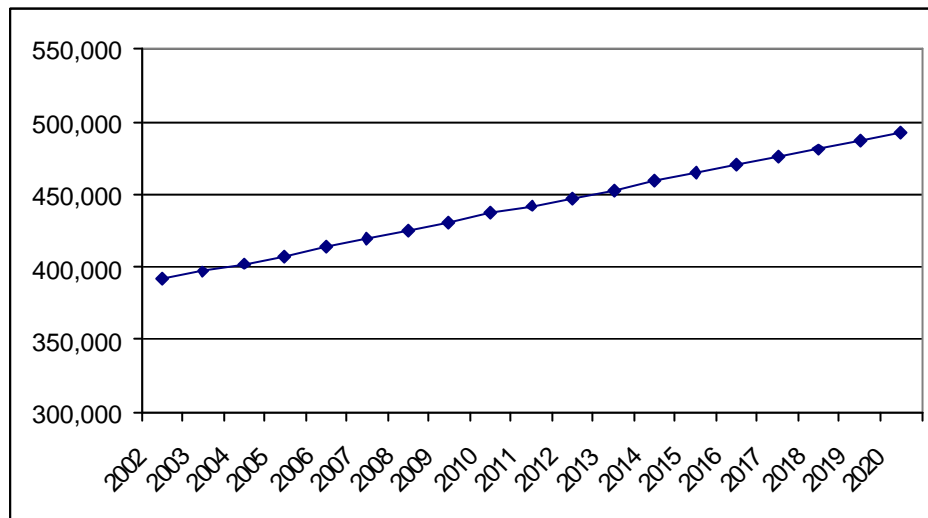
5.121 The BPEO for Waste Management in Northern Ireland: Guidance Document June 2005⁷ identifies that by 2020 it is projected that the amount of C&I waste arisings in Northern Ireland will increase to 800,000 tonnes per year. This represents an incremental increase of 26% over the period 2002 – 2020. Applying an increase of

26% on the waste arisings estimated for arc21 Region in 2002 (391,160 tonnes) equates to a C&I waste arisings in 2020 of 492,800 tonnes. The total arisings of C&I waste were projected and are summarised in table 5.24 and figure 5.17.

Table 5.24 - Future Trends for C&I Waste Arisings in arc21 Region (tonnes)

Year	C&I Generated (tonnes)
2004	402,453
2010	436,333
2015	464,567
2020	492,800

Figure 5.17 – Projected Waste Arisings for C&I in arc21 Region (tonnes per year)



5.122 Future trends for C & I waste are expected to be updated once the results of a new survey are published by the EHSNI in 2006.

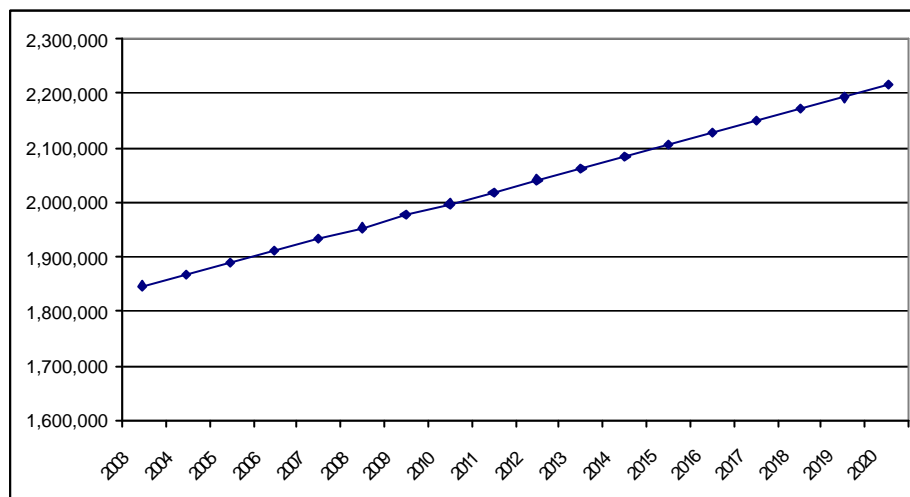
Construction, Demolition and Excavation Waste

5.123 The BPEO for Waste Management in Northern Ireland: Guidance Document June 2005⁷ identifies that by 2020 it is projected that the amount of C, D&E waste arising will increase to 4.5 million tonnes per year. This represents an incremental increase of 20% over the period 2003 – 2020. Applying an increase of 20% on the waste arisings estimated for arc21 Region in 2003 (1.85 million tonnes) equates to C, D & E waste arisings in 2020 of 2.2 million tonnes. Table 5.25 and Figure 5.18 identify projected C, D&E waste arisings for arc21 Region.

Table 5.25 – Future Trends for C, D&E Waste Arisings in Northern Ireland and arc21 Region

Year	C, D&E Waste in Northern Ireland (tonnes)	Estimated C, D&E Waste in arc21 Region (tonnes)
2004	3,794,118	1,868,064
2005	3,838,235	1,889,785
2010	4,058,824	1,998,394
2015	4,279,412	2,107,002
2020	4,500,000	2,215,610

Figure 5.18 – Projected Waste Arisings for C, D & E arc21 Region (tonnes per year)



5.124 Future trends for C, D&E waste are expected to be updated with the creation of a new survey published by the EHSNI in 2006.

5.125 Recent Northern Ireland investment strategies estimate a capital expenditure programme of £16 billion between 2005 and 2015³⁶. This involves spending on infrastructure projects such as roads, schools and hospitals. This means we can consider a small growth rate for construction and demolition waste arisings, leading to a greater need for recycling and reuse.

³⁶ EHS report – ‘Towards Resource Management – A consultation on proposals for a new Waste Management Strategy’ Annex 2

5.126 Targets for 2020 indicate that Northern Ireland will aim to reuse and recycle (this is assumed to include recovery) 75% of this material and landfill the remaining 25%. This figure is challenging, but considered achievable, for example, Holland and Denmark already achieves a 90% diversion rate for C, D& E waste and the Republic of Ireland has set a target of 85% recycling by 2013. Using the data in table 5.25 we can then assume that the targets for 2020 will be as follows:

Table 5.26 – Estimated CD&E Arisings Requiring Recovery in arc21 Region

Waste treatment	% of total waste	Northern Ireland Tonnage in 2020 (tonnes)	arc21 Region in 2020 (tonnes)
Reuse and Recycle	75%	3,331,233	1,632,304
Landfill	25%	1,110,412	544,101

EXISTING WASTE MANAGEMENT FACILITIES

Municipal Waste

5.127 As of December 2005, the arc21 Region councils owned and operated three landfill sites, two waste transfer stations, 44 civic amenity (CA) sites, 136 bring sites and a materials recovery facility (MRF). Composting facilities were available at all three of the landfill sites. A list of these sites, including one privately operated landfill site that accepts municipal waste and one privately operated composting facility, is given in Appendix 5C.

5.128 At present all arc21 Councils are sending the majority of their dry recyclable materials to the Bryson House facility in Mallusk.

5.129 There are currently two council waste transfer stations, operated by Ards and North Down with both Councils wishing to replace their existing transfer stations by 2007. Three other arc21 Councils (including Ards and North Down) are committed to constructing a transfer station by 2007.

5.130 Civic amenity sites are provided by all the councils for local residents to dispose of bulky waste, garden waste and recyclable materials. The CA sites are used to supplement the provisions for waste collection and recycling within the arc21 Region.

Table 5.27 Summary of Council Operated Facilities

Council	Landfill	Waste Transfer	Civic Amenity	Bring Site	Material Recovery Facility	Total
Antrim	-	-	3	2	1	6
Ards	-	1	7	10	-	18
Ballymena	1	-	2	9	-	12
Belfast	1	-	9	39	-	49
Carrickfergus	-	-	1	3	-	4
Castlereagh	-	-	11	2	-	13
Down	1	-	4	42	-	47
Larne	-	-	2	9	-	11
Lisburn	-	-	2	18	-	20
Newtownabbey	-	-	1	-	-	1
North Down	-	1	2	2	-	5
Total	3	2	44	136	1	186

- 5.131 There are approximately 44 operational CA sites located across the arc21 Region. The majority of sites have collection facilities for newsprint and magazines, card, brown, clear and green glass, cans, waste oils, textiles, scrap metals, white goods, TV's, car batteries, waste paint tins, gas cylinders and green waste. In addition, there are skips for general waste for disposal. The Councils operate all of the facilities, however, the majority of waste from the sites is uplifted by private waste management contractors for recycling or recovery. The Councils are already part of several joint collection contracts such as the All Ireland Fridges and Freezers contract. It is the intention that more joint collection contracts will be established for materials such as green and organic wastes, glass, cans, plastic and paper. Details of Civic Amenity Sites/ Household Waste Recycling Centres are available in Appendix 5C.
- 5.132 Bring systems involve the use of freestanding containers placed at specific locations where the public can deposit a variety of clean, segregated materials such as glass, textiles and aluminum cans. The bring sites vary in size from small facilities in car parks concentrating on glass and can collection, to larger facilities on dedicated sites collecting a wider range of materials. There are currently around 136 operational bring sites within the arc21 Region. The Councils operate 97 of these sites, however in Down there are 32 private bring sites, in North Down there are four and in Newtownabbey there are three. Details of bring sites are available in Appendix 5C.

5.133 Each Council in the arc21 Region now operates a kerbside collection co-mingled dry recyclables via recycling boxes and/or bins. At the present time the waste materials being uplifted by the Councils include, paper, cans, glass, card. In addition, each Council offers a segregated collection of green (garden) waste. In 2007 the arc21 Councils anticipate implementing a joint contract which will allow kitchen waste to be uplifted with the segregated garden waste and removed for in-vessel composting.

Table 5.28 - Kerbside Waste Collection Schemes Currently in Place in arc21 Council Areas

Council Area	Material	Households Served	Status
Antrim	Paper, Cans, Plastic bottles, Card, Glass, Green Waste	17,900	Fully implemented. Kitchen waste to be added in 2008.
Ards	Paper, Cans, Plastic bottles, Card, Glass, Green Waste	30,200	Fully implemented early 2006. Kitchen waste to be added in 2008
Ballymena	Paper, Cans, Plastic bottles, Card, Green Waste	23,364	Fully implemented. Kitchen waste to be added in 2008.
Belfast	Paper, Cans, Plastic bottles, Card, Green Waste	119,170	Fully implemented. Kitchen waste to be added in 2008.
Carrickfergus	Paper, Cans, Plastic bottles, Card, Glass, Textiles, Green Waste	15,000	Fully implemented. Kitchen waste to be added in 2008.
Castlereagh	Paper, Cans, Plastic bottles, Card, Green Waste	27,500	Fully implemented. Kitchen waste to be added in 2008.

Council Area	Material	Households Served	Status
Down	Paper, Cans, Plastic bottles, Green Waste	28,500	Fully implemented. Kitchen waste to be added in 2008.
Larne	Paper, Card, Plastic, Cans, Green Waste	12,750	Fully implemented. Kitchen waste to be added in 2008.
Lisburn	Paper, Card, Plastic, Cans, Green Waste	40,633	Fully implemented. Kitchen waste to be added in 2008.
Newtownabbey	Paper, Cans, Plastic bottles, Card, Green Waste	31,040	Fully implemented. Kitchen waste to be added in 2008.
North Down	Paper, Cans, Plastic bottles, Card, Green Waste	23,500	Fully implemented. Kitchen waste to be added in 2008.

5.134 The Councils employ a range of private contractors to uplift the materials disposed of at their CA sites. Many of these contractors provide services to more than one of the arc21 Councils.

Commercial Waste Uplifts

5.135 Each of the arc21 Councils currently operates a commercial waste uplift service for business in their areas. The majority of the councils have a dedicated vehicle that is used solely for the uplift of commercial waste. The scale of these services and the Councils' commitment to continue or expand them varies in each Council district. The majority of the Councils have a stable number of commercial premises that they currently uplift from and none of the Councils are currently expecting any large fluctuations in commercial premises requiring uplifts in the near future.

- 5.136 At present only Antrim, Ards, Newtownabbey and Lisburn offer a segregated uplift service for recyclables to commercial premises and this service is on an 'opt in' basis. The other arc21 councils will monitor their commercial waste arisings and consider implementing segregating uplifts in the future.
- 5.137 Ards Council currently offer 240 litre blue bins to commercial premises in which they can dispose of dry recyclables. The Council will uplift these blue bins at a lower cost than the general municipal bins they provide, as an incentive to encourage uptake amongst business. Newtownabbey conducted a pilot scheme where 25 commercial premises were provided with blue bins into which they could dispose of dry recyclables. The council does not have plans to expand the scheme in the immediate future. Lisburn have offered a separate uplift service of paper and card to 880 commercial customers since 1994. The paper and card are uplifted from premises primarily following a telephone request.

Bulky Waste

- 5.138 Each of the arc21 Councils has designated separate vehicles to deal with bulky waste items. The uplift schedules and the means by which the waste is separated varies between councils. Councils including Carrickfergus, Lisburn, Newtownabbey and North Down collect bulky items such as furniture, white goods and metals together but have separate vehicles and uplifts for fridges. Antrim and Castlereagh Borough Council have a dedicated day for the uplift of fridges only. Belfast intends to introduce a separate collection for bulky furniture items which will be re-used by a local charity. Bulky wastes collected by the majority of arc21 Councils, excluding fridges, are separated and sorted at the Council CA sites. Ballymena Borough Council operate a craned vehicle that separates bulky materials into separate compartments on the lorry and Castlereagh Borough Council has specific collection days assigned for the uplift of metals and large garden wastes for recovery and mixed bulky wastes such as furniture. Ards Borough Council currently recover some materials from bulky uplift collections via sorting at a MRF.

Street Sweepings

- 5.139 The arc21 Councils all operate fleets of street cleansing vehicles. All waste collected by these vehicles is sent to landfill.

Litter Collection

- 5.140 Litter collection is undertaken by each of the arc21 Councils. Caged vehicles are used by the majority of the Councils to collect the litter as a mixed waste, the exception to this is in Castlereagh where side loading vehicles with separate containers for the

different litter types. In addition, Belfast have implemented 40 multi-compartmental litters bins installed at various points located in the city to encourage public segregation of litter. Collections from these are undertaken by Bryson House.

Fly Tipped Waste

- 5.141 Each Council operates a collection service for fly tipped waste. The frequency of the uplifts is variable and the type of vehicle used may depend on the nature of the fly tipped waste to be uplifted. Fly tipped waste such as wood or metals are brought to one of the CA/HWRC sites for disposal. If mixed fly tipped waste is uplifted, it is taken to landfill.

Parks and Gardens

- 5.142 Green waste from the parks and gardens within the Council districts is separated by each Council and generally sent to CA/HWRC sites where it is composted. Remaining wastes such as litter that are collected by the parks and gardens services are sent to landfill.

Non Municipal Waste Management Facilities

- 5.143 Privately operated facilities licensed to take general non-hazardous and inert waste are listed in Appendix 5D. Of the privately owned facilities 26 are landfills that are licensed to accept non-municipal waste inert and/or non-hazardous wastes. There are currently no hazardous waste landfills in Northern Ireland. The remainder of the facilities are licensed to take both municipal and non-municipal waste.
- 5.144 There are 26 licensed waste transfer stations. Healthcare Trusts currently operate 4 of the sites and 7 sites are operated by industry.
- 5.145 Healthcare wastes are collected by Sterile Technologies Inc (STI) who are based at the Antrim Area Hospital in Antrim. STI collect healthcare wastes on behalf of the Northern Ireland Health Trusts and the Health Boards in the Republic of Ireland as part of an All Ireland approach to managing this waste stream. Approximately 375 tonnes per month of clinical waste and sharps are processed through the Antrim treatment facility and landfilled at the site in Ballyclare. This is anticipated to continue up until the landfill site closes in 2007. STI is yet to make alternative arrangements for disposal beyond this date. Approximately 26 tonnes per month of special, pharmaceutical, anatomical and pathological wastes are also collected. These wastes are not disposed of in Northern Ireland but are transported by boat for incineration at the Sterile Technologies (Newcastle) Ltd facility in Wrexham, North Wales.

Waste Disposal Sites and Estimated Capacity

- 5.146 Data on remaining capacity is limited, as there is no requirement under the current licensing system to provide such information. Remaining municipal waste disposal capacity for the council owned sites has been calculated for the purpose of establishing essential interim capacity requirements.
- 5.147 Input rates and the remaining capacity at private sites are regarded as commercially sensitive information by operators. During the development of the both the previous Waste Management Plan in 2002 and this revised Plan, a survey of operators was undertaken to obtain information on the privately operated licensed landfill sites within the arc21 Region. Where responses were obtained from private operators only very limited information on capacity was provided, either because the operator did not know or because they felt that the information requested was commercially confidential.

Capacity for Municipal Wastes

- 5.148 Currently there is only a limited amount of landfill capacity remaining for municipal waste in the arc21 region. At present only three Council owned landfill sites (Dargan Road, Drumanakelly and Ballymacvea) are operating in the arc21 Region. Drumlough landfill closed in 2003.
- 5.149 Of the remaining Council owned and operated facilities, Dargan Road is due to close in November 2006. Landfilling is due to cease at Ballymacvea in April 2007. Drumanakelly is scheduled to continue landfill operations until the year 2017. There are approximately 820,000 tonnes of available landfill capacity for municipal waste and other non-hazardous waste currently available at these three Council operated landfills.
- 5.150 The capacity of Council owned landfills is summarised in Table 5.29:
- 5.151 The current input rates at Drumanakelly are relatively low (40,000 tonnes but planning restrictions are in place) and the total remaining capacity at this site could be made available to other Councils in the short term if input rates were increased. Due to the location of this site at the periphery of the arc21 Region, accessibility to the site by the majority of arc21 Councils is constrained and limits practical use of this site as a major contributor to short term requirements. As noted above, Ballymacvea is due to close in April 2007 but may offer some a short term alternative to some of the waste requirements.

Table 5.29: Estimated available capacities of council owned landfills in the Eastern Region

Site	Total Remaining Capacity (tonnes)	Total Capacity Available for Municipal Waste (tonnes)	Input Rate (tonnes per year)
Ballymacvea	160,000	160,000	80,000
Dargan Road	180,000	180,000	216,000
Drumlough	0	0	Closed 2003
Drumanakelly	480,000	480,000	40,000

- 5.152 Landfilling operations are due to cease at Dargan Road in November 2006 and only limited short term capacity for municipal waste remains at this site.
- 5.153 Municipal waste currently also goes to the Green Road landfill operated by Biffa Waste Services. Three of the arc21 Councils currently have contracts to dispose of waste at this site. Antrim will be disposing of waste there until November 2006 and both Newtownabbey and Larne are disposing of waste at the site until March 2006. Lisburn City Council is currently disposing of some of its non-putrescible waste at the Aughrim landfill site operated by Cleanaway and will continue to send waste there until November 2006. North Down Council is disposing of some waste at Rockmount Quarries run by LT Wright and Son. They will continue to dispose of waste here until 2007.
- 5.154 In consideration of the need for short term landfill capacity in the eastern part of Northern Ireland, 3 landfill applications by private operators were approved by the Department of the Environment in March 2005. These are located at Cottonmount, Mallusk (Newtownabbey), Mullaghaglass in the Belfast Hills (Lisburn) and Aughrim Quarry (Lisburn). Cottonmount is anticipated to accept waste at a rate of 400,000 tonnes per annum over 12 years. Mullaghaglass is anticipated to accept up to 200,000 tonnes per annum over 10 years and Aughrim has a total void of 4.5million tones over an estimated 18 year lifespan.
- 5.155 arc21 has developed landfill contracts, which are due to commence in November 2006. This is a short term contract that will provide landfill capacity for a period of three years. This contract will make use of the Mullaghaglass and Cottonmount landfill sites and the arc21 Councils that will use each of the sites is detailed in Table 5.30 below

Table 5.30 – arc21 Region Landfill Joint Contract

Landfill Site	arc21 Councils Served Under Landfill Joint Contract
Mullaghaglass (Lisburn)	Ards, Lisburn, North Down, Antrim, Castlereagh, Belfast
Cottonmount (Newtownabbey)	Newtownabbey, Ballymena, Carrickfergus, Larne, Belfast, Antrim, North Down, Ards, Castlereagh

5.156 In summary, due to recent planning approvals by Government that have secured regional landfill capacity, the short term waste disposal requirements of arc21 Councils appear to be met. It is estimated that sufficient landfill capacity is available for municipal, commercial and industrial waste arisings in the short to medium term. Further landfill capacity is likely to be required half way through the Plan period to ensure that landfill needs are met and to stimulate a sufficiently competitive climate.

Non-Municipal Wastes

5.157 There is little information on disposal routes and capacities for commercial and industrial wastes; construction and demolition wastes; and inert wastes. The predominant method is still disposal to landfill.

5.158 A new survey of C, D&E waste arisings is being carried out by EHS to be published in 2006. The objective is to further improve the accuracy of data on waste arisings, waste composition and current management routes.

5.159 A survey of the NI aggregates sector called “Assessment of the State of the Construction Aggregates Sector in Northern Ireland, Report by Symonds Group, in association with WRc, for HM Customs and Excise” was published in October 2003. This survey estimated that C, D&E waste arisings were between 2.5 to 3.75 million tonnes per annum. This yields a per capita figure of around 2 tonnes per person which is similar to recent surveys in England and Wales. It was estimated that 1.28 million tonnes of this C, D&E waste was ‘hard’ construction waste suitable for crushing and recycling as aggregate.

5.160 It is considered that the majority of this waste is disposed of at the privately operated landfill sites within the arc21 Region (listed in Appendix 5G), although a proportion will also be deposited at landfill sites in the adjoining sub-regional areas.

- 5.161 At the present time the majority of C&I waste is collected by private sector waste management companies, but the KPI data for 2002/2003 indicates that approximately 63,000 tonnes is collected by District Councils³⁷. The waste collected by the Councils is counted as municipal waste and must comply with statutory waste targets such as the EC landfill directive target for biodegradable waste. In addition, the majority of C&I arisings within the arc21 Region are dealt with privately. It is estimated that 391,160 tonnes of commercial and industrial waste arisings were generated in the arc21 Region in 2002 and based on data available, projections have been calculated (as detailed in Table 5.24).

The EHS Document “Industrial and Commercial Waste Production in Northern Ireland, 2002” indicated that approximately 40% of Commercial and Industrial waste was landfilled, while 33% was recovered by reuse, recycling or composting. The remainder went to a variety of disposal routes including land application, combustion and other treatment facilities. On this basis, approximately 157,000 tonnes of C&I waste generated in the arc21 Region was disposed to landfill. It is considered that the majority of this waste is disposed of at the privately operated landfill sites within the arc21 Region (listed in Appendix 5G), although a proportion will also be deposited at landfill sites in the adjoining sub-regional areas.

- 5.162 A small amount of commercial and industrial wastes may be disposed of at a number of unlicensed facilities both within and outside the arc21 Region. There is no information available for these sites. However these sites are not regarded as providing future capacity for arc21 Region.
- 5.163 The EHS has carried out a NI-wide BPEO study in 2005 covering the major waste streams in consultation with key stakeholders. This study has identified the preferred mix of technologies to be used for C, D&E and C&I waste management in NI up to 2020. The study identified that limited synergy exists between municipal and C, D&E wastes, but emphasized the need for better project planning and more effective reuse of excavated materials that result in C, D&E arisings. The Study noted, however, the links between the requirements of municipal and commercial and industrial wastes and identified some of the key infrastructure needs to be developed to serve both of these major waste streams. The study also recommends a progressive increase in the level of reuse and recycling up to a target of 60% by 2020. In addition, landfilling of waste should be minimised and a balanced combination of alternative technologies such as thermal treatment, anaerobic digestion and mechanical biological treatment should be used to treat residual waste. The requirements of the NIBPEO along with more stringent and costly landfills, suggest that greater recovery of material from these two waste streams within the arc21 Region can be expected in the future.

³⁷ Arc21– Detailed Implementation Action Plan April 2002 – March 2020 Identification of Further Opportunities for Diversion of MSW – Briefing Paper August 2005

Waste Imports and Exports

- 5.164 The arc21 Region adjoins the council areas of the Northwest and Southern Waste Management Groups on its northern, western and southern sides. Some waste moves across these sub-regional group boundaries to landfills and reprocessing facilities within the arc21 Region. Household wastes are not exported for disposal to any significant degree and it is anticipated that this will continue in the medium term with the use of Cottonmount, Mullaghaglass and Drumanakelly landfills as part of the arc21 landfill contract.
- 5.165 Recently, household waste has been imported to Drumanakelly Landfill site from Banbridge Borough Council because the Council and a haulage contractor have an agreed contract capacity for this site. The amount of waste imported is approximately 15,000 tonnes per annum.
- 5.166 arc21 Councils collect a range of segregated materials for recycling and recovery through their network of Household Waste Recycling Centres. Materials are uplifted by specialist contractors who operate in the region. The fate of the materials collected is dependant on the availability of reprocessing facilities within Northern Ireland and where local reprocessing capacity does not exist, materials are transported to Great Britain for reprocessing. An example of this is the All Ireland Fridge Freezer Contract where local firms collect fridge freezers from the arc21 Region and then these are transported to M Baker Recycling's Facility at St Helens, Merseyside.
- 5.167 Until 2004, the District Councils in Northern Ireland were the competent authority in Northern Ireland for recording movements of waste under the Transfrontier Shipment of Wastes (TFS) Regulations 1994. This responsibility has transferred to the Environment and Heritage Service (EHS). Data recorded under the new system is anticipated later in 2006 once all movements have been reported to the EHS.
- 5.168 Imports and exports of controlled wastes are only permitted cross border under the TFS Regulations for specific defined activities (Landfill, Biological Treatment, Chemical Treatment, Physico-chemical Treatment and Incineration). Import of waste to Northern Ireland from the Republic of Ireland (RoI) for blending and mixing and repackaging of wastes is only permitted as long as the waste is disposed of in Northern Ireland or returned to RoI. All of the movements must give consideration to the proximity principle (i.e. local treatment/disposal must be given priority). In 2003, it was reported that 26,212 tonnes of waste were imported to Northern Ireland from

Republic of Ireland³⁸ and all of this waste was imported for treatment. Information was not available on what proportion of this tonnage was imported to the arc21 Region.

- 5.169 A review of information on movements of wastes under TFS by arc21 Councils for 2004 has identified the most significant level of movement involved Belfast City Council with 18,238 tonnes of waste imported into 2 sites within the Belfast area.
- 5.170 Commercial and industrial wastes are moved in response to competition on gate fees, temporary contract locations and transport logistics. High transport costs generally act to limit the movement of this waste. It is thought that wastes only move to and from the Northwest and Southern Region for disposal on the fringes of the sub-regional area. Of the total commercial and industrial waste arising it is thought that less than 10,000 tonnes per annum is exported presently to facilities outside the arc21 Region.

CONCLUSIONS

- 5.171 The arc21 Region continues to rely primarily on landfill for managing its waste. Recycling and composting rates are slowly increasing and overall recycling and composting account for 15% of MSW arisings with the remainder disposed to landfill. Approximately 33% of commercial and industrial waste is recorded as being recycled based on a survey of businesses with a further 40% of C&I waste disposed to landfill. The remainder is managed via a range of activities including landspreading, combustion and other treatment. Approximately 34% of C, D & E wastes are reused or recycled in Northern Ireland whilst the remaining 66% is mainly disposed to land. It is assumed that a similar breakdown occurs in the arc21 Region.
- 5.172 Municipal waste disposed of to landfill sites in the arc21 Region is estimated at 500,000 tonnes in the base year of 2002/2003 and the remaining capacity at council operated landfill sites within the arc21 Region is limited and estimated at 820,000 tonnes. This represents a total of 1 year disposal capacity for municipal waste. New merchant landfill sites have gained planning consent and arc21 has entered into contract with a number of these sites for disposal up to 2009/10. Additional disposal arrangements are required beyond this date.
- 5.173 A review of factors affecting MSW growth rates has identified a best estimate of future waste growth. Once the anticipated impact of waste prevention measures are taken into account this equates to 1.8% in 2005 decreasing to 1% by 2020, compared to a rate of 2.4% in the NI BPEO.

³⁸ EPA National Waste Database, Interim Report 2003, Table 15, Environmental Protection Agency, www.epa.ie/TechnicalGuidanceandAdvice/NationalwasteDatabase/

- 5.174 The position for commercial and industrial waste is complex. It is estimated some 160,000 tonnes of commercial and industrial wastes is disposed of at landfill sites in the arc21 Region including both council operated and private facilities licensed to take non-hazardous wastes. The remaining capacity at Council sites is minimal. New non-hazardous landfill sites (Cottonmount and Mullaghaglass) have obtained planning approval and are estimated to become operational in 2005, however the new merchant sites are likely to be heavily subscribed by Councils. In addition, requirements of the Landfill Directive for new landfill sites mean that existing capacity is likely to be limited. Additional sites with further capacity to meet commercial requirements is considered necessary.
- 5.175 The projected waste arisings indicate increasing quantities of municipal, commercial and industrial wastes will be generated over the Plan period. These wastes will need to be managed by a range of waste management technologies. The available technologies and options are reviewed in Chapter 7 and potential solutions assessed in Chapter 10.
- 5.176 For construction and demolition wastes, it is estimated that approximately 1.2m tonnes per annum of arc21 Region arisings are disposed of to land. For planning purposes, a similar level of disposal capacity may be assumed in the short term, with improved monitoring to allow more accurate predictions in the future.
- 5.177 As a result of increasing legislation targeting priority waste streams (used tyres, ELV, WEEE and batteries) it is anticipated that arisings of these waste streams are set to increase in the arc21 region up to 2020. There is still uncertainty on how a number of these waste streams will be managed and may require Council support to be achieved (e.g. WEEE).
- 5.178 Just over 60% of Northern Ireland's sewage sludge arisings are managed within the arc21 Region at the Dargan Road sewage sludge incinerator. The quantity of sewage sludge is predicted to increase in the future and provision will need to be made for landfilling around 12,000 tonnes per annum of incinerator residues, assuming Water Service proceeds with its proposals to build a second incineration facility in the arc21 Region.