

West Midlands Regional Assembly – Regional Planning Body

This report has been prepared on behalf of the West Midlands Regional Assembly, the Regional Planning Body, as technical advice to inform the Regional Spatial Strategy Revision process. It is one of a suite of technical reports commissioned to inform the development of spatial policy as part of Phase Two of the Revision of the West Midlands Regional Spatial Strategy.

Every effort has been made to verify and check the contents of this report including all figures and tables. However the West Midlands Regional Assembly can not accept any responsibility for errors or inaccuracies.

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West Midlands Regional Assembly

West Midlands Waste Facilities Phase 2: Future Capacity Requirements



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1. Introduction

- 1.1 The government wishes to see regional strategies developed for meeting likely future demands for waste management and disposal. These strategies should form an integral part of the Regional Spatial Strategies (RSS) prepared by the regional planning bodies (RPBs) for the regional planning areas in England. In the West Midlands Region, the RPB is the West Midlands Regional Assembly (WMRA) which is responsible for producing RSS for the West Midlands. Regional Planning Guidance (RPG) prepared under the former system is at an advanced stage of preparation with the guidance expected to be published in the summer of 2004. It is anticipated that this guidance will be reviewed to produce a Regional Spatial Strategy shortly.
- 1.2 The Regional Technical Advisory Body (RTAB) on Waste has been established in the West Midlands in order to provide advice to the RPB on options for the management of waste within the region. The RTAB published a draft Regional Waste Strategy (RWS) in December 1999. The draft strategy was used to inform the preparation of the RPG chapter on waste. Changes to the draft RWS including the need for a study of waste treatment facilities in the West Midlands are required in response to the Panel report on Draft Regional Planning Guidance and the response to the report from ODPM. This work has been divided into two phases: A study to establish the current situation with respect to the existing capacity of waste treatment facilities in the region which has been commissioned from consultants; and a study to establish the need for additional waste treatment capacity in the light of future changes which derive from known legislative and policy drivers (this study). The outcome of these studies will inform revisions to the RWS and the preparation of the relevant part of the partial review of RSS.

Objectives

- 1.3
- i. Assess the implications of the implementation of known policy instruments and targets (drivers) in terms of the need for additional waste management capacity during the period until 2021;
 - ii. Estimate the additional capacity that needs to be made to recover and dispose of waste in the West Midlands as a consequence of these drivers;
 - iii. Apportion additional capacity requirements by strategic planning authority (WPA).

Data Sources

- 1.4 Information on the generation and management of waste at a regional or sub-regional level varies by waste stream. The sources of information used to compile this report are listed by waste stream in Table 1.1 below:

Table 1.1: Data Sources

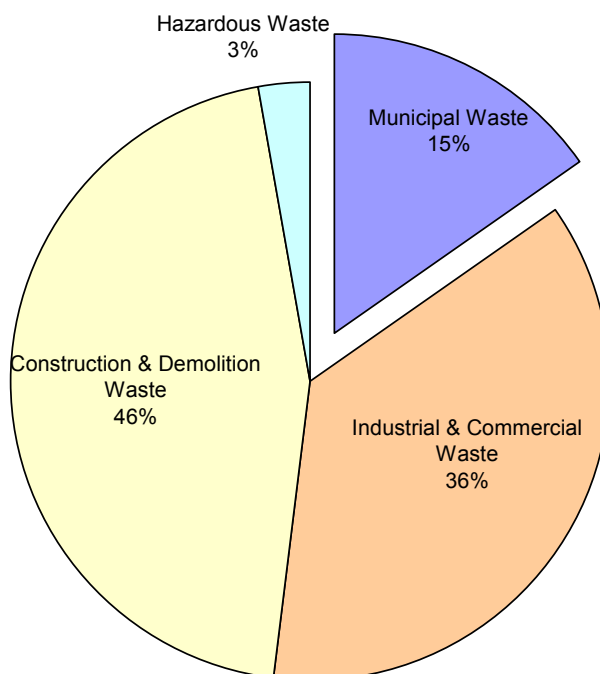
Waste Stream	Date	Source	Comment
Municipal	2002/03	Obtained direct from individual Waste Disposal Authorities in the region	This data is more recent and more accurate than that available from the Environment Agency or DEFRA.
Commercial & Industrial	1998/99	National waste production survey as published in the <i>Strategic Waste Management Assessment</i> (SWMA) for the West Midlands	Data for C&I waste in the SWMA has been modified to exclude Special (Hazardous Waste) for which separate data is available

Waste Stream	Date	Source	Comment
Construction & Demolition	2003	Symonds / ODPM Report:	Regional data in the report has been dis-aggregated to provide data for individual waste planning authorities using a development index.
Hazardous	2002	Environment Agency Special Waste Tracking database (SWaT)	SWaT 2002 data is the most recent available. The assumptions adopted in the projections reflect research commissioned by the Hazardous Waste Forum and the Environment Agency

Existing Situation

- 1.5 Approximately 19 million tonnes of waste were generated in the West Midlands in 2001. Municipal waste, whilst it has attracted a lot of attention from policy makers, represents only about 15% of the total. The remaining waste is generated by business from development (construction & demolition waste) and the operation of industrial and commercial businesses (Industrial, Commercial & Hazardous wastes). The contribution made by each waste stream is illustrated in Figure 1.1 below:

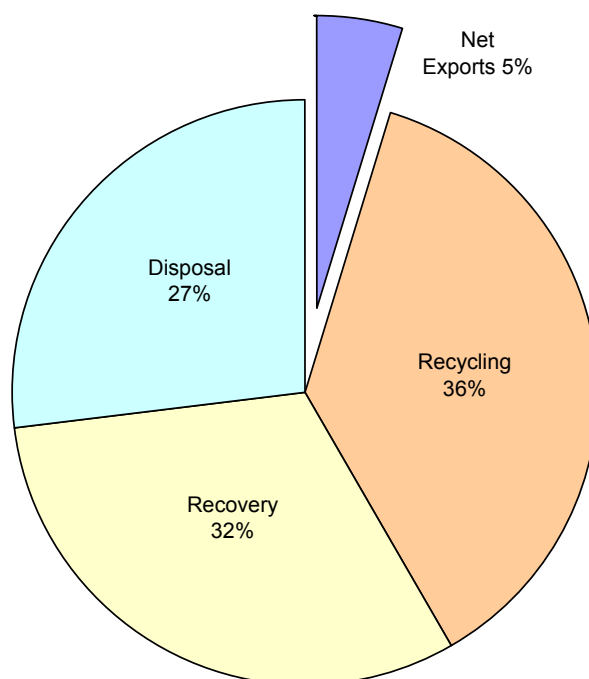
Figure 1.1: Waste Arising 2001



- 1.6 The majority of the waste generated in the region was managed locally. Roughly a third of waste was recycled, a third was subject to other forms of recovery and treatment (including

incineration) and a third was disposed at landfill sites. The way in which this waste was managed in 2001 is illustrated in Figure 1.2 below.

Figure 1.2: Waste Management Performance 2001



Methodology

1.7

- i. Identification of relevant drivers;
- ii. Discussion of the implications of these drivers;
- iii. Quantification of the impact of the implementation of drivers for each main waste stream (municipal; industrial & commercial; construction & demolition; hazardous);
- iv. Prepare list of assumptions for each waste stream. Assumptions are made explicit to enable transparency and were subject to authentication by representatives of the Environmental Services Association and the Environment Agency;
- v. Quantify waste arising for each of the waste streams identified in iii. above by WPA area, test growth rate options (worst case / status quo / best case), identify preferred growth rates and prepare projections. Quantities of waste by characteristics (inert / non-hazardous / hazardous) and appropriate EWC codes to describe the waste type are identified wherever possible;
- vi. Assess options for alternative means of managing the waste affected keeping to basic choices such as diversion from landfill and disposal (consistent with the Landfill Directive and the Waste Hierarchy), although this will vary by waste stream;
- vii. Construct spreadsheets to reflect the above;
- viii. Assess the capacity required by waste stream and management option for each WPA.

1.8

In forecasting waste arisings guidance contained within Annex D and Table 1 of PPG10 dated September 1999, has been taken into account. For forecasting purposes, arisings of waste have been assessed for the following waste types:

- Municipal Waste;
- Industrial / Commercial Waste;
- Construction and Demolition Waste;
- Special (Hazardous) Waste;
- Summary of All Waste Streams.

- 1.9 The report is divided into sections which consider each waste stream in turn indicating the anticipated generation of waste and the assumptions that have been used in forecasting. The same basic categories and layout have been used in each table.
- 1.10 Information with regard to the import and export of waste is given, where available, within the projections for each waste type. However, it should be remembered that there are extensive movements of waste both within and between planning authorities within the region which significantly complicate the process of making provision for waste arisings.

Additional Capacity Required

- 1.11 Some of the waste handled by recycling and recovery processes is rejected or remains for disposal after processing. In using the forecasts of waste arising, and data from the SWMA concerning the current pattern of waste management in each waste stream, an allowance has been made for the additional capacity required to process this waste. In applying data from the SWMA and other sources, it has been assumed that the figures for waste management performance in each waste stream represent the net diversion rather than the quantity of waste handled by each type of waste management process. Residual waste from each process is assumed to have been included in the totals for disposal. The proportion of waste assumed to be diverted by recycling is 80% of throughput for non municipal waste and 90% for municipal waste; the proportion of waste assumed to be diverted by recovery processes is 70% of throughput for Industrial & Commercial and Hazardous waste and 95% of throughput for Municipal waste. The proportion of waste assumed to be diverted by the recovery of construction and demolition waste on exempt sites is 100%.

Existing Capacity

- 1.12 The only source of comprehensive information on the capacity of waste management facilities is the EA data on *licensed* capacity and deposits at licensed facilities in 2000/01. A study commissioned by the WMRA on the existing capacity of waste management facilities¹ (the *Capacity Survey*) encountered difficulties in collecting and interpreting such data, but provides a valuable perspective on the capacity available for managing waste in the Region. Where the quantity of existing capacity is unclear, this study has adopted a 'worst case scenario' by using the EA data on waste deposits or throughput as a baseline. This approach does not take account of licensed capacity which was under used in 2001 and there may therefore be existing spare capacity at some facilities which is available to meet the shortfall identified.

Draft Regional Waste Strategy

- 1.13 The draft Regional Waste Strategy (RWS) which was published in December 1999 included an analysis of existing waste management practices which was based on information from the Environment Agency (SWMA 1998/99). The RWS also included an assessment of future waste management capacity needs for municipal waste and disposal capacity requirements for other waste streams. The projections which informed these assessments were based mainly on data taken from the SWMA. Since 1999, more recent data has become available and the current study involves the application of a more sophisticated methodology and different growth assumptions. The results from this study therefore differ from those in the RWS. These differences are highlighted, where appropriate, in the commentary on each waste stream below. As explained in paragraph 1.2 above, the outcome of this study and other related work will inform revisions to the RWS and the preparation of the relevant part of the partial review of RSS.

¹ Final Report on West Midlands Waste Treatment Capacity Survey, Golder Associates/ MEL for RTAB, September 2004

2. Municipal Waste

- 2.1 Municipal waste includes all waste under the control of local authorities or agents acting on their behalf. It includes all household waste, street litter, waste delivered to council recycling points, municipal parks and garden wastes, council office waste, civic amenity site waste, and some commercial waste from shops and smaller trading estates where local authority waste collection agreements are in place. Household waste includes waste from household collection rounds, bulky waste collection, hazardous household waste collection and separate garden waste collection, plus waste from services such as street sweeping, litter and civic amenity sites. The definition also covers waste from schools. (See Waste Strategy 2000, Part 2, Para 2.2). Municipal waste, included fractions which are separately collected, is classified in the European Waste Catalogue as Code 20. Municipal waste is generally considered to be non-hazardous, but can include hazardous materials. Only hazardous materials which are separately collected (e.g. paint and garden chemicals) require consignment and management as hazardous waste.
- 2.2 Local authorities have a duty to provide waste collection facilities for commercial users, and these too are counted as municipal waste arisings. This could include industrial and commercial waste and also waste arising from facilities such as nursing and residential homes for the elderly. In the West Midlands, the quantity of commercial waste collected by local authorities generally represents only a small percentage of the total quantity of municipal waste collected.
- 2.3 In addition to the waste collected directly by the authorities, waste which would otherwise have been part of the normal household waste stream may be collected for recycling by other bodies. This could be commercial companies, but is more commonly carried out by voluntary groups or charity shops. Where this waste has been diverted from the municipal waste stream it may qualify for recycling credits paid by Waste Disposal Authorities in lieu of disposal costs.
- 2.4 Municipal waste is one of the few waste streams where current, accurate data is available about the collection, movement and disposal of waste. Trend data is also available, which helps to establish patterns in the recent management of this waste stream.

Policy Drivers

- 2.5 Notwithstanding the fact that it represents only a small proportion of the total amount of waste, Municipal waste is the subject of a large number of policy drivers and targets which have been set as part of European and National policy. These drivers are identified in the table below:

Table 2.1: Municipal Waste Policy Drivers

Date	Action	Effect
Landfill Directive (99/31/EEC)		
July 2004	End to co-disposal of hazardous and non-hazardous waste in landfill.	Whilst the availability of disposal capacity will be limited and costs for hazardous waste treatment and disposal will rise, this will have a limited effect on municipal waste other than separately collected 'household hazardous waste'.

Date	Action	Effect
July 2005	Application of Waste Acceptance Criteria (WAC) requiring pre-treatment of waste to reduce quantity and hazard prior to landfill.	Non-hazardous waste including municipal waste will require pre-treatment to meet the requirements of WAC for non-hazardous landfill sites. However, the definition of 'treatment' includes separation of part of the municipal stream for recycling. Residual collected municipal waste will therefore meet the WAC.
2010-2020	Reduce Biodegradable Municipal Waste (BMW) to: <ul style="list-style-type: none"> • 75% of 1995 level by 2010; • 50% of 1995 level by 2013; • 35% of 1995 level by 2020. 	To meet the Directive requirements, the UK will need to limit the use of landfill to ensure that no more than the allowed amount of BMW is landfilled by the target dates. Action will also be needed to establish alternatives to landfill to deal with the diverted waste.
National Waste Strategy		
2005 - 2015	<ul style="list-style-type: none"> • Recover value from at least 40% & recycle at least 25% by 2005 • Recover value from at least 45% & recycle at least 30% by 2010 • Recover value from at least 67% & recycle at least 33% by 2015 	These targets are likely to be achieved through the interim application of 'Best Value' performance targets.
Best Value		
2003	<ul style="list-style-type: none"> • Local authorities to recycle & compost materials to meet individual Best Value targets. 	Combined target for England is 17%
2005	<ul style="list-style-type: none"> • Local authorities to recycle & compost materials to meet individual Best Value targets. 	Combined target for England is 25%
Hazardous Waste Regulations		
2004/5	Increase in the amount of waste classified as hazardous.	Changes to the definition of household waste will restrict the quantity of collected material which can be classed as household. Non-household material (e.g. trade waste) will need to be managed in the same way as waste collected by commercial companies. The quantity of separately collected household hazardous waste requiring treatment is likely to increase.
Producer responsibility legislation [End of life Vehicles (ELVs; 2000/53/EC) and Waste Electrical and Electronic Equipment (WEEE; 2002/96/EC) Directives]		
2003 to 2006	Promote the recovery of waste from ELVs and WEEE.	Diversion of ELVs and WEEE which are collected as part of the municipal waste stream.

Assumptions

2.6 Annexes 1-13 indicate the projected arisings of municipal waste (household collection plus civic amenity (CA) site wastes, and an element of non-domestic arisings) over the period 2001 – 2021 for each WPA. In preparing the forecast, the following assumptions have been made:

- **Municipal Waste Arising:** The waste arisings indicated in the table for the years from 2003 (the latest year for which data is available) have been calculated on the assumption that current levels of growth will reduce to a level consistent with the household growth rate. It has also been assumed that projected rates of household growth will reflect targets and allocations for new dwellings set out in RPG (see 2.7 below);
- **Biodegradable Waste Arising:** The projections assume 68% of municipal waste is biodegradable (for consistency with the Waste and Emissions Trading Bill);
- **Non-biodegradable Waste Arising:** Calculated by deducting biodegradable waste arising from municipal waste arising;
- No imports or exports have been identified for this waste stream. The projections therefore illustrate the capacity required to manage waste generated in each area;
- **Waste composted:** actual data where available, followed by incremental increases to 50% of recycling targets by 2010. Composted waste is assumed to be 100% biodegradable;
- **Waste recycled:** actual data where available, increased to reach 50% of recycling targets by 2010. Recycled waste is assumed to be 50% biodegradable;
- **Waste recycled and composted:** The projections assume that the targets for recycling and recovery set out in “Waste Strategy 2000” and that Best Value performance standards, along with any ‘stretch targets’ that apply following a Public Service Agreement between individual local authorities and central Government will be met; The projections assume that the Landfill Directive targets for biodegradable municipal waste will be met;
- **Recycling rate:** waste recycled and composted as a % of municipal waste arising, in later years target recycling rates based on Best Value performance targets or national targets;
- **Biodegradable residual for recovery & landfill:** biodegradable waste arising less waste composted and 50% of waste recycled;
- **Non-biodegradable residual for recovery & landfill:** non biodegradable waste less 50% of the waste recycled;
- **Landfill Directive limit on biodegradable landfill:** Targets taken from provisional LATS allowances prepared by DEFRA in July 2004;
- **Biodegradable residual needing recovery:** biodegradable residual for recovery & landfill less the landfill directive limit on biodegradable municipal waste;
- **Incinerated:** Where incineration plus recycling and composting (recovery) performance exceeds 85%, tonnage incinerated is reduced by the same % that recycling & composting increases (to avoid unrealistic rates of diversion from landfill);
- **Biodegradable Waste Incinerated:** assumed to be 56% of waste incinerated;
- **Non Biodegradable Waste Incinerated:** assumed to be 44% of waste incinerated;
- **Recovery Rate:** waste recycled + waste incinerated + additional recovery required, as a % of municipal waste arising;
- **Target Recovery Rate:** as set out in national policy guidance;
- **Additional Recovery required to meet target:** biodegradable waste requiring recovery less biodegradable waste incinerated; No specific technology is assumed to deliver additional recovery capacity requirements;
- **Municipal Waste landfilled:** municipal waste arising, less waste recycled, composted and incinerated + additional recovery capacity required;
- **Cumulative landfill void capacity required:** sum of annual landfill capacity requirement over the period.

Future Waste Arising

2.7 The quantity of Municipal waste arising (EWC Code: 20) has been growing at an average annual rate of 3% in the UK, although the rate has been higher for some authorities in the West Midlands. The options for future growth are therefore as follows:

1. Continuing growth at an average annual rate of 3% for the period 2004–2021 (worst case);
2. Current growth reduces to match policy driven household growth rates for each WPA;
3. Current growth reduces to projected household growth in the medium term, followed by zero growth in the longer term (best case).

It is clear from annual DEFRA returns that the growth of household waste is reducing, perhaps in response to greater awareness amongst householders and waste minimisation measures by local authorities. Continued growth at a compound rate of 3% (the worst case) is therefore considered unrealistic. Whilst rates of growth are slowing, an immediate reduction from an average annual regional growth rate of 2.8% (2001-2003) to the average annual household growth rate (range 0.5 -1.2%), followed by zero growth thereafter (the best case) is also considered unrealistic. The preferred growth rate option therefore assumes that current levels of annual growth will reduce to a level consistent with the household growth rate by 2007, to reflect greater emphasis on waste minimisation and the completion of the introduction of new waste collection systems which may inflate the quantity of municipal waste collected. For the period 2004-2007, the annual growth in municipal waste arising for each WPA has therefore been assumed to be the household growth rate (2000-2007) plus 1%. For the periods 2007-2011 and 2011-2021, it has been assumed that projected rates of household growth will reflect targets and allocations for new dwellings set out in RPG, adjusted to take account of demolitions and vacancy rates for each WPA area.

2.8 Using the preferred growth assumption, Table 2.2 illustrates the quantity of municipal waste which will be generated in each WPA area and the West Midlands region over the period 2001 – 2021:

Table 2.2: Cumulative Quantity of Municipal Waste Generated 2001-2021 ('000 tonnes)

Waste Planning Authority	Municipal Waste
Birmingham	11,425
Coventry	3,599
Dudley	3,071
Herefordshire	1,899
Sandwell	3,248
Shropshire	3,776
Solihull	1,924
Staffordshire	10,592
Stoke on Trent	2,960
Telford & Wrekin	2,162
Walsall	3,547
Warwickshire	6,253
Wolverhampton	3,196
Worcestershire	6,425
Metropolitan area	30,010
Shire area	34,067
West Midlands Region	64,077

Future Waste Management

- 2.9 As indicated in paragraph 2.6 above, the projections in Annexes 1-16 assume that short term Best Value and longer term national targets for recycling and composting will be met and that additional recovery of municipal waste will take place in order to meet the requirements of the Landfill Directive for the diversion of biodegradable waste away from landfill. The projections identify the annual capacity which will be required to meet these various targets and the landfill capacity needed for the disposal of residual waste, these are summarised in the tables below. No specific technology has been assumed to provide the means by which additional material is recovered from municipal waste since such decisions will be made by individual Waste Disposal Authorities to reflect the local context. Where the need for additional recovery is identified, this could be met through additional recycling, composting, energy recovery or other forms of treatment, or combinations of these technologies.
- 2.10 The capacity needed to manage municipal waste in each WPA area during the period is shown in Table 2.2 below:

Table 2.3: Indicative minimum annual throughput capacity required to recycle or compost municipal waste 2001- 2021 ('000 tonnes)

Waste Planning Authority	Capacity 2001 ²	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Birmingham	5	129	191	215	219
Coventry	1	35	60	68	70
Dudley	1	30	51	58	60
Herefordshire	0	26	32	36	38
Sandwell	1	32	54	61	63
Shropshire	34	48	61	67	79
Solihull	5	19	32	36	37
Staffordshire	34	136	179	201	205
Stoke on Trent	0	41	50	55	55
Telford & Wrekin	0	24	36	41	43
Walsall	1	44	59	69	73
Warwickshire	14	75	104	117	119
Wolverhampton	3	31	53	60	63
Worcestershire	10	80	108	121	124
Metropolitan area	17	320	500	567	585
Shire area	92	430	570	638	663
West Midlands Region	109	750	1,070	1,205	1,248

² Deposits at licensed Materials Recycling Facilities 2001 and capacity at exempt composting facilities 2002

Table 2.4: Indicative Minimum Annual Throughput Capacity Required to treat or recover municipal waste 2001- 2021 ('000 tonnes)

Waste Planning Authority	Capacity 2001 ³	Annual Capacity required by 2005	Annual Capacity required by 2010	Annual Capacity required by 2015	Annual Capacity required by 2021
Birmingham	400	366	334	324	324
Coventry	190	114	90	88	88
Dudley	95	94	89	87	87
Herefordshire	0	13	15	35	37
Sandwell	0	37	36	60	62
Shropshire	0	30	32	74	68
Solihull	0	62	55	54	54
Staffordshire	0	132	132	196	204
Stoke on Trent	200	91	87	82	82
Telford & Wrekin	0	20	17	40	42
Walsall	0	28	36	68	72
Warwickshire	0	58	49	114	116
Wolverhampton	105	106	96	93	93
Worcestershire	0	56	51	118	121
Metropolitan area	790	807	736	774	780
Shire area	200	400	383	659	670
West Midlands Region	990	1,207	1,119	1,433	1,450

Table 2.5: Indicative Minimum Cumulative Landfill Capacity Required to dispose of municipal waste 2001- 2021 ('000 tonnes)

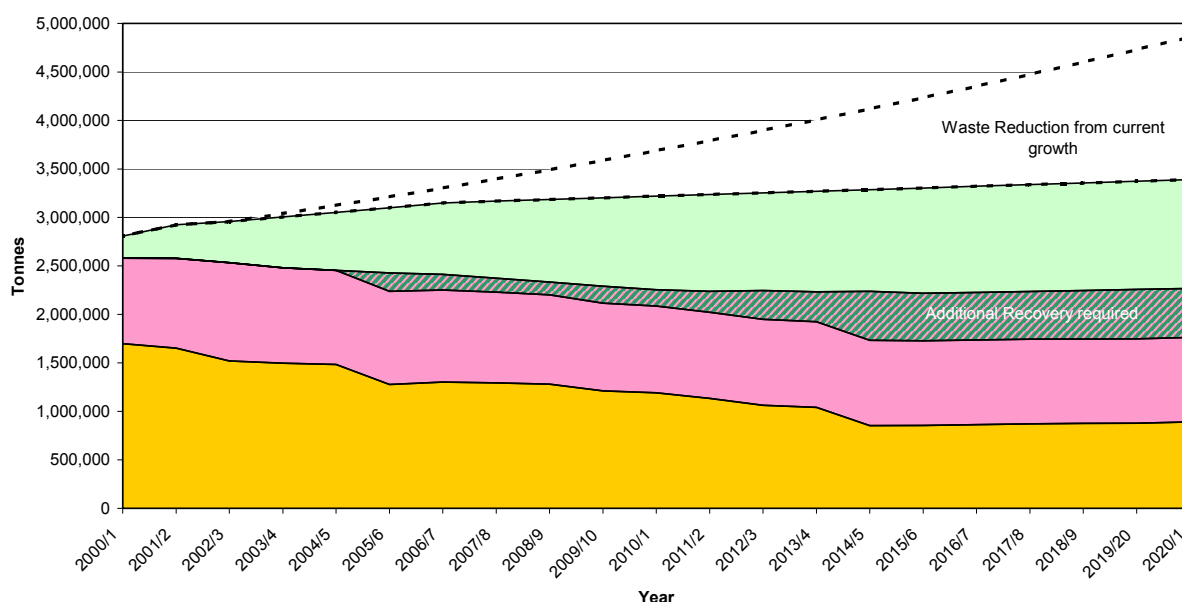
Waste Planning Authority	Cumulative Capacity required by 2005	Cumulative Capacity required by 2010	Cumulative Capacity required by 2015	Cumulative Capacity required by 2021
Birmingham	519	955	1,375	1,823
Coventry	219	432	635	850
Dudley	164	294	411	540
Herefordshire	331	604	818	985
Sandwell	541	980	1,295	1,573
Shropshire	698	1,239	1,652	1,982
Solihull	115	195	271	353
Staffordshire	1,311	2,604	3,609	4,506
Stoke on Trent	111	228	340	453
Telford & Wrekin	407	716	949	1,139
Walsall	590	1,082	1,446	1,769
Warwickshire	1,112	2,017	2,679	3,210
Wolverhampton	154	268	377	499
Worcestershire	1,160	2,091	2,794	3,346
Metropolitan area	2,302	4,206	5,810	7,407
Shire area	5,130	9,499	12,841	15,621
West Midlands Region	7,432	13,705	18,651	23,028

³ Environment Agency: Municipal Incinerator Capacity 2001

Commentary

- 2.11 The quantity of municipal waste in the region is projected to grow by about 16% over the period 2001 – 2021. This represents an average annual growth rate of only 0.8%, and assumes a substantial reduction from current growth rates. Although curtailing waste growth will help, substantial improvements in recycling and recovery performance will also be required if local authorities in the region are to achieve Government targets for the diversion of biodegradable municipal waste (BMW) away from landfill. The draft apportionment of targets for the diversion of biodegradable waste (under the Landfill Allowance Trading Scheme [LATS]) appears to favour authorities with existing municipal waste incinerators. These authorities will therefore have surplus credits to sell to lower performing authorities. Existing trends such as improved recycling performance amongst authorities with municipal waste incinerators freeing up recovery capacity which is then made available to neighbouring authorities are also likely to continue. These factors have the potential to improve overall regional performance on municipal waste management.

**Figure 2.1: Projected Municipal Waste Management Performance
West Midlands Region 2001-2021**



- 2.12 A comparison of the indicative capacity requirements illustrated in Tables 2.2 – 2.5 above with equivalent tables in Chapter 5 of the RWS is not possible because of differences in the methodology applied, in particular, the allowance for net capacity described in paragraph 1.9. Municipal waste is also subject to a number of new performance targets which were not introduced until after the RWS was published.
- 2.13 Comparing 2005/06 provisional landfill trading allowances against the quantity of biodegradable waste which was landfilled in 2002/03 reveals that a small number of authorities (Coventry, Telford & Wolverhampton) will need to increase BMW diversion rates in the next few years to avoid having to purchase credits. Comparing capacity data for 2001 with target performance for 2021 reveals that the recycling capacity required will need to increase eleven fold across the region as a whole. It is important to highlight that existing recycling performance (i.e. the amount of waste which is separated for recycling) is not the same as existing capacity. In 2001 much of the handling of recyclates and recycling activity for Municipal waste, for example at materials recycling facilities or reprocessors, took place outside the region and this trend may continue. A comparison of future capacity requirements

against 2003 performance in the region suggests that capacity will still need to increase by about 40% by 2005 and by as much as 135% by 2021 to meet Government targets. Using available capacity in 2001 as a base, the additional capacity required equates to 26 additional facilities being required by 2005 and 46 additional facilities being required by 2021. The need for additional capacity is divided fairly equally between metropolitan and shire areas. Further work will be required to establish the most appropriate geographical pattern of new facilities to serve the region's needs. These requirements are illustrated in Table 2.6 and Figure 2.1 below.

Table 2.6: Additional capacity and facilities required to recycle or compost municipal waste by 2005 and 2021 ('000 tonnes)

Waste Planning Authority	Capacity 2001 ⁴	Additional capacity required by 2005	Equivalent No. Facilities @25ktpa	Additional capacity required by 2021 ⁵	Equivalent No. Facilities @25ktpa
Birmingham	5	124	5	214	9
Coventry	1	34	1	69	3
Dudley	1	29	1	59	2
Herefordshire	0	26	1	38	2
Sandwell	1	31	1	62	2
Shropshire	34	14	1	45	2
Solihull	5	14	1	32	1
Staffordshire	34	102	4	171	7
Stoke on Trent	0	41	2	55	2
Telford & Wrekin	0	24	1	43	2
Walsall	1	43	2	72	3
Warwickshire	14	61	2	105	4
Wolverhampton	3	28	1	60	2
Worcestershire	10	70	3	114	5
Metropolitan area	17	303	12	568	23
Shire area	92	338	14	571	23
West Midlands Region	109	641	26	1,139	46

- 2.14 With respect to municipal waste recovery, despite substantial existing capacity and surplus capacity in some areas, a 46% increase in existing capacity will be needed to meet projected requirements for 2021. Additional recovery capacity could be achieved through recycling & composting, additional incineration or a combination of processes. New recovery processes such as mechanical biological treatment (MBT) and anaerobic digestion may also play a role. The additional capacity required equates to 1 new incinerator or 9 new recycling facilities by 2005 and 2 new incinerators or 19 new recycling facilities by 2021. Very little new capacity is required in metropolitan areas, reflecting existing incinerator capacity. Most of the additional capacity is therefore needed in the shire area. These requirements are illustrated in Table 2.7 and Figure 2.1 below. Further work will be required to establish the most appropriate geographical pattern of new facilities to serve the region's needs.
- 2.15 Even taking into account these significant performance improvements, approximately 1 million tonnes of landfill capacity will be required every year for the disposal of municipal waste, amounting to about 25 million tonnes capacity over the period 2001 – 2021. The need for non-hazardous waste disposal capacity for municipal waste is addressed in Chapter 6.

⁴ Deposits at licensed Materials Recycling Facilities 2001 and capacity at exempt composting facilities 2002

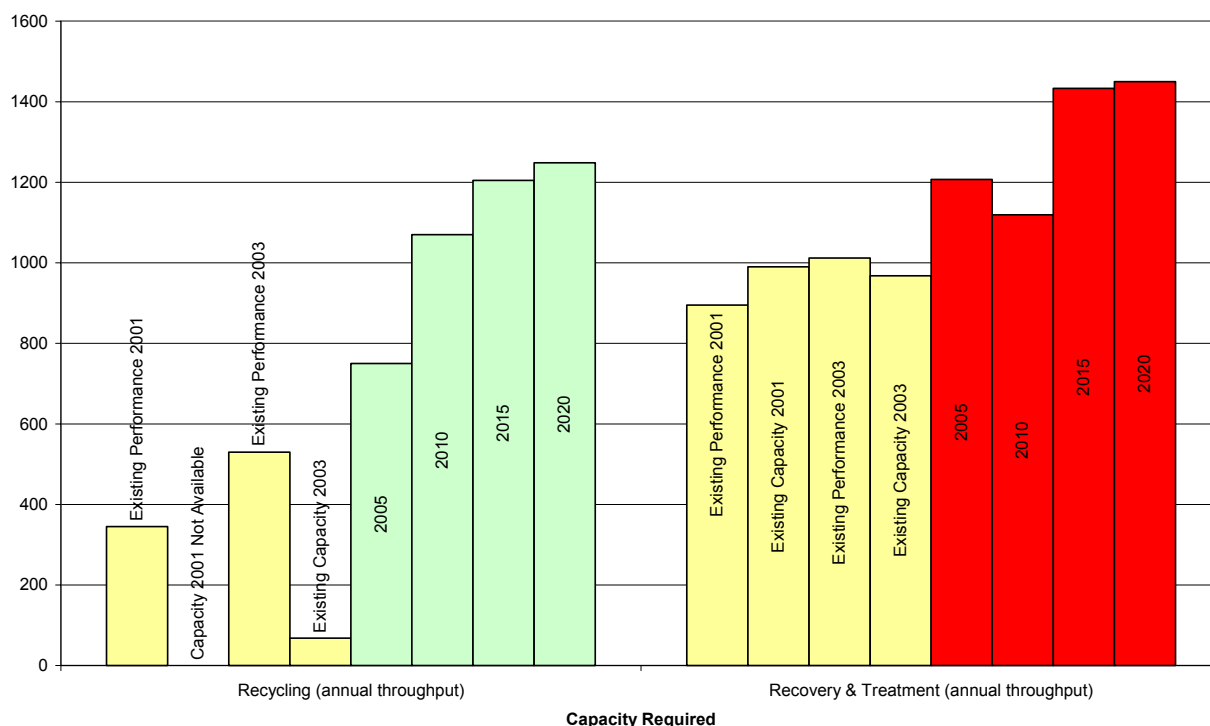
⁵ The figures represent the capacity which is required by 2021 over and above that existing at 2001

Table 2.7: Additional capacity and facilities required to treat / recover municipal waste by 2005 and 2021 ('000 tonnes)

Waste Planning Authority	Capacity 2001 ⁶	Additional capacity required by 2005	Equivalent No. Facilities @250ktpa	Equivalent No. Facilities @25ktpa	Additional capacity required by 2021 ⁷	Equivalent No. Facilities @250ktpa	Equivalent No. Facilities @25ktpa
Birmingham	400	-34	0	-1	-19	0	-1
Coventry	190	-76	0	-3	-147	-1	-6
Dudley	95	-1	0	0	-3	0	0
Herefordshire	0	13	0	1	37	0	2
Sandwell	0	37	0	2	62	0	3
Shropshire	0	30	0	1	68	0	3
Solihull	0	62	0	3	54	0	2
Staffordshire	0	132	1	5	204	1	8
Stoke on Trent	200	-109	0	-4	-113	-1	-5
Telford & Wrekin	0	20	0	1	42	0	2
Walsall	0	28	0	1	72	0	3
Warwickshire	0	58	0	2	116	1	5
Wolverhampton	105	1	0	0	-12	0	-1
Worcestershire	0	56	0	2	121	1	5
Metropolitan area	790	17	0	1	7	0	0
Shire area	200	200	1	8	475	2	19
West Midlands Region	990	217	1	9	482	2	19

NB: Negative values indicate a surplus

Figure 2.2: Additional Capacity Recycling and Recovery Capacity Required 2001-2021 ('000 tonnes)



⁶ Environment Agency: Municipal Incinerator Capacity 2001

⁷ The figures represent the capacity which is required by 2021 over and above that existing at 2001

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3. Industrial and Commercial Waste

- 3.1 For the purposes of this report, industrial and commercial waste is the waste produced by businesses, excluding those potentially more harmful wastes classified as hazardous waste, arisings from general demolition and construction activity and the relatively small proportion of such waste which is collected by local authorities and classed as municipal waste. Industrial and commercial waste ranges from packaging wastes such as paper and card, through discarded food from catering or food processing, through chemical, mineral and other waste which are produced as residues from manufacturing, to plant and machinery which has reached the end of its working life and becomes scrap. Changes to national waste legislation will shortly result in the inclusion of non-natural agricultural waste and non-mineral mines & quarries waste being re-classified as 'controlled waste'. These wastes are likely in future to be classed as industrial and commercial waste. In the UK as a whole, non-natural agricultural waste amounted to 0.5 million tonnes in 1998. In the West Midlands region it amounted to 35,000 tonnes in 1998 (EA 2002). A recent survey (Atkins 2002) on behalf of the Environment Agency was unable to assemble sufficient data to quantify the types and management methods for non-mineral wastes produced by the UK mineral industry. However, the Atkins study concludes that the majority of non-mineral wastes are already dealt with off-site via contract arrangements with the waste management industry, suggesting that the re-classification of these wastes will have little impact. In the context of the quantities of other industrial and commercial waste, the quantities of these types of waste are small and are not expected to result in any significant growth in the overall size of this waste stream.
- 3.2 Generally, businesses are expected to make their own arrangements for the collection, treatment and disposal of their wastes. Waste from smaller shops and trading estates where local authority waste collection agreements are in place will generally be treated as municipal waste. In general terms the following classifications are applied:
- Commercial waste – waste arising from wholesalers, catering establishments, retail premises and offices;
 - Industrial waste – waste arising from factories and industrial plants.
- 3.3 In statistical terms, waste is defined by its attributes using codes in the European Waste Catalogue (EWC) source, and by its source using Standard Industrial Classification (SIC) codes. In this document the definitions of Industrial and Commercial waste have been taken from the Environment Agency's SWMA unless otherwise stated.

Policy Drivers

- 3.4 Industrial & Commercial waste is the subject of a large number of policy drivers and targets which have been set as part of European and National policy. These drivers are identified in the table below:

Table 3.1: Industrial & Commercial Waste Policy Drivers

Date	Action	Effect
Landfill Directive (99/31/EEC)		
July 2004	End to co-disposal of hazardous and non-hazardous waste in landfill.	The future availability of disposal capacity is likely to be more limited and costs for waste disposal will rise, this will result in financial pressures to divert more non-hazardous commercial & industrial waste away from landfill.

Date	Action	Effect
July 2005	Application of Waste Acceptance Criteria (WAC) requiring pre-treatment of waste to reduce quantity and hazard prior to landfill.	Non-hazardous waste will require pre-treatment to meet the requirements of WAC for non-hazardous landfill sites. However, interpretation of the definition of 'treatment' includes separation of part of the stream for recycling, allowing residual collected waste to meet the WAC.
National Waste Strategy		
2005	Reduce quantity of waste landfilled to 85% of that landfilled in 1998.	Depending on waste growth, more material will need to be diverted away from landfill sites.
Hazardous Waste Regulations		
2004/5	Increase in the amount of waste classified as hazardous.	Changes to the definition of hazardous waste will increase the quantity of existing commercial & industrial waste which is classed as hazardous. The quantity of non-hazardous waste may therefore decrease.
Producer responsibility legislation [End of life Vehicles (ELVs; 2000/53/EC) and Waste Electrical and Electronic Equipment (WEEE; 2002/96/EC) Directives]		
2003 to 2006	Promote the recovery of waste from ELVs and WEEE.	Producers of ELVs and WEEE will need to make arrangements for the collection and recovery of materials to meet the Directive requirements.
Agricultural Waste Regulations and Mines & Quarries Waste		
2004 to 2005	Non-natural agricultural and non-mineral mining & quarrying wastes will become subject to waste management controls	The quantity of industrial and commercial waste will be increased. Producers of these wastes will need to make arrangements for the collection and recovery of materials to meet regulatory requirements.

Assumptions

3.5 Annexes 1-13 indicate the projected arisings of commercial & industrial waste in each WPA area over the period 2001 - 2021. In preparing the forecast, the following assumptions have been made:

- **Projected Future Generation:** taken from SWMA, Annex 2 Table 4, less Special Waste arising (see preferred growth option in paragraph 3.8);
- The waste arisings indicated in the table for the years from 1998/99 (the latest year for which data is available) have been calculated on the assumption that waste minimisation efforts; the impact of the Landfill Tax; Pre-Treatment requirements and the impact of the Hazardous Waste Regulations will result in a progressive reduction in waste arising of 0.5% per annum from the 1998 base data until 2005 and 1% per annum from the implementation of the landfill regulations in July 2005 until 2010. After 2010 the quantity of waste arising is assumed to remain static;
- **Predicted Re-use:** taken from SWMA, Annex 2 Table 4, less management of Special waste; assumed to increase at 0.5% per annum before levelling off when a recycling rate of 50% is achieved;
- **Waste Imported:** projected assuming that 1998-99 imports in SWMA remain unchanged, less Special Waste movements in 1998;

- **Waste Exported:** projected assuming that 1998-99 imports in SWMA remain unchanged, less Special Waste movements in 1998;
- **Recycling - Annual capacity required:** Assumes that 'reduction achieved' represents 80% diversion of throughput;
- **Recycling - reduction achieved:** taken from SWMA, Annex 2 Table 4, less management of Special waste; Projection increases base figure by between 0.5 and 1% per annum before levelling off at a maximum diversion from landfill through recycling and other recovery of 80%;
- **Recycling performance:** waste recycled and composted as a % of annual waste management requirement;
- **Other Recovery - Annual Capacity Required:** Assumes that 'reduction achieved' represents 70% diversion of throughput;
- **Other Recovery - reduction achieved:** taken from SWMA, Annex 2 Table 4, less management of Special waste; Projection increases base figure by between 0.5 and 1% per annum before levelling off at a maximum diversion from landfill through recycling and other recovery of 80%; Other recovery is assumed to comprise: Thermal recovery; Land recovery and Treatment; No specific technology is assumed to deliver additional recycling or recovery capacity requirements;
- **Other recovery performance:** waste recovered as a % of annual waste management requirement;
- **Landfill Disposal:** taken from SWMA, Table 2.5, assumed to be land disposal + 90% of unrecorded waste + a proportion of the waste transferred consistent with the overall proportion disposed / recovered;
- **Landfill Target:** National Waste Strategy: by 2005, reduce landfilling to 85% of commercial & industrial waste landfilled in 1998/9;
- **Landfill Disposal - Cumulative Capacity Required:** sum of annual landfill capacity requirement over the period.

Future Waste Arising

- 3.6 Data for the generation of industrial and commercial waste is derived from the 1998/99 data in the SWMA. The SWMA data has been modified to delete hazardous (Special) waste, using information from the Environment Agency's SWaT 1998 database.
- 3.7 In projecting the management of waste, the options for future growth are considered to be as follows:
1. In the absence of trend data, assume no growth or reduction from 1998-99 data (worst case);
 2. Assume that the combined impact of the policy drivers summarised in Table 3.1 will result in a progressive reduction in waste arising of 0.5% per annum from 1998 until 2005 and 1% per annum from the implementation of the landfill regulations in July 2005. Since it is unrealistic to assume that compound waste reduction will continue indefinitely, it is assumed that reduction at 1% will only continue until 2010 (preferred option);
 3. Assume that the combined impact of policy and taxation drivers will result in significant increases in resource efficiency, reducing waste arisings by 1% per annum from the 1998 base data until 2005 and 2% per annum from the implementation of the landfill regulations in July 2005 until 2015 (best case);
- 3.8 The limited availability of waste treatment facilities and increasing landfill disposal costs seem certain to prompt most businesses to reconsider their waste management arrangements. This suggests that assuming no change in the quantities of waste generated (the worst case) is unrealistic. However, a sustained and dramatic improvement in resource efficiency (the best case) is also considered unlikely in the context of the limited awareness of the likely impact of policy and taxation drivers amongst the business community (particularly SME's) in the

region. It has therefore been assumed that the most realistic option is to assume that these drivers will prompt a progressive reduction in waste arising of 0.5% per annum from the 1998 base data until 2005 and 1% per annum from the implementation of the landfill regulations in July 2005 until 2010.

- 3.9 Using the preferred growth option, Table 3.2 illustrates the projected cumulative quantity of Industrial and commercial waste which will be generated in each WPA area and the West Midlands region over the period 2001 – 2021:

Table 3.2: Projected Cumulative Quantity of Industrial & Commercial Waste Generated 2001-2021 ('000 tonnes)

Waste Planning Authority	Industrial & Commercial Waste 2001 - 2021
Birmingham	19,885
Coventry	6,997
Dudley	7,327
Herefordshire	3,121
Sandwell	10,470
Shropshire	6,841
Solihull	3,159
Staffordshire & Stoke on Trent	28,087
Telford & Wrekin	6,430
Walsall	7,157
Warwickshire	11,429
Wolverhampton	5,842
Worcestershire	14,326
Metropolitan area	60,837
Shire area	70,234
West Midlands Region	131,071

Future Waste Management

- 3.10 In the context of the combined impact of the policy drivers summarised in Table 3.1 above, the projections assume that re-use and recycling will increase slowly before levelling off at 50% and that other treatment and recovery will increase slowly to level off at 25% in order to reflect pre-treatment requirements and increased waste management costs. This change is assumed to be sufficient to meet the Landfill Target in the National Waste Strategy. The projections identify the annual capacity which will be required to meet the combined impact of these various targets and the landfill capacity needed for the disposal of residual waste, and these are summarised in the tables below. No specific technology has been assumed to provide the means by which additional material is recovered from industrial & commercial waste since the technologies available will be subject to commercial decisions. Where the need for additional recovery is identified, this could be met through additional recycling, composting, energy recovery or other forms of treatment, or combinations of these technologies. Whilst a proportion of the additional recycling or recovery capacity is likely to be met through merchant capacity associated with new municipal waste management infrastructure, this is unlikely to be sufficient to meet market demand.
- 3.11 The capacity needed to manage industrial & commercial waste in each WPA area during the period is shown in Table 3.3 below:

Table 3.3: Indicative Additional Capacity Required to Recycle and Recover Industrial & Commercial Waste 2005 & 2021 ('000 tonnes)

Waste Planning Authority	Existing Capacity 2001 ⁸	Annual Capacity required by 2005	Annual Capacity required by 2010	Annual Capacity required by 2015	Annual Capacity required by 2021
Birmingham	575	765	790	829	872
Coventry	72	329	338	347	355
Dudley	182	368	368	368	368
Herefordshire	10	28	28	29	31
Sandwell	592	360	369	378	388
Shropshire	40	214	220	226	232
Solihull	1	120	124	127	130
Staffordshire & Stoke on Trent	220	736	754	773	792
Telford & Wrekin	0	217	222	228	233
Walsall	263	264	270	277	284
Warwickshire	207	413	424	435	446
Wolverhampton	31	219	225	231	237
Worcestershire	93	222	228	234	239
Metropolitan area	1,716	2,425	2,484	2,557	2,634
Shire area	570	1,830	1,876	1,925	1,973
West Midlands Region	2,286	4,255	4,360	4,482	4,607

Table 3.4: Indicative Minimum Cumulative Landfill Capacity Required to Dispose of Industrial & Commercial waste 2001- 2021 ('000 tonnes)

Waste Planning Authority	Cumulative Capacity required by 2001-2005	Cumulative Capacity required by 2001-2010	Cumulative Capacity required by 2001-2015	Cumulative Capacity required by 2001-2021
Birmingham	2,091	3,837	5,384	6,768
Coventry	633	1,217	1,770	2,291
Dudley	376	716	1,056	1,396
Herefordshire	104	161	203	238
Sandwell	1,225	2,261	3,225	4,149
Shropshire	749	1,377	1,963	2,526
Solihull	320	583	822	1,049
Staffordshire & Stoke on Trent	2,941	5,406	7,708	9,929
Telford & Wrekin	598	1,082	1,525	1,944
Walsall	811	1,494	2,128	2,734
Warwickshire	2,102	3,969	5,759	7,506
Wolverhampton	579	1,056	1,494	1,910
Worcestershire	697	1,158	1,527	1,847
Metropolitan area	6,035	11,164	15,879	20,297
Shire area	7,191	13,153	18,685	23,990
West Midlands Region	13,226	24,317	34,564	44,287

⁸ Environment Agency: Industrial & Commercial waste deposits at open gate MRS, Physico-Chemical, Biological & Incineration facilities 2001

Commentary

- 3.12 The most recent data on the quantity of Industrial & Commercial waste dates from 1998. Whilst an updated national waste generation survey is planned, no trend data is available to chart patterns of waste growth for this stream. On the basis of the preferred growth option described in paragraph 3.8 above, the quantity of Industrial & Commercial waste is projected to fall by 7% over the period to 2021. Assessments of the quantity of existing capacity for this waste stream have proven problematic, in part because some waste handling facilities, notably metal recyclers, do not class materials as waste. Environment Agency data suggests that deposits at licensed waste management facilities in 2001 amounted to approximately 2.3 million tonnes, whilst capacity at such sites was assessed at approximately 3.3 million tonnes in 2001. This is consistent with the fact that theoretical capacity is higher than actual throughput. For 2003, the study carried out by Golders-MEL suggests that capacity amounted to only about 0.3 million tonnes, although this probably excludes significant capacity at metal recycling sites (deposits at metal recycling sites amounted to 1.8 million tonnes in 2001). It is also unclear to what extent the separation of materials for recycling at existing waste transfer stations is reflected in existing capacity data. There may therefore be more existing capacity than is reflected in existing assessments. More accurate data on waste arisings and waste management, including the role of transfer stations is urgently needed.
- 3.13 The projections indicate that, using waste deposits in 2001 as a base, the quantity of recycling and treatment capacity for industrial & commercial waste will need to increase by almost 90% by 2005 and will need to double by 2021. This equates to approximately 83 new facilities being needed by 2005 and 93 by 2021, with about 40% of the new capacity being required in the metropolitan area and 60% in the surrounding shire area. These requirements are illustrated in Table 3.5 and Figure 3.1 below. On the basis of deposits in 2001, some surplus capacity would appear to exist in Sandwell, and this is likely to reflect a complex pattern of waste movements both within the region and between the West Midlands and adjacent areas. The Regional Spatial Strategy and draft Regional Waste Strategy do not identify recycling and treatment capacity requirements for this waste stream and comparisons are therefore not possible. Further work will be required to establish the most appropriate geographical pattern of new facilities to serve the region's needs.

Table 3.5: Additional Capacity and facilities Required to Recycle and Treat Industrial & Commercial waste 2005 & 2021 ('000 tonnes)

Waste Planning Authority	Existing Capacity 2001/02 ⁹	Additional Capacity Require by 2005	Equivalent No. Facilities @25,000 tonnes /yr	Additional Capacity Require by 2021 ¹⁰	Equivalent No. Facilities @25,000 tonnes /yr
Birmingham	575	190	8	297	12
Coventry	72	257	10	283	11
Dudley	182	186	7	186	7
Herefordshire	10	18	1	21	1
Sandwell	592	-232	-9	-204	-8
Shropshire	40	174	7	192	8
Solihull	1	119	5	129	5
Staffordshire & Stoke on Trent	220	516	21	572	23
Telford & Wrekin	0	217	9	233	9

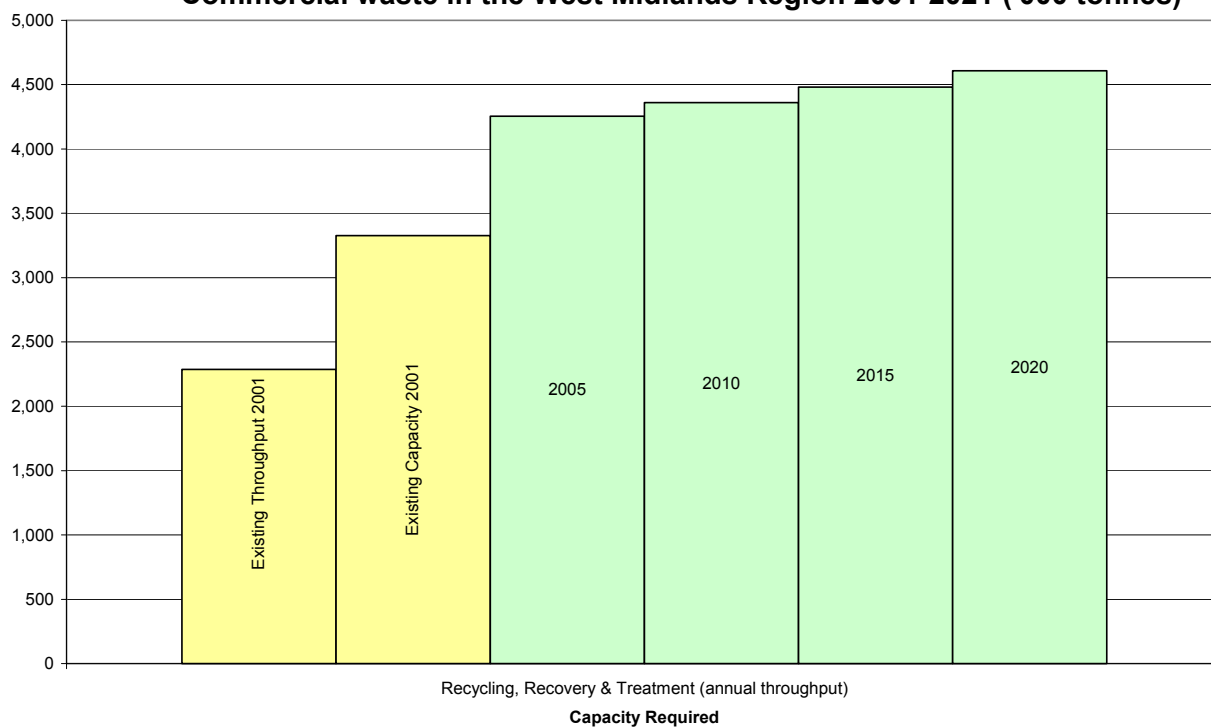
⁹ Environment Agency: Industrial & Commercial waste deposits at open gate MRS, Physico-Chemical, Biological & Incineration facilities 2001

¹⁰ The figures represent the capacity which is required by 2021 over and above that existing at 2001

Waste Planning Authority	Existing Capacity 2001/02 ⁹	Additional Capacity Require by 2005	Equivalent No. Facilities @25,000 tonnes /yr	Additional Capacity Require by 2021 ¹⁰	Equivalent No. Facilities @25,000 tonnes /yr
Walsall	263	1	0	21	1
Warwickshire	207	206	8	239	10
Wolverhampton	31	188	8	206	8
Worcestershire	93	129	5	146	6
Metropolitan area	1,716	709	28	918	37
Shire area	570	1,260	50	1,403	56
West Midlands Region	2,286	1,969	83	2,321	93

NB: Negative values indicate a surplus

Figure 3.1 Additional Capacity Required to Recycle and Treat Industrial & Commercial waste in the West Midlands Region 2001-2021 ('000 tonnes)



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4. Construction and Demolition Waste

- 4.1 Construction and demolition waste arises from the construction, repair, maintenance and demolition of buildings and structures. It mostly includes brick, concrete, hardcore, subsoil and topsoil, but it can also include quantities of timber, metal, plastics and (occasionally) special waste materials.
- 4.2 Construction and demolition waste has traditionally been disposed of locally at through exempt activities which use waste as a fill material; licensed activities which restore or reclaim land for beneficial use using waste as engineering or fill material and at landfill sites, often sites licensed specifically for these materials. However, changes in the waste management licensing regulations and the introduction of the Landfill and Aggregates Taxes have had a significant impact on this waste stream, an increasing proportion of which is being treated in screening and crushing plants prior to re-use as an aggregate or fill.
- 4.3 While these outcomes are very much in line with Government policy to reduce unnecessary regulation and reclaim as much material as possible, the changes in waste management have led to some difficulty in quantifying the amount of construction and demolition waste generated. The Government has taken a number of steps in an attempt to redress this gap in information, and the information within the section is based upon the findings of this research.

Policy Drivers

- 4.4 Construction and demolition waste is the subject of a number of policy and taxation drivers and targets which have been set as part of European and National policy. These drivers are identified in Table 4.1 below:

Table 4.1: Construction & Demolition Waste Policy Drivers

Date	Action	Effect
Landfill Directive (99/31/EEC)		
July 2005	Application of Waste Acceptance Criteria (WAC) requiring pre-treatment of waste to reduce quantity and hazard prior to landfill.	Non-hazardous waste will require pre-treatment to meet the requirements of WAC for non-hazardous landfill sites. However, interpretation of the definition of 'treatment' includes separation of part of the stream for recycling, allowing residual collected waste to meet the WAC.
Aggregates Levy		
April 2002	Application of standard levy to sand, gravel and rock extracted in UK	Encourage recycling of construction and demolition wastes to provide a source of aggregate materials.
Mineral Aggregates Provision (Minerals Planning Guidance Note 6)		
June 2003	Introduces targets (which may be disaggregated to individual Mineral Planning Authorities) for the production of secondary and recycled aggregate materials in order to offset the need for the production of primary aggregate materials from quarrying.	The guidance assumes that a much higher proportion of mineral aggregates will be provided from secondary and recycled sources than previously. Meeting the targets will require a substantial proportion of construction and demolition waste to be diverted for use as aggregates.

Assumptions

4.5 Annexes 1-13 indicate the projected arisings of construction & demolition waste over the period 2001 - 2021. In preparing the forecast, the following assumptions have been made:

- **Projected Future Arisings:** derived from Symonds / ODPM 2003, using a disaggregation index based on RPG policy on existing and future housing development rates). The quantity of C&D waste is assumed to change in line with levels of housing development (8% reduction 2000 - 2007; 4% reduction 2007 – 2011; static from 2011 – 2021);
- **Recycling – Annual capacity required:** Assumes that 'reduction achieved' represents 80% diversion of throughput;
- **Recycling - reduction achieved:** taken from Symonds / ODPM 2003, assumed to be the sum of material recycled as aggregate and material recycled as soil. The projection increases recycling rates at 1% per annum until 2010 to reflect the impact of policy and taxation instruments which encourage additional material recycling;
- **Recycling Performance:** waste recycled and composted as a % of annual waste management requirement;
- **Use on exempt sites and for engineering & land restoration - Capacity Required:** Assumes that 'reduction achieved' represents 100% diversion of throughput;
- **Use on exempt sites and for engineering & land restoration - reduction achieved:** taken from Symonds / ODPM 2003, assumed to be the sum of material used for landfill engineering or restoration; backfilling of quarry voids [including PPC permitted Inert landfills] and registered exemptions). The projection reduces recovery rates to reflect the equivalent growth in recycling in response to policy and taxation instruments (particularly mineral aggregates targets) which encourage additional material recycling;
- **Other recovery performance** (waste recovered as a % of annual waste management requirement);
- **Landfill disposal** (taken from Symonds / ODPM 2003, assumed to be land disposal + 90% of unrecorded waste + a proportion of the waste transferred consistent with the overall proportion disposed / recovered). The projection maintains landfill at 2003 rates (approximately 9% of arisings). Material landfilled is assumed to require capacity at non-hazardous landfills;
- **Landfill Disposal - Cumulative Capacity Required:** sum of annual landfill capacity requirement over the period.

Future Waste Arising

4.6 The SWMA (2000) provides only limited information about the generation and management of construction and demolition waste at a sub-regional level. More recent data for the West Midlands region is available from research carried out by the Symonds Group on behalf of the Office of the Deputy Prime Minister. Figures for the generation of construction and demolition waste have therefore been derived from regional estimates in Annex 8 of the 'Survey of Arisings and Use of Construction, Demolition and Excavation Waste as Aggregate in England in 2003 (ODPM October 2004). Several options for the disaggregation of the regional estimate given in the Symonds survey are available:

1. **Proportionality:** assumes that the relationship between C&D waste and other waste streams remains consistent with the regional average. Knowing the total quantity of waste in other waste streams allows an estimate of the quantity of C&D waste to be calculated;
2. **Employment:** assumes that the quantity of C&D waste is consistent with the relative levels of employment (including self employment) in construction and demolition businesses in each area;
3. **Population:** assumes that that the quantity of C&D waste is consistent with the relative size of the population in each WPA area;

4. **Development:** assumes that the quantity of C&D waste reflects the relative levels of housing development (as a proxy for all development), including a weighting for the proportion of development on previously developed land and the level of demolition in each area.

4.7 It seems certain that the relative levels of C&D waste generated will not remain constant throughout the region and option 1 must therefore be rejected. It is not possible to accurately quantify the relative levels of employment in construction and demolition in each WPA area. Employment statistics are skewed by the numbers of employees of large construction firms, which are based in a particular area, but do not work just in that area, so option 2 must also be rejected. The relative levels of population can be measured but do not necessarily provide an indicator of the level of construction and demolition activity. Option 3 must therefore be rejected in favour of option 4 which, whilst it does not measure all development, may provide a proxy. Significantly, option 4 also allows a weighting to be built in to reflect relative levels of demolitions and the proportion of development on previously developed land, both of which have the potential to significantly increase the quantity of C&D waste.

4.8 The quantity of construction and demolition waste generated in each Waste Planning Authority area over the period 2001 – 2021 has therefore been estimated using a ‘development’ index to disaggregate the regional total. This index is based on RPG11: Regional Planning Guidance for the West Midlands which identifies the distribution and rate of future housing development, demolitions and the use of previously developed land in each WPA area in three phases: the period to 2007; 2007 – 2011; and, 2011 – 2021 (RPG11, Tables 1-3, pp. 37-39). The calculation is illustrated in Table 4.2 below:

Table 4.2: Calculation of Construction & Demolition Waste using Weighted Annual % Share of Housing Development 2001 – 2021

	Weighted % Share to 2007	C&D Waste to 2007	Weighted % Share 2007-2011	C&D Waste 2007-2011	Weighted % Share 2011-2021	C&D Waste 2011-2021
West Midlands	100	8,130,000	100	7,447,893	100	7,141,040
Birmingham	17.68	1,437,047	23	1,744,936	24	1,712,228
Coventry	4.17	338,703	4	331,712	6	400,471
Dudley	4.05	329,440	5	371,855	7	507,449
Herefordshire	4.32	351,267	3	260,498	4	255,615
Sandwell	7.37	598,981	8	586,617	8	570,743
Shropshire	6.55	532,230	5	363,155	5	356,348
Solihull	2.20	179,187	2	175,488	3	201,906
Staffordshire	15.18	1,234,510	14	1,043,979	9	674,647
Stoke on Trent	5.01	407,104	5	398,700	5	391,227
Staffordshire & Stoke	20.19	1,641,614	19	1,442,679	15	1,065,874
Telford & Wrekin	6.37	517,738	7	507,050	4	262,444
Walsall	2.95	239,846	3	234,895	5	384,581
Warwickshire	10.65	865,477	9	643,787	8	566,840
Wolverhampton	3.45	280,455	4	274,666	6	437,021
Worcestershire	10.06	818,015	7	510,555	6	419,520
MUAs (approx)	46.87	3,810,763	55	4,118,869	64	4,605,625
Other Areas	53.13	4,319,237	45	3,329,024	36	2,535,415

Imports and Exports

- 4.9 The Plan assumes that there are no imports or exports of material in this waste stream. It is unlikely that this will be the case, however there is insufficient information available upon which to make assumptions as to the existing or future pattern of waste movement.

Future Waste Management

- 4.10 Table A8.1 of the 'Survey of Arisings and Use of Construction, Demolition and Excavation Waste as Aggregate in England in 2003 (ODPM October 2004) illustrates the composition of construction and demolition waste generated in the West Midlands region and the way in which this waste is managed. The 2003 survey indicates that, whilst changes between 2001 and 2003 are not statistically significant at a national level, there are more significant changes in West Midlands. In general terms, the quantity of C&D waste has reduced by 6% in the region, whilst the proportion recycled has increased from 50% to 61%, the highest performance for any region in England. This change has been accompanied by a halving of the quantity of material used at exempt sites to the lowest level of any region other than London. In the absence of local information about the management of this waste stream, it has been assumed that waste currently generated in individual WPA areas follows the regional pattern.
- 4.11 The recycling of C&D waste is essentially a market-driven activity, and the 2003 Symonds survey highlights evidence that the economics of recycling and policy instruments such as the Aggregates Levy are now encouraging recyclers to employ techniques (such as washing) which increase the recovery rate from mixed C&D waste. One important conclusion reached in the 2001 survey was that the scope for further recycling of 'hard' C&D waste for use outside landfills and registered exempt sites appeared to be limited. The new survey indicates that this remains broadly true as a 'snapshot' of the position in 2003, in that very little easily recyclable material (i.e. clean 'hard' C&D waste) was not recycled. This is especially true in the West Midlands, where the quantity of mixed C&D waste is half the national proportion and where recycling rates are much higher than average. Further growth in recycling in the region is likely to require material to be more actively 'won' from mixed waste through continued improvements in on-site separation of recyclable aggregate materials from soil and other potentially deleterious materials.
- 4.12 The 2003 Symonds survey indicates that there have also been changes since 2001 in the balance between C&D waste entering landfills and that used on registered exempt sites. The quantity of C&D waste landfilled as waste has grown since 2001, whilst the quantity used on registered exempt sites has fallen since 2001. This change may be linked to a change in the way that the Environment Agency has interpreted the need for construction sites to register for exemptions. Whereas most such sites were previously registered with the Agency, some sites which are carrying out simple 'cut and fill' activities using clean site-won excavation waste are now less likely to be required to register an exemption. Proposed future amendments to the Waste Management Licensing Regulations are likely to require all exemptions involving deposits of waste on land to make records available to the Agency and information about exempt activities is therefore expected to improve over time. Calculation of the landfill capacity requirement for construction and demolition waste over the period 2001 – 2021 has assumed that non-hazardous landfill capacity is required to dispose of residual waste from this stream.

4.13 The capacity needed to manage construction & demolition waste in each WPA area during the period is shown in Tables 4.3-4.5 below:

Table 4.3: Indicative Minimum Capacity Required to Recycle C&D waste 2001- 2021 ('000 tonnes)

Waste Planning Authority	Capacity 2001 ¹¹	Annual Capacity required by 2005	Annual Capacity required by 2010	Annual Capacity required by 2015	Annual Capacity required by 2021
Birmingham	125	1,227	1,400	1,407	1,407
Coventry	1	279	316	336	336
Dudley	0	276	394	433	433
Herefordshire	0	255	219	220	220
Sandwell	30	453	471	472	472
Shropshire	48	354	299	300	300
Solihull	70	138	160	168	168
Staffordshire & Stoke on Trent	57	1,202	977	923	923
Telford & Wrekin	0	397	256	221	221
Walsall	0	184	284	327	327
Warwickshire	0	594	500	490	490
Wolverhampton	5	215	324	369	369
Worcestershire	0	527	367	354	354
Metropolitan area	231	2,772	3,349	3,512	3,512
Shire area	105	3,329	2,618	2,508	2,508
West Midlands Region	336	6,101	5,967	6,020	6,020

Table 4.4: Indicative Minimum Capacity Required for Use on Exempt Sites and for Engineering & Land Restoration for C&D waste 2001- 2021 ('000 tonnes)

Waste Planning Authority	Cumulative Void Capacity required by 2005	Cumulative Void Capacity required by 2010	Cumulative Void Capacity required by 2015	Cumulative Void Capacity required by 2021
Birmingham	2,765	5,090	7,254	9,418
Coventry	620	1,094	1,573	2,051
Dudley	609	1,161	1,738	2,315
Herefordshire	618	945	1,226	1,507
Sandwell	1,148	2,055	2,889	3,723
Shropshire	913	1,391	1,812	2,232
Solihull	319	565	811	1,058
Staffordshire & Stoke on Trent	2,890	4,660	5,816	6,972
Telford & Wrekin	922	1,491	1,803	2,115
Walsall	427	799	1,242	1,685
Warwickshire	1,500	2,289	2,908	3,527
Wolverhampton	504	934	1,446	1,959
Worcestershire	1,398	2,058	2,551	3,043
Metropolitan area	6,392	11,698	16,953	22,209
Shire area	8,241	12,834	16,116	19,396
West Midlands Region	14,633	24,532	33,069	41,605

¹¹ Environment Agency: Capacity at Open Gate C&D waste treatment facilities 2001

Table 4.5: Indicative Non-Hazardous Landfill Capacity Required to Dispose of C&D waste 2001- 2021 ('000 tonnes)

Waste Planning Authority	Cumulative Void Capacity required by 2005	Cumulative Void Capacity required by 2010	Cumulative Void Capacity required by 2015	Cumulative Void Capacity required by 2020
Birmingham	551	1,323	2,094	2,864
Coventry	127	288	468	648
Dudley	125	311	539	768
Herefordshire	108	228	343	458
Sandwell	140	274	405	536
Shropshire	184	351	511	671
Solihull	65	148	239	330
Staffordshire & Stoke on Trent	588	1,194	1,673	2,153
Telford & Wrekin	189	380	498	616
Walsall	87	213	386	559
Warwickshire	303	588	844	1,099
Wolverhampton	103	247	444	641
Worcestershire	280	505	694	882
Metropolitan area	1,198	2,804	4,575	6,346
Shire area	1,652	3,246	4,563	5,879
West Midlands Region	2,850	6,050	9,138	12,225

Commentary

- 4.14 Construction & demolition waste is the largest waste stream in the region, accounting for 46% of all waste. Approximately 8.6 million tonnes (Mt) of C&D waste was generated in the region in 2001, dropping to 8.13 Mt by 2003. By 2021, the projections indicate that this will reduce to 7.14 million tonnes. Over the course of the period 2001 – 2021 approximately 150 Mt of construction and demolition waste will be generated if 2003 levels continue. The regional planning strategy set out in RPG11 concentrates development on brownfield land in the major urban areas (MUA's). The demolition of existing structures and the redevelopment of previously developed land are assumed to generate a greater quantity of C&D waste than the development of 'greenfield' sites. However, a significantly greater proportion of C&D waste is also likely to be classed as hazardous in future, reflecting the emphasis in national planning policy on brownfield land and the need to target hitherto less favoured contaminated land.
- 4.15 The quality of local data on the quantity and management of Construction & Demolition waste is very poor. Whilst the margin of error for regional data derived from the Symonds survey in 2003 has improved substantially from that for 2001, uncertainty surrounding the number of exempt sites is still highlighted as a significant issue. It is likely that this waste stream is subject to significant under recording of quantities, and levels of recycling & re-use which may take place without the material being registered as waste. In addition, although the projections take into account the targeting of metropolitan area for a substantial proportion of new development and the potential for economies of scale, they do not allow for the additional housing and associated reclamation which may derive from the recently published Barker report. The implications of this report on the need for additional housing development in the region, over and above that assumed in RSS, are currently unclear, but may have a substantial impact on the generation of C&D waste in the future.
- 4.16 The projections indicate that, using capacity at open gate facilities in 2001 as a base, the quantity of recycling and treatment capacity for C&D waste will need to increase by fifteen fold

by 2005. This equates to a requirement for approximately 57 additional facilities by 2005, split 40-60 between the metropolitan and shire areas. By 2021, the need for capacity stays the same but the balance between the metropolitan and shire areas reverses to reflect the fact that the quantity of C&D waste is assumed to change in line with relative levels of housing development. Further work will be required to establish the most appropriate geographical pattern of new facilities to serve the region's needs. These requirements are illustrated in Figure 4.1 and Table 4.6 below:

Figure 4.1: Additional Capacity Required to Recycle C&D Waste in the West Midlands Region 2001-2021 ('000 tonnes)

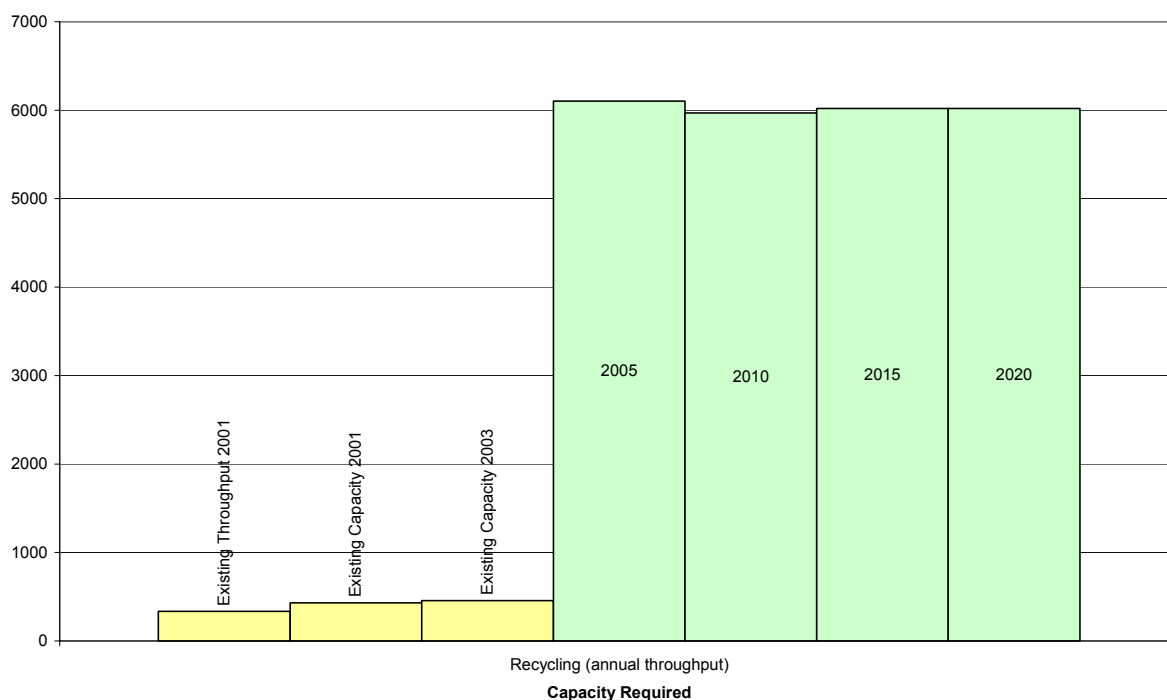


Table 4.6: Additional Capacity and Facilities Required to Recycle C&D Waste 2005 & 2021 ('000 tonnes)

Waste Planning Authority	Existing Capacity 2001 ¹²	Additional Capacity required by 2005	Equivalent No. Facilities @100ktpa	Additional Capacity required by 2021 ¹³	Equivalent No. Facilities @100ktpa
Birmingham	125	1,102	11	1,282	13
Coventry	1	278	3	335	3
Dudley	0	276	3	433	4
Herefordshire	0	255	3	220	2
Sandwell	30	423	4	442	4
Shropshire	48	306	3	252	3
Solihull	70	68	1	98	1
Staffordshire & Stoke on Trent	57	1,145	11	866	9
Telford & Wrekin	0	397	4	221	2
Walsall	0	184	2	327	3
Warwickshire	0	594	6	490	5

¹² Environment Agency: Capacity at Open Gate C&D waste treatment facilities 2001

¹³ The figures represent the capacity which is required by 2021 over and above that existing at 2001

Waste Planning Authority	Existing Capacity 2001 ¹²	Additional Capacity required by 2005	Equivalent No. Facilities @100ktpa	Additional Capacity required by 2021 ¹³	Equivalent No. Facilities @100ktpa
Wolverhampton	5	210	2	364	4
Worcestershire	0	527	5	354	4
Metropolitan area	231	2,541	25	3,281	33
Shire area	105	3,224	32	2,403	24
West Midlands Region	336	5,765	57	5,684	57

NB: Negative values indicate a surplus

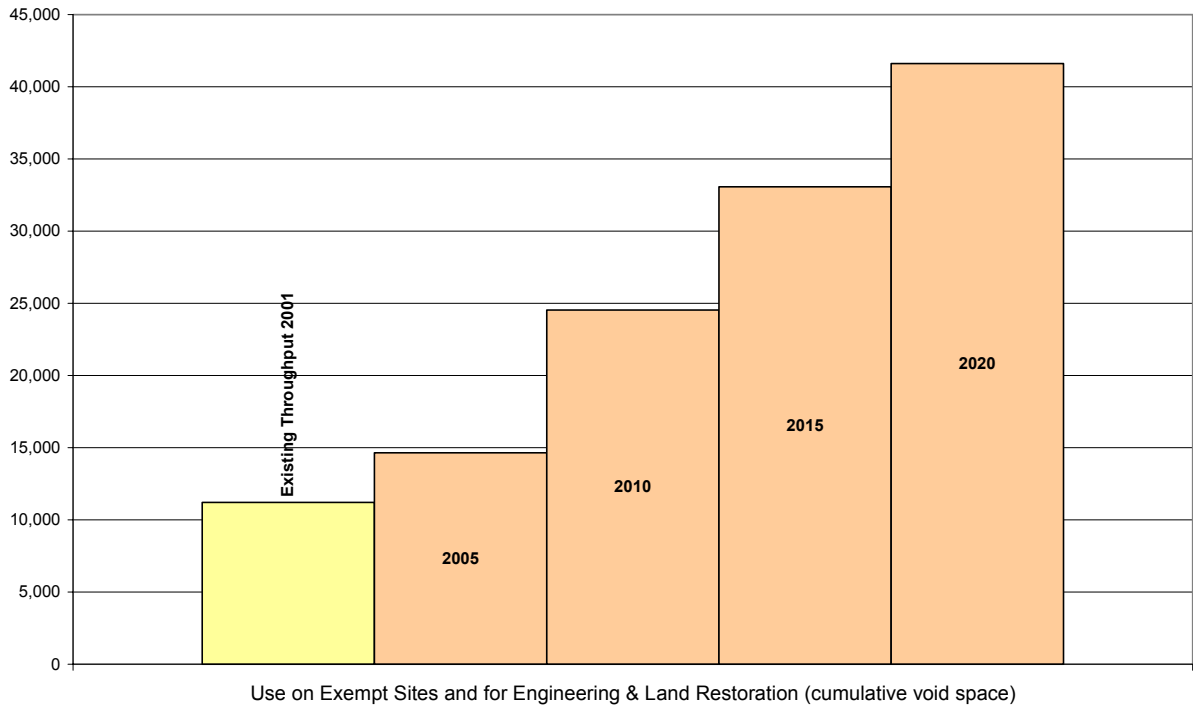
- 4.17 Notwithstanding a strong regional performance on recycling, approximately 0.8 million tonnes of hard C&D waste or mixed C&D waste was used on exempt sites and for engineering and land restoration in 2003. The Symonds study currently classes these uses as 'recovery' rather than 'disposal'. However, in many cases, these materials could be better used to offset the need for primary aggregates in a way consistent with national mineral planning guidance (MPG6) which sets regional targets for recycling C&D waste to offset the need for additional quarrying. However, even assuming that all the potentially suitable C&D waste materials could be captured and used to offset the need for quarrying, the quantities of materials which the 2003 survey indicates are generated in the region would be insufficient to meet the MPG6 target of 5.5 million tonnes per annum.
- 4.18 In the absence of any better measure of existing capacity, the projections in this study use existing void space at licensed inert landfill sites as a base, and project the cumulative quantity of void space required. The projections indicate that additional void space sufficient to accommodate approximately 3.4 Mt will be required by 2005 and that void space to accommodate approximately 30.4 Mt will be required by 2021. The pattern of capacity required is illustrated in Table 4.7 and Figure 4.2 below.

Table 4.7: Additional Capacity Required for Use on Exempt Sites and for Engineering & Land Restoration for C&D waste 2005 & 2021 ('000 tonnes)

Waste Planning Authority	Existing Capacity 2001 ¹⁴	Additional Capacity required by 2005	Additional Capacity required by 2021
Birmingham	0	2,765	9,418
Coventry	0	620	2,051
Dudley	0	609	2,315
Herefordshire	24	594	1,483
Sandwell	0	1,148	3,723
Shropshire	285	628	1,947
Solihull	0	319	1,058
Staffordshire & Stoke on Trent	9,602	-6,712	-2,630
Telford & Wrekin	0	922	2,115
Walsall	0	427	1,685
Warwickshire	705	795	2,822
Wolverhampton	0	504	1,959
Worcestershire	589	809	2,454
Metropolitan area	0	6,392	22,209
Shire area	11,205	-2,964	8,191
West Midlands Region	11,205	3,428	30,400

¹⁴ Environment Agency: Void Capacity at Licensed Inert Landfills 2001

Figure 4.2: Additional Capacity Required for Use on Exempt Sites and for Engineering & Land Restoration for C&D waste in the West Midlands Region 2001-2021 ('000 tonnes)



4.19 C&D materials disposed as waste are unlikely to be 'inert' and the projections therefore assume that non-hazardous landfill capacity is required to dispose of residual waste. Capacity requirements for non-hazardous landfill are illustrated in Chapter 6. Whilst changes to the waste management licensing (when system is reviewed) may improve data on exempt activities, there is an urgent need to improve local data quality in the region. The Regional Spatial Strategy and draft Regional Waste Strategy do not identify capacity requirements for this waste stream and comparisons are therefore not possible. The fact that so little is known about approximately half of the waste generated in the region is unacceptable in the context of the potential for greater resource efficiency. A regional mass balance study is therefore needed to identify quantity and fate of materials to act as a baseline for policy.

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5. Hazardous Waste

- 5.1 Hazardous wastes include many substances generally recognised as potentially dangerous such as pesticides, asbestos and strong acids. However, a number of wastes that result from everyday activities (for example mobile phone batteries and used engine oils) are also treated as hazardous. From 2002 redundant fridges and freezers have also been classed as hazardous waste and scrap cars (End of Life Vehicles) and some waste electrical equipment will also be classed as hazardous shortly.
- 5.2 Following the introduction of the Special Waste Regulations 1996, all movements of special waste are tracked until they reach a waste management facility. As a consequence, relatively detailed information about the production, movement and treatment of this waste stream is available, and has been supplied by the Environment Agency to facilitate the production of these forecasts.

Policy Drivers

- 5.3 Hazardous waste is the subject of a large number of policy drivers and targets which have been set as part of European and National policy. These drivers are identified in the table below:

Table 5.1: Hazardous Waste Policy Drivers

Date	Action	Effect
Landfill Directive (99/31/EEC)		
July 2002	Ban on certain hazardous wastes (liquid waste, explosive, corrosive, oxidising, highly flammable and flammable wastes and infectious clinical wastes) from landfill.	Relatively small amounts produced, but it is not clear what has happened to these waste streams. It is possible they are being stockpiled while industry decides what to do with them.
July 2004	End to co-disposal of hazardous and non-hazardous waste in landfill.	There are likely to be only 37 landfill sites that will accept hazardous waste after July 2004 (compared with 279 at present); only about 12 of these will be commercial sites (Table 2 and Figure 8). Some parts of the country will have no commercial landfill.
	Pre-treatment of hazardous waste to reduce quantity and hazard prior to landfill.	During this year site-specific regulatory controls will be needed for hazardous waste disposal at the few remaining landfills that will accept hazardous waste. It is likely this hazardous waste will not need to meet the EC waste acceptance criteria (WAC) and may be deposited in existing co-disposal cells. After July 2005 hazardous waste will have to meet WAC and will have to be deposited in new landfill cells.

Date	Action	Effect
July 2005	All hazardous waste must be treated to meet WAC prior to disposal at a landfill that accepts hazardous waste.	Industry has been reluctant to invest in new treatment facilities because of uncertainty as to what will be required and when WAC are likely to come into force. As a result, there could be a two million tonne shortfall in treatment capacity in England and Wales in 2004/5 (Entec, 2003). Given the time it takes to grant planning approval, it is unlikely that new facilities will be in place to meet the predicted shortfall in treatment.
Hazardous Waste Regulations		
2004/5	Increase in the amount of waste classified as hazardous.	The quantity of hazardous waste may exceed 7.5 million tonnes by 2007, produced by over three quarters of a million businesses (Entec, 2003 and 2004)
Producer responsibility legislation [End of life Vehicles (ELVs; 2000/53/EC) and Waste Electrical and Electronic Equipment (WEEE; 2002/96/EC) Directives]		
2003 to 2006	Promote the recovery of waste from ELVs and WEEE.	New facilities are needed for materials recovery from ELVs and WEEE and to treat and dispose of hazardous waste from that recovery. The Restriction on Hazardous Substances (RoHS) Directive will complement the WEEE Directive by banning the use of certain hazardous substances from products from 2006.
Pollution Prevention & Control (PPC)		
2000	Waste reduction targets	15% reduction in waste produced by regulated processes

Assumptions

5.4 Annexes 1-13 indicate the projected arisings of hazardous waste in each WPA area over the period 2001 - 2021. In preparing the forecast, the following assumptions have been made:

- **Projected Future Generation:** Special (Hazardous) Waste Arising 2001 & 2002 (taken from SWaT database);
- Projections of waste arising assume that the quantity of hazardous waste will increase by 22% in 2005 in response to the re-classification of waste by the Hazardous Waste Regulations, followed by a subsequent reduction of 2% per annum until 2010 to reflect minimisation efforts. After 2010 the quantity of waste arising is assumed to remain static. Although the type of hazardous waste generated in individual authorities will vary, these assumptions have been applied pro-rata;
- **Imports and Exports:** The projections assume that these will remain unchanged from 2002;

- **Waste Treatment:** The projections assume that solidification / stabilisation will increase the weight of hazardous waste treated by a factor of 1.5;
- **Recycling Performance:** The projections assume that re-use and recycling will remain static from the base date until 2005 and will increase by 1% per annum for 5 years from 2006 to reflect the need to meet pre-treatment requirements and other Waste Acceptance Criteria (WAC);
- **Treatment Performance:** The projections assume that treatment performance (assumed to comprise Stabilisation, Physico-chemical treatment, Solvent recovery, Bio- remediation, Waste water treatment, High temperature incineration and Co-incineration) will remain static from the base date until 2005, followed by an increase of 12% in 2005 and subsequent increases of 2% per annum for 5 years from 2006 to reflect the need to meet pre-treatment requirements and other Waste Acceptance Criteria (WAC);
- **Landfill Disposal:** The projections assume that hazardous disposal capacity requirements (assumed to be landfill + short term transfer in SWaT) will increase in 2005 to reflect the need to accommodate increases in the quantity of contaminated soils resulting from the implementation of the hazardous waste regulations and additional waste treated by stabilisation / solidification. In future years the projections assume that landfilling will decrease to reflect changes in the availability of landfill sites, the impact of waste minimisation, additional re-use, recycling and treatment of hazardous wastes to meet waste acceptance criteria (WAC) at non-hazardous landfill sites.
- Landfill capacity for hazardous waste will cease to be available in many areas, and the quantity which will require landfilling is therefore shown as a means of identifying the need for additional recycling and treatment capacity; void capacity in landfills accepting stabilised non-reactive wastes; or additional export capacity;
- Cumulative Capacity Required: Landfill (sum of annual landfill capacity requirement over the period)

Future Waste Arising

- 5.5 There are 3 key factors that are likely to have a significant impact on hazardous waste arisings in the future:
1. The potential for waste minimisation in response to policy drivers and cost increases;
 2. Changes in definition from special waste to hazardous waste;
 3. The targeting of brownfield redevelopment in the regional planning strategy (RPG11).
- 5.6 Work commissioned by the Hazardous Waste Forum which is relevant to the first 2 factors is summarised in Tables 5.2 – 5.3 below:

Table 5.2: Summary of Potential Waste Minimisation

EWC Code	EWC Chapter	% Change	Basis of Reduction
06	Inorganic chemical processes	-20%	Resulting from PPC requirements
07	Organic chemical processes	-10%	Resulting from PPC requirements
08	Paint, varnish, adhesive, inks	-20%	Move away from solvent based materials
12	Shaping / treatment of metals / plastics	-10%	Resulting from PPC requirements
13	Oil & oil/water waste	-20%	Continuation of recent trend
1705	Contaminated soil	-10%	In-situ remediation

Table 5.3: Summary of Impact of Hazardous Waste Definition Change

EWC Code	EWC Chapter	% Change	Basis of Reduction
1701	Concrete, bricks, tiles	+25%	Lower thresholds for ecotoxic materials
1705 1707	Contaminated soil and asbestos	+50%	Lower thresholds for ecotoxic materials
06, 07	Organic and inorganic chemical processes	+10%	Lower thresholds for ecotoxic materials
1003	Wastes from aluminium thermal metallurgy	+300%	Information from industry association
15	Contaminated packaging	+100%	Assessment of waste against all hazardous properties

- 5.7 It is anticipated that the implementation of the Hazardous Waste Regulations in 2005 will increase the tonnage of wastes defined as hazardous, regardless of trends in the overall volume of waste generated. The impact of this change on contaminated soils is particularly significant since such wastes comprise a substantial proportion of the hazardous waste generated in the region. Pressure to reduce the amount of hazardous waste produced will result from any new measures taken to remove hazardous chemicals from the utility chain, for example in response to the Restriction of Hazardous Substances (RoHS) Directive and financial pressures from producer responsibility legislation. However, it is unclear what level of awareness exists amongst hazardous waste producers, and in particular amongst smaller companies who are likely to become producers of hazardous waste for the first time as a result of the implementation of the Hazardous Waste Regulations in 2005. This report therefore takes a precautionary stance by assuming that waste minimisation efforts will not take effect until 2006. The report therefore assumes that minimisation will not therefore limit the effect of the increase in the quantities of hazardous waste which will arise from the re-classification of waste in 2005. This stance differs from that which has been adopted by DEFRA and the Hazardous Waste Forum.
- 5.8 With respect to the regional planning strategy, RPG11 proposes the major urban areas of the region for the majority of new development and sets targets for the redevelopment of brownfield land. A significant proportion of this land has been affected by previous industrial development and is likely to contain contamination which will need to be addressed as part of the redevelopment process. Contaminated soils represent approximately 20% of the current regional quantity of special (hazardous) waste. National data¹⁵ suggests 98.4% of contaminated construction and demolition and asbestos waste is landfilled. Such wastes represent approximately 60% of all hazardous wastes disposed to landfill. The projected growth of 38% in 2005 for this type of waste (see Table 5.4 below) therefore has a significant bearing on the overall growth of this waste stream.
- 5.9 Applying the net effect of these three factors to the profile of hazardous wastes produced in the West Midlands (derived from SWaT 2002) indicates the likely changes to the quantity of hazardous waste arising:

¹⁵ Hazardous Waste Forum Status Report Section 7.1

Table 5.4: Impact of Re-Classification of Hazardous Waste Arisings in the West Midlands

EWC Code	EWC Chapter	2002 Arisings (tonnes)	% Change Assumed	Estimated Arisings 2005 ¹⁶
01	Mining and Minerals	13	No Change	13
02	Agricultural and Food Production	341	No Change	341
03	Wood and Paper Production	261	No Change	261
04	Leather and Textile Production	6	No Change	6
05	Petrol, Gas and Coal Refining/Treatment	339	No Change	339
06	Inorganic Chemical Processes	26,458	3	27,238
07	Organic Chemical Processes	49,225	10	54,148
08	MFSU Paints, Varnish, Adhesive and Inks	18,631	No Change	18,631
09	Photographic Industry	3,862	No Change	3,862
10	Thermal Process Waste (inorganic)	37,798	146	93,055
11	Metal Treatment and Coating Processes	28,997	10	31,874
12	Shaping/Treatment of Metals and Plastics	26,843	10	29,490
13	Oil and Oil/Water Mixtures	122,856	No Change	122,856
14	Solvents	2,050	No Change	2,050
15	Packaging, Cloths, Filter Materials	9,337	100	18,673
16	Not Otherwise Specified	39,284	13	44,275
17	C&D Waste and Asbestos	104,235	38	143,934
18	Healthcare	876	No Change	876
19	Waste/Water Treatment and Water Industry	50,918	No Change	50,918
20	Municipal and Similar Commercial Wastes	5,446	No Change	5,446
99	Unclassified	13,800	No Change	13,800
	TOTAL	541,575	22	662,086

5.10 However, although the type of hazardous waste generated in individual authorities will vary, and therefore the relative growth of waste in each area may also vary to some extent, it has not been possible to model growth projections for each authority individually at this time and the projections therefore assume that hazardous waste in each area will follow the same growth pattern from 2005 (see paragraph 5.4 above).

Imports and Exports

5.11 Most hazardous waste requires specialised waste management facilities which are not available some areas due to the small quantities of such wastes which are generated. Significant quantities of such wastes are therefore exported for treatment or disposal. The

¹⁶ Note: Projections for Industrial & Commercial and Construction & Demolition wastes include equivalent reductions to allow for the reclassification of waste which will become hazardous from 2005.

level of imports and exports for each area has been taken from information supplied by the Environment Agency from the 'Special Waste Tracking System'. In the absence of trend data, and in the context of the likelihood of substantial increases in the movement of hazardous wastes between areas, the projections assume that imports and exports of hazardous waste will remain at 2002 levels. It is unlikely that this will be the case, however there is insufficient information available upon which to make assumptions as to the future pattern of imports and exports. No merchant hazardous waste landfill sites are currently planned for the region, although limited in house capacity for APC residues and some capacity in separate cells for stabilised non-reactive hazardous waste is likely to be available over the period 2001 – 2021. Landfill capacity for hazardous waste will therefore cease to be available in many areas, and the projected quantity which will require landfilling is therefore shown as a means of identifying the need for additional recycling and treatment capacity; void capacity in landfills accepting stabilised non-reactive wastes; or additional export capacity.

Future Waste Management

- 5.12 A complex set of overlapping requirements for the management of hazardous waste results from the application of the various policy drivers applicable to this waste stream. The general pattern is that more re-use, recycling and waste treatment capacity will be required to reflect treatment requirements and the increased cost and limited future availability of landfill capacity. The estimated capacity needed to manage hazardous waste in each WPA area during the period is shown in Table 5.5 below:

Table 5.5: Indicative Capacity Required to Re-use & Recycle Hazardous Waste 2001-2021 ('000 tonnes)

Waste Planning Authority	Existing Capacity 2001 ¹⁷	Annual Capacity required by 2005	Annual Capacity required by 2010	Annual Capacity required by 2015	Annual Capacity required by 2020
Birmingham	70	50	54	56	56
Coventry	12	0	0	0	0
Dudley	0	3	3	3	3
Herefordshire	0	0	0	0	0
Sandwell	192	100	116	117	117
Shropshire	0	2	3	3	3
Solihull	0	0	0	0	0
Staffordshire & Stoke	16	18	21	21	21
Telford & Wrekin	0	0	0	0	0
Walsall	123	146	168	168	168
Warwickshire	0	15	18	18	18
Wolverhampton	43	18	19	19	19
Worcestershire	10	59	72	72	72
Metropolitan area	440	317	360	363	363
Shire area	26	94	114	114	114
West Midlands Region	466	411	474	477	477

¹⁷ Environment Agency: Deposits at Open Gate Special Waste Treatment Facilities 2001

Table 5.6: Indicative Cumulative Landfill Capacity Required to Dispose of Hazardous Waste 2001- 2021 ('000 tonnes)

Waste Planning Authority	Capacity 2001/02	Cumulative Capacity required by 2005	Cumulative Capacity required by 2010	Cumulative Capacity required by 2015	Cumulative Capacity required by 2020
Birmingham	0	115	236	331	426
Coventry	0	5	22	34	46
Dudley	0	185	431	668	904
Herefordshire	0	0	0	0	0
Sandwell	0	154	322	456	591
Shropshire	0	18	44	66	88
Solihull	0	0	0	0	0
Staffordshire & Stoke	0	316	664	981	1,298
Telford & Wrekin	0	81	159	234	309
Walsall	0	54	82	83	84
Warwickshire	0	430	871	1,294	1,717
Wolverhampton	0	5	11	12	12
Worcestershire	0	57	79	82	86
Metropolitan area	0	518	1,104	1,584	2,063
Shire area	0	902	1,817	2,657	3,498
West Midlands Region	0	1,420	2,921	4,241	5,561

Commentary

- 5.13 Approximately 0.53 Mt of hazardous waste was produced in the region in 2001, rising to 0.54 Mt in 2002. The projections indicate that this is expected to rise to 0.575 Mt in 2021, representing an overall growth of 8.5%. In all, 12 Mt of hazardous waste are expected to be generated in the region over the period 2001 – 2021. The region is a net importer of Hazardous waste, reflecting the availability of treatment capacity in some areas. Taking into account the balance of imports and exports, 0.59 Mt of Hazardous waste was managed in the region in 2002. The future management of hazardous waste in the region will change in response to legislative and financial drivers and the geographical availability of facilities to manage this type of waste. Data quality is generally good, although the extent of existing waste movements and the likelihood that such movements will increase, complicate the objective of providing for waste generated in a particular geographical area.
- 5.14 Establishing a clear picture of the current capacity which is available to recycle or treat hazardous waste is complicated by the fact that theoretical licensed capacity is likely to be greater than actual capacity. It is also very difficult to generalise about hazardous waste capacity since processing requirements and capacity are specific to the characteristics and relative concentration of the material being handled. Whilst not specific to this waste stream, the 2004 study by Golders / MEL indicates that some spare waste treatment capacity may be available at existing sites. On the basis of the quantities of waste handled at licensed hazardous waste recycling and treatment facilities in 2001, the projections indicate that existing capacity may be adequate to manage the future quantities of waste likely to be generated.

Table 5.7: Additional Capacity Required to Recycle and Treat Hazardous Waste by 2005 and 2021 ('000 tonnes)

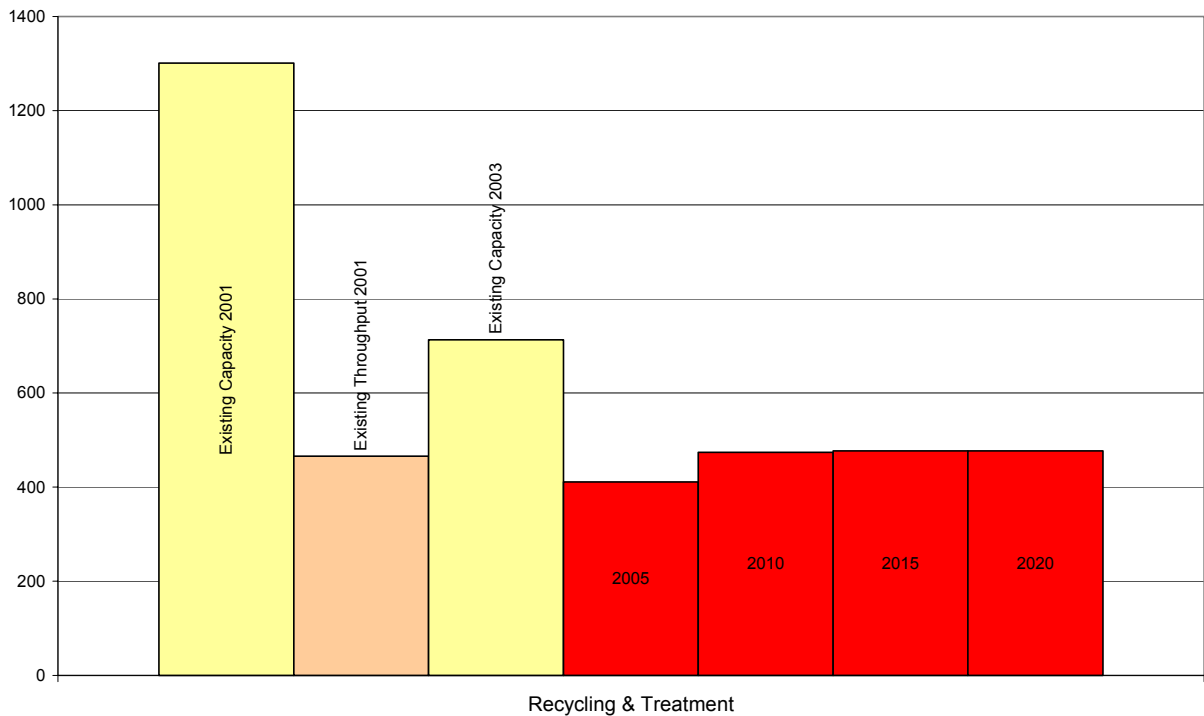
Waste Planning Authority	Existing Capacity 2001 ¹⁸	Additional Capacity required by 2005	Equivalent No. Facilities @25ktpa	Additional Capacity required by 2020	Equivalent No. Facilities @25ktpa
Birmingham	70	-20	-1	-14	-1
Coventry	12	-12	0	-12	0
Dudley	0	3	0	3	0
Herefordshire	0	0	0	0	0
Sandwell	192	-92	-4	-75	-3
Shropshire	0	2	0	3	0
Solihull	0	0	0	0	0
Staffordshire & Stoke	16	2	0	5	0
Telford & Wrekin	0	0	0	0	0
Walsall	123	23	1	45	2
Warwickshire	0	15	1	18	1
Wolverhampton	43	-25	-1	-24	-1
Worcestershire	10	49	2	62	2
Metropolitan area	440	-123	-5	-77	-3
Shire area	26	68	3	88	3
West Midlands Region	466	-55	-2	11	0

NB: Negative values indicate a surplus

- 5.15 The extent to which this is the case will depend to some extent on how the issue of the need to treat contaminated soils is tackled. The Regional Spatial Strategy, which came into force in September 2004, focuses development in the metropolitan area, where a substantial proportion of the land requires redevelopment, including the reclamation of contaminated land. It is currently unclear to what extent hazardous materials generated by this redevelopment focus will be able to be treated at existing hazardous waste treatment sites. In addition, further treatment capacity may be needed more generally to for the pre-treatment of hazardous wastes to enable their disposal at non-hazardous landfill sites. The Regional Spatial Strategy and draft Regional Waste Strategy do not identify capacity requirements for this waste stream and comparisons are therefore not possible. Further work will be required to establish the most appropriate geographical pattern of new facilities to serve the region's needs. The capacity needed to recycle and treat hazardous wastes is illustrated in Table 5.8 and Figure 5.1 below:

¹⁸ Environment Agency: Deposits at Open Gate Special Waste Treatment Facilities 2001

Figure 5.1: Additional Capacity Required to Recycle and Treat Hazardous Waste in the West Midlands Region 2001-2021 ('000 tonnes)



5.16 There are currently no licensed waste disposal facilities for hazardous waste in the West Midlands and the availability of such facilities is very limited nationally. Some capacity in separate cells for Stabilised Non-Reactive Hazardous Wastes (SNRHW) is expected, but Waste Acceptance Criteria (WAC) will limit the types of materials which can be accepted at these sites. The shortfall in disposal capacity for Hazardous waste implies that such waste is likely to be subject to more frequent movement than at present and over greater distances. Increased waste transport costs for hazardous waste reinforce the need for additional pre-treatment capacity (although some spare capacity may exist, see 5.14 above) to facilitate disposal as non-hazardous waste. It may be possible to meet any additional capacity requirements through the expansion of existing facilities.

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6. All Waste Streams

6.1 This chapter summarises the projections for all the waste streams covered in the previous chapters, giving an overview of the total quantities of waste which require management over the period 2001 - 2021.

Future Waste Arising

6.2 Approximately 19 Mt of waste was generated in the West Midlands region in 2001 and the projections indicate that this will reduce slightly to 17.5 Mt by 2021. Over the course of the period until 2021, approximately 356 million tonnes of waste will be generated in the region. The projected quantities and types of waste from all waste streams are shown by Waste Planning Authority in Table 6.1. Taking into account waste re-use and the balance of known imports and exports, approximately 337 million tonnes of waste will require management in the region over the period 2001-2021.

Table 6.1: Cumulative Quantity of Waste Arising by Waste Stream and WPA 2001 – 2021 ('000 tonnes)

Waste Planning Authority	Municipal Waste 2001 - 2021	Industrial & Commercial Waste 2001 - 2021	Construction & Demolition Waste 2001 - 2021	Hazardous Waste 2001 - 2021	All Waste Streams
Birmingham	11,425	19,885	33,353	1,624	66,287
Coventry	3,599	6,997	7,553	529	18,678
Dudley	3,071	7,327	8,876	917	20,191
Herefordshire	1,899	3,121	5,641	181	10,842
Sandwell	3,248	10,470	11,656	1,189	26,563
Shropshire	3,776	6,841	7,998	288	18,903
Solihull	1,924	3,159	3,846	811	9,740
Staffordshire & Stoke on Trent	13,552	28,087	25,600	2,652	69,891
Telford & Wrekin	2,162	6,430	7,374	256	16,222
Walsall	3,547	7,157	6,454	959	18,117
Warwickshire	6,253	11,429	13,092	1,379	32,153
Wolverhampton	3,196	5,842	7,412	306	16,756
Worcestershire	6,425	14,326	9,773	915	31,439
Metropolitan area	30,010	60,837	79,150	6,335	176,332
Shire area	34,067	70,234	69,478	5,671	179,450
West Midlands Region	64,077	131,071	148,628	12,006	355,782

Future Waste Management

6.3 Many waste handling and waste management facilities can handle materials from different waste streams, whilst materials from some waste streams tend to be managed in facilities which deal exclusively with waste from a single waste stream. In forecasting future waste management capacity, this study identifies future capacity requirements for the following categories:

- Recycling facilities for Municipal waste by WPA;
- Recovery facilities for Municipal waste by WPA;
- Recycling and recovery facilities for Industrial & Commercial waste by WPA;
- Recycling facilities for Construction & Demolition waste by WPA;

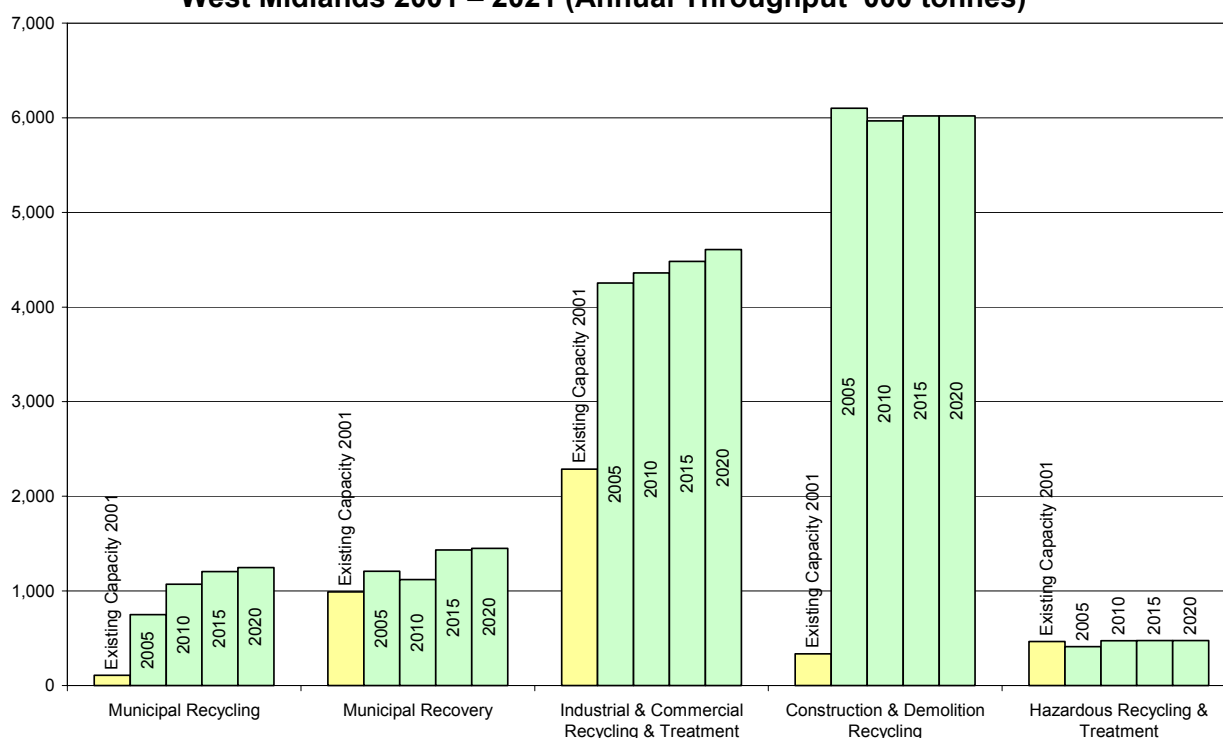
- The use of Construction & Demolition waste on exempt sites and for engineering & land restoration by WPA;
- Recycling and recovery facilities for Hazardous Waste by WPA;
- Non-hazardous landfill by WPA;
- Hazardous landfill by WPA.

6.4 Information about existing capacity at these types of facilities has been taken from the Environment Agency's 2001 update to the SWMA, supplemented by the findings of a study carried out by Golders / MEL on behalf of the WMRA where appropriate. The indicative waste management capacity needed to manage waste during the period is shown in Tables 6.2 - 6.3 and Figures 6.1 – 6.3 below. Annexes 1-16 illustrate the additional capacity requirements for waste from each waste stream for each WPA.

Table 6.2: Indicative Capacity Required to Manage Waste in the West Midlands Region by Type of Capacity 2001- 2021 ('000 tonnes)

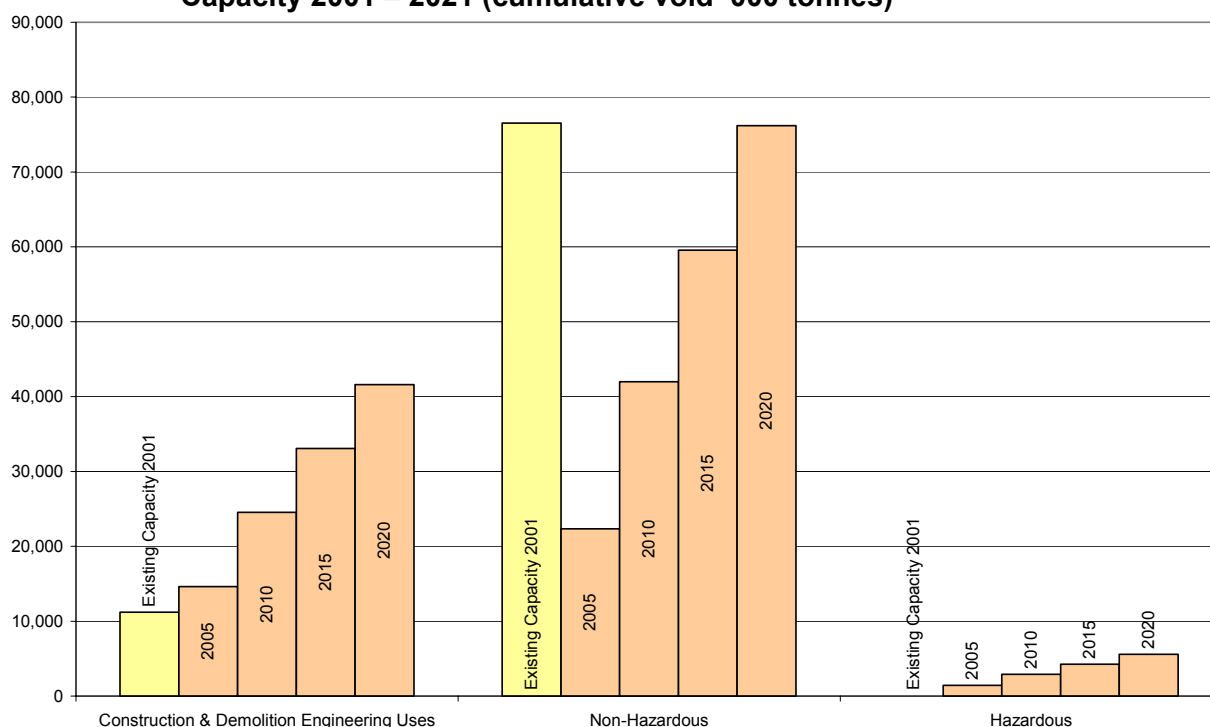
Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling & Recovery					
Municipal Recycling	109	750	1,070	1,205	1,248
Municipal Recovery	990	1,207	1,119	1,433	1,450
Industrial & Commercial Recycling & Recovery	2,286	4,255	4,360	4,482	4,607
Construction & Demolition Recycling	336	6,101	5,967	6,020	6,020
Construction & Demolition Engineering Uses	11,205	14,633	24,532	33,069	41,605
Hazardous Recycling & Recovery	466	411	474	477	477
Disposal					
Non-Hazardous	76,515	22,348	41,981	59,559	76,194
Hazardous	0	1,420	2,921	4,241	5,561

Figure 6.1: Future Recycling & Recovery Requirement by Type of Capacity in the West Midlands 2001 – 2021 (Annual Throughput '000 tonnes)



- 6.5 The need for additional municipal recycling and recovery capacity derives from a complex interaction of Government targets, particularly those relating to the diversion of biodegradable waste away from landfill. Even taking into account the fact that much of the recycling activity for municipal waste currently takes place outside the region, the projections indicate that significant additional municipal recycling & composting capacity will be required. The need for additional municipal recovery capacity could be met through additional recycling facilities; energy recovery facilities; mechanical biological treatment facilities or a combination of these and other new technologies, depending on local circumstances.
- 6.6 There is also an urgent need for new recycling and treatment capacity for industrial & commercial wastes, especially in metropolitan areas where businesses are still heavily reliant on disposal to landfill. It is likely that more capacity exists than is reflected in existing assessments due problems with the recording of waste by metal recyclers and at commercial transfer stations. Some of this capacity may be provided as merchant capacity at new municipal facilities. Notwithstanding strong existing performance, there is also an urgent need to capture more of the value of C&D waste through the development of additional recycling capacity especially in areas targeted for development in RSS. Existing treatment for hazardous wastes may be adequate depending on pattern of waste movements and need for pre-treatment to allow the disposal of residual waste in on-hazardous landfills.

Figure 6.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)



- 6.7 Based on the Environment Agency's 2001 assessment of existing licensed capacity at non-hazardous landfill sites, the projections suggest that adequate capacity probably already exists. Further capacity with planning permission but which is unlicensed was identified in the draft Regional Waste Strategy and would provide flexibility. However, whilst there may be adequate non-hazardous landfill capacity regionally, local deficiencies will occur. Given the recent changes to the regulation of landfill sites which derive from the implementation of the Landfill Directive, more recent information concerning existing landfill capacity is required. Both the Environment Agency and the RTAB are currently collecting data to update existing knowledge.

Table 6.3: Summary of Additional Waste Management Facilities Required to Manage Waste in the West Midlands Region by Type of Capacity 2001- 2021 ('000 tonnes)

Waste Planning Authority	Municipal Recycling Facilities	Municipal Recovery Capacity	Municipal Recovery Capacity	I&C Recycling & Recovery	C&D Recycling	C&D Engineering & Voids	Hazwaste Recycling & Recovery	Non-Hazardous Landfill	Hazardous Landfill
	25 ktpa	25 ktpa	250 ktpa	25 ktpa	100 ktpa	Cumulative Void	25 ktpa	Cumulative Void	Cumulative Void
Birmingham	9	-1	0	12	13	17,082	-1	11,355	426
Coventry	3	-6	-1	11	3	3,832	0	1,923	46
Dudley	2	0	0	7	4	4,390	0	-2,492	904
Herefordshire	2	2	0	1	2	2,351	0	-12,870	0
Sandwell	2	3	0	-8	4	5,928	-3	3,683	591
Shropshire	2	3	0	8	3	2,899	0	-16,628	88
Solihull	1	2	0	5	1	1,978	0	-8,928	0
Staffordshire & Stoke on Trent	9	3	0	23	9	1,034	0	16,588	1,298
Telford & Wrekin	2	2	0	9	2	3,541	0	1,513	309
Walsall	3	3	0	1	3	3,085	2	-1,843	84
Warwickshire	4	5	1	10	5	4,336	1	1,114	1,717
Wolverhampton	2	-1	0	8	4	3,708	-1	5,261	12
Worcestershire	5	5	1	6	4	4,029	2	1,003	86
Metropolitan area	23	0	0	37	33	40,003	-3	8,959	2,063
Shire area	23	19	2	56	24	18,190	3	-9,280	3,498
West Midlands Region	46	19	2	93	57	58,193	0	-321	5,561

NB: Negative values indicate a surplus

Conclusions

- 6.8 This study is based on limited information about capacity at existing facilities and should therefore be interpreted as illustrating a worst case scenario. As a broad indication of the scale of change which is required, 176 additional waste recycling and treatment facilities are likely to be required by 2005 and 215 additional facilities are likely to be required by 2021. The availability of additional waste management capacity would significantly enhance the region's ability to achieve greater resource efficiency and to curtail existing dependence on landfill.
- 6.9 There are particular challenges ahead with respect to the future management of C&D waste and Hazardous waste and further work is recommended on these issues in particular. Further work will also be required to assess the most sustainable options for tackling the need for new waste capacity and to establish the most appropriate geographical pattern of new facilities to serve the region's needs.

Annexes 1 – 13:

**Waste Generation and Management Projections
by Waste Planning Authority**

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Annex 1: Birmingham

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Table A1.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	5	129	191	215	219
Municipal Recovery	400	366	334	324	324
Industrial & Commercial Recycling & Treatment	575	765	790	829	872
Construction & Demolition Recycling	125	1,227	1,400	1,407	1,407
Construction & Demolition Engineering Uses	0	2765	5090	7254	9418
Hazardous Recycling & Treatment	70	50	54	56	56
Disposal					
Non-Hazardous	0	3,161	6,115	8,853	11,455
Hazardous	0	115	236	331	426

Figure A1.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

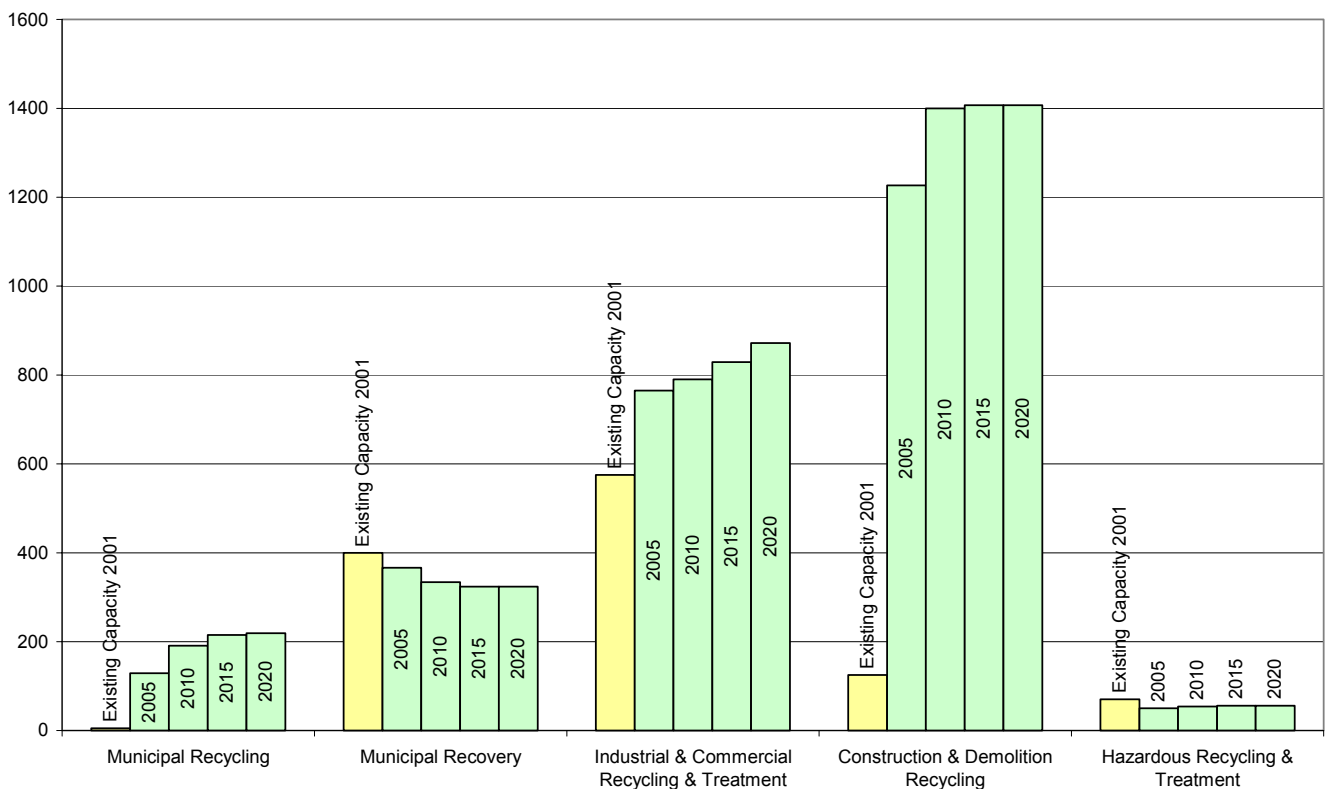


Figure A1.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

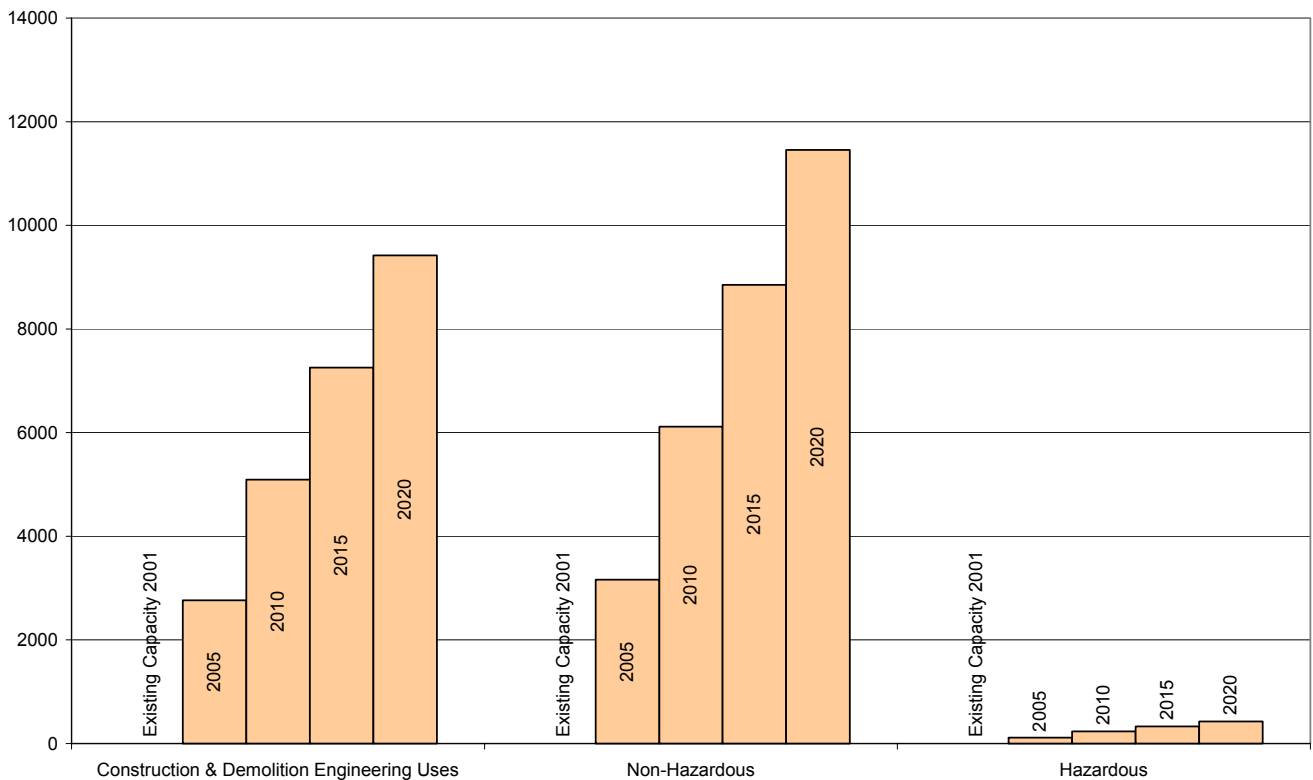


Table A1.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	5	124	5	210	8
Municipal Recovery Capacity (Through Recycling)	400	-34	-1	-76	-3
Industrial & Commercial Recycling & Treatment	575	190	8	297	12
Construction & Demolition Recycling	125	1,102	11	1,282	13
Hazardous Recycling & Treatment	70	-20	-1	-14	-1
TOTAL	1,175	1,362	22	1,699	29

NB: Negative values indicate a surplus

Annex 2: Coventry

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Table A2.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	1	35	60	68	70
Municipal Recovery	190	114	90	88	88
Industrial & Commercial Recycling & Treatment	72	329	338	347	355
Construction & Demolition Recycling	1	279	316	336	336
Construction & Demolition Engineering Uses	0	620	1,094	1,573	2,051
Hazardous Recycling & Treatment	12	0	0	0	0
Disposal					
Non-Hazardous	1500	979	1937	2,873	3,789
Hazardous	0	5	22	34	46

Figure A2.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

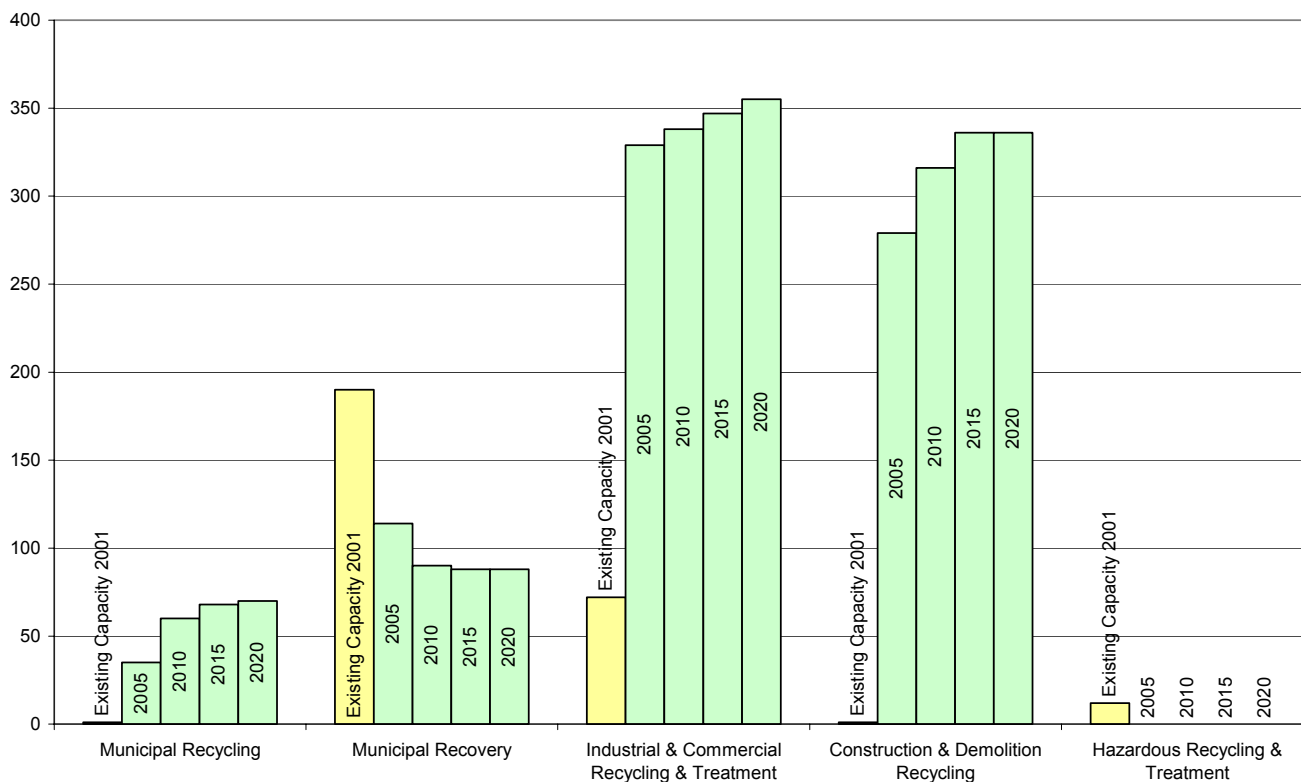


Figure A2.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

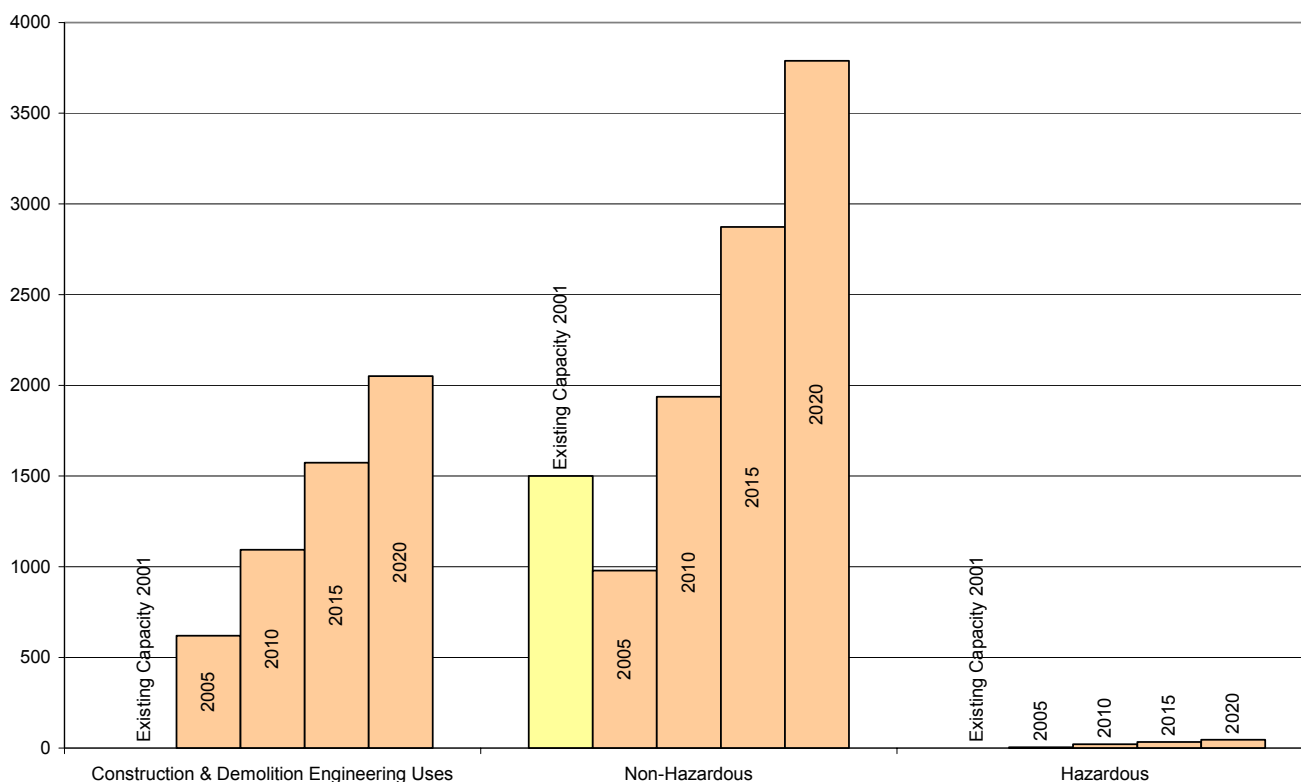


Table A2.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	1	34	1	69	3
Municipal Recovery (Recycling)	190	-76	-3	-102	-4
Industrial & Commercial Recycling & Treatment	72	257	10	283	11
Construction & Demolition Recycling	1	278	3	335	3
Hazardous Recycling & Treatment	12	-12	0	-12	0
TOTAL	276	481	11	573	13

NB: Negative values indicate a surplus

Annex 3: Dudley

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Table A3.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	1	30	51	58	60
Municipal Recovery	95	94	89	87	87
Industrial & Commercial Recycling & Treatment	182	368	368	368	368
Construction & Demolition Recycling	0	276	394	433	433
Construction & Demolition Engineering Uses	0	609	1,161	1,738	2,315
Hazardous Recycling & Treatment	0	3	3	3	3
Disposal					
Non-Hazardous	6275	665	1321	2,006	2,704
Hazardous	0	185	431	668	904

Figure A3.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

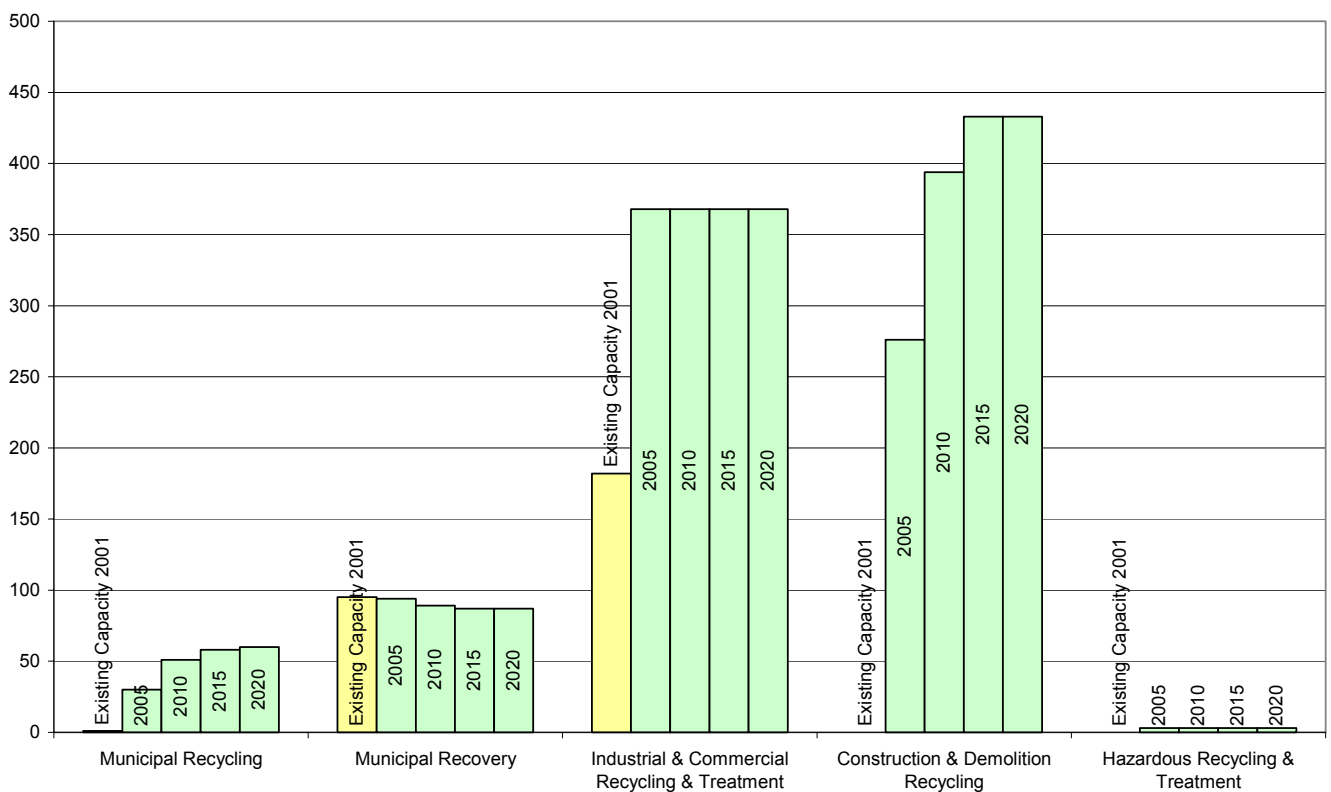


Figure A3.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

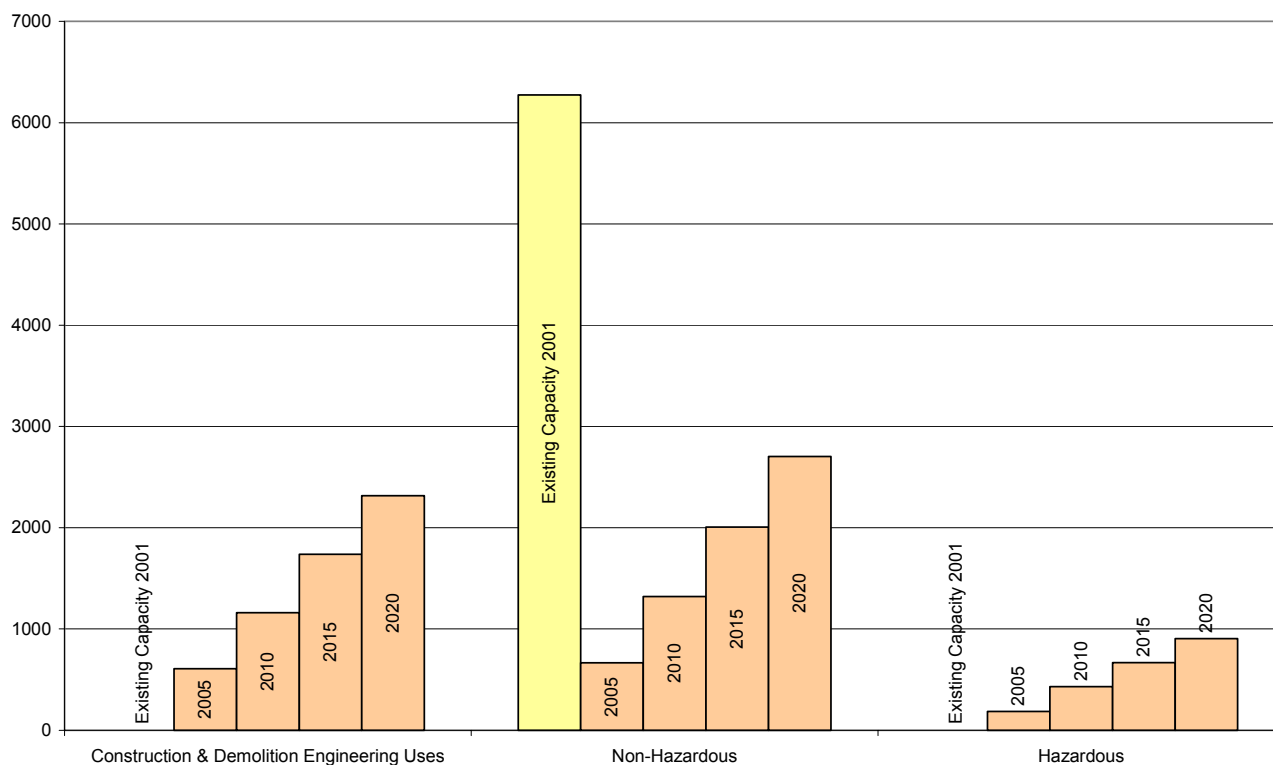


Table A3.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	1	29	1	59	2
Municipal Recovery (Recycling)	95	-1	0	-8	0
Industrial & Commercial Recycling & Treatment	182	186	7	186	7
Construction & Demolition Recycling	0	276	3	433	4
Hazardous Recycling & Treatment	0	3	0	3	0
TOTAL	278	493	11	673	13

Annex 4: Herefordshire

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Table A4.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	0	26	32	36	38
Municipal Recovery	0	13	15	35	37
Industrial & Commercial Recycling & Recovery	10	28	28	29	31
Construction & Demolition Recycling	0	255	219	220	220
Construction & Demolition Engineering Uses	24	618	945	1,226	1,507
Hazardous Recycling & Recovery	0	0	0	0	0
Disposal					
Non-Hazardous	100	543	993	1,364	1,681
Hazardous	0	0	0	0	0

Figure A4.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

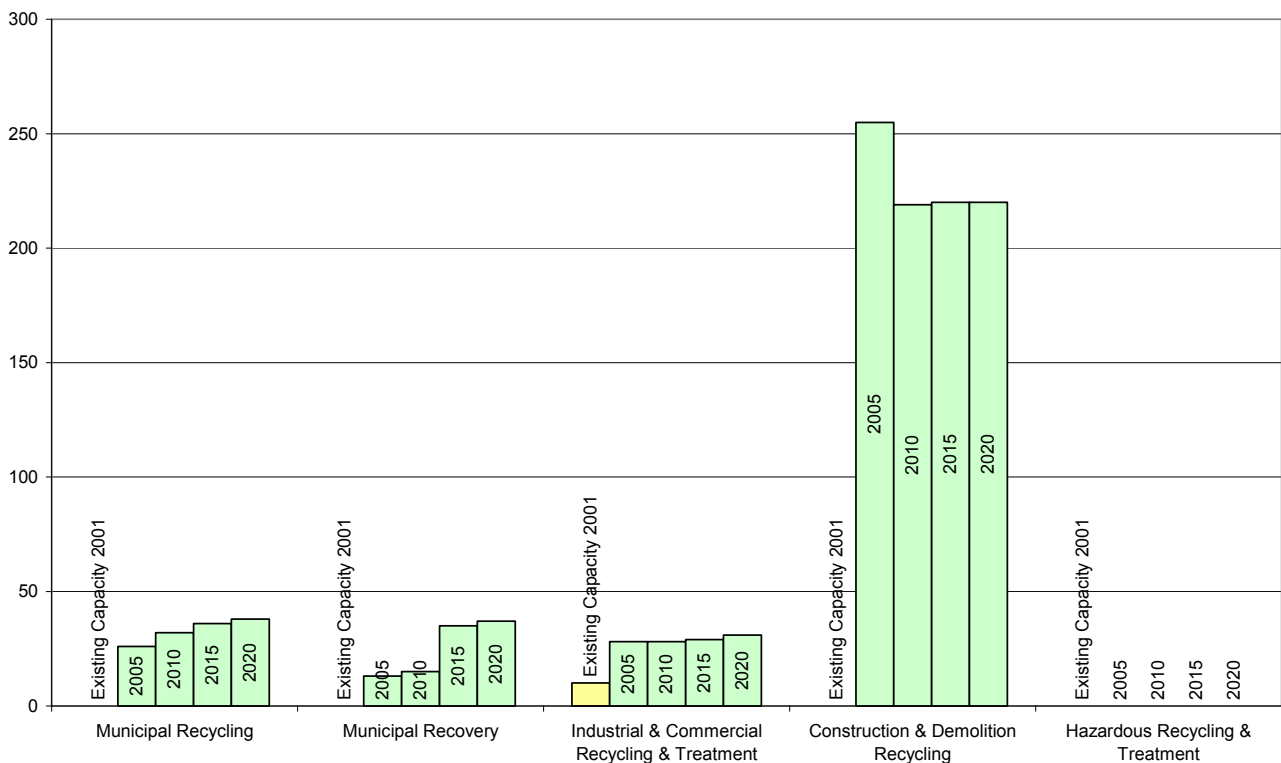


Figure A4.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

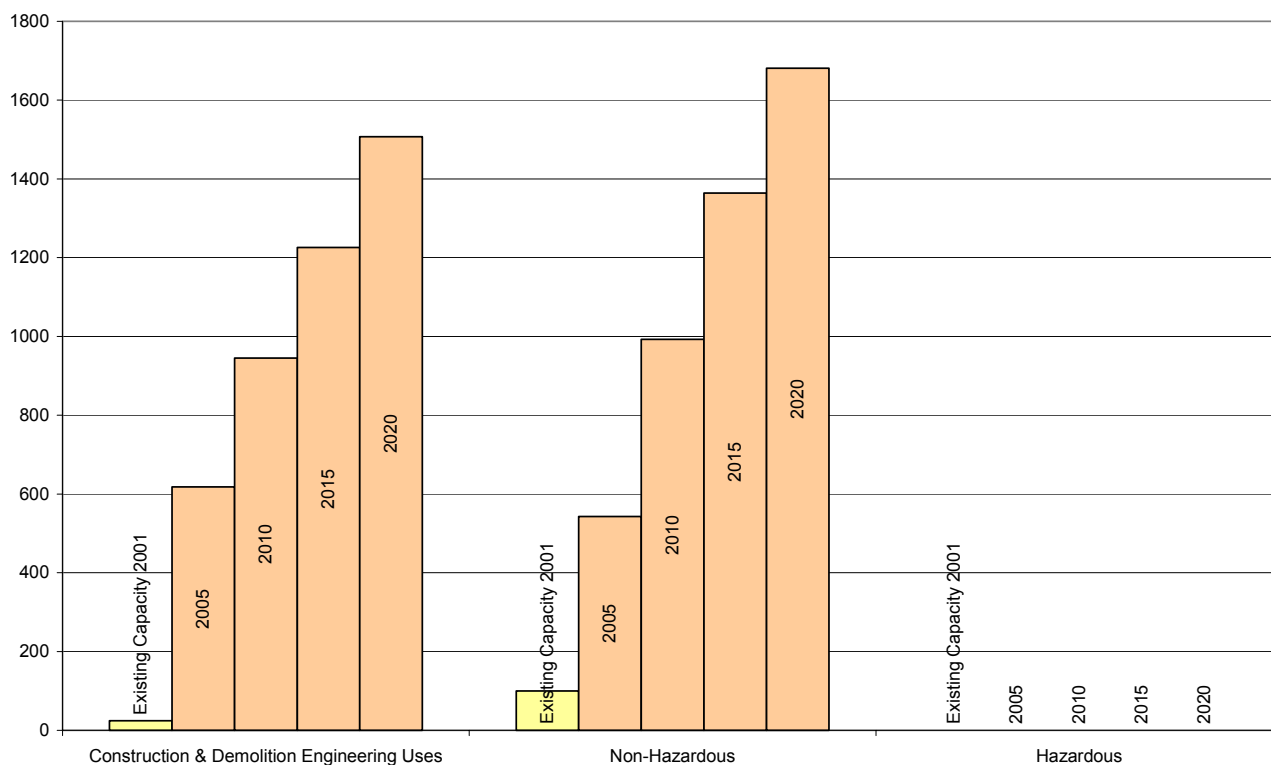


Table A4.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	26	1	38	2
Municipal Recovery (Recycling)	0	13	1	37	1
Industrial & Commercial Recycling & Recovery	10	18	1	21	1
Construction & Demolition Recycling	0	255	3	220	2
Hazardous Recycling & Recovery	0	0	0	0	0
TOTAL	10	312	6	316	6

Annex 5: Sandwell

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Table A5.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	1	32	54	61	63
Municipal Recovery	0	37	36	60	62
Industrial & Commercial Recycling & Recovery	592	360	369	378	388
Construction & Demolition Recycling	30	453	471	472	472
Construction & Demolition Engineering Uses	0	1,148	2,055	2,889	3,723
Hazardous Recycling & Recovery	192	100	116	117	117
Disposal					
Non-Hazardous	9,260	1,906	3,515	4,925	6,258
Hazardous	0	154	322	456	591

Figure A5.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

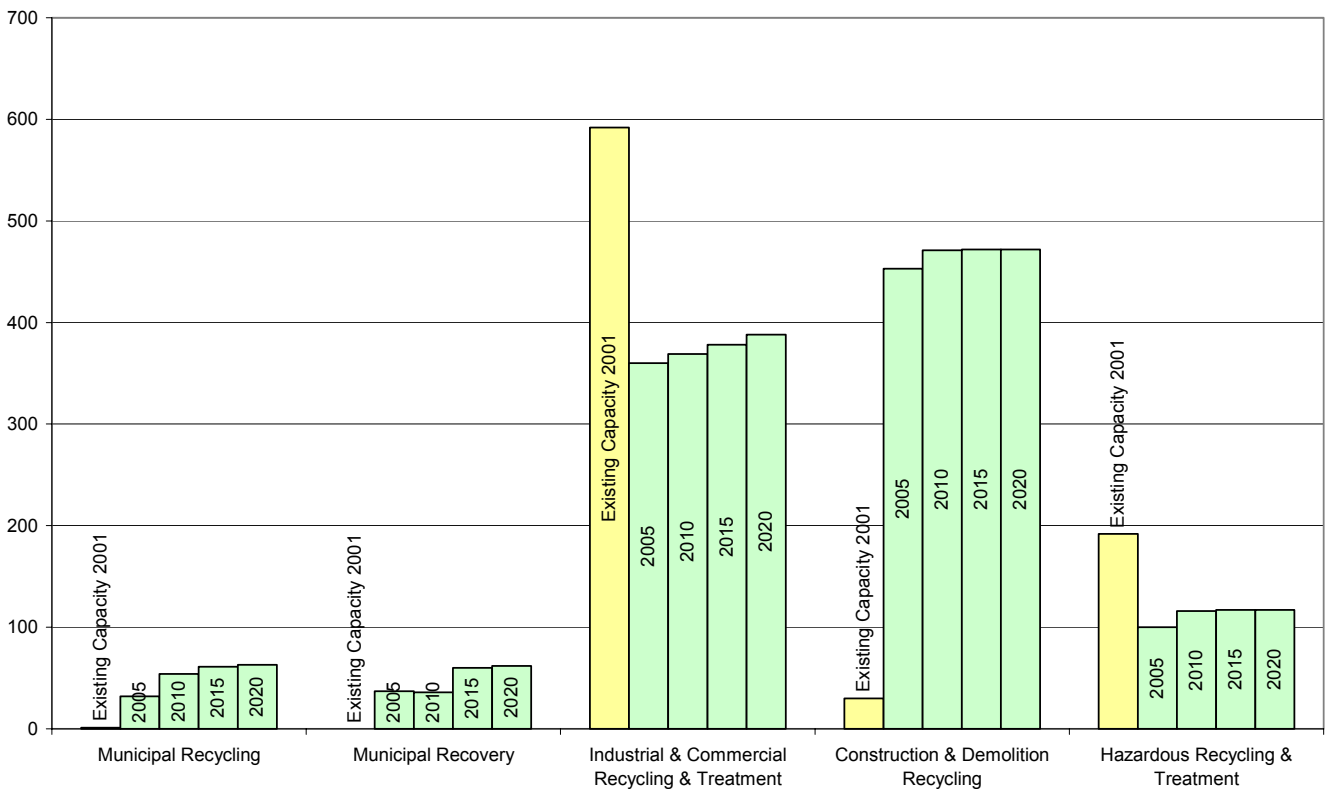


Figure A5.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

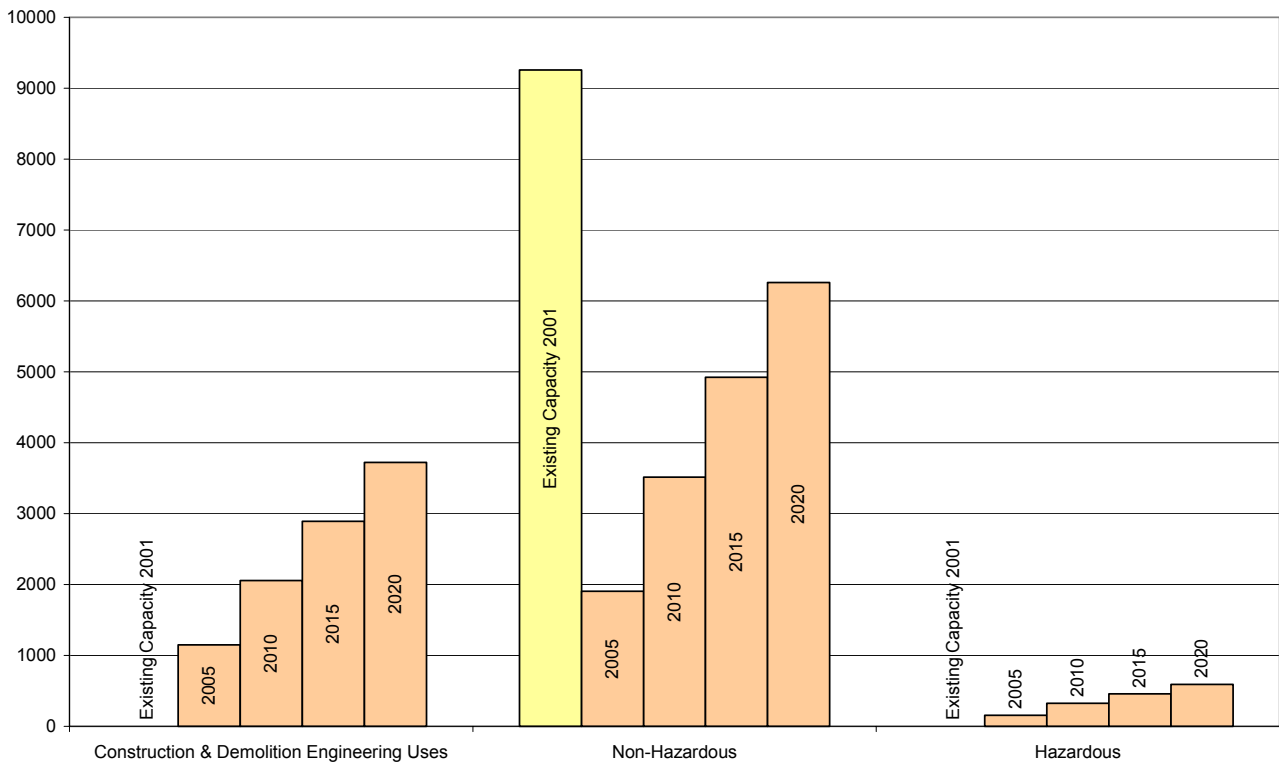


Table A5.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	31	1	62	2
Municipal Recovery (Recycling)	0	37	1	62	2
Industrial & Commercial Recycling & Recovery	592	-232	-9	-204	-8
Construction & Demolition Recycling	30	423	4	442	4
Hazardous Recycling & Recovery	192	-92	-4	-75	-3
TOTAL	814	167	-7	287	-3

NB: Negative values indicate a surplus

Annex 6: Shropshire

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Table A6.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	34	54	69	76	89
Municipal Recovery	0	41	43	101	93
Industrial & Commercial Recycling & Recovery	40	214	220	226	232
Construction & Demolition Recycling	48	354	299	300	300
Construction & Demolition Engineering Uses	285	913	1,391	1,812	2,232
Hazardous Recycling & Recovery	0	2	3	3	3
Disposal					
Non-Hazardous	1,866	1,631	2,967	4,126	5,179
Hazardous	0	18	44	66	88

Figure A6.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

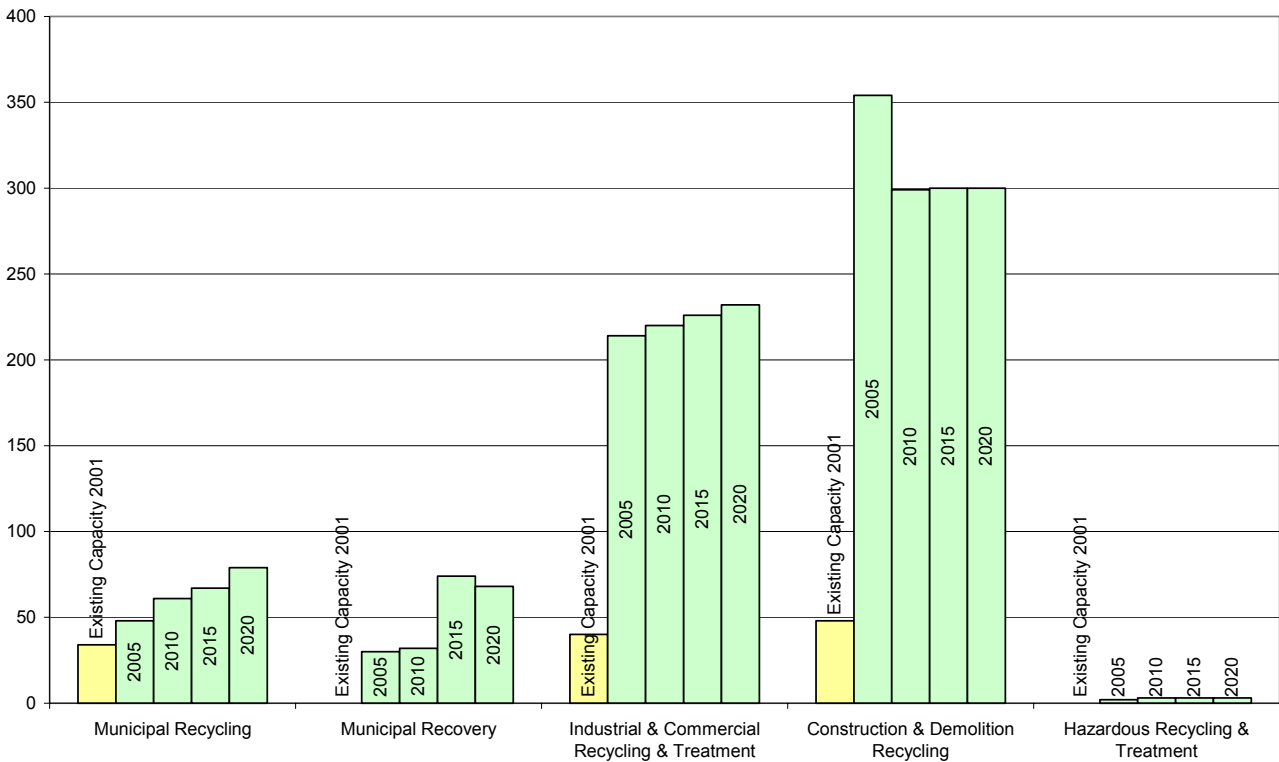


Figure A6.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

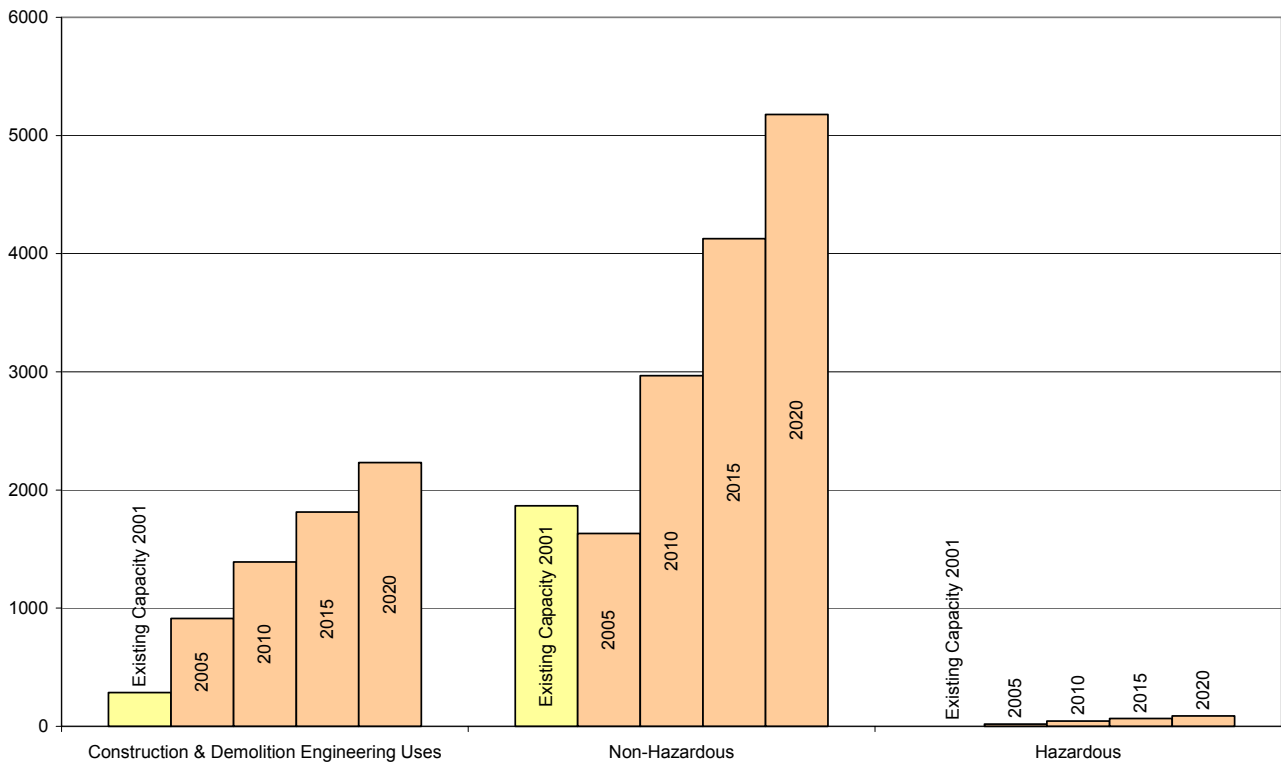


Table A6.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	14	1	45	2
Municipal Recovery (Recycling)	0	30	1	68	3
Industrial & Commercial Recycling & Recovery	40	174	7	192	8
Construction & Demolition Recycling	48	306	3	252	3
Hazardous Recycling & Recovery	0	2	0	3	0
TOTAL	88	526	12	560	16

Annex 7: Solihull

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Table A7.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	5	19	32	36	37
Municipal Recovery	0	62	55	54	54
Industrial & Commercial Recycling & Recovery	1	120	124	127	130
Construction & Demolition Recycling	70	138	160	168	168
Construction & Demolition Engineering Uses	0	319	565	811	1,058
Hazardous Recycling & Recovery	0	0	0	0	0
Disposal					
Non-Hazardous	500	500	926	1,332	1,732
Hazardous	0	0	0	0	0

Figure A7.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

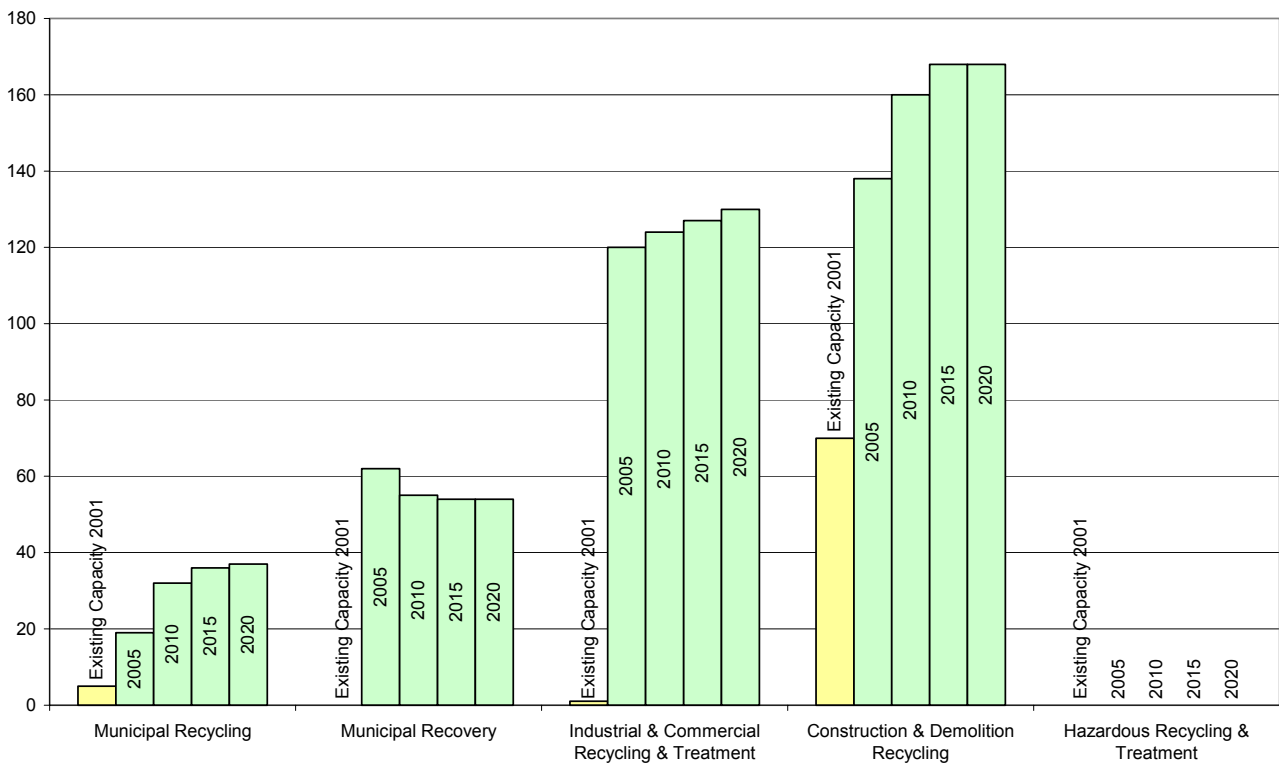


Figure A7.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

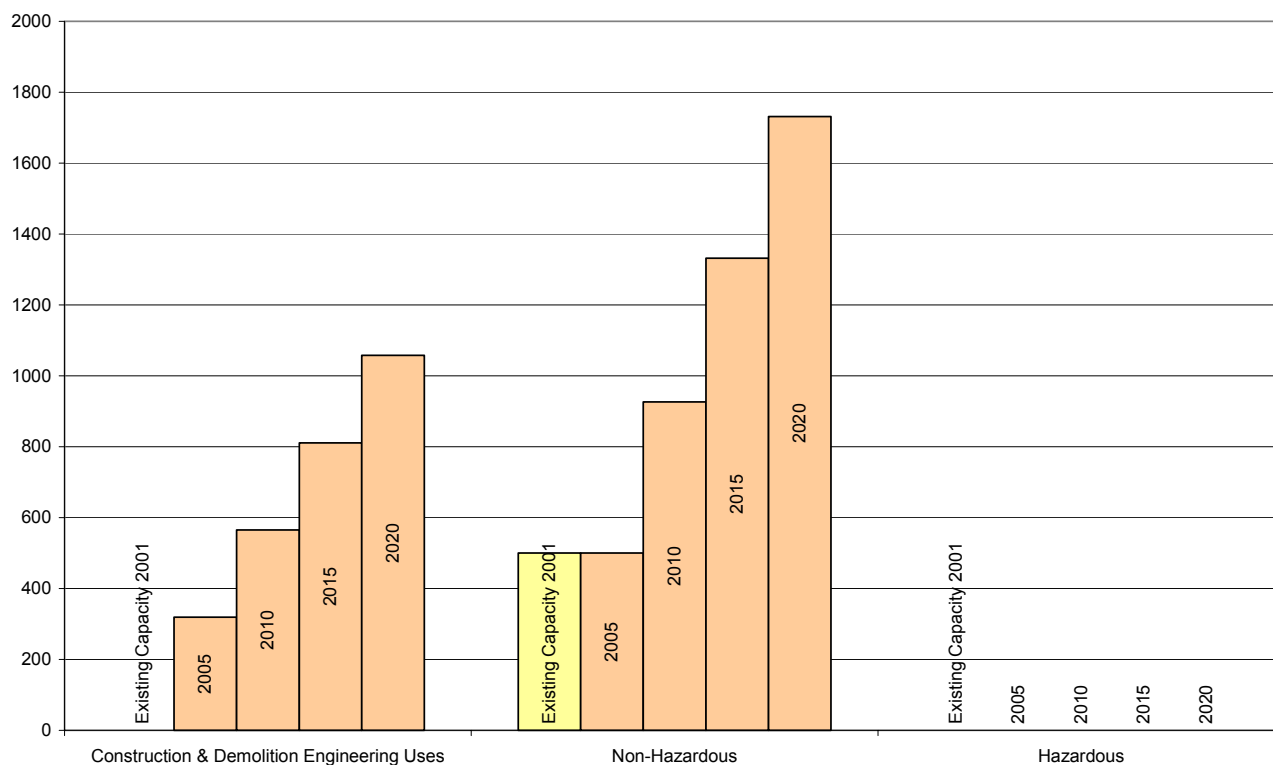


Table A7.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	14	1	32	1
Municipal Recovery (Recycling)	0	62	2	54	2
Industrial & Commercial Recycling & Recovery	1	119	5	129	5
Construction & Demolition Recycling	70	68	1	98	1
Hazardous Recycling & Recovery	0	0	0	0	0
TOTAL	71	263	9	313	9

Annex 8: Staffordshire & Stoke

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Table A8.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	39	177	229	256	260
Municipal Recovery	200	223	219	278	286
Industrial & Commercial Recycling & Recovery	220	736	754	773	792
Construction & Demolition Recycling	57	1,595	1,261	1,066	1,066
Construction & Demolition Engineering Uses	9602	2,890	4,660	5,816	6,972
Hazardous Recycling & Recovery	16	18	21	21	21
Disposal					
Non-Hazardous	17,126	4,840	9,204	12,990	16,588
Hazardous	0	316	664	981	1298

Figure A8.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

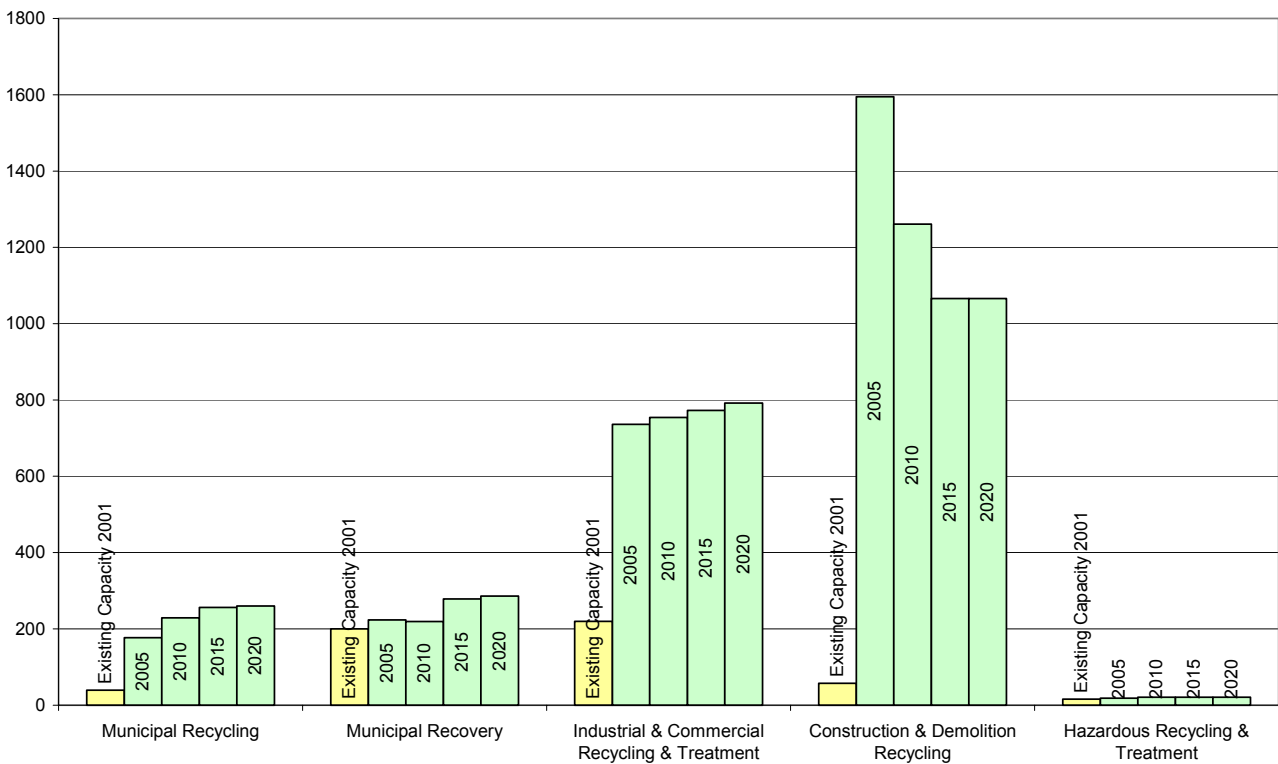


Figure A8.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

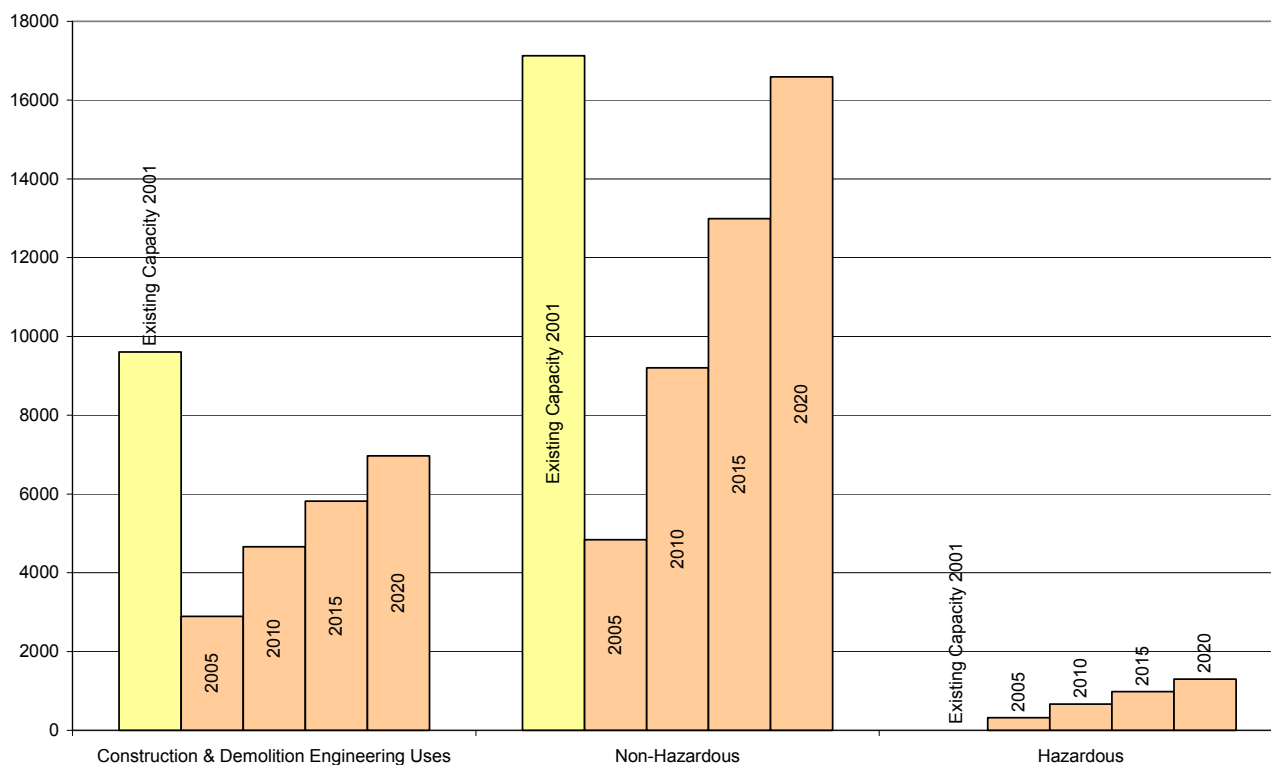


Table A8.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	138	6	221	9
Municipal Recovery (Recycling)	200	23	1	86	3
Industrial & Commercial Recycling & Recovery	220	516	21	572	23
Construction & Demolition Recycling	57	1,538	15	1,009	10
Hazardous Recycling & Recovery	16	2	0	5	0
TOTAL	493	2,217	43	1,893	45

Annex 9: Telford & Wrekin

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Table A9.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	0	24	36	41	43
Municipal Recovery	0	20	17	40	42
Industrial & Commercial Recycling & Recovery	0	217	222	228	233
Construction & Demolition Recycling	0	397	256	221	221
Construction & Demolition Engineering Uses	0	922	1,491	1,803	2,115
Hazardous Recycling & Recovery	0	0	0	0	0
Disposal					
Non-Hazardous	1,500	898	1,690	2,363	3,013
Hazardous	0	81	159	234	309

Figure A9.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

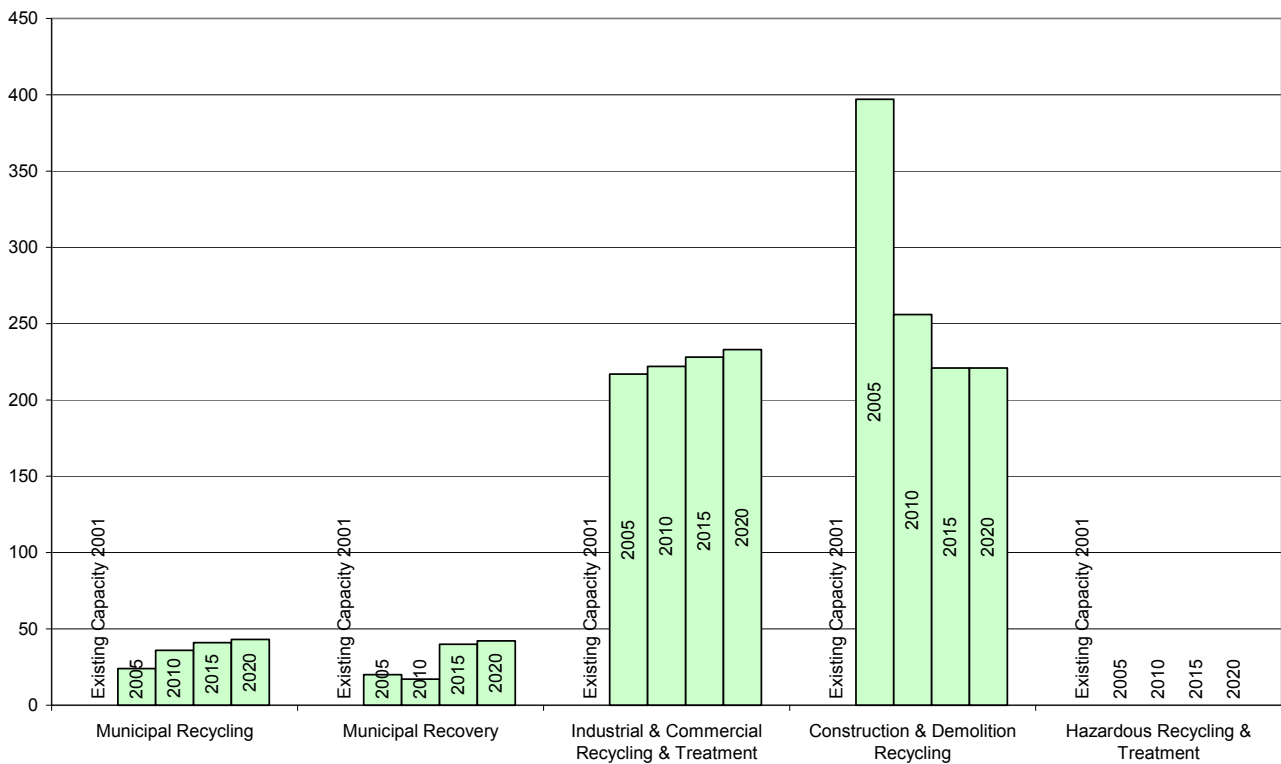


Figure A9.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

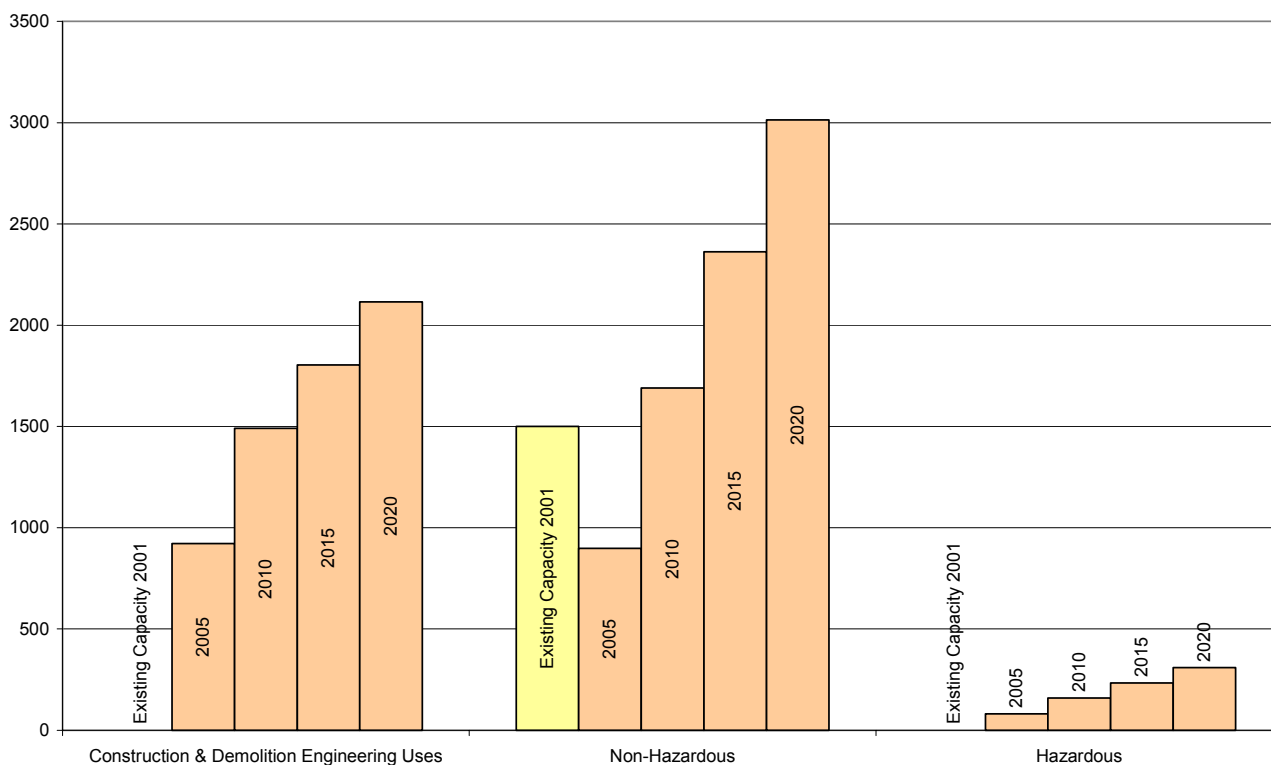


Table A9.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	24	1	43	2
Municipal Recovery (Recycling)	0	20	1	42	2
Industrial & Commercial Recycling & Recovery	0	217	9	233	9
Construction & Demolition Recycling	0	397	4	221	2
Hazardous Recycling & Recovery	0	0	0	0	0
TOTAL	0	658	15	539	15

Annex 10: Walsall

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Table A10.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	1	44	59	69	73
Municipal Recovery	0	28	36	68	72
Industrial & Commercial Recycling & Recovery	263	264	270	277	284
Construction & Demolition Recycling	0	184	284	327	327
Construction & Demolition Engineering Uses	0	427	799	1,242	1,685
Hazardous Recycling & Recovery	123	146	168	168	168
Disposal					
Non-Hazardous	6,275	1,305	2,423	3,463	4,432
Hazardous	0	54	82	83	84

Figure A10.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

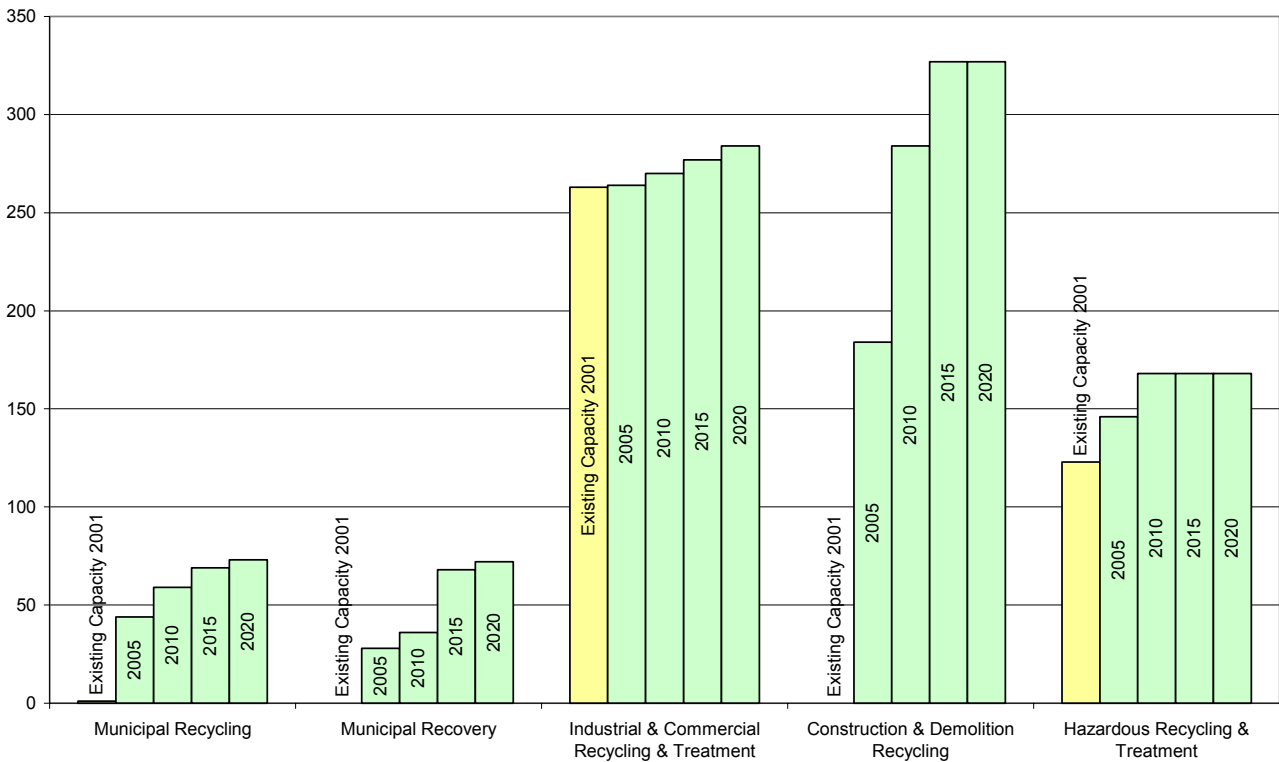


Figure A10.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

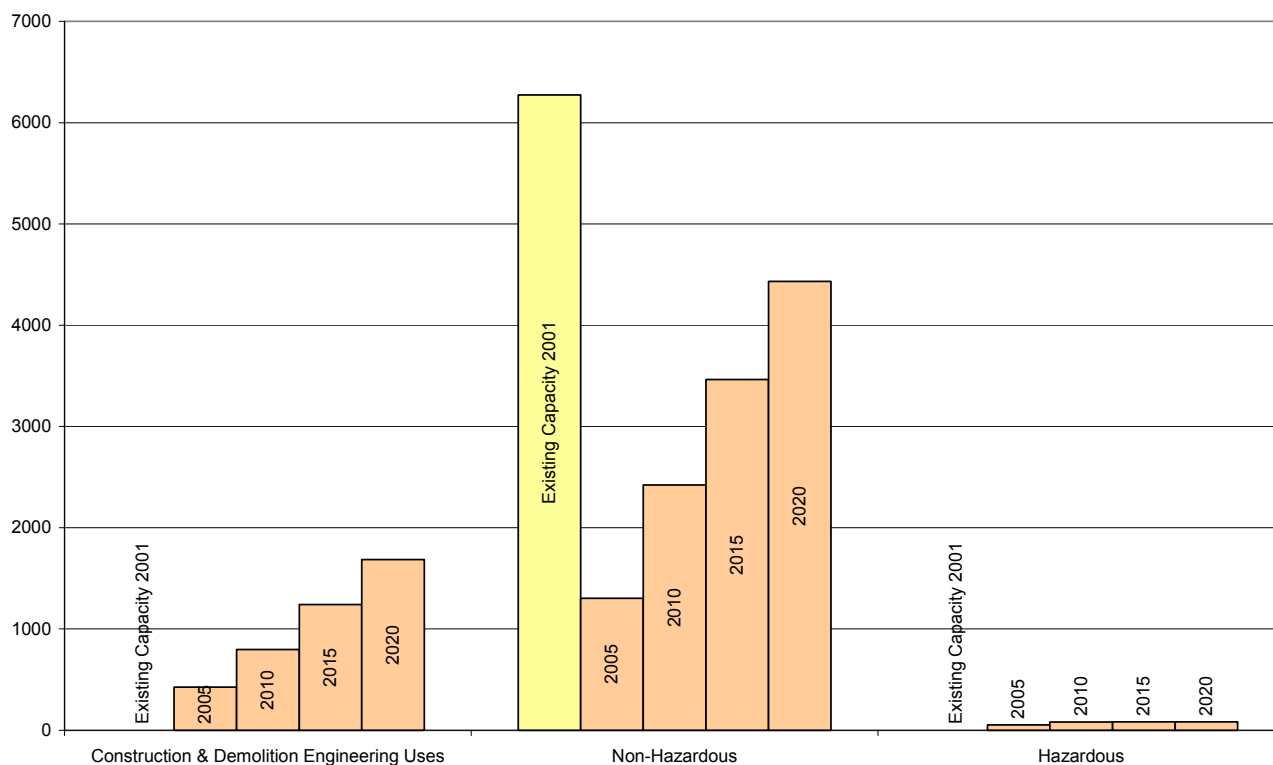


Table A10.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	43	2	72	3
Municipal Recovery (Recycling)	0	28	1	72	3
Industrial & Commercial Recycling & Recovery	263	1	0	21	1
Construction & Demolition Recycling	0	184	2	327	3
Hazardous Recycling & Recovery	123	23	1	45	2
TOTAL	386	279	6	537	12

Annex 11: Warwickshire

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Table A11.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	14	75	104	117	119
Municipal Recovery	0	58	49	114	116
Industrial & Commercial Recycling & Recovery	207	413	424	435	446
Construction & Demolition Recycling	0	594	500	490	490
Construction & Demolition Engineering Uses	705	1,500	2,289	2,908	3,527
Hazardous Recycling & Recovery	0	15	18	18	18
Disposal					
Non-Hazardous	9,260	2,995	5,639	8,049	10,374
Hazardous	0	430	871	1,294	1,717

Figure A11.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

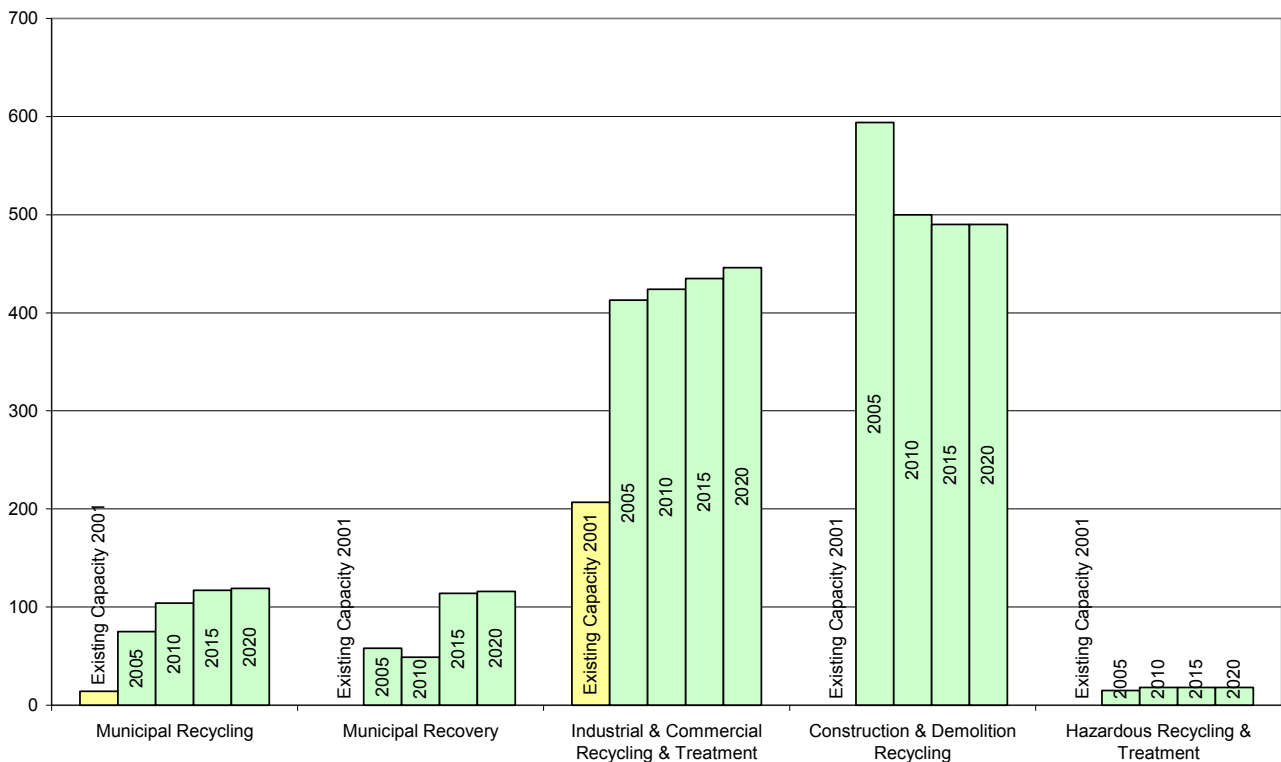


Figure A11.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

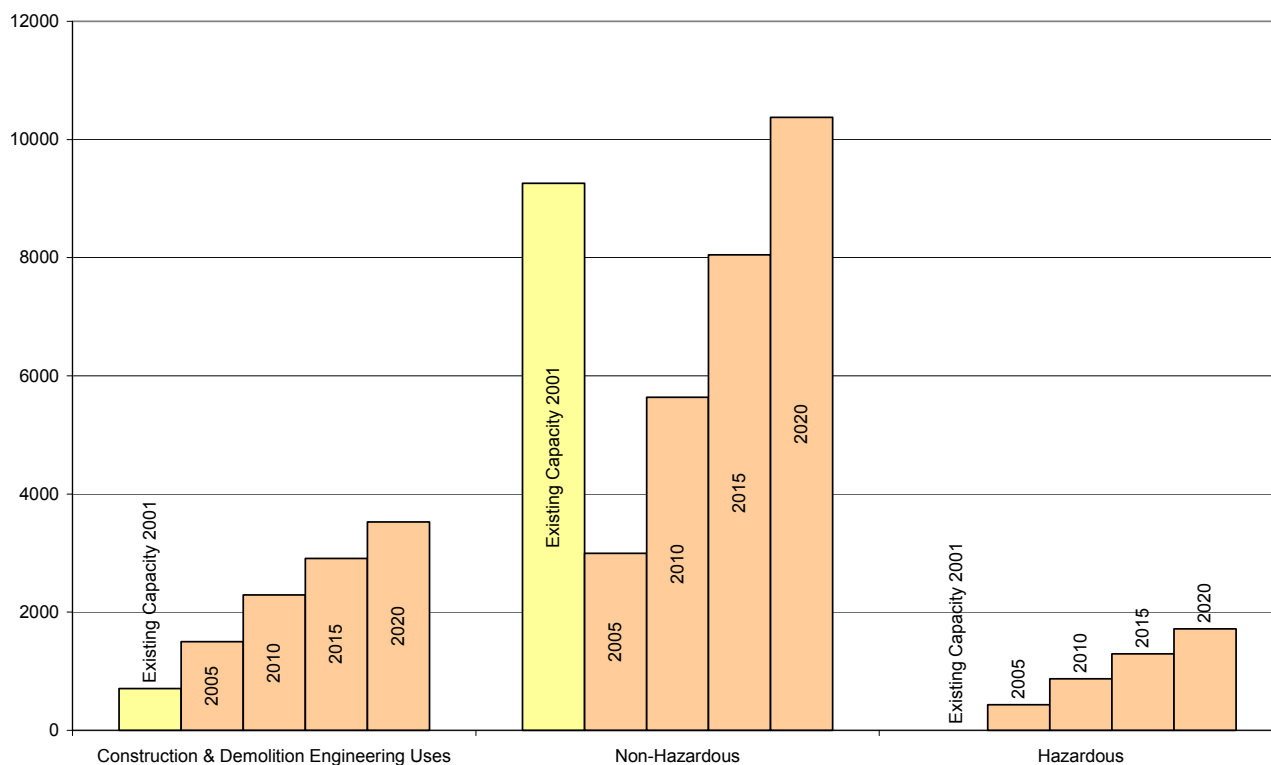


Table A11.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	61	2	105	4
Municipal Recovery (Recycling)	0	58	2	116	5
Industrial & Commercial Recycling & Recovery	207	206	8	239	10
Construction & Demolition Recycling	0	594	6	490	5
Hazardous Recycling & Recovery	0	15	1	18	1
TOTAL	207	934	19	968	25

Annex 12: Wolverhampton

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Table A12.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	3	31	53	60	63
Municipal Recovery	105	106	96	93	93
Industrial & Commercial Recycling & Recovery	31	219	225	231	237
Construction & Demolition Recycling	5	215	324	369	369
Construction & Demolition Engineering Uses	0	504	934	1,446	1,959
Hazardous Recycling & Recovery	43	18	19	19	19
Disposal					
Non-Hazardous	500	1,794	3,320	4,617	5,761
Hazardous	0	5	11	12	12

Figure A12.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

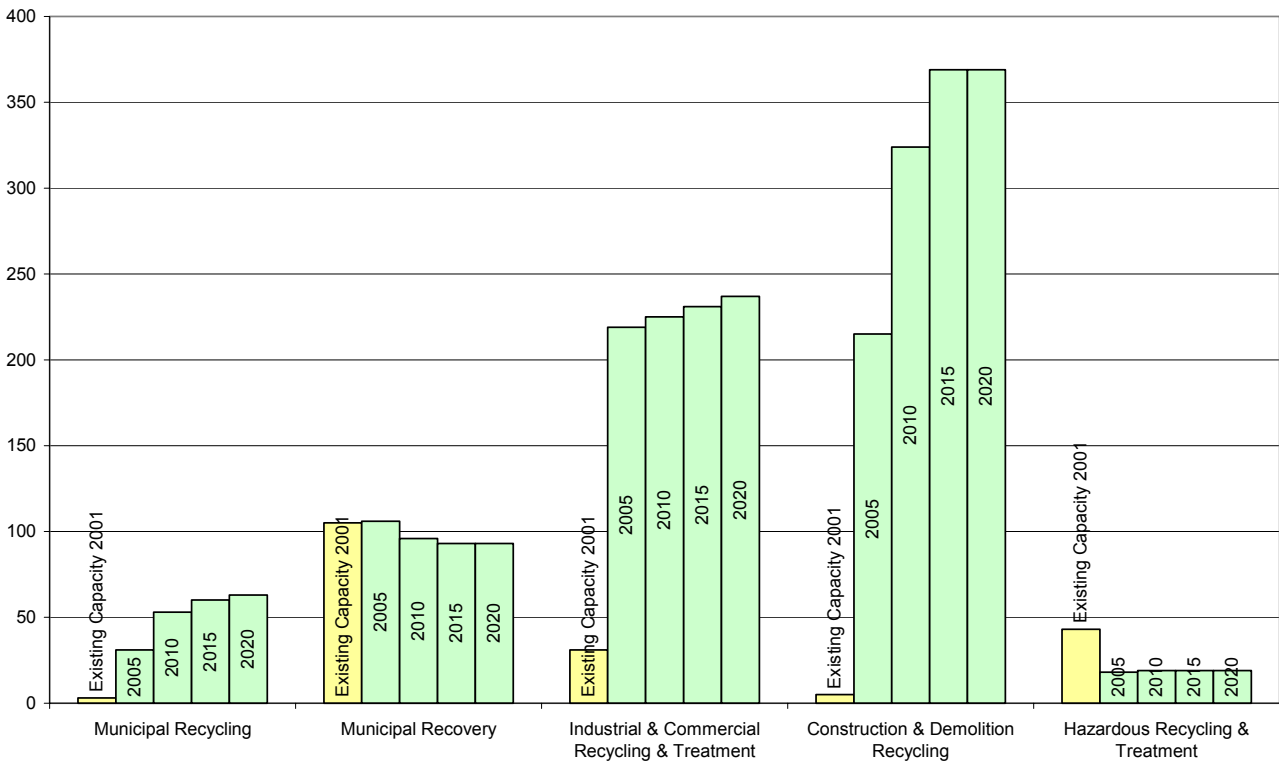


Figure A12.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

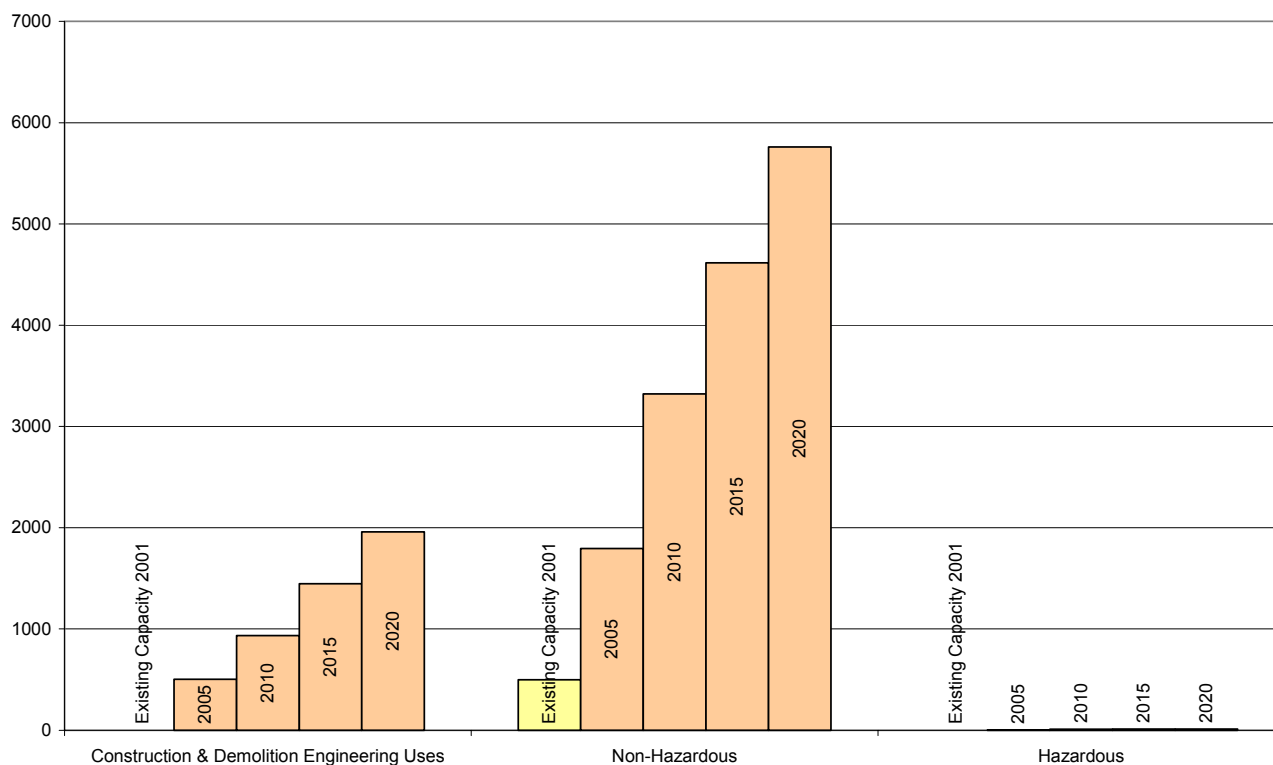


Table A12.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	28	1	60	2
Municipal Recovery (Recycling)	105	1	0	-12	0
Industrial & Commercial Recycling & Recovery	31	188	8	206	8
Construction & Demolition Recycling	5	210	2	364	4
Hazardous Recycling & Recovery	43	-25	-1	-24	-1
TOTAL	184	402	10	594	13

Annex 13: Worcestershire

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Table A13.1: Indicative Future Capacity Required 2001 – 2021 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity 2001	Capacity required by 2005	Capacity required by 2010	Capacity required by 2015	Capacity required by 2021
Recycling, Recovery & Treatment					
Municipal Recycling	10	80	108	121	124
Municipal Recovery	0	56	51	118	121
Industrial & Commercial Recycling & Recovery	93	222	228	234	239
Construction & Demolition Recycling	0	527	367	354	354
Construction & Demolition Engineering Uses	589	1,398	2,058	2,551	3,043
Hazardous Recycling & Recovery	10	59	72	72	72
Disposal					
Non-Hazardous	2,225	1,131	1,931	2,598	3,228
Hazardous	0	57	79	82	86

Figure A12.1: Future Recycling & Recovery Requirement by Type of Capacity 2001 – 2021 (Annual Throughput) '000 tonnes)

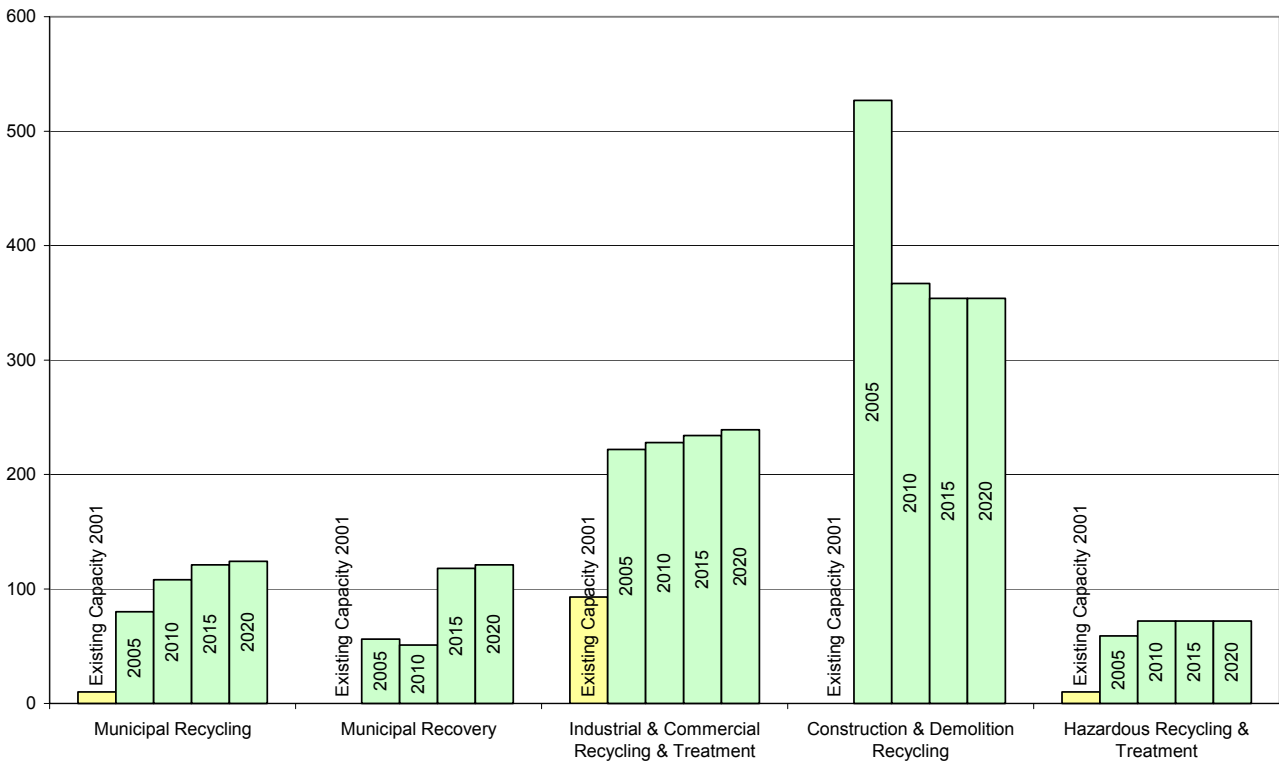


Figure A13.2: Future Requirement for C&D Engineering Uses and Landfill by Type of Capacity 2001 – 2021 (cumulative void '000 tonnes)

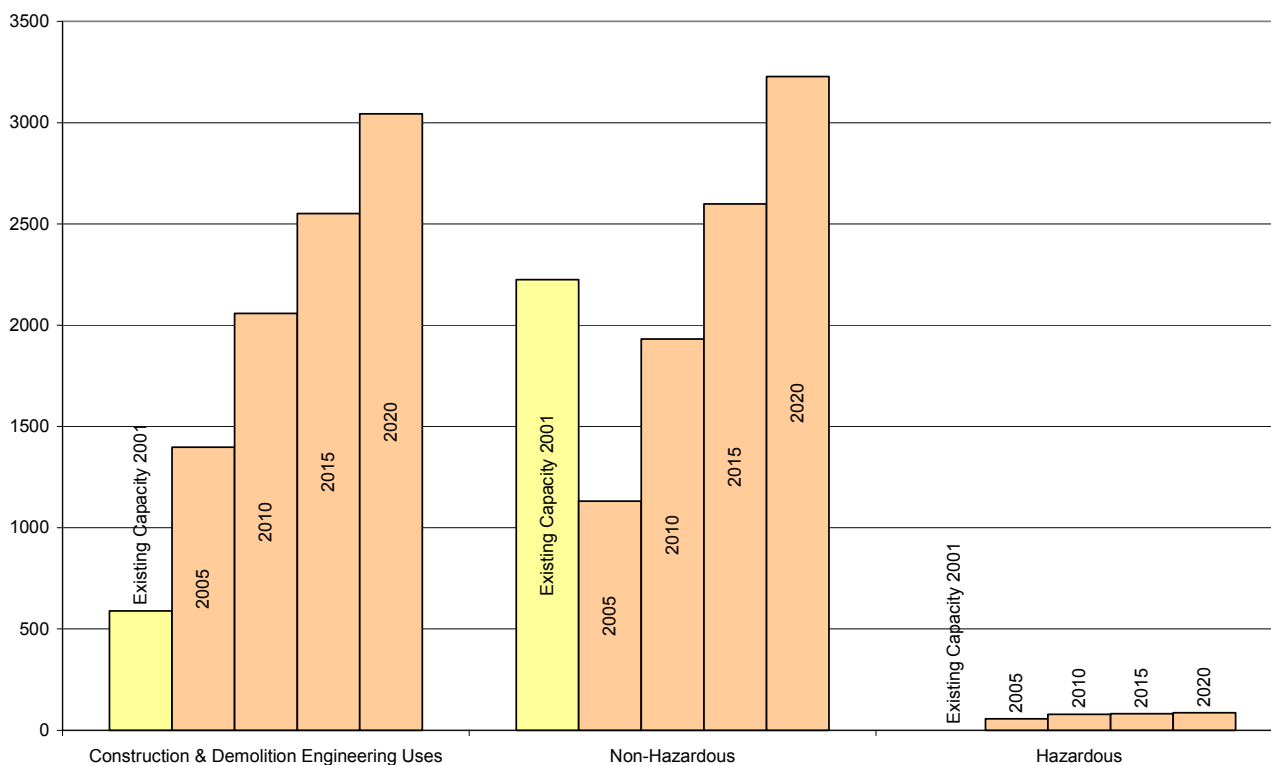


Table A13.2: Number of Additional Recycling & Recovery Facilities Required 2005 and 2020 ('000 tonnes)

Future Requirement by Type of Capacity	Existing Capacity	Additional Capacity Required by 2005	Equivalent No. Facilities	Additional Capacity Required by 2021	Equivalent No. Facilities
Municipal Recycling	0	70	3	114	5
Municipal Recovery (Recycling)	0	56	2	121	5
Industrial & Commercial Recycling & Recovery	93	129	5	146	6
Construction & Demolition Recycling	0	527	5	354	4
Hazardous Recycling & Recovery	10	49	2	62	2
TOTAL	103	831	17	797	22