
Estimated Waste Arisings in the South East Region
Viridis Report: January 2003
Milton Keynes
Banbury
BUCKINGHAMSHIRE
Oxford
Aylesbury
OXFORDSHIRE
Wycombe
BERKSHIRE
Newbury
Slough
Reading
Basingstoke
SURREY
Dartford
Maidstone
KENT
Tonbridge
Canterbury
Winchester
Guildford
Ashford
Dover
Tunbridge Wells
HAMPSHIRE
Crawley
Folkestone
Southampton
WEST SUSSEX
EAST SUSSEX
Portsmouth
Chichester
Brighton
Eastbourne
Newport
ISLE OF WIGHT

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Executive Summary

Viridis were commissioned by SEEDA to produce this report which presents the findings of a study on waste arising in the South East of England. The research, carried out using the best available published statistics and some proxy data, provides an estimate of waste arising for a baseline year (2000) from which projections for up to 2010 have been made.

It is estimated that for the year 2000, the region produced 28 million tonnes of total waste. Current projections would predict that these arisings will increase to approximately 35 million tonnes in 2010.

The main waste streams identified are (per annum):

- Agricultural waste: **5 million tonnes**
- Household waste : **4.4 million tonnes**
- Industrial and commercial waste: **9 million tonnes**
- Construction and demolition waste: **13.5 million tonnes**.
- ELVs: **330,000** vehicles
- Post-consumer tyres: **50,000 tonnes**

Potentially recyclable materials within these waste streams amount to:

- Plastics: **1.6 million tonnes**
- Green waste: **570,000 tonnes**
- Paper and cardboard: **4.4 million tonnes**
- Glass: **510,000 tonnes**
- Metals: **980,000 tonnes**
- Wood: **540,000 tonnes**.

This data has been broken down to provide the relative contributions of the different Counties in the Southeast. The following plates present a breakdown of the significant waste streams per material and per County:

Plate 1: Household waste

Plate 2: Industrial waste

Plate 3: Commercial waste

Plate 4: Clinical waste

Plate 5: Special waste

Plate 6: Total arising by recyclable materials

Plate 7: Construction & Demolition waste

Plate 8: WEEE

Plate 9: Tyres

Plate 10: ELVs.

Tables with County-level breakdown of waste arisings are presented in the Appendix.

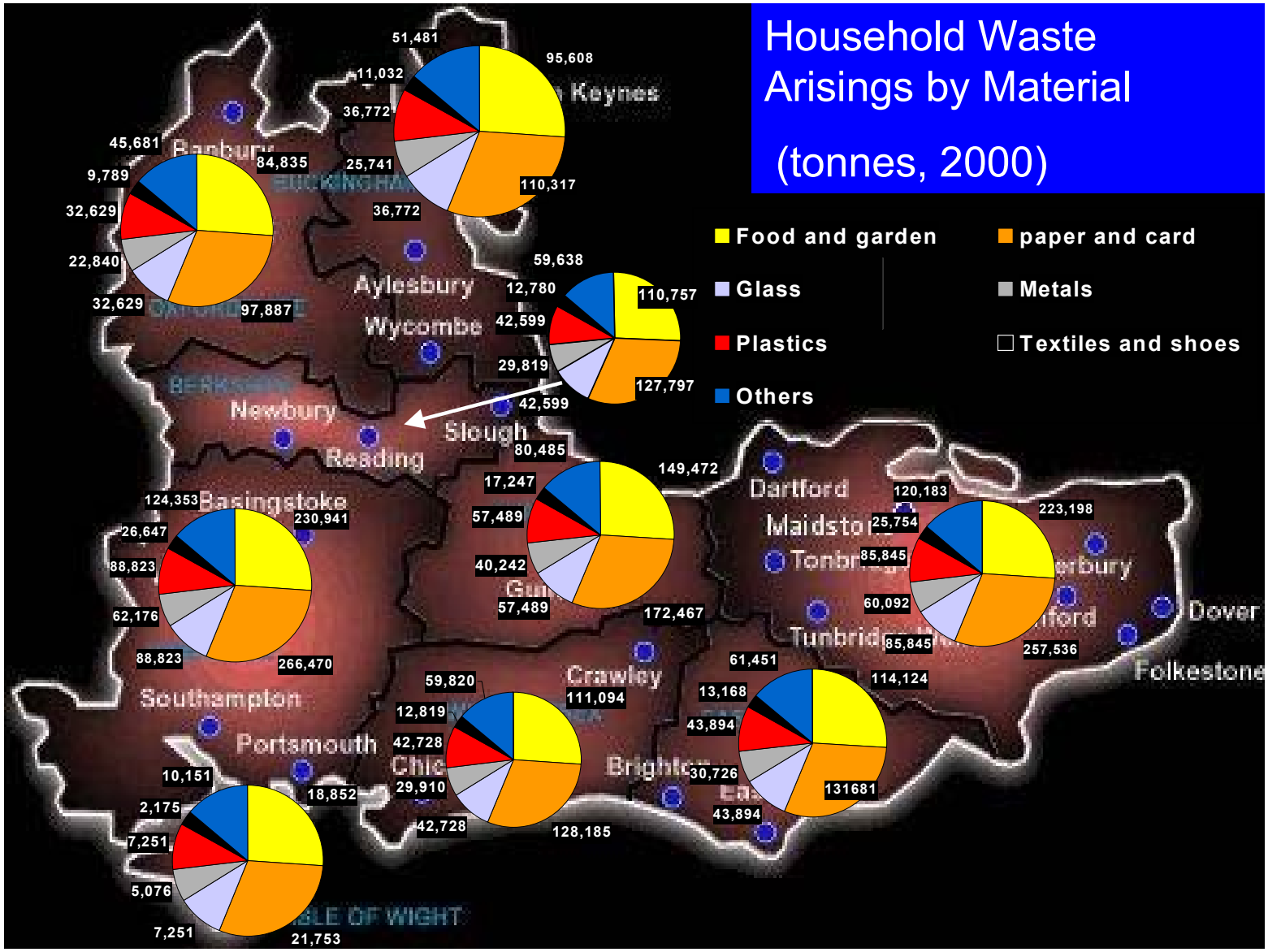


Plate 1 Household Waste Arisings by Material

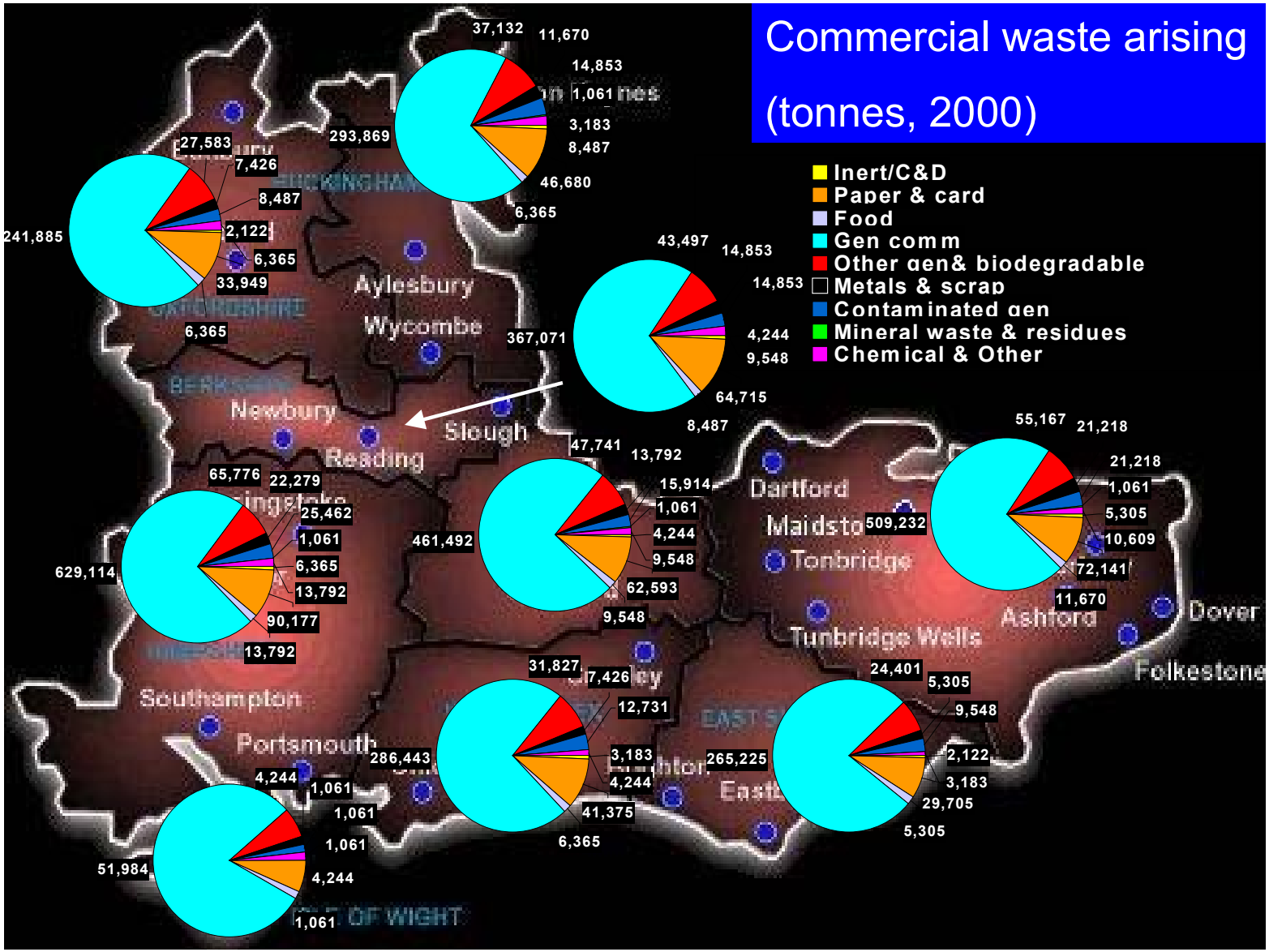


Plate 2 Commercial Waste Arisings

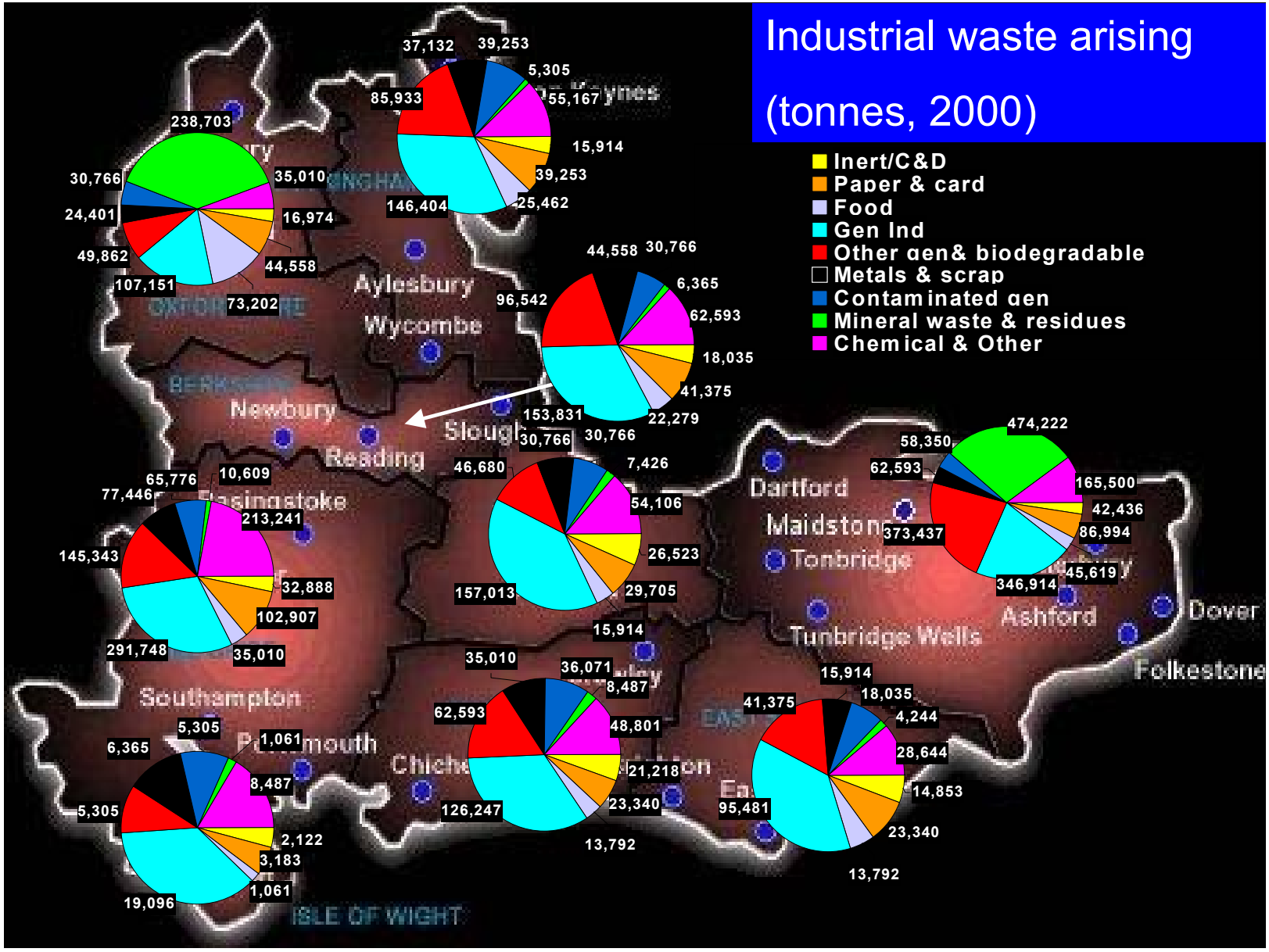


Plate 3 Industrial Waste Arisings

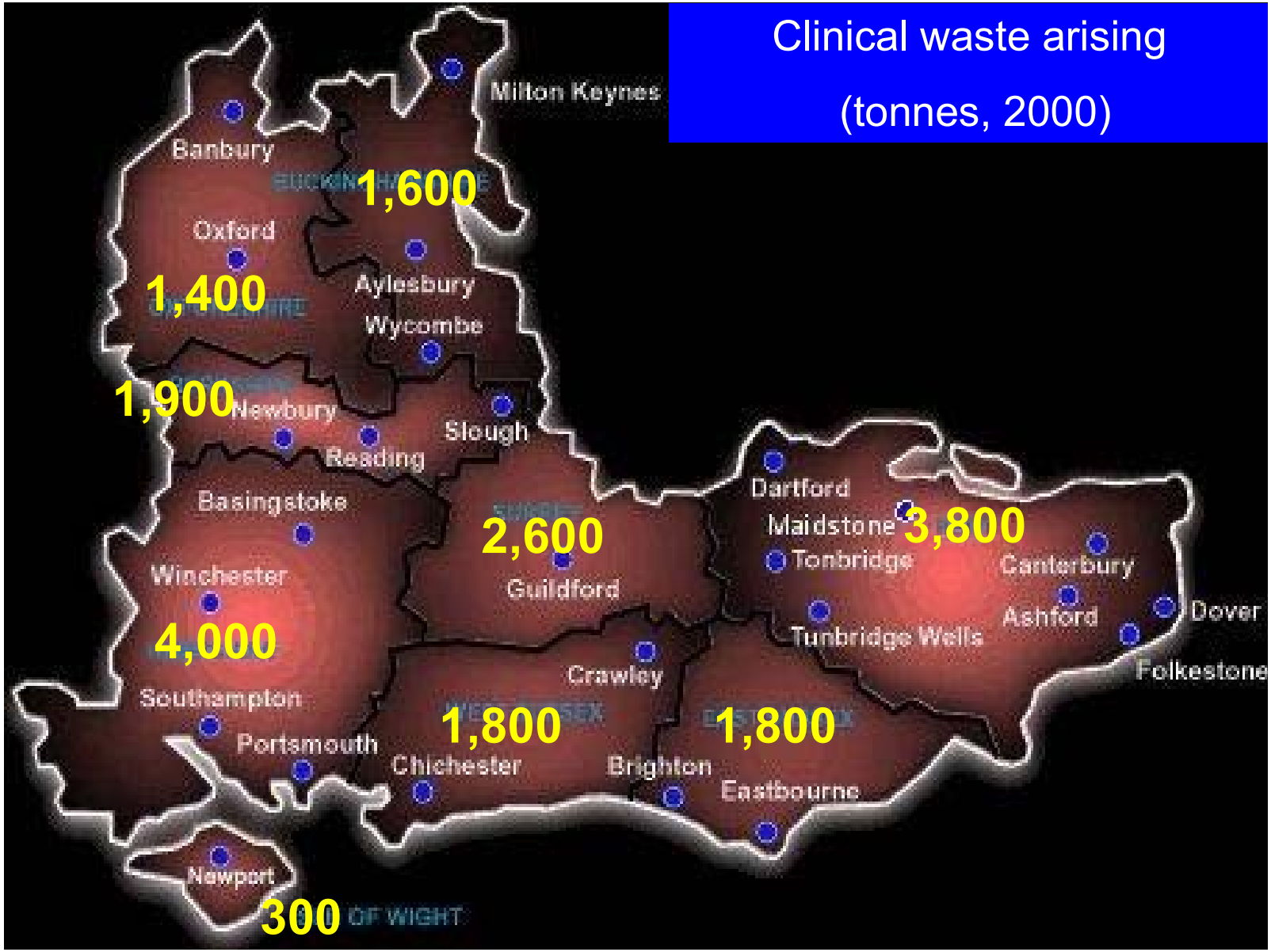


Plate 4 Clinical Waste Arisings

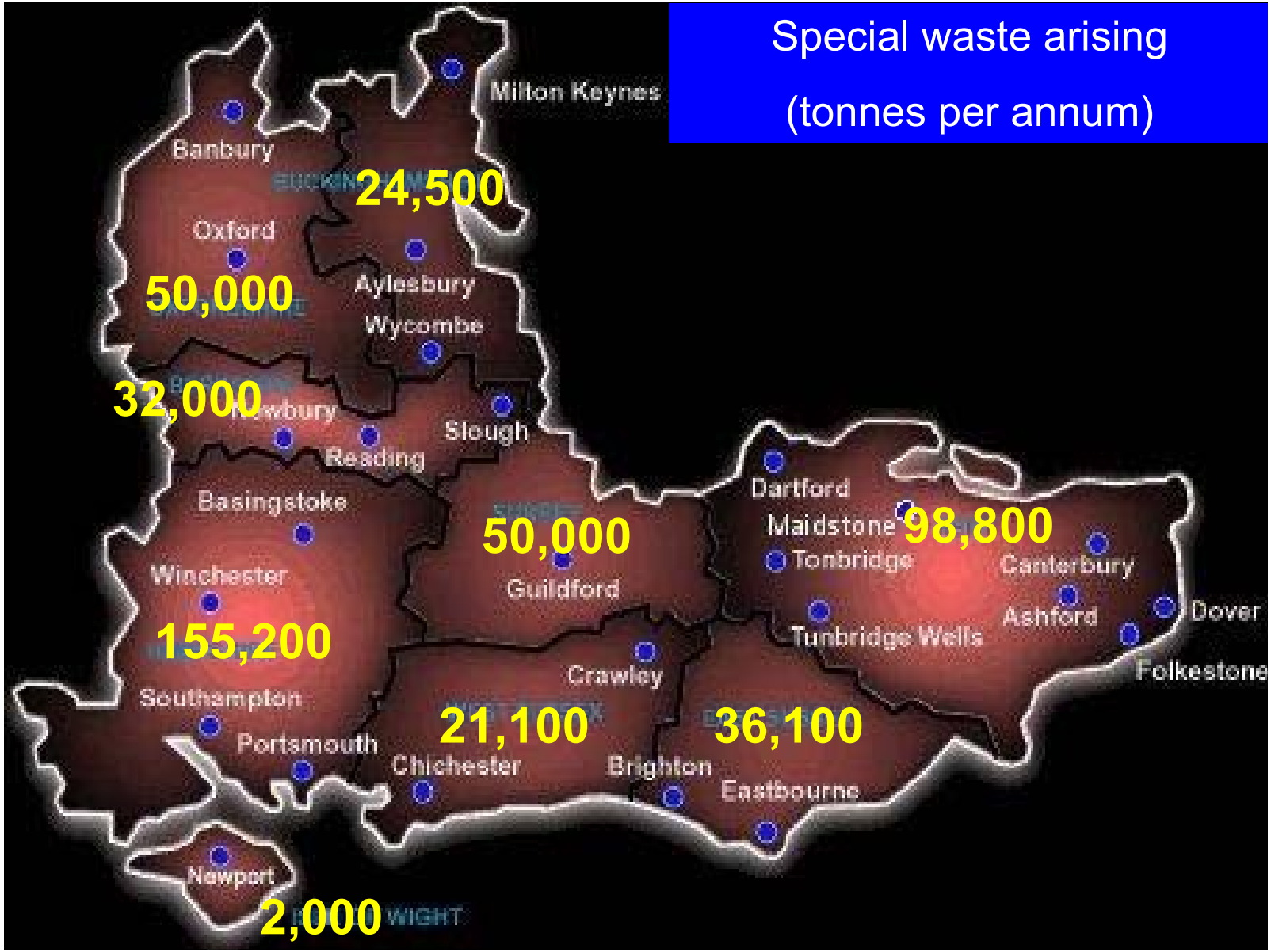


Plate 5 Special Waste

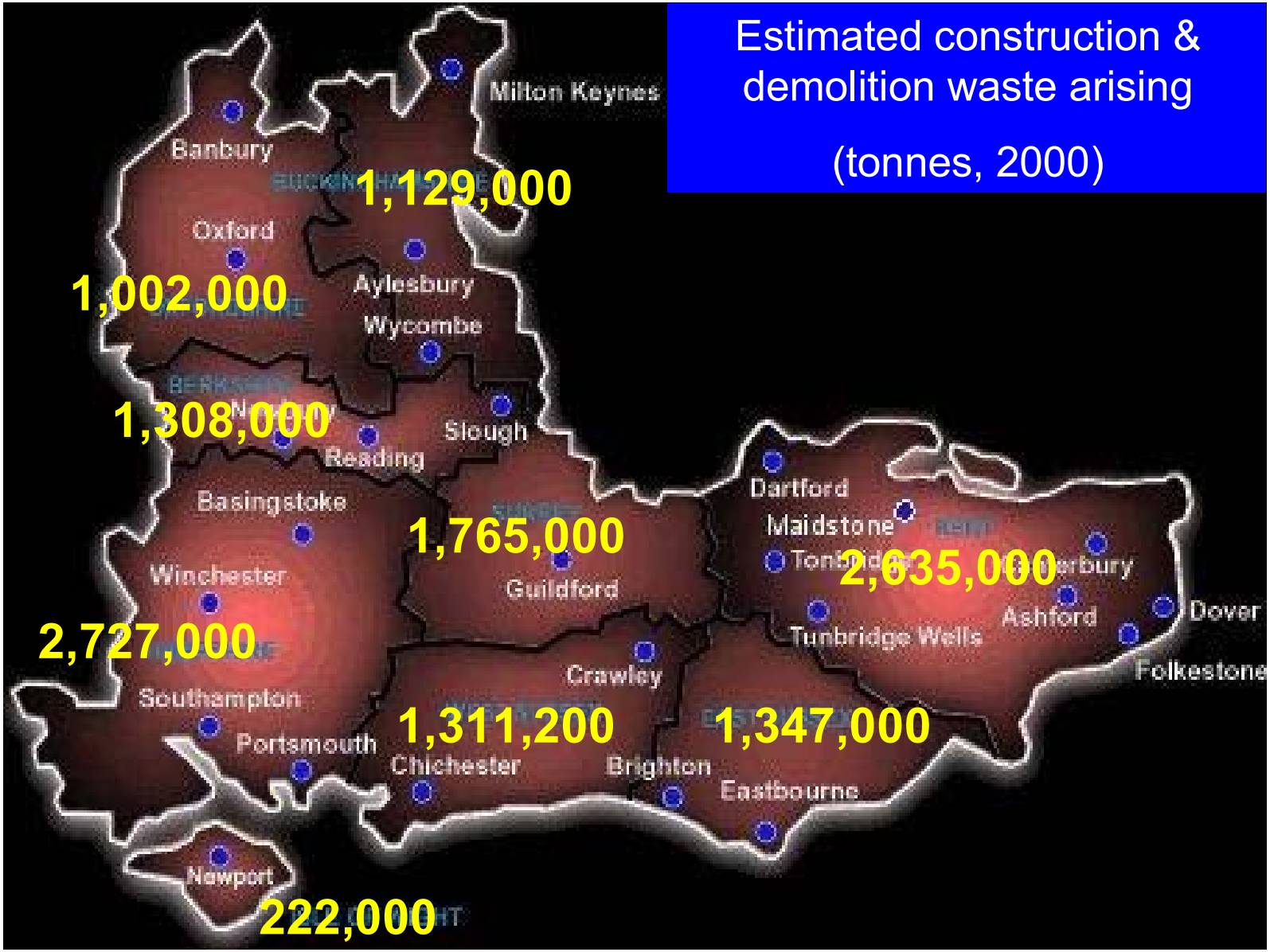


Plate 6 Construction and Demolition Waste

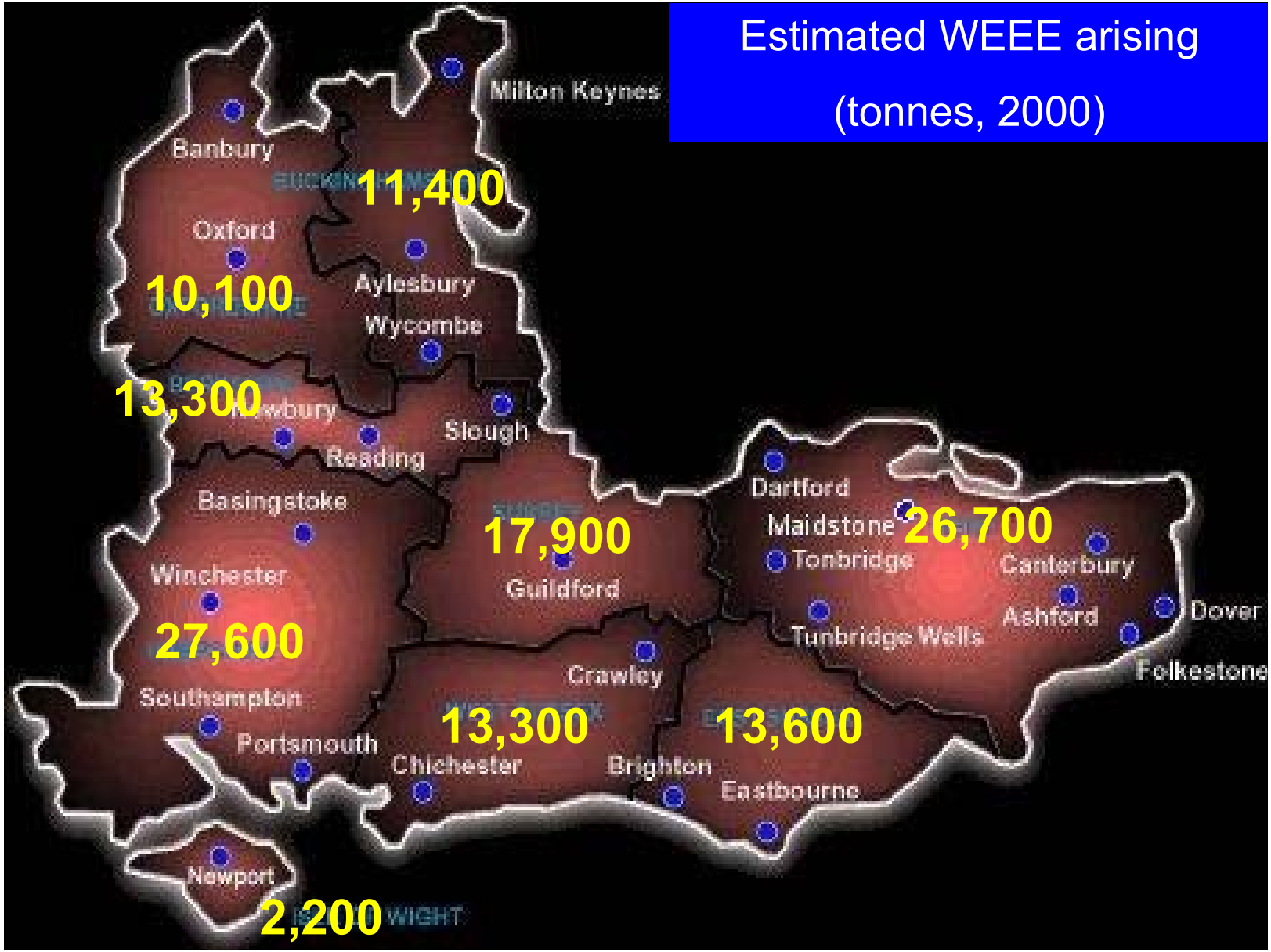


Plate 7 Waste Electrical and Electronic Equipment Arisings

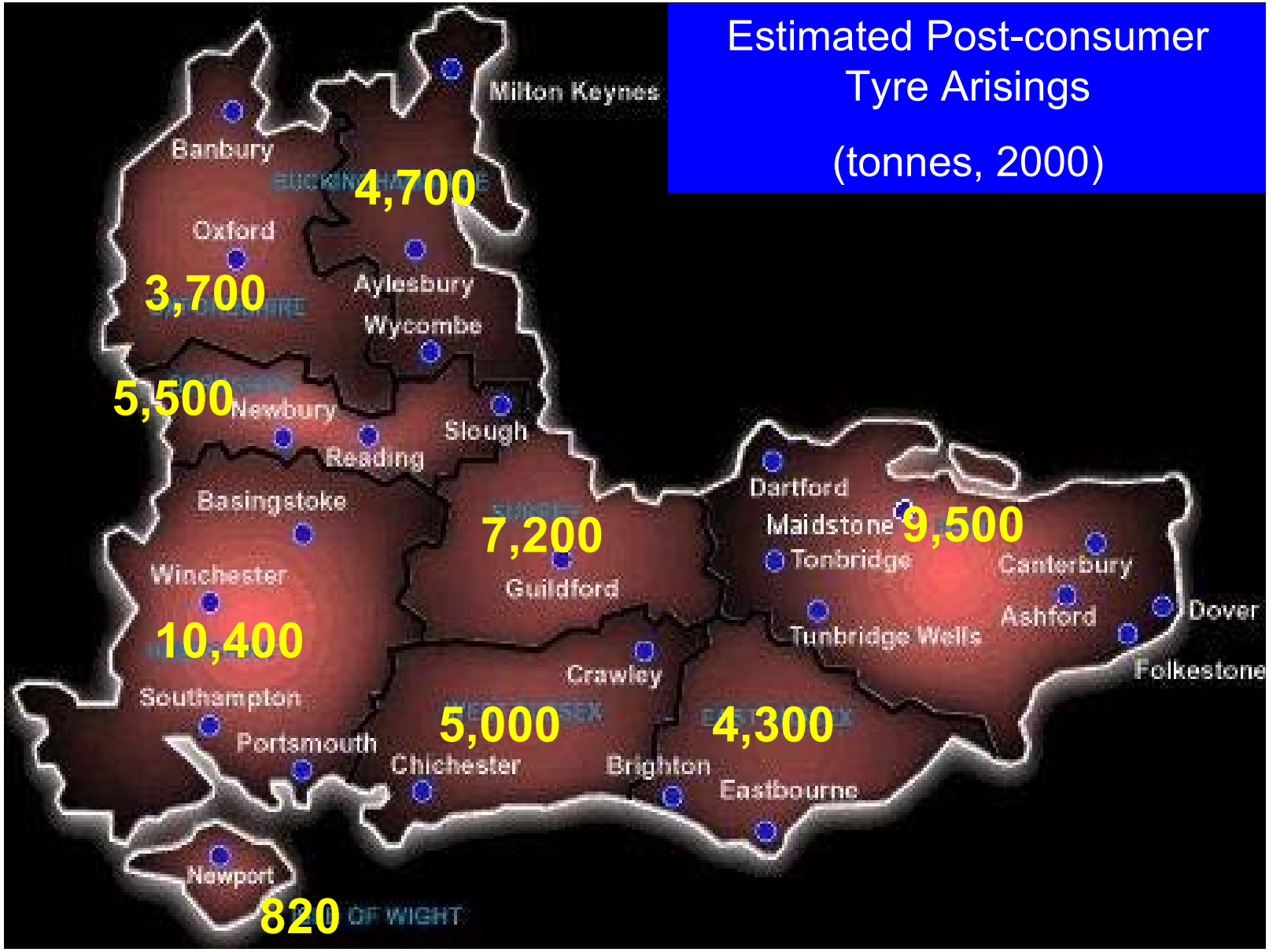


Plate 8 Post-consumer Tyre Arisings

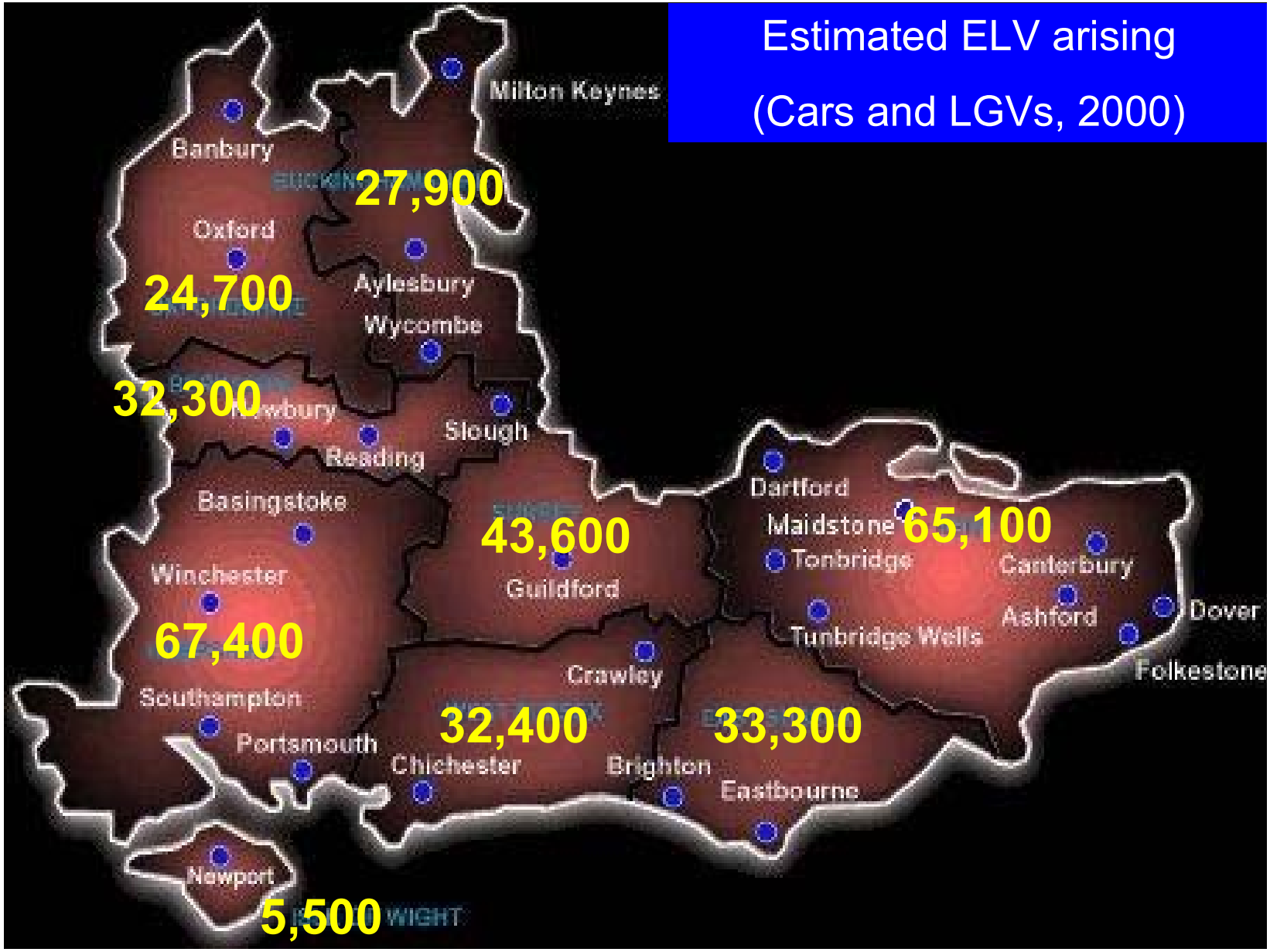


Plate 9 ELV Arisings

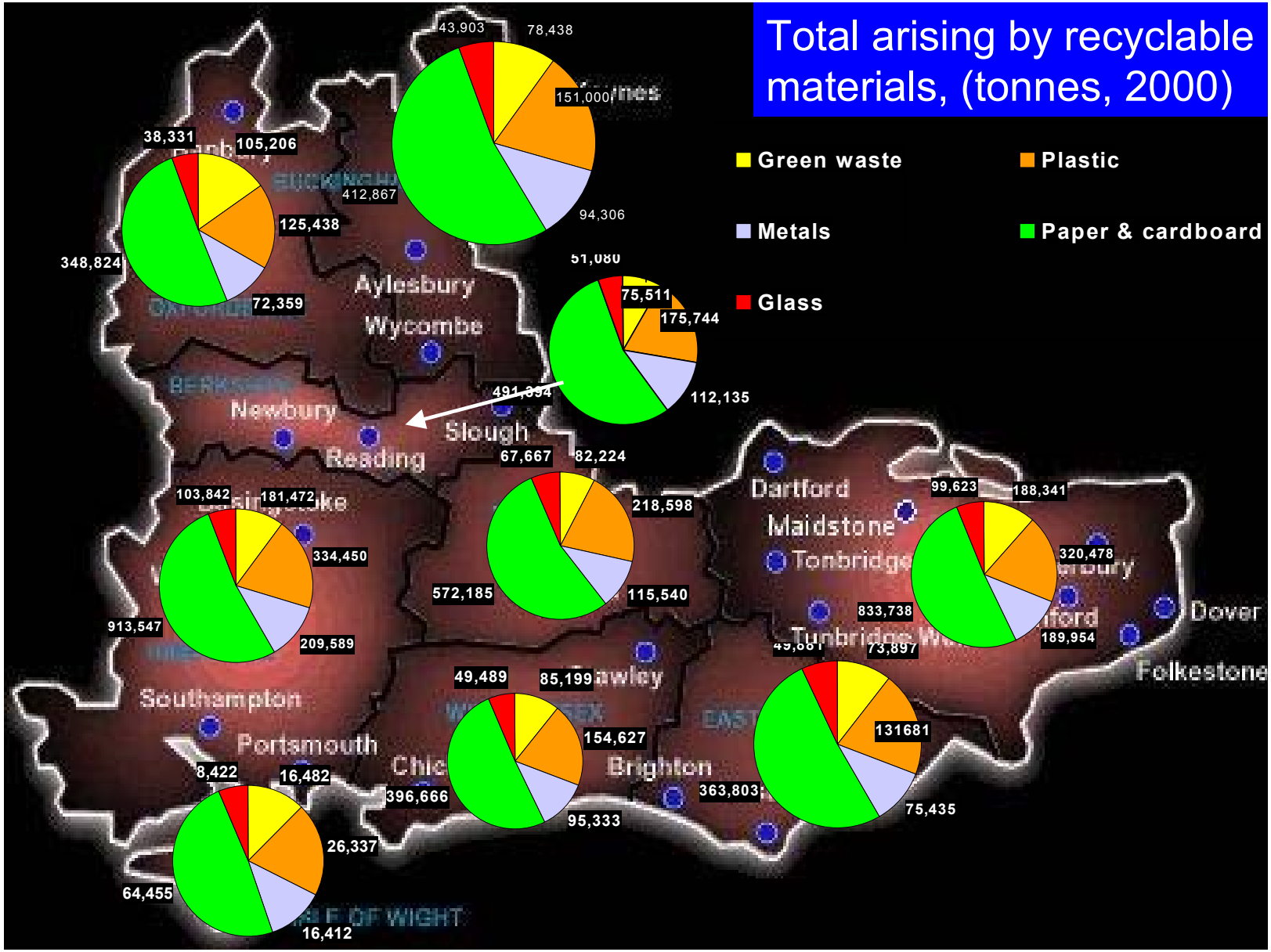


Plate 10 Recyclable Material Arisings

1 Introduction

1.1 Background

Viridis have been commissioned by SEEDA to provide factual data on the arisings of different waste materials in their region. The work has been carried out based upon best available published information including:

- SWMA data for the South East Region as published by the Environment Agency in 2000.
- Local Authorities Waste plans and strategies, latest publications.
- Government commissioned research on mineral planning (SEERAWP, 2001), construction and demolition waste (Symonds Group, 2000 and 2002a), secondary aggregates (Symonds Group , 2002b).
- TRL and Viridis published and confidential research on ELV, tyres (Hird *et al*., 2002), construction industry (Smith *et al.,* 2002).
- Other research (ICER, 2000; EEA, 2002).

SEEDA have requested that the work be carried out to provide broad figures for the different waste types to outline the scale of the problem and provide information on local arisings (at the County level). It is intended that the results of this baseline study will allow some initial conclusions to be made on:

- Areas with the greatest arisings of particular wastes.
- Areas which provide the potential opportunity for location of facilities to deal with particular wastes.
- Potential recycling opportunities within the region.

1.2 Setting the Scene

In 2001, about 8 million people were registered as living in the South East of England (ONS, 2002a). This population was distributed in about 3.4 million households (ONS, 2002b). Government projections forecast that population will increase by 10% and households by 20% over the next 20 years (ODPM, 2000; EA, 2000).

The economy of the region is based mainly on the service sector, which employs nearly 80% of the workforce. The manufacturing and construction industry account for 19% and a small fraction is employed in the agricultural sector (EA, 2000).

1.2.1 Population

Table 1 outlines the estimated population projections for each of the Counties within the South East region, taken from the Office of the Deputy Prime Minister' research finidngs (ODPM, 2000). This shows a gradual increase in population at a rate of just over 0.3% per annum.

This indicates that waste arisings will increase with increasing population notwithstanding changes in product design or waste minimisation.

1.2.2 Households

Table 2 outlines the estimated household projections for each of the Counties within the South East region, taken from the Office of National Statistics (ONS, 2002a). This shows a gradual increase in the number of households at a rate of over 1.1% per annum. Reasons for this include greater numbers of individuals outliving their partners, high divorce rates and an increase in the desire to live independently.

The number of households can have an even greater impact upon the waste produced within a region. An increase in households which exceeds that of population indicates that there will be

an increase in the number of one person dwellings.

This will lead to an increase in waste per capita through decreased sharing of materials and resources. The packaging from one new television set will be the same for a one person dwelling as a family of five. However, the waste produced per capita for a family of five is one-fifth of that for a single occupier dwelling.

1.3 Limitations

The nature of this work has entailed both research into published statistics and the use of proxy data to determine approximate arisings for a number of waste types. This has required the use of a number of assumptions to aid in the production of realistic figures for the various waste types. This data has been used to equalise all arisings to the year 2000 (the majority of available collected data is from 1998). This equalisation has allowed growth estimates to be used to determine the future potential for growth in the different waste arisings.

The use of such methods may be subject to error, but the statistics analysed, assumptions used, and sources used during the research are outlined in Section 3.

Rounding has been used in the production of the figures for this report. The accuracy of any un-rounded figures is due entirely to mathematical necessity.

The report is based upon published data only. No organisations have been contacted to confirm the validity of the data used. Due to the timescale available for the project, permission to use data has not been requested from the authors of the publications detailed in the references section. Viridis would suggest that permission should be requested from these authors should any parts of the report be prepared for external publication or use by SEEDA.

It is not intended that SEEDA or any other reader infer unrealistic accuracy from the tables and figures illustrated in this report. Viridis is not responsible for the accuracy of the published data, nor for how this data is used.

Table 1: Population Projections for the South East Region

Date	South East	Berkshire	Bucks	East Sussex	Hampshire	Isle of Wight	Kent	Oxfordshire	Surrey	West Sussex
2001	**8,008,980**	**800,248**	**686,847**	**742,984**	**1,643,793**	**133,000**	**1,582,144**	**606,965**	**1,059,331**	**754,589**
2002	8,035,410	802,889	689,114	745,436	1,649,218	133,439	1,587,365	608,968	1,062,827	757,079
2003	8,061,926	805,538	691,388	747,896	1,654,660	133,879	1,592,603	610,978	1,066,334	759,578
2004	8,088,531	808,197	693,669	750,364	1,660,120	134,321	1,597,859	612,994	1,069,853	762,084
2005	8,115,223	810,864	695,958	752,840	1,665,599	134,764	1,603,132	615,017	1,073,384	764,599
2006	8,142,815	813,621	698,325	755,400	1,671,262	135,223	1,608,583	617,108	1,077,033	767,199
2007	8,170,500	816,387	700,699	757,968	1,676,944	135,682	1,614,052	619,206	1,080,695	769,807
2008	8,198,280	819,163	703,081	760,545	1,682,646	136,144	1,619,540	621,311	1,084,369	772,424
2009	8,226,974	822,030	705,542	763,207	1,688,535	136,620	1,625,208	623,486	1,088,165	775,128
2010	8,255,768	824,907	708,011	765,878	1,694,445	137,098	1,630,896	625,668	1,091,973	777,841

Table 2: Household Projections for the South East Region

Date	South East	Berkshire	Bucks	East Sussex	Hampshire	Isle of Wight	Kent	Oxfordshire	Surrey	West Sussex
2000	**3,382,000**	**329,000**	**284,000**	**339,000**	**686,000**	**56,000**	**663,000**	**252,000**	**444,000**	**330,000**
2001	3,405,000	340,000	289,000	340,000	699,000	55,000	656,000	251,000	441,000	330,000
2002	3,445,860	344,080	292,468	344,080	707,388	55,660	663,872	254,012	446,292	333,960
2003	3,487,210	348,209	295,978	348,209	715,877	56,328	671,838	257,060	451,648	337,968
2004	3,529,057	352,387	299,529	352,387	724,467	57,004	679,901	260,145	457,067	342,023
2005	3,571,406	356,616	303,124	356,616	733,161	57,688	688,059	263,267	462,552	346,127
2006	3,567,000	356,616	308,000	358,000	737,000	57,000	677,000	266,000	456,000	347,000
2007	3,607,664	360,682	311,511	362,081	745,402	57,650	684,718	269,032	461,198	350,956
2008	3,648,791	364,793	315,062	366,209	753,899	58,307	692,524	272,099	466,456	354,957
2009	3,690,387	368,952	318,654	370,384	762,494	58,972	700,418	275,201	471,774	359,003
2010	3,732,458	373,158	322,287	374,606	771,186	59,644	708,403	278,339	477,152	363,096

2 Headline Figures

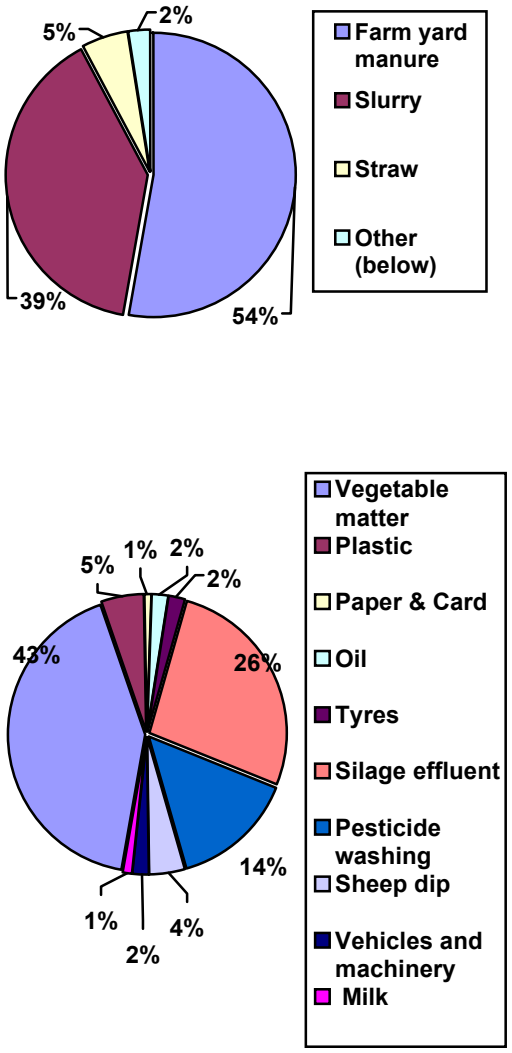
The South East is a major waste producer with some 28 million tonnes created annually from all of the major waste streams. Current projections would indicate that by 2010 the South East Region will have to manage 25% more waste, or a total increased arising of all types of waste equivalent to over 7 million tonnes throughout the period.

The following provides a breakdown of the major waste streams produced in the South East. More detailed information on these arisings, including the assumptions surrounding their derivation are included in Chapter 3.

2.1 Agricultural Arisings

The total recorded agricultural waste arisings in the South East region are of the order of **5 million tonnes per annum**, 92% of which is animal matter. Approximately 10% of these arisings would be classified as Special Waste. Figure 1 illustrates the composition of the Agricultural waste stream in the South East as detailed in the SWMA (EA, 2000). The second chart shows the composition of the materials which make up the 'Other' slice of the first chart.

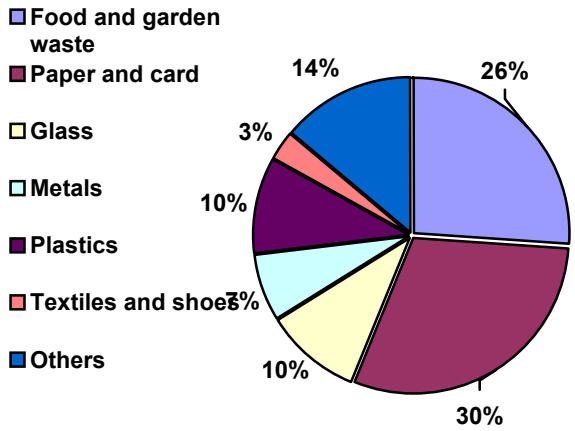
Figure 1: Agricultural Waste Composition (EA, 2000)



2.2 Household Waste

The total recorded municipal waste arisings are in the order of **4.4 million tonnes per annum**. Figure 2 illustrates the general UK composition of Household Waste.

Figure 2: Household Waste Composition (Northants, 2002)



2.3 Industrial and Commercial Waste

Industrial and commercial waste accounted for approximately **9 million tonnes** in 1998 (Environment Agency' survey for the Strategic Waste Management Assessment for the South East, 2000). The Industrial

waste stream composition is illustrated in Figure 3.

Figure 3: Composition of the Industrial Waste Stream (EA, 2000)

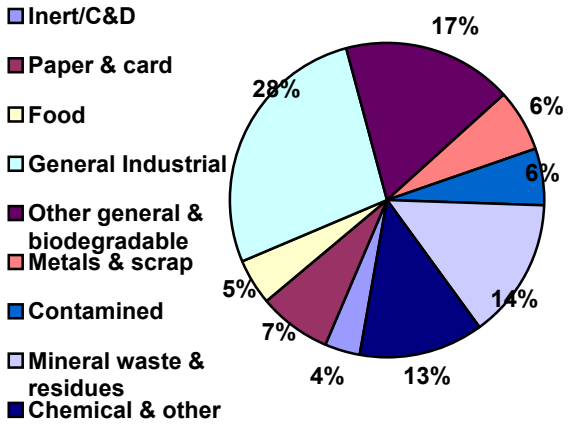
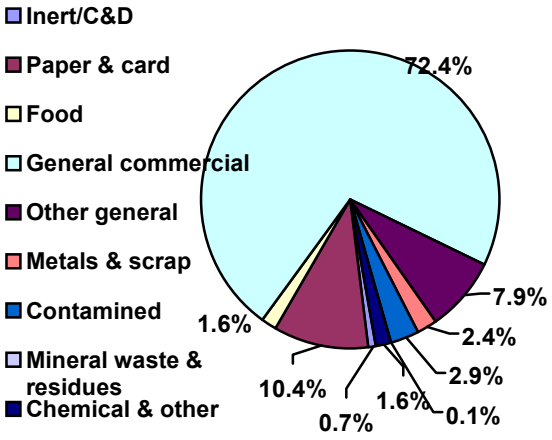


Figure 4 outlines the composition of the commercial waste stream in the South East region.

Figure 4: Composition of the Commercial Waste Stream (EA, 2000)



2.4 Construction and Demolition Waste

The total recorded Construction and Demolition (C&D) waste arisings within the region are in the order of **13.5 million tonnes** in 2000. However, C&D waste production varies in relation to the work being undertaken at any one time, and so will rise and fall with the property trade.

The sources of C&D waste include household and municipal streams as well as property development and construction, and industrial and commercial arisings. The general composition of Construction waste in the UK is outlined in Figure 5.

Figure 5: Composition of the Construction Waste Stream (Hurley, 2001)

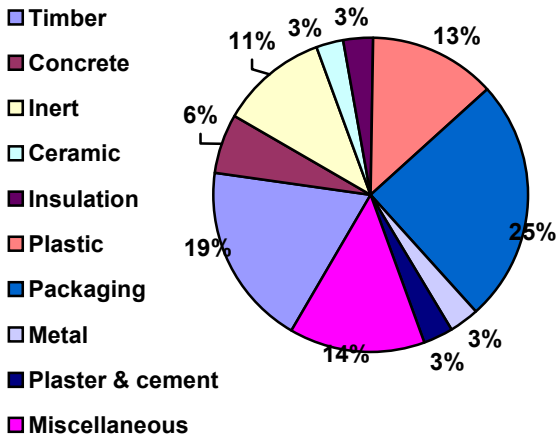
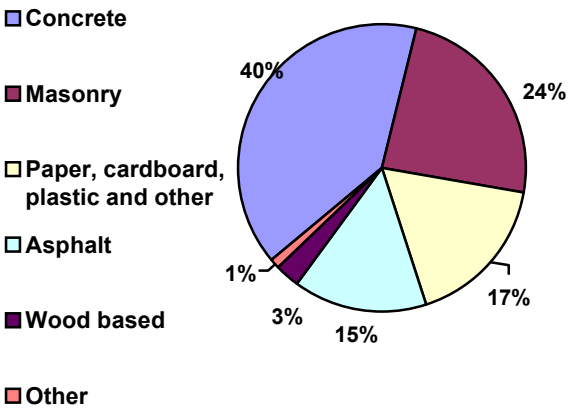


Figure 6 outlines the general composition of Demolition waste in the UK.

Figure 6: Composition of the Demolition Waste Stream (Hurley, 2001)



2.5 Green Waste Arisings

Green waste includes garden materials from homes and public gardens. The total recorded green waste arisings are in the order of **570,000 tonnes per annum**. This consists primarily of household garden waste collected either as part of the municipal waste collection or through Civic Amenity sites. It does not include green waste arisings from agriculture.

2.6 Clinical Waste

The total recorded arisings of clinical waste are in the order of **20,000 tonnes per annum**, of which approximately **1,600 tonnes will be classified as Special Waste**.

2.7 Mine and Quarry Waste

The total recorded arisings of waste from the mining and quarrying industry is in the order of **5.1 million tonnes per annum**.

2.8 End of Life Vehicles

The total recorded End of Life Vehicles arising are in the order of **330,000 vehicles, or approximately 310,000 tonnes per annum**.

2.9 Post-consumer Tyres

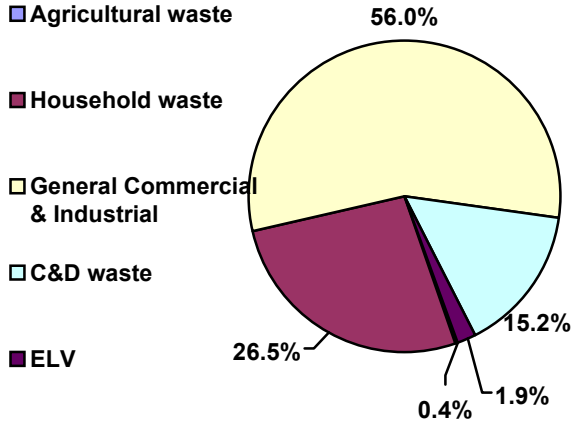
Post-consumer tyre arisings are in the order of **50,000 to 80,000 tonnes per annum**, depending upon the reference source consulted[1].

[1] The lower figure is based upon the Viridis Report, (Hird et al, 2002), the higher figure is based upon the arisings provided by the EA in the SWMA for the South East. Both figures are based upon 1998 arisings.

2.10 Plastics

The total arisings of plastic are in the order of **1.6 million tonnes per annum**. Plastic comes from a variety of sources as outlined in Figure 7.

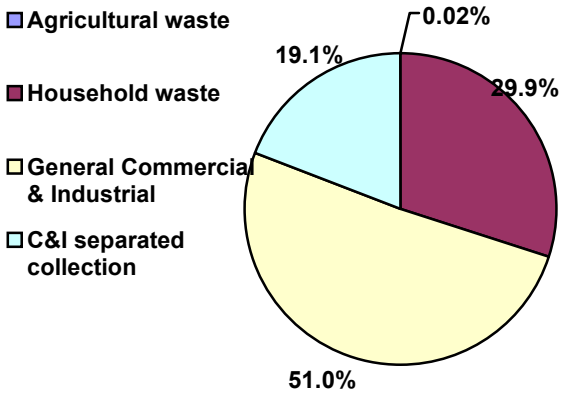
Figure 7: Sources of Waste Plastic (all types)



2.11 Paper and Card

The total recorded arisings of paper and card are in the order of **4.4 million tonnes per annum.** Figure 8 outlines the various sources of paper and cardboard.

Figure 8: Sources of Paper and Cardboard.



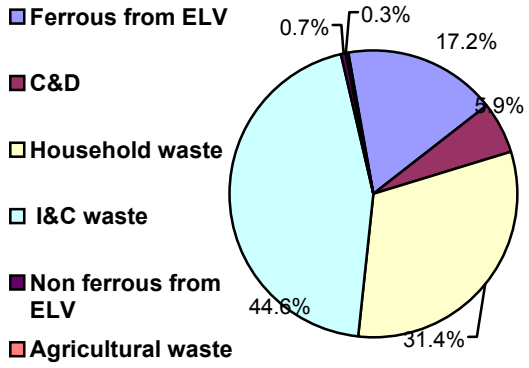
2.12 Glass

The total recorded glass are in the order of **510,000 tonnes per annum**, approximately 86% of which comes from the municipal waste stream.

2.13 Metals

The total estimated arisings of metal (ferrous and non-ferrous) is in the order of 980,000 tonnes per annum. Figure 9 outlines the sources of both ferrous and non-ferrous wastes in the region.

Figure 9: Sources of Ferrous and Non-ferrous Metal



2.14 Wood Waste

The total recorded wood waste arisings (as timber) in the South East region are in the order of **540,000 tonnes per annum**. As with C&D waste, this is prone to fluctuation with economic and property market conditions.

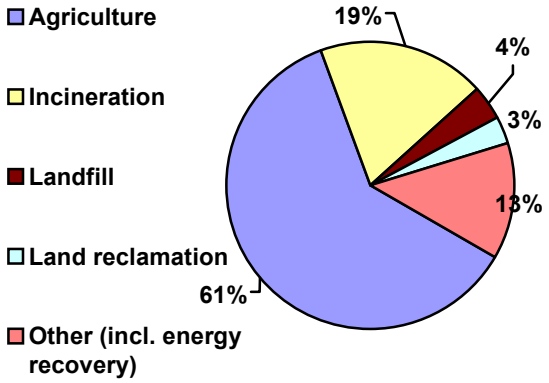
2.15 Power Station Ash

The total recorded arisings of power station ash within the South East are in the region of **540,000 tonnes per annum**. Approximately 18% of this is disposed of to landfill, the remainder finding alternative uses.

2.16 Sewage Sludge

The total arisings of sewage sludge are in the order of **20,000 tonnes per annum** (5% dried solids). Approximately 50% of this is classified as Special Waste. The disposal options for sewage sludge throughout the UK are illustrated in Figure 10.

Figure 10: Sewage Sludge Recycling and Disposal Options (CIRIA, 2002)



2.17 WEEE Arisings

The total Waste Electrical and Electronic Equipment arisings in the

South East have been estimated in the order of **136,000 tonnes per annum**.

2.18 Batteries

This includes lead acid vehicle batteries and household batteries used to power household appliances. The total estimated arisings of lead acid batteries is in the order of **18,000 tonnes per annum**.

The total estimated arisings of household batteries in the South East is **2,700 tonnes per annum**.

2.19 Textiles and Clothing

The total arisings of waste clothing and textiles have been estimated in the order of **130,000 tonnes per annum**.

2.20 Fluorescent Tubes

The total recorded arisings of fluorescent tubes are in the order of **1,600 tonnes per annum**.

2.21 Waste Oils

The total arisings of waste oils have been estimated in the order of **230,000 tonnes per annum**. Approximately 80% of these arisings would be classified as Special Waste.

2.22 Waste Solvents

The total recorded arisings of organic solvents in the South East are of the order of **16,700 tonnes per annum**. The majority of these arisings would be classified as Special Waste.

2.23 Polychlorinated Biphenyls

The total arisings of have been estimated in the order of **40 tonnes per annum**. The arisings of PCBs will fluctuate depending upon the servicing of equipment containing them as coolants or lubricating agents.

3 Assumptions Used

3.1 Research Sources

The following outlines the list of documents and sources used for the production of the data outlined in this report:

- SWMA data for the South East Region as published by the Environment Agency in 2000 (EA, 2000).
- Local Authorities Waste plans and strategies, latest publications.
- Government commissioned research on mineral planning (SEERAWP, 2001), construction and demolition waste (Symonds Group, 2000 and 2002a), secondary aggregates (Symonds Group , 2002b).
- TRL and Viridis published and confidential research on ELV, tyres (Hird *et al*., 2002), construction industry (Smith *et al.,* 2002).
- Other research (ICER, 2000; EEA, 2002).

3.2 Baseline year

All the data presented estimates the arising of waste for year 2000, the baseline year. This means that all the data available for previous years have been manipulated to reflect the growth up to the baseline year, as from the assumptions outlined in the following section.

All the projections for years up to 2010 have been made using the data for 2000 as baseline.

3.3 Assumptions

3.3.1 Agricultural Waste

Agricultural waste arisings came directly from the SWMA 2000 for the South East. No further analysis has been carried out.

3.3.2 Household Waste

The data produced for the household waste arisings was based on average household waste production per household per week (taken from the UK Environmental Statistics), multiplied by 52 weeks, multiplied by household numbers.

A few of the Counties (e.g., Kent, Oxfordshire, Buckinghamshire) have developed estimates of arisings for future years, mostly based on a 3% increase rate. The same Counties have analysed the typical composition of the household waste (including waste collected from houses, or brought to CA sites etc).

For simplicity, a standard UK dustbin composition has been used for quantifying the amount of glass, plastic, paper, biodegradable waste, metal etc., for all of the calculated household waste arisings (Northamptonshire County Council, 2002). Data taken from the Counties waste plan has not been used for the calculations.

The biodegradable waste has been split between kitchen waste and garden waste. Data for *municipal* waste arising is not available for all of the Counties and thus has not been taken into account.

3.3.3 Commercial and Industrial

The data used has been taken directly from the SWMA for the region. The compositions of the General Commercial and Industrial waste has been estimated from other work currently being undertaken by Viridis. This is based upon data provided to Viridis by the Environment Agency for another project within a separate UK region. This composition analysis is

provided in Figures 11 and 12 in Section 4.

3.3.4 Construction and Demolition Waste

The data for C&D waste arisings has been taken from a report produced by Symonds Consulting Ltd. (Symonds, 2002a). In addition, the composition of C&D waste has been taken from a report produced by BRE (Hurley *et al*, 2001) and applied to the recorded arisings in the South East.

Where possible the different components of this waste stream have been provided separately. These include the Special waste (including Asbestos), Commercial and Industrial (EA, 2000) and Household Waste components.

3.3.5 Special Waste

Special waste will be included in the other waste streams, although the data used in this study is taken directly from published sources (SWMA 2000). Where possible individual Special Waste streams have been identified (solvents, PCBs, etc). However, this could lead to double counting, so care should be taken with the use of these figures.

3.3.6 WEEE

From ICER report (1998) plus estimate of growth (European) plus apportionment based on household numbers in 2000. Assumes 4% growth in arisings per annum.

3.3.7 End of Life Vehicles

ELV arisings have been estimated using a method developed by TRL Ltd, and Viridis for use in both a report for DEFRA on the End of Life Vehicles Directive and for a forthcoming Motor Mass Balance Study to be published under Biffaward's Programme for Sustainable Resource Use. This includes data for 2000 and 2001, and includes the weight of natural and premature (insurance write off) ELVs estimated for those two years.

Future arisings have been considered by analysing the UK total sales in the previous 13 years, but future weights should be calculated through further analysis of vehicle sales per vehicle model.

Apportioning ELV arisings to the different counties within the region has been carried out considering the % of household with use of at least one car (as provided in UK National Statistics, ONS 2002c) taking an average of the ELV arising over this value and multiplying by household numbers.

3.3.8 Post-consumer Tyres

The information on post-consumer tyre arisings has been taken from the Viridis report on tyre arisings (Hird et al, 2002).

3.3.9 Green Waste

Total and apportioned green waste arisings have been taken from the SWMA for the South East.

3.3.10 Plastics

The figures for plastic waste outlined within this report include the streams from Household, Commercial and Industrial waste, Agricultural waste, Construction and Demolition waste, and ELV disposal. Other plastic arising from secondary processes (i.e.: batteries and WEEE dismantling) has not been considered at this stage.

3.3.11 Batteries

The numbers of batteries arising from ELV and replacement parts have been estimated from the aforementioned Motor Mass Balance study, i.e.,

number of batteries removed per circulating vehicle given the average lifespan of a car battery and the number of batteries sold.

For household appliance batteries, data from the British Batteries Manufacturers Association has been used (number of batteries per household and % of sales of battery type by the weight of each type).

3.3.12 Metals

Together with the Household Waste portion, metal waste arising from the Commercial and Industrial and Agricultural waste streams has been accounted for.

For the SE as a whole, the metal generated by ELV dismantling and C&DW has been included (ELV for 2000 and 2002 data only). Other metal arising from secondary processes (i.e., batteries and WEEE dismantling) has not been considered at this stage.

3.3.13 Clinical Waste

The arising of clinical waste per bed has been multiplied by the number of hospital beds in the South East to estimate the total. This data has been taken from both the SWMA and NHS data.

3.3.14 Mine and Quarry Waste

Mine and Quarry waste arisings have been developed through proxy data by the calculation of waste per tonne of mineral sold. The total arisings include Commercial and Industrial and Special Waste taken from the SWMA statistics (EA, 2002).

3.3.15 Power Station Ash

The information for this section is taken directly from the study of Secondary aggregate arisings (Symonds, 2002b).

3.3.16 Textiles and Clothing

The arisings of textiles and clothing have been developed through a direct application of the standard UK waste composition which specifies that textiles and clothing make up 3% of the total household waste stream.

3.3.17 Paper and Card

The total arisings for paper and card are aggregated from the totals for household waste, and Commercial and Industrial waste. The Commercial and Industrial waste stream include the arisings provided in the SWMA plus the portion of arisings estimated from the breakdown of the General Commercial and Industrial waste streams as per further work by Viridis.

3.3.18 Glass

The total arisings of glass within the region have been calculated as an aggregate of the household waste plus the Commercial and Industrial waste stream. The Commercial and Industrial waste stream includes the portion coming from General Commercial and Industrial stream (see above) plus agriculture, Construction & Demolition waste and ELV/ replacement parts arisings (the latter, for 2000 and 2002 data only).

3.3.19 Wood Waste

Timber has been estimated as 4% of C&D waste arising (Hurley, 2001).

3.3.20 Sewage Sludge

Calculated as arising per person and assuming 5% dry solids content.

4 Projected Arisings

4.1 Household Waste

It is estimated that the volume of household waste produced by 2010 will be in the order of **33.5 kg per household per week**, or **5.9 million tonnes per annum**; an increase of approximately **8.6 kg per household per week** (UK average in 2000 of 24.9 kg per household per week), or **1.5 million tonnes per annum**.

Table 3: Household Waste Composition for 2000 and 2010 (all values in Tonnes per annum)

Waste Type	Proportion	2000	2010	Increase
Food and garden	26.0%	1,138,544	1,530,107	391,564
Paper and card	30.0%	1,313,704	1,765,508	451,804
Glass	10.0%	437,901	588,503	150,601
Metals	7.0%	306,531	411,952	105,421
Plastics	10.0%	437,901	588,503	150,601
Textiles and shoes	3.0%	131,370	176,551	45,180
Others	14.0%	613,062	823,904	210,842
Total	**100%**	**4,379,014**	**5,885,028**	**1,506,014**

All of this will need to be managed according to legal requirements set down in UK and EU legislation. However, it will also have to be managed in a manner that has the minimum impact upon human health or the environment.

Table 3 outlines the relative increase in particular waste types from the household waste stream, assuming that the general waste composition remains the same throughout the period. This indicates that there will be a significant increase in the arising of materials which are currently suitable for recycling, including paper, glass, plastic and metal.

However, unless market development is improved and new significant uses are found for the recycling or reuse of these materials this increase will lead to the production of material which will have to be managed using a technology which is lower down in the Waste Hierarchy. This opens up opportunities for new and existing industries to identify sustainable options that will utilise these materials as a resource rather than treat them as a waste.

Table 4: Industrial Waste Composition for 1998 and 2010 (all values in Tonnes per annum)

Waste Type	Proportion	1998	2010	Increase
Inert/C&D	3.6%	180,000	256,637	76,637
Paper & card	7.5%	372,000	530,383	158,383
Food	4.7%	232,000	330,777	98,777
General Industrial	27.4%	1,360,000	1,939,035	579,035
Other General and Biodegradable	17.3%	856,000	1,220,451	364,451
Metals & Scrap	6.4%	315,000	449,115	134,115
Contaminated General	6.0%	297,000	423,451	126,451
Mineral waste & residues	14.4%	713,000	1,016,568	303,568
Chemical & Other	12.8%	633,000	902,507	269,507
Total	100%	4,958,000	7,068,924	2,110,924

4.2 Industrial Waste

It is estimated that the total volume of Industrial Waste produced by 2010 will be in the order of **7 million tonnes per annum**. This represents an increase in total arisings of **over 2 million tonnes per annum** when compared against a baseline of 1998.

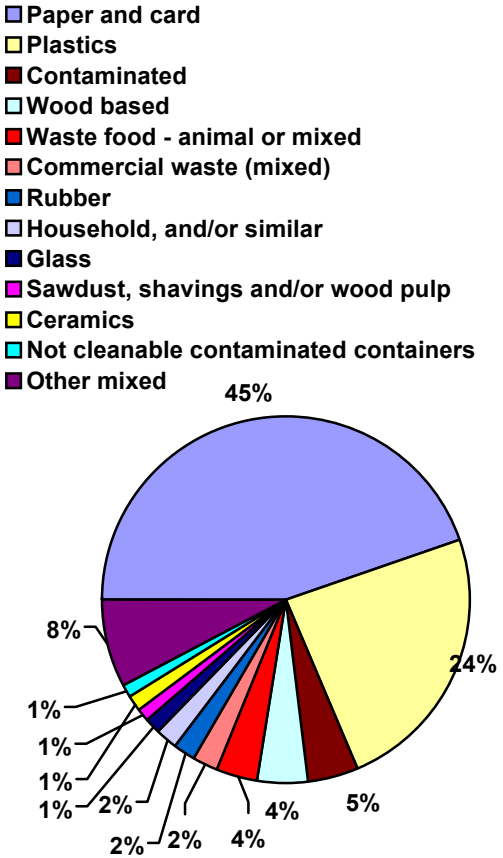
Table 4 outlines the composition of the Industrial waste stream, and provides an estimate for the increase in the different waste types over the period 1998 to 2010. This assumes that the composition of the Industrial Waste stream remains constant throughout the period.

The significant waste streams, which can be managed through recycling and composting, make up a substantial volume of the total arisings. There will be a need for further facilities to deal with these arisings within the region.

The 'General Industrial' waste stream can be further broken down into a number of different components as outlined in the pie chart in Figure 11. These would tend to increase the overall level of paper and card and the other streams, although it should be noted that the general stream is more likely to be contaminated, and hence more difficult to extract value from.

This indicates that there is potentially significant recyclable material hidden away within the mixed waste stream which could be dealt with in the future.

Figure 11: Pie-chart Illustrating the Composition of the 'General Industrial' Waste Stream



4.3 Commercial Waste

Table 5: Commercial Waste Composition for 1998 and 2010 (all values in Tonnes per annum)

Waste Type	Proportion	1998	2010	Increase
Inert/C&D	0.72%	29,000	41,337	12,337
Paper & card	10.39%	420,000	598,671	178,671
Food	1.61%	65,000	92,652	27,652
General Industrial	72.43%	2,929,000	4,175,021	1,246,021
Other General and Biodegradable	7.86%	318,000	453,280	135,280
Metals & Scrap	2.45%	99,000	141,115	42,115
Contaminated General	2.89%	117,000	166,773	49,773
Mineral waste & residues	0.10%	4,000	5,702	1,702
Chemical & Other	1.56%	63,000	89,801	26,801
Total	100%	4,044,000	5,764,351	1,720,351

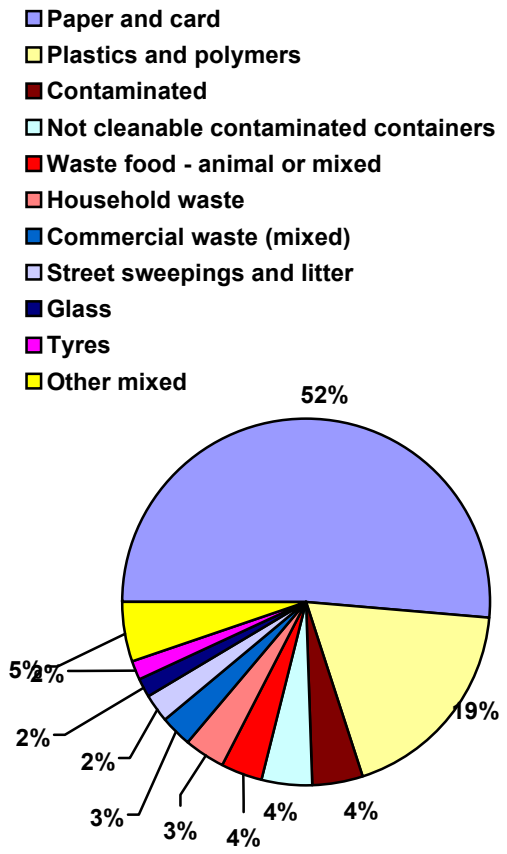
It is estimated that the total volume of Commercial Waste produced by 2010 will be in the order of **5.8 million tonnes per annum**. This represents an increase in total arisings of **over 1.7 million tonnes per annum** when compared against a baseline of 1998.

Table 5 outlines the composition of the Commercial waste stream, and provides an estimate for the increase in the different waste types over the period 1998 to 2010. This assumes that the composition of the Commercial Waste stream remains constant throughout the period.

The waste streams managed through recycling and/or composting comprises a significant proportion of the commercial arisings. There will be a need for further facilities to deal with these arisings within the region.

The 'General Commercial' waste stream can be further broken down into a number of different components as outlined in Figure 12 below. These would tend to increase the overall level of paper and card and the other streams, although it should be noted that the general stream is more likely to be contaminated, and hence more difficult to extract value from. This indicates that there is potentially significant recyclable material hidden away within the mixed waste stream which could be dealt with in the future.

Figure 12: Pie-chart Illustrating the Composition of the 'General Commercial' Waste Stream



4.4 Construction and Demolition Wastes

The arising of Construction and Demolition wastes is linked to both the

economic situation within the region and the need to build further residential industrial or retail premises, or to improve the local transport infrastructure. As such, the growth rate for Construction and Demolition waste is assumed in most quarters to be static.

When considering the development and location of facilities to recycle C&D waste, careful analysis of the local situation will be required. In this study we have taken the rate of growth in this waste stream as 3% per annum. If taken on purely economic activity terms the growth rate would be in the order of 10%. However, the activity rate does not correspond with the waste production rate as detailed in a comparison between data for 1999 and 2000 (only 2% increase).

4.5 Other Waste Projections

The projections for the other waste arisings outlined above are illustrated in Table 6. It should be borne in mind that these are estimates only, and careful consideration should be given to a full assessment of forward projections.

Business decisions should not be made based solely on the results of this study. This section includes information on some of the individual waste streams which are included in the Household, Commercial or Industrial waste streams. As such, caution should be exercised with respect to "Double Counting".

Table 6: Projected Arisings for the Different Waste Types (Tonnes per annum) [*Data for 2000 and 2002 include plastic, metals and glass arising form ELV processing.]

Waste Type	2000*	2002*	2004	2006	2008	2010
Special Waste	470,000	470,000	470,000	470,000	470,000	470,000
Clinical Waste	20,000	20,000	20,000	20,000	20,000	20,000
Green waste	886,601	921,269	958,049	997,069	1,038,465	1,082,383
Plastic	1,651,399	1,741,327	1,806,686	1,908,092	2,015,425	2,129,040
Metals	980,881	1,025,055	903,393	956,355	1,012,486	1,071,976
Paper & cardboard	4,396,656	4,664,353	4,948,351	5,249,645	5,569,289	5,908,398
Glass	512,559	543,359	573,516	608,441	645,493	684,801
ELVs	310,000	361,257	276,302	307,840	346,677	391,433
WEEE	136,000	147,457	159,490	172,504	186,580	201,805

A breakdown of projected arisings for the different waste streams by County is provided in Appendix 1. All projections are estimates only, based upon the assumptions outlined in Section 3. As such, the true arisings may be greater or less than those specified.

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Appendix

Waste Arisings Projections by County in the South East

Former Berkshire County Council (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	425,989	451,932	479,455	508,653	539,630	572,494
Commercial	527,267	559,378	593,444	629,585	667,926	708,603
Industrial	476,344	505,353	536,129	568,780	603,418	640,167
C&D	1,307,829	1,347,063	1,387,475	1,429,100	1,471,973	1,516,132
Agricultural	322,500	322,500	322,500	322,500	322,500	322,500
Special Waste	32,000	32,000	32,000	32,000	32,000	32,000
Clinical Waste	1,957	1,964	1,977	1,990	2,003	2,018
Green waste	75,511	78,883	82,461	86,257	90,284	94,556
Plastic	175,744	185,484	192,774	203,689	215,244	227,479
Metals	112,135	100,752	106,692	112,988	119,661	126,736
Paper & cardboard	491,394	521,316	553,060	586,737	622,466	660,370
Glass	51,125	53,929	59,482	62,966	66,662	70,583
ELVs	30,209	35,146	26,881	29,949	33,727	38,082
WEEE	13,262	14,345	15,515	16,781	18,150	19,632

Buckinghamshire County Council (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	367,723	390,118	413,876	439,081	465,821	494,189
Commercial	423,299	449,078	476,427	505,441	536,223	568,879
Industrial	449,822	477,216	506,278	537,111	569,821	604,523
C&D	1,128,946	1,162,815	1,197,699	1,233,630	1,270,639	1,308,758
Agricultural	613,700	613,700	613,700	613,700	613,700	613,700
Special Waste	24,500	24,500	24,500	24,500	24,500	24,500
Clinical Waste	1,680	1,685	1,697	1,708	1,720	1,732
Green waste	78,438	81,349	84,438	87,714	91,191	94,879
Plastic	151,000	159,345	165,571	174,922	184,822	195,303
Metals	94,306	84,329	89,296	94,560	100,141	106,056
Paper & cardboard	412,867	438,004	464,672	492,964	522,978	554,821
Glass	43,942	46,351	51,332	54,327	57,503	60,874
ELVs	26,077	30,339	23,204	25,853	29,114	32,873
WEEE	11,448	12,383	13,393	14,486	15,668	16,946

East Sussex County Council (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	438,937	465,668	494,028	524,114	556,033	589,895
Commercial	344,793	365,790	388,067	411,700	436,773	463,372
Industrial	255,677	271,248	287,767	305,292	323,884	343,608
C&D	1,347,580	1,388,008	1,429,648	1,472,537	1,516,713	1,562,215
Agricultural	485,000	485,000	485,000	485,000	485,000	485,000
Special Waste	36,125	36,125	36,125	36,125	36,125	36,125
Clinical Waste	1,817	1,823	1,835	1,848	1,860	1,873
Green waste	73,897	77,372	81,059	84,970	89,119	93,521
Plastic	145,137	152,971	158,146	166,915	176,193	186,010
Metals	75,435	61,270	64,806	68,552	72,520	76,724
Paper & cardboard	363,803	385,954	409,454	434,385	460,834	488,894
Glass	49,928	52,650	57,264	60,665	64,274	68,102
ELVs	31,128	36,214	27,698	30,859	34,753	39,239
WEEE	13,665	14,781	15,987	17,291	18,702	20,228

Hampshire County Council (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	888,233	942,326	999,714	1,060,596	1,125,187	1,193,711
Commercial	867,816	920,666	976,735	1,036,218	1,099,324	1,166,272
Industrial	974,967	1,034,343	1,097,334	1,164,162	1,235,059	1,310,274
C&D	2,726,962	2,808,770	2,893,034	2,979,825	3,069,219	3,161,296
Agricultural	988,100	988,100	988,100	988,100	988,100	988,100
Special Waste	155,260	155,260	155,260	155,260	155,260	155,260
Clinical Waste	4,020	4,034	4,060	4,088	4,115	4,144
Green waste	181,472	188,504	195,965	203,880	212,276	221,184
Plastic	334,450	352,789	365,897	386,438	408,180	431,194
Metals	209,589	184,384	195,208	206,680	218,839	231,727
Paper & cardboard	913,547	969,170	1,028,180	1,090,784	1,157,201	1,227,662
Glass	103,936	109,621	120,599	127,681	135,194	143,165
ELVs	62,990	73,283	56,049	62,447	70,325	79,404
WEEE	27,653	29,910	32,351	34,990	37,846	40,934

Isle of Wight UA (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	72,509	76,925	81,609	86,579	91,852	97,446
Commercial	64,715	68,656	72,837	77,273	81,979	86,971
Industrial	51,984	55,150	58,509	62,072	65,852	69,862
C&D	222,609	229,287	236,166	243,251	250,549	258,065
Agricultural	137,000	137,000	137,000	137,000	137,000	137,000
Special Waste	2,000	2,000	2,000	2,000	2,000	2,000
Clinical Waste	325	326	329	331	333	335
Green waste	16,482	17,056	17,665	18,311	18,997	19,724
Plastic	26,337	27,773	28,778	30,385	32,086	33,887
Metals	16,412	14,311	15,148	16,036	16,976	17,973
Paper & cardboard	64,455	68,379	72,542	76,959	81,644	86,615
Glass	8,430	8,890	9,713	10,288	10,897	11,544
ELVs	5,142	5,982	4,575	5,098	5,741	6,482
WEEE	2,257	2,442	2,641	2,856	3,089	3,342

Kent County Council (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	858,452	910,732	966,196	1,025,037	1,087,462	1,153,688
Commercial	707,620	750,714	796,433	844,936	896,392	950,983
Industrial	1,656,065	1,756,919	1,863,916	1,977,428	2,097,853	2,225,613
C&D	2,635,533	2,714,599	2,796,037	2,879,918	2,966,315	3,055,305
Agricultural	635,800	635,800	635,800	635,800	635,800	635,800
Special Waste	98,800	98,800	98,800	98,800	98,800	98,800
Clinical Waste	3,870	3,882	3,908	3,934	3,961	3,989
Green waste	188,341	195,137	202,347	209,997	218,112	226,721
Plastic	320,478	338,025	350,506	370,159	390,961	412,979
Metals	189,954	164,828	174,477	184,703	195,540	207,026
Paper & cardboard	833,738	884,502	938,357	995,492	1,056,107	1,120,413
Glass	99,713	105,163	116,683	123,477	130,685	138,331
ELVs	60,878	70,826	54,170	60,353	67,967	76,742
WEEE	26,726	28,907	31,266	33,817	36,577	39,561

Oxfordshire County Council (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	326,290	346,161	367,242	389,607	413,334	438,506
Commercial	334,184	354,535	376,126	399,033	423,334	449,115
Industrial	620,627	658,423	698,521	741,060	786,191	834,070
C&D	1,001,741	1,031,793	1,062,747	1,094,629	1,127,468	1,161,292
Agricultural	911,900	911,900	911,900	911,900	911,900	911,900
Special Waste	50,000	50,000	50,000	50,000	50,000	50,000
Clinical Waste	1,484	1,489	1,499	1,509	1,520	1,530
Green waste	105,206	107,789	110,529	113,437	116,521	119,794
Plastic	125,438	134,060	137,242	144,925	153,058	161,667
Metals	72,359	62,807	66,473	70,357	74,475	78,838
Paper & cardboard	348,824	370,055	392,580	416,475	441,827	468,722
Glass	38,366	40,465	44,509	47,123	49,896	52,838
ELVs	23,139	26,920	20,590	22,940	25,834	29,169
WEEE	10,158	10,987	11,884	12,854	13,902	15,037

Surrey County Council (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	574,891	609,902	647,045	686,450	728,255	772,606
Commercial	625,931	664,050	704,491	747,394	792,911	841,199
Industrial	398,898	423,191	448,964	476,306	505,313	536,086
C&D	1,764,972	1,817,921	1,872,459	1,928,633	1,986,492	2,046,087
Agricultural	302,700	302,700	302,700	302,700	302,700	302,700
Special Waste	50,000	50,000	50,000	50,000	50,000	50,000
Clinical Waste	2,591	2,599	2,617	2,634	2,652	2,671
Green waste	82,224	86,775	91,604	96,727	102,161	107,927
Plastic	218,598	229,575	239,269	252,737	266,993	282,083
Metals	115,540	98,009	103,723	109,779	116,195	122,994
Paper & cardboard	572,185	607,029	643,994	683,211	724,816	768,955
Glass	67,727	71,435	78,101	82,716	87,612	92,807
ELVs	40,769	47,431	36,277	40,418	45,517	51,393
WEEE	17,898	19,359	20,938	22,647	24,495	26,494

West Sussex County Council (tonnes)

Waste Type	2000	2002	2004	2006	2008	2010
Household	427,284	453,306	480,912	510,199	541,271	574,234
Commercial	393,594	417,564	442,993	469,972	498,593	528,957
Industrial	375,559	398,430	422,695	448,437	475,746	504,719
C&D	1,311,804	1,351,158	1,391,693	1,433,443	1,476,447	1,520,740
Agricultural	560,100	560,100	560,100	560,100	560,100	560,100
Special Waste	21,125	21,125	21,125	21,125	21,125	21,125
Clinical Waste	1,846	1,852	1,864	1,876	1,889	1,902
Green waste	85,199	88,582	92,171	95,978	100,017	104,302
Plastic	154,627	191,093	168,953	178,396	188,390	198,967
Metals	95,333	82,871	87,720	92,859	98,306	104,078
Paper & cardboard	396,666	420,817	446,439	473,622	502,459	533,053
Glass	49,534	52,240	57,283	60,658	64,239	68,037
ELVs	30,301	35,253	26,962	30,040	33,830	38,197
WEEE	13,303	14,388	15,562	16,832	18,206	19,691