

## Stage 4: Mapping

# Scoping Review Of Recycling & Reprocessing Infrastructure in South East England

Prepared for



Final Issue

15<sup>th</sup> December 2006



**Beyond Waste**

[www.beyond-waste.com](http://www.beyond-waste.com)

# South East Capacity Review

## Stage 4: Mapping

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#### **Disclaimer**

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# South East Capacity Review

## Stage 4: Mapping

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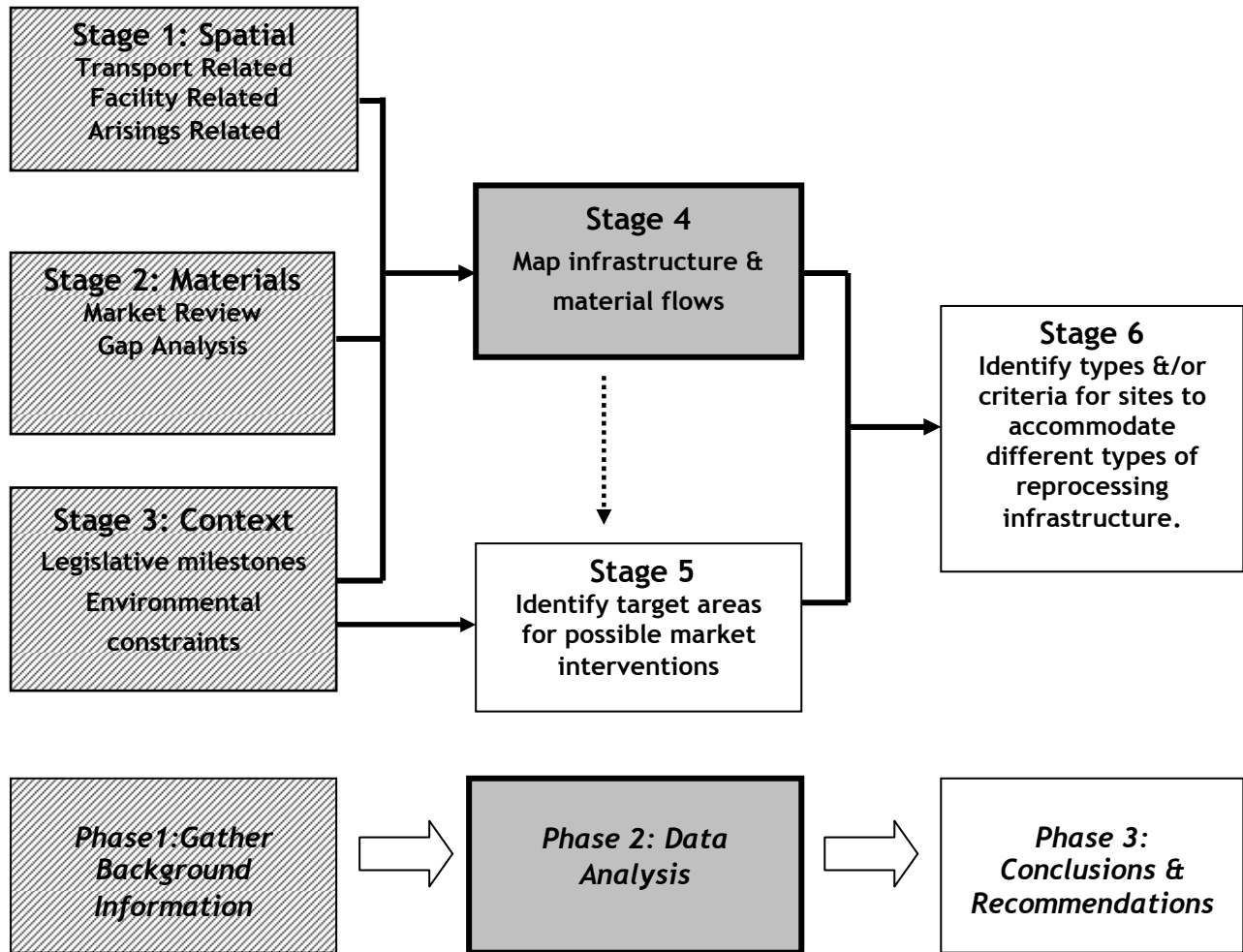
# South East Capacity Review

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### Introduction

The South East England Regional Development Agency commissioned Beyond Waste to undertake a scoping review of recycling and reprocessing capacity and associated infrastructure within the region.

### Project Structure



Work has been completed on Phase 1 which has been reported on separately. This report summarises the findings of our work on Stage 4 of the project focussing on mapping the recycling and reprocessing infrastructure and material flows within the region.

It presents maps showing locations of the in-region recycling and reprocessing infrastructure identified; indicative flows of materials for recycling; and commentary on these maps.

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### Mapping Current Infrastructure & Identifying Markets Utilised

Current infrastructure and destinations for recyclates have been identified through a survey of Waste Disposal Authorities (WDAs) and operating companies.

The following methodology has been developed to establish current recycling capacity:

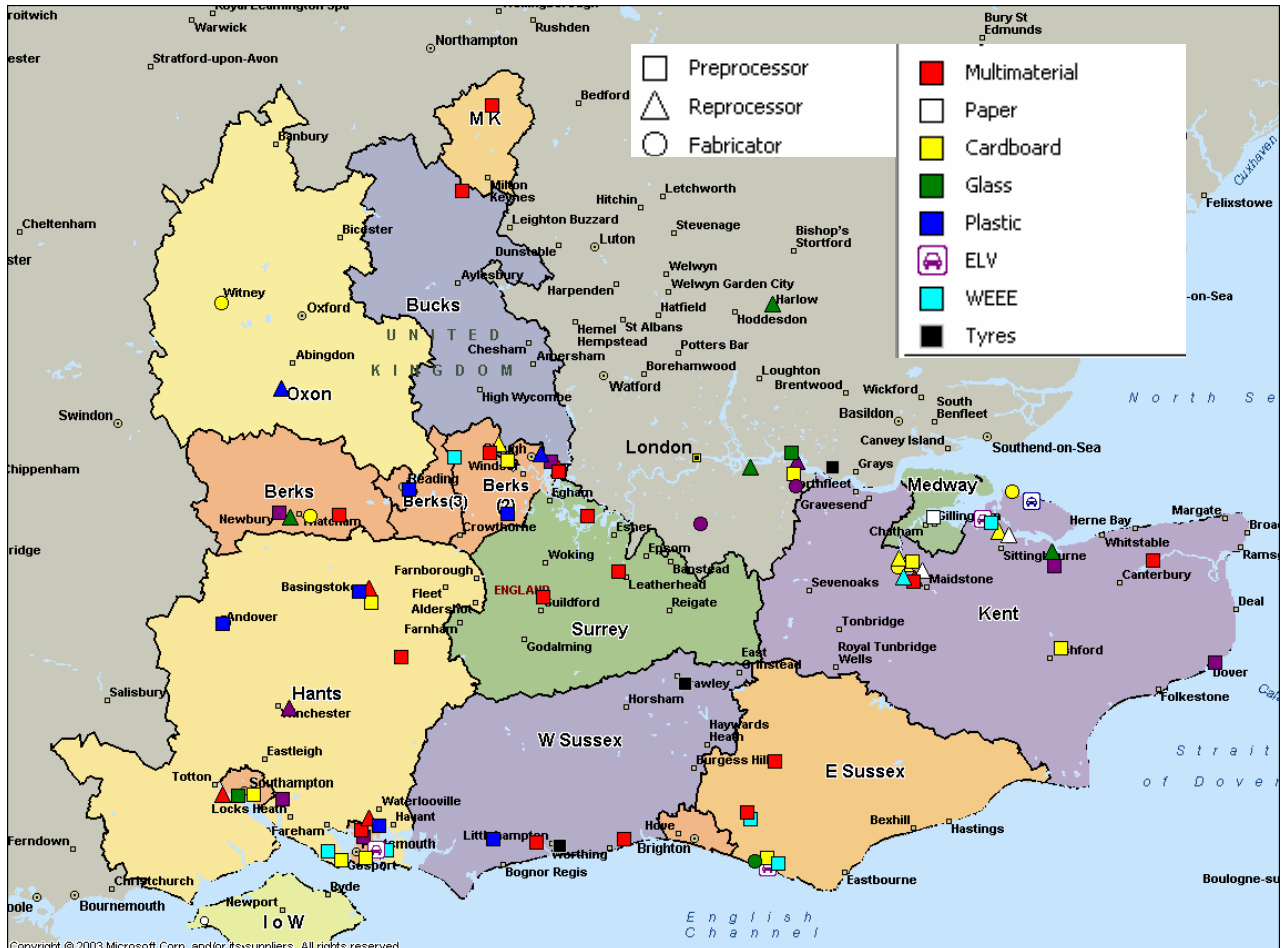
1. Survey of all WDAs to establish current flows of materials from the Municipal Solid Waste (MSW) stream. This signposted key facilities, recyclers and reprocessors serving the region.
2. Identification of recyclers and reprocessors believed to be active within the region through a search of different databases listed in Appendix 1. This was cross-checked with the Environment Agency listing of licensed sites.
3. Scoping of identified recyclers and reprocessors through a telephone survey.
4. Review of outputs by key players and stakeholders complemented with the outputs of the Vision Event convened in November 2005 (the proceedings of this event have been reported separately).

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### Mapping Reprocessing Infrastructure

The information obtained from the survey is shown in Map 1 below.



Map 1: Pre-Processors, Reprocessors And Fabricators

### Guide to Map 1

Three symbols have been used to distinguish between pre-processing (squares), reprocessing (triangles) and fabrication (circles) sites. Where more than one of these activities takes place on the same site the symbol that corresponds to the principal activity has been used. Showing sites where reprocessing is undertaken have been given priority. The symbols have been colour-coded according to the material handled. Thus the blue symbols all relate to wood; the yellow symbols to card etc. By representing these in different colours it is possible to see how different sites might interlink - although it should not be assumed that they actually do so in practice. Flows appear to be dictated largely by the market and commercial arrangements within or between businesses. Where sites handle more than one material the principal material colour has been used. Where the sites are genuinely multi-material such as Material Reclamation

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Facilities (MRFs) and Energy from Waste (EfW) sites then they have been assigned red as a colour.

Sub region	MRF location (operation/tpa)	Operator	Declared Capacity (tpa)	Materials handled	Sources of Materials Handled
<b>Berkshire</b>	Colnbrook	Grundon	130,000	Mixed paper, card, plastics & glass.	90% MSW
	Beenham Reading	Grundon	50,000	Paper, card, plastics & cans.	Kerbside commingled and CA banks
	Windsor, Stafferton Way, Maidenhead	Onyx as managers for RBWM	10,000	Paper, plastic & glass.	Kerbside commingled and CA banks
<b>East Sussex</b>	Bellbrook Uckfield	Wealden DC	9,900	Glass, paper & plastics.	Kerbside commingled and CA banks
	North Street Lewes	Lewes DC	9,900	Sorting & baling cardboard, cans & plastics.	Kerbside commingled and CA banks
	<i>Hollingdean Brighton</i>	<i>Onyx Floor area 3,750 m<sup>2</sup></i>	<i>33,000-46,000</i>	<i>Plastics, cardboard, paper, metals, glass, textiles &amp; magazines.</i>	<i>kerbside and bring site recycles.</i>
<b>Hampshire</b>	Alton	Onyx	85,000	Newspapers, magazines, plastic bottles, tins & cans.	
	Portsmouth	Onyx	72,000	Newspapers, magazines, plastic bottles, tins & cans.	
	Otterbourne	Onyx	10,000		
<b>Kent</b>	Hersden, Canterbury	Viridor (Brett)	40,000	Paper, green waste & glass.	MSW bring & Commercial
	<i>Allington</i>	<i>WRG</i>	<i>65,000</i>	<i>Paper, plastics &amp; cans.</i>	<i>Commingled kerbside</i>
<b>Oxfordshire</b>	Ewelme	Grundon	40,000	Glass.	C&I plus some MSW glass
<b>Milton Keynes</b>	Wolverton	Community Recycling /Cutts	100,000	Plastics inc shrink wrap, glass bulking, paper, card & cans	Kerbside commingled & some C&I
	Newton Longville	Pearce Recycling		Plastics & paper.	MSW & Commercial
<b>Surrey</b>	Leatherhead	Grundon	40,000	Mixed paper and card, plastic bottles & metal cans.	Kerbside commingled
	Slyfield Guildford	SWML (SITA)	25,000	Bulking glass& paper.	MSW
	Charlton Lane	SWML (SITA)	24,000	Sorting glass, paper & plastic.	MSW
<b>West Sussex</b>	<i>Ford To come on line 2008</i>	<i>Viridor</i>	<i>100,000 30-40,000 spare till 2015</i>	<i>Paper, plastics &amp; cans.</i>	<i>Kerbside commingled. Possible C&amp;I</i>
	Sompting To close Dec 06	Viridor	3,000	Bulking glass, paper. Sorting plastics & cans.	MSW Banks & Kerbside commingled

**Table 1 MRFs taking MSW sourced materials in South East**

### Material Reclamation Facilities (MRFs)

The red squares on Map 1 represent MRFs identified through the survey as either pre-processing or densifying an element of regional MSW.<sup>1</sup> The MRFs identified are detailed below. Three sites that are permitted but not yet operational have been italicised.<sup>2</sup>

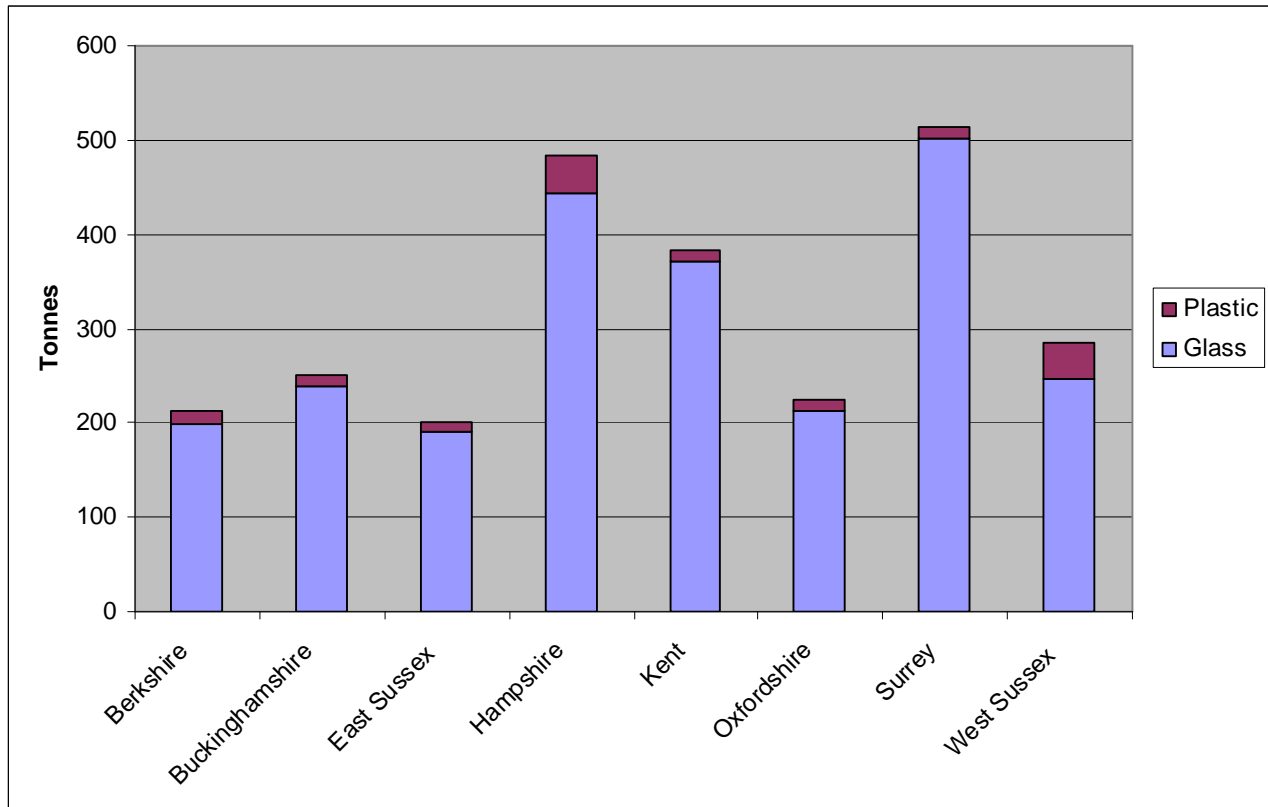
<sup>1</sup> Although data was supplied for all sites identified as licensed transfer sites it has not been possible to distinguish sites where materials are actually taken in and sorted for onward recycling/reprocessing. In view of the fact that the focus of this study is on recycling and reprocessing capacity it was considered that to include these sites without having sieved them would have significantly distorted the picture.

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### Mapping Material Flows

Our survey of operators and WDAs established indicative flows of materials arising within the region. Where flows relate to MSW derived materials the flows mapped are those declared by the Waste Disposal Authorities (WDAs) and Waste Collection Authorities (WCAs) that operate intermediate sites. To get full coverage for MSW flows, all WCAs would need to be surveyed as they may have direct relationships with reprocessors as well. Project resources did not allow this. An indication of the magnitude of materials handled by WCAs (and not covered fully) is given in Figure 1.



**Figure 1: WCA Sourced Packaging Materials Recycled (2003)**

Aggregated by SubRegion Source :VALPAK

In some cases the flows shown in the map go in more than one direction from the same source. This is because a number of destinations were identified by survey respondents. While data on volumes was derived for flows of MSW these represent a snapshot.

While it has been possible to derive indicative flows for municipal waste it has only been possible to identify flows of materials coming from commercial sources (which tend to be more disparate for tyres and ELVs that come via an established network of pre-processing facilities. The flows shown for some materials - particularly paper, plastic and glass - are only partial and should not be relied upon for planning purposes<sup>3</sup>. Nevertheless, it is legitimate to use the maps as giving an indication of flows.

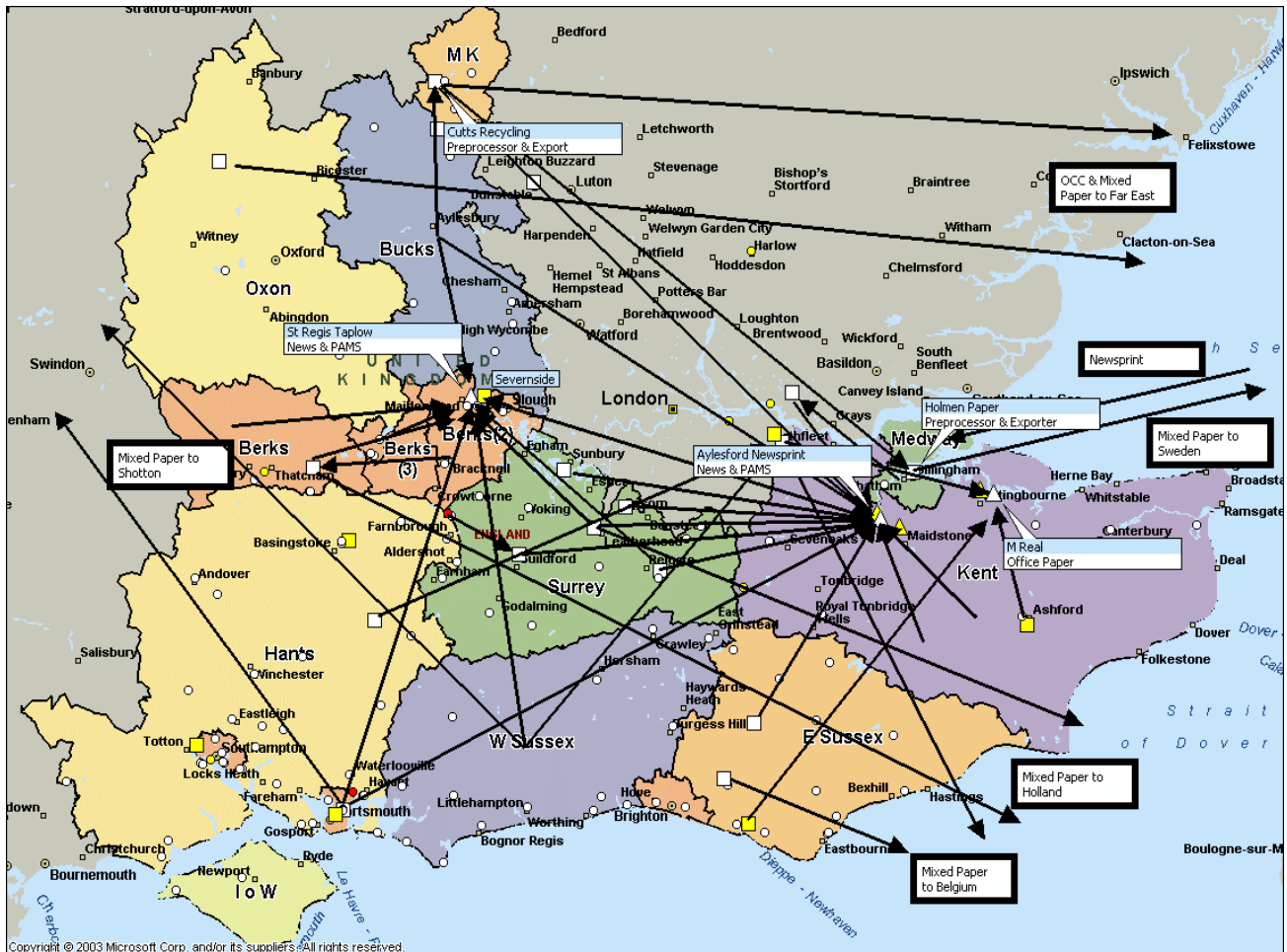
<sup>2</sup> Slough CHP takes the residue from many of the MRFs in the region. However high gate prices has resulted in some residue going to landfill. It is unclear if this counts against recycling targets.

<sup>3</sup> Obtaining this information would be very difficult not least due to commercial sensitivity but also because arrangements for commercially sourced recyclate will tend to be shorter term than for MSW.

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### Paper/Card



**Map 2: MSW Sourced Paper Flows**

### Commentary

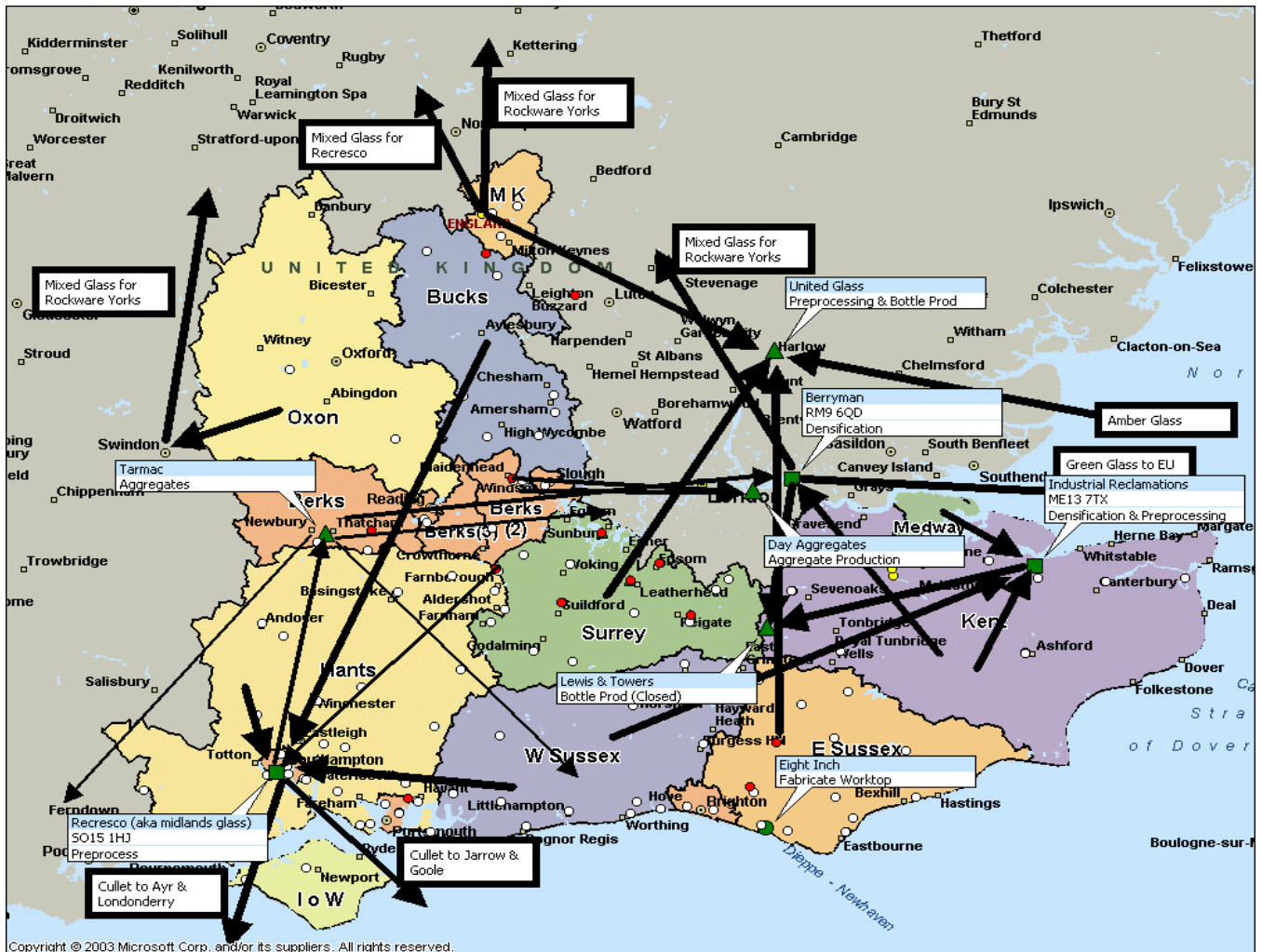
While some material is going for export it does clearly illustrate the centre of gravity is Aylesford in the East and Taplow in the West. These sites are also receiving quantities of paper from outside the region and this suggests the region is a net importer of paper for reprocessing. (See material profile in Stage 2 report.)

Flows to the M-Real site in Kent are not properly represented as this site primarily receives paper sourced from the commercial stream. It is known that commercial paper supplies will flow from some of the depots operated by the paper merchants operating within the region as well as significant flows of office paper from London.

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### Glass



Map 3: MSW Sourced Glass Flows

### Commentary

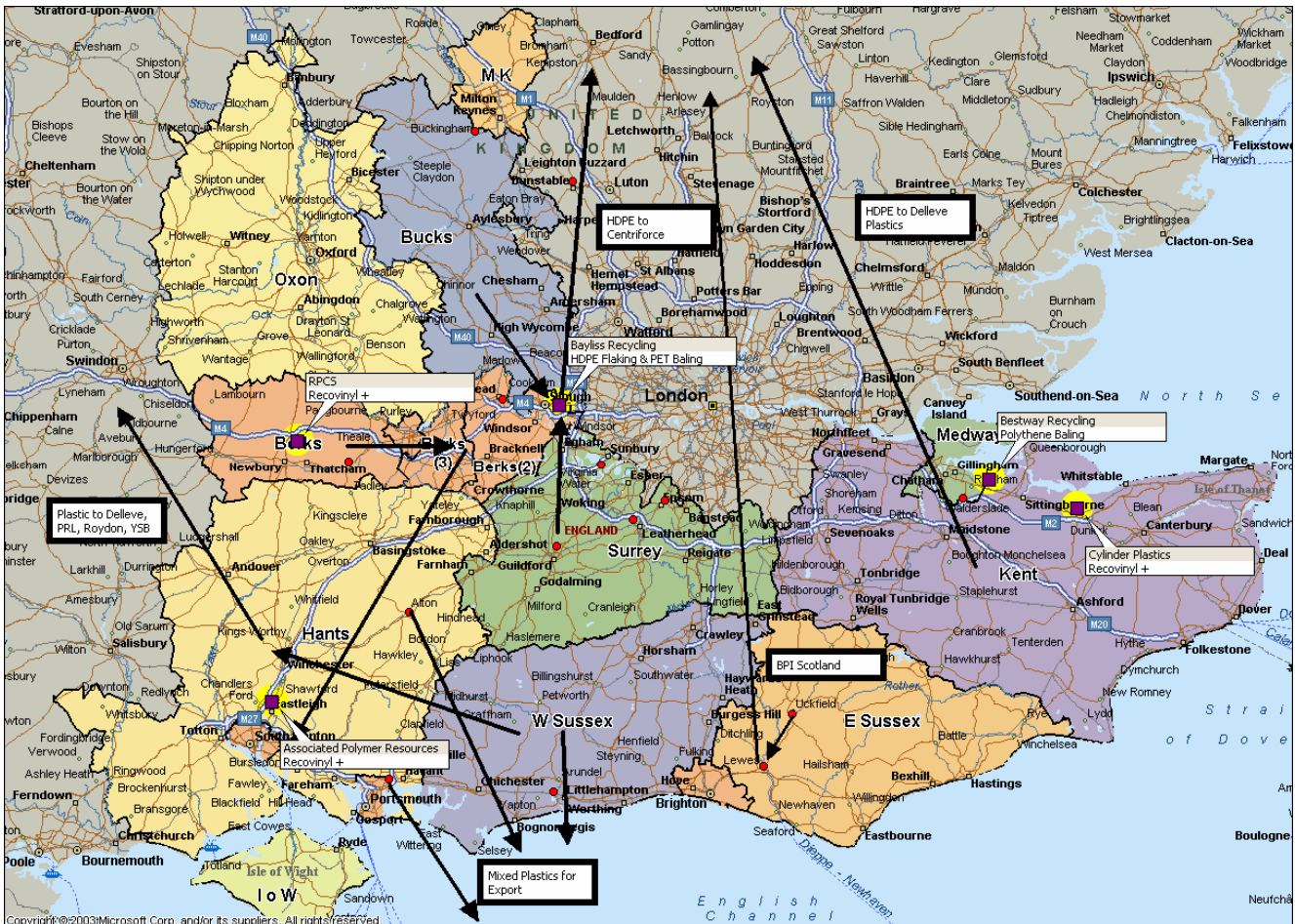
This map does illustrate that within the region the centre of gravity is the Recresco facility in Southampton and Industrial Reclamation in Faversham Kent. Out of region flows figure quite significantly particularly to the United Glass (now O-I) facility in Harlow and other container furnaces outside the region. Since the original mapping exercise the only container furnace within the region - Lewis and Towers has closed. This leaves a quantity of amber cullet requiring an alternative outlet. In the absence of this outlet being identified in our survey the flow has been left.

Glass is a material that can move quite extensive distances once it has been reduced to cullet size or below. For example, one user reported purchasing crushed glass from Yorkshire for specialist applications in East Sussex; another imports processed glass suitable for specialist applications from the Republic of Ireland. This suggests that the focus should be on sites for pre-processing through size reduction along with capacity to either keep or separate out colours as the three principal colours can have quite different outlets. (See Glass material profile in Stage 2 report for further details.)

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### Plastic



Map 4: MSW Sourced Plastic Flows

### Commentary

The flows of plastic demonstrate the disparate nature of plastic recycling in the region. Materials follow no predominant route, which reflects the dynamic nature of the market including the existence of a strong export market.

Plastics are sourced from other waste streams and the majority of pre-processing facilities shown within the region are in fact focussing on serving commercial/ industrial sources. In addition plastics cover a wide range of materials and their specific nature will determine the appropriate outlet if higher value markets are to be sought. Export occurs for bulk mixed plastics including residue from Waste Electrical & Electronic Equipment (WEEE) pre-processors amongst other things. Our survey sources did not identify any significant primary users of pre-processed plastics in the region.

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### Wood



**Map 5: Wood Facilities in the Region**  
(60 minute drive-time catchment in blue)

### Commentary

The principal pre-processors are largely handling commercially sourced wood - mainly in the form of pallets. The principal outlet for wood chip in the region is the Slough CHP plant. It is reported that there is a well-developed network of suppliers to the plant. Fuel is sourced from a range of sources including wood, packaging and residues from MRFs. A substantial quantity of material is sourced from London. Most pre-processors identified fall within a 60-minute drive-time catchment of the site. The study commissioned by WRAP<sup>4</sup> reported that “Geographically the wood recycling businesses in SE England are fairly well distributed except for an apparent vacuum south-east of London, principally in Kent.”

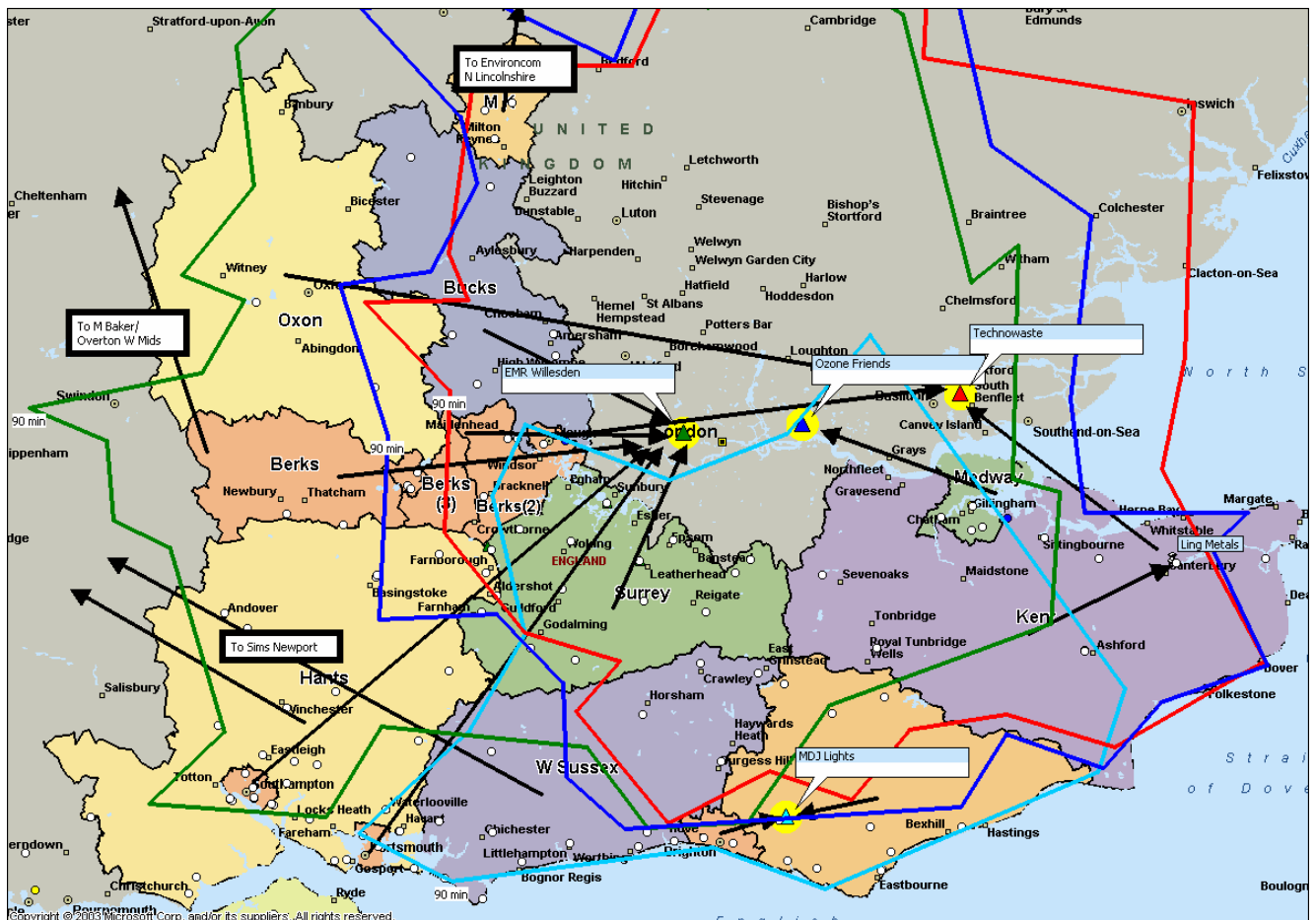
The WRAP study also reported that two power stations within the region - at Didcot and Kingsnorth - accepted wood waste. Inquiries indicated the use had been problematic and ceased. Moreover applications to permit burning of waste beyond December 2005 as required by the Waste Incineration Directive were not made for these sites: they have therefore been omitted from this map. They have however been included on the map in Stage 1 Report for prospective sites.

<sup>4</sup> Wood Recovery Infrastructure in South-East England August 2005  
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### Waste Electrical & Electronic Equipment



**Map 6: Flows & Fate of Fridges from MSW Stream**  
(Drive-time catchment line colour corresponds to site symbol colour)

#### Commentary

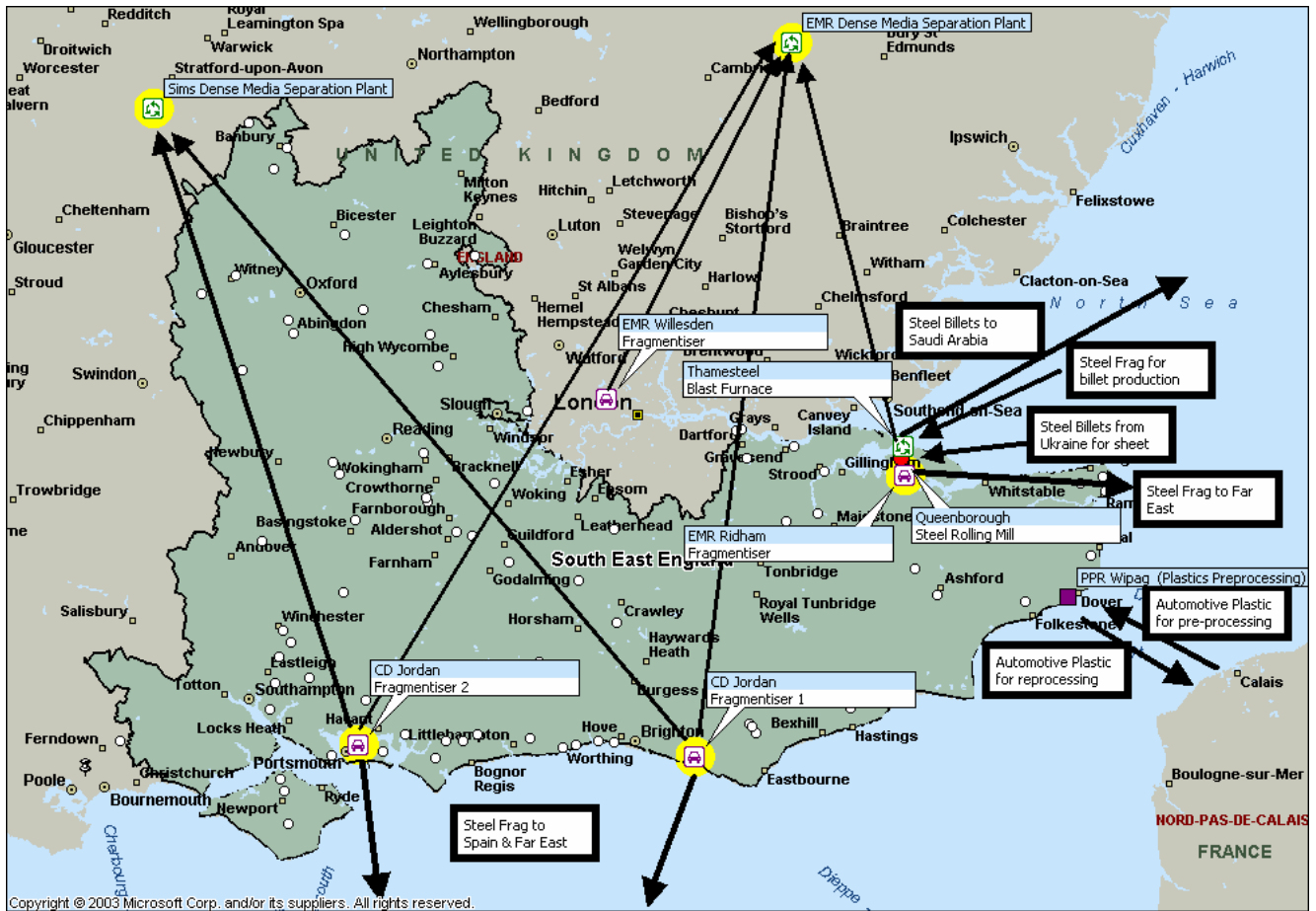
The flows on this map show that in spite of there being an accredited reprocessor of fridges within the region the vast majority of fridges flow out of the region. By plotting the 90 minute drive-time catchment of the most proximal sites it shows that the in-region location provides little advantage in travel time beyond the home sub-region. The in-region reprocessor receives substantial quantities of fridges from London. Overall the flows suggest that the movements are not sensitive to travel time or cost.

Flows of fridges have developed since the implementation of the Ozone Depleting Substances Regulations in 2000. This flow is a subset of movement relating to WEEE reprocessing which is in its infancy. There are indications that operators of fridge processing units will diversify into processing of other WEEE to varying degrees. Hence the current fridge flows may be replicated across the waste stream.

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### End of Life Vehicles



Map 7: Flows & Fate of ELVs

### Commentary

The flows on this map relate to End of Life Vehicles (ELVs) coming from all waste streams. It is based on a survey of the operators of fragmentisers in the region. The white dots show sites where dismantling and prior depollution may take place (known as Authorised Treatment Facilities or ATFs). Virtually all vehicles will end up at one of the four fragmentisers serving the region. (See material profile in Stage 2 report for further detail.)

This shows that flows of ELVs are largely regional although material travels out of the region following primary pre-processing/ densification. These flows are well established although the creation of ELV compliance schemes may result in some reassignment of sites as schemes require ATFs to sign up to a contract of supply to particular fragmentisers. The steel frag that forms the bulk of the ELV pre-processing residue is generally exported. The only in-region reprocessor is a steel furnace<sup>5</sup> that now imports steel frag for billet production and then exports the billet to Saudi Arabia where its owner is based. The only in-region fabricator is a steel rolling mill in close proximity to

<sup>5</sup> Plastics can be used as a reducing agent in steel making.

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the furnace that imports billet from a sister company in the Ukraine. This shows that steel frag is regarded as a global commodity. The fact that steel moves around the world when process loops are close at hand also indicates that the income from exports including shipping costs is higher than doing business locally. However, the operator of the blast furnace is now building a steel rolling mill at its site too.

The other aspect of ELV processing is the non-ferrous fraction. The map shows the flows of post-shredder material that go on to one of two sites for further separation. Both sites are out of the administrative region of the South East but fall within the commercial business unit that serves the South East. This highlights a point that has been raised repeatedly by respondents to the survey. The 'South East' is almost invariably regarded as including London as well as the shire counties. This difference between common usage of the term and the regional focus of this study created significant difficulties in eliciting relevant information when interfacing with industry and business and is something that needs to be considered further if communication is to be facilitated. <sup>6</sup>

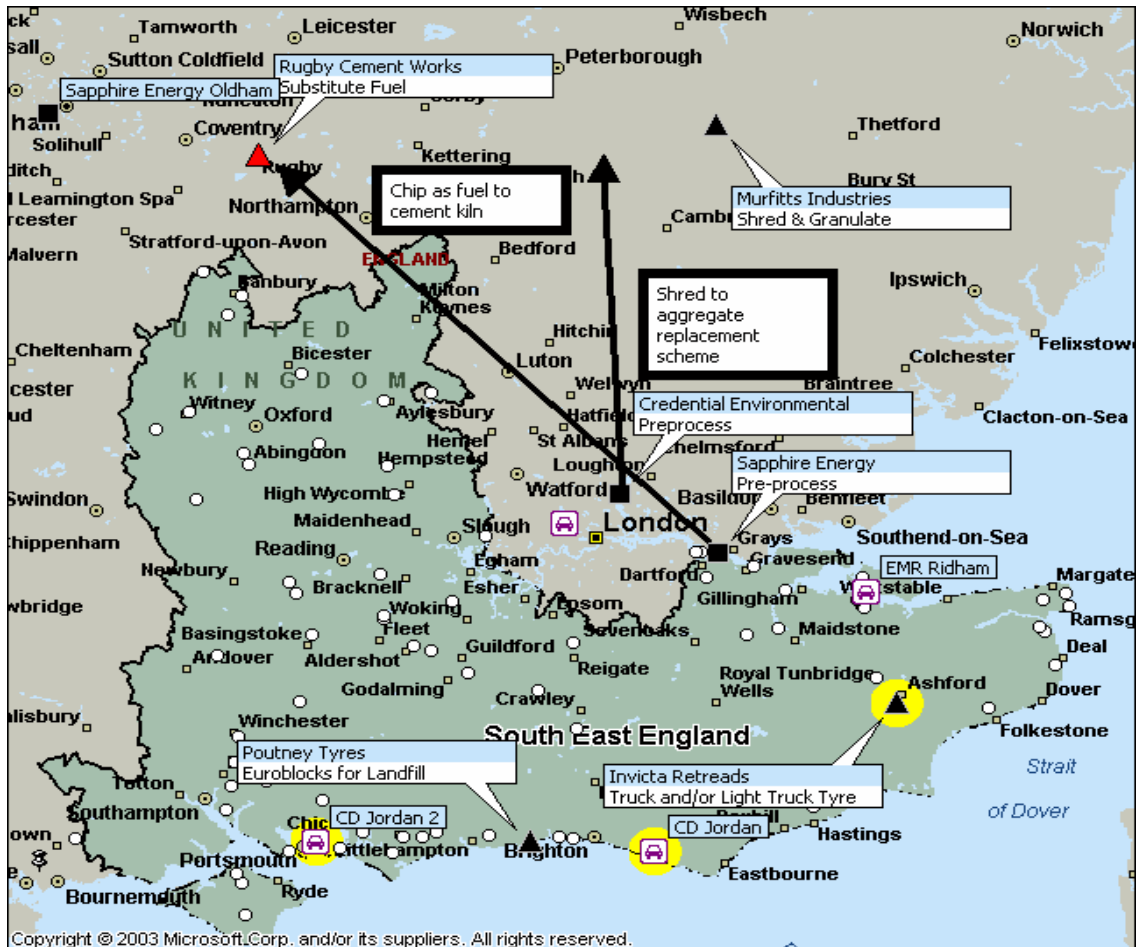
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<sup>6</sup> It is notable that the WRAP survey of wood recycling potential in South East England extended beyond the administrative boundaries of the region to include London and the Home Counties.

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### Tyres



Map 8: Flows of Tyres

### Commentary

The map shows the sources of tyres to be the same facilities as were identified for the purposes of ELVs. Tyres will either be removed at the initial stage or passed on to the fragmentiser operators. There are a further 200 possible source sites within the region from the Kwikfit and ATS groups and the national tyre distributors network. These have not been mapped due to lack of specific location data. Intermediate collectors service these networks and then act as the source of tyres available for recycling/reprocessing.

The two principal outlets for tyres for the region are outside of the region. All major operators reported their catchments as extending across the region and including London and some of East of England. It appears that the cost of road transport does not act as an inhibitor for movement even where drive-time exceeds 2 hours each way in some cases. This reinforces the point made above that while outlets may serve limited catchments; the catchments themselves extend beyond the administrative boundaries of the region.

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### Summary

The maps demonstrate that flows are largely beyond the region boundary and seem to be relatively insensitive to transport distance and cost. Our capacity assessment indicates that for some materials the region is a net importer - principally paper/ card and possibly wood while for plastics and tyres it is a net exporter having little or no indigenous reprocessing capacity. For glass, WEEE and ELV there is some capacity and potential for developing further outlets.

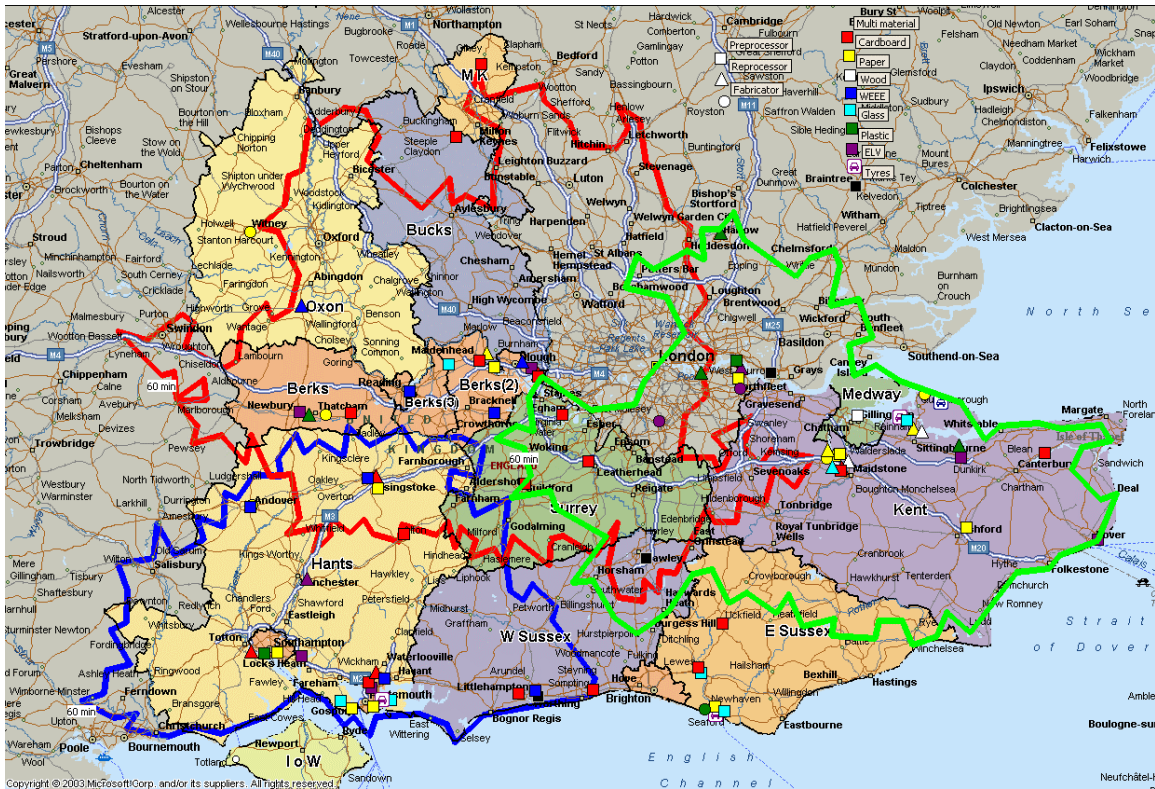
A key finding that has been raised repeatedly by respondents to the survey is that the 'South East' is almost invariably regarded as including London as well as the Home Counties. This difference between common usage of the term and the regional focus of this study created significant difficulties in eliciting relevant information when interfacing with industry and business and is something that needs to be considered further if communication is to be facilitated with the business community. The WRAP survey of wood recycling potential in South East England extended beyond the administrative boundaries of the region to include London and the Home Counties. We recommend that the study be extended to London and the adjacent sub-regions in the East of England to get a complete picture of flows.

While the flows for each material are distinct it is possible to discern a pattern of sorts. The M25 with radiating motorways means that it is possible to get from a central point in the region (around Reading) to most key points in the region within 100 minutes drive-time. However the drive time must increase to 140 minutes if travel is to or from the coastal belt. As transport by road is predominant, this means that flows tend to be divided sub-regionally with north-south flows in the west of the region, east-west flows along the coastal strip and west-east flows in the eastern hinterland. Using the emerging centres of gravity for reprocessing paper/card and glass a catchment map has been created (Map 9). This map shows that Kent's relative geographic isolation in the regional context (as reported in WRAP's wood study) is created by the regional boundary not embracing London and Essex. This also has knock on effects on East Sussex that does not have a direct motorway connection. This suggests that either these sub-regions should be a focus for developing new capacity or that the interconnection with London needs to be exploited further. In the absence of a good motorway connection in East Sussex increased use of rail might be favoured. Alternatively development of port capacity as has occurred in Hampshire might be a favourable route. In contrast Hampshire and West Sussex tend to align moving to the South West or out of region via ports. The sub-regions in the Northern Section benefit from being extremely well connected via the motorway network to the extent that material moves readily out of the region into the Midlands and beyond.

The opportunity to explore further synergies with adjoining regions on shared capacity development is key here.

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Map 9: In Region Catchments

### The Role of Exports

The mapping of flows in the South East region show for some materials significant trade is taking place with other EU states. The principal points of exit are shown in Map 9.



Map 10: Exit Points in South East for Identified Material Exports

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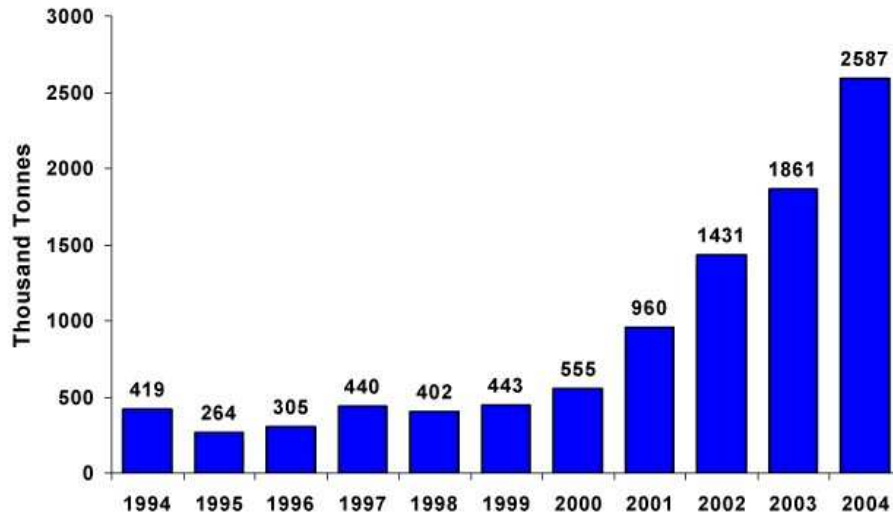
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### Putting Exports in Context

This section describes how the trend in exports is reflected across the UK.

### Paper

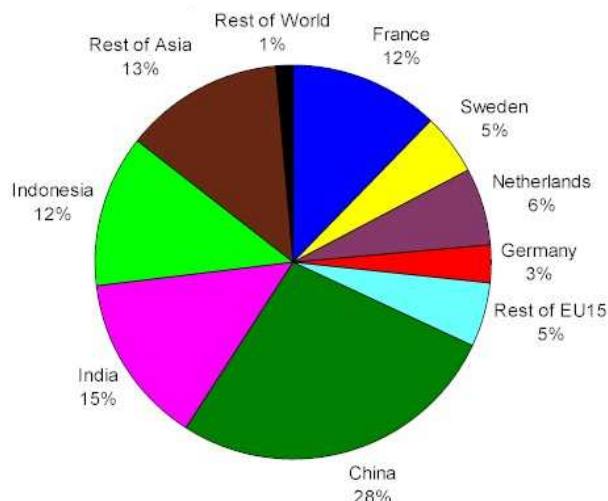
Recovered paper exports have grown significantly as the pressure to recycle has grown. Indigenous capacity is contracting.



Source: Customs and Excise + Confederation of Paper Industries

Figure 2 : UK Recovered Paper Exports

Figure shows the destinations of exports. This indicates that 31% of exports go to other EU Member States. This equates to 800,000 tonnes of paper.



Source: Customs and Excise

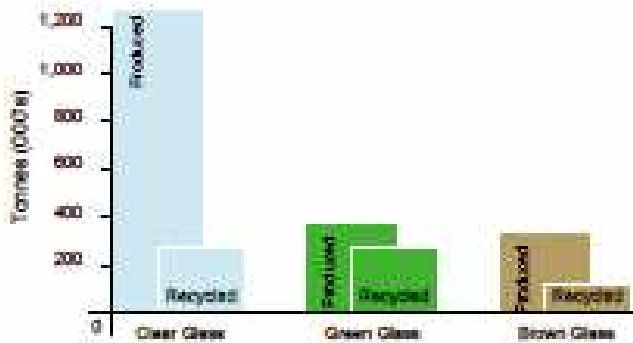
Figure 3: UK Exports of Recovered Paper 2004 by Destination

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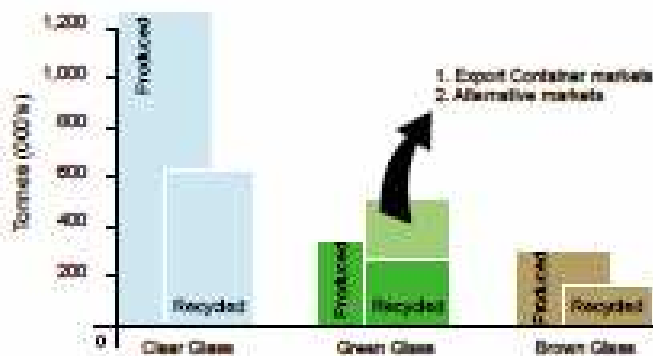
### Glass

The bulk of UK glass container production is clear and amber glass while imports are predominantly green glass in the form of wine and beer bottles. And while the recycling rate for green glass is near its theoretical maximum we still only recover 30% of glass of all colours for recycling.



**Figure 4: UK Production v Recycling 2003 (38%): the UK's colour imbalance**  
Source: British Glass

As a result of the colour imbalance there is a surplus of green glass collected above that which can be used in domestic capacity. In 2003 approximately 100,000 tonnes of glass were exported to European container makers. This surplus is predicted to increase to around 200,000 tonnes per annum as the Packaging Directive targets bite.



**Figure 5: Predicted UK Production v Recycling: 2008 (60%)**  
Source: British Glass

Alternative applications such as use for road or filtration media is being developed but the glass container sector argues that 'closed loop' recycling into bottles is preferable. Emerging Life Cycle Analysis evidence indicates that export of this glass back to furnaces in producing countries within Europe is preferable from the Carbon Dioxide emission perspective.<sup>7</sup>

<sup>7</sup> Glass Recycling - Life Cycle Carbon Dioxide Emissions - A Life Cycle Analysis Report Prepared for British Glass by Enviro Consulting Ltd November 2003.

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### Plastic

Export of plastic for recycling is increasing. This is primarily driven by the Packaging Directive targets plus the ELV and WEEE targets for which plastic represents significant element. Figure 17 presents the balance between indigenous processing and exports across the UK to meet the Packaging Directive targets. Table 3 shows the actual tonnage balance.

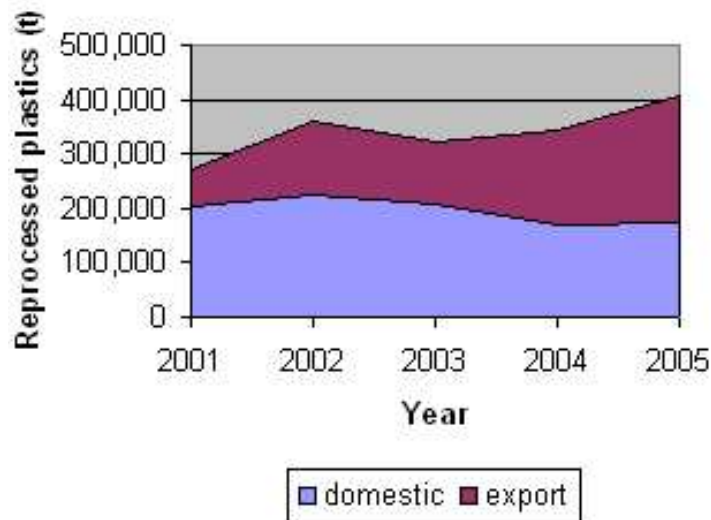


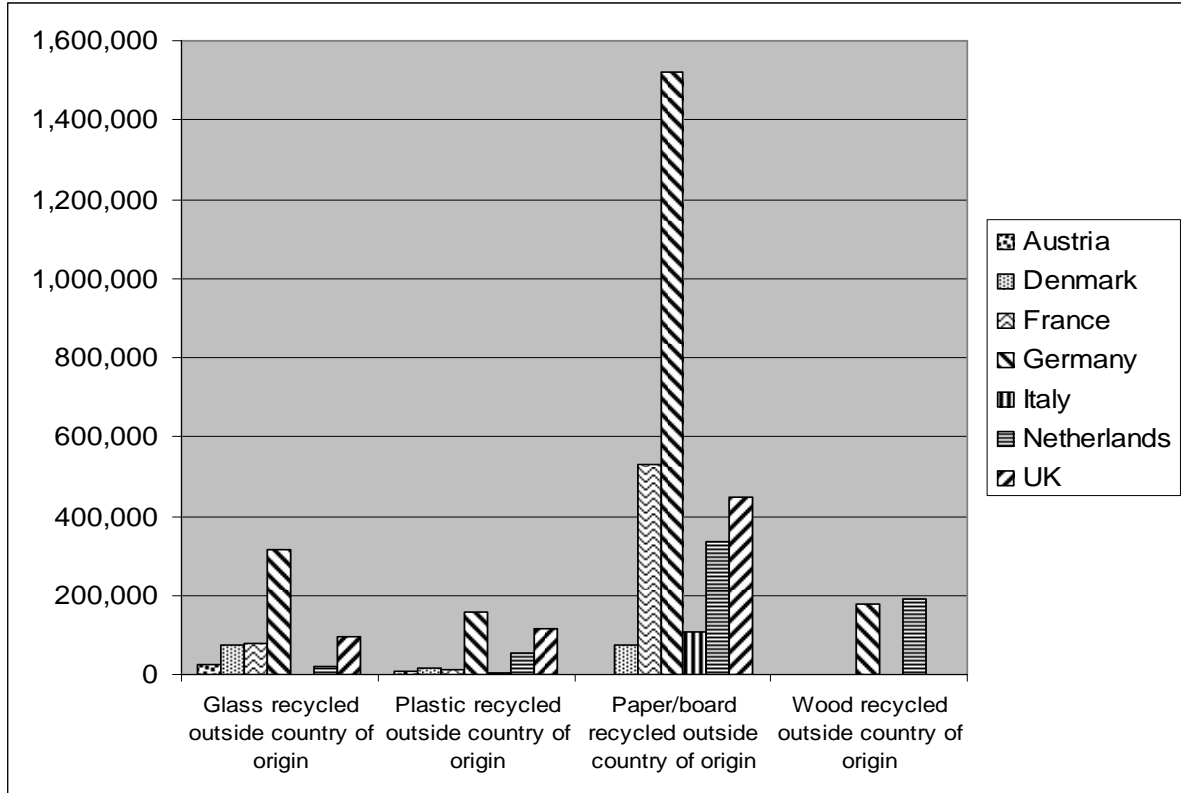
Figure 6: Plastic Reprocessing Export Trend

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### UK Exports in Context

Figure plots data relating to Packaging Directive compliance for 2003 from selected EU Member States.



**Figure 7: Export of Packaging Materials for Recycling from Selected EU states**

### Summary

This shows that UK is not alone in undertaking substantial exports of materials. The matrix in Figure below shows that patterns do exist for countries performance across the materials.

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Rank \	GLASS	PLASTIC	PAPER/BOARD	WOOD
1	Italy	Italy	Austria	Denmark
2	France	France	Italy	France
3	Netherlands	Austria	France	Italy
4	UK	Germany	UK	UK
5	Germany	UK	Denmark	Austria
6	Austria	Netherlands	Germany	Germany
7	Denmark	Denmark	Netherlands	Netherlands

**Figure 8: Ranking of Countries by Self Sufficiency (1 is most, 7 is least)**

### Commentary

This matrix shows that UK is not the most reliant on exports of the countries considered. It should be borne in mind that this ranking does not reflect the actual size of the market nor the actual difference in performance on each material. So while Germany ranks low on most materials the actual quantity of material being dealt with by the national reprocessing infrastructure exceeds that of all other countries for all materials except for wood. Similarly in the case of wood while 5 countries are virtually self sufficient The Netherlands is reliant on exports.<sup>8</sup>

### **Conclusion**

Export markets make a significant contribution to the achievement of national recycling targets in the UK, notably for packaging. As recycling activity increases a key issue is that given the dynamic nature of world markets, what is the desirable balance between domestic capacity and reliance on overseas markets? Should Government intervene so that a different balance to that which would otherwise occur if left to the market? And if so how? This raises issues around global security, future fuel price for shipping and development of indigenous recyclate capture systems by importing countries. There may be lessons to learn from other states on this. This is explored further in the Stage 5 Report.

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<sup>8</sup> The issues raised by this data are further explored in a sister project to this undertaken by Beyond Waste on behalf of the Interreg 3c funded European Waste Management Project

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### Appendix 1

### Listing of Sources of Companies Surveyed

## South East Capacity Review Stage 4: Mapping

Source	Material Type	Format
Environment Agency Accredited Reprocessors	Packaging	<a href="http://www.environment-agency.gov.uk/business/444304/444641/136872/508243/?version=1&amp;lang=_e">http://www.environment-agency.gov.uk/business/444304/444641/136872/508243/?version=1&amp;lang=_e</a>
Project Integra Waste Exchange Directory	Various	<a href="http://www.integra.org.uk/wastedirectory/companies/companydetail36.html">http://www.integra.org.uk/wastedirectory/companies/companydetail36.html</a>
Environment Agency Waste Minimisation & Recycling Directory	Various	<a href="http://www.environment-agency.gov.uk/commondata/acrobat/waste_recycling_directory_for_ha">http://www.environment-agency.gov.uk/commondata/acrobat/waste_recycling_directory_for_ha</a>
WRAP Recycled Products Guide	Various	<a href="http://www.recycledproducts.org.uk/">http://www.recycledproducts.org.uk/</a>
Tyre Industry Council Responsible Recycler Scheme	Tyres	<a href="http://www.tyresafety.co.uk/">http://www.tyresafety.co.uk/</a>
Letsrecycle.com recycling and waste directory.	Various	<a href="http://www.letsrecycle.com/directory/index.jsp">http://www.letsrecycle.com/directory/index.jsp</a>
The waste book	Various	<a href="http://www.recycle.mcmail.com/">http://www.recycle.mcmail.com/</a>
Accredited recycler under sustainalite scheme	Lamps (WEEE)	<a href="http://www.sustainalite.co.uk/accredited.html">http://www.sustainalite.co.uk/accredited.html</a>
WRAP Wood Project	Wood	Appendix
ICER Directory of Recyclers	WEEE recyclers and refurbishers	<a href="http://www.icer.org.uk/direct.htm">http://www.icer.org.uk/direct.htm</a>
British Plastics Federation	Plastics Recyclers	Manual listing of membership
E Generation Recycling Directory	Various	<a href="http://www.egeneration.co.uk/centre/services/rb/search.asp?accepted=T&amp;search_output=&amp;recycle=T&amp;wanted=T&amp;rb_type_id=6&amp;description=&amp;rb_subtype_id=0&amp;county_id=0&amp;x=27&amp;y=3">http://www.egeneration.co.uk/centre/services/rb/search.asp?accepted=T&amp;search_output=&amp;recycle=T&amp;wanted=T&amp;rb_type_id=6&amp;description=&amp;rb_subtype_id=0&amp;county_id=0&amp;x=27&amp;y=3</a>
Corporate Environmental Advisory Centre	Various	<a href="http://www.ceac.co.uk/waste___recycling.html#Consultancy">http://www.ceac.co.uk/waste___recycling.html#Consultancy</a>
Oxford Brookes Environmental Information Exchange	Various	<a href="http://www.brookes.ac.uk/eie/recycl.htm">http://www.brookes.ac.uk/eie/recycl.htm</a>
SEEDA Directory of Environmental Industries in South East	Various	
DTI directory of UK companies involved in the disposal and storage of waste fridges and refrigeration equipment	Fridge Recyclers	<a href="http://164.36.164.20/cgi-bin/wr/search.pl">http://164.36.164.20/cgi-bin/wr/search.pl</a>