



Taking Stock Fact sheet 6: Waste



Introduction

Solid waste is the residue at the end of the material chains of an industrial society – a massive resource devalued to zero or less by our wasteful production and consumption. Until recently the waste industry was mainly concerned with holes in the ground, but now there is no such thing as a cheap and environmentally acceptable method of disposal. In the longer term, the issue is not so much waste management as materials management – where recycling, re-using, recovering and minimisation are the only viable options. This will involve re-organising and re-engineering material chains and processes throughout the region.

In reality this is a huge challenge. The growth in national waste arisings of 1-3% per year (in the absence of better information) means waste could double in 25 years, and responsibility for such a growing mountain is fragmented into many competing purchasers and providers. At each stage in the material chain there are government, counties and districts, partnership companies and private companies. Each is getting to grips with interlocking contracts, new subsidies and taxes, new technology, new environmental standards, new targets and directives, and new commodity markets – altogether a rich mixture.

The main contribution of the regional Mass Balance and Ecological Footprint study is to provide some fundamental information on the environmental impacts and benefits of waste streams and different options for management. This is at least a start in piecing together this part of the bigger picture of the Factor Four strategy for the region as a whole.

Key facts

- A total of 36.8 million tonnes of waste were produced in the SE region in 2000. Over half of this was in construction and demolition (C&D) waste – nearly all of which is inert waste (non-biodegradable). See Figure 1
- The waste management industry dealt with 25 million tonnes (mt) of this waste: 4.2 mt of municipal solid waste (MSW); 7.2 mt commercial & industrial (C&I); and 13.5 mt of construction & demolition waste (C&D).
- The 6 mt of quarry and mining waste is generally managed on site, as is most of the 6 mt of agricultural waste.

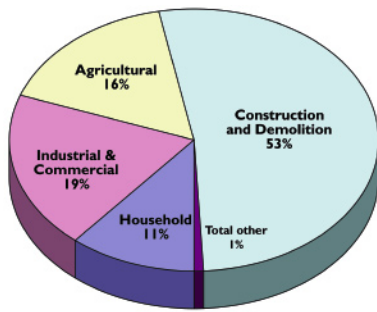
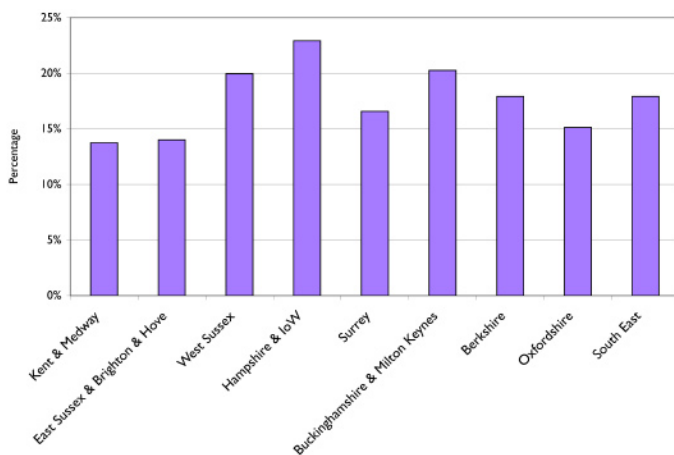


Figure 1: Waste

- The 4.2 million tonnes of municipal waste (collected by local authorities) is only 11% of the total, but the most difficult and expensive to deal with, as it is a mixture of material types, spread around in many locations.
- Commercial waste was around 5.8 million tones, almost 16% of the regional total, with industrial waste (excluding all construction waste) of approximately 1.4 million tonnes. Each of these have higher rates of recycling and recovery, as they have generally larger volumes of recycleable materials. Commercial waste is notable as nearly half of it is in paper and card products - around 30% of this is recycled at present.
- Sewage sludge amounted to 151,000 tonnes per year which is small in relation to total waste flows, but a sizeable problem.
- The SE also took 3.2 million tonnes of waste from Greater London, much of this in C&D waste - this volume is projected to be halved in 20 years.

Figure 2: Recycling rates of the South East Sub-regions, 2000



There is a considerable difference between the recycling rates of the sub-regions, the lowest being Kent and East Sussex (14 per cent) and the highest Hampshire (23 per cent). West Sussex and Buckinghamshire (including Milton Keynes) also have high recycling rates, and in fact all the sub-regions of the South East have achieved a higher recycling rate than the UK average. In terms of the tonnage of waste produced per capita, sub-regions that have higher recycling rates also, an average, produce more rubbish.

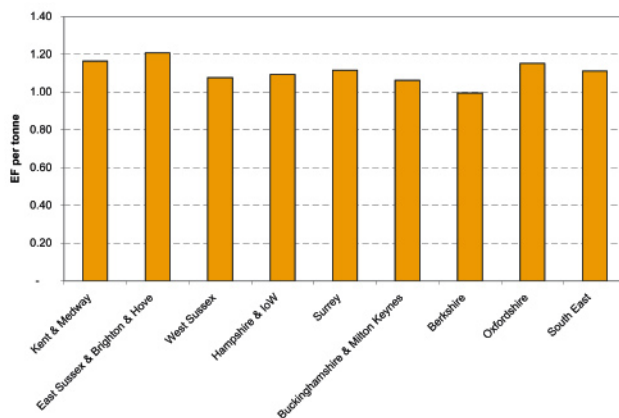
The Ecological Footprint (EF) for waste should be seen as a ‘satellite account’, i.e. supplementary to the EF of the main consumption sectors for the region as a whole, since materials which go to waste are already included in the EF for the relevant sectors, e.g. food. We include it because of the importance of waste management to regional strategy. As the sector where the basic materials have zero or negative value, the waste sector is the key to integrated resource management – reducing waste will involve working back up the supply chain, to improve the efficiency and lower the impacts, of production, distribution and utilization of materials of all kinds.

The EF for household waste management in the SE region in 2000 amounts to 4.5 million global hectares. This is equivalent to 8% of the overall regional total EF. From the domestic waste stream, paper and card accounts over 50% of the total EF from landfilling this waste, while other combustibles account for 17%.

For commercial and industrial waste (C&I), paper and card is over 44% of the total, but at present only 27% of this is recycled. For construction and demolition waste (C&D), some notional EF can be derived in terms of the tonnage of bulk material taken to landfill, which amounts to 13.5 million tonnes (this excludes hazardous and contaminated waste). Other waste streams including agricultural and quarry wastes are accounted for separately in the EF factors for production in the relevant sectors. There is considerable potential for waste minimisation and increasing recycling in many of these sectors – see case studies 1 and 2.

Using an EF per tonne measure, a useful indicator of resource productivity, Berkshire, at just over 1 global

Figure 3: Ecological Footprint per tonne of waste, South East Sub-regions, 2000.



hectare per tonne, is able to process their waste more efficiently than any of the other sub-regions. Potential reasons for this include lower 'embodied' energy in the waste stream due to a different material composition or a different recycling composition (see Figure 3).

Policy background

The latest UK Government Report on waste was published by the Strategy Unit in December, 2002 entitled "Waste Not, Want Not – A Strategy for Tackling the Waste Problem in England". Important points emphasised in the report include the need to reduce the growth of waste and to recycle more. The fundamental shift in waste management relies on the "Waste Hierarchy" (reduce - re-use – recycle – recover) to establish the priorities.

An interesting possibility introduced in this report is the introduction of 'incentive based schemes'. In reality this might mean Council Tax discounts for people who recycle or compost and giving the local authority freedom to introduce variable charging schemes, where the Council Tax element for waste would be removed and charges to households made according to the amount of un-recycled and unsorted waste they produce.

There is a particular fear in the South East that there is very little available space suitable for landfill sites, however the Strategy Unit suggest that a change to a more sustainable approach to waste management could take between 10 and 15 years. This highlights the need for urgent action. Statutory performance standards have been set for local authority recycling in England, towards meeting the overall recycling targets for household waste of 25% by 2005 and 30% by 2010.

The consultation draft of the regional strategy "No Time to Waste" produced by the South East Regional Assembly (SEERA) sets out the priorities of minimising the amount of waste produced and ensuring the overwhelming majority of materials are re-used, recycled or recovered in order to protect and enhance the environment for future generations. Again the waste hierarchy is emphasised.

Possible future scenarios

In the full Taking Stock Project Report we consider four scenarios for each sector, ranging from high growth (Factor 0) through business as usual (Factor 1) to low growth (Factor 2) and finally a 'Factor Four' scenario which represents a more sustainable alternative involving more efficient use of resources and a reduced ecological footprint. The Factor Four scenarios are designed to achieve a 40% reduction in EF by 2020, and a 75% reduction by 2050, in line with the 'halving resource use – doubling efficiency' targets first set out in the book Factor Four published in 1997.

High growth scenario (F-0)

This scenario corresponds to the continuing 3% annual growth in waste arisings. Increasing amounts of material are processed, purchased and disposed, in ever shorter time cycles. Mechanical biological treatment (MBT) is increasingly used, mainly to reduce volume, but this is energy intensive and as a result the total EF in the waste sector doubles in 25 years.

Business as usual (F-1)

This scenario corresponds to an interesting combination of aspiration and reality on the part of the SE Regional Waste Strategy. Waste grows at around 2% per annum, while imports from London taper off. A diverse mixture of larger scale technologies is introduced, with a rather brave assumption that recycling rates increase up to 50-75%. This corresponds with the F-1 ethos, which sees enlightened public management as containing the worst impacts of free market behaviour without restricting the root causes. The EF in this scenario would be roughly static, a balance between growing volumes and increasing recycling rates.

Low growth scenario (F-3)

This scenario by contrast assumes that whatever can go wrong probably will. Consumers refuse to participate, new facilities cannot get planning permission, the MBT technologies don't work as expected, and there is massive shakeout of commercial operators, all of which results in chaos. The implications for the EF would be for zero growth in waste arisings, while processing and recycling fail to take off, and hence stalemate all round.

Factor four scenario (F-4)

The Factor Four scenario is closely aligned with the 'rapid minimisation' forecast in the Strategy, i.e, initially 3% annual growth, tapering to -3% annual reduction, giving a -14% net reduction in waste arisings by 2020. This can be coupled with recycling rates up to the technical optimum for each material stream. Naturally this scenario depends on social, political and cultural changes to produce the desired framework for integrated resource management. In particular it highlights the positive combination of trends which the regional waste strategy would need to influence. The overall result and EF forecast for this scenario would in principle see a halving of waste volumes, with a doubling of efficiency in recovery or recycling by 2050.

Policy implications

Overall the prospects for waste management in the SE region show pressing problems and uncertainties, but on the horizon there is a new kind of material metabolism in production and consumption. Non-essential throughput of materials would be minimized, all products would be designed for re-use and recycling, and remaining waste would be sorted on collection. Organic and nutrient-rich materials from households, agriculture, and industry would be composted and linked through local and regional eco-cycles.

The analysis we have undertaken in the full project report of the different waste streams supports the theories behind the "Waste Hierarchy". In every case it is most beneficial not to produce the waste in the first place. Looking at the preferred scenario from the regional strategy, proposing a 60% recycling rate by 2025, it is clear this would bring about a substantial reduction in the Ecological Footprint, possibly a 58% reduction by 2020. This is based on reducing growth in waste to 1% per year. If no reduction in growth is achieved the EF would only reduce by 29%, meaning that half the reduction would be due to waste minimisation.

It is interesting to note from the analysis that the sub-regions with the highest recycling rates did not necessarily have the lowest ecological footprint. The main reason for this is that the sub-regions in question produce considerably more waste. Again this emphasises the importance of waste minimisation as the most effective method by which to reduce the EF impact of the waste stream.

The analysis also highlights particular materials of concern that cannot be recycled or where the benefits of recycling are marginal. The energy required to recycle is always lower than that used in producing the product from virgin materials, but there is a large variation between products in the potential for energy savings from recycling. For example the EF for recycled aluminium cans is 95% less than for those made from virgin materials, whereas recycling some plastics gives only an 11% advantage over using raw materials.

To achieve the reduction in landfill disposal required by the EC Directive and UK guidance, the regional strategy proposes rapid increases in recycling and a diversity of treatment technologies, with more benefits coming from larger facilities. The consultation is focused on the appropriate balance of aspiration (exceeding the targets) with practicality (meeting the targets). However there is a risk of failure, because it relies partly on new methods with unproven technologies and commercial viabilities. There is also a risk that the environmental and EF benefits will not be maximised, but this is partly because the question of where the waste comes from, and how far the stream can be minimized, is largely outside the powers or resources of the public sector

In this wider picture, success could only be achieved by coordination of public waste management for municipal waste, with private sector waste management of Commercial and Industrial, Construction and Demolition and special waste streams. It also depends on coordination between retailers, packagers, producers, and many others. Possibly the most effective way forward would be through an accelerated 'greening' of public sector purchasing and procurement, within a regional strategy for integrated resource management.

Case Study 1 - Betre West Sussex

Over 300 small businesses took part in the West Sussex business excellence through resource efficiency (betre) project aiming to reduce waste, water and energy use and make significant cost savings. The programme offered free support and advice over 18 months, including workshops, newsletters, environmental audits, grants and a technical helpline. 308 businesses took part, 158 were trained and 64 implemented 214 different actions to improve efficiency and reduce waste. The table below summarises the successful outcomes of the project. Based on the experience of other similar projects future savings could potentially top £1 million as businesses continue to identify and implement further actions. Environmental compliance was also improved with the potential to save a further £204,000 in avoided fines.

Taking the savings achieved by 64 SMEs as outlined, rough estimates can be made of the potential savings at regional level if all SMEs were to take similar actions, as shown in the table.

For more information, see the full case study on the Taking Stock website: www.takingstock.org

Main Category	Betre W Sussex total savings (From 64 SMEs, 11 – 199 employees)	Estimated potential regional savings (Based on 34,376 SMEs in SE region, giving multiplication factor of 537)
Waste reduced per annum	1,437 tonnes	771,800 tonnes
Energy saved p.a	1.559 million KWh	837 million KWh
CO ₂ emissions reduced p.a	668 tonnes	359,000 tonnes
Water saved p.a	62,900 m ³	33,795,000 m ³
Cost saved p.a	£215,357	£115,700,000
Cost to implement actions (Note some costs are ongoing annual costs, making this hard to gross up)	£96,909	

Case Study 2 – ReMaDe Kent and Medway

ReMaDe Kent and Medway aims to increase recycling by creating new markets for recycled products. Four priority materials were initially highlighted – glass, organic waste, plastic and paper – and to these have been added construction and demolition waste, electrical waste, end of life vehicles and tyres in response to new opportunities and developing legislation. The project target is to recycle or compost at least an additional 77,000 tonnes of waste by the end of 2004. In 2002 273 businesses were assisted or advised and 6 seminars or training events were run, which together involved engaging with 335 waste professionals.

The table below shows the target tonnage diverted to recycling for Kent and Medway, and an estimate of the regional potential diversion if all sub-regions were to introduce similar projects.

Material	Total projected recycling diversion tonnage over 3 years - Kent & Medway	Potential total target recycling diversion tonnage over 3 years - regional estimates
Glass	8,500	68,000
Organic waste / wood	21,050	168,400
Plastic	800	6,400
Paper / card	3,350	26,800
Electrical equipment (Mainly IT)	3,595	28,760
Other waste materials	16,350	130,800
Tyres	9,000	72,000
Vehicles	2,500	20,000
Construction	10,000	80,000
Total	75,145	601,160

For more information, see the full case study on the Taking Stock website: www.takingstock.org

For further details of our findings on waste see the full Project Report at www.takingstock.org.uk

Project Partners



Project Funders

