Review of England's Waste Strategy

Environmental Report under the "SEA" Directive

APPENDICES PART 2

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APPENDIX B – ENVIRONMENTAL EFFECTS PER TYPE OF WASTE MANAGEMENT FACILITY

Activity	Noise	Odour	Dust	Flora/fauna	Soils	Water quality/flow	Air quality[1]	Climate
Composting	+7 to +32 dBA increment recorded. Complaints recorded at up to 150 m, but relatively few	Contribute up to 680 OU/m^3. Complaints up to 80 m	Typical of industrial area – adjacent to site only	Low risk of effect due to emissions to water: indirect benefit from replacement of peat with compost	Benefit from improving soil structure. Potential effect of elevated levels of metals	Possible effect due to emissions to water/sewer, but water normally recirculated within process	Micro-organisms up to 10^6 cfu/m^3. May be significant at distance of up to 250 m. Can be abated with in-vessel system	Small effect due to CO_2 and possibly emissions, but less than landfill
Mechanical biological treatment	Noise from shredding could be significant, but can normally be controlled with proper mitigation	Could be significant: abatement would normally be required	Might be significant, although dust generating activities carried out indoors	Low	Low	Possible effect due to rainwater or washdown water runoff	Micro-organisms and VOCs may be significant. Would normally be abated	Small effect due to CO_2 emissions, but less than landfill
Materials recycling facility	Low potential. +15 to +20 dBA increment recorded. No complaints normally	Nil at clean MRF, no complaints normally. Low potential for complaints at dirty MRF	Low potential. No complaints normally	Low	Low	Possible effect due to rainwater or washdown water runoff at dirty MRF	Micro-organisms up to 5000 cfu/m^3, unlikely to be significant	Slight overall benefit

Activity	Noise	Odour	Dust	Flora/fauna	Soils	Water quality/flow	Air quality[1]	Climate
Anaerobic digestion	Could be significant, but can normally be controlled with proper mitigation	No complaints normally. Odours from waste storage/ processing can be controlled via combustion air	Low potential. No complaints normally	Low risk of effect due to emissions to water: may be indirect benefit from replacement of peat with composted end product	May be benefit from improving soil structure from use of composted end product. Potential effect of elevated levels of metals	Possible effect due to elevated N levels in wastewater (290 – 500 litres per tonne)	Emissions of combustion products. Offset to some extent by avoided power generation emissions	Small effect due to CO_2 emissions, but less than landfill
Gasification/ pyrolysis	+5 dBA increment recorded. Some noise sources could be significant, but can normally be controlled with proper mitigation	Potentially significant, but odours from waste storage/ processing are normally controlled via combustion air	Can normally be adequately controlled via combustion air. Ash handling/ transportation is possible source of dust	Low	Low	Low	Minor contribution to local levels of NOx (likely to be less than incineration)	Small effect due to CO_2 emissions, but less than landfill
Un-segregated Incineration	Some noise sources could be significant, but can normally be controlled with proper mitigation	Potentially significant, but odours from waste storage/ processing are normally controlled via combustion	Can normally be adequately controlled via combustion air. Ash handling/ transportation is possible source of dust	Potentially significant risk of accumulation of metals and dioxins and furans, though other sources more significant. No adverse	Potentially significant risk of accumulation of metals and dioxins and furans, though other sources more significant and found not to be	Potentially significant risk of contaminants leaching from ash. Contributes less than 20% of contaminants in	Minor contribution to local levels of NOx and metals (contribution typically 1 – 10% of local background)	Small effect due to CO_2 emissions, but less than landfill

Activity	Noise	Odour	Dust	Flora/fauna	Soils	Water quality/flow	Air quality[1]	Climate
		air		animal health effects observed	significant health issue. Dioxins: Contribution 0.1 – 1 ng/kg compared to background of 0.1 – 100 ng/kg	precipitation		
Landfill	5% of complaints caused by noise. +5 to +10 dBA increment recorded	60% of complaints caused by odour. Complaints recorded at up to 2 km	1% of complaints caused by dust. Complaints recorded at up to 250 m	Potential effect in the event of leachate escaping or from vermin. Restoration may provide improved habitat	Potentially significant as large area may be excavated	Potentially significant, but generally low/non detectable effects from current UK landfills	Potentially significant effects from engine/flare emissions (NOx, metals) or VOCs from fugitive gas	Significant adverse effect mainly due to methane emissions, even if landfill gas collected and burnt
Transport-ation/ Transfer stations	Low potential for noise nuisance	Odours could potentially be significant. Normally controlled by minimising turnaround time	Low	Low	Low	Possible effect due to rainwater or washdown water runoff	Low. Potentially minor impact from micro-organisms	Minor benefit due to more efficient logistics

Source: Defra (2004), *Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes*, (report prepared by Enviros Consulting and the University of Birmingham). This summary of observed environmental effects was based on a literature review. For details of the literature searched and for the bibliography see p.219, available at http://www.defra.gov.uk/environment/waste/research/health/#stage1

APPENDIX C – ASSESSMENT TABLES

The environmental assessment of the strategies are recorded in standard tabular format. In all cases, the direction of impact and the extent of impact are indicated in the assessment tables against each indicator:

+ + major environmental improvement or benefit,

+ minor environmental improvement or benefit,

0 neutral (no significant change),

- minor environmental degradation or disbenefit,

- - major environmental degradation or disbenefit, and

? uncertain or unknown impact.

Scenario 0: No change to existing waste management policy

Indicator		2010	2020	Notes
	BIODIVERSITY, FLORA AND FAUNA			
1	Percentage of waste management sites with a local BAP	+	+	It can be expected that the number of sites implementing local BAPs will increase with time due to regulatory pressure, and all new plants will operate to best practice.
2	Percentage of sites with registered EMS	+	+	It can be expected that the number of sites implementing EMS will increase with time due to regulatory pressure, and all new plants will operate to best practice.
3	Total landtake of waste infrastructure	+	+	The number of operating landfills is anticipated to decrease to 511 by 2010 then to 414 by 2020 (compared to 1170 in 2002)[1]. Other waste management facilities will be built as wastes are diverted from landfill. These will require less area than landfill per facility and, overall, there will be a net reduction in land area required for waste management facilities[2] by 2490 ha in 2010 and 6350 ha in 2020. These numbers are shown in Table A which makes the distinction between landtake for non-landfill facilities and for landfills. These numbers take into account landfills estimated to be closed since 2002/03: the land area required for new facilities (including landfills) is more than offset by land for landfills closed since 2002/03 which will be restored and returned to other uses[3].
	POPULATION AND HUMAN HEALTH			
4	Number of incidents of fly-tipping	0	0	The incidence of fly-tipping is independent of the facility types and is controlled by such things as the cost of disposal and the distance to waste management facilities. This scenario does not anticipate any significant change in fly-tipping.
5	Number of complaints to waste management sites related to operation	+	-	The total number of complaints to waste management sites is broadly related to the number of facilities operating. This scenario anticipates a net decrease of 176 operating facilities in 2009 as old landfills are closed but a net increase of 150 by 2019 as new waste processing facilities are built.
	WATER AND SOIL			
6	Percentage of sites exceeding EA discharge authorisations in the previous year			Proposed as future monitoring indicator.
7	Number of serious waste-related	-	-	Most pollution incidents to water are associated with both operating and closed landfills.

[1] See footnote 71 above and Appendix D for details of the assumptions underlying these estimates.

[2] Net of landfills closed since 2002/03.

[3] For further information on calculation on number of landfills see D2 of Appendix D below.

Indicator		2010	2020	Notes
	pollution incidents to water			This scenario anticipates 511 operating landfills in 2010 and 414 in 2020 in addition to the 1170 landfills operating in 2002 that will all be closed by 2006.
8	Number of serious waste-related pollution incidents to land	+	-	Most pollution incidents to land are associated with transfer stations, and the number of transfer stations is roughly related to the total number of facilities operating. This scenario anticipates a net decrease of 176 operating facilities in 2009 as old landfills are closed but a net increase of 150 by 2019 as new waste processing facilities are built. This indicator is considered to be more significant than incidents to water (Indicator 8) and to air (Indicator 11) because statistically more incidents to land occur.
9	Eutrophication			Proposed as future monitoring indicator.
	AIR			
10	Number of serious waste-related pollution incidents to air	+	+	Most pollution incidents to air are associated with operating landfills. This scenario anticipates a decrease in the number of operating landfills to 511 by 2010 then to 414 by 2020.
11	Annual concentrations of dioxins in air	0	0	Properly run facilities should emit negligible amounts of dioxins to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of dioxins in air.
12	Annual concentrations of mercury in air	0	0	Properly run facilities should emit negligible amounts of mercury to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of mercury in air.
	CLIMATIC FACTORS			
13	Total CO_2 and CH_4 emissions from waste management			Proposed as future monitoring indicator.
14	Carbon equivalent emissions	+	+ +	Diversion of waste from landfill to incinerator reduces the emissions of greenhouse gases, partly from the reduction in the generation of methane in landfills and partly from the offsetting of fossil fuel combustion via EfW. This scenario anticipates a net decrease in carbon equivalent emissions of 2485 kte in 2010 and 5837 kte in 2020 compared to 2003.
	CULTURAL HERITAGE			
15	Proportion of sites within or affecting areas with landscape designations	+	-	This scenario anticipates a net decrease of 176 operating facilities in 2009 as old landfills are closed but a net increase of 150 by 2019 as new waste processing facilities are built. It is likely that new build facilities will put pressure on designated landscapes, although the impact is expected to be kept to a minimum through the planning system.
	RESOURCE DEPLETION AND UTILISATION			

Indicator		2010	2020	Notes
16	Resource use – domestic material consumption			Proposed as proxy for an SCP indicator that may be developed in due course.
17	Electricity generation from waste (excluding landfill gas)	+	+	This scenario anticipates electricity generated from waste via incineration and pyrolysis plants to be 595 MW in 2010 and 890 MW in 2020. Additional energy may be generated by EfW associated with combustion of landfill gas.
	WASTE ARISINGS			
18	Total MSW arisings	-	- -	This scenario anticipates the total amount of MSW arising to increase to 31,780 kte by 2010 and 36,997 kte by 2020 (i.e. approximately 25% more than arose in 2003).
19	Household waste arisings per person			Proposed as future monitoring indicator.
20	Proportion MSW recycled or composted	+	+ +	This scenario anticipates the total amount of MSW recycled or composted to increase to 38% in 2010 and 57% in 2020 (compared to the 15% recycled in 2002/2003).
21	Total C&I waste arisings	-	- -	This scenario anticipates the total amount of C&I arising to increase to approximately 68,860 kte by 2010 and 82,290 kte by 2020 (compared to 66,040 kte - which excludes hazardous liquid wastes - in 2003).
22	Proportion C&I wastes recycled	+	+	This scenario anticipates the total amount of C&I recycled (excluding re-use) to increase to 43% in 2010 and 45% in 2020 (compared to the 32% recycled in 2003). (Recycling and reuse combine increase to 53 and 54% respectively.)
23	Total CDW arisings	0	0	This scenario does not anticipate any change to the CDW arisings which were approximately 90,000 kte in 2003.
24	Proportion CDW recycled	0	0	This scenario does not anticipate any change to the proportion of CDW arisings beneficially reused which were approximately 90% in 2003.
	HAZARDOUS WASTE			
25	Total hazardous waste arisings	-	-	It is anticipated that arisings (2060 kte in 2002/03) will decrease following the changes to the hazardous waste regulations. Although the overall trend in hazardous waste arisings is downwards, quantities may increase in the short term as a result of more waste being classified as hazardous. This will be offset by the impact of the landfill controls and the requirements under relevant EU Directives encouraging greater hazardous waste minimisation, greater recycling and safer disposal.
26	Proportion of hazardous wastes treated and diverted permanently from landfill			Proposed as future monitoring indicator. However in 2002/3 approximately 50% was disposed to landfill. Following changes to the regulations the proportion diverted from landfill permanently is expected to increase.
27	Hazardousness of waste			Proposed as future monitoring indicator.

Scenario 1: Reduction in arisings

Indicator		2010	2020	Notes
	BIODIVERSITY, FLORA AND FAUNA			
1	Percentage of waste management sites with a local BAP	+	+	It can be expected that the number of sites implementing local BAPs will increase with time due to regulatory pressure, and all new plants will operate to best practice.
2	Percentage of sites with registered EMS	+	+	It can be expected that the number of sites implementing EMS will increase with time due to regulatory pressure, and all new plants will operate to best practice.
3	Total landtake of waste infrastructure	+	+ +	The number of operating landfills is anticipated to decrease to 511 by 2010 then to 321 by 2020 (compared to 1170 in 2002)[4]. Other waste management facilities will be built as wastes are diverted from landfill. These will require less area than landfill per facility and, overall, there will be a net reduction in land area required for waste management facilities[5] by 2570 ha in 2010 and 11550 ha in 2020. These numbers are shown in Table A which makes the distinction between landtake for non-landfill facilities and for landfills. These numbers take into account landfills estimated to be closed since 2002/03: the land area required for new facilities (including landfills) is more than offset by land for landfills closed since 2002/03 which will be restored and returned to other uses[6].
	POPULATION AND HUMAN HEALTH			
4	Number of incidents of fly-tipping	0	0	The incidence of fly-tipping is independent of the facility types and is controlled by such things as the cost of disposal and the distance to waste management facilities. This scenario does not anticipate any significant change in fly-tipping.
5	Number of complaints to waste management sites related to operation	+	0	The total number of complaints to waste management sites is broadly related to the number of facilities operating. This scenario anticipates a net decrease of 211 operating facilities in 2009 as old landfills are closed and a decrease of 182 by 2019 as new waste processing facilities are built.
	WATER AND SOIL			
6	Percentage of sites exceeding EA discharge authorisations in the			Proposed as future monitoring indicator.

[4] See footnote 71 above and Appendix D for details of the assumptions underlying these estimates.

[5] Net of landfills closed since 2002/03.

[6] For further information on calculation on number of landfills see D2 of Appendix D below.

Indicator		2010	2020	Notes
	previous year			
7	Number of serious waste-related pollution incidents to water	-	-	Most pollution incidents to water are associated with both operating and closed landfills. This scenario anticipates 511 operating landfills in 2010 and 321 in 2020 in addition to the 1170 landfills operating in 2002 that will all be closed by 2006.
8	Number of serious waste-related pollution incidents to land	+	+	Most pollution incidents to land are associated with transfer stations, and the number of transfer stations is roughly related to the total number of facilities operating. This scenario anticipates a net decrease of 211 operating facilities in 2009 and 182 by 2019. This indicator is considered to be more significant than incidents to water (Indicator 8) and to air (Indicator 11) because statistically more incidents to land occur.
9	Eutrophication			Proposed as future monitoring indicator.
	AIR			
10	Number of serious waste-related pollution incidents to air	+	+ +	Most pollution incidents to air are associated with operating landfills. This scenario anticipates a decrease in the number of operating landfills to 511 by 2010 then to 321 by 2020.
11	Annual concentrations of dioxins in air	0	0	Properly run facilities should emit negligible amounts of dioxins to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of dioxins in air.
12	Annual concentrations of mercury in air	0	0	Properly run facilities should emit negligible amounts of mercury to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of mercury in air.
	CLIMATIC FACTORS			
13	Total CO_2 and CH_4 emissions from waste management			Proposed as future monitoring indicator.
14	Carbon equivalent emissions	+	+ +	Diversion of waste from landfill to incinerator reduces the emissions of greenhouse gases, partly from the reduction in the generation of methane in landfills and partly from the offsetting of fossil fuel combustion via EfW. This scenario anticipates a net decrease in carbon equivalent emissions of 2583 kte in 2010 and 6361 kte in 2020 compared to 2003.
	CULTURAL HERITAGE			
15	Proportion of sites within or affecting areas with landscape designations	+	+	This scenario anticipates a net decrease of 211 operating facilities in 2009 and 182 by 2019. The net reduction may lift pressure to build near designated sites.

Indicator		2010	2020	Notes
	RESOURCE DEPLETION AND UTILISATION			
16	Resource use – domestic material consumption			Proposed as proxy for an SCP indicator that may be developed in due course.
17	Electricity generation from waste (excluding landfill gas)	+	+	This scenario anticipates electricity generated from waste via incineration and pyrolysis plants to be 575 MW in 2010 and 756 MW in 2020. Additional energy may be generated by EfW associated with combustion of landfill gas.
	WASTE ARISINGS			
18	Total MSW arisings	0	0	This scenario anticipates the total amount of MSW arisings to be 29942 kte in 2010 and 30,036 kte in 2020 (i.e. approximately the same as arose in 2003).
19	Household waste arisings per person			Proposed as future monitoring indicator.
20	Proportion MSW recycled or composted	+	+ +	This scenario anticipates the total amount of MSW recycled or composted to increase to 33% in 2010 and 50% in 2020 (roughly doubled compared to the 15% recycled in 2003).
21	Total C&I waste arisings	-	- -	This scenario anticipates the total amount of C&I arising to be approximately 65,910 kte in 2010 and 65,830 kte in 2020 (i.e. approximately the same as arose in 2003).
22	Proportion C&I wastes recycled	+	+	This scenario anticipates the total amount of C&I recycled to increase to 43% in 2010 and 45% in 2020 (compared to the 32% recycled in 2003).
23	Total CDW arisings	0	0	This scenario does not anticipate any change to the CDW arisings which were approximately 90,000 kte in 2003.
24	Proportion CDW recycled	0	0	This scenario does not anticipate any change to the proportion of CDW arisings beneficially reused which were approximately 90% in 2003.
	HAZARDOUS WASTE			
25	Total hazardous waste arisings	-	-	It is anticipated that arisings (2060 kte in 2002/03) will decrease following the changes to the hazardous waste regulations.
26	Proportion of hazardous wastes treated and diverted permanently from landfill			Proposed as future monitoring indicator. However in 2002/3 approximately 50% was disposed to landfill. Following changes to the regulations the proportion diverted from landfill permanently is expected to increase.
27	Hazardousness of waste			Proposed as future monitoring indicator.

Scenario 2: Enhanced levels of recycling

Indicator		2010	2020	Notes
	BIODIVERSITY, FLORA AND FAUNA			
1	Percentage of waste management sites with a local BAP	+	+	It can be expected that the number of sites implementing local BAPs will increase with time due to regulatory pressure, and all new plants will operate to best practice.
2	Percentage of sites with registered EMS	+	+	It can be expected that the number of sites implementing EMS will increase with time due to regulatory pressure, and all new plants will operate to best practice.
3	Total landtake of waste infrastructure	+	+	The number of operating landfills is anticipated to decrease to 511 by 2010 then to 385 by 2020 (compared to 1170 in 2002)[7]. Other waste management facilities will be built as wastes are diverted from landfill. These will require less area than landfill per facility and, overall, there will be a net reduction in land area required for waste management facilities[8] by 2460 ha in 2010 and 7650 ha in 2020. These numbers are shown in Table A which makes the distinction between landtake for non-landfill facilities and for landfills. These numbers take into account landfills estimated to be closed since 2002/03: the land area required for new facilities (including landfills) is more than offset by land for landfills closed since 2002/03 which will be restored and returned to other uses[9].
	POPULATION AND HUMAN HEALTH			
4	Number of incidents of fly-tipping	0	0	The incidence of fly-tipping is independent of the facility types and is controlled by such things as the cost of disposal and the distance to waste management facilities. This scenario does not anticipate any significant change in fly-tipping.
5	Number of complaints to waste management sites related to operation	+	-	The total number of complaints to waste management sites is broadly related to the number of facilities operating. This scenario anticipates a net decrease of 162 operating facilities in 2009 as old landfills are closed but a net increase of 191 by 2019 as new waste processing facilities are built.
	WATER AND SOIL			
6	Percentage of sites exceeding EA discharge authorisations in the			Proposed as future monitoring indicator.

[7] See footnote 71 above and Appendix D for details of the assumptions underlying these estimates.

[8] Net of landfills closed since 2002/03.

[9] For further information on calculation on number of landfills see D2 of Appendix D below.

Indicator		2010	2020	Notes
	previous year			
7	Number of serious waste-related pollution incidents to water	-	-	Most pollution incidents to water are associated with both operating and closed landfills. This scenario anticipates 511 operating landfills in 2010 and 385 in 2020 in addition to the 1170 landfills operating in 2002 that will all be closed by 2006.
8	Number of serious waste-related pollution incidents to land	+	-	Most pollution incidents to land are associated with transfer stations, and the number of transfer stations is roughly related to the total number of facilities operating. This scenario anticipates a net decrease of 162 operating facilities in 2009 as old landfills are closed but a net increase of 191 by 2019 as new waste processing facilities are built. This indicator is considered to be more significant than incidents to water (Indicator 8) and to air (Indicator 11) because statistically more incidents to land occur.
9	Eutrophication			Proposed as future monitoring indicator.
	AIR			
10	Number of serious waste-related pollution incidents to air	+	+	Most pollution incidents to air are associated with operating landfills. This scenario anticipates a decrease in the number of operating landfills to 511 by 2010 then to 385 by 2020.
11	Annual concentrations of dioxins in air	0	0	Properly run facilities should emit negligible amounts of dioxins to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of dioxins in air.
12	Annual concentrations of mercury in air	0	0	Properly run facilities should emit negligible amounts of mercury to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of mercury in air.
	CLIMATIC FACTORS			
13	Total CO_2 and CH_4 emissions from waste management			Proposed as future monitoring indicator.
14	Carbon equivalent emissions	+	+ +	Diversion of waste from landfill to incinerator reduces the emissions of greenhouse gases, partly from the reduction in the generation of methane in landfills and partly from the offsetting of fossil fuel combustion via EfW. This scenario anticipates a net decrease in carbon equivalent emissions of 2684 kte in 2010 and 6232 kte in 2020 compared to 2003.
	CULTURAL HERITAGE			
15	Proportion of sites within or affecting areas with landscape designations	+	-	This scenario anticipates a net decrease of 162 operating facilities in 2009 as old landfills are closed but a net increase of 191 by 2019 as new waste processing facilities are built. It is likely that new build facilities will put pressure on designated

Indicator		2010	2020	Notes
				landscapes, although the impact is expected to be kept to a minimum through the planning system.
	RESOURCE DEPLETION AND UTILISATION			
16	Resource use – domestic material consumption			Proposed as proxy for an SCP indicator that may be developed in due course.
17	Electricity generation from waste (excluding landfill gas)	+	+	This scenario anticipates electricity generated from waste via incineration and pyrolysis plants to be 595 MW in 2010 and 808 MW in 2020. Additional energy may be generated by EfW associated with combustion of landfill gas.
	WASTE ARISINGS			
18	Total MSW arisings	-	- -	This scenario anticipates the total amount of MSW arising to increase to 31,780 kte by 2010 and 36,997 kte by 2020 (i.e. approximately 25% more than arose in 2003).
19	Household waste arisings per person			Proposed as future monitoring indicator.
20	Proportion MSW recycled or composted	+	+ +	This scenario anticipates the total amount of MSW recycled or composted to increase to 38% in 2010 and 59% in 2020 (compared to 15% recycled in 2003).
21	Total C&I waste arisings	-	- -	This scenario anticipates the total amount of C&I arising to increase to approximately 68,860 kte by 2010 and 82,290 kte by 2020 (compared to 66,040 kte in 2003).
22	Proportion C&I wastes recycled	+	+	This scenario anticipates the total amount of C&I recycled (excluding re-use) to increase to 46% in 2010 and 49% in 2020 (compared to the 32% recycled in 2003).
23	Total CDW arisings	0	0	This scenario does not anticipate any change to the CDW arisings which were approximately 90,000 kte in 2003.
24	Proportion CDW recycled	0	0	This scenario does not anticipate any change to the proportion of CDW arisings beneficially reused which were approximately 90% in 2003.
	HAZARDOUS WASTE			
25	Total hazardous waste arisings	-	-	It is anticipated that arisings (2060 kte in 2002/03) will decrease following the changes to the hazardous waste regulations.
26	Proportion of hazardous wastes treated and diverted permanently from landfill			Proposed as future monitoring indicator. However in 2002/3 approximately 50% was disposed to landfill. Following changes to the regulations the proportion diverted from landfill permanently is expected to increase.
27	Hazardousness of waste			Proposed as future monitoring indicator.

Scenario 3A: Enhanced EfW

Indicator		2010	2020	Notes
	BIODIVERSITY, FLORA AND FAUNA			
1	Percentage of waste management sites with a local BAP	+	+	It can be expected that the number of sites implementing local BAPs will increase with time due to regulatory pressure, and all new plants will operate to best practice.
2	Percentage of sites with registered EMS	+	+	It can be expected that the number of sites implementing EMS will increase with time due to regulatory pressure, and all new plants will operate to best practice.
3	Total landtake of waste infrastructure	+	+	The number of operating landfills is anticipated to decrease to 511 by 2010 then to 390 by 2020 (compared to 1170 in 2002)[10]. Other waste management facilities will be built as wastes are diverted from landfill. These will require less area than landfill per facility and, overall, there will be a net reduction in land area required for waste management facilities[11] by 2410 ha in 2010 and 7580 ha in 2020. These numbers are shown in Table A which makes the distinction between landtake for non-landfill facilities and for landfills. These numbers take into account landfills estimated to be closed since 2002/03: the land area required for new facilities (including landfills) is more than offset by land for landfills closed since 2002/03 which will be restored and returned to other uses[12].
	POPULATION AND HUMAN HEALTH			
4	Number of incidents of fly-tipping	0	0	The incidence of fly-tipping is independent of the facility types and is controlled by such things as the cost of disposal and the distance to waste management facilities. This scenario does not anticipate any significant change in fly-tipping.
5	Number of complaints to waste management sites related to operation	+	-	The total number of complaints to waste management sites is broadly related to the number of facilities operating. This scenario anticipates a net decrease of 149 operating facilities in 2009 as old landfills are closed but a net increase of 110 by 2019 as new waste processing facilities are built.
	WATER AND SOIL			
6	Percentage of sites exceeding EA discharge authorisations in the			Proposed as future monitoring indicator.

[10] See footnote 71 above and Appendix D for details of the assumptions underlying these estimates.

[11] Net of landfills closed since 2002/03.

[12] For further information on calculation on number of landfills see D2 of Appendix D below.

	previous year			
7	Number of serious waste-related pollution incidents to water	-	-	Most pollution incidents to water are associated with both operating and closed landfills. This scenario anticipates 511 operating landfills in 2010 and 390 in 2020 in addition to the 1170 landfills operating in 2002 that will all be closed by 2006.
8	Number of serious waste-related pollution incidents to land	+	-	Most pollution incidents to land are associated with transfer stations, and the number of transfer stations is roughly related to the total number of facilities operating. This scenario anticipates a net decrease of 149 operating facilities in 2009 as old landfills are closed but a net increase of 110 by 2019 as new waste processing facilities are built. This indicator is considered to be more significant than incidents to water (Indicator 8) and to air (Indicator 11) because statistically more incidents to land occur.
9	Eutrophication			Proposed as future monitoring indicator.
	AIR			
10	Number of serious waste-related pollution incidents to air	+	+	Most pollution incidents to air are associated with operating landfills. This scenario anticipates a decrease in the number of operating landfills to 511 by 2010 then to 390 by 2020.
11	Annual concentrations of dioxins in air	0	0	Properly run facilities should emit negligible amounts of dioxins to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of dioxins in air.
12	Annual concentrations of mercury in air	0	0	Properly run facilities should emit negligible amounts of mercury to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of mercury in air.
	CLIMATIC FACTORS			
13	Total CO_2 and CH_4 emissions from waste management			Proposed as future monitoring indicator.
14	Carbon equivalent emissions	+	+ +	Diversion of waste from landfill to incinerator reduces the emissions of greenhouse gases, partly from the reduction in the generation of methane in landfills and partly from the offsetting of fossil fuel combustion via EfW. This scenario anticipates a net decrease in carbon equivalent emissions of 2618 kte in 2010 and 5766 kte in 2020 compared to 2003.
	CULTURAL HERITAGE			
15	Proportion of sites within or affecting areas with landscape designations	+	-	This scenario anticipates a net decrease of 149 operating facilities in 2009 as old landfills are closed but a net increase of 110 by 2019 as new waste processing facilities are built. It is likely that new build facilities will put pressure on designated landscapes, although the impact is expected to be kept to a minimum

				through the planning system.
	RESOURCE DEPLETION AND UTILISATION			
16	Resource use – domestic material consumption			Proposed as proxy for an SCP indicator that may be developed in due course.
17	Electricity generation from waste (excluding landfill gas)	+	+ +	This scenario anticipates electricity generated from waste via incineration and pyrolysis plants to be 774 MW in 2010 and 1214 MW in 2020. Additional energy may be generated by EfW associated with combustion of landfill gas.
	WASTE ARISINGS			
18	Total MSW arisings	-	- -	This scenario anticipates the total amount of MSW arising to increase to approximately 31,780 kte by 2010 and 36,997 kte by 2020 (i.e. approximately 25% more than arose in 2003).
19	Household waste arisings per person			Proposed as future monitoring indicator.
20	Proportion MSW recycled or composted	+	+ +	This scenario anticipates the total amount of MSW recycled or composted to increase to 38% in 2010 and 52% in 2020 (compared to 15% recycled in 2003).
21	Total C&I waste arisings	-	- -	This scenario anticipates the total amount of C&I arising to increase to approximately 68,860 kte by 2010 and 82,290 kte by 2020 (compared to 66,040 kte in 2003).
22	Proportion C&I wastes recycled	+	+	This scenario anticipates the total amount of C&I recycled to increase to 43% in 2010 and 45% in 2020 (compared to the 32% recycled in 2003).
23	Total CDW arisings	0	0	This scenario does not anticipate any change to the CDW arisings which were approximately 90,000 kte in 2003.
24	Proportion CDW recycled	0	0	This scenario does not anticipate any change to the proportion of CDW arisings beneficially reused which were approximately 90% in 2003.
	HAZARDOUS WASTE			
25	Total hazardous waste arisings	-	-	It is anticipated that arisings (2060 kte in 2002/03) will decrease following the changes to the hazardous waste regulations.
26	Proportion of hazardous wastes treated and diverted permanently from landfill			Proposed as future monitoring indicator. However in 2002/3 approximately 50% was disposed to landfill. Following changes to the regulations the proportion diverted from landfill permanently is expected to increase.
27	Hazardousness of waste			Proposed as future monitoring indicator.

Scenario 3B: Maximum EfW

Indicator		2010	2020	Notes
	BIODIVERSITY, FLORA AND FAUNA			
1	Percentage of waste management sites with a local BAP	+	+	It can be expected that the number of sites implementing local BAPs will increase with time due to regulatory pressure, and all new plants will operate to best practice.
2	Percentage of sites with registered EMS	+	+	It can be expected that the number of sites implementing EMS will increase with time due to regulatory pressure, and all new plants will operate to best practice.
3	Total landtake of waste infrastructure	+	+	The number of operating landfills is anticipated to decrease to 511 by 2010 then to 368 by 2020 (compared to 1170 in 2002)[13]. Other waste management facilities will be built as wastes are diverted from landfill. These will require less area than landfill per facility and, overall, there will be a net reduction in land area required for waste management facilities[14] by 2410 ha in 2010 and 8650 ha in 2020. These numbers are shown in Table A which makes the distinction between landtake for non-landfill facilities and for landfills. These numbers take into account landfills estimated to be closed since 2002/03: the land area required for new facilities (including landfills) is more than offset by land for landfills closed since 2002/03 which will be restored and returned to other uses[15].
	POPULATION AND HUMAN HEALTH			
4	Number of incidents of fly-tipping	0	0	The incidence of fly-tipping is independent of the facility types and is controlled by such things as the cost of disposal and the distance to waste management facilities. This scenario does not anticipate any significant change in fly-tipping.
5	Number of complaints to waste management sites related to operation	+	-	The total number of complaints to waste management sites is broadly related to the number of facilities operating. This scenario anticipates a net decrease of 149 operating facilities in 2009 as old landfills are closed but a net increase of 87 by 2019 as new waste processing facilities are built.
	WATER AND SOIL			
6	Percentage of sites exceeding EA discharge authorisations in the			Proposed as future monitoring indicator.

[13] See footnote 71 above and Appendix D for details of the assumptions underlying these estimates.

[14] Net of landfills closed since 2002/03.

[15] For further information on calculation on number of landfills see D2 of Appendix D below.

Indicator		2010	2020	Notes
	previous year			
7	Number of serious waste-related pollution incidents to water	-	-	Most pollution incidents to water are associated with both operating and closed landfills. This scenario anticipates 511 operating landfills in 2010 and 368 in 2020 in addition to the 1170 landfills operating in 2002 that will all be closed by 2006.
8	Number of serious waste-related pollution incidents to land	+	-	Most pollution incidents to land are associated with transfer stations, and the number of transfer stations is roughly related to the total number of facilities operating. This scenario anticipates a net decrease of 149 operating facilities in 2009 as old landfills are closed but a net increase of 87 by 2019 as new waste processing facilities are built. This indicator is considered to be more significant than incidents to water (Indicator 8) and to air (Indicator 11) because statistically more incidents to land occur.
9	Eutrophication			Proposed as future monitoring indicator.
	AIR			
10	Number of serious waste-related pollution incidents to air	+	+	Most pollution incidents to air are associated with operating landfills. This scenario anticipates a decrease in the number of operating landfills to 511 by 2010 then to 368 by 2020.
11	Annual concentrations of dioxins in air	0	0	Properly run facilities should emit negligible amounts of dioxins to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of dioxins in air.
12	Annual concentrations of mercury in air	0	0	Properly run facilities should emit negligible amounts of mercury to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of mercury in air.
	CLIMATIC FACTORS			
13	Total CO_2 and CH_4 emissions from waste management			Proposed as future monitoring indicator.
14	Carbon equivalent emissions	+	+ +	Diversion of waste from landfill to incinerator reduces the emissions of greenhouse gases, partly from the reduction in the generation of methane in landfills and partly from the offsetting of fossil fuel combustion via EfW. This scenario anticipates a net decrease in carbon equivalent emissions of 2618 kte in 2010 and 5468 kte in 2020 compared to 2003.
	CULTURAL HERITAGE			
15	Proportion of sites within or affecting areas with landscape designations	+	-	This scenario anticipates a net decrease of 149 operating facilities in 2009 as old landfills are closed but a net increase of 87 by 2019 as new waste processing facilities are built. It is likely that new build facilities will put pressure on designated

Indicator		2010	2020	Notes
				landscapes, although the impact is expected to be kept to a minimum through the planning system.
	RESOURCE DEPLETION AND UTILISATION			
16	Resource use – domestic material consumption			Proposed as proxy for an SCP indicator that may be developed in due course.
17	Electricity generation from waste (excluding landfill gas)	+	+ +	This scenario anticipates electricity generated from waste via incineration and pyrolysis plants to be 774 MW in 2010 and 1448 MW in 2020. Additional energy may be generated by EfW associated with combustion of landfill gas.
	WASTE ARISINGS			
18	Total MSW arisings	-	- -	This scenario anticipates the total amount of MSW arising to increase to approximately 31,780 kte by 2010 and 36,997 kte by 2020 (i.e. approximately 25% more than arose in 2003).
19	Household waste arisings per person			Proposed as future monitoring indicator.
20	Proportion MSW recycled or composted	+	+ +	This scenario anticipates the total amount of MSW recycled or composted to increase to 38% in 2010 and 51% in 2020 (compared to 15% recycled in 2003).
21	Total C&I waste arisings	-	- -	This scenario anticipates the total amount of C&I arising to increase to approximately 68,860 kte by 2010 and 82,290 kte by 2020 (compared to 66,040 kte in 2003).
22	Proportion C&I wastes recycled	+	+	This scenario anticipates the total amount of C&I recycled to increase to 43% in 2010 and 45% in 2020 (compared to the 32% recycled in 2003).
23	Total CDW arisings	0	0	This scenario does not anticipate any change to the CDW arisings which were approximately 90,000 kte in 2003.
24	Proportion CDW recycled	0	0	This scenario does not anticipate any change to the proportion of CDW arisings beneficially reused which were approximately 90% in 2003.
	HAZARDOUS WASTE			
25	Total hazardous waste arisings	-	-	It is anticipated that arisings (2060 kte in 2002/03) will decrease following the changes to the hazardous waste regulations.
26	Proportion of hazardous wastes treated and diverted permanently from landfill			Proposed as future monitoring indicator. However in 2002/3 approximately 50% was disposed to landfill. Following changes to the regulations the proportion diverted from landfill permanently is expected to increase.
27	Hazardousness of waste			Proposed as future monitoring indicator.

Scenario 4: Enhanced diversion from landfill

Indicator		2010	2020	Notes
	BIODIVERSITY, FLORA AND FAUNA			
1	Percentage of waste management sites with a local BAP	+	+	It can be expected that the number of sites implementing local BAPs will increase with time due to regulatory pressure, and all new plants will operate to best practice.
2	Percentage of sites with registered EMS	+	+	It can be expected that the number of sites implementing EMS will increase with time due to regulatory pressure, and all new plants will operate to best practice.
3	Total landtake of waste infrastructure	+	+	The number of operating landfills is anticipated to decrease to 511 by 2010 then to 402 by 2020 (compared to 1170 in 2002)[16]. Other waste management facilities will be built as wastes are diverted from landfill. These will require less area than landfill per facility and, overall, there will be a net reduction in land area required for operating waste management facilities[17] by 2490 ha in 2010 and 6980 ha in 2020. These numbers are shown in Table A which makes the distinction between landtake for non-landfill facilities and for landfills. These numbers take into account landfills estimated to be closed since 2002/03: the land area required for new facilities (including landfills) is more than offset by land for landfills closed since 2002/03 which will be restored and returned to other uses[18].
	POPULATION AND HUMAN HEALTH			
4	Number of incidents of fly-tipping	0	0	The incidence of fly-tipping is independent of the facility types and is controlled by such things as the cost of disposal and the distance to waste management facilities. This scenario does not anticipate any significant change in fly-tipping.
5	Number of complaints to waste management sites related to operation	+	-	The total number of complaints to waste management sites is broadly related to the number of facilities operating. This scenario anticipates a net decrease of 176 operating facilities in 2009 as old landfills are closed but a net increase of 128 by 2019 as new waste processing facilities are built.
	WATER AND SOIL			
6	Percentage of sites exceeding EA discharge authorisations in the			Proposed as future monitoring indicator.

[16] See footnote 71 above and Appendix D for details of the assumptions underlying these estimates.

[17] Net of landfills closed since 2002/03.

[18] For further information on calculation on number of landfills see D2 of Appendix D below.

Indicator		2010	2020	Notes
	previous year			
7	Number of serious waste-related pollution incidents to water	-	-	Most pollution incidents to water are associated with both operating and closed landfills. This scenario anticipates 511 operating landfills in 2010 and 402 in 2020 in addition to the 1170 landfills operating in 2002 that will all be closed by 2006.
8	Number of serious waste-related pollution incidents to land	+	-	Most pollution incidents to land are associated with transfer stations, and the number of transfer stations is roughly related to the total number of facilities operating. This scenario anticipates a net decrease of 176 operating facilities in 2009 as old landfills are closed but a net increase of 128 by 2019 as new waste processing facilities are built. This indicator is considered to be more significant than incidents to water (Indicator 8) and to air (Indicator 11) because statistically more incidents to land occur.
9	Eutrophication			Proposed as future monitoring indicator.
	AIR			
10	Number of serious waste-related pollution incidents to air	+	+	Most pollution incidents to air are associated with operating landfills. This scenario anticipates a decrease in the number of operating landfills to 511 by 2010 then to 402 by 2020.
11	Annual concentrations of dioxins in air	0	0	Properly run facilities should emit negligible amounts of dioxins to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of dioxins in air.
12	Annual concentrations of mercury in air	0	0	Properly run facilities should emit negligible amounts of mercury to the atmosphere, in accordance with strict limits on emissions included in licence conditions. This scenario should not, therefore, result in any significant increase in the annual concentrations of mercury in air.
	CLIMATIC FACTORS			
13	Total CO_2 and CH_4 emissions from waste management			Proposed as future monitoring indicator.
14	Carbon equivalent emissions	+	+ +	Diversion of waste from landfill to incinerator reduces the emissions of greenhouse gases, partly from the reduction in the generation of methane in landfills and partly from the offsetting of fossil fuel combustion via EfW. This scenario anticipates a net decrease in carbon equivalent emissions of 2485 kte in 2010 and 5999 kte in 2020 compared to 2003.
	CULTURAL HERITAGE			
15	Proportion of sites within or affecting areas with landscape designations	+	-	This scenario anticipates a net decrease of 176 operating facilities in 2009 as old landfills are closed but a net increase of 128 by 2019 as new waste processing facilities are built. It is likely that new build facilities will put pressure on designated

Indicator		2010	2020	Notes
				landscapes, although the impact is expected to be kept to a minimum through the planning system.
	RESOURCE DEPLETION AND UTILISATION			
16	Resource use – domestic material consumption			Proposed as proxy for an SCP indicator that may be developed in due course.
17	Electricity generation from waste (excluding landfill gas)	+	+	This scenario anticipates electricity generated from waste via incineration and pyrolysis plants to be 595 MW in 2010 and 908 MW in 2020. Additional energy may be generated by EfW associated with combustion of landfill gas.
	WASTE ARISINGS			
18	Total MSW arisings	-	- -	This scenario anticipates the total amount of MSW arising to increase to 31,780 kte by 2010 and 36,997 kte by 2020 (i.e. approximately 25% more than arose in 2003).
19	Household waste arisings per person			Proposed as future monitoring indicator.
20	Proportion MSW recycled or composted	+	+ +	This scenario anticipates the total amount of MSW recycled or composted to increase to 38% in 2010 and 56% in 2020 (compared to 15% recycled in 2003).
21	Total C&I waste arisings	-	- -	This scenario anticipates the total amount of C&I arising to increase to approximately 68,860 kte by 2010 and 82,240 kte by 2020 (compared to 66,040 kte in 2003).
22	Proportion C&I wastes recycled	+	+	This scenario anticipates the total amount of C&I recycled to increase to 43% in 2010 and 44% in 2020 (compared to the 32% recycled in 2003).
23	Total CDW arisings	0	0	This scenario does not anticipate any change to the CDW arisings which were approximately 90,000 kte in 2003.
24	Proportion CDW recycled	0	0	This scenario does not anticipate any change to the proportion of CDW arisings beneficially reused which were approximately 90% in 2003.
	HAZARDOUS WASTE			
25	Total hazardous waste arisings	-	-	It is anticipated that arisings (2060 kte in 2002/03) will decrease following the changes to the hazardous waste regulations.
26	Proportion of hazardous wastes treated and diverted permanently from landfill			Proposed as future monitoring indicator. However in 2002/3 approximately 50% was disposed to landfill. Following changes to the regulations the proportion diverted from landfill permanently is expected to increase.
27	Hazardousness of waste			Proposed as future monitoring indicator.

APPENDIX D – MODELLING APPROACHES AND ASSUMPTIONS

D.1 The models used

Two software models were used to estimate the amounts of waste materials that would be treated by various processes and, thus, the infrastructure requirements in the different scenarios assessed. These models are:

- Local Authority Waste Recycling Recovery and Disposal (LAWRRD) for the modelling of MSW; and

- C&I model, for the modelling of C&I wastes, based on the REEIO and HMCE Landfill Tax models (described below).

The infrastructure predictions from these models were used as one of the main inputs to the environmental assessment.

LAWRRD

The LAWRRD model was developed for Defra by AEA Technology. It is a replacement for the Strategy Unit (SU) model that was created as part of the Cabinet Office SU report 'Waste not Want not'. The model's purpose is to predict local authorities waste management costs, flows of materials and the facilities needed for waste treatment to meet the EU Landfill Directive targets and increased rates of recycling and recovery. Different policy initiatives can be modelled using the LAWRRD (e.g. different taxes and target rates).

LAWRRD is a costs-driven, bottom up model. It models waste management by taking input data on waste arisings, numbers of actual or planned facilities from each local authority in turn and then summing the relevant outputs to develop a picture representing England as a whole.

Each local authority is assigned to one of up to three 'typologies' (i.e. urban, suburban and rural). The typologies allow user input of waste composition, growth rates, local gate fees and 'pressure factors' reflecting political and practical weighting against certain options (e.g. anti-incineration and non-achievement of targets). The assignment of typology is determined by the socio-economic and demographic characteristics of each area. The typology approach allows for the introduction of local variations in the model that cannot be reflected when the country is, in effect, treated as a single waste disposal authority, as in the SU model.

The model works by simulating the decision processes of each waste disposal authority. Each year, the costs of adding different waste management facilities at various operational scales are compared with the cost of making no change to the existing suite of facilities. The cost of each option includes the gate fees, costs of residue treatment and disposal, taxes, tradable allowances, fines and 'pressure' factors.

Having identified the lowest cost additional plant (or found that 'no change' is cheapest), the model then adds a facility of the selected type to the existing options for that local authority and then repeats the process for the following year. By basing decisions on economic costs, the model simulates the main

driver for local authority decision making. The LAWRRD model includes waste industry capacity constraint curves to ensure that the number of facilities predicted by the LAWRRD do not exceed industries ability to deliver.

LAWRRD considers the material flows and costs from collection of recyclates and residual waste via civic amenity (CA) sites, 'bring' and direct recycling and kerbside collection options. The waste management options in the model are placed in a hierarchy , in which recyclates are removed at the top of the hierarchy[19], leaving residues for treatment in the lower levels.

The C&I model

The C&I model developed by Defra is a combination of the REEIO model and the HMCE landfill tax model.

The REEIO model was developed by Cambridge Econometrics (CE) for the Environment Agency in partnership with the RDAs. It is a regional model that predicts sectoral shift in the economy and then maps historic ratios of environmental impacts (including waste) per unit of output. Defra commissioned CE to produce a national version of REEIO to examine C&I waste, with a steering group of Defra, EA, WRAP and HMCE.

The HMCE Landfill Tax model, which had previously been created to inform the level of the current landfill tax escalator and estimate the revenue to be returned to business (BREW) and local government (EPCS), was then applied. It was updated for the purposes of this review.

The combination of REEIO and the HMCE landfill tax model give a baseline against which to design and model any policy options. The evaluation for CIH wastes is less robust than that for MSW as less compositional data is available.

The Environment Agency C&I waste survey data for 2002/3 was split into waste categories which, in turn, are split into C&I by National Waste Type. The waste quantities are then allocated to different treatment options to calculate overall tonnage throughputs, costs and numbers of facilities. For further details on the categories of waste and treatment options see Annex B of the accompanying pRIA. For a fuller description of the C&I model see Annex J of the pRIA.

D.2 Key approaches and assumptions

This section sets out in more detail how the models were applied to the SEA.

MSW and C&I wastes were modelled independently using the two models described above. The required facilities were taken as a sum of the two modelling outputs. In practice, there may be some sharing of facilities, and co-location of facilities which may result in some economies of scale and consequent reduction in environmental impact. However, in this SEA the

[19] The hierarchy of treatment options is in descending order, MRF, Dirty MRF, green waste composting, biowaste composting, Bio-Mechanical Treatment with refuse-derived fuel production, MBT with compost /RDF production, MBT with compost produced going to landfill, EfW combustion, Advanced conversion technologies (e.g. pyrolysis and gasification which also recovery energy), residues to landfill.

conservative approach is taken that these facilities are separate. This represents the worst case and may overstate the adverse environmental impacts.

The facility categories generated using the unit impact assessment approach (see section 6.4 above for a description of each of these types) were categorised as follows: Materials Recycling Facility (MRF), Anaerobic Digestion (AD), Windrow composting, In vessel composting (IVC), Incinerator, Pyrolyis, Mechanical Biological Treatment plant (MBT) and Landfill. It was considered that this categorisation enabled all major treatment types (present and likely to be used in the UK in the period up to 2020, on the basis of current knowledge) to be assessed in a manageable way. For regional or local planning purposes, it may be desirable to examine more detailed categories or specific facility types. However, this is not appropriate for this high-level assessment.

Number of future landfill sites – both the MSW and C&I modelling estimated future landfill requirements (millions of tonnes per year). In order to assess the environmental impact, it was necessary to estimate the implications of this in terms of *numbers* of future new landfills required. There is no reliable data on forecast numbers. For the purposes of this assessment, it has therefore been assumed that the average annual input of waste would be 100,000 tonnes and that new landfills would have an average active lifetime of 10 years, i.e. an average capacity of 1.5 million tonnes. These figures are towards the higher end of current practice and reflect the trend over recent years towards larger landfills as smaller landfills close. The modelling has also taken into account residual capacity within existing landfills. In terms of existing landfills, applying total (MSW and C&I) 2002/03 arisings and estimating a smaller annual input of 50,000 tonnes per year, 1170 landfills are estimated to have been in operation in 2002/03 for the purposes of this assessment. Environment Agency figures for numbers of operating landfills in England range between approximately 500 and 2000, depending on the categorisation used. For the purposes of this assessment, all landfills in operation in 2002/03 are assumed to be closed by 2009/10, and, given the assumed 10 yr active lifetime for new landfill, all landfills in operation in 2009/10 are assumed to be closed by 2019/20.

Further points which apply to the specific scenarios are as follows:

Scenario 1 (Reduction in arisings) - the effect of waste reduction on the modelling assumptions results in some excess treatment capacity within the infrastructure already planned for by local authorities (since most local authority planning anticipates higher growth rates). The net effect is to reduce recycling rates over the modelling period as this excess capacity is under-utilised. In practice, some sharing of capacity between authorities is likely to occur, which would mitigate this tendency. The environmental benefits are therefore likely to be understated.

Scenario 3B - Maximum likely rate of diversion of waste to EfW. In relation to MSW, this is the same as Scenario 3A. The reason is that the high EfW rate achieved is considered to be a realistic maximum for this waste stream given that the principal driver on local authorities is the achievement of their landfill allowances under the Landfill Allowance Trading Scheme. Higher EfW rates would imply displacement of recycling by EfW in latter years. This is

considered unrealistic given that this would imply a loss of public service provision in these latter years.

Scenario 4 (enhanced diversion from landfill) – this scenario achieves the smallest amount of MSW disposed to landfill in 2020. In contrast, the smallest amount of C&I to landfill is associated with Scenario 1 (reduction in waste arisings). This is mainly because the model envisages policy instruments to divert landfill further only taking effect in the latter years, whereas the reductions in waste growth apply throughout the period.

D.3 Modelling of greenhouse gas emissions

Greenhouse gas emissions represent a key environmental impact. The two models, LAWRRD and C&I, were therefore also used to estimate greenhouse gas emissions for the scenarios. MSW and C&I wastes were modelled independently. As in relation to infrastructure, the forecast emissions were taken as a sum of the two modelling outputs. In practice, due to factors such as sharing of facilities, and co-location of facilities this may result in the understatement of the carbon savings. The emissions of six greenhouse gases (carbon dioxide, methane, nitrous oxide, PFCs, HFCs & CFCs and SF) were expressed as carbon equivalents.

An emissions factor (kg/CO_2 equivalent per tonne of waste processed) was obtained for each material, such as for paper and card, kitchen waste or glass etc[20]. The emissions factors were taken from a Defra commissioned study by ERM '*Impact of Energy from Waste and Recycling Policy on UK Greenhouse Gas Emissions'*[21]. The factors are based on a life cycle assessment and include not only the carbon costs of treating and transporting waste, but also the potential benefits where primary resource extraction or electricity generation are offset with energy recovery. (The offset is against combined cycle gas turbine electricity generation.) For example, for every tonne of material sent to recycling, emissions factors describing the production of a tonne of that material from virgin material were used to calculate the potential savings in greenhouse gas emissions from recycling.

The modelling provides a conservative estimate of environmental benefits as the wider environmental improvements in virgin materials reduction, resource utilisation and non-greenhouse gas impacts of materials production and consumption are not included. For further details of how the models were applied, see Annex H of the pRIA.

The results of this assessment are shown in Table A in Section 9 above. Each of the scenarios considered (including Scenario 0) delivers a net carbon saving to the environment relative to the 2002/03 baseline. This is because the direct emissions from the waste management facilities (an environmental burden) are less than the offset emissions (an environmental benefit) from the production of virgin material or the generation of energy. Waste minimisation saves not only the emissions from the production of the virgin material but also the direct emissions associated with waste management facilities. The carbon savings for the scenarios (relative to this 2002/03 baseline) by 2020 are estimated to be around 6 million tonnes, with variations between the

[20] The emissions factors used are set out in the accompanying partial Regulatory Impact Assessment (see Table H1).

[21] ERM (2006), report for Defra.

scenarios. This equates broadly to around 3% of current UK greenhouse gas emissions and exceeds the direct emissions currently attributable to the UK waste sector, *but* most of these savings will occur outside the UK as recycling displaces raw material extraction and production elsewhere in the world.

Further comments on specific scenarios are as follows:

Scenario 1 (Reduction in arisings) – As explained in D2 above, the conservative assumption is made that excess capacity within facilities is not shared between local authorities. The full environmental benefits are therefore not realised. The further conservative assumption has therefore been made that the emissions are equivalent to Scenario 0 (No change in existing policy). The actual carbon saving would be a result of offset savings due to waste minimisation and reduced transport and facility impacts.

Scenarios 3A and 3B (Increased and maximum Energy from Waste) – these scenarios result in net savings in carbon emissions greater than Scenario 0 (No change in existing waste management policy) in 2009/10, but marginally higher emissions in 2019/20 than in the other scenarios. The reason is that increasing energy from waste displaces recycling in meeting the landfill allowance targets in relation to municipal waste. Of these two treatment types recycling delivers greater carbon savings. There is no such constraint observed with C&I wastes.

APPENDIX E – CONTEXT REVIEW

Introduction

This document constitutes Appendix E to the Environmental Report on the SEA of the review of England's waste strategy. It sets out the full Context Review. Key messages from the Context Review are included in Section 3 of the Environmental Report.

The SEA Directive requires the Environmental Report to include information on: the relationship [of the plan or programme] with 'other relevant plans and programmes'; the environmental protection objectives, established at international, [European] Community or [national] level, which are relevant to the plan or programme, and the way those objectives and any environmental considerations have been taken into account[22]. This is in addition to information on the existing state of the environment.

Therefore, development of strategic objectives that form the assessment framework at the heart of the SEA should be informed not only by the condition of the current environment (see Chapter 4 – Baseline – of the Environmental Report) but also by the policy framework within which the strategy is being developed, including the environmental protection objectives of those policies[23]. This framework defines the legislative instruments which the strategy can use or must complement; obligations which policy must meet (e.g. on reducing atmospheric emissions of CO_2); as well as the targets which are set by the overarching legislation. It therefore defines an 'envelope' of requirements which the Waste Strategy must fulfil, and may identify other initiatives which offer synergies in addressing certain areas of policy.

Overview of scope of the review

A Context Review was carried out to identify and describe other 'relevant plans and programmes' and their environmental protection objectives and to enable these to be taken into account. Given the national level of the proposals for the revised waste strategy, the Context Review focuses on international (global and European) and UK-wide legislation, policy and planning guidance. It lists the key plans and programmes reviewed and is structured as follows[24].

- A) Pan-international legislation: The Kyoto Protocol on Climate Change and WHO guidelines.
- B) EU legislation (including relevant thematic strategies), relating to waste and to wider environmental protection and quality.
- C) UK legislation, strategies and policy statements, relating to waste and to wider environmental protection and quality.

This Context Review specifies the principal aims, objectives and mechanisms of each of these other plans and programmes, and identifies targets where appropriate. In some

[22] See Annex I of the SEA Directive.

[23] See further Section 5 of the Environmental Report for more detail on how the SEA objectives were developed.

[24] It is not an exhaustive list of all other legislation and strategies which have some impact on waste but is intended to encapsulate the key relationships. For the sake of brevity, some relationships are not included because the primary synergy is captured by other legislation described.

instances additional observations are made on any implications that the plan or strategy may have for the revised waste strategy and the approach taken in the SEA.

The documents reviewed range from generic strategies and legislation on environmental protection, to regulations prescribing the treatment and disposal of specific types of waste (e.g. batteries and vehicles), and also including broad guidance on planning controls. The range of messages emerging from this Context Review is correspondingly broad. This is to be expected in the context of a high-level review of a national strategy.

This Context Review contains the key points identified from each of the reviewed documents. Further assessment of this material defined a set of cross-cutting themes which have informed the subsequent stages of the SEA. These themes are presented within Table 3.1 of the Environmental Report and Section 3 sets out the key messages arising from this Context Review.

A) PAN-INTERNATIONAL LEGISLATION

1 Kyoto Protocol	
Proponent body	United Nations
Status (e.g. statutory, non-statutory)	Statutory
Date	1992
Summary / Overview	
Protocol aim to achieve quantified emission limitation and reduction in order to promote sustainable development.	
Opportunities / Synergies / Constraints / Challenges	
• Enhancement of energy efficiency in relevant sectors of the national economy • Promotion of sustainable forms of agriculture • Research and promotion of renewable forms of energy • Encouragement of reforms aimed at limiting or reducing greenhouse gas emitting sectors • Cooperate with other Parties to the Convention • Minimise adverse effects of climate change. Reducing the waste sector's contribution to climate change impacts is to be considered as one of the principal overarching objectives which is prioritised in the SEA.	
Internet link: http://unfccc.int/resource/docs/convkp/kpeng.html	

2 World Health Organisation (WHO) Guidelines	
Proponent body	World Health Organisation
Status (e.g. statutory, non-statutory)	Non-statutory
Date produced	1999
Summary / Overview	
The World Health Organisation set air quality guidelines, which are applicable globally. There is a general downward revision of air quality standards as evidence becomes available of health-based effects of certain air pollutants. Therefore the WHO guidelines are likely to be revised again in coming years. Numerical guideline values are not to be regarded as separating the acceptable from the unacceptable, but rather as indicators. They are proposed in order to help avoid major discrepancies in reaching the goal of effective protection against recognised hazards for human health and the environment.	
Opportunities / Synergies / Constraints / Challenges	
Guideline values set down for individual substances. These thresholds can be used in assessing the potential impacts of individual sites where there is evidence that waste facilities contribute significantly to emissions of these materials.	
Internet link: http://www.euro.who.int/air/activities/20050223_3	

B) EUROPEAN LEGISLATION

Part 1 – Cross-Sectoral Legislation

3 Directive 79/409/EEC on the Conservation of Wild Birds ('The Birds Directive')	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date produced	1979

Opportunities / Synergies / Constraints / Challenges
Among the main provisions of the Directive are: • The maintenance of the favourable conservation status of all wild bird species across their distributional range (Article 2) with the encouragement of various activities to that end. • The identification and classification of Special Protection Areas for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance. • The establishment of a general scheme of protection for all wild birds. For implications for waste management see the Habitats Directive below.
Internet link: http://europa.eu.int/eur-lex/en/consleg/pdf/1979/en_1979L0409_do_001.pdf

4 Directive 1980/68/EC on the Protection of Groundwater against pollution caused by certain dangerous substances ('The Groundwater Directive')	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date	1980
Summary / Overview	
The goal of this Directive to prevent certain substances, as stated in List I and II, from entering groundwater and as far as possible to reduce the pollution that has already occurred	
Opportunities / Synergies / Constraints / Challenges	
The Directive prohibits any substances identified in List I from entering groundwater . Substances included in List II are subject to a risk assessment for their disposal. Authorisation is therefore required before any substances from List I or II are disposed into groundwater.	
Internet link: http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31980L0068&model=guichett	

5 Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ('The Habitats Directive')	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date produced	1992
Opportunities / Synergies / Constraints / Challenges	
The Habitats Directive sets out the requirement to submit and subsequently adopt Special Areas of Conservation (SAC) under the Natura 2000 network. Article 6 of the Directive sets out the requirements for protection, and compensation for loss of these sites. The principal implications are at site level in terms of determining whether planning permission can be granted. Large-scale expansion of infrastructure needs to consider the increased likelihood of impacts and therefore should favour those waste treatment facilities that carry a lower risk of biodiversity damage.	
Internet link: http://europa.eu.int/comm/environment/nature/nature_conservation/eu_nature_legislation/habitats_directive/index_en.htm	

6 Directive 2000/60/EC establishing a Framework for Community Action in the Field of Water Policy ('The Water Framework Directive' (WFD))	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory

Date	2000
Summary / Overview	
This Directive has been adopted in order to establish a framework for protecting inland surface waters, transitional waters, coastal waters and groundwater. The Directive aims for waters in the European Community to achieve 'good status' by set deadlines. Community involvement is paramount and water management is to be pursued in a river basin approach and in a 'combined approach' which incorporates emission limit values and quality standards.	
Opportunities / Synergies / Constraints / Challenges	
The Directive prohibits direct discharges to groundwater and requires Member States to monitor groundwater in order to detect any changes which are a result of diffuse pollution. Action should then be taken to reverse any upward pollution trends in the groundwater quality. Specifically the Directive sets out to: • Ensure the progressive reduction of pollution of groundwater and prevent its further pollution • Set emissions controls based on best available techniques and/or emissions values and where pollution is diffuse ensure best environmental practice • In addition, the Directive aims to protect terrestrial and marine waters and Member States are to endeavour to prevent the deterioration of surface waters, to enhance and to restore all bodies of surface water. The aim is to ensure the highest ecological and chemical status is achieved in terrestrial and coastal waters and that further deterioration of water bodies is prevented. Substances which threaten the aquatic environment shall be prioritised through a risk assessment approach. There is therefore a need to consider the implication of waste facilities on water resources and restrict waste facilities to areas which are not deemed as high risk from pollution. Existing controls take account of this.	
Internet link: **http://europa.eu.int/eur-lex/pri/en/oj/dat/2000/l_327/l_32720001222en00010072.pdf**	

7 The Sixth Environmental Action Programme (EAP) Environment 2010: Our Future Our Choice, COM (2001) 31	
Proponent body	Commission of the European Communities
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2001
Summary / Overview	
The strategic focus of the Sixth Environmental Action Programme effectively sets out the environmental objectives and priorities that form an integral part of the EU strategy for sustainable development. Implementation of existing environmental legislation needs to be improved. Integration of environmental concerns into other policies must be deepened. Working with the market through business and consumer interests will contribute to more sustainable production and consumption patterns.	
Opportunities / Synergies / Constraints / Challenges	
Four priority areas: • Climate change – ratification and implementation of Kyoto Protocol to cut greenhouse emissions by 8% over 1990 levels by 2008-12. • Nature and biodiversity – pressures from pollution, unsustainable use of land and risks to biodiversity need to be redressed. Valuable environmental areas protected by Natura 2000 programme and this must be implemented fully. • Environment and health – increasing evidence that human health is affected by environmental problems relating to air and water pollution, dangerous chemicals and noise. A holistic and comprehensive approach required with particular attention to vulnerable groups. • Sustainable use of natural resources and management of waste – ensure the consumption of renewable and non-renewable resources does not exceed the carrying capacity of the environment.	
Internet link: http://europa.eu.int/comm/environment/newprg/	

8 Directive 2001/81/EC of the European Parliament and the Council on national ceilings levels for atmospheric pollutants	
Proponent body	European Parliament and the Council of the European Union
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2001
Summary / Overview	
The aim of this Directive is to limit emissions of acidifying and eutrophying pollutants and ozone precursors in order to improve the protection in the Community of the environment and human health against risks of adverse effects from acidification, soil eutrophication and ground-level ozone and to move towards the long-term objectives of not exceeding critical levels and loads and of effective protection of all people against recognised health risks from air pollution by establishing national emission ceilings, taking the years 2010 and 2020 as benchmarks, and by means of successive reviews.	
Opportunities / Synergies / Constraints / Challenges	
Interim environmental objectives relating to: • Acidification. • Health related ground level ozone exposure. • Vegetation related ground level ozone exposure. • National emissions ceilings for SO_2; NO_x; VOCs; NH_3	
Internet link: http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:32001L0081:EN:HTML	

9 Directive 2002/49/EC relating to the assessment and management of environmental noise ('The Environmental Noise Directive' (END))	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2002
Opportunities / Synergies / Constraints / Challenges	
The aim of the END is to define a common approach across the European Union with the intention of avoiding, preventing or reducing on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise. This will involve: • Informing the public about environmental noise and its effects; • The preparation of strategic noise maps for: large urban areas including industrial sites as defined in Annex 1 of the END; and • Preparing action plans based on the results of the noise mapping exercise. Such plans will aim to manage and reduce environmental noise where necessary, and preserve environmental noise quality where it is good. The noise mapping and action planning process is to be taken forward on a five-yearly rolling programme. Annex I identifies the following relevant industrial activities**: • Installations for the incineration of waste materials; • Installations for the disposal and/or recovery of materials from hazardous wastes; • Installations for the disposal of non-hazardous wastes with a capacity of >50 tonnes per day; • Landfills receiving >10 tonnes per day, or with a total capacity of >25,000 tonnes (landfills taking inert waste only are excluded). By 30 June 2007, strategic noise maps showing the situation in the preceding calendar year must be drawn up for all agglomerations with over 250,000 inhabitants and their main transport routes. Principal effects of the Directive occur at site level, where the noise-mapping will help to inform decisions about the impacts of waste management sites, and the consideration of the additional effects of construction and operational noise throughout the lifetime of the facility.	
Internet link: http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_189/l_18920020718en00120025.pdf	

10 Communication COM2002/179: Towards a Thematic Strategy on Soil Protection	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Non-statutory – communication inviting responses
Date produced	2002
Summary / Overview	
First step towards an overarching policy on conserving soil as a non-renewable natural resource, with measures to limit wholly man-made impacts and natural ones that may be worsened by human activity. As a result of consultation a revision to the Sewage Sludge Directive (86/227/EC) was made to allow for re-use of a wider range of such materials.	
Opportunities / Synergies / Constraints / Challenges	
Identifies waste landfill as a continuing significant source of contamination due to the large volume of material which continues to be landfilled. Sewage sludge is potentially useful as soil conditioner and alternative to chemical fertilisers but requires modification of control processes to ensure harmful materials are extracted before re-use (this is the only specific reference to waste activities as a source of diffuse soil pollution). Considers the Landfill, Incineration Sewage Sludge and other Directives provide a framework for controlling waste-related contamination. Proposes extending Habitats Directive to make more explicit reference to soil-based habitats. Encourages development of nationally-based systems for monitoring threats to soil resource and quality.	
Internet link: http://europa.eu.int/eur-lex/en/com/pdf/2002/com2002_0179en01.pdf	

11 Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage ('The Environmental Liability Directive')	
Proponent body	European Parliament
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2004
Summary / Overview	
Applies primarily to spatial planning issues and to remediation of environmental damage (though this should not prevent using it to reduce the number of situations where environmental risk may arise). Main legal impact is on businesses, road hauliers, etc., although there will be an enforcement impact on waste licensing and environmental monitoring bodies	
Opportunities / Synergies / Constraints / Challenges	
Requires measures to remediate environmental damage and to take protective steps where it is reasonable to predict a strong risk of significant damage. Damage to biodiversity, water resources and human health are a specific priority. Annex III makes clear that the Directive applies to all forms of waste management activity, including incineration, landfill and other activities disposing of residual materials. Requires explicit consideration of the risk that waste management facilities required by the Strategy will not give rise to unnecessary risks (insofar as this is possible without knowing their location)	
Internet link: http://europa.eu.int/eur-lex/pri/en/oj/dat/2004/l_143/l_14320040430en00560075.pdf	

Part 2 – Waste Sector Legislation

12 Directive 75/442/EEC on waste (amended by 91/692/EEC) ('The Waste Framework Directive' (WFD))	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date	1975
Summary / Overview	

This Directive requires member states to implement measures designed to encourage the prevention and/or reduction of the production of waste and its harmfulness and to increase the amount of waste recovered. The amendment to the directive in 1991 set out the legal context for the disposal, management and avoidance of waste.

Opportunities / Synergies / Constraints / Challenges

Member states are obliged to make sure that waste is disposed of, or recovered, in a way which does not harm human health or the environment.
The uncontrolled disposal of waste or its abandonment is prohibited.
Members are also to set up an integrated network of waste disposal installations which are sufficient to deal with waste arisings.
Waste carriers are to be registered and operations carrying out waste management activities must be permitted to do so.
The costs of disposal are to be borne by the waste 'holder' in line with the polluter pays principle.
Members are to have a waste management plan in place.

Internet link: http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31975L0442&model=guichett

13 Directive 75/439/EC on the disposal of Waste Oils

Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date	1975

Summary / Overview

The objective of this Directive is to ensure that waste oils are 'collected and disposed of without causing any avoidable damage to man and the environment'

Opportunities / Synergies / Constraints / Challenges

Member States are instructed to give priority to the processing of waste oils by regeneration. Where regeneration is not possible, the combustion of waste oils should be carried out in the most environmentally sensitive way and in a manner that is technically, economically and operationally feasible. Failing regeneration and combustion, Members should ensure the safe destruction or controlled storage or tipping of waste oils. Member states are required to ensure that regeneration and combustion processes are operated in a way which minimises their impacts on the environment and to human health, creating appropriate limitations on emissions levels and toxicity.

Discharges which may affect water courses or bodies, drainage systems or coastal waters, soils or give rise to air pollution are prohibited. Any undertaking that requires the disposal of waste oils must obtain a permit. Any establishment which produces a 500 litres, or more, is required to submit details of their operations to the competent authority on request.

Internet link: http://europa.eu.int/eur-lex/en/consleg/pdf/1975/en_1975L0439_do_001.pdf

14 Directive 1986/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture ('The Sewage Sludge Directive')

Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date	1986

Summary / Overview

This Directive aims to encourage the use of sewage sludge in agriculture but seeks to ensure that the environment is protected in the process. A Working Document produced by the Commission in 2000 extends and refines the scope the Directive.

Opportunities / Synergies / Constraints / Challenges
Members are required to regulate the use of sewage sludge in agriculture so that it does not have an adverse affect on soil, vegetation, animals and man. The Working Document broadens the Directive to include the use of industrial sludge from a list of specific food, leather and paper industries waste water treatment operations. It also sets out to state measures to reduce the chances of pathogens entering the environment and to use a narrower definition of treated sludge. The Document encourages the inclusion of other potential receptors of sewage sludge such as silviculture, reclaimed land and green areas and introduces a requirement for producer responsibility and certification. Stricter limit values for heavy metals content of sludge used in agriculture are also identified.
Internet link: **http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:31986L0278:EN:HTML**

15 Directive 1991/689/EEC on hazardous waste ('The Hazardous Waste Directive')	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date	1991
Summary / Overview	
This Directive provides a framework for the 'controlled management' of hazardous wastes. The Directive requires Member States to produce a hazardous waste management plan which must be made public.	
Opportunities / Synergies / Constraints / Challenges	
The Directive requires: A record of all sites where tipping of hazardous waste occurs and for permitted sites to keep records for a minimum of 3 years. Non-hazardous and hazardous wastes to be kept separate and to be prevented from being mixed. Within economic and technical constraints, hazardous wastes are to be separated from other wastes. Transport, labelling and packaging of hazardous wastes to be carried out within Community standards. Sites where hazardous waste is disposed must be inspected as must the producers of such waste.	
Internet link: http://europa.eu.int/eur-lex/en/consleg/pdf/1991/en_1991L0689_do_001.pdf	

16 Directive 96/61/EC concerning integrated pollution prevention and control	
Proponent body	European Parliament and the Council of the European Union
Status (e.g. statutory, non-statutory)	Statutory
Date produced	1996
Opportunities / Synergies / Constraints / Challenges	
Establishes requirement for licensing based on the Best Available Technique principle (although more rigorous technological controls may be warranted in certain cases). Generic requirements to: avoid significant pollution; dispose of waste materials minimising impact on the environment; use energy efficiently; use appropriate remediation techniques to limit risk of pollution once a site is closed. Defines the basic requirements of a licensing system which can be managed by several competent authorities, with controls on licensing requirements and monitoring.	
Internet link: http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:31996L0061:EN:HTML	

17 Directive 99/31/EC of the European Parliament and the Council on the landfill of waste ('The Landfill Directive'	
Proponent body	European Parliament
Status (e.g. statutory, non-statutory)	Statutory
Date produced	1999
Summary / Overview	
Establishes over-arching legislative requirement to reduce volume of wastes sent to landfill, and defines what may/may not be sent to landfill, pre-treatment obligations, licensing and permits, etc. Elements of the Directive are already being enacted by regional, county and local UK plans.	
Opportunities / Synergies / Constraints / Challenges	
Requires treatment in some form of all wastes before disposal to landfill (except inert wastes for which there is no appropriate treatment measure). Requires stricter segregation of landfill sites to distinguish those where only non-hazardous waste is accepted, and those that only accept inert waste. Establishes a system of licensing permits. Annex II defines strict controls on types of materials, the design of landfill sites, and the environmental factors which must be considered when licensing new sites. Excludes disposal of agricultural sludge, inert wastes and deposition of soil from construction sites.	
Key targets	
Establishes the need for a framework of thresholds and targets to be implemented according to national circumstances. However there are specific targets: • landfill of whole tyres to end by 2003, and of shredded tyres by 2006 • landfill of various forms of hazardous / clinical wastes (by 2001). Other targets related to recycling packaging, end of life vehicles, etc. are included but are taken forward by other EU and UK legislation reviewed here.	
Internet link: http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:31999L0031:EN:HTML	

18 Directive 2000/76/EC of the European Parliament and the Council on the incineration of waste	
Proponent body	European Parliament and the Council of the European Union
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2000
Opportunities / Synergies / Constraints / Challenges	
Places procedural controls to licence incineration and co-incineration of various generic forms of waste. Incineration of various forms of vegetable waste, animal carcasses and radioactive waste are excluded. Requires opportunity for energy recovery and re-use to be maximised. Places specific controls on the carbon content of the residual slag to maximise energy recovery. Requires that sites should not give rise to "significant ground-level air pollution" using the high of the exhaust stack to control such risks. Requires separate treatment of clinical waste without storage. Requires waste water used in cleaning exhaust gases to be cleaned and its release to natural water courses controlled and limited as far as possible. Provides daily permissible levels for the release of carbon monoxide and nitrous oxides. Also specifies general requirements for controlling the storage of materials before incineration, and removal and transport of residual residues, all of which are determined by the appropriate competent authority.	
Internet link: http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:32000L0076:EN:HTML	

19 Council Regulations 2037/2000 on Substances that Deplete the Ozone Layer	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date	2000
Summary / Overview	
The Council Regulations were drawn up as a result of technological advances in the replacement of ozone depleting substances (ODS) which meant stricter control measures could be put in place.	
Opportunities / Synergies / Constraints / Challenges	
The Regulations outline the targets to be met for the production of certain substances. There are also provisions for the importation, exportation and trade of substances listed in the Regulations. The Regulations require that ODS be recovered from refrigeration, fire safety systems and air conditioning units during their maintenance or their dismantling. Once recovered, the ODS must be destroyed in a manner that is sensitive to the environment (this excludes HCFCs which can be released until 2015). All necessary precautions must be taken to minimise leakages of controlled substances. Evaluation of waste management scenarios also needs to take account of the recovery of ozone-depleting substances in waste products.	
Key Targets	
• By 2004 Member States are to produce no Methyl Bromide • By 2025 Member States are to produce no HCFCs	
Internet link: **http://europa.eu.int/eur-lex/pri/en/oj/dat/2000/l_244/l_24420000929en00010024.pdf**	

20 Council Regulations 2150/2002 Regulations on Waste Statistics	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date	2002
Summary / Overview	
The aim of the Regulations is to 'establish a framework for the production of community statistics on the generation, recovery and disposal of waste'	
Opportunities / Synergies / Constraints / Challenges	
Members are required to collect statistical information on the generation, recovery and disposal of waste, and to continually update this information. (See separate entries on Defra's Waste Data Strategy). Appendix I outlines the different categories of the generation of waste for which data must be gathered and process to follow when producing the statistics Appendix II sets out the same features but in relation to recovery and disposal of waste Member states should collect data by means of surveys, statistical estimation procedures or from other sources (e.g. under obligations set out in other Community Legislation)	
Internet link: **http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_332/l_33220021209en00010036.pdf**	

21 COM /2003/302 on Integrated Product Policy	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Non-statutory
Date	2003
Summary / Overview	
The Integrated Product Policy aims to reduce the use of resources and diminish the environmental	

impact of waste. The policy aims to promote sustainable development and to engage all stakeholders including business.

Opportunities / Synergies / Constraints / Challenges

The Policy advocates changing and reducing the production of waste. Among the barriers to this are:

- The increase in quantity of products
- The increased variety of products
- Innovation constantly creates new products
- Products are traded globally
- Products are becoming more complex
- Inappropriate use and disposal can lead to significant environmental impacts
- Products involve a greater variety of actors throughout their lifecycle.

The policy sets out to encourage the use of green products, to use fewer products and to reduce the impact of products on the environment. The whole life cycle of a product must be considered and the environmental impact at each stage taken into account. Stakeholder involvement is also an important part of the process.

Internet link: http://europa.eu.int/eur-lex/en/com/cnc/2003/com2003_0302en01.pdf

22 COM /2003/723 to Replace 91/157/EC on Batteries and Accumulators containing certain Substances ('The Batteries Directive')	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2006 (Proposed adoption year)

Summary / Overview

The Batteries Directive received a second reading in the European Parliament on 12 December 2005. The final text is expected to be agreed mid-2006 and it is anticipated that the Directive will come into force in the UK in 2008. The objectives of the Directive are to reduce the number of hazardous and non-hazardous batteries going to landfill and to salvage larger proportions of the materials they contain. The Directive focuses on producer responsibility and aims to ensure a high standard of environmental protection.

Opportunities / Synergies / Constraints / Challenges

The main objectives of the Directive are to 'contribute to a high level of environmental protection and to contribute to the proper functioning of the market'

Key targets

Key parts of the "common position" agreed by Environment Ministers include:
"A 25% collection rate for portable household batteries to be reached four years from the transposition of the Directive into UK law. There is also a 45% collection rate to be reached after 8 years of transposition.
Collection schemes for the return of used portable batteries are to be established. These are to be free of charge to the end user. As a producer responsibility Directive, the collection schemes are more than likely to be financed by producers.
Prohibition of final disposal of automotive & industrial batteries into landfill and incineration, therefore all industrial and automotive batteries to be recycled (indirectly means 100% collection rate).

Internet link: http://www.defra.gov.uk/environment/waste/topics/batteries/index.htm

23 Communication COM (2005) 666 Final Taking sustainable use of resources forward: A thematic strategy on the prevention and recycling of waste	
Proponent body	**European Commission**
Status (e.g. statutory, non-statutory)	**Non-Statutory**
Date produced	December 2005
Summary / Overview	
A new strategy proposed by the European Commission under the 6th Environmental Action Plan. This Strategy, and its accompanying proposals for legislative change at the European level, endorses the basic objectives of EU waste policy. It emphasises its potential to contribute to reducing the overall negative environmental impact of resource use; and it sets a long-term goal for the EU to become a recycling society, organised around the maximum recovery of materials where this makes environmental and economic sense, and energy recovery where this is more efficient with high environmental reference standards. It highlights waste growth across member states as a key problem with no reduction, in absolute terms, of amount being landfilled. No new waste stream specific legislation is proposed at EU level for at least five years but there is a focus on full implementation of the existing legislations by member states.	
Internet link: http://www.europa.eu.int/comm/environment/waste/pdf/com_waste_en.pdf	

24 Waste Electrical & Electronic Equipment (WEEE Directive) (2002/96/EC)	
Proponent body	European Commission
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2003
Summary / Overview	
The WEEE Directive aims to minimise the impacts of electrical and electronic equipment on the environment during their life time and when they become waste. It applies to a huge spectrum of products. It encourages and sets criteria for the collection, treatment, recycling and recovery of waste electrical and electronic equipment. It makes producers responsible for financing most of these activities (producer responsibility). Private householders are to be able to return WEEE without charge. In December 2005, the DTI announced an immediate review of proposals for implementing the WEEE Directive in the UK.	
Opportunities / Synergies / Constraints / Challenges	
Member States are required to adopt appropriate measures to minimise the disposal of WEEE as unsorted municipal waste. Member States must ensure that the WEEE is treated using the best available treatment, recovery and recycling techniques.	
Key targets	
Collection of 4kg of WEEE per head of population within 36 months of transposing the Directive into native law.	
Internet link: http://www.dti.gov.uk/sustainability/pdfs/finalweee.pdf	

C) U.K. LEGISLATION & STRATEGY

Part 1 – Sector-Specific Legislation & Strategy

25 Waste Strategy 2000 (WS2000)	
Proponent body	Defra
Status (e.g. statutory, non-statutory)	The current national strategy
Date produced	2000

Summary / Overview

The current waste strategy for England. WS 2000 was the Government's statutory response to the EU Waste Framework Directive (and to the Landfill Directive to a lesser extent), setting out a roadmap for delivering the necessary reduction in landfilling and increased recovery of value in different forms. It is a co-ordinated strategy to reduce the amount of waste produced, increase the proportion re-used, recovered and recycled, and sets targets for the recycling of industrial, commercial and municipal waste. It aims to increase re-use, recovery and recycling; recovery of energy from waste, identifying the priorities in the Waste Hierarchy.

Government committed to a review of WS2000. It is this review that is currently taking place.

Opportunities / Synergies / Constraints / Challenges

See the accompanying Consultation Document for more details of WS2000, including the objectives set out therein.

Key targets

Recycling or composting of household wastes: 25% by 2005; 30% by 2010; 33% by 2015.
Landfill of biodegradable municipal waste: to 75% of 1995 levels by 2010; to 50% of 1995 levels by 2013; to 35% of 1995 levels by 2020.
Value recovery from municipal waste: from 40% by 2005; from 45% by 2010; from 67% by 2015.
Reduce landfilling of industrial & commercial wastes to 85% of 1998 levels by 2005.

Internet link: http:// http://www.defra.gov.uk/environment/waste/strategy/cm4693/

26 Household Waste Recycling Act	
Proponent body	HM Government
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2003

Summary / Overview

An amendment to the Environmental Protection Act (1990). Requires separate collection of at least two types of recyclable waste from households.

Key targets

Requirement is for the collection of at least two types of recyclable waste together or individually separated from the rest of the household waste by 2010. The aim of the Act is to increase the recycling rate, which currently stands at 17.7%, by helping local authorities achieve their statutory recycling targets which underpin national targets to recycle or compost at least 25% of household waste by 2005, 30% by 2010 and 33% by 2015.

Implicitly requires consistent and regular monitoring to track achievement towards targets.

Internet link: http://www.hmso.gov.uk/acts/acts2003/20030029.htm

27 Waste and Emissions Trading Act	
Proponent body	HM Government
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2003
Summary / Overview	
Helps the UK meet its European obligations under the Landfill Directive and gives statutory footing to penalties in the world's first economy wide emissions trading scheme. Part 1 provides for the allocation of allowances, which may be tradable, to waste disposal authorities and contains two measures to promote joint working between authorities in two-tier areas; a requirement for some authorities in two-tier areas to have in place by April 2005 a joint strategy for the management of municipal waste and a power for waste disposal authorities to direct a collection authority to direct a collection authority to deliver waste in a separated form. Part 2 places on a statutory footing the penalties for direct participants in the UK Greenhouse Gas Emissions Trading Scheme.	
Opportunities / Synergies / Constraints / Challenges	
Intended to provide a cost effective way of enabling England to meet its targets for reducing the landfilling of biodegradable municipal waste.	
Key targets	
Targets set under the allowance trading system.	
Internet link: http://www.defra.gov.uk/environment/waste/localauth/lats/index.htm	

28 Packaging (Essential Requirements) Regulations	
Proponent body	HM Government
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2003
Summary / Overview	
An extension of the Producer Responsibility Obligations (Packaging Waste) Regulations of 1997 which defines requirements that must be met for product packaging used in the UK. The original regulations addressed arisings of plastic, paper, card and other packaging materials, however these regulations define additional requirements which also affect processing and disposal of other materials.	
Opportunities / Synergies / Constraints / Challenges	
Schedule II: Packaging must be manufactured so that a proportion can be recovered for re-use as a secondary product – the proportion varies with type of material. Other conditions require: • packaging designed to be reusable should be capable of making several use rotations in normal conditions of use • minimum calorific standards apply for packaging designed to be burned for energy recovery • packaging intended to be composted should be sufficiently biodegradable that it can be collected separately or in combination with other waste products • biodegradable packaging should decompose into CO_2, water and biomass. Noxious or hazardous packaging materials (regulated metals including lead, cadmium, mercury and chromium) must be minimised in emissions and ash produced by incineration, or in leachate from landfill.	
Key targets	
A maximum concentration of regulated metals of 100ppm is permissible for any packaging produced in or after 2001; higher concentrations are permissible for packaging produced earlier. Regulated metals can still be included in glass packaging until July 2006, and in recycled plastics until early March 2009.	
Internet link: http://www.hmso.gov.uk/si/si2003/20031941.htm	

29 End of Life Vehicles Regulations	
Proponent body	HM Government
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2003
Summary / Overview	
The End of Life Vehicles Directive, and these associated UK regulations, provide for the mandatory dismantling of waste motor vehicles on licensed sites, in effect extending the Integrated Pollution Control system to this activity. Legislation implies that new facilities may be required. There is an implication of this requirement when combined with the Proximity Principle regarding the availability of suitable sites and their proximity to sensitive receptors (and also whether licensing would result in an increase in activity at these sites. Since disposal facilities are operated by the private sector there is a need to implement data collection and monitoring to track achievement and compliance.	
Internet link: http://www.hmso.gov.uk/si/si2003/20032635.htm	

30 Waste Not, Want Not	
Proponent body	No.10 Strategy Unit
Status (e.g. statutory, non-statutory)	Non-statutory
Date produced	2002
Summary / Overview	
A set of strategic recommendations to government about potential direction in waste policy produced at the midway point to the quinquennial review. A focus on municipal waste.	
Opportunities / Synergies / Constraints / Challenges	
Selected key elements of relevance to national strategy: • Established Waste Implementation Programme to support local authority delivery of Landfill Directive Targets. • Extend voluntary producer responsibility for waste reduction and recycling. • Promote use of secondary resources. • New targets for waste minimisation / disposal. • Improved quality / quantity of data on waste arisings, treatment and disposal methods, and more open systems for accessing this information. (This requirement resulted in development of the Waste Data Strategy, which is reviewed below).	
Internet link: http://www.strategy.gov.uk/downloads/su/waste/report/index.html	

31 Strategy Unit Report on 'Waste Not Want Not' Recommendations – Final Update	
Proponent body	No.10 Strategy Unit
Status (e.g. statutory, non-statutory)	Non-statutory
Date produced	2005
Summary / Overview	
The final report monitoring the extent to which the recommendations of *Waste Not, Want Not* have resulted in changes to waste management policy in England, within the continuing framework of the Waste Strategy 2000 and other initiatives that it generated (eg. WRAP).	

Opportunities / Synergies / Constraints / Challenges

Principal outstanding actions:

- Investigation of options to influence household behaviour continuing (the action encouraged local authorities to be given powers to take forward incentive schemes).
- Energy Using Products Directive will be used to take forward incentives which encourage more ecologically sustainable products.
- Further consultation ongoing on UK response to the EU Bio-waste Directive.
- The case for a ban on landfill or incineration of recyclable products and materials to be reviewed in the revised waste strategy.

Internet link: http://www.defra.gov.uk/environment/waste/review/stratunit-updatejuly05.pdf

32 Government response to the Strategy Unit Report: Waste Not Want Not

Proponent body	DEFRA
Status (e.g. statutory, non-statutory)	Non-statutory
Date	2003

Summary / Overview

The Government response to *Waste Not Want Not* outlines the action that has been taken by the Government as a result of the report. It also details the Government response to each recommendation made in the report and to work on non-municipal wastes

Opportunities / Synergies / Constraints / Challenges

The Government recognises the need to work closely with all of the bodies who are involved with waste management.
The Government will fully fund any extra costs incurred to Local Government as a result of any new burdens they experience as a result of changes to waste management.
The Government also agrees that a long term approach should be adopted and waste should be managed in a way to work to work towards the goals of sustainable development.
The Response provides detail for specific actions which are planned in response to each recommendation outlined in *Waste Not Want Not*.

Internet link: http://www.defra.gov.uk/environment/waste/review/strategyunit_response.pdf

33 Waste and Resources R&D Strategy

Proponent body	Defra
Status (e.g. statutory, non-statutory)	Non-statutory
Date produced	2004

Summary / Overview

Outlines programme for improving information about waste arisings, treatment processes and a broader range of activities (eg. the effect of producer responsibility initiatives occurring earlier in the resource lifecycle) for the benefit of future policy-making and strategic work.

Opportunities / Synergies / Constraints / Challenges

Key objectives:

- Develop and implement a strategy for access to R&D information on waste-related activities
- Provide a mechanism for communicating and disseminating R&D information

R&D requirements driven by a range of UK-based and European programmes in the short and medium-term, including EU Thematic Strategies, and ongoing transposition of waste-related EU Directives into UK law.
The strategy's main focus is in aligning R&D activities on waste with development of strategic policies resulting from continued EU legislation, however its requirements complement that of the Waste Data Strategy (see below).

Internet link: http://www.defra.gov.uk/environment/waste/wip/research/pdf/rdstrategy.pdf

34 Waste Data Strategy	
Proponent body	Defra
Status (e.g. statutory, non-statutory)	Non-statutory (consultation document which identifies key objectives of the strategy)
Date produced	2004
Summary / Overview	
Proposed strategy is direct response to *Waste Not, Want Not* (see separate entry in this review) which required an improvement in the quality and quantity of data about the waste sector, and better mechanisms for accessing it for analysis and strategy evaluation.	
Opportunities / Synergies / Constraints / Challenges	
Proposed key requirements: • Quarterly reporting of arisings for all waste streams, available by sector and down to local authority (waste collection authority) level. • Quarterly reporting of waste management – ie. proportions recycled, treated, combusted or disposed to landfill. • Quarterly reporting of cross-boundary transfer of waste materials. • Annual survey/review of waste infrastructure. • A basic suite of analytical summaries of the main trends in arisings, processing, etc. • Potential to integrate / overlay output data with other facilities. Consultation process revealed the following issues: • While improving the quality, quantity and consistency of reporting, data collection mechanisms will focus on waste production. • Consequently further action will be required to develop data capture and reporting mechanisms to monitor initiatives addressing producer responsibility. • Also a need for a comprehensive overhaul and standardisation on waste terminology, definitions and categories. • Further work is also needed to understand users requirements in terms of the interface to the data system and what reports it should provide. • There is a key requirement to reduce the number of reporting mechanisms. Recommendations on monitoring and observations on current data gaps (and their importance for informing future review of strategy) derived from the SEA need to reflect and be consistent with the aims of the strategy.	
Internet link: http://www.defra.gov.uk/corporate/consult/wip-data/index.htm (provides links to the consultation document and summary of responses)	

Part 2 – Generic Legislation & Strategy

35 One Future – Different Paths: The UK's Shared Framework for Sustainable Development	
Proponent body	UK Government
Status (e.g. statutory, non-statutory)	Non-statutory
Date produced	2005
Summary / Overview	
The Shared Framework sets the overarching requirements for achieving sustainable development in the UK and devolved democratic bodies. The framework covers the period 2005 – 2020 and comprises: • A shared understanding of sustainable development • A common purpose outlining what we are trying to achieve and the guiding principles we all need to follow to achieve it • Our sustainable development priorities for UK action, at home and internationally • Indicators to monitor the key issues on a UK basis	

Opportunities / Synergies / Constraints / Challenges
There are 5 principles that a policy must adhere to in order to be sustainable, namely: • Living within Environmental Limits • Ensuring a strong healthy and just society • Achieving a sustainable economy • Promoting good governance • Using sound science responsibly
Internet link: http://www.sustainable-development.gov.uk/documents/publications/SD%20Framework.pdf

36 Securing the Future: UK Government Sustainable Development Strategy	
Proponent body	UK Government
Status (e.g. statutory, non-statutory)	Non-statutory
Date	2005
Summary / Overview	
The main goal of the Government's Sustainable Development Strategy is to enable all the people in the world to 'satisfy their basic needs and enjoy a better quality of life without compromising the quality of life for future generations'. The four key priorities outlined in the Strategy include: • sustainable consumption and production; • climate change; • natural resource protection; • sustainable communities. The guiding principles of the Strategy are: • Living within environmental limits; • Ensuring a strong, healthy and just society; • Using sound science responsibly; • Promoting good governance; • Achieving a sustainable economy. Its four agreed priorities for action are: sustainable consumption and production, climate change, natural resource protection and sustainable communities. It also sets out the Government's objective for waste policy as being "protection of human health and the environment by producing less waste and by using it as a resource wherever possible. Through more sustainable waste management – reduction, re-use, recycling, composting and using waste as a source of energy – the Government aims to break the link between economic growth and the environmental impact of waste".	
Opportunities / Synergies / Constraints / Challenges	
The Strategy aims, inter alia, to improve resource use efficiency and to reduce the production of waste and emissions across business sectors. It also sets out to influence consumption patterns and to encourage sustainable procurement The relevance to the revised waste strategy is to place more emphasis on reducing waste at source, using it as a resource, and to set waste policy within the sustainable consumption and production agenda.	
Internet link: **http://www.sustainable-development.gov.uk/documents/publications/strategy/SecFut_complete.pdf**	

37 Delivering the Essentials in Life – DEFRA's 5-year Strategy	
Proponent body	DEFRA
Status (e.g. statutory, non-statutory)	Non- statutory
Date	2004
Summary / Overview	

The key aims of this Strategy are to:

- Improve environmental leadership
- Put sustainable development into practice
- Regulate better
- Protect the nation from emergencies
- Change the way DEFRA does business

Outlines a number of initiatives that have been instigated to meet the aims of the strategy

Opportunities / Synergies / Constraints / Challenges

The objectives of the strategy include:

- Providing cleaner, greener, safer and healthier local environments and to meet the challenge of climate change
- To change the behaviour of Government, business, farming and consumers
- To build sustainable rural communities
- To embed sustainable development in government
- To protect our natural resources
- To improve the health and welfare of animals
- To develop sustainable farming and food industries

In relation to waste, the Strategy suggests initiatives, which aim to change the behaviour of business by making it more resource efficient. In addition, the Strategy also sets out initiatives such as developing incentives for household recycling and waste reduction, and new ways of getting local buy-in on waste choices.

Internet link: http://www.defra.gov.uk/corporate/5year-strategy/5year-strategy.pdf

38 Working with the grain of nature: a biodiversity strategy for England	
Proponent body	UK Government
Status (e.g. statutory, non-statutory)	Non-statutory
Date produced	2002

Summary / Overview

In June 1992, 159 governments signed the Convention on Biological Diversity (CBD) at the Earth Summit in Rio de Janeiro. The CBD called for the preparation and enforcement of national strategies and action plans to conserve, protect and enhance biodiversity. The UK Biodiversity Action Plan (UKBAP):

- Is the Government's response to the CBD
- Describes the UK's biological resources
- Commits a detailed plan for the protection of these resources
- Has 391 Species Action Plans, 45 Habitat Action Plans and 162 Local Biodiversity Action Plans with targeted actions

The Strategy sets out a series of actions that will be taken by the Government and its partners to make biodiversity a fundamental consideration across all main sectors of public policy.

Opportunities / Synergies / Constraints / Challenges

Economic activities can adversely affect biodiversity, by using up the resources on which biodiversity relies; by converting resources and habitats to other uses; by polluting habitats and by increasing the risk of impacts from invasive species.

Consideration of biodiversity impacts should be included in the assessment of alternatives. However, most of these impacts can only be considered at site level.

Internet link: http://www.ukbap.org.uk/EBG/england_biodiversity_strategy.asp

39 Our Energy Future – creating a low-carbon economy (Energy White Paper)	
Proponent body	Department of Trade and Industry (DTI)
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2003

Summary / Overview

The Energy White Paper presents the Government's energy policy vision for the UK, analysing the necessary year-2020 achievements, based in part on the context of the year 2050. Major aims are to cut emissions of CO_2 by 60% by 2050, maintain energy supply reliability, support domestic and worldwide energy market competitiveness and ensure the adequacy and affordability of heating every home. In light of global warming and the burning of fossil fuels, the Energy White Paper promotes *inter alia* renewable energy, wishing to increasingly support its use and promote its growth. This includes local energy generation fuelled by locally generated waste.

Opportunities / Synergies / Constraints / Challenges

- Promote renewable energy generation from waste (e.g. biogas).
- Promote a healthy research base in energy generation from waste.

Key targets

- 60% reduction of UK CO_2 emissions by 2050
- 20% reduction below 1990 levels of UK CO_2 emissions by 2010
- 110 – 120 million tonnes carbon in CO_2 emissions in 2020 (current predicted = 135)
- to reduce the amount of energy consumed nationally
- 10% of UK energy supply by renewables means by 2010 (note: January 2000 objective)
- 20% of UK energy supply by renewables by 2020
- to reduce the number of households spending greater than 10% of income on heating their homes adequately (2003 = around 3 million).

Internet link: http://www.dti.gov.uk/energy/whitepaper/index.shtml

40 The Air Quality Strategy for England, Wales, Scotland and Northern Ireland Working Together for Clean Air	
Proponent bodies	Department of the Environment, Transport and the Regions in partnership with the Scottish Executive, The National Assembly for Wales and the Department of the Environment in Northern Ireland.
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2000

Summary / Overview

The proposals in this strategy aim to protect people's health and the environment without imposing unacceptable economic or social costs. They form an essential part of the Government's strategy for sustainable development. The pollutants covered are: benzene; 1,3-butadiene; carbon monoxide; lead; nitrogen dioxide; ozone; particles (PM10); and sulphur dioxide.

Opportunities / Synergies / Constraints / Challenges

This Strategy sets objectives for eight main air pollutants to protect health. Performance against these objectives will be monitored where people are regularly present and might be exposed to air pollution. Under local air quality management (LAQM), local authorities will work towards achieving the objectives prescribed by regulation for seven of the pollutants, but not that for ozone as this is affected by pollutants produced outside the UK.

Evaluation of treatment technologies and infrastructure growth scenarios needs to take account of potential impacts, especially those resulting from waste transport by road and the contribution of landfill to PM_{10} levels. However difficulties in identifying the contribution of waste activities to background levels of key pollutants suggest that impacts are more likely to be site-specific and therefore would be considered in EIA of planning applications for new waste sites.

Internet link: http://www.defra.gov.uk/environment/airquality/strategy/pdf/foreword.pdf

41 Countryside Agency - The State of the Countryside Report 2005	
Proponent body	Countryside agency
Status (e.g. statutory, non-statutory)	Non-statutory
Date	2005

Summary / Overview

This annual Report provides detailed information on the status of rural England and the surrounding countryside. The report is divided into 4 main sections:

1. Characteristics of rural England
2. Living in the countryside
3. Economic health
4. Land and environment

Opportunities / Synergies / Constraints / Challenges

The key findings from the study include:
The majority of England's 13 million hectares is in farming use (esp. crops and grassland).
Ownership of the land is diverse however a number of larger landholdings still remain.
One quarter of the land in England is covered by coastal and landscape designations.
Access to services is generally worse than urban areas and there is a strong reliance on car ownership.
There is generally low unemployment in rural areas but there is evidence of deprived households and elements of social segregation, especially in sparsely populated areas.

Internet link:
http://www.ruralcommunities.gov.uk/data/uploads/State%20of%20the%20Countryside%202005.pdf

42 Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes	
Proponent body	Enviros on behalf of Defra
Status (e.g. statutory, non-statutory)	Non-statutory
Date	2004

Summary / Overview

This report was commissioned by Defra in response to the Prime Minister's Strategy Unit's report *Waste not, Want not*, which recommended that an independent body bring the literature and evidence on the environmental effects of the different waste management options together. These effects are reported relative to each other and to other activities affecting health and the environment.

Opportunities / Synergies / Constraints / Challenges

Extensive use of this report was made in the Assessment. For more details of the Report, see sections 8 and 10 and Appendices A and B of the accompanying Baseline Document for further details.

Implications include:

- Lack of studies/data on the health effects of MRFs, anaerobic digestion, pyrolysis and waste transport (by road) on people living nearby
- Lack of information on emissions from composting.
- More detailed environmental monitoring would be useful in several respects: emissions pathway studies (bio-accumulation), effects on sensitive species and the significance of greenhouse gas emissions.

However implications of the lack of data lie outside the scope of WS2006 (although they limit the ability of the SEA to take account of potential impacts), but might be addressed through the Waste and Resources R&D Strategy (see separate item) if this programme sponsors further investigation of the impacts of waste management on health.

Internet link: http://www.defra.gov.uk/environment/waste/research/health/

43 Environmental Quality in Spatial Planning	
Proponent body	Countryside Agency, Environment Agency, English Heritage & English Nature
Status (e.g. statutory, non-statutory)	Non-statutory (advisory)
Date	2005
Summary / Overview	
Provides the above bodies' advice on how planning authorities can seek good quality environmental design, conditions and protection, thereby implicitly applying to guidance and policy as applied to new waste infrastructure. Although this is an advisory document and it refers primarily to regional and local spatial planning, these bodies' involvement in the planning approval process mean that the guidance identifies priorities they would expect to see addressed in applications for new waste sites.	
Opportunities / Synergies / Constraints / Challenges	
Given the nature of the document the principal recommendations are generic rather than specific to the waste sector, but they include: • Involve conservation bodies early in the planning process and use their data resources to help understand and evaluate local environmental conditions and problems, and to use this resource to maintain up-to-date information; • Planning authorities should communicate clear picture of their environmental objectives through the new planning process and the documents it will generate; • Seek win-win solutions that acknowledge the economic and social benefits of environmental assets while ensuring development is necessary, highly sustainable, benefits the local community, and balances socio-economic and environmental considerations; • Identify areas that are unsuitable for development for reasons including climate change risk, and identify other areas with the capacity to absorb additional growth; • Identify targets and thresholds for new development that will contribute to environmental quality and protection; • Development should be directed towards the most sustainable locations and use techniques and materials that reflect local character and which support major initiatives on climate change and energy efficiency.	
Internet link: http://www.english-heritage.org.uk/upload/pdf/Envir_Quality.pdf [and from websites of the other agencies and bodies]	

44 Land-Use Planning for Sustainable Waste Management	
Proponent body	Environmental Services Association (ESA)
Status (e.g. statutory, non-statutory)	Non-statutory
Date	2004
Summary / Overview	
Proposes planning guidance on enabling the UK to meet the waste management capacity requirements of the EU Landfill Directive, estimated at some 2,000 facilities, and represents a collective position statement from the waste management sector, comprising waste management authorities and private sector contractors. It identifies and analyses land-use planning issues (particularly with relation to delays in decision making within the planning process), and suggests a strategy towards sustainable use of resources through land-use planning.	
Opportunities / Synergies / Constraints / Challenges	

Nationally:

- Promotion of waste management diversification – a variety of waste management solutions;
- Provision of clear information on the health implications of waste management;
- Appropriate weight to national, regional and local targets;
- Appropriate weight to the social, environmental and economic benefits of a waste management facility;
- Promotion of environmental business-planning zones, uniting compatible environmental industries on-site in a localised environmental supply-chain;
- Encouragement of waste destination by principal physical characteristics rather than source;
- Encouragement of the replacement of LAs with the EA in determining waste destination into sites;
- Promotion of simultaneous applications for planning permissions and PPC permit/waste management licence;
- Recognition of the diversity of types and looks of waste management facilities, and ability to contribute to different areas (e.g. added value to brownfield land or 'valuable environmental role in designated areas');
- Exploration of opportunities to introduce a use class for waste management;
- Recognition that the proximity principle may not be consistent with environmental goals;
- Recognition of the constraints/problems of the BPEO for waste management.

Internet link: http://www.esauk.org/publications/reports/landuseplanning.pdf

Part 3 – Planning Guidance

45 PPS1 – Creating Sustainable Communities	
Proponent body	HM Government (ODPM)
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2004
Summary / Overview	
Replaces PPG1 and defines the new framework for planning and development control. Sustainable communities require "a flourishing economy supported by adequate infrastructure"	
Opportunities / Synergies / Constraints / Challenges	
Integration of four aims of Sustainable Development (economic development; social inclusion; environmental protection; prudent use of resources) with all aspects of spatial planning. Planning to be open and accountable and actively promote participation. Plans should address accessibility issues. Protection of character of countryside and townscapes, habitats and natural resources. Energy efficiency and opportunities for renewable energy and combined heat and power in developments encouraged.	
Internet link: http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_027494.pdf	

46 PPS7 – Sustainable Development in Rural Areas	
Proponent body	HM Government (ODPM)
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2004
Summary / Overview	
Sets out government policy with respect to land use planning in rural areas, including towns and villages and the wider, undeveloped countryside, and with respect to all forms of land use. (In many respects the PPS is an umbrella document for various aspects of conservation policy, which reflect national and/or international priorities).	

Opportunities / Synergies / Constraints / Challenges
Specific relevant requirements: • Brownfield development is preferred to greenfield • People in rural areas should have reasonable access to facilities (i.e. waste facilities) and plans should support the creation of small scale, local facilities to meet community needs • New development in countryside should be strictly controlled • No major developments in designated areas (unless in exceptional circumstances) • Protect best and most versatile agricultural land
Internet link: http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_030148.hcsp

47 PPS9 – Biodiversity & geological conservation	
Proponent body	HM Government (ODPM)
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2004
Opportunities / Synergies / Constraints / Challenges	
Policy guidance is based on the principles set out in *Working with the grain of nature – a biodiversity strategy for England*. PPS9 emphasises that the planning system has a significant part to play in meeting the Government's international commitments and domestic policies for biodiversity and this will be carried through into assessment of waste management sites. Para. 24 places particular emphasis on the strength of protection afforded to international designations. • Development on a site which may give rise to significant harmful effects will need to demonstrate that all reasonable alternative sites that would result in less or no harm have been fully considered • There is also a requirement to take account of biodiversity strategies at local level • Development should incorporate beneficial biodiversity and geological features within its design where possible	
Internet link: http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_606919.hcsp	

Note that other guidance on archaeology (PPG16, ODPM, 2001) and the historic environment (PPG15, ODPM, 1994) applies essentially the same approach of applying constraints proportional to the importance of the assets that would be affected, with particular emphasis on internationally designated sites and assets, and with a requirement to demonstrate appropriate consideration of alternative sites has been made. Therefore these two documents are not reviewed separately, and as with other PPGs/PPSs, their main focus is on controlling the impact of developments on a site-by-site basis.

48 PPS10 – Planning for sustainable waste management	
Proponent body	HM Government (ODPM)
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2005
Summary / Overview	
The principal document defining the link between strategy on waste management and the practical issues of dealing with provision of new infrastructure on the ground.	
Opportunities / Synergies / Constraints / Challenges	

Key objectives:

- Driving waste management up the waste hierarchy, addressing waste as a resource.
- Enabling timely and sufficient provision of waste management facilities.
- Secure recovery / disposal of waste without endangering human health and the environment.

Identifies the relative responsibilities of the Regional Spatial Strategy and the role of county and local waste duties in planning for waste management, land and infrastructure, with a requirement to maintain at least a 10-year horizon. Also identifies that waste planning and pollution control mechanisms are complementary but separate.

Internet link: http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_030148.hcsp

49 PPS22 – Renewable energy	
Proponent body	HM Government (ODPM)
Status (e.g. statutory, non-statutory)	Statutory
Date produced	2004

Summary / Overview

Statement of government policy concerning planning and development control of renewable energy developments. Landfill gas and energy from waste schemes among others would be covered by this guidance. However energy from mass incineration of domestic waste is not covered by PPS22.

Opportunities / Synergies / Constraints / Challenges

Planning policies that rule out or place constraints on the development of all, or specific types of, renewable energy technologies should not be included in plans (and strategies, presumably).

Small-scale projects can provide a limited but valuable contribution to overall outputs of renewable energy and to meeting energy needs both locally and nationally.

Internet link: http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_030334.hcsp

50 PPG25 – Development and flood risk	
Proponent body	UK Government
Status (e.g. statutory, non-statutory)	Non - Statutory
Date	2001

Summary / Overview

PPG 25 is designed to promote the integration of development policy and flooding and coastal defence strategies. The document provides guidance for Local Authorities and promotes the consideration the issues of flooding in the wider context of the river catchments and coastal cell.

The Government is now consulting on PPS25. The consultation period ends in February 2006.

Opportunities / Synergies / Constraints / Challenges

The recognition of flooding risk should be an important consideration in the planning process and development should not occur in areas of highest flood risk. Appropriate measures should be put in place to ensure developments, which are at risk, are safe in the event of a flood.

All developments should provide an assessment on the risk from flooding and implications for flooding elsewhere. There should also be details of how these risks and effects will be mitigated and managed with the least impact on the environment.

Waste operations should not be located in areas of highest flood risk. This also relates to the requirements of the Water Framework Directive where pollution of inland, transitional, coastal and ground waters must be avoided.

Internet link: http://www.odpm.gov.uk/index.asp?id=1144121#P154_53830

APPENDIX F – SCOPING REPORT

OCTOBER 2005, SENT TO THE STATUTORY CONSULTEES: COUNTRYSIDE AGENCY, ENGLISH HERITAGE, ENGLISH NATURE AND THE ENVIRONMENT AGENCY

Note: the appendices to this Scoping Report are not included below.

1. INTRODUCTION

The purpose of this scoping report

The purpose of this scoping report (the 'Scoping Report') is to seek the views of the Consultation Bodies on the proposed scope and level of detail of the information that must be included in the environmental report as part of the strategic environmental assessment ('SEA')[25] to be undertaken in the context of the interim review of the Waste Strategy 2000 (the 'Review).

This high-level, strategic Review precedes publication (intended for summer 2006) of a revised waste strategy for England. The intention is to publish for consultation a substantial progress report (the 'Progress Report') which will contain the elements of the draft strategy. It will seek views on the Government's vision for England's waste strategy and the 'route-map' to achieve that vision until the root-and-branch review of Waste Strategy 2000[26] ('WS 2000') to be undertaken in 2010.

The Review applies to England only and therefore the relevant consultation bodies are, as set out in Regulation 4 of the Environmental Assessment of Plans and Programmes Regulations 2004[27] (the 'Regulations'), the Countryside Agency, English Heritage, English Nature and the Environment Agency.

2. WASTE STRATEGY 2000 AND THE WASTE STRATEGY REVIEW

WS 2000

The Department for Environment, Food and Rural Affairs (Defra) is responsible for the National Waste Strategy for England[28]. This is currently set out in WS 2000, which forms part of the waste management plan required under Article 7 of the EU Waste Framework Directive and the Environmental Protection Act 1990 (as amended in 1995). WS 2000 set the Government strategy for waste management in England and Wales up to 2020. It included a commitment for a root-and-branch review in 2010, with smaller,

[25] The term SEA is used for the purposes of simplicity, even though the Directive refers only to 'environmental assessment'.

[26] Waste Strategy 2000, DETR, published in May 2000 and available at http://www.defra.gov.uk/environment/waste/strategy/cm4693/index.htm

[27] The Environmental Assessment of Plans and Programmes Regulations 2004, SI 2004 No. 1633, available at http://www.opsi.gov.uk/si/si2004/20041633.htm#1

[28] The Welsh Assembly Government published a National Waste Strategy for Wales in June 2002.

interim reviews in 2005 and 2015. This first interim review is currently being undertaken and is the subject of this SEA.

WS 2000 offered a strategic overview of waste policy, outlined the scale of the task and the tools that could be brought to bear on that challenge, and gave details of the actions stakeholders needed to take to meet the vision and targets set out in WS 2000.

Advances since WS 2000

In November 2002 the Cabinet Office Strategy Unit published *Waste not, Want not - A Strategy for Tackling the Waste Problem*. The report focussed on municipal waste in the context of the need to meet the new biodegradable municipal waste reduction requirements set out in the Landfill Directive. This current Review differs in that it considers all waste streams, not just municipal waste.

The Government welcomed *Waste not, Want Not* and published in May 2003 a detailed response to each of the Strategy Unit's recommendations[29]. The recommendations in *Waste not, Want not*, and Government's response to each of these, has helped to ensure that – since 2000 – England's performance has moved very much in the right direction. In particular:

- less industrial and commercial waste is being landfilled;
- recycling and composting of household waste has doubled in the last five years;
- greater amounts of packaging material are being recovered and recycled;
- significant improvements continue to be made in the recycling and re-use of construction and demolition waste; and
- considerable progress has been made in developing new and stronger markets for recycled materials.

Despite these positive trends, the Government is not complacent. The amount of waste generated in England continues to rise, with most of this continuing to go to landfill. Compared with many other European countries, England still produces more waste per head, and recycles less. The potential for encouraging more beneficial ways of using waste is still considerable.

To continue moving forwards in tackling the huge volumes of waste generated in England, a clear vision is required. The Review builds on WS 2000 to develop this vision. It does so in the context of key recent developments which are summarised below:

Since the publication of WS 2000 there have been some major advances:

- the introduction of progressive increases in Landfill Tax, up to £35

[29] The response is available at http://www.defra.gov.uk/environment/waste/review/strategyunit_response.pdf

per tonne in the medium to long term, to incentivise alternative ways of managing and disposing of waste. Revenues are being redirected to local authorities and business to promote investment in reduction, re-use and recycling

- a new system of tradable landfill allowances for local authorities to ensure that obligations under the landfill directive are met in the most cost efficient and effective way for England as a whole;
- a range of waste minimisation measures, including in the retail sector
- challenging recycling targets for household waste, packaging materials and waste electrical and electronic equipment
- better information and advice to households and businesses to support increases in active participation in recycling, composting and waste minimisation activities
- work to improve the range and quality of recycled materials and products available and help build demand for them
- a new spatial and strategic waste planning framework to reduce delays in getting planning permission for waste facilities
- long-term strategies to improve data and research for all waste streams
- new hazardous waste regulations to promote greater hazardous waste minimisation at source
- setting up the Aggregates Levy, which has been an important tool in reducing demand for virgin aggregates, encouraging the use of recycled materials and addressing the environmental costs associated with quarrying (e.g. noise, dust and visual intrusion)

The Appendix sets out the key waste targets which constitute an important part of the framework within which the Review operates. These include:

- reduction of biodegradable municipal waste to landfill;
- recovery of value from increasing proportions of municipal waste;
- recycling or composting of increasing proportions of household waste;
- reduction of amount of commercial and industrial waste sent to landfill;
- increased recovery of packaging and increased recycling of specific packaging materials.

The Appendix also illustrates progress towards these targets over recent years. Graphs and explanatory text are provided to give some background and show recent trends. In most cases the charts illustrate the position pre- and post-WS 2000. Most of this underlying data will form part of the environmental baseline for the SEA.

The review of WS 2000

This Review provides an opportunity to reflect on recent progress, evaluate existing policies and delivery mechanisms, and place England's waste strategy firmly within the Government's new sustainable development strategy and its evolving policy on sustainable consumption and production.

The Government intends to publish the Progress Report by the end of the year for public consultation. Subject to the outcome of this consultation, the Government intends to publish a revised waste strategy for England in summer 2006. This will set out the Government's vision and strategic direction on waste for the next 15 to 20 years, as well as the policies and actions to deliver the strategy.

3. OUTLINE OF THE PROPOSED PROGRESS REPORT

The policy proposals currently being considered for inclusion in the Progress Report (and set out below) are subject to change prior to public consultation due, for example, to consultation responses to this Scoping Report, the SEA itself and further comments from key stakeholders. The proposals are likely to cover policy areas which will include:

- a clearer long-term vision for waste and resource management;
- an optimised framework of targets for recycling and composting;
- ensuring a modernized land use planning regime enables better waste management; and
- the use of economic and other incentives to drive businesses and consumers to manage their waste and resources more sustainably.

The policy proposals in the Progress Report – relationship with SEA

The Progress Report will set out a series of policy proposals intended to deliver outcomes with respect to the objectives set out on pages 12 to 13 below. The Environmental Report will identify, describe and evaluate the likely significant effects on the environment of implementing the plan or programme and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme[30]. It will therefore consider the environmental implications of the outcomes proposed in the Progress Report and various alternative means of achieving those outcomes. For example, the Progress Report will consider the impact of diverting waste from landfill (an outcome) and there will be several means of achieving this outcome, such as through waste prevention, recycling, energy from waste, etc. Many, possibly most, of these policy proposals will be relatively high-level and strategic and thus assessment of environmental impacts is likely also to be relatively 'high-level'.

[30] This requirement is contained in Regulation 12(2) of the Regulations.

Outline of policy proposals in the Progress Report

Of the draft policy proposals currently being considered the following may affect the environmental impacts of delivered outcomes and are therefore relevant to the environmental assessment:

National targets – on waste reduction, recycling, composting and landfill reduction. The Progress Report will review progress towards targets currently in place, such as those arising from EC legislation and WS 2000. It is likely to raise the issue of the desirability of certain further targets for England for the following waste streams: household; commercial and industrial; construction and demolition and hazardous waste. For example, views will be invited on higher recycling targets for household waste.

If targets are felt by stakeholders to be desirable, issues include, on whom the targets should be imposed, what waste streams and products should be covered and what levels of target might be imposed. Targets will affect the amounts of waste produced and the recovery and disposal methods used.

Greater role for local authorities in relation to non-municipal waste streams – there are potential efficiency benefits from a more integrated approach to treatment of municipal and non-municipal waste, as exists in some EU Member States. A clear framework would be required to realise these benefits. Options include extending the role of local authorities in relation to strategic planning for all wastes, extending municipal waste services and facilities to other businesses or providing an extended service to more businesses.

Changes to local authority governance and funding – Local authority governance and funding is an important issue for waste management but any changes must be in line with development of local government strategy by the Office of the Deputy Prime Minister and HM Treasury's spending review. Changes could affect the nature and scale of waste management services and facilities with implications for efficiency and perhaps transport. The Progress Report is likely to invite views on some of these issues but final decisions are likely to be beyond publication of the revised strategy in 2006.

Tackling waste impacts higher up the production chain – new measures are required to place greater emphasis on waste prevention in the earlier stages of product life and in production processes and to move towards more sustainable consumption patterns. The aims are to reduce the amount of waste produced and to change the composition of products and waste to take out environmental impacts.

Waste prevention and minimization, being positioned at the top of the waste management hierarchy bring great environmental benefits and the Government is keen to encourage this as part of the push towards sustainable consumption and production. The Progress Report is likely to suggest more emphasis in policy on how to 'design out' waste in product design, how to reduce waste in manufacturing and service processes and how to treat waste more actively as a resource available as a substitute for new products or product components.

Extending producer responsibility measures – in line with the polluter pays principle, the producer has responsibility for helping deliver to improved

environmental outcome for waste. Producers take on responsibility for recycling and recovery and are incentivised to reduce waste. There is already in place a mix of legislation, e.g. Directives on Waste Electrical and Electronic Equipment, End of Life Vehicles, Batteries and Packaging, and voluntary agreements, such as for newsprint. The Progress Report will consider whether more use should be made of producer responsibility and, if so, what approaches should be used (e.g. voluntary or statutory) and what products or sectors should be considered.

Extending sectoral approaches – the Progress Report will seek views on whether there is merit in increasing the emphasis on tackling commercial and industrial waste issues from a sectoral viewpoint.

As mentioned above, certain sectors are already subject to producer responsibility legislation. The Environment Agency is also developing plans with key regulated industries for voluntary performance targets on key environmental indicators, including waste disposal. The Progress Report is likely to consider whether this approach should be extended, with a role for more sectoral targets, such as on sectors with the greatest environmental impact from hazardous waste.

Future local authority targets – the Progress Report will consider whether statutory targets for local authorities should be set to assist the process of delivering national targets for England. Only to the extent that they affect the way local authorities contribute to delivering national targets would these be expected to have separate or additional environmental impacts.

Clarifying role of energy from waste and residual waste management technologies – England is required to make substantial reductions in the amount of biodegradable municipal waste which is landfilled. The Review will need to consider whether, even after greater efforts on waste reduction, recycling and composting, it would be desirable to increase the amount of waste sent for energy recovery. If so, issues include the number and type of facilities needed.

Landfill is not, in many respects, a desirable environmental outcome. However, greater use of energy from waste (with correspondingly less waste landfilled) might increase emissions to air, for example. Concerns are frequently expressed about public health effects.

Collection of hazardous household waste – it is recognised that more needs to be done to prevent, recycle and recover a greater proportion of hazardous waste, whether from commercial and industrial sources or from householders. Although hazardous waste is a small proportion of all household waste, as increasing volumes of non-hazardous waste are collected for recycling there may be an increasing concentration of hazardous substances in the remaining wastes. There are likely to be environmental benefits from separate collection and treatment of such wastes.

The Progress Report is likely seek views on whether measures should be taken to achieve greater separate collection of household hazardous waste, and, if so, the options and mechanisms for collection arrangements.

Transfrontier shipments of waste – there are two issues here: (1) export of waste from the UK for recycling and (2) import and export of waste for disposal.

Increasing amounts of waste materials for recycling are exported from the UK to Europe, OECD countries and developing countries such as China and India as part of the changing pattern of international production and trade. The Progress Report is likely to consider the desirability of this for social, economic or environmental reasons and how this should be managed.

The UK is bound by new EU legislation on transfrontier shipments and will be developing a new import/export plan next year within this context.

Stimulation of markets for recyclates and procurement of more sustainable products and services – Good progress is already being made by WRAP to promote and encourage markets for recyclates. The Progress Report will assess progress here and consider how market functioning could be improved further.

The Government's Sustainable Procurement Task Force is charged with drawing up an action plan by April 2006 to bring about a step-change in sustainable public procurement. A key aim of the action plan is to avoid adverse environmental impacts arising on the government estate and in the supply-chain. The application of product criteria for sustainable procurement is an issue which will be considered by the Progress Report.

Strengthened enforcement – the Progress Report will consider whether, and how, enforcement powers should be strengthened, particularly in relation to waste crime and fly-tipping. Clearly, as policies bite harder on reducing landfill, so the incentive for waste crime may grow and the revised waste strategy needs to tackle this issue. It is important that new measures to promote better waste management do not result in increased fly-tipping which would affect landscapes and flora and fauna, for example.

4. STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE REVIEW

In September 2005 the Office of the Deputy Prime Minister published the final version of its *Practical Guide to the Strategic Environmental Assessment Directive*[31]. It is intended to carry out this SEA in compliance with the SEA Directive[32] (the 'Directive'), and the Regulations and it will follow the ODPM's Practical Guide wherever practicable.

The Environmental Report is required to assess the "likely significant effects on the environment, including short, medium, and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects, on issues suggested in Annex 1 of the Directive and in Schedule 2 of the Regulations. It is required to assess the policy proposals, the 'business as usual' and reasonable

[31] Available from the ODPM's website at http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_041102.pdf

[32] Directive 2001/42/EC of the European Parliament and of the Council on the assessment of the effects of certain plans and programmes on the environment

alternatives taking into account the objectives and geographical scope of the Review.

As regards level of detail, the following extracts from the ODPM's Practical Guide are relevant:

- "Environmental assessment need not be done in any more detail, or using any more resources, than is useful for its purpose. It should focus on the significant environmental effects of the plan or programme, ensuring that reasonable alternatives that take into account the objectives and the geographical scope of the plan or programme are considered. It is desirable to provide sufficient commentary to justify the conclusions arrived at, with reference to the baseline information wherever possible" (paragraph 2.22);

- "It is not usually appropriate in SEA, and is often impracticable, to predict the effects of an individual proposal in the degree of detail that would normally be required for an EIA (environmental impact assessment) of a project" (paragraph 2.24).

The comparison with EIA is valid. The Review is high-level and strategic and therefore does not propose development or type of land use for particular areas or sites.

Defra will use indicators as are relevant and appropriate for the purposes of the assessment. Waste data is improving but the scope and depth of available waste data is still deficient in some respects[33]. Defra will have to conduct its assessment within these constraints. Key data sources are outlined at the end of section 5 below. Defra has a range of models which may be used to interrogate data and to assess future trends. These will be made available as appropriate to assist the assessment. All underlying assumptions will be set out in the Environmental Report.

Defra is commissioning consultants to provide technical assessment expertise as part of the process of undertaking the environmental assessment.

5. SEA BASELINE, OBJECTIVES AND INDICATORS

Environmental issues

The Environmental Report aims to include any relevant existing environmental problems and, where possible, to support their inclusion by evidence in the form of baseline information. Identifying environmental problems, in consultation with the Consultation Bodies and others, is an opportunity to define key issues and refine the SEA objectives.

[33] Defra recognises that a lack of information on specific waste streams, their growth rates, composition life cycles and impact is hampering the development of an effective waste strategy for household and other waste streams, and the ability to measure and monitor progress effectively. It is putting in place a new national Waste Data Strategy to address this. The Progress Report is likely to include recommendations for improving collection of waste data. At the present time, however, the environmental assessment can only be undertaken with the data available.

The consumption, production and disposal of goods and services give rise to a number of environmental impacts throughout their lifecycle. The purpose of Government policy is to mitigate any adverse impacts as far as possible.

Very broadly, the environmental issues associated with waste are:

- Global impacts: resource depletion, emissions to air - including greenhouse gas impacts, ozone depletion and biodiversity.

- Local impacts: emissions to land and water, acidification, landtake, landscape and visual intrusion and environmental crime.

Question 1 – Are there any specific **environmental issues related to waste** that have not been included in this Scoping Report, and which you consider to be significant? If so, please give details.

SEA objectives

SEA objectives provide a methodological yardstick against which to assess the environmental impacts of the Review and reasonable alternatives taking into account the objectives of the Review. They help identify potential synergies or inconsistencies between the objectives of the plan or programme and the SEA objectives.

SEA objectives will be revised as baseline information is collected and environmental problems identified. The development of SEA objectives and indicators and the collection of baseline information inform each other. The SEA objectives set out below are suggestions for the Consultation Bodies' comments. Following receipt of these comments and those of other stakeholders, the objectives will be reviewed in the light of baseline information and any fresh problems identified.

We propose for examination in the table set out on pages 14-17 below a set of SEA objectives that reflect the environmental issues set out above.

Question 2 – Do you agree that an **appropriate set of SEA objectives** is suggested upon which to assess the likely significant effects on the environment of the proposals to be considered in the Progress Report? If not, please give reasons and describe any alternative or additional objectives you consider to be appropriate.

The table below also presents a suggested set of indicators which provide a quantitative or qualitative measure of the impact of the proposals being considered against each objective.

Relationship with other plans and programmes

This section is devoted to ensuring that plans and programmes relevant to the waste strategy have been recognised, and that there are no unwarranted overlaps with, or omissions from, them.

Relevant plans or programmes include the Kyoto Protocol on climate change, EU Framework Directives on Waste and Water, the UK's framework for sustainable consumption and production set out in Changing Patterns, the UK Biodiversity Action Plan, the Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working together for clean air, amongst others.

All these are orchestrated and subsumed within the new sustainable development strategy for the UK, *Securing the future*[34], the UK's revised and updated sustainable development strategy, which was published in March 2005. Therefore, when considering the derivation of the SEA objectives contained in this Scoping Report, *Securing the future* was used as the foundation, rather than the individual initiatives mentioned above. The principal aims and objectives of *Securing the future* are set out below.

Securing the future includes the four central aims of the 1999 sustainable development strategy which were:

- Social progress which recognises the needs of everyone;
- Effective protection of the environment;
- Prudent use of natural resources, and
- Maintenance of high and stable levels of economic growth and employment.

Securing the future set out four agreed priorities for immediate action:

- Sustainable consumption and production;
- Climate change and energy;
- Natural resource protection and environmental enhancement;
- Sustainable communities.

These fit with the three central aims of WS 2000 which were that:

- changing the way we manage waste and resources can make an important contribution to improving our quality of life;
- we need to tackle the amount of waste produced, breaking the link between economic growth and increased waste; and,
- where waste is produced, we must put it to good use, through re-use, recycling, composting and recovering energy.

The Review will also help ensure that England's waste policy sits within the broader context of action at the EU level on sustainable development. The Review will take account, in particular, of the European Commission's

[34] 'Securing the future – delivering UK sustainable development strategy', HM Government, March 2005, available at http://www.sustainable-development.gov.uk/publications/uk-strategy/uk-strategy-2005.htm. Securing the future builds on the 1999 strategy A better quality of life (which was the strategy on which WS 2000 was based).

forthcoming Thematic Strategies on Waste Prevention and Recycling and on Sustainable Use and Management of Resources. These have not yet been published.

There are statutory requirements for a national waste strategy of which WS 2000 forms a part. These are contained in the Framework Directive on Waste (as amended). Also relevant are the Hazardous Waste Directive (as amended), the Packaging and Packaging Waste Directive (as amended) and the Landfill Directive (as amended). For example, the last of these requires Member States to set up a national strategy for the implementation of the reduction of biodegradable waste going to landfills.

Also relevant is the European Community Directive 92/443/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) which aims to set up an ecological network of special areas of conservation. Although *Securing the Future* refers to this and the Directive has been implemented in England through the Conservation (Natural Habitat, &c.) Regulations 1994 the relationship with waste strategy is not immediately apparent. This issue is addressed in the Scoping Report under the Environmental Objectives section “Biodiversity, flora and fauna”.

Coincident with the publication of *Securing the Future,* ODPM published its Minerals Policy Statement 2 (Controlling and mitigating the environmental Effects of Mineral Extraction in England). This sets out the policies and considerations in relation to the environmental effects of minerals extraction that the Government expects Mineral Planning Authorities (MPAs) in England to follow when preparing development plans and in considering applications for minerals development. MPAs are expected to incorporate the objectives of sustainable development in minerals planning, recognising the potential conflict between the exploitation of resources and environmental aims. In order to reconcile such conflicts, MPAs will aim (amongst other things) to minimise production of waste and to encourage efficient use of materials, including appropriate use of high-quality materials, and recycling of waste. Thus the general tenets of WS 2000 and the envisaged Progress Report are in harmony with this and there is no need to consider this initiative further.

SUGGESTED SEA OBJECTIVES	SUGGESTED INDICATORS
Biodiversity, flora and fauna	
Where practicable to maintain and enhance biodiversity	Percentage of waste management sites with a Local Biodiversity Action Plan in place (Source – Green Alliance corporate indicators for the waste sector) Percentage of sites with registered Environmental Management Systems (Source – Green Alliance corporate indicators for the waste sector)
Population and human health	
Protect human health and where practicable enhance local environmental conditions Reduce and prevent crime Decrease noise and general nuisance	Percentage of sites with Environment Agency discharge authorisations which exceeded the limits set in the previous year (Source – Environment Agency) The total number of incidents of fly-tipping cleared or investigated during the previous year, in each local authority area (Source – *Flycapture* database developed by Defra, Environment Agency, Welsh Assembly Government and English and Welsh Local Government Associations) Number of complaints received divided by the number of waste management sites (Source – Green Alliance corporate indicators for the waste sector)
Water and soil	
Limit water pollution to levels that do not damage natural systems Reduce contamination, and safeguard soil quality and quantity	Serious [waste-related] pollution incidents affecting water, air or land: 2004 (EIYP, 2005, page 12; source – Environment Agency) Exceedences of environmental quality standards for mercury and cadmium in water 1995 to 2002 (Source – Environment Agency)
Air	
Limit air pollution to levels that do not damage natural systems	Serious [waste-related] pollution incidents affecting water, air or land: 2004 (EIYP, 2005, page 12; source – Environment Agency)

	Emissions of air pollutants - NH_3, NO_x, PM_{10} and SO_2 emissions and GDP, 1990 –2003 (SDIP, 2005, page 50; source – Environment Agency, netcen, ONS) Annual concentrations of dioxins in air: 1991 to [2003] (Source – Netcen) Air quality and health - (a) annual levels of particles and ozone, 1990-2004 and (b) days when air pollution is moderate or higher, 1990-2004 (SDIP, 2005, page 82; source – Defra, netcen)
Climatic factors	
Reduce greenhouse gas emissions Disposal of waste as close to source as practicable	Greenhouse gas emissions – Kyoto target and CO_2 emissions, 1990 to 2012 (SDIP, 2005, page 19; source – Defra, DTI, netcen) Carbon dioxide emissions by end user – CO_2 emissions from industry, domestic, transport sectors (excluding international aviation and shipping), 1990 to 2003 (SDIP, 2005, page 20; source –netcen) Methane emissions, by source: 1970-2003 (EIYP, 2005, page 22; source – netcen) Electricity generated by renewable sources: 1998-2004 (EIYP, 2005, page 60; source – DTI Total greenhouse gas emissions divided by total waste handled (Source – Green Alliance corporate indicators for the waste sector) Fuel used divided by miles travelled (Source – Green Alliance corporate indicators for the waste sector) Fuel used divided by number of tonnes of waste handled (Source – Green Alliance corporate indicators for the waste sector)
Resource depletion and utilisation	
Enhance measures to close	Resource use – domestic material consumption and GDP, 1990-2004 (SDIP,

the loop in the way we use resources i.e. minimise waste, then re-use or recover it through recycling, composting or energy recovery	2005, page 30; source – ONS; and SCP 2005, Indicator 1) Estimated total annual waste arisings , by sector (EIYP, 2005, page 43; source – Defra, Environment Agency, Water UK) Waste arisings by sector and by disposal 1998/99-2002/03 (SDIP, 2005, pp 34 and 35; source – Defra, Environment Agency, ODPM) Industrial and commercial waste arisings and management: 1998/99-2002/03 (EIYP, 2005, page 47; source – Environment Agency) Methods of commercial and industrial waste disposal by sector: 1998/99 and 2002/03 [Insert source] Industrial and commercial waste production, by business sector: 2002-03 [Insert source] Management of construction and demolition waste arisings in England, 1999 to 2003 [Insert source] Amounts of secondary/recycled aggregates used compared with virgin aggregates: 1989 to [2001] [Insert source] Household waste per person (a) arisings (b) recycled or composted, 1991/92-2003/04 (SDIP, 2005, page 36; source – Defra, EH, SEPA, WAG) Municipal waste management in England: 1998/99 to 2003/04 (recycled/composted, other, landfill, incineration with energy from waste) [Insert source] Household final consumption expenditure and waste arising, 1990 to 2003 (SCP, 2005, Indicator 9; source – ONS, Defra) Household waste recycling, by material: 1996/97-2003/04 (EIYP, 2005, page 46; source – Defra) Materials recycling (for specified materials – eg paper), 1984 to 2003(Source – Defra, industry bodies)

	Hazardous waste arisings: 1986/87 to 2003 [Insert source] Hazardous waste managed in England, 1998/99 to 2003 [Insert source] Hazardous waste methods of disposal, 2003 [Insert source] Construction output and extraction of construction materials, 1990-2003 (SDIP, 2005, page 31; source – ONS) Environmental protection expenditure by private industry: 2003 (EIYP, 2005, page 65; source – Defra) Environmental protection expenditure by the public sector: 2003 (EIYP, 2005, page 66; source – Defra)
Cultural heritage, including architectural and archaeological heritage, and landscape	
To avoid damage to, and wherever practicable enhance, historic buildings, archaeological sites and other culturally important features. To avoid damage to, and wherever practicable enhance, designated landscape features (e.g. AONB's and National Parks)	Proportion of sites which have taken steps to identify their relationship with historic buildings, archaeological sites and other culturally important features (Source – heritage bodies) Proportion of sites which have implemented (voluntary) Conservation Management Plans (Source – heritage bodies) Local environmental quality, 2001/02-2003/04 (SDIP, 2005, page 80; source – Defra, ENCAMS)

Indicators

An aspirational list of suggested indicators is set out in the table above. At this stage, it is considered that these indicators are potentially of relevance to the environmental assessment. The aim (following Environment Agency guidance) is to reduce this list to a manageable, strategic set of 15 to 20 indicators and the views of the Consultation Bodies are sought here. In particular, it will probably not be feasible or desirable to use all of the 'resource depletion and utilisation' indicators which include many measurements of amounts of waste arisings and recovery/disposal methods.

Choice of indicators depends on their ability to collect baseline data to examine the current and future status of the SEA objectives. The firm choice of indicators on which the assessment shall be based has not yet been made and cannot be made prior to final collation of the baseline data. It will be necessary to investigate how these indicators are constructed, what data underlies them and how reliable they are; and to determine what quantitative or qualitative information is available to estimate how these indicators are likely to be affected by the Review. The choice of indicators and associated baseline data will evolve as the policy proposals and SEA develop.

Question 3 – Please give your views on **which indicators** (given the objective of developing a set of 15-20 indicators) **are the most relevant and reliable** for the purpose of assessing the likely significant effects on the environment of the proposals (and reasonable alternatives) to be considered in the Progress Report.

Question 4 – **Are there additional or alternative indicators** you consider to be appropriate? (If possible, please provide us with guidance on how these additional/alternative indicators could be used to predict the likely significant effects on the environment.)

The indicators suggested are taken principally from the following published Government indicator sets*:*

Securing the future[35] introduced a new set of sustainable development indicators, more focussed on outcomes. It outlines 68 indicators, including a core set of 20 "UK Framework Indicators" These are set out in *Sustainable Development Indicators in your Pocket 2005* ("SDIP")[36].

Certain additional indicators relevant to waste are included in *The Environment in Your Pocket 2005*, the ninth edition of Defra's annual booklet of key environmental statistics ("EIYP, 2005").

In June 2005 Defra and National Statistics Office published *Sustainable Consumption and Production Indicators: a revised basked of decoupling indicators* ("SCP 2005"*)*. This basket of indicators

[35] See section 2 above.

[36] Sustainable Development Indicators in your Pocket 2005, Defra – seehttp://www.sustainable-development.gov.uk/performance/sdiyp.htm

monitors the decoupling between resource use and environmental degradation.

In addition to these Government indicator sets, other datasets on environmental quality and quality of life are produced by Defra and other sources such as the Environment Agency. Some of these are relevant, such as in relation to hazardous waste arisings. Other suggested indicators are taken from the set of indicators for the waste management industry developed by Green Alliance in consultation with the industry.

Many of the suggested indicators should be treated with caution, for reasons such as differences between data sets, insufficient data over time to produce a reliable trend and simply the nature of what the data measures.

Baseline information

Baseline data provides the basis for predicting likely significant environmental effects, and helps identify current and future environmental problems. It also assists in the process of setting meaningful environmental objectives, targets and indicators for use in the SEA process (and in subsequent monitoring of the effectiveness of the waste strategy).

Key data sources which will be used to establish the environmental baseline include the following:

- Defra's survey of Municipal Waste Management 1998/99 - 2003/04 (to be replaced by the more comprehensive *WasteDataFlow* database from 2005-06, which will be quarterly).
- Environment Agency surveys of industrial and commercial waste, 1998/99 and 2002/03.
- Hazardous waste data compiled by the Environment Agency as part of their regulatory function.
- OPDM construction and demolition waste surveys for 1999, 2001 and 2003.
- ONS Environmental Accounts and ONS material use estimates compiled from Material Flow Accounts.
- National Atmospheric Emissions Inventory
- Environment Agency Pollution Inventory

We would be grateful if you could provide any information (additional to that listed above) which could assist in establishing the baseline and predicting likely significant effects on the environment.

Question 5 – Are you aware of any data additional to that listed out above which would be of assistance in establishing the current environmental baseline and the future environmental impact of the proposals to be contained in the Environmental Report? If so, please provide this data, or a data reference, and

any suggestions you have for applying it to the environmental assessment.

Question 6 – Additionally, are you aware of data sources and modeling approaches that could be used to assess the waste-specific impacts on the baseline and chosen indicators?

6. THE ENVIRONMENTAL REPORT – PROPOSED STRUCTURE

The Environmental Report will contain the information required under Annex I of the Directive[37].

The form of the environmental report has not yet been defined but it is likely that the content will be structured under a number of key headings:

- Non-technical summary: succinct summary of the SEA process in this context and the likely significant effects on the environment;
- Introduction: that explains the background to and the purpose of the environmental report, including the objectives of the Review and outline of the proposed Progress Report;
- Assessment methodology: that describes the approach adopted in the SEA, including any difficulties encountered (e.g. lack of data);
- Baseline and environmental objectives: including a description of the relevant environmental objectives, the SEA objectives targets and indicators and collation of the baseline data;
- Consideration of alternatives: providing an overview of the reasonable alternative approaches considered;
- Assessment of environmental effects: the assessment of the likely significant effects on the environment of the proposals and alternatives considered, and including any proposed mitigation measures;
- Monitoring arrangements required.
- Summary: that identifies the main environmental effects of the proposals and alternatives considered.

[37] See Figure 1 on page 10 of the ODPM Practical Guide which sets out the information required in the Environmental Report.

APPENDIX G - STATUTORY CONSULTEE RESPONSES TO THE SCOPING REPORT

A Scoping Report was written to seek the views of the relevant English Consultation Bodies. These bodies are the Countryside Agency, English Heritage, English Nature and the Environment Agency. Responses were received from the Countryside Agency and the Environment Agency, and these are documented in Table G.1, together with a commentary as to how the individual comments were dealt with in the assessment.

Table G.1: Summary of responses from the Statutory Consultees to the Scoping Report and commentary on how they were dealt with.

Precis of comment	Response
Responses from the Countryside Agency	
Include clear baseline data on landscape designations, etc., and identify the location of current and future waste sites to them.	√ Reference included in baseline to AONBs, World Heritage Sites and Conservation Areas. **?** Further work post-SEA needed to identify relative location of facilities, but data are available from CA/EA/Magic GIS datasets, and from EA REGIS database of sites (which includes closed sites).
Include Heritage Coasts as designated sites and ideally other assets such as Heritage Trails.	√ Reference to heritage Coasts included in the baseline and recognised that desirable to site waste infrastructure away from these areas. **?** Others are not being considered at this stage, however the assessment assumes local authorities will consider impacts on such sites in proportion to their importance when reviewing applications for new waste sites and with a view to avoiding or limiting the impacts of new facilities on them.
Discuss impacts of WSR on these areas and in future areas in respect of landscape, access and recreation.	√ Impacts will be reviewed qualitatively, but the effect 'on the ground' will depend on planning decisions taken by LPA/LWPA bodies. However a presumption in favour of avoiding designated areas underlies the assessment.
Identify the cumulative environmental effects of WSR and changes it proposes.	√ Essential (and obligatory) aspect of the analysis – see Section 6 of the Environmental Report.
Include indicators that can monitor the likely impacts on landscape, access and recreation.	√ The CA response acknowledges the difficulties of assessing some of these impacts, and that their localised nature means that responsibility lies primarily with local authorities. Nevertheless, an indicator monitoring the number of sites lying within landscape quality designations has been included in the proposed indicator list (see Table 4.1 in Chapter 4 and monitoring proposals in Section 8).

The CA response also identified a range of Internet-based data sources which would help in preparing the baseline dataset.	√ Several of the recommended sources were used and are documented in the main baseline dataset again relevant maps and statistics.
Responses from English Heritage	
Comments have been received verbally. Importantly English Heritage believe that the majority of impacts with the potential to arise from adoption of the proposed strategy will occur at a local level and the best mitigation measures will be via planning controls.	√ Defra recognise that English Heritage is the Government's statutory advisor with responsibility for protecting and promoting all aspects of the historic environment in England, including buildings, monuments landscapes and archaeological remains. The assessment has therefore had due regard for this part of the environment and has taken into account the importance of areas designated for their historic significance.
Responses from English Nature	
Planning Controls. The influence of the planning system starts with Regional Spatial planning (Regional Spatial Strategies) and Local Development Frameworks, or their equivalents, and these are critical in planning for waste facilities on a regional and local basis. Good practice in waste management planning, in development control are to be encouraged. PPS10 is a key factor in this and should be referred to directly in order to provide consistent and cross-cutting guidance. "Environmental Quality in Spatial Planning", produced by CA, EH, EN and EA, is also a key document.	√ Planning Policy Statement 10 (PPS 10) is acknowledged as being a key driver in helping deliver sustainable waste management and is referred to throughout the Environmental Report. "Environmental Quality in Spatial Planning" has also been reviewed as part of the background in conducting this SEA.
Principal EU Directives - should include Water Framework Directive, as this is important with regard to water quality.	√ This had already been reviewed as part of the SEA process but it is now explicitly referred to.
Biodiversity, flora and fauna – geodiversity should also be included.	√ Agreed, and changes made. Defra recognises the potential for such facilities as landfill sites to impact upon geodiversity without effective planning control. This is now reflected

	throughout the Environment Report. Local Geodiversity Action Plans and Company GAPs are also now mentioned where relevant.
Pollution is a significant issue in SSSI management more widely (see "England's best wildlife and geological sites: the condition of SSSIs in England in 2003", available via EN website (under publications). Waste management, particularly landfill, can have direct impact on geological SSSIs.	√ From the consultation reply Defra now understand that EA and EN are examining pollution issues with regard to designated sites. An indicator for 'land taken by waste infrastructure within vicinity of designated sites' was considered but felt not to be necessary or appropriate in view of existing controls.
Primary impacts on designated sites may be site specific, but the issues are national ones, eg impacts of pollution on SSSIs	√ Many of the potential effects of the proposed programme could be felt at a local level. The authors have been aware of this throughout and have sought to look at the synergistic and cumulative effects of potential local impacts aggregated across the whole country.
Ensure addition of the spatial planning process as a essential first stage in controlling development of waste management facilities & minimising their potential environmental impacts. RSS's and LDFs are critical in assessing regional need for waste management facilities and assigning potential locations.	√ The response above under the comment on “Planning Controls” applies.
Various more detailed comments on Table 8.1	√ These have been incorporated
Regarding, water quality, soil resource and land contamination. It may be worth mentioning that landfill in particular, but also potentially other forms of waste management, can have long term impacts on water, soil and land quality. These are critical factors to be taken into account when considering environmental assessment as, with landfill, the concern lasts for decades. More research needs to be done on the long term efficacy of landfill liner systems, and also on potential long term impacts of other waste	√ This point is well made and was recognised in the assessment process though not explicitly. √ Regarding research requirements Defra have included these items in their research programme, and the EA is also undertaking work in this area.

management systems.	
Responses from the Environment Agency	
Consider local impacts on groundwater, land contamination (from landfill and hazardous wastes), health impacts and traffic impacts.	√ Potential impacts based on recent incident rates are included in the baseline dataset and as a qualitative input to assessing the likely impact of infrastructure growth scenarios which vary the number and type of facilities added. **?** Health impacts are reviewed in the baseline and are also a qualitative component of the assessment. It is not possible to do more on this as the existing reviews provide little clear, conclusive evidence of a relationship between waste facilities and health impacts on those living close to waste sites.
Revise biodiversity objective to "maintain and enhance" and remove proviso that this is "where practicable"	√ Enhancement and restoration included in a revised objective. **X** However it would be impractical to require enhancement in all circumstances and this change is not accepted. It is assumed such benefits would be sought through the local planning system under the combined effect of PPS9, PPS10 and S.106 agreements.
Revise objective 3 to refer to waste crime specifically, and to fly-tipping	√ The objective was revised accordingly. √ There is currently no data to link fly-tipping to specific types of infrastructure. However available data is included in the baseline and the assessment will consider the likely effect of infrastructure and instruments on fly- tipping if it appears likely that a particular scenario would constrain landfill while making other treatment options too expensive, too remote, or otherwise unattractive.
Water pollution should be "prevented" and also refer to preventing construction in floodplains	√ First change has been made. **X** Development avoiding floodplains is implicit and would be addressed through application of PPS25 principles in planning decisions rather than through the Strategy.
Air pollution should be prevented or minimised, and human health impacts should be avoided	√ Minimisation taken as implicit, though would be implemented by the PPC regime. Other changes actioned in revised objective.
Objective to "*introduce energy efficient options in new industrial development*"	**X** It is implicit that England's waste strategy embraces the principles of the UK Sustainable Development agenda in relation to sustainable construction. Moreover the impact assessment considers the contribution of the waste sector to generation of energy from reused materials (i.e. EfW).
Prefer an indicator monitoring the preparation	√ Both are retained but as provisional indicators for consultation only which would need further

of LBAPs for sites rather than EMSs (the former being preferable)	discussion and consideration by stakeholders – see Section 8 of the Environmental Report.
Focus on incidents affecting water and soil rather than air, and identify facilities at risk from flooding	√ Incidents have been split out separately into those affecting water, land and air. However the EA's pollution data shows that waste activities are the principal attributed source of pollution incidents to air and it appears prudent to continue to treat events affecting all three media with equal weight. **X** The requirement for flood assessment is noted but it is not possible to include it in the SEA, and it is not clear what plans could be implemented to close and/or relocate any existing infrastructure in medium/high risk (<100 year event) areas.
Limit to emissions of air pollutants from waste management facilities rather than from air pollutants generally	√ Baseline research identifies difficulties in attaching clear links between specific pollutants and waste activities, but levels of dust, dioxins and mercury are included in the indicator table.
Ensure there is a clear link between waste management activities and climatic factors	√ The baseline identifies trends in GHGs, and specifically CO_2 and methane, and the extent to which these can be attributed to waste activities. The impact assessment includes estimates of the emissions of both gases by different types of treatment facility, and vehicle movements are used as a means of estimating the relative levels of traffic-related contribution to CO_2. Baseline research also considered other less significant greenhouse gases.
Reduce the number of resource depletion and utilisation indicators, using EA advice as necessary.	√ This section of the baseline / indicator set has been reduced considerably, focusing: on a small number of 'headline' parameters; arisings recycling and disposal of the main waste streams; and on trends in aggregate use (virgin and secondary materials).
It may be difficult to link local environmental quality indicators to waste sites.	**?** Acknowledged, but at least one indicator is desirable as this impact topic is included in Annex 1 of the SEA Directive. Further discussion would be needed with English Heritage and the Countryside Agency, in conjunction with other stakeholders, to develop or adapt indicators on heritage impact and landscape impacts respectively. See section 8 of the Environmental Report for details.
EA provided an extensive list of data sources of potential use in compiling the baseline dataset, and potentially of use in impact assessments.	√ Use of these sources is acknowledged in the main SEA report and the appended baseline document, and Defra and the consultant thank the EA and its staff for their assistance.

Mix qualitative and quantitative methods in the impact assessment as per ODPM guidance on SEA	√ Agreed – see section 6 of the Environmental Report
Scoping Report does not describe details of the likely alternatives to be considered	√ A description of the reasonable alternatives selected, and the reasons for doing so, is included in the Environmental Report.
Review of other plans / programmes should include the Water Framework Directive, Defra's "Making Space for Water" and PPS25 on Development and Flood Risk.	√ The Water Framework Directive was incorporated in the context review. The context review includes PPG25 to ensure that the key planning requirements and overarching objectives are identified. The consultation period for PPS25 ends in February 2006.
No reference is made to a review of other plans and programmes and how this will be presented in the report.	√ Acknowledged, and the main report makes good this requirement (see Chapter 3 and Appendix E).