

Defra

Updated Impact Assessment of the Industrial Emissions Directive (IED)

Final Report



AMEC Environment & Infrastructure UK Limited

27 January 2012

Copyright and Non-Disclosure Notice

The contents and layout of this report are subject to copyright owned by AMEC (©AMEC Environment & Infrastructure UK Limited 2012), save to the extent that copyright has been legally assigned by us to another party or is used by AMEC under licence. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report.

The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of AMEC. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third-Party Disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by AMEC at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. AMEC excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Document Revisions

No.	Details	Date
1	Draft Report	16 October 2009
2	Final Report	4 January 2010
3	Updated Final Report	31 January 2011
4	Draft Final Report	02 September 2011
5	Final Report	27 January 2012

Report for

Richard Vincent, Head of Air and Environment Quality
Area 3C
Ergon House
17 Smith Square
London
SW1P 3JR

Main Contributors

Keith Lawton
Richard Noden
Rohit Mistry

Issued by

.....
Richard Noden

Approved by

.....
Keith Lawton

**AMEC Environment & Infrastructure
UK Limited**

17 Angel Gate, City Road, London EC1V 2SH,
United Kingdom
Tel +44 (0) 207 843 1400
Fax +44 (0) 207 843 1410

Doc Reg No. 28632 2001012i1

H:\Projects\28632 PPAQ Defra IED IA\C - Client\Draft Final\Other
January update\28632 Final 200112i1.doc

Defra

Updated Impact Assessment of the Industrial Emissions Directive (IED)

Final Report

AMEC Environment & Infrastructure
UK Limited

27 January 2012



Certificate No. FS 13881



Certificate No. EMS 69090

In accordance with an environmentally responsible approach,
this document is printed on recycled paper produced from 100%
post-consumer waste, or on ECF (elemental chlorine free) paper

Executive Summary

Purpose of this Report

This Regulatory Impact Assessment (RIA) report provides an updated position on the potential impacts in the UK of the Industrial Emissions (Integrated Pollution Prevention and Control) Directive (Recast) (IE(IPPC)D) (Directive 2010/75/EU). This impact assessment report, first commissioned by Defra in May 2008, has been updated to reflect new information supplied from the UK's environmental regulatory authorities and other non-departmental government bodies, trade organisations and industry enterprises. The data contained within this report has been gathered from reputable sources and in utilising the data supplied, we have, where practicable, made best endeavours to validate its accuracy. Where assumptions have been made in order to calculate costs, these have been clearly stated in the relevant sections or within appropriate footnotes.

The report sets out a revised position on the potential number of sites within the UK (either presently active or likely to be active at the scheduled implementation of the Directive) that by virtue of the changes are likely to fall within the scope of IE(IPPC)D. The report sets out the 'previous regulatory' (IPPC) position together with estimated impacts and cost ranges associated with the transition of these sites into IE(IPPC)D. Please note that the 'previous regulatory position' was referred to as the baseline in earlier versions of this report. Where it has been possible, the report highlights the environmental benefits, uncertainties and key issues foreseen by industry.

This report presents the updated impacts associated with the UK's wood preservation sector, mixed animal and vegetable processing industries, specified treatments of non-hazardous waste for recovery and independently-operated wastewater treatment plants.

An updated impact assessment has been prepared on the potential impact for the UK's large combustion plant and is presented within in a separate report.

Introduction

The Commission published its proposal and an impact assessment for a Directive on industrial emissions (Industrial Emissions Integrated Pollution Prevention and Control, IE(IPPC)D¹) on 21 December 2007. Following a series of debates a political agreement on the text was reached at the European Council². The final version of the Directive was formally adopted by the European Parliament on 7 July 2010 and published in the Official Journal on

¹ "Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast)". European Commission, Brussels, 21st December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

² <http://register.consilium.europa.eu/pdf/en/09/st11/st11885.en09.pdf>

17 December 2010³; coming into force on 7 January 2011. The timetable for implementation of the new directive is set out in the table below:

Key Dates for Implementation of Directive 2010/75/EU (IE(IPPC)D)

Date	Description
January 2013	Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with many of the IED articles (not 'other activities') (See Article 80); those measures shall apply from the same date.
January 2014	Directives 78/176/EEC, 82/883/EEC, 92/112/EEC, 1999/13/EC, 2000/76/EC and 2008/1/EC, as amended by the acts listed in Annex IX, Part A are repealed.
July 2015	The newly prescribed activities such as additional poultry installations, smaller combustion units and wood preservation activities must meet the requirements of the new Directive.
January 2016	Member States shall establish an annual inventory of the sulphur dioxide, nitrogen oxides and dust emissions and energy input of combustion plant.
January 2016	Directive 2001/80/EC as amended by the acts listed in Annex IX, Part A is repealed.
January 2016	The Commission shall submit to the European Parliament and to the Council a report reviewing the implementation of the Directive; this process is to be repeated every three years.

The revised Directive consolidates seven existing Directives related to industrial emissions into “a single clear and coherent legislative instrument” and includes a number of changes related to new and existing activities.

Defra conducted a number of assessments on the impact (IAs) to the UK of adoption of the IE(IPPC)D text across a range of industry sectors that were potentially at risk of being affected by a new Directive on industrial emissions. These IAs were published by Defra in 2008 for public consultation; the responses being used by the UK government to inform debate at a European-level on the IE(IPPC)D.

Changes to IPPC

Details on the changes are discussed within relevant introductory sections of this report, however the changes are also summarised in the following table:

³ <http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2010:334:SOM:EN:HTML>

Activity Reference	Scope of Change	IE(IPPC)D Text
5.3(b)	New activity	<p>Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, and excluding activities covered by Directive 91/271/EEC:</p> <ul style="list-style-type: none"> (i) biological treatment; (ii) pre-treatment of waste for incineration or co-incineration; (iii) treatment of slags and ashes; (iv) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components. <p>When the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for this activity shall be 100 tonnes per day¹.</p>
6.4(b)	<ul style="list-style-type: none"> (ii) text amended (iii) new activity 	<ul style="list-style-type: none"> (ii) <u>only</u> vegetable raw materials with a finished product production capacity greater than 300 tonnes per day or 600 tonnes per day where the installation operates for a period of no more than 90 consecutive days in any year; (iii) Treatment and processing, other than exclusively packaging, of the following raw materials, whether previously processed or unprocessed, intended for the production of food products for humans or animals from a mix of animal and vegetable raw materials with a finished product production capacity in tonnes per day greater than: <ul style="list-style-type: none"> • 75 if A is equal to 10 or more; • $[300 - (22.5 \times A)]$ in any other case. <p>Where 'A' is the portion of animal material (in percent) of the finished product production capacity.</p>
6.10	6.9 text amended	Preservation of wood and wood products with chemicals with a production capacity exceeding 75 m ³ per day other than exclusively treating against sapstain.
6.11	New activity	Independently operated treatment of waste water not covered by Directive 91/271/EEC and discharged by an installation covered by Chapter II.

Note 1: In January 2012, Defra clarified the interpretation of point 5.3b in annex 1 of the IE(IPPC)D in the UK with regard to water industry assets. Water industry sewage sludge treatment, using anaerobic digestion with a capacity >100 tonnes per day, where the activity is related to treatment of urban waste water or sludges thereof, will be exempt from regulation under IE(IPPC)D; these plants (of which there may be ~120) are therefore excluded from the analysis in this report.

Previous Regulatory Positions

Details on the main regulatory elements for each of the four activities are presented within the relevant sections of this report. Many of the installations that have been identified as potentially coming into the scope of the IE(IPPC)D have been identified as being regulated through one of the regimes that exist in England and Wales, Scotland and Northern Ireland. The findings indicate potentially affected installations have been regulated to date through “Part B” (air emissions only) or waste management licensing legislation. The transition into a fully integrated regulatory regime (as would be required under IE(IPPC)D), is likely to result in a requirement for these sites to take a number of measures to ensure application of Best Available Techniques (BAT). In many cases, sites are undertaking a wide range of measures to protect and enhance the environment and to mitigate the impact of their operations upon human health and the surrounding environment. Whilst it is likely that under BAT-based regulation many sites would be required to go further in a number of areas (e.g. energy efficiency, impact assessment, waste minimisation, accident control), the prevalence of business as usual measures (such as industry codes of practice and voluntary agreements on environmental protection) mean that there is a certain degree of attenuation of the impact.

Impacts

Number of Affected Installations

Activity/Sub-sector		Number of Affected Installations	
		Low	High
5.3(b) Recovery or a mix of disposal and recovery of non-hazardous waste	Water sector 'off-site' STCs	0	20
	Waste sector - composting (>75 tpd)	48	48
	Waste sector - anaerobic digestion (>100 tpd)	6	125
	Waste sector - MBT (>75 tpd)	16	16
	Treatment of slags and ashes (>75 tpd)	10	20
	Treatment of metals using shredders (>75 tpd)	62	67
6.4(b) Mixed animal and vegetable processing	Vegetable only processors (>600 tpd/90 days)	0	0
	Mixed animal and vegetable processors	20	40
6.10 Preservation of wood and wood products	-	244	244
6.11 Independently operated treatment of waste water not covered by the UWWTD	-	3	5
Totals		409	585

Costs

Where costs are presented, one-off costs (i.e. non-recurring capital costs) have been annualised using a 3.5% discount rate over a period of 20 years. The estimated costs of compliance have been made after consultation with the regulatory agencies, industry and trade organisations. The low estimates are calculated using the low estimates of administrative/compliance costs and the lower estimate of installations affected, and vice versa. A summary of the administrative and compliance costs for each sector is presented below:

Summary of administrative and compliance costs

Activity	No. Installations		Admin. costs / installation, recurring: £000 p.a.		Compliance costs / installation, recurring: £000 p.a.		Admin. costs / installation, annualised non-recurring: £000 p.a.		Compliance costs / installation annualised non-recurring: £000 p.a.		Total annual costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
5.3(b) - Water Sector Biological Treatment	0	20	£0.0	£0.9	£28.5	£165.0	£1.2	£10.8	£4.4	£9.1	£0.0	£3.7
5.3(b) - Treatment of Slags and Ashes	10	20	£0.9	£1.8	£4.0	£20.0	£1.2	£10.8	£1.6	£9.1	£0.1	£0.8
5.3(b) - Treatment of Scrap Metal with Shredders	62	67	£0.4	£0.5	£4.0	£20.0	£1.2	£10.8	£12.6	£17.9	£1.1	£3.3
5.3(b) - Waste Sector Biological Treatment (MBT, AD & Composting)	70	189	£0.9	£0.9	£4.0	£20.0	£1.2	£10.8	£1.0	£5.4	£0.5	£7.0
5.3(b) Recovery or a mix of disposal and recovery of non-hazardous waste - Total	142	296									£1.7	£14.8
6.4(b) Mixed animal and vegetable processing	20	40	£29.6	£72.7	£1.5	£1.5	£2.1	£5.6	£1.3	£4.4	£0.7	£3.4
6.10 Preservation of wood and wood products	244	244	£2.3	£6.8	£0.0	£0.0	£0.5	£0.8	£0.0	£0.0	£0.9	£2.1
6.11 Independently operated treatment of waste water not covered by the UWWTD	3	5	£3.6	£11.7	£7.0	£22.1	£1.3	£18.7	£3.8	£8.2	£0.0	£0.3
Total – All sectors	409	585									£3.4	£20.6

Note 1: All figures are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

Note 3: Our research indicated that operators will not incur additional operational costs associated with improvements to meet BAT under the requirements of IPPC.

Benefits

The application of IPPC requirements to the installations that may be affected by the change to the IPPC Directive, could potentially lead to improvements in environmental performance of the affected installations. This is attributable to the requirement under IE(IPPC)D to apply BAT⁴ and to include other environmental aspects and impacts such as: energy and resource efficiency, impact assessment and subsequent potential further measures to abate pollution, management of raw materials and implementation of formalised environmental management systems.

Within the scope of this impact assessment, the lack of suitable data on the potential emissions reductions has resulted in a position where it has not been possible to make quantitative estimations of the benefits. In qualitative terms however, the benefits foreseen as a result of the adoption of the IE(IPPC)D are:

- A reduction in emissions to the environment, notably fugitive emissions to air (including dust and odour);
- A reduction in the environmental risk associated with operational management and storage of raw materials and wastes;
- A reduction in the overall level of energy, water and resources consumed by installations affected by the IE(IPPC)D;
- A decrease in the overall volume of waste produced and potentially an increase in the level of waste recovered by the processes;
- Greater levels of characterisation and control on certain raw materials (notably biocides), which may lead to a decrease in the risk to the environment from accidental pollution and pollutant releases; and
- An increase in the level of formalised environmental management systems, which could lead to operation cost savings, greater levels of resource efficiency, continual improvement, increased and more accurate reporting on environmental performance and corporate environmental governance.

Uncertainties/Limitations

The following are considered to be the main limitations and uncertainties associated with this assessment.

- Assumptions regarding how the regulators would implement the requirements of the IE(IPPC)D. It has been assumed that the UK government will apply the IPPC Directive changes in line with current

⁴ Article 11(b) for general principles governing the obligations of the operator and Article 14 and 15, which set requirements on competent authorities to use BAT to set permit conditions, in particular emission limit values (Article 15(2)).

arrangements for IPPC. Specifically, the way in which the capacity of an installation is determined will have a significant effect on the number of installations affected;

- Uncertainties in the estimation of the number of installations potentially affected by the IE(IPPC)D. There are two factors which introduce uncertainty into estimating installation numbers, specifically:
 - Assumptions regarding industry structures;
 - A lack of data on the number of EPR-waste exemptions (for certain sectors) that may exceed the 75 tonnes per day threshold.
- Uncertainties in the costs involved for operators in compliance with the requirements of the IE(IPPC)D. Many of the stakeholders contacted as part of this assessment were unable to provide costs for the implementation of the IE(IPPC)D. Where possible, AMEC has made estimates of the potential costs based on our professional experience for undertaking such work. Costs have been presented based on those charges made in England and Wales;
- Lack of quantitative data on the benefits to the UK from the IE(IPPC)D. It was not possible to quantify or monetarise the potential benefits of implementing the IE(IPPC)D. In part this is due to the highly variable nature of the facilities covered by the proposals, but also because the main benefits are achieved by better implementation of the waste hierarchy (and so improved resource efficiency) and reduction in fugitive emissions; and
- Lack of clarity on certain definitions contained within the IE(IPPC)D, to which further regulatory interpretation may be required in order to reduce the uncertainty expressed by certain stakeholders.

Contents

1.	Introduction	1
1.1	Background to the Industrial Emissions Directive (IED)	1
1.2	What are the Objectives and Intended Effects?	2
1.3	Purpose, Scope and Structure of this Report	3
2.	Impact Assessment for Recovery, or a Mixture of Recovery and Disposal of Non-Hazardous Waste	5
2.1	Background and Definitions	5
2.2	Who is Affected?	9
2.3	Previous Regulatory Position Definition	9
2.3.1	Number of Installations	10
2.3.2	Installations Included in the Water Sector Biological Treatment	10
2.3.3	Waste Management Sector Biological Treatment	12
2.3.4	Pre-treatment for Co-incineration	13
2.3.5	Treatment of Slags and Ashes	14
2.3.6	Treatment of Scrap Metal	15
2.4	Costs	16
2.4.1	Approach - Non-Hazardous Waste Treatment for Recovery	16
2.4.2	Administrative Costs	16
2.4.3	Administrative Cost Impact Under IE(IPPC)D	18
2.4.4	Compliance Costs	20
2.5	Benefits	24
2.6	Competition Assessment	24
2.6.1	Water Sector Physico-chemical and Biological Treatment	25
2.6.2	Waste Management Sector Physico-chemical and Biological Treatment	26
2.6.3	Pre-treatment for Co-incineration	26
2.6.4	Treatment of Slags and Ashes	27
2.6.5	Treatment of Scrap Metal	28

2.7	Social Impact Assessments	28
2.7.1	Statutory Equality Duties Impact Test guidance	28
2.7.2	Health and Well-being	28
2.7.3	Human Rights	29
2.7.4	Justice	29
2.7.5	Rural Proofing	29
2.7.6	Sustainable Development	29
2.8	Limitations and Uncertainties	29
2.8.1	Main Limitations	29
2.8.2	Number of Installations	30
2.8.3	Assumptions Regarding Industry Structure	30
2.8.4	Uncertainties on Compliance Costs for Operators	31
2.8.5	Lack of Quantitative Data on Benefits	31
3.	Impact Assessment for the Treatment and Processing of Raw Materials Intended for the Production of Food or Feeds	33
3.1	Background and Definitions	33
3.2	Who is Affected?	34
3.3	Number of Installations	34
3.4	Results	38
3.5	Summary	38
3.6	Costs	39
3.6.1	Compliance Costs	39
3.6.2	Administrative Costs	40
3.6.3	Compliance Costs	44
3.7	Benefits	45
3.7.1	Approach	45
3.8	Quarterly Basis Amendment	46
3.9	Competition Assessment	46
3.10	Distributional Impacts on Different Sizes	47
3.11	Social Impact Assessments	48

3.11.1	Statutory Equality Duties Impact Test Guidance	48
3.11.2	Health and Well-being	48
3.11.3	Human Rights	48
3.11.4	Justice	48
3.11.5	Rural Proofing	49
3.11.6	Sustainable Development	49
4.	Impact Assessment for the Preservation of Wood and Wood Products	51
4.1	Background and Definitions	51
4.2	Who is Affected?	51
4.3	Previous Regulatory Position Definition	51
4.3.1	Number of Installations	51
4.4	Overview of Previous Immediately Relevant Legislation	54
4.4.1	Environmental Permitting (EP) Regulations, 2010	54
4.4.2	Solvent Emissions Directive (SED)	55
4.5	Results	56
4.6	Costs	60
4.6.1	Compliance Costs	60
4.7	Administrative Costs	61
4.8	Benefits	64
4.8.1	Emission Reductions	64
4.9	Competition Assessment	65
4.10	Distributional Effects on Different Sizes	66
4.11	Social Impact Assessments	66
4.11.1	Statutory Equality Duties Impact Test Guidance	66
4.11.2	Health and Well-being	66
4.11.3	Human Rights	66
4.11.4	Justice	67
4.11.5	Rural Proofing	67
4.11.6	Sustainable Development	67

5.	Impact Assessment on Independently Operated Waste Water Treatment	69
5.1	Background and Definitions	69
5.2	Who is Affected?	69
5.3	Previous Regulatory Position Definition	69
5.3.1	Number of Installations	69
5.3.2	Environmental Impacts	70
5.3.3	Results	71
5.4	Costs	71
5.4.1	Compliance Costs	71
5.5	Administrative Costs	73
5.6	Results	74
5.7	Benefits	76
5.7.1	Damage Cost Function	77
5.8	Competition Assessment	78
5.9	Social Impact Assessments	79
5.9.1	Statutory Equality Duties Impact Test Guidance	79
5.9.2	Health and Well-being	79
5.9.3	Human Rights	80
5.9.4	Justice	80
5.9.5	Rural Proofing	80
5.9.6	Sustainable Development	80
Table 1.1	Key Dates for Implementation of the IE(IPPC)D	2
Table 2.1	Definition of Key Terms Affecting the Scope of this Assessment	8
Table 2.2	Numbers of Water Industry Installations Involved in Biological Treatment of Waste for Recovery With a Capacity Greater Than 75 Tonnes (>100 tonnes solely for AD) Per Day	12
Table 2.3	Numbers of Installations Involved in Biological Treatment of Waste with an Estimated Capacity Greater Than 100 Tonnes Per Day for Anaerobic Digestion and 75 Tonnes Per Day for Other Means	13
Table 2.4	Number of Installations Involved in the Treatment of Scrap Metal Using Shredders with a Capacity Greater than 75 Tonnes per Day	15
Table 2.5	'Standard' and 'Fixed Condition Licences' Fees	16
Table 2.6	'Previous Regulatory Position' Administrative Costs by Element for EP-waste and Part B Permits	17
Table 2.7	Modelled Administrative Costs for Part A(1) Installations	18
Table 2.8	Administrative Costs Relative to the 'Previous Regulatory Position'	19
Table 2.9	Actions Potentially Required at Waste Treatment Installations Newly Subject to IPPC by the IE(IPPC)D	20
Table 2.10	Indicative Compliance Cost Ranges for a Waste Treatment Installation Newly Subjected to IPPC by the IE(IPPC)D	22
Table 2.11	Modelled Compliance Costs	23
Table 2.12	Benefits	24
Table 2.13	Summary of the Competition Test	25

Table 3.1	Number of Food and Drink Installations Previously Regulated Under IPPC	34
Table 3.2	Type and Number of Sites Identified That May be Affected by the Changes to the IPPC Directive	37
Table 3.3	Modelled Administrative Costs for Mixed Animal and Vegetable Sites	43
Table 3.4	Modelled Compliance Cost Ranges for Vegetable and Mixed Vegetable and Animal Processing Sites	44
Table 3.5	Environmental Benefits	45
Table 3.6	Summary of the Competition Test	47
Table 3.7	Annualised Costs (£) per Affected Installation	47
Table 4.1	Criteria for Installations Coming Under IPPC and SED in the UK	52
Table 4.2	Number of Installations in the UK and Number Potentially Affected By the Changes ⁴⁶	53
Table 4.3	VOC Emission Limits for Chemical Treatment of Timber and Wood Based Products in UK	55
Table 4.4	VOC Contained and Fugitive Emission Limits For Activities Not Using Total Emission Limit Values in UK	56
Table 4.5	Current Cost-Estimates for a Part B Permit (Per Installation)	61
Table 4.6	Current Cost-Estimate Ranges For a Part A(2) Permit (Per Installation)	62
Table 4.7	Administrative Costs	63
Table 4.8	Summary of the Competition Test	65
Table 5.1	Potential Impact of Waste Water Treatment Facilities	70
Table 5.2	Compliance Costs for a Single Installation	72
Table 5.3	Modelled Compliance Cost Ranges for an Independently Operated Wastewater Treatment Works	75
Table 5.4	Administrative Costs	76
Table 5.5	Benefits	76
Table 5.6	Summary of the Competition Test	78
Table A1	Relevant Statutory Instruments for the Treatment of Non-hazardous Waste	A1
Table A2	Categories of Regulated Sites Discussed in this Report	A2
Table A3	Main Differences Between the Regulatory and Permitting Requirements ^[1] for EPR-IPPC and EPR-waste	A4
Table A4	Standard EPR-waste Permits Relevant to the Sectors Affected by the IE(IPPC)D Proposals ^[1]	A6
Table A5	EPR-waste Exemption Thresholds for each of the Activity Types Identified in section 5.3, Annex 1 of the IE(IPPC)D	A9
Table A6	Summary and Comparison of Non-Hazardous Waste Treatment Requirements	A11
Table B1	Potential Impact of Food and Drink Industry	B1
Table B2	Environmental Performance of the Food and Drink Industry 2006	B2
Table B3	Total Releases (tonnes) from Animal, Vegetable and Food PPC Regulated Sites for 2005 and 2006	B4
Table C1	Typical Emissions from Biological Treatment of Non-hazardous Sewage and Water Treatment Sludges	C1
Table C2	Typical Emissions from Biological Treatment Facilities	C2
Table C3	Emissions from Scrap Metal Facilities	C3
Table E1	Main Types of Product Mix, Preservative Types and Quantities Used In UK	E1
Table F1	Relevant Statutory Instruments for the Permitting/Licensing of Waste Water Treatment Activities	F1
Figure 3.1	Amendment to IPPC Directive for Mixed Food and Drink Installations	35
Figure E1	UK Preservative Product Mix Trends ('000s m ³ sold/year)	E2
Appendix A	Previous Regulatory Position: Definition for the Recovery, or a Mixture of Recovery and Disposal of Non-Hazardous Waste	
Appendix B	Previous Regulatory Position: Treatment and Processing of Raw Materials	
Appendix C	Typical Emissions from Non-Hazardous Waste Treatment for Recovery	
Appendix D	Overview of Additional Previous Legislation Affecting the Wood Preservation Sector	
Appendix E	Preservatives Currently Used In the UK	
Appendix F	Overview of Previous Legislation for Independently Operated Waste Water Treatment	

1. Introduction

1.1 Background to the Industrial Emissions Directive (IED)

The Commission published its proposal and an impact assessment for a Directive on industrial emissions (Industrial Emissions Integrated Pollution Prevention and Control, henceforth cited as “IE(IPPC)D”⁵) on 21 December 2007, which consolidated seven existing Directives related to industrial emissions into a single clear and coherent legislative instrument. Those Directives were three related to the titanium dioxide industry (78/176/EEC, 82/883/EEC, 92/112/EEC), the IPPC Directive (2008/1/EC), the Solvent Emission Directive (1999/13/EC), the Waste Incineration Directive (2000/76/EC) and the LCP Directive (2001/80/EC). The Commission’s IA⁶ identified a number of problems related “(1) to shortcomings in the current legislation that lead to unsatisfactory implementation and difficulties in Community enforcement actions and, thereby, to loss of health and environmental benefits and (2) to the complexity and lack of coherence of parts of the current legal framework.” The IE(IPPC)D was therefore intended to harmonise the various strands of industrial regulation.

Political agreement on the text was reached at the European Council on 25 June 2009 and a common position outlined by the Commission in November 2009⁷. The final version of the Directive (2010/75/EU) was formally adopted by the European Parliament on 7 July 2010 and published in the Official Journal on 17 December 2010⁸; coming into force on 7 January 2011. The timetable for implementation of the new Directive is set out in Table 1.1 below:

⁵ “Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast)”. European Commission, Brussels, 21st December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

⁶ “Commission Staff Working Document: Accompanying document to the Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast). Impact Assessment.” European Commission, Brussels, 21st December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

⁷ Common Position adopted by the Council with a view to the adoption of a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (Recast), Interinstitutional File: 2007/0286 (COD), 11962/09.

⁸ <http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2010:334:SOM:EN:HTML>

Table 1.1 Key Dates for Implementation of the IE(IPPC)D

Date	Description
07/01/2011	Entry into force.
07/07/2011	Implementing rules concerning the determination of start-up and shut-down periods (Art. 3(26) and Annex V, Part 4, point 1) and TNP.
31/12/2011	Review on animal rearing activities.
31/12/2012	Review on combustion plants below 50 MW, intensive rearing of cattle and spreading of manure.
07/01/2013	End of transposition deadline (implementation date for articles mentioned in Art. 80(1) unless mentioned otherwise in Art. 82).
07/01/2013	New emission limit values for <u>new</u> combustion plants which co-incinerate waste.
31/12/2013	Report on the need to establish Union-wide emission limit values and/or to amend the ELVs of Annex V for certain LCPs.
07/01/2014	Repeal of Directives 78/176/EEC, 82/883/EEC, 92/112/EEC, 1999/13/EC, 2000/76/EC, 2008/1/EC
07/01/2014	Implementation date for articles mentioned in Art. 80(1) for installations <u>already falling under the scope</u> of Directive 2008/1/EC.
01/06/2015	Implementation of articles 58 and 59(5) (use of organic solvents).
07/07/2015	Implementation date for Annex I activities <u>not covered</u> by Directive 2008/1/EC.
01/01/2016	Implementation date for combustion plants falling under Art. 30(2) (new emission limit values).
01/01/2016	New emission limit values for <u>existing</u> combustion plants which co-incinerate waste.
01/01/2016	Repeal of Directive 2001/80/EC.
07/01/2016	First report reviewing the implementation of the Directive.

1.2 What are the Objectives and Intended Effects?

The main drivers for the revision of industrial emissions legislation are described in the IA undertaken by the Commission:

- The Lisbon Strategy and the EU Sustainable Development Strategy; this strategy stresses the role of environmental technologies in having “significant economic, environmental and employment potential”;
- The different Thematic Strategies (Air Pollution, Soil Protection etc.) set objectives to protect human health and the environment from key air pollutants. Industrial emissions regulation has a major role in meeting these objectives;
- The need for “Better Regulation” and designing laws and legislation in a more coherent way and with minimum administrative burden; and
- Experience in the implementation of the IPPC Directive in the last 10 years and ways to improve the legal framework to ensure that its objectives are met.

The Commission's proposals aim to address the issues identified via a number of amendments to the existing legislation including the following:

- Clarification and strengthening of the concept of Best Available Techniques (BAT);
- Revision of the minimum Emission Limit Values (ELVs) for some sectors (for example, large combustion plants) to bring them into line with BAT standards;
- Introduction of provisions on inspection and environmental improvements;
- Stimulating innovation and the development and deployment of new techniques;
- Simplifying and clarifying certain provisions on issuing permits, monitoring and reporting to cut unnecessary administrative burdens; and
- Extending and clarifying the scope and provisions of the legislation to better contribute to the objectives of the Thematic Strategies.

In response to the announcement of a political agreement on the text being reached, Defra published a paper that outlined and examined the key features of the agreed text⁹. With regard to the components that are relevant to the activities examined in this report, the paper highlighted the following:

- Activity 5.3(b) would extend IPPC to specified non-hazardous waste recovery with a capacity exceeding 75 tonnes/day (100 tonnes/day for anaerobic digestion). Recovery activities covered (in the competent authority's view) by the "urban waste water treatment" Directive would be exempt, and it should be noted that physico-chemical recovery activities in general would not be covered;
- Changes to Activity 6.4 would clarify coverage of food production activities, notably in respect of seasonal vegetables and mixed animal and vegetable products; and
- Of the added Activities 6.9-6.11, only 6.10 would significantly extend previous UK regulatory practice.

1.3 Purpose, Scope and Structure of this Report

This Regulatory Impact Assessment (RIA) report has been produced to provide an updated and final position on the potential impacts to the UK of Directive 2010/75EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast).

This report (and the preceding reports) have been produced with the assistance of the UK's environmental regulatory authorities (including the Environment Agency, Scottish Environment Protection Agency and Northern Ireland Environment Agency), Defra, trade organisations (including Water UK, the Food and Drink Federation, British Metal Recycling Association, Agricultural Industries Federation, Chilled Food Association, Pet Food

⁹ Defra, Paper on Proposal for a directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (Recast), 28th July 2009.

Manufacturers Association, Wood Protection Association and the British Metal Recycling Association). A wide range of manufacturers, industry enterprises and companies were also engaged. The data contained within this report has been gathered from reputable sources and in utilising the data supplied, we have, where practicable, made best endeavours to validate its accuracy. Where assumptions have been made in order to calculate costs, these have been clearly stated in the relevant sections or within appropriate footnotes.

This report sets out a revised position on the potential number of sites within the UK (either presently active or likely to be active at the scheduled implementation dates for Directive 2010/75/EU) that by virtue of the changes will fall within the scope of IE(IPPC)D. The report sets out the ‘previous regulatory position’ position¹⁰ (that which would have occurred under IPPC) together with estimated impacts and cost ranges associated with the transition of these sites into IE(IPPC)D. Where it has been possible, the report highlights the environmental benefits, uncertainties and key issues foreseen by industry.

This report only presents the updated impacts associated with the UK’s wood preservation sector, mixed animal and vegetable processing industries, specified treatments of non-hazardous waste for recovery and independently-operated wastewater treatment plants.

The scope of the impact assessment was to consider two policy options, the previous regulatory position case under the IPPC Directive (2008/1/EC) and that under the new IE(IPPC)D (2010/75/EU). The new directive does have a number of transitional provisions and therefore regulation under the provisions of the IPPC Directive will continue during this transitional period.

The report is structured as follows:

- A general introduction and background (this section);
- Four separate sections for each activity that present;
 - Relevant background and definitions;
 - Who is affected by the changes;
 - Previous regulatory position definition and number of installations affected;
 - Calculated administrative and compliance costs;
 - Environmental and other benefits;
 - Competition assessment;
 - Uncertainties and limitations on the assessment.

¹⁰ The ‘previous regulatory position’ was previously referred to as the baseline, or business-as-usual in earlier versions of this study.

2. Impact Assessment for Recovery, or a Mixture of Recovery and Disposal of Non-Hazardous Waste

2.1 Background and Definitions

This section of the report assesses the likely impacts of the proposal in relation to disposal or recovery of non-hazardous waste within the UK at installations with a capacity exceeding 75 tonnes per day¹¹.

The Commission's own impact assessment identified a significant issue associated with Directive 2008/1/EC whereby the treatment of non-hazardous wastes is covered only if it results in final compounds or mixtures which are discarded through disposal operations. This meant that similar installations (with similar environmental impacts) resulting in waste or products (e.g. composting) which are not disposed of but recovered or used as products were not covered. These inconsistencies may have resulted in possible distortion of competition between disposal and recovery activities. The Commission's own analysis suggested that removing the inconsistencies would lead to significant environmental benefits (linked to the implementation of BAT) and limited economic and social impacts. In addition, positive impacts on the consistent permitting of these installations are expected, contributing to the objectives of the Waste Thematic Strategy¹².

This section of the report considers the extension of IPPC to include the following new activities:

- Pre-treatment of waste for co-incineration;
- Treatment of slags and ashes; and
- Treatment of scrap metal.

Having regard to metal treatment and recovery activities, the Commission's assessment of the IE(IPPC)D proposals suggested that about 230 integrated shredders of End of Life Vehicles (ELV) and Waste Electrical and Electronic Equipment (WEEE) would be affected in the EU. Given that the IE(IPPC)D sets a higher threshold of 75 tonnes per day, fewer installations will be affected within the EU. The installations that fall out of the scope of IE(IPPC)D already fall under the scope of the ELV and WEEE Directives and so are subject to the requirements of those Directives which have a bearing on environmental protection.

The Commission's IA identified that the environmental benefits would be significant mainly due to reductions of dust and dioxin emissions from these installations. The IA also stated that in those Member States where BAT has already been implemented, the economic impacts of including this sector within the scope of the Directive were

¹¹ The IE(IPPC)D includes a specific threshold for Anaerobic Digestion of 100 te/day.

¹² <http://ec.europa.eu/environment/waste/strategy.htm>

limited. No significant additional administrative costs were expected since these installations are already subject to permitting under waste legislation.

The project team has consulted with the following stakeholders to support the development of this updated report:

- Regulators - Environment Agency for England & Wales, Environment Agency Northern Ireland and Scottish Environment Protection Agency;
- Industry associations - Water UK and British Metals Recycling Association (BMRA);
- Non-governmental organisations, including the Waste and Resource Action Programme and the National Industrial Symbiosis Programme¹³; and
- Installations in the waste management and water sectors involved in the recovery of waste from biological activities with 3 responses received from waste management companies and a further 6 from water companies. In addition the following were contacted:
 - Installations involved in the treatment of slag and ashes - 5 responses received;
 - Installations involved in the treatment of scrap metal - 1 response received;
 - Installations involved in the pre-treatment of waste for co-incineration - 2 responses received.

The IE(IPPC)D includes the following as a listed activity:

5.3(b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, and excluding activities covered by Directive 91/271/EEC:

(i) biological treatment;

(ii) pre-treatment of waste for incineration or co-incineration;

(iii) treatment of slags and ashes;

(iv) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.

When the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for this activity shall be 100 tonnes per day.

The fundamental change is the extension from the previous IPPC Directive to include 'treatment for recovery' (above the relevant threshold) rather than just 'treatment for disposal' and to include the additional activities of

¹³ NISP is now under the control of WRAP and is contractually administered by International Synergies (<http://www.international-synergies.com/>).

shredding waste and treatment of slags/ashes. Also of relevance is the removal of physico-chemical treatment and the additional threshold capacity clause for anaerobic digestion; inserted during the co-decision process.

The meaning of the following terms is important for outlining the scope of this assessment:

- Waste;
- Non-hazardous waste;
- Disposal;
- Recovery;
- Treatment;
- Pre-treatment; and
- Biological treatment.

Although the first two of these terms are defined in the IE(IPPC)D (by reference to the Directive on Waste (2008/98/EC), the others are not and so, for the purposes of this assessment, we have used the interpretation adopted in Defra's EPR-WFD¹⁴ guidance and the Environment Agency's EPR2¹⁵ guidance. A brief summary of the position taken in these documents is provided in the table below:

¹⁴ Defra (2008), The Waste Framework Directive: Environmental Permitting Guidance for the Environmental Permitting Regulations (England and Wales) Regulations 2007.

¹⁵ Environment Agency (March 2008), Environmental Permitting Guidance for the Environmental Permitting Regulations (England and Wales) Regulations 2007: Regulatory Guidance Series, No.EPR 2: Understanding the meaning of regulated facility, Version 1.0.

Table 2.1 Definition of Key Terms Affecting the Scope of this Assessment

Term	Definition
Waste	<p>Waste Framework Directive (WFD, Council Directive 2008/98/EC):</p> <p>Article 3(1): 'waste' means any substance or object which the holder discards or intends or is required to discard.</p>
Hazardous waste	<p>Waste Framework Directive (WFD, Council Directive 2008/98/EC):</p> <p>Article 3(2): 'hazardous waste' means waste which displays one or more of the hazardous properties listed in Annex III.</p>
Non-hazardous waste	<p>By implication, Non-hazardous wastes do not display any of the hazardous properties set out in Annex III of the WFD.</p>
Disposal/Recovery	<p>Article 3 (19) of Directive 2008/98/EC states that, "<i>disposal</i> means any operation which is not recovery even where the operation has a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations'.</p> <p>Article 3 (15) of Directive 2008/98/EC states that, "<i>recovery</i> means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II sets out a non-exhaustive list of recovery operations'.</p> <p>However, the Court has explained that the lists of disposal and recovery operations in Annex IIA and Annex IIB to the WFD are intended to provide illustrations of the way these operations are carried out in practice and are not intended to be exhaustive. An operation may be disposal or recovery within the meaning of the WFD even if it is not listed in Annex IIA and Annex IIB.</p> <p>The terms recovery and disposal are mutually exclusive - a given operation cannot be both a disposal and a recovery operation.</p> <p>The key feature of a recovery operation is that its principal objective is to ensure that waste serves a useful purpose by replacing other substances which would have had to be used for that purpose (thereby conserving natural resources).</p> <p>Disposal operations however are primarily aimed at getting rid of waste. Any benefits that result as a secondary consequence will not affect the nature of the operation.</p>
Treatment	<p>For the purposes of this assessment all treatment can be considered to be either biological or physico-chemical treatment.</p> <p>The current Environment Agency interpretation of 'treatment' for sewage treatment works (STWs) is that primary, secondary or tertiary sewage treatment is covered by the Urban Waste Water Treatment Directive (UWWTD) and is not subject to IPPCD. However, other ancillary activities at STWs, such as sludge treatment are currently interpreted as being covered by IPPCD and therefore requiring, in most cases, an environmental permit.</p>
Pre-treatment	<p>Pre-treatment is a physical, thermal, chemical or biological process (including sorting) that changes the characteristics of the waste in order to reduce its volume, facilitate its handling and enhance its recovery.</p>
Co-incineration	<p>The IE(IPPC)D states that a, "<i>waste co-incineration plant</i> means any stationary or mobile technical unit whose main purpose is the generation of energy or production of material products and which uses as a regular or additional fuel or in which waste is thermally treated for the purpose of disposal through the incineration by oxidation of waste as well as other thermal processes if the substances resulting from the treatment are subsequently incinerated'.</p>
Biological treatment	<p>For the purposes of this report, biological treatment includes: anaerobic and aerobic digestion and/or partial composting.</p>

2.2 Who is Affected?

The changes will affect the regulatory agencies, trade bodies, water treatment companies, operators of material recycling facilities (MRFs) and mechanical/biological treatment plants (MBTs), operators of ash and slag treatment centres, operator of compost sites that have an annual capacity of ~>25 000 tonnes, operators of anaerobic digestion facilities that have an annual capacity of ~>35 000 tonnes and operators of metal recycling facilities that operate crushers (including cars, fridges and waste electrical and electronic equipment (WEEE) in the UK.

The main groups to be affected will be:

- Operators of non-hazardous waste treatment installations previously falling outside of the scope of the IPPCD (i.e. >75/100 tonnes per day treatment capacity for recovery) will be affected, including organisations from the following sectors:
 - The water industry (in particular sludge and sewage treatment centres **not** falling under the remit of the Urban Waste Water Treatment Directive);
 - Municipal waste treatment by local authorities, their contractors and commercial enterprises, including composting and biological treatment by anaerobic digestion;
 - Treatment of commercial and industrial wastes, including organic wastes.
- Operators of non-hazardous waste operations undertaking pre-treatment for co-incineration in facilities with a treatment capacity >75 tonnes per day;
- Operators of non-hazardous waste operations undertaking treatment of slags and ashes in facilities with a treatment capacity >75 tonnes per day;
- Operators of non-hazardous waste operations undertaking treatment of scrap metal in facilities with a treatment capacity >75 tonnes per day; and
- Competent authorities regulating non-hazardous waste operations in facilities with a treatment capacity >75/100 tonnes per day, including:
 - Environment Agency for England and Wales;
 - Scottish Environmental Protection Agency (SEPA);
 - Northern Ireland Environment Agency (NIEA);
 - Defra and the devolved administrations of Scotland and Wales.

2.3 Previous Regulatory Position Definition

The three key elements of the 'previous regulatory' position of this impact assessment are (1) the previous legislation relevant to non-hazardous waste treatment for recovery and disposal at facilities with a capacity greater than 75 tonnes per day, which in turn informs (2) the estimates of the number of installations falling within the

scope of Directive 2008/1/EC (IPPC) and (3) the emissions from, and other environmental impacts of, these sites. The previous legislation and regulatory requirements and the key environmental issues are reviewed in Appendix A.

2.3.1 Number of Installations

The following sections identify the number of installations affected by the IE(IPPC)D.

The following assumptions apply throughout Section 2.4:

- Data presented is for facilities treating over 75 tonnes per day of non-hazardous waste for recovery and over 100 tonnes per day of non-hazardous waste for recovery treated solely by anaerobic digestion;
- Facilities previously regulated under EPR-IPPC were already covered by the IPPCD and so are assumed to undertake treatment for disposal. These sites are not therefore affected by the IE(IPPC)D and are not included in the assessment of impact presented within this report; and
- Facilities previously regulated under EPR-waste or associated exemptions were not covered by IPPCD and so it is assumed that they are undertaking treatment for recovery. These sites would potentially be affected by the IE(IPPC)D and are included in the figures presented in Section 2.4.

2.3.2 Installations Included in the Water Sector Biological Treatment

Sewage Sludge Treatment

Water and sewage companies in the UK undertake treatment of water (for drinking) and sewage. These processes generate water and sewage treatment sludges, which may be further treated in facilities located outside the main treatment works. The IE(IPPC)D excludes waste disposal and recovery activities covered by the UWWTD.

The water industry has sought additional clarity from the Government on whether the Directive will apply to the biological treatment of sewage and wastewater sludges processed at Sewage Treatment Centres and Sewage Treatment Works given that the reality is that these facilities lie on sites whose key activities fall within the scope of the UWWTD. This is understood to be the case in all but a very small number of examples. The current interpretation is that such sites will not be subject to the requirements of the IE(IPPC)D and therefore these have been excluded from the analysis.

Sludge Treatment Centres (STCs)

Sludge is generated at the individual water and sewage treatment works (STWs). In some cases, sludges are then transferred to centralised sludge treatment centres (STCs). Following treatment, the majority of treated sludge is

recovered principally through landspreading for agricultural benefit. At a relatively small number of works the treated sludge is sent for disposal, primarily through landfilling and incineration; these sites are already subject to EPR-IPPC permits and will continue to be so under IE(IPPC)D.

In January 2012, Defra provided a clarification on the interpretation of point 5.3b in annex 1 of the IE(IPPC)D. Where water industry anaerobic digestion plants with a capacity >100 tonnes per day (and used to treat sludges from urban waste water) are considered part of a site whose primary activities fall under the scope of the UWWTD, the anaerobic digestion facilities will remain exempted from regulation under IE(IPPC)D. There could be around 120 such plants in the UK, and on the basis of the clarification have been excluded from further analysis in this report.

Other Sludge Treatment (remote) Sites

In addition to the centralised STCs discussed above, there exists the possibility that sludge treatment either in a basic form (pre-treatment) such as dewatering or gravity thickening, or anaerobic digestion, may occur off the main UWWTD site (remote sites). These sites, many of which may 'treat' more than 75 tonnes per day of wet sludge or 100 tonnes via anaerobic digestion, have not been previously captured under EPR-IPPC for the following reasons:

- Most sludges are ultimately recovered rather than disposed of; and
- The competent authorities have not interpreted sludge treatment outside of STCs to be relevant to IPPCD.

Revisions made to the text of the IE(IPPC)D results in physico-chemical treatment processes and installations covered by the Urban Waste Water Treatment Directive (91/271/EEC) not being covered by the extension to recovery activities of point 5.3 of Annex I. However, Water UK¹⁶ believes that the exclusion of activities covered by UWWTD applies to activities carried out on the main site and therefore remote sites may not be excluded. Water UK estimate that there are less than 20 of these sites, and therefore, for the purpose of this assessment, the costs for permitting and maintaining permits on these 20 sites have been included in the impact assessment.

¹⁶ An extract of a communication between Water UK and Defra on this issue was made available to AMEC on the 4th January 2011.

Summary of Data Provided by Water UK and the Water Companies

Table 2.2 Numbers of Water Industry Installations Involved in Biological Treatment of Waste for Recovery With a Capacity Greater Than 75 Tonnes (>100 tonnes solely for AD) Per Day

Treatment for Recovery Activities >75 Tonnes (>100 tonnes for AD) Per Day	IPPC Part A	EP-waste
STCs (other bio)	0	0
Other STCs 'off-site'	0	20
Totals (low estimate)	0	0
Totals (high estimate)	0	20

Note: In January 2012, Defra clarified the interpretation of point 5.3b in annex 1 of the IE(IPPC)D in the UK will exclude the majority of the water industry's anaerobic digestion plants with a capacity >100 tonnes per day from regulation under IE(IPPC)D; these plants are therefore excluded from the analysis in this report.

2.3.3 Waste Management Sector Biological Treatment

The following activities are considered to represent the main types of installations that would be affected by the non-hazardous waste treatment proposals in the IE(IPPC)D.

- Composting plants operating with a capacity in excess of 75 tonnes per day;
- Anaerobic digestion plants using waste as a whole or partial feedstock and operating with a capacity above 100 tonnes per day; and
- Mechanical biological treatment (MBT), usually in association with anaerobic digestion operating with a capacity above 75 tonnes per day.

Clear data on potential or actual processing capacity is not widely available for all the above facilities and therefore in judging the potential numbers that may be affected, certain assumptions have been made.

- AD sites with a processing capacity of more than 35 000 tonnes per annum have been assumed to likely to have a daily capacity of 100 or more tonnes. This is based on the technical requirements for the plants to have a steady and well maintained feedstock flow in order to ensure a good biological balance to ensure effective digestion; and
- Compost and other biological treatment sites with a processing capacity of more than 25 000 tonnes per annum have been assumed to have a daily capacity of 75 or more tonnes.

Table 2.3 identifies the number of waste management biological treatment facilities likely to be operating with a capacity exceeding the relevant daily thresholds in IE(IPPC)D.

Table 2.3 Numbers of Installations Involved in Biological Treatment of Waste with an Estimated Capacity Greater Than 100 Tonnes per Day for Anaerobic Digestion and 75 Tonnes per Day for Other Means

Type of Treatment	IPPC Part A	EP-waste/WML	EP-exemption
Composting	1	47 ^[1]	0 ^{+[2]}
Anaerobic digestion	1	5-124 ^[3]	0
MBT with anaerobic digestion		16 ^[4]	0
Totals	2	68-187	0

Notes:

1. The Environment Agency's Regis database identifies 202 EPR-waste permits for composting sites in England and Wales, although it does not distinguish between sites above and below the 75 tonnes per day treatment threshold. The Association for Organics Recycling (AFOR, formerly The Composting Association) identifies that there are 178 'PAS 100' registered sites and provides data on annual throughput. It has been assumed that an annual throughput equivalent or greater than 25,000 tonnes per year is broadly equivalent to a daily treatment capacity of 75 tonnes per day. Using the data provided by the AFOR, 45 of the 178 process more than 25 000 tonnes; 14 of which process category 3 animal by-products wastes. The view of the regulatory consultees is that non-PAS registered sites (26) are likely to be much smaller and therefore below the 75 tonnes per day capacity threshold in IE(IPPC)D. 2 sites were identified in Northern Ireland that are currently subject to waste management licensing controls yet have a daily capacity in excess of 75 tonnes.

2. Information provided by the Environment Agency for this project identifies 2706 registered exempt composting facilities in England and Wales. Data was unavailable for Scotland and Northern Ireland. Based on the exemption thresholds (<1000 te/anytime) it has been assumed that none are likely to exceed the 75 tonnes per day IE(IPPC)D threshold.

3. The Environment Agency's Regis database identifies 115 EPR-waste permits for biological treatment sites in England and Wales, although does not distinguish between sites above and below the 100 tonnes per day treatment threshold or between aerobic and anaerobic treatments. Figures provided by WRAP's organics team indicate that there are currently 5 operational AD plants where the capacity is known and with a capacity exceeding 35,000 tonnes per annum (4 commercial AD, 1 on-farm AD). The data also indicated that a further 20 in build, 32 with planning permission granted and a further 24 plants have applied for planning permission. For on-farm AD, a further 10 were in build, 21 with planning permission granted and a further 21 have applied for planning permission. It is recognised that the commercial economies of scales set for planned AD plants mean that most will fall at or above the 100 tonnes per day threshold. The impact assessment has been conducted on the basis that all the above planned commercial AD plants are likely to have a capacity greater than 35 000tpa. For on-farm AD, this argument does not necessarily apply, so it has been assumed that the future capacity profile of on-farm AD mirrors the current profile. The Northern Ireland Environment Agency¹⁷ indicated they presently do not have any plants but that in future there would be a drive to increase capacity. Although figures have not been provided, it would be likely that such plants would have a capacity above 35 000tpa. At present, the impact cannot be judged. SEPA identified 2 sites under WML but these were not of sufficient size to process 100 tonnes per day.

4. A Defra report (2007) "Mechanical Biological Treatment of Municipal Solid Waste" identifies that there are 7 MBTs in the UK with a further 9 planned. It is assumed that all of these plants will be operational by 2014 and due to the nature of the process have a daily capacity exceeding 75 tonnes per day.

2.3.4 Pre-treatment for Co-incineration

Energy from waste (EfW) facilities are currently operating in the UK to produce refuse derived fuel (RDF) and solid recovered fuel (SRF), the terms used when referring to the outputs from a pre-treatment for co-incineration facility. Pre-treatment for co-incineration may take place either at the site where the co-incineration will take place or off-site. The techniques used for pre-treatment typically include physical treatment such as a primary pulveriser, rotary screen, air classifier, secondary shredder, pelletiser or MBT.

Incineration is interpreted to be a *disposal* activity as the calorific value recovered from wastes used in this fashion is less than the calorific value input required to burn the waste. In contrast, co-incineration is interpreted to be

¹⁷ E-mail communication with NIEA, 24th September 2009.

recovery whereby the calorific value derived from the waste is more than the calorific value input required to burn the waste. It is therefore likely that some facilities undertaking pre-treatment for co-incineration did not need an EPR-IPPC permit. The various potential regulatory situations are summarised below:

- If the pre-treatment takes place at the same site as the co-incineration then this will already be captured under EPR-IPPC as a directly associated activity (DAA) and so the IE(IPPC)D will have no effect for these sites;
- Offsite pre-treatment of waste using heat is already captured under EPR-IPPC in the UK as a Section 5.5 A(1)(a) activity covering the production of fuel from waste and so the IE(IPPC)D will have no effect for these sites; and
- Offsite pre-treatment of waste for co-incineration without the use of heat did not require an EPR-IPPC permit. There is no EPR-waste exemption available for such operations so all such facilities should be regulated under an EPR-waste permit.

In conclusion, it has not been possible to identify the number of installations specifically associated with pre-treatment for co-incineration affected by the IE(IPPC)D proposals. However, the MBT facilities are incorporated into the estimated number of sites for waste management biological treatment.

2.3.5 Treatment of Slags and Ashes

Treatment of slags and ashes is undertaken to facilitate their recovery as aggregate and typically involves physico-chemical treatment in the form of grading, grinding or washing. Although not covered by the IPPCD, such activities are captured in the UK under EPR-IPPC as a Section 3.5 B(a) activity. As a 'Part B' activity these sites are regulated by the local authorities, who apply a BAT-based permitting system for emissions to air but who do not cover other aspects covered by the IPPCD such as emissions to water, land, energy efficiency and so forth.

Information on the number of sites regulated by the local authorities under EPR Section 3.5 B(a) was not readily available.

The Defra 2006-07 survey of local authority regulated sites¹⁸ identifies that there are 1,617 'other minerals' sites in England and Wales. The vast majority of these sites will be associated with the management of other aggregate materials such as concrete or roadstone rather than slags and ashes. This position is reinforced by feedback received from a leading provider of treatment facilities to the major steelworks in the UK, which has six sites directly owned and operated in the UK, all of which were confirmed to be EPR-IPPC (Part B) permitted already.

On this basis it is considered that there may be something in the order of 10-20 sites regulated under EPR-IPPC (Part B) in the UK undertaking the treatment of slags and ashes, however this range is associated with a high degree of uncertainty.

¹⁸ Defra (2007), Local Pollution Control Statistical Survey 2006/07: A Survey of Local Authorities in England and Wales by the Department for Environment, Food and Rural Affairs and the Welsh Assembly Government.

2.3.6 Treatment of Scrap Metal

The following activities are considered to represent the main types of installations that would be affected by the non-hazardous waste treatment proposals in the IE(IPPC)D.

- Vehicle dismantlers. This does not include end of life vehicles (ELV) de-pollution¹⁹ facilities as the de-pollution of vehicles involves hazardous waste (e.g. waste oils, lead acid batteries);
- WEEE facilities not involving hazardous wastes; and
- Metal recycling sites.

The table below identifies the number of metal treatment facilities with a capacity exceeding 75 tonnes per day. This data has not been disaggregated by capacity or throughput therefore it is difficult to get a true perception of the potential implications of the changes of the IE(IPPC)D on the industry. The figures represent our best estimates, based on industry and regulatory opinion together with supporting data available from the BMRA in September 2009. There remains a degree of uncertainty around the actual number of installations that will be affected as the BMRA could only provide estimates of the number of WEEE shredders (15-20) and fridge processing sites (5) with sufficient capacity.

Table 2.4 Number of Installations Involved in the Treatment of Scrap Metal Using Shredders with a Capacity Greater than 75 Tonnes per Day

Type of Treatment	EP-Waste
Vehicle dismantlers (excluding ELV sites)	42
WEEE facilities	15-20 ¹
Metal recycling facilities	5 ¹

¹ Estimates from the BMRA, September 2009. BMRA are currently undertaking a comprehensive study to identify affected sites, but this information was not available at the time of publishing.

¹⁹ 'De-pollution' is a term used to describe the removal of pollutants from vehicles at the end-of-life as described in: Defra, (2004), 'Depollution Guidance for End-of-Life Vehicles over 3.5 tonnes'. Available from: <http://archive.defra.gov.uk/environment/waste/producer/vehicles/documents/elv-depollution.pdf>

2.4 Costs

2.4.1 Approach - Non-Hazardous Waste Treatment for Recovery

Compliance costs for the non-hazardous waste treatment installations that may be affected by the changes to include treatment for recovery (as well as pre-treatment for co-incineration, treatment of slags and ashes, and treatment of scrap metal) have been estimated based on discussions with relevant stakeholders (for example, Water UK) and published information on the potential measures that may be required and their associated costs. However, the non-hazardous waste treatment sector is so diverse that there is considerable uncertainty in the data developed as part of this assessment.

2.4.2 Administrative Costs

Previous Regulatory Position Costs for Waste Recovery Operations Previously Regulated Under EPR-IPPC Part B, EP-Waste (Tier 2) and EP-Exemptions

The additional administrative cost that may be incurred by existing Part B operators and those with EP waste permits, transferring into Part A is difficult to judge. Under the 2010/11 EPR charging scheme, the majority of plants will be subject to fixed Tier 2 fees, but some plants may be subject to Tier 3 fees due to their size. For the purposes of this study it is assumed that all plants will be subject to Tier 2 fees. A further complication is that the fees vary depending on whether plants are eligible for ‘standard’, or ‘Fixed condition licences’²⁰ (FCL) fees; the range of fees for the plants under consideration are shown in Table 2.5 (below).

Table 2.5 ‘Standard’ and ‘Fixed Condition Licences’ Fees

Activity	Fee Type	Subsistence
Composting in closed vessels	FCL	£2,420
Composting in open windows	FCL	£2,420
Treatment of waste to produce soil, soil substitutes and aggregate - up to 75 000 tonnes	Standard	£1,540
Composting in open windows	Standard	£1,540
Composting in closed vessels	Standard	£1,540
On-farm anaerobic digestion including use of the resultant biogas - up to 75 000 tonnes	Standard	£1,540
Anaerobic digestion facility including use of the resultant biogas - up to 75 000 tonnes	Standard	£2,420

²⁰ ‘Fixed condition licence’ means an environmental permit which was originally a waste management licence granted by the Agency under section 36 of the 1990 Act as a fixed condition licence. Environment Agency, (2010), ‘Environmental Permitting/Charging Scheme Guidance 2010/11’.

Activity	Fee Type	Subsistence
Non-hazardous Mechanical biological treatment facility	FCL	£2,420
Waste Electrical & Electronic Equipment (WEEE) treatment facility	FCL	£2,830
Waste Electrical & Electronic Equipment (WEEE) treatment facility	Standard	£2,830
Metal recycling	FCL	£2,420
Materials recycling facility	FCL	£1,990
Scrap metal	Standard	£2,420

Source: Environment Agency, (2010), 'Environmental Permitting/Charging Scheme Guidance 2010/11'.

The low estimates of Part B costs per installation (shown below) are based on the lower estimates of the fees shown above; the low estimates of the total annual costs are estimated by multiplying the sum of the recurring and non-recurring annual costs per installation by low estimate of the number of installations. The high estimates of Part B costs per installation (shown below) are based on the higher estimates of the fees shown above; the high estimates of the total annual costs are estimated by multiplying the sum of the recurring and non-recurring annual costs per installation by low estimate of the number of installations. Annualised costs are costs are estimated assuming a lifetime of 20 years and a discount rate of 3.5%. Fees are applied to all installations in the 'specified treatment' category, irrespective of the activity and 'standard'/FCL status of the plants.

Table 2.6 'Previous Regulatory Position' Administrative Costs by Element for EP-waste and Part B Permits

Activity	No. Installations		Admin. costs / installation, recurring: £000 p.a.		Admin. costs / installation, annualised non-recurring: £000 p.a.		Total annual admin. costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
5.3(b) - Water Sector Biological Treatment (EPR)	0	20	£3.3	£4.2	£0.0	£0.0	£0.0	£0.1
5.3(b) - Treatment of Slags and Ashes (Part B)	10	20	£2.4	£3.3	£0.0	£0.0	£0.0	£0.1
5.3(b) - Treatment of Scrap Metal with Shredders (EPR)	62	67	£2.9	£4.6	£0.0	£0.0	£0.2	£0.3
5.3(b) - Waste Sector Biological Treatment (MBT, AD & Composting) (EPR)	68	187	£2.4	£4.2	£0.0	£0.0	£0.2	£0.8
5.3(b) - Waste Sector Biological Treatment (MBT, AD & Composting) (Part A)	2	2	£3.3	£5.1	£0.0	£0.0	£0.0	£0.0
5.3 (b) Total	142	296	"-	"-	"-	"-	£0.4	£1.3

Note 1: All monetary values are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

Previous Regulatory Position Costs to Regulators

It has been assumed for the purposes of this impact assessment that the permit fees and subsistence charges paid by operators are sufficient to cover regulators' costs for the processing of the permit and ongoing enforcement.

2.4.3 Administrative Cost Impact Under IE(IPPC)D²¹

Administrative costs for operators²² required to change from Part B or EP-waste into EP Part A(1) can be broken down into two main elements (non-recurring and recurring). To assess the likely impact of the IE(IPPC)D the administrative costs have been modelled on the basis of the indicative number of installations likely to be affected.

In Table 2.7 (below) the low estimates of Part A costs per installation (shown below) are based on the lower estimates of the fees shown above; the low estimates of the total annual costs are estimated by multiplying the sum of the recurring and non-recurring annual costs per installation by low estimate of the number of installations. The high estimates of Part A costs per installation (shown below) are based on the higher estimates of the fees shown above; the high estimates of the total annual costs are estimated by multiplying the sum of the recurring and non-recurring annual costs per installation by the high estimate of the number of installations. Annualised costs are costs are estimated assuming a lifetime of 20 years and a discount rate of 3.5%.

Table 2.7 Modelled Administrative Costs for Part A(1) Installations

Activity	No. Installations		Admin. costs / installation, recurring: £000 p.a.		Admin. costs / installation, annualised non-recurring: £000 p.a.		Total annual admin. costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
5.3(b) - Water Sector Biological Treatment (EPR)	0	20	£3.3	£5.1	£1.2	£10.8	£0.0	£0.3
5.3(b) - Treatment of Slags and Ashes (Part B)	10	20	£3.3	£5.1	£1.2	£10.8	£0.0	£0.3
5.3(b) - Treatment of Scrap Metal with Shredders (EPR)	62	67	£3.3	£5.1	£1.2	£10.8	£0.3	£1.1
5.3(b) - Waste Sector Biological Treatment (MBT, AD & Composting) (EPR)	68	187	£3.3	£5.1	£1.2	£10.8	£0.3	£3.0
5.3(b) - Waste Sector Biological Treatment (MBT, AD & Composting) (Part A)	2	2	£3.3	£5.1	£0.0	£0.0	£0.0	£0.0

²¹ Based on OPRA band B installation and 100% compliance multiplier - bands C, D and E costs will be higher.

²² Indicative administrative cost data range is a combination of research and data provided by water industry companies.

Activity	No. Installations		Admin. costs / installation, recurring: £000 p.a.		Admin. costs / installation, annualised non-recurring: £000 p.a.		Total annual admin. costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
5.3 (b) Total	142	296	"-	"-	"-	"-	£0.6	£4.7

Note 1: All monetary values are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

Administrative costs would be incurred by the non-hazardous waste treatment sites through permit application and subsistence costs as the IE(IPPC)D will capture sites that have previously not been regulated under the IPPC regime.

In some instances these sites may have been covered by a lower tier regulatory regime however the administrative costs of applying for a new permit under IE(IPPC)D will still be incurred as a simple transfer from Part B, EP-waste or EP-exemption into Part A(1) is unlikely to be appropriate. This is due to the substantial additional information requirements at application phase, which all operators not previously subject to IPPC Part A(1) will be required to submit.

It has therefore been assumed for the purposes of this impact assessment report that the total modelled administrative costs are likely to be incurred in full by UK industry. The total administrative costs for the UK installations relative to the previous regulatory position are shown below in Table 2.8. The low estimate of the change in annual costs is calculated by subtracting the low estimate of administrative costs from the low estimate of administrative costs under IE(IPPC)D. The same process is followed for calculating the high estimates, except the high estimates of costs and numbers of installations are used in each case.

Table 2.8 Administrative Costs Relative to the 'Previous Regulatory Position'

Activity	No. Installations		Total annual admin. costs: £million p.a.	
	Low	High	Low	High
5.3(b) - Water Sector Biological Treatment (EPR)	0	20	£0.0	£0.2
5.3(b) - Treatment of Slags and Ashes	10	20	£0.0	£0.3
5.3(b) - Treatment of Scrap Metal with Shredders	62	67	£0.1	£0.8
5.3(b) - Waste Sector Biological Treatment (MBT, AD & Composting) (Part A)	70	189	£0.1	£2.2
5.3(b) Total	142	296	£0.3	£3.4

Note 1: All monetary values are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

2.4.4 Compliance Costs

Compliance costs for the non-hazardous waste recovery installations affected by the IE(IPPC)D have been estimated based on discussions with waste and waste management companies, some of whom already hold environmental permits for both for installations relevant to this assessment and also for other activities.

Given the information presented by the UK water industry on potential cost of compliance with IPPC requirements for secondary containment²³, the compliance costs for the water industry have been presented separately in order to avoid complication and increase the accuracy of calculated cost ranges. The compliance costs are detailed in Tables 2.9 and 2.10.

Compliance Costs for Operators

Compliance costs for operators have been based on the actions that may be required at non-hazardous waste treatment facilities to meet IPPC requirements (shown in Table 2.9).

These are based on actions previously required for other UK waste installations. Actions that may result from the development of BAT for the non-hazardous waste treatment activities newly subject to IPPC may or may not be similar to these.

Table 2.9 Actions Potentially Required at Waste Treatment Installations Newly Subject to IPPC by the IE(IPPC)D

Action	EPR/IPPC Part B	EPR-waste	EPR-exemption
Review treatment process against BAT and undertake improvements.	x	✓	✓
Review resource efficiency/use of the waste hierarchy against BAT and undertake improvements.	✓	✓	✓
Develop an environmental management system.	x	x	✓
Waste pre-acceptance and acceptance procedures.	✓	✓	✓
Develop an accident management plan.	x	x	✓

²³ Secondary containment can be defined as measures taken to further reduce the risk posed by an uncontrolled release to ground and/or groundwater of digestate and/or other liquids from the main digestion process – the definition commonly includes measures such as double-skin digestion tanks, additional bunds, reinforced platforms and installation of leak detection supported by routine tank integrity inspections.

Action	EPR/IPPC Part B	EPR-waste	EPR-exemption
Proposals to be developed for providing secondary containment, or other appropriate measures, to prevent, or where that is not practicable, to minimise leakage and spillage from primary pipe work including drains, sumps, storage and treatment vessels in relation to their risk of causing pollution.	✓	✗	✓
Development of proposals for a monitoring programme for the detection of leaks from the surface and subsurface infrastructure including tanks, sumps, pumps, pipework, hardstanding and the drainage system.	✓	✓	✓
Development of a written report detailing the condition of the installations drainage which includes reviewing the condition of drains and developing a detailed drainage plan.	✓	✗	✓
Develop a site closure plan.	✓	✓	✓
Develop a site protection and monitoring.	✓	✓	✓
Proposals to be developed for providing sampling access for monitoring discharges to air, surface waters and sewer.	✗	✓	✓
Monitoring.	✓	✓	✓
Review odour emissions and develop an odour management plan where there are deficiencies.	✓	✗	✓
Review noise and vibration emissions and develop a noise and vibration management plan where there are deficiencies.	✓	✗	✓

The costs associated with these actions have been researched using a combination of industry consultation, desk-based assessment and consultancy experience working within the field of industrial IPPC improvement programmes. Given the level of uncertainty surrounding the costs, ranges have been adopted to reduce the uncertainty. The cost ranges provided in Table 2.10 have been informed by best estimates based on discussions with a number of industry stakeholders supported by AMEC's consultancy expertise in the sector. In the case of the water industry, costs have been provided by the industry themselves.

Table 2.10 Indicative Compliance Cost Ranges for a Waste Treatment Installation Newly Subjected to IPPC by the IE(IPPC)D

Action	Capital Cost	Annual Cost
Review treatment process against BAT and undertake improvements.	£5,000-£50,000	-
Review resource efficiency/use of the waste hierarchy against BAT and undertake improvements.		
Develop an environmental management system.	£5,000-£10,000	£500-£1,000
Waste pre-acceptance and acceptance procedures.		
Develop an accident management plan.	£2,000-£10,000	-
Water Treatment Industry Only	£50,000 – £150,000 ^[2]	£25,000 - £75,000 ^[3]
Risk-based assessment of the need for secondary containment, or other appropriate measures, to prevent, or where that is not practicable, to minimise leakage and spillage from primary pipe work including drains, sumps, storage and treatment vessels in relation to their risk of causing pollution.		
Development of proposals for a monitoring programme for the detection of leaks from the surface and subsurface infrastructure including tanks, sumps, pumps, pipework, hardstanding and the drainage system.		
Other Affected Industries	£5,000-£50,000	£500-£5,000
Proposals to be developed for assessing the requirement for and if necessary provision of secondary containment, or other appropriate measures, to prevent, or where that is not practicable, to minimise leakage and spillage from primary pipe work including drains, sumps, storage and treatment vessels in relation to their risk of causing pollution.		
Development of a written report detailing the condition of the installations drainage which includes reviewing the condition of drains and developing a detailed drainage plan.	£2,000-£5,000	£500-£1,000
Develop a site closure plan.	£2,000-£5,000	-
Develop a site protection and monitoring programme.	£5,000-£30,000	-
Proposals to be developed for providing sampling access for monitoring discharges to air, surface waters and sewer.	£5,000	-
On-site monitoring.	-	£1,000-£10,000
Review odour emissions and develop an odour management plan where there are deficiencies.	£2,000-£5,000	£500-£1,000
Review noise and vibration emissions and develop a noise and vibration management plan where there are deficiencies.	£5,000	£1,000-£2,000

Note 1: Costs for all improvements have been developed on the basis of estimated man-days effort (at £250 cost per man-day) plus estimated capital cost of purchasing equipment and equipment necessary to undertake and maintain efficiency.

Note 2: Stakeholder operators have indicated that the cost for introducing secondary containment, if the risk-based assessment showed a clear need, would be in the order of £10s millions. The majority of the cost relates to the construction of concrete 'bunding' around existing drains, sumps, storage and treatment vessels and infrastructure. This would be an extremely expensive process, as the water treatment sites commonly operate on a gravity-feed system, with infrastructure extending deep below the ground. Contacts from the water treatment industry commented that it had not been possible to determine how this could be achieved, or even if it would be possible to retrofit secondary containment to existing sites; if this was required, new sites may need to be built. However, it is possible that the regulator may not require secondary containment to be installed, if the risk-based assessment showed that there was not a clear need. Contacts from the water treatment industry stated that in certain areas it was more common for the regulator to request RAM (risk assessment modelling) for the site considering the hydrology of the site, the risk of leaks, the age of the plant and the time profile for any potential on the impact on the water course. The risk profile of water treatment sites increases where they are located close to watercourses, on 'built-up' ground, or over porous geology. For water companies, any expenditure of this nature would need to be agreed with Ofwat in advance.

Note 3: A range of costs have been identified by UK water companies to undertake annual assessments of tank integrity. Estimates ranged from £44,000 - £10+ million. The lower range of the estimate is based on costs provided by a water company to Ofwat for assessing secondary

containment for treatment plant already captured under the IPPCD because the wastes are disposed of rather than recovered. The upper estimate reflects other costs to the company, particularly at larger STCs and STWs where plant may have to be taken off-line to undertake the assessment. The high costs reflect issues in managing the sewage and sludge during such periods rather than that for the assessment survey alone. However, it is not clear what potential there is for assessing tank integrity during periods of planned maintenance (thus avoiding/reducing business interruption costs); how frequently the assessments would be needed; what techniques could be applied (which could involve less process interruption); and how representative the very high costs would be. Therefore, without further supporting information, we have not included the very high quoted costs in this assessment.

Detailed Compliance Costs for Operators

Using the information from the table above and the number of installations potentially affected by the IE(IPPC)D proposals, compliance costs have been calculated for each affected sector. Detailed analysis is contained on the electronic database models that accompany this impact assessment report. Table 2.11 (below) shows the compliance costs for each sector. The low estimates of compliance costs are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation. The high estimates of compliance costs are estimated by multiplying the higher estimates of the sum of the recurring and non-recurring annual costs per installation.

Table 2.11 Modelled Compliance Costs

Activity	No. Installations		Compliance costs / installation, recurring: £000 p.a.		Compliance costs / installation, annualised non-recurring: £000 p.a.		Total annual compliance costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
5.3(b) - Water Sector Biological Treatment	0	20	£28.5	£165.0	£4.4	£9.1	£0.0	£3.5
5.3(b) - Treatment of Slags and Ashes	10	20	£4.0	£20.0	£1.6	£9.1	£0.1	£0.6
5.3(b) - Treatment of Scrap Metal with Shredders	62	67	£4.0	£20.0	£12.6	£17.9	£1.0	£2.5
5.3(b) - Waste Sector Biological Treatment (MBT, AD & Composting)	70	189	£4.0	£20.0	£1.0	£5.4	£0.3	£4.8
5.3(b) Recovery or a mix of disposal and recovery of non-hazardous waste - Total	142	416					£1.4	£11.4

Note 1: All figures are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

Note 3: Annualised compliance costs are estimated by multiplying the unit per installation by the assumed proportion of installations which will require the measure.

2.5 Benefits

The following table summarises the benefits likely to be achieved from capturing non-hazardous waste treatment for recovery under the IE(IPPC)D. Due to lack of available information it is not possible to quantify the benefits.

Table 2.12 Benefits

Benefits	Situation Under IE(IPPC)D	Business as Usual (BAU)
Waste reduction, minimisation and resource efficiency	All IPPC permits include standard conditions designed to address waste reduction, minimisation and resource efficiency.	The existing EPR-IPPC (Part B), EPR-waste permits and exemptions do not contain conditions to address waste reduction, minimisation and resource efficiency.
Reduction in pollution	<p>IPPC permits issued to non-hazardous waste recovery treatment plants may be expected to contain improvement conditions designed to reduce pollution, such as:</p> <ul style="list-style-type: none"> • Leak detection and possibly secondary containment; • Assessment of environmental impact; • Odour management plans. 	<p>Noise and odour will be previously regulated by the local authority as Statutory Nuisance. Odour control is already subject to a Defra Code of Practice and is reported to be easily enforceable.</p> <p>Leak detection and secondary containment is previously only addressed for facilities regulated under EPR-waste. There are no requirements to address these issues for EPR-IPPC Part B permits or EPR-waste exemptions.</p> <p>Under EPR-waste permits, there should already be a requirement for no point source emissions to air, water or land.</p>
Formalisation of environmental management systems	IPPC permits include standard conditions designed to require the operators to implement and maintain a management system, organisational structure and allocate resources that are sufficient to achieve compliance with the limits and conditions of the permit.	<p>EPR-waste exemptions do not require formal environmental management systems.</p> <p>Equivalent requirements are already in place for EPR-IPPC Part B permits and EPR-waste permits.</p>
Prevention of accidents and minimisation of their consequences	IPPC permits contain standard conditions requiring the maintenance and implementation of an accident management plan.	<p>EPR-waste exemptions do not require formalisation of environmental management systems.</p> <p>Equivalent requirements are already in place for EPR-IPPC Part B permits and EPR-waste permits.</p>

2.6 Competition Assessment

The competition guidelines (August 2007)²⁴ set out four main questions, in order to ascertain whether the policy (revisions in the IPPCD) would affect the market by:

1. Directly limiting the number or range of suppliers?
2. Indirectly limiting the number or range of suppliers?
3. Limiting the ability of suppliers to compete?

²⁴ http://www.offt.gov.uk/shared_offt/reports/comp_policy/oft876.pdf

4. Reducing suppliers' incentives to compete vigorously?

A brief summary of the four questions are presented below in Table 2.13 and for those where the answer to one of the questions is “Yes”, then an explanation is provided in the following sections.

The results should be included in the “Evidence Base” within the Impact Assessment template.

Table 2.13 Summary of the Competition Test

Question	Water Sector Physico-chemical and Biological Treatment	Waste Management Sector Physico-chemical and Biological Treatment	Pre-treatment for Co-incineration	Treatment of Slags and Ashes	Treatment of Scrap Metal
Q1. Directly limit the number or range of suppliers?	No*	No*	No*	No*	No*
Q2. Indirectly limit the range of suppliers?	No	No	No	No	Yes
Q3. Limit the ability of suppliers to compete?	No	No	No	No	No
Q4. Reduce suppliers' incentives to compete vigorously?	No	No	No	No	No

* For installations above the threshold an IPPC permit will be required. The requirement for a permit could directly limit the number of installations although the cost is unlikely to be significant enough to restrict the number of suppliers. This is explained further below.

2.6.1 Water Sector Physico-chemical and Biological Treatment

Water companies are natural monopolies, because it is not possible for more than one company to survive and benefit from economies of scale (based on current infrastructure). This generally means that, subject to economic regulation by Ofwat, they have the ability to set prices rather than being a price taker. In the UK each region has one water company and a limited number of treatment sites. Therefore sludge treatment plants are not necessarily competing with another treatment plant to provide a better or cheaper service, especially if all the treatment plants in the area are owned by the same company. In some instances where there are different treatment installations not owned by the same company (e.g. an independent treatment plant), there may be more competition over price, but the possibility of transporting treatment material to another site will be limited to distances where the inclusion of transportation costs makes it cheaper to treat the material at the nearest site.

If Ofwat allowed it, the water and sewage companies could pass on the costs of the new requirements of the IE(IPPC)D to their customers. However if they are unable to pass on costs, this may lead to a redistribution of expenditure with spending elsewhere reduced (e.g. on infrastructure) which may ultimately reduce the value offered to consumers and the general public.

2.6.2 Waste Management Sector Physico-chemical and Biological Treatment

Historically, the UK has been reliant on landfill for waste disposal. However legislation such as the EU landfill Directive, national and local authority targets require substantial reductions in the amount of waste being landfilled and increases in the amounts of wastes recovered. The non-hazardous waste must be treated before it is recovered (e.g. used for composting, spreading on land, used in anaerobic digesters).

Waste treatment recovery is more capital intensive than landfill due to the processing facilities required. For municipal waste treatment services private companies often enter into long term contracts with local authorities to build the facility and then treat the waste for a given number of years. One reason for this is to ensure that the high sunk costs (costs that cannot be recovered) associated with building treatment sites can be offset by having a guaranteed stream of revenue over a given number of years.

The industry is typically dominated by larger private sector companies who are able to supply integrated waste management services (e.g. collection, treatment and disposal). In most regions of the UK a single firm (private company or a local authority waste disposal company (LAWDC)) would have exclusive supply of waste within a region (e.g. a county or several local authorities) and therefore would not be subject to competition from other waste treatment plants during the term of the contract.

Therefore these firms should be able to pass on the costs of the IE(IPPC)D through higher fees when they are tendering to win the contract. However some contractors may already be operating on a fixed variable charge (e.g. a fixed £/t received) and therefore may not be able to pass on the costs until the contract can be re-negotiated or re-tendered during procurement (this will depend on the terms in the contract as some may be able to pass these costs on if they are beyond the environmental standards set out in the contract). However, given that the IE(IPPC)D requirements upon activities newly covered do not apply until July 2015, it is likely that most new (or recent) contracts and prices will be adjusted before then.

2.6.3 Pre-treatment for Co-incineration

Co-incineration is in effect defined in the IE(IPPC)D as the use of waste as an additional fuel to generate energy or material products. It is gaining popularity because conventional fossil fuels are becoming increasingly expensive and generate carbon dioxide (and other harmful emissions such as SO₂, NO_x and PM), and in many countries waste disposal options are limited. Several industrial sectors use co-incineration including the cement industry, power plants and firing installations, the pulp and paper industry, iron and steel production, the non-ferrous metals industry and the chemical industry (Economic and Social Council 2001²⁵).

Many types of wastes can be used for co-incineration including plastics, used tyres, sewage sludge and other residues from water treatment, residues and rejects from the pulp and paper industry, residues from wood processing, waste oil/petrol coke, and solvents. These waste products need to be pre-treated and converted into a form that is suitable for co-incineration (this may vary for different users).

²⁵ <http://www.incineration.info/files/publications/7.pdf>

Pre-treatment installations for co-incineration are already compliant with EPR-waste regulation (with no exemptions) and therefore additional costs of compliance with IPPC regulation should not be significantly higher. The ability to pass on any additional costs is discussed below.

The economic feasibility of using waste fuel depends on several factors, although the main factors are likely to be the cost of conventional fossil fuels and the cost and level of emissions reductions required vs. the cost of pre-treated “ready to burn” waste fuel and the savings and level of emissions that could be achieved. This typically means that it is only economically viable to purchase treated waste fuel from nearby suppliers, thus restricting competition to a regional level when the cost of transportation is taken into account.

Therefore in practice affected installations treating waste may be able to pass through the costs by charging a higher gate fee (i.e. a fee to accept the waste) or charge co-incineration plants a higher fee for the pre-treated and “ready to burn” fuel source due to the market being restricted to a regional level.

However this may encourage users of co-incineration to pre-treat and convert waste material into a “ready to burn” fuel source onsite rather than pay the higher cost (it should also be noted that some pre-treatment plants may already have an IPPC permit and therefore there may be no change in price). It could also discourage waste co-incineration as compared to other forms of fuels.

It will also depend on the ability of installations below the threshold (and therefore unaffected by the changes under the IE(IPPC)D) to supply a greater quantity of “ready to burn” waste for co-incineration and still stay below the threshold. If they are able to supply to a greater market this may deter larger installations from passing on the costs of IPPC to avoid losing their market share. It may also encourage new entrants to enter below the Directive capacity threshold (or encourage a downscaling of capacity to below the threshold) to avoid the cost of IPPC permits and attempt to gain a significant market share due to being able to charge a lower price (or at least have lower costs). It should be noted that a combination of several smaller installations may not necessarily be as efficient as a single larger capacity installation and therefore may result in a less efficient use of resources. However there is currently insufficient data to determine whether this scenario could occur.

2.6.4 Treatment of Slags and Ashes

Installations treating slags and/or ashes are already compliant with EPR part B (with no exemptions) and therefore additional costs of compliance with IPPC regulation (e.g. additional permitting, administrative, energy efficiency costs etc) should not be significantly higher. The ability to pass on any additional costs is discussed below.

Both slag and fly ash have many uses and as a by-product have a significant market value (although not high enough to be exposed to import penetration). Some power plants already have an IPPC permit for treatment of fly ash and so there will be no additional costs from the IE(IPPC)D. Slag is typically sold to pre-treatment installations who then sell the treated slag to construction companies and other outlets. Therefore it may be possible for many installations that are affected by the Directive to be able to pass on the costs to their customers.

2.6.5 Treatment of Scrap Metal

In Section 2.3.6 it was suggested that the main industries affected are likely to be vehicle dismantlers (excluding ELV depollution facilities), WEE facilities not involving hazardous wastes and metal recycling sites.

It is possible that small and medium sized installations will now have an incentive to reduce capacity below the threshold value to avoid the costs associated with the IE(IPPC)D. This is considered likely given that the long run historical global price increases in scrap metals should make it viable for these plants to continue to produce scrap metals without fully being able to exploit the benefits of economies of scale. Given the short timescales of the project, it is not possible to determine whether this will necessarily give them a competitive advantage in price due to the loss in benefits from economies of scale that larger installations benefit from. It is worth noting that recent changes in the economic climate have led to a reduction in scrap prices, however there are signs that these reductions have bottomed out and that prices may be being to rise again.

Based on communications with the British Metals Recycling Association (BMRA), a possible result of their inclusion in the scope of the IE(IPPC)D could be the adoption as BAT of containment of shredders in buildings to deal with fugitive dust emissions. The use of these systems could fundamentally alter practices within the metal recycling industry, particularly in the car crushing sector.

For larger installations given the value of scrap metals the costs of IPPC may not necessarily result in companies exiting the market (or necessarily deter new entrants to enter the market) although if it is not possible for them to pass on the costs of IPPC compliance this may, for example, result in a reduced return to companies providing them with scrap metals and products that have scrap value (e.g. cars) and/or companies no longer providing free collections.

2.7 Social Impact Assessments

2.7.1 Statutory Equality Duties Impact Test guidance

The impact of the proposals on the people of different ages, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation have been considered and it is not expected that the proposals will have any impact.

2.7.2 Health and Well-being

The impact of the proposals on education, housing, crime, transport and people's lifestyle choices have been considered and it is not expected that the proposals will have any impact. The impacts of the proposals are discussed in depth in the benefits section and the impact on employment is discussed in the competition assessment section.

2.7.3 Human Rights

The impact of the proposals on human rights has been considered and it is not expected that the proposals will have any significant impact.

2.7.4 Justice

The impact of the proposals on the courts, tribunals, prisons, probation, the legal aid budget, the prosecuting bodies and the judiciary have been considered and it is not expected that the proposals will have any significant impact.

2.7.5 Rural Proofing

The impact of the proposals on rural communities has been considered and it is not expected that the proposals will have any impact.

2.7.6 Sustainable Development

The inclusion of new installations in the scope of the IE(PPC)D will increase scrutiny of the installations waste production and energy and water efficiency; this scrutiny is expected to improve the installations' performance in these areas. However, it has not been possible to estimate the scale of improvement in this study.

2.8 Limitations and Uncertainties

2.8.1 Main Limitations

The following are considered to be the main limitations and uncertainties associated with this assessment:

- Assumptions regarding how the regulators would implement the requirements of the IE(IPPC)D;
- Uncertainties in the estimation of the number of installations potentially affected by the IE(IPPC)D;
- Uncertainties in the costs involved for operators in compliance with the requirements of the IE(IPPC)D; and
- Lack of quantitative data on the benefits to the UK from transposition of the IE(IPPC)D.

Implementation of the IE(IPPC)D

It has been assumed that the UK government will apply the IE(IPPC)D along similar lines to the previous arrangements for IPPC, namely division into:

- EPR-IPPC Part A:
 - Activities covered by the IE(IPPC)D and UK BAT-based regulation.
- EPR-IPPC Part B:
 - Activities not covered by the IE(IPPC)D but are covered by UK BAT-based regulation.
- EPR-waste:
 - Operations covered by the WFD but not the IE(IPPC)D.
- EPR-waste exempt:
 - Operations covered by the WFD but exempt from the requirement to obtain a permit.

2.8.2 Number of Installations

There is a diverse range of installations for treatment of non-hazardous waste for recovery. This assessment has identified some 142-296 installations that are likely to be affected by the IE(IPPC)D. There are two factors that introduce uncertainty into the estimations of the affected installation numbers, specifically:

- Assumptions regarding industry structure; and
- Lack of data on the number of EPR-waste exemptions that may exceed the 75 tonnes per day threshold.

2.8.3 Assumptions Regarding Industry Structure

Some of the sources of information used to identify the number of installations affected by the IE(IPPC)D, such as the Environment Agency Regis database or data from trade associations, do not categorise sites according to daily treatment capacity. For example, EPR-waste exemptions are based on a threshold for annual throughput. Although this can be converted to a daily throughput, this is not directly equivalent to treatment capacity because averaging throughput over the year is likely to underestimate the number of sites with high capacity but relatively low throughput.

Other sources of data can only provide information on the total number of a particular type of treatment site in the UK with no quantitative data on capacity or throughput being available.

In such circumstances, AMEC have used our professional experience of the industry sector to make assumptions regarding the size (capacity) distribution of facilities. For example, the Environment Agency's Regis database identifies 86 EPR-waste permits for MRFs in England and Wales, although does not discern between sites above and below the 75 tonnes per day treatment threshold. However, experience of the sector suggests that all of these sites are likely to operate above the 75 tonnes per day treatment capacity threshold.

2.8.4 Uncertainties on Compliance Costs for Operators

Many of the stakeholders contacted as part of this assessment were unable to provide costs for the implementation of the IE(IPPC)D's new requirements. Where possible, AMEC has made estimates of potential costs based on our professional experience for undertaking such work.

The revised assessment has identified a relatively small number of installations that would be affected by the IE(IPPC)D. As noted in the previous section, there is some uncertainty regarding this number, which in turn affects the total costs identified in the assessment of current estimates.

2.8.5 Lack of Quantitative Data on Benefits

It was not possible to quantify or monetarise the potential benefits of implementing the IE(IPPC)D. In part this is due to the highly variable nature of the facilities covered and also because the main benefits are achieved by better implementation of the waste hierarchy (and so improved resource efficiency) and reduction in fugitive emissions.

3. Impact Assessment for the Treatment and Processing of Raw Materials Intended for the Production of Food or Feeds

3.1 Background and Definitions

The main objective of this report is to assess the impacts of the transposition of the IE(IPPC)D on animal and vegetable processing installations within the UK, building and commenting on as well as extending the Commission's Impact Assessment (IA), where appropriate. In particular, this report focuses on the changes relating to the capacity and operational thresholds for vegetable processing and the definition of "mixed" food and drink installations.

The IE(IPPC)D includes the following as a listed activity:

"Treatment and processing, other than exclusively packaging, of the following raw materials, whether previously processed or unprocessed, intended for the production of food products for humans or animals from a mix of animal and vegetable raw materials with a finished product production capacity in tonnes per day greater than:

- 75 if A is equal to 10 or more; and
- $[300 - (22.5 \times A)]$ in any other case.

Where 'A' is the portion of animal material (in percent) of the finished product production capacity".

Packaging is not included in the final weight of the product. In addition, this subsection does not apply where the raw material is milk only.

The purpose of the change from the IPPCD was to clarify the threshold for installations that are mixing animal and vegetable food within their products. Thresholds previously within the IPPC Directive are only set for the production from exclusively one type of raw material (75 tonnes a day for animal raw materials and 300 tonnes per day for vegetable raw materials).

In addition, the IE(IPPC)D includes a further amendment of activity 6.4 in Annex I of the IPPC Directive to include a further threshold for the seasonal processing of vegetable raw materials with a finished product production capacity of "...600 tonnes per day where the installation operates for a period of no more than 90 consecutive days in any year." This is in addition to the existing threshold of 300 tonnes per day.

3.2 Who is Affected?

The changes will affect the regulatory agencies, trade bodies and food manufacturing installations in the UK.

3.3 Number of Installations

The food and drink sector is currently regulated by the Environmental Permitting Regulations (EPR) 2010 in England and Wales under section 6.8 "The Treatment of Animal and Vegetable Matter and Food Industries" Part A(1) (d). The regulations applied to food and drink industries that:

- Treat and process animal raw materials with a finished product production capacity greater than 75 tonnes per day; and
- Treat and process vegetable raw materials with a finished product production capacity greater than 300 tonnes per day.

The same activity definitions are contained in the Pollution Prevention and Control Regulations for Scotland and for Northern Ireland.

The Environment Agency defines animal raw material as:

“Anything from a living or dead animal and includes minerals derived from an animal source, such as bone”²⁶.

In 2009, some 355 food and drink sites were regulated by the Environment Agency under the IPPC Directive. It is estimated that 25% (approximately 89 sites) of all the IPPC permitted food and drink installations are currently “mixed” installations²⁷ as, under current EA guidance²⁸, any operator exceeding a level of 10% animal raw materials on any single day would be viewed as a processor of animal raw materials. Table 3.1 provides a breakdown of the food and drink installations regulated under IPPC.

Table 3.1 Number of Food and Drink Installations Previously Regulated Under IPPC

No. of IPPC Permitted Installations (2009)	No. of Installations Permitted under Part A(1) (d)(i)	No. of Installations Permitted under Part A(1) (d)(ii)	No. of Permitted Installations Covered Elsewhere under Section 6.8 of the EPR
356	61	153	142

²⁶ Environment Agency (2008): *Regulatory Guidance Series No. EPR 2 ‘Understanding the meaning of regulated facility’, Version 1.0.*

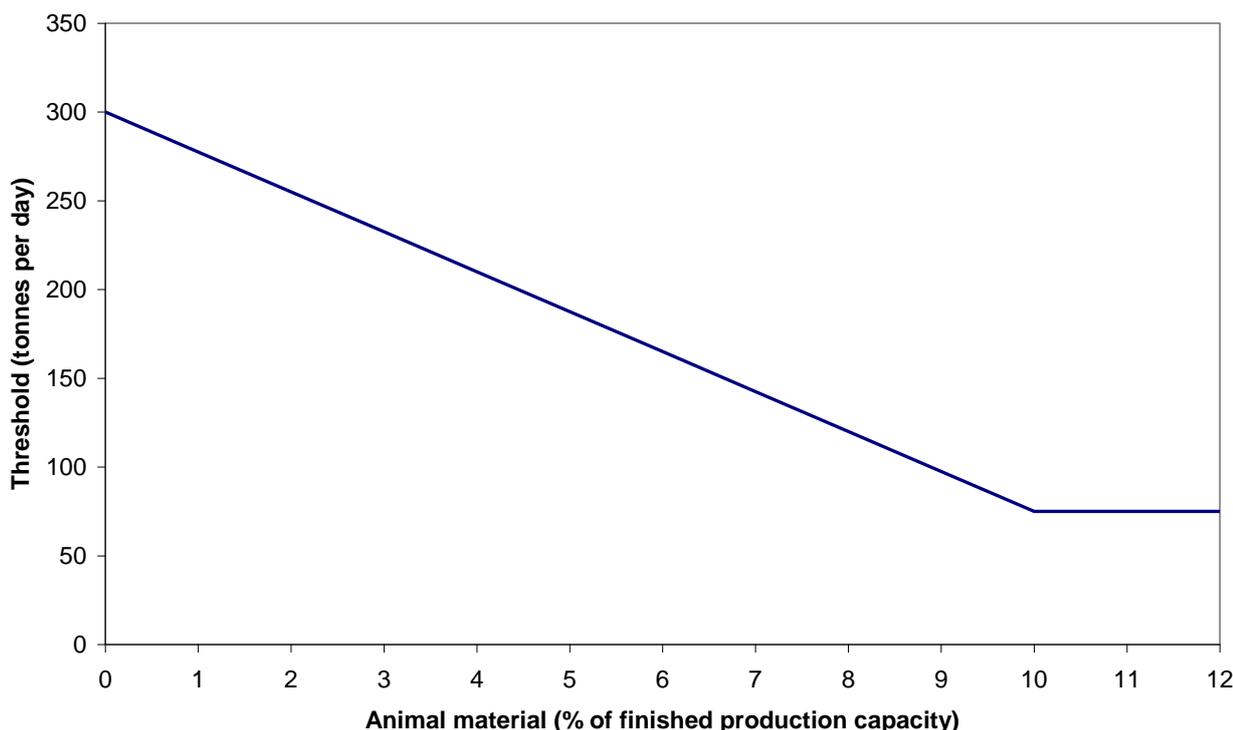
²⁷ Commissions Impact Assessment.

²⁸ Environment Agency (2008), *Regulatory Guidance Series No. EPR 2 – Understanding the meaning of regulated facility, Version 1.0 March 2008.*

From initial discussions with key stakeholders (AIC, FDF and the EA) it appeared that the addition of a 600 tonnes per day/90 consecutive day threshold for vegetable processing (activity 6.4(b)(ii)) would be unlikely to affect any installations in the UK. However, following the removal of ‘average value on a quarterly basis’ in the final legislation, the stakeholders (AIC, FDF and the EA) believe that some additional installations may be captured by the IED. The number of new installations to be covered will depend on how the competent authority implements the Directive in practice. As AIC and the EA are continuing to discuss this issue, the impact of the change has not been considered further in the costs and results sections, but is highlighted as a significant uncertainty.

In addition to the inclusion of the threshold above, the amendments to activity 6.4(b) of Annex I of the Directive include the incorporation of the >10% animal raw materials rule for mixed installations, which is already defined within UK guidance. The amendments also consider a proportional approach to regulating food and drink companies with a daily finished product production capacity of between 75 and 300 tonnes and an animal raw material content of between 1-10%. This method is as outlined in Figure 3.1 below.

Figure 3.1 Amendment to IPPC Directive for Mixed Food and Drink Installations



Based on discussions with a range of stakeholders, the main sector that may be affected by the changes related to mixed processing, as defined by the SIC code (refer to Table 3.1) is expected to be 15.8 ‘Manufacture of other food products’. There are 3 133 enterprises in this sector, making up 45% of the total food and drink

manufacturing sector. The sector employs approximately 180 000 people²⁹. This sector is large and consists of 9 sub-sectors. The following sub-sectors were identified as being the most likely to be affected by the changes:

- 15.81: Manufacture of bread, fresh pastry goods and cakes;
- 15.82: Manufacture of rusks and biscuits, preserved pastry goods and cakes;
- 15.84: Manufacture of cocoa, chocolate and sugar confectionary; and
- 15.89: Manufacture of other food products not elsewhere classified (15.89/1 represents the manufacture of soup).

These 4 sub-sectors consist of 2 857 enterprises and account for 91% of the whole 15.8 sector (Manufacture of other food products) or, alternatively, 41% of the total number of food and drink manufacturing enterprises in the UK. The majority of these enterprises are likely to have <10 employees³⁰, which is representative of the overall UK sectoral profile.

These sub-sectors may use small amounts of animal raw material in their products (for example butter, animal protein, eggs, gelatine etc.), which could bring them into the IE(IPPC)D. The main processes involved in the manufacture of cakes are: mixing, baking and cooling. For biscuit manufacturing the processes involved are: dough mixing, formation of the dough pieces, baking, cooling and packaging. The basic processes involved in chocolate production are: the preparation and mixing of ingredients, refining and conching.

Other sectors which are likely to be affected include³¹:

- 15.7 Manufacture of prepared animal feeds.

This sector can be broken down into two distinct sub-sectors;

- 15.71: Manufacture of prepared feeds for farm animals; and
- 15.72: Manufacture of prepared pet foods.

The animal feed sector consist of 475 enterprises (308 in the compound (livestock) feed and 167 in the pet feed), accounting for 6.8% of the total food and drink manufacturing sector. The animal feed sector employees approximately 13 000 people (9 000 employees in compound animal feed and 4 000 employees in pet feed). Livestock feeds are predominately dry, while pet food may have significant moisture content (for cats and dogs). However, dry pet food also exists (for cats, dogs, birds and rodents). The compound feed manufacturers may also produce dry feeds for pets. Thus there are linkages between the two sub-sectors. In both sectors, the manufacturing process involves blending of a range of ingredients such as cereals, protein sources, vitamins, minerals, fats and

²⁹ Office of National Statistics (2006): *Annual Business Inquiry*
http://www.statistics.gov.uk/abi/downloads/Subsection_DA.xls

³⁰ Based on 2006 data obtained from Nomis labour market statistics: *Annual Business Inquiry, 2008*.

³¹ Based on discussions with key stakeholders.

oils. The process involves grinding and blending of ingredients. Steam is applied in a process known as conditioning before the feed is converted to pellets. The feed pellets are then dried, cooled and packaged.

Based on discussions with stakeholders, **20-40 sites**³² have been identified, which were not previously permitted under IPPC and which *may* fit into the mixed animal and vegetable processing definition in the revised Directive and outlined in Figure 3.1 above. This estimation is based on a response from four of the larger food manufacturing companies in the UK and discussions with the regulators. There is the potential that more sites affected by the amendment exist, although it is not possible to quantify the total number due to the limited information for the sector. Table 3.2 summarises the types and number of installations identified that may be affected.

Table 3.2 Type and Number of Sites Identified That May be Affected by the Changes to the IPPC Directive

SIC Code	Type of Installation	Number. of Sites Potentially Affected
15.7	Manufacture of prepared animal feeds	10-30
15.81, 15.82	Cake manufacturing	5
15.82	Biscuit manufacturing	3
15.89	Meat based Soups	1
15.89	Soups and other products	1
	Total	20-40

It should be noted that the number of sites which are potentially affected depends on the interpretation of capacity by the EA in practice. Industry representatives (FDF, AIC) report that many more installations could be affected if ‘capacity’ is interpreted to be the maximum possible capacity of the plant; most plants have a maximum capacity far in excess of the typical daily production. The estimates in Table 3.2 assume that the EA will continue to take an approach to the assessment of capacity in line with current guidance from the European Commission.

A further 4 sites may be affected in Scotland and 1 in Northern Ireland, according to SEPA and the NIEA. However, these sites have not been confirmed and no further information on these sites could be obtained.

In addition, other than those operators that will be immediately affected by the IE(IPPC)D, there will be others that may apply for a permit, not because they currently exceed the threshold, but to avoid risk of error/miscalculation of their output vs composition in the future, owing to the less certain approach associated with having two variables. The EA experienced this type of behaviour by operators of food and drink installation when the IPPC Directive was initially implemented.

³² This estimate was discussed with stakeholders (FDF, AIC, EA) during the 2011 update and agreed as reasonable. It should be noted that this is a conservative estimate and could increase significantly, depending on: the interpretation of capacity and how uncertainty over a changing proportion of meat is dealt with.

Based on AMEC's experience of the food and drink industry, an assumption has been made that plants employing <10 people, are unlikely to have the production capacity to meet the revised threshold and therefore would fall outside the scope of the IE(IPPC)D. It is not accurately known how many enterprises employ between 1-10 people, however, based on 2006 data obtained from the Annual Business Enquiry, this figure could be above 80% of the food and drink manufacturing sector³³.

Discussions with one of the largest manufacturers of chilled food (including prepared meals, cakes and desserts) in the UK, indicated that all installations for this company that are not already covered by IPPC, would not be affected as they all have a production capacity of <75 tonnes per day.

It could not be determined how many pet food manufacturing installations may be covered by these changes.

3.4 Results

Based on discussions with stakeholders there are a number of sites that may be affected by the amendment to the IPPC Directive related to mixed animal and vegetable processing. Our study identified 20 to 40 potential sites, however this number is likely to be higher³⁴. The total number of affected production installations could not be determined due to the limited availability of data for the sector.

The main environmental impacts associated with mixed food and drink industries include water use, effluent discharges, energy use and waste generation. The sector is a significant water consumer for process consumption, means of conveyance and cleaning. Untreated wastewater can be high in BOD and COD, suspended solids, fats, oils and greases. Main emissions to air from food and drink processes are dust and odour (some caused by VOC). The industry is also a major energy user, the main energy using technologies being process heating, cooling and refrigeration. Emissions to air from combustion processes include CO₂, SO_x, NO_x and particulates. Other emissions to air include refrigerant releases containing ammonia and halogen. The food and drink industry is reported to be the third highest producer of waste of all sites regulated under IPPC.

While these sites that may be affected by the changes were not initially permitted under IPPC, they are covered by legislation which controls the waste, emissions to water and energy use. In addition there are a number of sector specific initiatives which are designed to drive improvements in efficiencies within this sector.

3.5 Summary

There are approximately 6 947 food and drink manufacturing installations in the UK. 369 of these are currently regulated under IPPC. In the UK it is estimated that 25% of all IPPC permitted food and drink installations are 'mixed installations'.

³³ Based on 2006 data from Office of National Statistics: *Annual Business Inquiry, 2008*.

³⁴ A further 4 sites may be affected in Scotland and 1 in Northern Ireland according to SEPA and the EHS.

Consultation with key stakeholders indicates that the addition of a 600 tonnes per day/90 consecutive day threshold for vegetable processing is unlikely to affect any installations in the UK. Therefore, no impacts are expected in relation to this amendment.

However, between 20 and 40 sites have been identified which *may* be affected by the revisions to the IPPC Directive relating to mixed animal and vegetable processing; between 10 and 30 animal feed producers and a further 10 sites which produce ‘other food’ products. The ‘Manufacture of other food products’ sector represents the manufacture of biscuits, cakes, confectionary and soups. These sub-sectors may use small amounts (<10%) of animal raw material in their products (for example butter, animal protein, eggs, gelatine etc.), which may allow them to be captured under this option. Between 10 and 30 animal feed mills are expected to be affected by the revisions to the IPPC Directive, although this estimate is uncertain.

The main environmental impacts associated with mixed food and drink industries include water use, effluent discharges, energy use and waste generation. The Food and Drink BREF and the Environment Agency Sector Guidance Note S6.10³⁵ provide BAT for the prevention and reduction of environmental impacts.

3.6 Costs

3.6.1 Compliance Costs

Compliance costs for the food and drink installations that may be affected by the IE(IPPC)D have been estimated based on discussions with food and drink companies and published information on the potential measures that may be required and their associated costs. Due to the diverse nature of the food and drink sector and limited information on the types of food and drink companies that will be affected, it is difficult to understand what actions will need to be taken by companies not previously regulated under IPPC Part A.

Based on professional knowledge and understanding of the generic environmental impacts of the food and drink sector, it may include the following:

- Development of a formal environmental management system;
- Development of a site closure plan;
- Development of an accident management plan;
- Review of the containment and pollution prevention measures provided for the potentially polluting substances held on-site in order to prevent fugitive losses, including:
 - Review of bunding of raw material storage vessels;

³⁵ Environment Agency, ‘Sector Guidance Note IPPC S6.10’. Available from: <http://publications.environment-agency.gov.uk/pdf/GEHO1205BJZJ-e-e.pdf>

- Review of the condition of all sub-surface pipe work (i.e. through a drainage survey).
- Monitoring and measuring of emissions (to air and to sewer/controlled waters);
- Review of cleaning techniques, including assessing opportunities for waste minimisation and cleaning agent selection;
- Noise management plan;
- Odour management plan.

3.6.2 Administrative Costs

Operators

Previous Regulatory Position

Under the ‘previous regulatory’ permitting regime, smaller scale industries will be controlled by the ‘Part B’ regime of the Regulations, which focuses on air emissions only. The industry is regulated under Part B, where installations are involved in the following activities:

(a) Processing, storing or drying by the application of heat the whole or part of any dead animal or any vegetable matter (other than treatment of effluent) if these activities: (i) are not covered by Part A (1) or A(2), (ii) is not an excluded activity, or (iii) which may result in releases to air of any substance in paragraph 6(3) of Part 1, or any offensive smell noticeable outside premises.

For the purposes of this study we assume that all affected installations will be regulated under the ‘Part B’ regime and will face costs, based on the charges for Part B permits in England and Wales (2010/11):

- Subsistence costs (annual cost):
 - Subsistence charge: £510’
 - Subsistence time costs: £900-£1 800.

IED

Under the Environmental Permitting (England and Wales) Regulations, mixed food and drink installations would be classed as tier 3 facilities, which means they are regarded as being more complex and high risk facilities that require a more detailed and individually-tailored permit. The associated costs for application submission fees and annual subsistence charges for these installations will therefore be based on the relevant permit application charge multiplier for that facility, multiplied by the relevant Environmental Protection Operator and Pollution Risk

Appraisal (EP-OPRA) charging score for that facility. Based on the 2010/2011 figures the permit application charge multiplier is £201 and the subsistence charge multiplier is £97, and the full surrender charge multiplier £124.

Administrative costs for operators within England and Wales can be broken down into two main elements each of which can be further sub-divided:

- Permit application (one-off cost):
 - Permit application fee (£10 000-£20 000);³⁶
 - Time to prepare the permit (staff time, consultancy fees) - between £20 000-£60 000 depending upon the extent to which external consultants are used, the complexity of the operations and the extent to which emission monitoring and modelling is required;
 - Improvement costs³⁷ - (e.g. costs for secondary containment, minimisation studies, odour abatement, setting up a management system etc) - between £30 000 and £350 000. Costs are variable depending on the issue, ranging from a few thousand pounds for secondary containment improvements up to several million pounds for the installation of thermal oxidiser abatement plant or the installation of effluent treatment plant.
- Subsistence costs (annual cost):
 - Subsistence Charge (£6 000-£10 000);³⁶
 - Annual Operational costs³⁷ - (staff time for management and reporting) - generally between £25 000 and £65 000 per year including on-site resource costs for management, reporting and emissions monitoring requirements.

One-off costs have been annualised over the lifetime of a permit (assumed to be 20 years in line with Defra, 2006) with a discount rate of 3.5%.

Within Northern Ireland, the fees and charges associated with IPPC are set out in a guidance document published by EHS (now the NIEA)³⁸. The administrative costs are component-based³⁹ and include:

- Permit application (one-off cost):

³⁶ Please note that this estimate has not changed from the 2010 estimate, as the change in charge multipliers was ~1%, which is insignificant in comparison to the uncertainty surrounding the original estimate.

³⁷ Stakeholders (FDF, AIC) were contacted for the 2011 update and stated that there was no reason to change the previous estimates of improvement and operational costs.

³⁸ Department of Environment (Northern Ireland), (2010), 'The Pollution and Control (Industrial Pollution and Radiochemical Inspectorate) Charging Scheme (Northern Ireland) 2010. Available from: http://www.doeni.gov.uk/niea/ppc_charging_scheme.pdf

³⁹ Currently the component-based charging scheme is calculated for 6.8 Part A 1(d) as 1 component charged where processing is less than or equal to 5 times the Schedule 1 thresholds (300 t/d & 75 t/d). 2 components are charged where processing capacity is greater than 5 times the Schedule 1 thresholds.

- Permit application fee (£4 483 per component);
- Time to prepare the permit (staff time, consultancy fees) - between £20 000-£60 000 depending upon the extent to which external consultants are used, the complexity of the operations and the extent to which emission monitoring and modelling is required;
- Improvement costs - (e.g. costs for secondary containment, minimisation studies, odour abatement, setting up a management system etc): £30 000-£350 000. Costs are variable depending on the issue, ranging from a few thousand pounds for secondary containment improvements up to several million pounds for the installation of thermal oxidiser abatement plant or the installation of effluent treatment plant.
- Subsistence costs (annual cost):
 - Subsistence charge (£1 591 per component);
 - Annual Operational costs - (staff time for management and reporting) - generally between £25 000 and £65 000 per year including on-site resource costs for management, reporting and emissions monitoring requirements.

In Scotland, the fees and charges associated with IPPC are set out in a guidance booklet published by SEPA⁴⁰. The administrative costs are activity-based and include:

- Permit application (one-off cost):
 - Permit application fee (£3 159 x (A+2) where A is sum of application charge units). For installations falling under 6.8 Part A (1)(d) this charge can be calculated to be £3 159 x (3+2) = £15 795;
 - Time to prepare the permit (staff time, consultancy fees) - between £20 000-£60 000 depending upon the extent to which external consultants are used, the complexity of the operations and the extent to which emission monitoring and modelling is required;
 - Improvement costs - (e.g. costs for secondary containment, minimisation studies, odour abatement, setting up a management system etc) - between £30 000 and £350 000. Costs are variable depending on the issue, ranging from a few thousand pounds for secondary containment improvements up to several million pounds for the installation of thermal oxidiser abatement plant or the installation of effluent treatment plant.
- Subsistence costs (annual cost):
 - Subsistence charge ($S \times C \times £700$ (where S is the number of subsistence charge units and C is the appropriate compliance factor)). For installations falling under 6.8 Part A (1)(d) this charge can be calculated to be $2 \times 3 \times £700 = £4 200$;
 - Annual Operational costs - (staff time for management and reporting) - generally between £25 000 and £65 000 per year including on-site resource costs for management, reporting and emissions monitoring requirements.

⁴⁰ [SEPA](#), (2010), 'Pollution Charges and Control (Parts A and B) Fees and Charges (Scotland) Scheme 2010'.

Please note that the previous regulatory position administrative costs for part B permits were not considered in the previous regulatory position, as they are presumed to be amortised for existing installations.

Regulators

It has been assumed that the permit fees and subsistence charges paid by operators through the charging schemes employed in the UK would be sufficient to cover regulators' costs for the processing of the permit and ongoing enforcement.

Results

The administrative costs associated with the IE(IPPC)D are summarised in Tables 3.3 and 3.4 below. For calculation of these costs, it has been assumed that 10 food installations and between 10 and 30 animal feed plants in the UK will be affected. Costs have been estimated on the basis of charges for England and Wales.

The low estimates of the total annual costs under the previous regulatory regime are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation under the previous regulatory regime by low estimate of the number of installations. The low estimates of the total annual costs under IE(IPPC)D are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation under IE(IPPC)D by low estimate of the number of installations. The low estimate of the change in annual costs is calculated by subtracting the low estimate of administrative costs from the low estimate of administrative costs under IE(IPPC)D. The same process is followed for calculating the high estimates, except the high estimates of costs and numbers of installations are used in each case.

Table 3.3 Modelled Administrative Costs for Mixed Animal and Vegetable Sites

Activity	No. Installations		Admin. costs / installation, recurring: £000 p.a.		Admin. costs / installation, annualised non-recurring: £000 p.a.		Total annual admin. costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
Previous Administrative costs	20	40	£1.4	£2.3	£0.0	£0.0	£0.0	£0.1
IE(IPPC)D administrative costs	20	40	£31.0	£75.0	£2.1	£5.6	£0.7	£3.2
Increase in administrative costs under IE(IPPC)D	20	40	£29.6	£72.7	£2.1	£5.6	£0.6	£3.1

Note 1: All figures are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

3.6.3 Compliance Costs

Estimates of the compliance costs likely to be incurred by operators of the mixed food and drink installations falling within the scope of the IE(IPPC)D are presented in Table 3.4. These costs are broken down into capital (one-off) and annual costs. For calculation of these costs, it has been assumed that between 20 and 40 installations in the UK will be affected.

Due to the wide range of food and drink industry activities and resulting BAT, it has not been possible to capture all of the costs associated with ensuring compliance with the requirements of the IE(IPPC)D. The costs do not reflect the significant costs that may be incurred through major capital projects, such as installation of thermal oxidisers, odour treatment or effluent treatment plants. These have been required for some food and drink installations which were previously permitted under IPPC and the associated costs are reported to have been in the order of several million pounds⁴¹. The low estimates of compliance costs are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation. The high estimates of compliance costs are estimated by multiplying the higher estimates of the sum of the recurring and non-recurring annual costs per installation.

Table 3.4 Modelled Compliance Cost Ranges for Vegetable and Mixed Vegetable and Animal Processing Sites

	No. Installations		Compliance costs / installation, recurring: £000 p.a.		Compliance costs / installation, annualised non-recurring: £000 p.a.		Total annual compliance costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
Compliance costs	20	40	£1.5	£1.5	£1.3	£4.4	£0.1	£0.2

Note 1: All figures are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

Note 3: Annualised compliance costs are estimated by multiplying the unit per installation by the assumed proportion of installations which will require the measure.

⁴¹ Stakeholders were contacted (FDF, AIC) were contacted as part of the 2011 update, but were unable to provide estimates of the costs for major capital compliance costs, or the number of installations which may require them.

3.7 Benefits

3.7.1 Approach

The following table summarises the benefits likely to be achieved from permitting those mixed installations with a production capacity between 75-300 tonnes per day and using <10% animal raw material. Due to the lack of available information, it has not been possible to quantify the benefits.

Table 3.5 Environmental Benefits

Benefits	Situation Under IE(IPPC)D	Business as Usual (BAU)
Formalisation of environmental management systems	IPPC permits include standard conditions designed to require the operators to implement and maintain a management system, organisational structure and allocate resources that are sufficient to achieve compliance with the limits and conditions of the permit.	There are no requirements to implement an environmental management system. The discharge consents do not contain conditions to address environmental management.
Fugitive emissions	IPPC permits issued to food and drink installations may contain improvement conditions relating to a need to review and provide secondary containment to raw material storage areas.	This is not addressed.
Odour and Noise	<p>IPPC permits issued to food and drink installations may include improvement conditions which include:</p> <ul style="list-style-type: none"> • A need to have in place odour and/or management plan/s; • Requirements to implement odour abatement measures (i.e. thermal oxidisers, scrubbers etc.) or noise attenuation measures (acoustic cladding etc). 	Noise and odour will be regulated by the local authority as Statutory Nuisance.
Waste reduction, minimisation and resource efficiency	All IPPC permits include standard conditions designed to address waste reduction, minimisation and resource efficiency.	Waste reduction, minimisation and resource efficiency are currently addressed through industry initiatives, although these are not enforced.

Food and drink manufacturing installations can affect the environment through the release of emissions, including wastewater, air pollutants such as dust, odour and pollutants from combustion processes (CO₂, SO_x, NO_x), water and energy consumption.

In the UK the food and drink industry is already covered by water emissions regulations, packaging requirements and waste management regulations. The larger installations are regulated under IPPC. The main benefits of the IE(IPPC)D would be to enforce further resource efficiency measures to reduce water consumption, wastewater generation, packaging, waste and energy usage. Resource efficiency issues are currently being addressed through voluntary industry initiatives such as the FDF's five fold ambition for the environment and the Courtauld Commitment. Reductions in the volume of wastewater generated in this sector can be achieved through process optimisation, resource efficiency and application of best practice.

Regulation under the scope of the IE(IPPC)D is likely to provide opportunities to reduce emissions caused by energy use (CO₂, SO₂, NO_x) as energy efficiency considerations must be made by site operators at permit application.

It has not been possible to quantitatively assess these benefits and those of reducing other environmental impacts due to the limited availability of data for the sector.

3.8 Quarterly Basis Amendment

The adopted IE(IPPC)D removes the phrase “average value on a quarterly basis” from earlier drafts of section 6.4(a)(ii), when referring to the calculation of finished product production capacity of facilities treating and processing vegetable raw materials.

The EA is currently discussing this issue with industry and has indicated that they would review its guidance in light of the published IE(IPPC)D to determine whether or not any changes would be required with respect to the way in which product production capacity is determined for vegetable processing plants. A conclusion had not been reached at the time of the 2011 update to this report.

3.9 Competition Assessment

The competition guidelines (August 2007)⁴² set out four main questions in order to ascertain whether the IE(IPPC)D (Recast) would affect the market by:

1. Directly limiting the number or range of suppliers?
2. Indirectly limiting the number or range of suppliers?
3. Limiting the ability of suppliers to compete?
4. Reducing suppliers’ incentives to compete vigorously?

A brief summary of the four questions are presented in Table 3.6 (below) and for those where the answer to one of the questions is “Yes”, then an explanation is provided in the following sections.

The results should be included in the “Evidence Base” within the Impact Assessment template.

⁴² http://www.offt.gov.uk/shared_offt/reports/comp_policy/oft876.pdf

Table 3.6 Summary of the Competition Test

Question	Mixed Food and Drink Installations
Q1. Directly limit the number or range of suppliers?	No
Q2. Indirectly limit the range of suppliers?	No
Q3. Limit the ability of suppliers to compete?	No
Q4. Reduce suppliers' incentives to compete vigorously?	No

An assumption could be made that plants employing <10 people, are unlikely to have the production capacity to meet the threshold and therefore would fall outside the scope of IPPC. It is not accurately known how many enterprises employ between 1-10 people, however based on 2006 data obtained from the Office of National Statistics Annual Business Enquiry, this figure could be above 80% of the food and drink manufacturing sector.

Fewer uncertainties and discrepancies between EU member states may reduce market distortions and create a more “level playing field” for companies. Between 20 and 40 installations (see Table 3.1) have been identified that may be affected by the revisions and this represents a small number relative to the overall number of enterprises (6 947 food and drink manufacturing enterprises).

3.10 Distributional Impacts on Different Sizes

As mentioned in the previous section between **20 and 40 installations** are likely to be affected. Based on the costs shown in section 5 and turnover data it is estimated that these installations could incur annualised costs in the region of £83k-493k which would represent a cost/turnover percentage of 1-7%. This is shown below in:

Table 3.7 Annualised Costs (£) per Affected Installation

Costs per Affected Installation (£)		
Turnover		
Turnover of manufactures of other food product (SIC code 15.8)	£21,148,000,000	
Number of enterprises	3,133	
Average turnover per enterprise p.a.	£6,750,080	
Cost of IPPC Legislation per Affected Installation	Low	High
Average annualised cost of compliance	£2,345	£5,476
Average annualised cost of admin	£34,489	£103,975
Average total annualised cost of IPPC (compliance +admin)	£36,834	£109,450
Average cost as % of turnover	1%	2%

Note: It is assumed in the absence of better data an even distribution of turnover amongst the enterprises. Average total annualised costs are based total annualised values (one off + annual costs) divided by the number of affected installations.

Turnover reflects the value of goods sold and is not necessarily an indicator of profitability since it does not take into consideration of the costs to industry of making their products (e.g. labour, capital, raw materials etc). However in the absence of profitability indicators, turnover information provides a useful indicator in order to understand the significance of the costs of compliance.

Costs under a high scenario represent a significant impact on an installation's profitability if these costs cannot be passed on. Without further installation level information on their products (who they supply and compete against) it is unclear whether pass on of costs is possible in the price. It is worth noting that operating costs are likely to be rising in part due to higher energy and grain prices and combined with growing consumer pressure on these industries to not increase prices further, it is unclear if these costs would be fully passed on to consumers.

3.11 Social Impact Assessments

3.11.1 Statutory Equality Duties Impact Test Guidance

The impact of the proposals on the people of different ages, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation have been considered and it is not expected that the proposals will have any impact.

3.11.2 Health and Well-being

The impact of the proposals on education, housing, crime, transport and people's lifestyle choices have been considered and it is not expected that the proposals will have any impact. The impacts of the proposals are discussed in depth in the benefits section and the impact on employment is discussed in the competition assessment section.

3.11.3 Human Rights

The impact of the proposals on human rights has been considered and it is not expected that the proposals will have any significant impact.

3.11.4 Justice

The impact of the proposals on the courts, tribunals, prisons, probation, the legal aid budget, the prosecuting bodies and the judiciary have been considered and it is not expected that the proposals will have any significant impact.

3.11.5 Rural Proofing

The proposals may increase administrative and compliance costs for animal feed mills if the installations meet the threshold criteria; animal feed mills may be located in rural areas. The potential administrative and compliance costs represent a not insignificant proportion of the average turnover for installations in this sector (see above). The potential impacts of the proposals on animal feed mills are:

- If the animal feed mills are able to pass-through costs, the price of animal feed will increase, which will adversely impact on the profitability of livestock operations; and
- If the animal feed mills are not able to pass-through costs, these installations will become less profitable and those which already operate on the margin of profitability may be forced to close.

3.11.6 Sustainable Development

The inclusion of new installations in the scope of the IE(PPC)D will increase scrutiny of the installations waste production and energy and water efficiency; this scrutiny is expected to improve the installations' performance in these areas. However, it has not been possible to estimate the scale of improvement in this study.

4. Impact Assessment for the Preservation of Wood and Wood Products

4.1 Background and Definitions

The main objective of this report is to assess the likely impacts to the UK of the IE(IPPC)D, which sets a treatment capacity threshold of $>75 \text{ m}^3$ but specifically excludes the exclusive treatment of wood for sapstain.

The published IE(IPPC)D includes a new activity:

“6.10. Preservation of wood and wood products with chemicals with a production capacity exceeding 75 m^3 per day other than exclusively treating against sapstain”.

The purpose of this inclusion is to cover installations that do not already fall under the IPPC or SE Directives, and which have similar environmental impacts to soil and water as IPPC/SED installations previously covered. This option will affect those larger installations which do not use solvents (or small quantities). The installations within the UK which exclusively treat wood against sapstain will be excluded.

For the wood preservation sector the main objectives are to improve consistency providing a more level playing field since only part of the sector which previously fell under the scope of the IPPC Directive despite having similar environmental impacts to water and soil.

In addition, it is thought that the changes will provide a positive environmental impact through the implementation of BAT for the sector and positive social impacts through the reduced impacts on health.

4.2 Who is Affected?

The transposition of the IE(IPPC)D in the UK will affect the regulatory agencies, trade bodies and wood/timber preservation companies that treat wood with preservatives other than solely against sapstain.

4.3 Previous Regulatory Position Definition

4.3.1 Number of Installations

The wood preservation industry was regulated under The Environmental Permitting (England and Wales) Regulations 2010 and, in Scotland and Northern Ireland, by the Pollution Prevention and Control Regulations for

those respective territories. Under all those Regulations, a distinction is made between “Part A” activities which are subject to IPPC and “Part B” activities which are subject only to air pollution controls. Those Regulations also provide for regulation in accordance with the Solvents Emissions Directive (SED). Table 4.1 sets out the criteria for installations coming under Part A, Part B and SED.

Table 4.1 Criteria for Installations Coming Under IPPC and SED in the UK

Part A Activity	Part B Activity	SED
Curing, or chemically treating timber using any substance listed in paragraph 7 of Part 1 of Schedule 1 to the EP Regulations (or the analogous reference in the Scotland and Northern Ireland Regulations.	(a) Manufacturing products wholly or mainly of wood at any works if the activity involves a relevant activity (Note 1) and the throughput of the works in any period of 12 months is likely to be more than (ii) 1 000 m ³ .	Covered under SED if an installation uses a wood preservative product that contains solvents such as white spirit, involving 25 tonnes or more organic solvent, or the treating of 1 000 m ³ of wood per year.

Note 1: PGN 6/3(04)⁴³ states, “relevant activities” other than sawing are “exempt activities” where, if no sawing were carried out at the works, the activities carried out there would be unlikely to result in the release into the air of any substances listed in paragraph 12 of Part 2 of this Schedule in a quantity which is capable of causing significant harm.’

According to the Wood Protection Association (WPA), there are approximately 500 industrial wood preservation installations in the UK, with a few locations having more than one treatment cylinder⁴⁶. At these installations wood is treated with water-based products, solvent-based products or creosote. In the UK a varying mixture of chemicals/methods are used to treat sapstain, commonly used are borates, quaternary ammonium compounds and IPBC⁴⁴. If the wood is treated for sapstain this will normally occur where the timber is converted in to logs. Information on the size distribution of wood preservation companies within the UK is very limited. This is partially down to the operation of wood preservation being only one stage in the operations of the larger wood products companies, often with more than one activity.

Table 4.2 provides details of the number of installations in the UK and the numbers of potentially affected by the changes. The total number of installations affected was supplied by the Wood Protection Association (WPA)⁴⁵ and the number of installations with Part B permits and those excluded due to exclusively treating sapstain were taken from the 2007 Defra survey of permitted installations⁴⁶.

⁴³ Defra, (2004), ‘Process Guidance Note 6/3(04): Secretary of State’s Guidance for Chemical Treatment of Timber and Wood Based Products’

⁴⁴ OMACIDE IPBC 30 INDUSTRIAL FUNGICIDE: pesticide's toxicity code is 1, which corresponds to a toxicity category of Danger. Active Ingredients 30% by Mass ‘3-IODO-2-PROPYNYL BUTYLCARBAMATE’.

⁴⁵ Aston, D. :Personal communications in April 2008 and August 2011.

⁴⁶ Defra (2007), Local Pollution Control Statistical Survey 2006/07: A Survey of Local Authorities in England and Wales by the Department for Environment, Food and Rural Affairs and the Welsh Assembly Government.

Table 4.2 Number of Installations in the UK and Number Potentially Affected By the Changes⁴⁶

No. of Installations In UK	Average Production Capacity Per Installation M ³ /Day	No. of Installations Covered By IPPC Part B	No. of Installations Excluded Due to Exclusively Treating Sapstain	No. of Installations Potentially Affected
500	20-30	43 ⁴⁷	6	244

According to one of the UK's main suppliers of preservative products, the wood preservation industry is a sector producing around three million cubic metres of treated wood a year⁴⁸. From this data an upper limit for the average production could be estimated between 20-30 m³/day (at 200-300 days/year) and the WPA concluded that if a daily 75 m³/day capacity threshold (not adjusted for actual throughput) were to be applied, then more than 50% (250 installations) of the industry in the UK would be above it⁴⁵. From information obtained from the Defra survey for 2007 on numbers of Part B PPC regulated sites, there are some 43 wood preservation installations⁴⁹. It should be noted that the total number of installations which will be affected by the IE(IPPC)D will be much higher than those which currently hold Part B permits, as the IE(IPPC)D threshold limits are based on daily treatment capacity, whereas the thresholds for Part B permits are currently based on the actual annual throughput of the installation.

Further consultation was carried out with the WPA and it was highlighted that a relatively small amount of UK grown timber is treated exclusively with sapstain control products within the UK. Figures provided by the WPA indicate that there are only 6 facilities in the UK which operate sapstain only treatments. So 244 of the installations seem likely to fall under the scope of the IE(IPPC)D.

Of the seven installations contacted for this assessment, four were identified that were likely to have with production capacities above 75 m³/day and which were not already a Part A activity. Two of the operators contacted reported that there were no emissions from operations onsite as all runoff and solution is recycled back into the process and in addition all areas are adequately bunded and all necessary control measures are in place to prevent any water or soil contamination. No discharge consents were required by these sites.

Actual plant throughput can easily be quantified through the plant management procedures for recording treatment charges, quantities of wood preservatives used and compliance with timber treatment process specifications. Most plants now operate on automated cycles. Double vacuum/low pressure plants nominally have a much higher potential capacity than high vacuum pressure plants because the process cycle times are much shorter.

⁴⁷ Based on 'Defra (2007), Local Pollution Control Statistical Survey 2006/07: A Survey of Local Authorities in England and Wales by the Department for Environment, Food and Rural Affairs and the Welsh Assembly Government.' figures; not including installations in Scotland. According to the NIEA there are no permitted wood preservation installations in Northern Ireland.

⁴⁸ Personal communication, April 2008

⁴⁹ This is for England and Wales only and does not include installations regulated in Scotland, numbers of which could not be determined for this assessment. Only an estimation of numbers in England and Wales could be made.

The business patterns for some key types of treatment plants can vary seasonally, for example the fencing industry. Some plants only treat for their own wood product manufacturing requirements whilst others provide a timber treatment service for third parties.

4.4 Overview of Previous Immediately Relevant Legislation

The most important environmental legislation for the wood preservation industry is related to the use of organic solvents and biocides. The UK is one of a few Member States that have introduced specific requirements for wood preservation sector.

4.4.1 Environmental Permitting (EP) Regulations, 2010

The wood preservation industry is regulated under the Environmental Permitting Regulations 2010 (in England and Wales) as follows:

Timber Activities Section 6.6 Part B process:

(a) Manufacturing products wholly or mainly of wood at any works if the activity involves a relevant activity and the throughput of the works in any period of 12 months is likely to be more than—

(ii) 1 000 cubic metres.

‘Relevant activity’ is defined for these purposes as meaning ‘the sawing, drilling, sanding, shaping, turning, planing, curing or chemical treatment of wood’. If wood is only sawed, or only subject to any other ‘excluded activity’ (also defined), the threshold is 10 000 cubic metres.

The same activity definitions are contained in the Pollution Prevention and Control Regulations for Scotland and for Northern Ireland.

The sector is also covered under these Regulations for the use of certain substances as follows:

Timber Activities Section 6.6 Part A(1):

Curing, or chemically treating timber using any substance listed in paragraph 7 of Part 1 of Schedule 1.

However, there are currently no timber treatment installations covered by Part A (1) in the UK⁵⁰. Listed substances such as tributyltin compounds/pentachlorophenol/lindane/dieldrin or chromate copper arsenate (CCA) are not in use any more in the UK. This is a result of either industry led/market response changes or the withdrawal of authorisations for the placing on the market of wood preservative formulation containing them.

⁵⁰ Communication with Environment Agency.

Surface treating timber using organic solvents in a plant with a consumption capacity of more than 150 kg/hour or more than 200 tonnes per year is a Part A activity; the WPA indicated that there are currently no Part A(1) installations in the UK⁵¹. Below those thresholds, coating activities likely to use more than 5 tonnes per year of organic solvents are Part B activities. Irrespective of solvent use, chemical treatment of wood is a Part B activity if the annual throughput is more than 1 000 cubic metres. For the purposes of this study it is assumed that any installation which consumes more than 5 tonnes per year of organic solvents will also process more than 1 000 cubic metres of timber annually. According to the DEFRA survey 2007, there are approximately 43⁵² installations in the UK with a throughput of 1 000 m³ per annum or more⁵³. Part B activities are regulated for emissions to air only.

4.4.2 Solvent Emissions Directive (SED)

The SED requirements are implemented in the UK through the Regulations which also transpose IPPC requirements. The Directive focuses on the limitation of organic solvents in certain activities and installations. The Directive establishes emission limit values for VOCs in waste gases and maximum levels for fugitive emissions (expressed as percentage of solvent input) for solvent using operators. Installations fall under the scope of the SED if they use a wood preservative product that contains solvents such as white spirit, involving 25 tonnes or more organic solvent, or the treating of 1 000 m³ of wood, per year.

The UK have established the Process Guidance 6/3 (04) ‘Chemical Treatment of Timber and Wood Based Products’⁵⁴ for the sector which introduces total emission limit values and emission and fugitive limits for VOCs.

The VOC emission limit for all processes/activities with a solvent consumption of 40 tonnes and more is 150 mg/Nm³.

Table 4.3 VOC Emission Limits for Chemical Treatment of Timber and Wood Based Products in UK

Activities - Solvent Consumption	VOC- Emission Limits
All processes/activities solvent consumption 80 tonnes or more*	VOC expressed as total C excluding particulate matter 150 mg/Nm ³
All processes/activities solvent consumption 40-80 tonnes**	

⁵¹ Aston, D. :Personal communications in April 2008 and August 2011

⁵² These numbers are for England and Wales only and do not include installations in Scotland. The EHS stated that there are no permitted installations in Northern Ireland.

⁵³ The number of these 43 installations which would be included within the scope of IE(IPPC)D is uncertain, as it is not clear if from the survey whether the treatment of timber is chemical or biological, but it is thought that the majority will use chemical treatment, as those which use sapstain have been excluded. If a lower number of installations have Part B permits, the increase in administrative costs will be marginally lower.

⁵⁴ Defra, (2004), ‘Process Guidance Note 6/3 (04) for Chemical treatment of timber and wood based products’

New, substantially changed and by 31 October 2007 existing SED installations with a solvent consumption of 25 tonnes or more, should have applied the provisions of:

- Total Emission Limit Values for SED installations, i.e. 11 kg/m³; and
- Emission and Fugitive Limits for SED installations (Table 4.4).

Table 4.4 VOC Contained and Fugitive Emission Limits For Activities Not Using Total Emission Limit Values in UK

VOC In Waste Gases	Emission Limits/Requirements	Fugitive Emission Values
Wood treatment installations Solvent consumption 25 tonnes or more	VOC expressed as total mass of organic carbon, Note 1	25 % of solvent input
Waste gases from oxidation plant used as abatement	Until 1 April 2013, Note 2 150 mg C/Nm ³	
Waste gases from turbines, reciprocal engines or boilers used as abatement plant	Until 1 April 2013, Note 2 150 mg C/Nm ³ 100 mg C/Nm ³	
Any other waste gases	100 mg C/Nm ³	

Note 1: The emission limit requirements should not apply to processes involving the use of creosote where no other organic solvent borne preservative is employed.

Note 2: For abatement plant existing prior to 1 April 2001, the higher contained emission figure may be used until 1 April 2013 if: the total emissions of the whole installation (fugitive + contained emission) does not exceed the total emission allowed after 1 April 2013 (Fugitive + contained emission after 1 April 2013).

These total emission limit values and waste gas emission and fugitive emission limits correspond to the SED values and limits except for the fugitive emission value which is 25% of the solvent input, whereas the SED imposes 45%. According to all processes/activities should comply with the emission limits and provisions with regard to non-VOC releases.

An overview of other legislation which affects the wood preservation sector is included in Appendix D.

4.5 Results

The environmental issues related to the impregnation of wood are mainly emissions to air, discharges of hazardous substances to water and risks of soil contamination. The preservatives applied in this industry are intended to prevent the action of organisms that deteriorate wood such as fungi and insects and therefore will be toxic to these organisms (and possibly other non-target organisms) at the concentrations applied to wood. The three main types of preservatives that are used by the industry are: creosote, water-based used at low pressure, water-based used at high pressure and solvent-based preservatives. The main environmental impacts of wood preservation installations relate to emissions to soil and (ground) water. The industry has in the past been a significant source of some POPs

(persistent organic pollutants) mainly polycyclic aromatic hydrocarbons (PAHs), due to the use of creosote. In addition, there have been concerns over the potential releases of heavy metals, such as copper and chromium, to soil and water.

BAT for the Wood Preservation Sector

The BREF most relevant to the sector is 'Surface Treatment Using Organic Solvents'. The BREF considers industrial processes for the preservation with, or immersion of, wood in organic solvent-based preservatives, creosote or solvent free preservatives. The impregnation with solvent use with a consumption of less than 150 kg/hour and less than 200 tonnes/year is not covered by the IPPC Directive. The BREF contains a number of practices considered to be BAT and which could be applied to the wood impregnation sector. However, there are only a small number of plants using organic solvent-based preservatives which the BREF can be applied to.

The BREF mentions BAT for the reduction of emissions to soil and water from wood impregnation as:

- Drain surplus pesticide system in contained areas for both water- and solvent based systems. The collected pesticide can either be re-used or disposed of as hazardous waste;
- Other measures;
- Take preventive measures (e.g. good housekeeping measures concerning the evacuation of the treated wood from the application area);
- Install a rework system that returns the dripped agent to the storage vessel and/or have an impermeable floor so the risk of soil contamination and possible (ground)water pollution can be avoided;
- When impregnation takes place under pressure usually the vessel is put under vacuum as a final stage of the procedure. Afterwards the wood produces less drip down;
- A fixation process can be performed or otherwise the wood can be stored inside;
- In order to reduce the environmental effects of the use of creosote it is advisable to use a type of creosote with a limited PAH-content;
- Process wastewater containing chemical preservatives should be contained as part of a closed loop application system;
- Effluents that may contain wood preservative chemicals require an additional level of treatment, such as detoxification (using ultraviolet oxidation) and precipitation or stabilisation of heavy metals, depending on the nature of contamination;
- Storage tanks and components should meet international standards for structural design integrity and operational performance;
- Chemical storage and treatment sites and tanks should be situated in containment areas for example, a covered, walled, concrete area beneath which there is an impermeable membrane. Any spills into this area should drain into a tank/sump located in a contained area from which leaks can be detected;

- Level gauges, alarms, and cut-off systems on storage tanks should be installed to decrease the risk of overfilling;
- Tankers delivering bulk shipments of treatment chemicals should employ spill prevention measures;
- A contained and impermeable post treatment dripping zone should be located within the total containment area. Residue from dripping timber should be collected for reuse;
- Treatment chemicals that can be heat-cured onto wood should be adopted to prevent leaching properties. The curing machine should be located within the containment area; and
- Treated wood that is cured may be stored in the open. If not cured, wood should be covered and storm water should be collected and treated.

The wood preservation industry has established a Code of Practice for Timber Treatment Installations, which has been endorsed by the UK Government and its agencies, as it references the Secretary of State's Guidance for Chemical Treatment of Timber and Wood Based Products (PG 6/03). It currently forms the basis of how the operator and the regulator can demonstrate BAT. The WPA recommends the Code of Practice (CoP) be used as the basis for BAT by the industry. There are plans to review and update the CoP in line with current legislation and industry practices. The CoP outlines measures that should be taken to eliminate, or where this is not possible, minimise and render harmless any releases to air, water (surface and ground) or land. Discussions with operators of timber treatment installations confirmed that the industry CoP is widely used within the sector⁵⁵ and the following measures are taken to control emissions to soil and water across the industry:

- Bunding of timber treatment plant and wood-preserved storage tanks: The plant associated loading and unloading area and preservative storage tank should be located within a bund. The bund should be impervious and resistant to chemicals that it contains. The bund should be covered in an enclosed area to avoid the collection of rainwater. Provisions should be made for the secure and contained storage of packaging that contains wood preservatives such as 200 litre drums or intermediate bulk containers (IBCs). Bunding should have an adequate capacity to contain a spillage (110% of the total quantity of each). Regular inspections of the bunding should be carried out;
- Post treatment containment and conditioning areas: Treated wood must be held until surfaces are dry and within a bunded area. The dripping area should be contained and impermeable and timber should be transferred from plant to post treatment area within a total containment zone;
- Storage of conditioned timber: Bulk dry treated timber should be stored under cover on an impermeable surface;
- Waste management: Wastes associated with wood preservation processes (i.e. redundant preservative solution, sawdust used to soak up spills, redundant preservative containers, contaminated rainwater from bunds etc), are usually classified as hazardous and should be dealt with as per Hazardous Waste Regulations;

⁵⁵ It is not possible to say exactly how widely used the CoP is, however, all operators contacted for this assessment stated that they follow the CoP, and this was reaffirmed by the WPA and the main preservative suppliers.

- Bulk delivery of chemicals: Containment of any potential spill from the tanker, delivery and/or handling vehicle, taking the discharge system into account. Tankers should discharge chemicals within a contained area close to the bunded storage area; and
- Plant maintenance: A planned written scheme of maintenance and examination should be followed. This should cover all protective devices, pressure valves and pipework that could give rise to pollution in the event of failure.

A separate BREF would need to be established to determine BAT for the sector, building on BAT conclusions contained in the BREF on the Surface treatment using solvents and the Industry Code of Practice.

Impacts of the IE(IPPC)D on the UK's Wood Preservation Industry

Two timber treatment companies contacted for this assessment that operate a number of installations stated that there were no emissions to water or soil from onsite processes. These sites were not already covered by IPPC. In these cases, copper based waterborne preservatives are used and all runoff is collected in a sump, and recycled back into the process. The operators stated that this is common throughout the industry. There were no regulatory requirements with regards to discharge consents for discharges to water or any trade effluent consents for discharges to sewer. According to these operators, all necessary control measures were in place to prevent any water or soil contamination. Operators employ BAT through the industry CoP, and related guidance. All installations consulted stated that in addition to the CoP and WPA, the main source of technical and legislative advice came from the preservative suppliers, of which there are four main firms operating in the UK.

Those installations falling under this option will be required to apply for an IPPC Part A permit. Those installations that are above the threshold and are already regulated under a Part B permit for their emissions to air, will most likely be required to acquire a Part A permit to cover their emissions to soil and (ground) water.

Some of the wood preservation installations operating in the UK may hold discharge consents or trade effluent consents for their discharges to surface water or sewer. It is likely that previous discharge limits held by the operators would not provide adequate environmental protection now, with a result that limits will most likely be lowered. Once these installations come under IPPC, their existing discharge consents would be built into their permit.

For those not already covered under IPPC, costs to the operators may be incurred through the requirement of additional abatement, monitoring or plant equipment. All of the installations that were contacted for this assessment, and that were not under IPPC, stated that BAT was applied on their sites through the industry CoP and they did not believe that significant measures would be required to comply with the IE(IPPC)D although until the next iteration of the BREF is published this is an area of uncertainty. The majority are using water-based alternatives with significantly lower toxicity, and any runoff is reused back in the process. This option should have limited impact on those installations already covered under IPPC or SED, the main cost impact being the possible requirement to be regulated under a Part A (1) or Part A(2) permit, as opposed to a Part B which only covers emissions to air. A decision on who will regulate point 6.10 installations in England and Wales has yet to be made.

For those already regulated as Part B activities, there ought to be no difference in impacts on business from having one or other regulator, except in relation to permit charges.

Being covered by IPPC may also lead to implementation of specific additional BAT concerning soil protection and water treatment. The most significant impacts in terms of regulatory costs will be for those installations not already covered by IPPC or SED. The costs incurred by installations affected in this way will very much depend on the environmental performance of each operator, the scale of the company and the measures already in place for environmental protection. Only limited information could be obtained for this assessment on potential costs to industry affected by this option.

The main impact for the Regulatory authorities would be the additional workload involved in processing applications, compliance checking, site inspections etc.

From discussions with one operator, the main concern of further regulation for the industry would be the cost implications for preservatives and plant equipment. The operator believes that the cost of these would increase and stated that the price of treated wood in the UK has not increased for 10 years. This may have significant implications for industry competition with other Member States. It was the operator's belief that many timber treatment companies are shutting down their sites in the UK and relocating to other less regulated parts of Europe and shipping treated wood back to the UK for sale.

4.6 Costs

4.6.1 Compliance Costs

From discussions with Defra, the Environment Agency Local Authority Unit and other stakeholders, there is some uncertainty over the exact measures that wood preservation installations previously covered may have to implement if they were to be regulated under IPPC following implementation of the IE(IPPC)D. The evidence gathered during this report indicates that a combination of other regulatory controls⁵⁶ and use of the Industry Code of Practice, results in a high level of overall environmental protection that is comparable (in most aspects) to that required under application of BAT within IPPC. It is therefore not anticipated that there will be any significant measures required by the industry to ensure compliance, due to the reduced use of the main pollutants of concern as a result of existing legislation and the fact that BAT is already applied throughout the industry⁵⁷. This leads to an assumption that there will be no additional operational costs associated with improvements to meet BAT under the requirements of IPPC.

⁵⁶ Biocidal Products Regulations (SI 2001/880) (as amended) and Biocidal Products Regulations (Northern Ireland) (SR 2001/442) (as amended).

⁵⁷ Communication with, WPA.

4.7 Administrative Costs

Operators

The administrative costs that will apply to operators following implementation of IE(IPPC)D are related to the transition from the previous Part B process (i.e. outside of the previous scope of IPPC) to a Part A process or from a previous position of no regulation to Part A.

Part B

The chemical treatment of timber and wood based products is Part B activity and is regulated by the local authority⁵⁸. It has been assumed that ‘PG6/3(04) – chemical treatment, timber, wood-based products’ will normally be considered to be a low standard risk activity, as the Classification of processes by Advisory Panel on Risk Ranking (CAPPR)⁵⁹ has ranked this activity as a category 1 Part B activity⁶⁰. The ongoing administrative fees for those installations which required a Part B permit under the previous regulatory regime is £739⁶¹. Permitting charges for Scotland and Northern Ireland are shown in Table 4.5 (below).

In addition to the administrative costs associated with the permit application and subsistence charges, there is also a cost to the operator associated with compliance and reporting, record keeping, inventory preparation, staff training and inspections. Indicative estimates from industry sources appear to suggest that this may be in the region of £400 per installation.

Table 4.5 Current Cost-Estimates for a Part B Permit (Per Installation)

Cost Element	Unit Cost (£/Installation) England & Wales	Unit Cost (£/Installation) Scotland	Unit Cost (£/Installation) Northern Ireland
Subsistence charge	£739 ¹	£4,180 ²	£976
Subsistence time costs	£400	£400	£400
Sub-Total	£1,139	£4,580	£1,376

⁵⁸ ‘Business Link (website): Information. Support. Compliance: Environmental permits – who needs to comply’. Available from:

<http://www.businesslink.gov.uk/bdotg/action/detail?itemId=1086299320&r.11=1079068363&r.12=1086048470&r.13=1086287989&r.s=sc&type=RESOURCES>

⁵⁹ Defra, (March 2009, revised June 2009), ‘Local Air Pollution Prevention and Control: LAPPC Risk Method’

⁶⁰ Please note that as the standard risk categories consider the proximity of sensitive receptors, some installations may be categorised as higher risk.

⁶¹ Defra, (2011), ‘Charging scheme for local authorities: The local authorities permits for Part B installations and mobile plant (fees and charges) (England) Scheme 2011’.

Note 1: Subsistence charge is based on a standard permit cost.

Note 2: Based on an average compliance score of 1.

Part A(2)

All costs have been assessed on the basis that all installations will be subjected to a standard permit. All installations for the assessment have come under part A(2) because from our engagement with the industry they do not use substances listed under part A(1) therefore for the purpose of the impact assessment the costs are similar to Part B costs.

In addition to the administrative costs associated with the permit application, subsistence and surrender charge, there is also a cost to the operator associated with completing the application to the required standard, which has been estimated to be between £6 000 and £10 000 per installation⁶². Additionally, once the permit is in place, there is a cost associated with compliance and reporting, record keeping, inventory preparation, staff training and inspections. Estimates based on previous experience and feedback from industry suggests that this may be in the region of 2 to 3 man-days per month per installation. Based on an environmental manager salary band of between £25 000 and £40 000⁶³, this would work out to be costs in the range of c£2 900 to £6 920 per installation.

Table 4.6 Current Cost-Estimate Ranges For a Part A(2) Permit (Per Installation)

Cost Element	Unit Cost (£/Installation) England & Wales ⁶⁴	Unit Cost (£/Installation) Scotland ⁶⁵	Unit Cost (£/Installation) Northern Ireland ⁶⁶
Permit application fees	£1,590	£3,224-£9,477 ^{1,2}	£1,779
Application preparation costs	£6,000-£10,000	£6,000-£10,000	£6,000-£10,000
Subsistence charge	£510-970 ¹	£557-£2,100 ^{1,2}	£1,073
Subsistence time costs	£2,900-£6,920	£2,900-£6,920	£2,900-£6,920
<i>Sub-Total</i>	<i>£11,060-£19,480</i>	<i>£12,681-£28,479¹,</i>	<i>£11,752-£19,772</i>

Note 1: Lower bound relates to a low impact Part A installation; higher to a bespoke Part A(2) installation.

Note 2: Application charging unit A = 1, Subsistence charging unit = 3, and complexity (C) is assumed to be 1 for wood preservation activities.

⁶² Costs have been estimated from research previously conducted by AMEC on behalf of Defra for IPPC application costs for Part A2 installations.

⁶³ Employer add-ons calculated at 25% of basic salary.

⁶⁴ Environment Agency, (2010), 'Environmental Permitting Charging Scheme Guidance 2010/11'. Available from: http://www.environment-agency.gov.uk/static/documents/EP_scheme_and_guidance_2010-11.pdf

⁶⁵ SEPA (2010), 'Pollution Prevention and Control (Parts A and B) Fees and Charges (Scotland) Scheme 2010'.

⁶⁶ Ministry of the Environment (Ireland), (2010), 'The Pollution Prevention and Control (Industrial Pollution and Radiochemical Inspectorate) Charging Scheme (Northern Ireland) 2010'.

Regulators

It has been assumed that the permit fees and subsistence charges paid by operators through the charging schemes employed in the UK would be sufficient to cover regulators' costs for the processing of the permit and ongoing enforcement.

Results

Having identified that there are 43 wood preservation installations in the UK currently operating under a Part B permit, these installations will bear a reduced cost for transition to a Part A under the IE(IPPC)D. Of the 500 installations falling under Section 6.6, it has been estimated that 244 of these will be affected by the changes. 43 of these will be required to bear the costs for conversion from Part B to Part A and 201 will be required to bear the costs of new applications for operating under a Part A permit. The estimated administrative cost-ranges for the UK associated with the change to wood preservation installations are summarised in Table 4.7. These figures are based on the cost ranges for installations in England and Wales. The costs will vary if substantial numbers of installations are located in Scotland or Northern Ireland.

The low estimates of the total annual costs under the previous regulatory regime are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation under the previous regulatory regime by low estimate of the number of installations. The low estimates of the total annual costs under IE(IPPC)D are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation under IE(IPPC)D by the low estimate of the number of installations. The low estimate of the change in annual costs is calculated by subtracting the low estimate of administrative costs from the low estimate of administrative costs under IE(IPPC)D. The same process is followed for calculating the high estimates, except the high estimates of costs and numbers of installations are used in each case.

Table 4.7 Administrative Costs

Activity	No. Installations (Note 3)		Admin. costs / installation, recurring: £000 p.a.		Admin. costs / installation, annualised non- recurring: £000 p.a.		Total annual admin. costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
Administrative costs under the previous regulatory regime (Part B)	43	43	£1.1	£1.1	£0.0	£0.0	£0.0	£0.0
Administrative costs under the IE(IPPC)D	244	244	£3.5	£7.9	£0.5	£0.8	£1.0	£2.1
Change in administrative costs due to implementation of IE(IPPC)D	244	244	£2.3	£6.8	£0.5	£0.8	£0.9	£2.1

Activity	No. Installations (Note 3)		Admin. costs / installation, recurring: £000 p.a.		Admin. costs / installation, annualised non- recurring: £000 p.a.		Total annual admin. costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High

Note 1: All figures are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

Note 3: The number of installations which previously held a Part B permit and would be included within the scope of IE(IPPC)D is uncertain, as it is not clear if from the survey whether the treatment of timber is chemical or biological, but it is thought that the majority will use chemical treatment, as those which use sapstain have been excluded. If a lower number of installations have Part B permits, the increase in administrative costs will be marginally lower.

4.8 Benefits

The following section summarises the benefits to be had from permitting the wood preservation industry.

4.8.1 Emission Reductions

There may be reductions in fugitive emissions of heavy metals, such as copper, and PAHs from creosote use. However, due to the limited information on emissions from the wood preservation industry, it has not been possible to quantify any emission reductions. In the UK, the wood preservation industry is already meeting the requirements of a number of EU Directives to reduce industry emissions. Both copper and creosote are currently being evaluated through the BPD, and it is expected that the use of creosote will be restricted to only certain applications. If this happens, then any emission reductions from regulation of the industry under IPPC will be minimal. In addition, chromium is not in use in the UK anymore.

The main benefit of inclusion of the wood preservation industry under the IPPC Directive would be when biocidal chemicals are used that are authorised by the BPD without restrictions, the application of controls under IE(IPPC)D would lead to the use of BAT, resulting in a higher protection of the (ground) water and soil. Without a full characterisation of the emissions of biocidal chemicals from UK wood preservation installations, it is not possible to put an estimated figure on the potential benefits.

4.9 Competition Assessment

The competition guidelines (August 2007)⁶⁷ set out four main questions, which requires asking whether the adopted IE(IPPC)D will affect the market by:

1. Directly limiting the number or range of suppliers?
2. Indirectly limiting the number or range of suppliers?
3. Limiting the ability of suppliers to compete?
4. Reducing suppliers' incentives to compete vigorously?

A brief summary of the four questions are presented below in Table 4.10 and for those where the answer to one of the questions is "Yes", then an explanation is provided in the following sections.

The results should be included in the "Evidence Base" within the Impact Assessment template.

Table 4.8 Summary of the Competition Test

Question	Wood Preservation Installations
Q1. Directly limit the number or range of suppliers?	No
Q2. Indirectly limit the range of suppliers?	No
Q3. Limit the ability of suppliers to compete?	No
Q4. Reduce suppliers' incentives to compete vigorously?	No

There is a lack of available data to determine whether any particular type of installation (e.g. due to a particular process or preservation technique/substance) is more affected than another type⁶⁸. For those affected by the threshold, the cost of compliance is expected to be quite low as the sector is already applying what they consider to be BAT through the industry code of practice. The main cost is the cost of the permit and subsistence costs associated with an IPPC permit.

The introduction of the threshold may encourage many smaller installations to reduce their production capacity below 75 m³/day to avoid the cost of a permit. This may also encourage smaller installations planning to enter the industry to have a production capacity of below 75 m³/day. This will larger depend on cyclical demand for treated wood over a given year. If it is estimated that the revenue gained from sales when demand requires production capacity above 75 m³/day outweighs the costs of permits, then installations will still have an incentive to operative

⁶⁷ http://www.offt.gov.uk/shared_offt/reports/comp_policy/oft876.pdf

⁶⁸ It is advisable that this be sought during public consultation.

with a production 75 m³/day. Given that average throughput over the year is in the region of 20-30 m³/day, the adoption of revisions in the IPPC directive may lead to more installations reducing productive capacity below 75 m³/day. This is likely to be an inefficient use of resources (e.g. labour and capital) compared to a situation with larger companies who can benefit from economies of scale.

4.10 **Distributional Effects on Different Sizes**

The main costs of the IPPC are likely to occur on those installations close to the 75 m³/day threshold. Those installations below the threshold are unaffected whilst those significantly above the threshold are likely to be better financially placed to either pass on the additional costs (permit costs) to their customers or partially absorb some of the costs. The introduction of the threshold may encourage those below the threshold to reduce production capacity below 75 m³/day to avoid the costs associated with permits.

4.11 **Social Impact Assessments**

4.11.1 **Statutory Equality Duties Impact Test Guidance**

The impact of the proposals on the people of different ages, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation have been considered and it is not expected that the proposals will have any impact.

4.11.2 **Health and Well-being**

The impact of the proposals on education, housing, crime, transport and people's lifestyle choices have been considered and it is not expected that the proposals will have any impact. The impacts of the proposals are discussed in depth in the benefits section and the impact on employment is discussed in the competition assessment section.

4.11.3 **Human Rights**

The impact of the proposals on human rights has been considered and it is not expected that the proposals will have any significant impact.

4.11.4 Justice

The impact of the proposals on the courts, tribunals, prisons, probation, the legal aid budget, the prosecuting bodies and the judiciary have been considered and it is not expected that the proposals will have any significant impact.

4.11.5 Rural Proofing

The proposals will increase administrative and compliance costs for installations engaged in the chemical treatment of timber and wood if they meet the threshold criteria; installations engaged in the chemical treatment of timber and wood may be located in rural areas. The potential administrative and compliance costs represent a not insignificant proportion of the average turnover for installations in this sector. The potential impacts of the proposals on facilities for the chemical treatment of timber and wood are:

- If the plants are able to pass-through costs, the price of chemically treated wood will increase, which will adversely impact on the profitability of these operations; and
- If the plants are not able to pass-through costs, these installations will become less profitable and those which already operate on the margin of profitability may be forced to close.

4.11.6 Sustainable Development

The inclusion of new installations in the scope of the IE(PPC)D will increase scrutiny of the installations waste production and energy and water efficiency; this scrutiny is expected to improve the installations' performance in these areas. However, it has not been possible to estimate the scale of improvement in this study.

5. Impact Assessment on Independently Operated Waste Water Treatment

5.1 Background and Definitions

The main objective of this report is to assess the likely impacts of the IE(IPPC)D in relation to independently operated waste water treatment within the UK, building and commenting on as well as extending the Commission's Impact Assessment (IA), where appropriate.

The IE(IPPC)D includes the addition of the following as a listed activity:

6.11 "Independently operated treatment of waste water not covered by Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment and discharged by an installation covered by Chapter II" (of the IPPC Directive).

The purpose of this inclusion is to include industrial waste water treatment plants which are not located on the site of an IPPC installation, and are not covered by the Urban Waste Water Treatment Directive. This is what is understood by the definition of independently operated.

The aim of the amendments is to provide more consistency, with independently operated waste water treatment plants being regulated the same as industrial waste water treatment plants which were previously covered under the scope of the IPPC Directive as a result of being an IPPC installation in its own right or, more commonly, as a directly associated activity to another IPPC permitted activity.

5.2 Who is Affected?

The changes will affect the regulatory agencies, trade bodies and operators of wastewater treatment works not presently under the control of the UWWTD that treat effluent from an IPPC installation.

5.3 Previous Regulatory Position Definition

5.3.1 Number of Installations

Based on discussion with the stakeholders, a total of three independently operated waste water treatment plants have been identified where independently operated activities occur which *may* fit into the definition outlined above. These include the following:

- Waste water from an IPPC permitted milk processing plant which is pre-treated within an independently operated waste water treatment plant operating under a waste management licence (WML) before being discharged into the sewage treatment works (STW);
- Waste water from an IPPC permitted brewery, which is pre-treated at a STW through a dedicated pre-filter which reduces the load of the effluent prior to it being mixed with domestic waste water; and
- Waste water from a poultry factory (not confirmed as an IPPC installation) which is pre-treated at a STW prior to being mixed with the urban waste water treatment flow.

This information is based on a response from nine waste water treatment companies in the UK and one independent company specialising in water and waste water asset management. There is the potential that more sites affected by the amendment exist, although the total number is expected to be no more than 5 installations⁶⁹.

All of the installations identified above are located in England and Wales.

5.3.2 Environmental Impacts

The potential impacts of waste water treatment plants on the environment have been described in detail in a fact sheet⁷⁰ produced on behalf of the Commission and are summarised in Table 5.1 below.

Table 5.1 Potential Impact of Waste Water Treatment Facilities

Environmental Compartment	Potential Effect/Emission
Air	<ul style="list-style-type: none"> • Evaporation/formation of odour (H₂S, NH₃, mercaptans, etc.); • Formation of aerosols; • Drift of potentially hazardous micro-organisms from the treatment plant; • VOC emissions (evaporated or stripped from the water); • If biogas is generated and to used as fuel for energy supply, it is normally flared, resulting in emissions to air.
Water	<ul style="list-style-type: none"> • In principle, significant reduction of water emission; • When rainwater is treated together with process water, the treatment system might get overloaded in the event of heavy rain fall, which can cause additional pollutant emission because the treatment system cannot function properly.
Waste	<ul style="list-style-type: none"> • Waste water treatment sludge and scrubber solutions.
Other	<ul style="list-style-type: none"> • The central WWTP consumes energy. In some cases, biogas is generated and can be used as a source of energy.

⁶⁹ The water industries were unable to provide a more specific estimate when contacted during the 2011 update process.

⁷⁰ Data gathering and impact assessment for a possible technical review of the IPPC Directive. Fact Sheet B.4 http://circa.europa.eu/Public/irc/env/ippc_rev/library?l=/gathering_amendments_1/final_report/oiwtp_finaldoc/_EN_1.0_&a=d.

In addition, impacts to land, groundwater and water may occur as a result of leaks and spillages from infrastructure associated with waste water treatment processes. Waste water treatment companies which were previously permitted under IPPC have requirements to conduct leak detection and consider secondary containment. However there is currently no quantitative data available to determine the current risk to the environment of leaks and spillages from infrastructure.

The independently operated waste water treatment plants likely to be affected by the amendments to the Directive are small in nature and may incorporate tanks and associated pipeworks, odour control and chemical dosing. None of the waste water plants are connected to CHP units or boilers, therefore the potential environmental impact is likely to include fugitive emissions to land, groundwater and water as a result of leaks and spillages, and fugitive emissions to air, which include odour.

5.3.3 Results

Based on discussions held with the stakeholders there are a very limited number of independently operated waste water treatment plants in the UK that will be affected by the transposition of the IE(IPPC)D; the water industry estimates that a minimum of 3 and a maximum of 5 sites will be affected⁶⁹. The sites identified as part of this impact assessment are pre-treating waste water from food processing industries prior to discharge into an urban waste water treatment plant. As a result the coverage of these installations under the definition of the Directive would be limited to the plant treating the waste water up to the point where it discharges into the urban waste water treatment plant.

The main environmental impacts associated with the operation of waste water treatment plants are fugitive emissions to air, water and land and odour, however due to lack of available data it is not possible to quantify the extent of these emissions.

5.4 Costs

5.4.1 Compliance Costs

Compliance costs for the waste water treatment installations that may be affected by the changes to the threshold have been estimated based on discussions with waste water treatment companies who currently hold IPPC permits for waste water treatment installations. Prior to the introduction of IPPC, these installations were regulated in the same way as those which potentially may be included with the amendment regarding independently operated treatment; therefore it is reasonable to assume that the changes that would be required under the IE(IPPC)D and environmental improvements may be similar. The only exception is the improvement conditions relating to operation of flares and CHP units as these are unlikely to apply.

The improvements that, therefore, may be required at independently operated waste water treatment plants as a result of a requirement to meet BAT, include the following:

- Development of an odour management plan;
- Development of a site closure plan;
- Development of a flood risk and spillage plan;
- Development and implementation of a competence and training plan;
- Review of the condition of all sub-surface pipe work and storage measures including sumps, lagoons, storage tanks and vessels in relation to their potential to cause fugitive emissions to surface and ground water;
- Development of proposals for a monitoring programme for the detection of leaks from the surface and subsurface infrastructure including tanks, sumps, pumps, digesters and associated pipework;
- Proposals to be developed for providing secondary containment, or other appropriate measures, to prevent, or where that is not practicable, to minimise leakage and spillage from primary pipe work including drains, sumps, storage and treatment vessels in relation to their risk of causing pollution;
- Development of a written report detailing the condition of the installations drainage which includes reviewing the condition of drains and developing a detailed drainage plan; and
- Review of odour emissions abatement equipment to assess their adequacy.

The above are based on the improvement conditions previously required for UK installations. The potential future requirements that may apply through the development of BAT for the independently operated waste water treatment installations may or may not be similar to these. Table 5.2 (below) presents estimates of the costs for the improvements that may be needed, for a single installation.

Table 5.2 Compliance Costs for a Single Installation

Cost Element	Proportion Affected (%)	Capital Cost (£/unit)	Annual Cost (£/unit)	Total Annualized Capital Cost (£/unit)	Total Annual Cost (£/unit)
Odour mgt plan	100%	£5,000	£1,500	£352	£1,852
Site closure plan	100%	£2,000-£4,000	-	£141-£281	£141-£281
Flood risk & spillage plan	100%	£15,000-£20,000	-	£1,055-£1,407	£1,055-£1,407
Competence and training plan	100%	£5,000-£20,000	-	£352-£1,407	£352-£1,407
Review of sub-surface pipes	100%	£7,000-£10,000	-	£493-£704	£493-£704
Leak detection monitoring	100%	£15,000-£50,000	£5,000-£20,000	£1,055-£3,518	£6,055-£23,518
Secondary containment	100%	NE	NE	NE	NE
Drainage survey	100%	£2,500-£3,000	£500-£600	£176-£211	£676-£811
Review odour abatement	20%	£15,000-£20,000	-	£211-£281	£42-£56

Note: One-off costs have been annualised over the lifetime of a permit (assumed to be 20 years in line with Defra, 2006) with a discount rate of 3.5%. NE = Not estimated.

The costs provided within this report are very broad due to the relatively small number of sites identified and the nature of the independently operated waste water treatment. They should therefore be viewed as indicative only. However they are based on experience to date of regulatory compliance under EPR for similar types of installations.

5.5 Administrative Costs

Operators

The three independently operated waste water treatment plants where independently operated activities occur which *may* be affected by the IE(IPPC)D are all located in England and Wales; the maximum number of installations modelled is 5. No installations were identified in Northern Ireland or Scotland, therefore the administrative costs outlined in this section refer to England and Wales only. Previously, the independently operated waste water treatment plants required a waste management license if the installation treats > 100,000m³ per annum. Based on the 2010/2011 EPR Permitting Scheme Guidance⁷¹, the ‘standard’ and ‘FCL’ charges for ‘Non-hazardous (sewage) sludge chemical and physical treatment facility’ and ‘Non-hazardous (sewage) sludge treatment facility’ are identical. The unit costs range between £7 730 and £8 630. The previous regulatory position administrative costs for operators can be broken down::

- Subsistence Costs (annual):
 - subsistence charge: £3 330;
 - time for record keeping, inventory preparation, staff training and inspections: £900-£1 800.

Under the Environmental Permitting Regulations, waste water treatment works would be classed as tier 3 facilities, which means they are regarded as being more complex and high risk facilities that require a more detailed and individually-tailored permit. The associated costs for application submission fees and annual subsistence charges for these installations will therefore be based on the relevant permit application charge multiplier for that facility, multiplied by the relevant OPRA charging score for that facility. Based on the 2010/11 figures the permit application charge multiplier is £201, the subsistence charge multiplier is £97 and the surrender charge multiplier is £124.

Administrative costs for operators can be broken down into two main elements each of which can be further sub-divided:

- Permit Application (one-off):
 - permit application fee (£4 600-£16 000);

⁷¹ Environment Agency (2010), ‘Environmental Permitting Scheme Guidance 2010/11 (April 2010 (revised May 2010))’.

- time and costs to prepare the permit and carry out associated investigations (assumed to vary between £13 500-£250 000).
- Subsistence Costs (annual):
 - subsistence charge (£6 000-£15 000);
 - time for record keeping, inventory preparation, staff training and inspections (may be up to 10 f.t.e. days per year (equivalent to around £1 800)).

One-off costs have been annualised over the lifetime of a permit (assumed to be 20 years in line with Defra, 2006) with a discount rate of 3.5%.

Regulators

In line with the cost recovery basis of the charging scheme, permit charges paid by operators should be sufficient to cover regulators' costs for permit application and subsistence.

Payment of Costs

The compliance and administration costs to the waste water treatment company could not be recovered if the discharge from the PPC installation is consented under a trade effluent consent, i.e. if the trader discharges directly to sewer, as these charges are based on an agreed national formula.

If there is a trade agreement in place the costs might be able to be passed back to the trader, at the time an agreement is made. For existing agreements both parties would have to agree to vary the agreement before any costs could be passed back to the trader. This is unlikely to occur and could take many years to be resolved.

5.6 Results

Compliance Costs

Estimate of the compliance costs likely to be incurred by operators of the additional waste water treatment plants that would be included under IE(IPPC)D are presented in Table 5.3. These are broken down into capital (one-off) and annual costs. The costs do not include costs for replacement of infrastructure following the results of reviews or monitoring. The low estimates of compliance costs are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation. The high estimates of compliance costs are estimated by multiplying the higher estimates of the sum of the recurring and non-recurring annual costs per installation.

Table 5.3 Modelled Compliance Cost Ranges for an Independently Operated Wastewater Treatment Works

Activity	No. Installations		Compliance costs / installation, recurring: £000 p.a.		Compliance costs / installation, annualised non-recurring: £000 p.a.		Total annual compliance costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
Compliance costs	3	5	£7.0	£22.1	£3.8	£8.2	£0.0	£0.2

Note 1: All figures are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

Note 3: Annualised compliance costs are estimated by multiplying the unit per installation by the assumed proportion of installations which will require the measure.

Administrative Costs

Administrative costs will be incurred by the waste water treatment sites through permit application and subsistence costs as the change to the IPPC Directive includes sites which have previously not been regulated under the IPPC regime. In some instances these sites may have been covered by the WML Regulations⁷²; however IPPC costs will be higher due to the move from Tier 2 to Tier 3 facilities under OPRA.

The administrative costs associated with the independently operated waste water treatment falling within the scope of the IE(IPPC)D are summarised in the Table 5.4 below. The low estimates of the total annual costs under the previous regulatory regime are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation under the previous regulatory regime by low estimate of the number of installations. The low estimates of the total annual costs under IE(IPPC)D are estimated by multiplying the lower estimates of the sum of the recurring and non-recurring annual costs per installation under IE(IPPC)D by the low estimate of the number of installations. The low estimate of the change in annual costs is calculated by subtracting the low estimate of administrative costs from the low estimate of administrative costs under IE(IPPC)D. The same process is followed for calculating the high estimates, except the high estimates of costs and numbers of installations are used in each case.

⁷² The results presented assume that all sites will have previously had a WML.

Table 5.4 Administrative Costs

Activity	No. Installations (Note 3)		Admin. costs / installation, recurring: £000 p.a.		Admin. costs / installation, annualised non- recurring: £000 p.a.		Total annual admin. costs: £million p.a.	
	Low	High	Low	High	Low	High	Low	High
Administrative costs under the previous regulatory regime (EPR)	3	5	£4.2	£5.1	£0.0	£0.0	£0.0	£0.0
Administrative costs under the IE(IPPC)D	3	5	£7.8	£16.8	£1.3	£18.7	£0.0	£0.2
Change in administrative costs due to implementation of IE(IPPC)D	3	5	£3.6	£11.7	£1.3	£18.7	£0.0	£0.2

Note 1: All figures are rounded to one decimal place.

Note 2: Costs are annualised over a time period of 20 years, using a discount rate of 3.5%

5.7 Benefits

The following table summarises the benefits likely to be achieved from permitting the off-site waste water treatment works. Due to lack of available information it is not possible to quantify the benefits.

Table 5.5 Benefits

Benefits	Situation Under IE(IPPC)D	Business as Usual (BAU)
Reduction in pollution	<p>IPPC permits issued to waste water treatment plants contain improvement conditions designed to reduce pollution, including combinations of the following:</p> <ul style="list-style-type: none"> Leak detection/secondary containment; Impact assessment; Odour management plans. 	<p>Noise and odour will be previously regulated by the local authority as Statutory Nuisance. Odour control is already subject to a Defra Code of Practice and is reported to be easily enforceable.</p> <p>Leak detection and secondary containment is not currently addressed.</p>
Waste reduction, minimisation and resource efficiency	All IPPC permits include standard conditions designed to address waste reduction, minimisation and resource efficiency.	The discharge consents and waste management licences do not contain conditions to address waste reduction, minimisation and resource efficiency.
Formalisation of environmental management systems	IPPC permits include standard conditions designed to require the operators to implement and maintain a management system, maintain a management system, organisational structure and allocate resources that are sufficient to achieve compliance with the limits and conditions of the permit.	The discharge consents and waste management licences do not contain conditions to address environmental management.

Benefits	Situation Under IE(IPPC)D	Business as Usual (BAU)
Prevention of accidents and minimisation of their consequences	IPPC permits contain standard conditions requiring the maintenance and implementation of an accident management plan.	Discharge consents do not contain conditions to address accident prevention and minimisation. Waste management licences generally contain standard conditions to address site facilities and infrastructure (including drainage and hardstandings), fire-fighting and pollution control with respect to spillages.

5.7.1 Damage Cost Function

Independently operated waste water treatment works can affect the environment through the fugitive releases of emissions, including waste water, sludge and biogas. The impact of these emissions may include:

- Land contamination;
- Pollution of controlled waters;
- Pollution of groundwater; and
- Public nuisance due to odour.

The main impact of the IE(IPPC)D is predicted to be a reduction in fugitive and odorous emissions, however due to limited information available from the stakeholders, BREF documents and EA guidance it is not possible to quantify this. Waste water treatment plants previously permitted under IPPC are investigating the feasibility of leak detection and secondary containment in line with BAT requirements relating to storage of waste within bulk storage vessels. This investigation is still in the preliminary stages so it is not currently possible to determine:

- The extent of leakage from the existing WwTW assets; and
- The damage that any leaks may have on the environment.

This current work is in relation to sludge and the perceived “negative” impact of uncontrolled leaks/spills of sludge to land is deemed questionable by the waste water treatment companies, as sludge to agricultural and for ecological benefit is the dominant sludge disposal route.

In relation to the off-site waste water treatment plants the environmental impact of the leak is dependent on the nature of the waste water. The installations identified within this report are all pre-treating food processing waste which can have a high BOD and is highly biodegradable. In some instances, however more complex waste, such as from a chemical works, may be treated.

If secondary containment is deemed to be required then there may be a need for replacement of the whole asset in the event that secondary containment cannot be retrofitted (at substantial cost) although this will not necessarily be required in practice. In addition, contingency measures may need to be brought in for the treatment of the wastewater. All of this can add up to a significant cost.

It has not been able to quantitatively estimate benefits of reduced environmental impacts in quantitative or monetary terms due to a lack of information on the substances likely to be released and their likely impacts.

5.8 Competition Assessment

The competition guidelines (August 2007)⁷³ set out four main questions in order to ascertain whether the transposition of the IE(IPPC)D in the UK will affect the market by:

1. Directly limiting the number or range of suppliers?
2. Indirectly limiting the number or range of suppliers?
3. Limiting the ability of suppliers to compete?
4. Reducing suppliers' incentives to compete vigorously?

A brief summary of the four questions are presented in Table 5.6 and for those where the answer to one of the questions is "Yes", then an explanation is provided in the following sections.

The results should be included in the "Evidence Base" within the Impact Assessment template.

Table 5.6 Summary of the Competition Test

Question	Off-site Waste Water Treatment
Q1. Directly limit the number or range of suppliers?	No
Q2. Indirectly limit the range of suppliers?	No
Q3. Limit the ability of suppliers to compete?	No
Q4. Reduce suppliers' incentives to compete vigorously?	No

Water companies are natural monopolies, because it is not possible for more than one company to survive and benefit from economies of scale (based on current infrastructure and the investment costs involved). This generally means they have the ability to set prices rather than being a price taker. In the UK each region has one water company and a limited number of treatment sites.

Therefore in some instances waste water treatment works, used by IPPC installations are not necessarily competing with other treatment works to provide a better or cheaper service as it is limited to the distribution of the waste

⁷³ http://www.offt.gov.uk/shared_offt/reports/comp_policy/oft876.pdf

water network. Under these circumstances the costs of IPPC may be passed on to its customers through a trade agreement.

However within the UK there are a number of independent companies specialising in water and waste water asset management, who may either tanker waste water to an off-site treatment plant or construct a waste water treatment plant on the same site as an IPPC installation. Although both of these scenarios may still require permitting under IPPC (either as a directly associated activity, or activity in its own right), it may result in more competition to the waste water treatment companies which may make it more difficult to pass on the costs of IPPC compliance to the customer through a trade agreement.

The possibility of transporting treatment material to an independent off-site waste water treatment plant will be limited to distances where the inclusion of transportation costs makes it cheaper to treat the material at the nearest offsite treatment plant (who charges a higher price) or to treat the waste water on-site. If off-site waste water treatment sites do increase their prices, this will make the costs of onsite treatment and transporting waste water more competitive and may even encourage new entrants to the market (for independent treatment of both on-site and off-site waste water treatment) if there is a possibility of treating waste water at a lower cost than the local off-site waste water treatment works.

Water companies are regulated by OWFAT to ensure; an adequate supply, good quality of water and at a good value to consumers. In theory the water company can pass on the costs of IPPC legislation to its customers if it can be justified to OWFAT. However if they are unable to pass on costs (either due to competition or regulation), this may lead to a redistribution of expenditure with spending elsewhere reduced (e.g. on infrastructure) which may ultimately reduce the value offered to consumers and the general public.

5.9 Social Impact Assessments

5.9.1 Statutory Equality Duties Impact Test Guidance

The impact of the proposals on the people of different ages, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation have been considered and it is not expected that the proposals will have any impact.

5.9.2 Health and Well-being

The impact of the proposals on education, housing, crime, transport and people's lifestyle choices have been considered and it is not expected that the proposals will have any impact. The impacts of the proposals are discussed in depth in the benefits section and the impact on employment is discussed in the competition assessment section.

5.9.3 Human Rights

The impact of the proposals on human rights has been considered and it is not expected that the proposals will have any significant impact.

5.9.4 Justice

The impact of the proposals on the courts, tribunals, prisons, probation, the legal aid budget, the prosecuting bodies and the judiciary have been considered and it is not expected that the proposals will have any significant impact.

5.9.5 Rural Proofing

The impact of the proposals on rural communities has been considered and it is not expected that the proposals will have any impact.

5.9.6 Sustainable Development

The inclusion of new installations in the scope of the IE(PPC)D will increase scrutiny of the installations waste production and energy and water efficiency; this scrutiny is expected to improve the installations' performance in these areas. However, it has not been possible to estimate the scale of improvement in this study.

Appendix A

Previous Regulatory Position: Definition for the Recovery, or a Mixture of Recovery and Disposal of Non-Hazardous Waste

Relevant Legislation and Regulatory Requirements

Statutory Instruments

The regulation of non-hazardous waste treatment facilities is achieved through a range of statutory instruments in England and Wales, Scotland and Northern Ireland. The purposes of these statutory instruments are broadly similar, but a basic understanding of the different regimes is required in order to estimate the number of installations previously covered by the IPPCD and those affected by the IE(IPPC)D.

Table A1 Relevant Statutory Instruments for the Treatment of Non-hazardous Waste

Scope of the IPPCD and IE(IPPC)D	Waste Treatment Activity included in the scope of IPPCD / IE(IPPC)D ⁽¹⁾	UK Administrative Area	Statutory Instrument
Covered by the previous IPPCD.	Treatment of non-hazardous waste for <u>disposal</u> in facilities with a capacity >50 tonnes per day.	England and Wales	Schedule 1 of the Environmental Permitting (England and Wales) Regulations 2010 SI 2010 No. 675.
		Scotland	Pollution Prevention and Control (Scotland) Regulations 2000.
		Northern Ireland	The Pollution Prevention and Control Regulations (Northern Ireland) 2003.
Not fully covered by the previous IPPCD. Coverage by IE(IPPC)D.	Treatment of non-hazardous waste for <u>recovery</u> in facilities with a capacity >75 tonnes per day.	England and Wales	Regulation 2 of the Environmental Permitting (England and Wales) Regulations 2010 SI 2010 No. 675.
		Scotland	Waste Management Licensing Regulations 1994, as amended.
		Northern Ireland	The Waste Management Licensing Regulations (Northern Ireland) 2003.
Not fully covered by the previous IPPCD. Not coverage by IE(IPPC)D.	Treatment of non-hazardous waste for <u>disposal or a mix of disposal and recovery</u> in facilities with a capacity <75 tonnes per day.	England and Wales	Regulation 2 of the Environmental Permitting (England and Wales) Regulations 2010 SI 2010 No. 675.
		Scotland	Waste Management Licensing Regulations 1994, as amended.
		Northern Ireland	The Waste Management Licensing Regulations (Northern Ireland) 2003.

Note 1: Covering biological and physico-chemical treatment, pre-treatment for co-incineration, treatment of slags and ashes and treatment of metals.

Although there is considerable variability between the UK administrative areas in the statutory instruments associated with non-hazardous waste treatment, the requirements of these regulations are broadly similar.

For the purposes of this report we have included a common 'short name' for each of the main regulatory requirements. In summary these are:

EPR Part A PPC Part A	Activities that are covered by the IPPC Directive.
EPR-Part B PPC Part B and C	Activities that are not covered by the IPPC Directive but are covered by UK BAT-based regulation (emissions to air only).
EPR/WML	Waste operations covered by the Waste Framework Directive but not the IPPC Directive.
EPR Exemptions	Waste operations covered by the Waste Framework Directive but exempt from the requirement to obtain a permit.

For simplicity, the regulatory mechanism is described as a permit or an exemption, although it is recognised that for EPR-waste the appropriate term in Scotland and Northern Ireland is 'waste management licence' (WML).

The table below provides more detail on the different types of permits and licences required in the UK for the non-hazardous waste treatment activities covered in the IE(IPPC)D.

Table A2 Categories of Regulated Sites Discussed in this Report

Treatment Activities >75 Tonnes Per Day	Previously Covered by the IPPCD?	Affected by the IE(IPPC)D Proposals?	Previous UK Regulatory Regime
Biological treatment for disposal	Yes	No - not considered further	EPR-IPPC (Part A) Section 5.3 A(1)(c)(i) Disposal of non-hazardous waste in a facility with a capacity of more than 50 tonnes per day by biological treatment.
Physico-chemical treatment for disposal	Yes	No - not considered further	EPR-IPPC (Part A) Section 5.3 A(1)(c)(ii)
Biological treatment for recovery	No	Yes	EPR-waste EPR-waste exemptions
Physico-chemical treatment for recovery	No	No - not considered further	Outside of the scope of IE(IPPC)D. Will remain as EPR-waste and EPR-exempt
Pre-treatment for co-incineration for disposal or recovery	No	Yes	EPR-IPPC (Part A) Pre-treatment at the co-incineration plant, directly associated activity to a listed Section 5.1 A(1)(c) activity Making solid fuel from waste using heat: Section 5.5 A(1)(a). EPR-waste

Treatment Activities >75 Tonnes Per Day	Previously Covered by the IPPCD?	Affected by the IE(IPPC)D Proposals?	Previous UK Regulatory Regime	
Treatment of slags and ashes for disposal or recovery	No	Yes	EPR-IPPC (Part B)	Section 3.5 B(a) Crushing, grinding, size reduction, grading, screening or heating of mineral or mineral product where the operation is likely to result in the release of particulate matter to air
Treatment of scrap metal for disposal or recovery	No	Yes	EPR-waste EPR-waste exemptions	

Overview of Regulatory Requirements

EPR/PPC Requirements

Previously, an Environmental Permit (EP) issued in accordance with the requirements of the IPPCD is required for non-hazardous waste installations in England and Wales (Pollution Prevention and Control Permit in Scotland and Northern Ireland) that undertake treatment for disposal with a capacity greater than 50 tonnes per day. The integrated permit covers all environmental aspects of the installation, including acceptance of waste, odour and noise management, accident prevention, energy efficiency, waste minimisation and assessment of the impact of emissions on the environment.

At present, operators need to apply for an EPR/PPC permit, which involves completion of an application form and supporting documentation such as: application site report, site plans and assessment of environmental impacts. It may also include an odour or noise management plan. The operator is then issued with a permit from the competent authority which requires them to use the Best Available Techniques (BAT), also referred to as ‘appropriate measures’ in the Sector Guidance Notes’s (SGNs) published by the Environment Agency in relation to all EPR/PPC requirements (i.e. management, accidents, energy efficiency, efficient use of raw materials, disposal and recovery of wastes, operating techniques, closure and decommissioning, site protection and monitoring programme, odour, noise and vibration, monitoring, records and notifications). The permit will include installation-specific emission limits, monitoring requirements and improvement conditions.

Discussions with the environmental regulatory agencies indicated they would expect to use ‘standard rules permits’⁷⁴, for non-hazardous waste treatment (recovery and disposal) EPR/PPC activities to be used to implement the requirements of the IE(IPPC)D; these are currently available for EPR-waste operations. Although standard rules permits are not currently available in Scotland and Northern Ireland, these permits have been assumed, for the purposes of this impact assessment, to give a good indication of the regulatory requirements for operators in the EPR-waste category.

⁷⁴ <http://www.environment-agency.gov.uk/business/topics/permitting/118404.aspx>

Application for a standard rules permit is a simpler process compared to that for a ‘bespoke’ permit and costs are reduced due to the limited effort to produce the permit. However this would only be possible if the operator could comply with the rules and the site can meet the following criteria:

- The only discharges to controlled waters are surface water from the roofs of buildings and from areas of the site not used for the storage or treatment of wastes; and
- The activities are not carried out within 500 metres of a European site, Ramsar site or Site of Special Scientific Interest (SSSI) as outlined in the Defra Environmental Permitting Core Guidance document 2007 and the Standard Rules Chapter 4 of the EPR.

EPR-waste Requirements

The Environment Agency⁷⁵ has confirmed that IPPC installations and waste operations regulated under EPR will be identical with respect to the administrative requirements for the operator and regulator; layout and presentation of permits; and auditing/inspection. However, there are some fundamental differences for sites regulated under EPR-IPPC and EPR-waste as indicated in the following table.

Table A3 Main Differences Between the Regulatory and Permitting Requirements^[1] for EPR-IPPC and EPR-waste

Requirement	EPR-IPPC	EPR-waste
Main sources of regulatory requirements	IPPCD, 2008/01/EC	Waste Framework Directive (WFD), 2006/12/EC (codified version of Directive 75/442/EEC, as amended).
General principles	<p>Article 3 of the IPPCD sets out general principles which include requirements that:</p> <ul style="list-style-type: none"> • all the appropriate preventive measures are taken against pollution, in particular through application of the BAT; • no significant pollution is caused; • The general principles also require specific consideration of; • energy efficiency; • waste hierarchy principles; • waste disposal issues; • accident prevention; and • securing site protection on closure. <p>If significant pollution would be caused, even after applying BAT stricter conditions (or refusal) may be applied.</p>	<p>Article 4 sets out the relevant objectives of the WFD, which include requirements that waste is recovered or disposed of without endangering human health and without using processes or methods which could harm the environment and in particular without:</p> <ul style="list-style-type: none"> (i) risk to water, air, soil, plants or animals; or (ii) causing nuisance through noise or odours; or (iii) adversely affecting the countryside or places of special interest; <p>The key differences to note for EPR-waste compared to EPR-IPPC is that there is no requirement to apply BAT. Ultimately EPR-waste is aimed at primary impacts on the environment (i.e. emissions), rather than looking at a high level of environmental protection and issues such as the use of raw materials or process efficiency.</p>
Other requirements	<p>The IPPCD requires a consideration of the effects of:</p> <ul style="list-style-type: none"> • raw materials; • implications for soil and groundwater; 	No equivalent under WFD.

⁷⁵ Telephone conversation with EPR Policy Advisor, Environment Agency on 23rd May 2008.

Requirement	EPR-IPPC	EPR-waste
BAT & ELVs	<ul style="list-style-type: none"> • monitoring; and • waste management. <p>ELVs must be included for polluting substances that are likely to be emitted in significant quantities (this requirement does not apply to emissions of carbon dioxide from those installations that are subject to the EU Emissions Trading Scheme).</p> <p>The ELVs must be based on BAT, “but shall take account of the technical characteristics of the particular installation..., its geographical location and the local environmental conditions”.</p>	No equivalent under WFD.
ELVs and European environmental quality standards (EQS)	If a European EQS requires a stricter ELV than indicated on the basis of BAT, the regulator must impose that ELV or consider refusing the permit altogether.	The general objectives of the WFD could be considered equivalent to the ELV/EQS requirements of the IPPCD.
ELVs and equivalent technical measures	ELVs may be supplemented or replaced by “equivalent parameters or technical measures” where it more appropriate or effective to demonstrate process control.	No equivalent under WFD.

Note 1: Source of data: Environment Agency, Regulatory Guidance Series No EPR4: Setting standards for environmental protection, Version 1.0 March 2008.

In summary, despite the parallels between EPR-IPPC and EPR-waste there are still differences between the permits that regulators can issue for the two types of activities, specifically:

- Permits for EPR-IPPC should require the operator to implement BAT. There is no equivalent requirement for EPR-waste; and
- Permits for EPR-IPPC should consider the impact on the environment taken as a whole, which is not just the impact of emissions but also wider impacts associated with impacts such as energy efficiency, raw materials or process efficiency.

It is therefore important to recognise that it is not possible to implement the same standard rules for EPR-IPPC activities and EPR-waste operations.

Standard Permits

The table below identifies the current standard permits available for certain EPR-waste operations (i.e. treatment for recovery) in England and Wales. These permits are based on the requirements of the Waste Framework Directive (Directive 2008/98/EC), which are not as broad as the IPPCD.

Table A4 Standard EPR-waste Permits Relevant to the Sectors Affected by the IE(IPPC)D Proposals^[1]

IE(IPPC)D Activities	Standard EPR-waste Permits	Additional Qualifying Requirements
Water sector biological treatment.	Non-hazardous sludge biological treatment site.	Two types of standard permit are available with the following thresholds on annual waste accepted: <ul style="list-style-type: none"> • <75 000 tonnes/year; • <250 000 tonnes/year. Liquids may be discharged into the head works of a sewage works or a sewer subject to a consent issued by the local water company and may be taken off-site in a tanker for disposal or recovery.
Waste management sector biological treatment.	Non-hazardous mechanical biological (aerobic) treatment facility. Composting in open windrows. Composting in closed vessels.	Three types of standard permit are available with the following thresholds on annual waste accepted: <ul style="list-style-type: none"> • <5 000 tonnes/year; • <25 000 tonnes/year (only available for waste treatment inside a building); • <75 000 tonnes /year (only available for waste treatment inside a building). The waste storage and treatment building must be at least 250 metres away from any residential property or workplace. Three types of standard permit are available with the following thresholds on annual waste accepted: <ul style="list-style-type: none"> • <5 000 tonnes/year; • <25 000 tonnes/year (only available for waste treatment inside a building); • <75 000 tonnes/year (only available for waste treatment inside a building). The storage, physical treatment, composting and maturation of wastes must be at least 250 metres away from any residential property or workplace. The activities must also be outside groundwater protection zones 1 (inner) or 2 (outer) and more than 250 metres from any water abstraction point. The activities are not carried out within 1 kilometre of a European site, Ramsar site or Site of Special Scientific Interest (SSSI).
Pre-treatment for co-incineration.	No standard permits currently available.	-
Treatment of slags and ashes.	No standard permits currently available.	-
Treatment of scrap metal.	Metal recycling site. Waste electrical and electronic equipment authorised treatment facility (ATF) excluding ozone depleting substances.	Three types of standard permit are available with the following thresholds on annual waste accepted: <ul style="list-style-type: none"> • <5 000 tonnes/year; • <25 000 tonnes/year (only available for waste treatment inside a building); • <75 000 tonnes/year (only available for waste treatment inside a building).

Note 1: This table is based on the standard EPR-waste permits available from the Environment Agency. SEPA also makes standard permits available, but the exact details may differ slightly.

There are common requirements for the standard permit as detailed below:

- General management: activities shall be managed and operated in accordance with a management system;

- Competence: the operator shall comply with the requirements of an approved competence scheme or shall hold an appropriate certificate of technical competence or other approval;
- Accident management plan: the operator shall maintain and implement an accident management plan;
- Operations: the operator shall only accept waste if it is of a type and quantity covered by the standard permit and conforms to the description in the documentation supplied by the producer and holder;
- Point source emissions: there shall be no point source emissions to air, water or land;
- Fugitive emissions: emissions shall not cause pollution. This can be demonstrated by the following:
 - Buildings for waste treatment shall be maintained under negative pressure and fitted with extraction systems with relevant physical control (e.g. bio-filters);
 - Waste is stored and treated on an impermeable surface with sealed drainage system;
 - All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container;
 - Fugitive emissions management plan is implemented.
- Odour: emissions shall be free from odour at levels likely to cause annoyance outside the site. The appropriate measures for demonstrating control of odour include implementation of an approved odour management plan;
- Noise and vibration: emissions shall be free from noise and vibration at levels likely to cause annoyance outside the site. The appropriate measures for demonstrating control of noise and vibration include implementation of an approved noise and vibration management plan;
- Pest: scavenging animals, scavenging birds and other pests shall not cause nuisance;
- Reporting and notification requirements.

Additional Requirements Under IE(IPPC)D

As identified above EPR-waste permits do not currently require the operator to implement BAT. However, it can be concluded that an EPR-waste permit requires the equivalent of BAT for:

- General management;
- Operator competence;
- Accident management;
- Point source and fugitive emissions;
- Odour;

- Noise and vibration; and
- Pests.

These requirements are primarily focused on measures to protect the immediate environment. However, IE(IPPC)D requirements require consideration against BAT of the following, which are not necessarily fully covered by existing EPR-waste permits.

- Resource efficiency:
 - The purpose of waste recovery activities is to reduce the consumption of natural resources, both in terms of the materials being recovered and also the 'embedded' water and energy originally required to create the original product. If the waste treatment process does not produce a quality product the opportunities for recovering value through waste treatment is very much diminished.
- Selection of appropriate treatment techniques: techniques should be designed and operated to avoid deliberate or inadvertent production and/or displacement of substances that may be harmful to the environment and to prevent the transfer of such substances from one environmental medium to another.

EPR-waste Exemption Requirements

Waste operations that are exempt from EPR-waste permitting requirements are required to register with the competent authority. The table below identifies the EPR-waste exemptions relevant to this assessment, including the thresholds over which an EPR-waste permit is required.

Table A5 EPR-waste Exemption Thresholds for each of the Activity Types Identified in section 5.3, Annex 1 of the IE(IPPC)D

IE(IPPC)D Activities	Examples of the Likely Installations Affected	Relevant EPR-waste Exemption	
Biological treatment	Waste industry anaerobic digestion.	Paragraph 12 (Simple)	Anaerobic digestion of up to 1000m ³ of waste at any one time (including the storage of waste prior to and following treatment via AD).
	Composting.	Paragraph 12 (Simple)	Composting biodegradable waste, so long as the total quantity of waste on-site remains < 1,000 cubic metres at the place of production or the place of landspreading. The threshold rises to 10,000 tonnes per year for mushroom compost. The equivalent exemption in Scotland limits the amount of waste to 400 tonnes or 1000 tonnes depending on waste type. Rises to 2,500 tonnes for mushroom composting.
	Mechanical biological treatment (MBT).	No exemption.	-
Pre-treatment for co-incineration	Treatment to produce refuse derived fuel (RDF) and solid recovered fuel (SRF).	No exemption.	-
Treatment of slags and ashes	Physical separation, grading, grinding and washing of slags and ashes.	No exemption.	-
Treatment of scrap metal	Waste electrical and electronic equipment (WEEE) treatment facilities	Paragraph 41 (England and Wales) Paragraph 47 (Scotland) (Notifiable)	Treatment of <5 tonnes / day of WEEE. In Scotland there is also a 2 tonne per day limit for discarded equipment arising from both domestic and non-domestic premises that is not potentially a hazardous mirror entry. Allowance is made for storage of 50m ³ for these wastes. In Scotland, there is also a 5 tonne per day limit for WEEE containing hazardous substances other than those specifically named. Allowance is made of storage of 80 m ³ .
	Vehicle dismantler facilities (depolluted vehicles)	Paragraph 45 (Complex)	40 vehicles per week.
	End of life vehicle (ELV) treatment facilities	No exemption	The above exemption does not apply to activities to depollute ELVs as this involves the treatment of hazardous wastes (e.g. waste oils, lubricants, coolants, anti-freeze).
	Metal recycling site	Paragraph 45 (Complex)	Sorting, grading, baling, shearing, compacting, cutting and crushing of ferrous metals and ferrous metal-alloys to a maximum of 8000 tonnes per week; Sorting, grading, baling, shearing, compacting, cutting and crushing of certain defined non-ferrous metals to a maximum of 400 tonnes per week; Sorting, grading, baling, shearing, compacting, cutting and crushing of turnings of the above to a maximum of 300 tonnes per week.

Depending on the exemption, different levels of information must be provided as part of the registration reflecting the level of risk the activity poses. There are two types of exemption, 'simple' and 'notifiable' reflecting lower and higher risk activities; the table above identifies which category the relevant exemptions fall under. For exemptions under Paragraph 45, the exemption is similar to notifiable but is not referred to as such in the regulations. Therefore, the term 'complex' has been used in this instance.

Operators of simple EPR-waste exempt activities must provide information to the competent authority identifying the exempt activity and provide administrative information such as contacts, organisation name and location of the exempt activity.

Operators of notifiable EPR-waste exempt activities must provide additional information to the competent authority so that they can assess the risks, specifically:

- Description of the exempt activity and justification as to why the activities constitute an exempt activity;
- Amount of waste treated or recovered over a 12 month period and the maximum stored at any one time;
- Map or plan showing the site boundary, locations where the exempt activities are carried out, areas that are impermeable pavement / hardstanding / un-surfaced, and details of the site drainage system;
- Inclusion of a Pollution Risk Assessment that:
 - Describes how the waste will be stored securely;
 - Provides details of the pollution containment systems on the site in the areas where the waste is to be stored or treated, including impermeable pavements, drainage systems and other containment systems;
 - Describes how the operator intends to treat and recover the waste;
 - Specifies how the operator will control potential nuisance from the treatment, movement and storage of the waste;
 - Identifies if the land is within 1 km of an environmentally sensitive site.

If the risks are too high, the competent authority may refuse to register the activity as exempt. Most of these exemptions are charged and must be renewed annually.

Summary of Regulatory Requirements

A summary and comparison of the current regulatory requirements for the treatment of non-hazardous waste is provided in Table A6.

Table A6 Summary and Comparison of Non-Hazardous Waste Treatment Requirements

Topic Area	Current Requirements for Sites Subject to EPR-IPPC on the Basis of: Treatment of non-hazardous Waste for <u>Disposal</u> in Facilities with a Capacity > 50 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste Exemptions on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes per day
Management			
General Management	<p>Activities to be managed and operated in accordance with a management system which identifies and minimises risks of pollution, and by competent persons.</p> <p>Records to demonstrate the above requirement to be maintained.</p> <p>Easy access to permit duties to be provided for personnel.</p>		No requirement.
Accidents	Accident management plan.		No requirement. Non-statutory guidance provided in PPG 21 Pollution incident response planning.
Energy Efficiency	Take measures to ensure energy efficiency.	Voluntary commitment to Climate Change Levy Agreement enables operators to achieve reduced rate relief.	
Use of Raw Materials	Take measures to ensure raw materials and water are used efficiently.	<p>In England and Wales and Northern Ireland, if you abstract > 20 m3/day of water from ground or surface waters, you must obtain an abstraction licence from the Environment Agency and the EHSNI, respectively.</p> <p>In Scotland, if you abstract > 10m3/day of water you must obtain authorisation from SEPA. If you abstract < 10m3/day of water per day and comply with certain general binding rules (GBRs) you do not need to contact SEPA.</p>	
Avoidance, recovery and disposal of wastes produced by the activities	Take appropriate measures to ensure that waste produced by the activities is avoided or reduced, or where waste is produced it is recovered wherever practicable or otherwise disposed of in a manner which minimises its impact on the environment;	No requirement.	No requirement.
Site Security	Prevention of unauthorised access to site.		No requirement.

Table A6 (continued) Summary and Comparison of Non-Hazardous Waste Treatment Requirements

Topic Area	Current Requirements for Sites Subject to EPR-IPPC on the Basis of: Treatment of non-hazardous Waste for <u>Disposal</u> in Facilities with a Capacity > 50 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste Exemptions on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes per day
Operations			
Operating techniques	<p>Operating techniques shall only be in accordance with those described in the application.</p> <p>Waste shall only be accepted if it :</p> <p>Is of a type and quantity provided for in the permit.</p> <p>Conforms to the description in the documentation supplied by the producer and holder.</p> <p>Processed in the manner specified in the permit.</p> <p>Records shall be kept of all waste accepted onto the site.</p> <p>Provide information on waste produced at the installation to any waste recovery or disposal facility that receives the waste, including:</p> <p>The nature of the process producing the waste</p> <p>The composition of the waste</p> <p>The handling requirements of the waste</p> <p>The waste code of the waste</p> <p>Any waste sent to landfill meets the waste acceptance criteria for that landfill.</p>	<p>Waste shall only be accepted if it :</p> <p>Is of a type and quantity provided for in the permit.</p> <p>Conforms to the description in the documentation supplied by the producer and holder.</p> <p>Processed in the manner specified in the permit.</p>	<p>Only wastes subject to the exemption can be treated.</p>

Table A6 (continued) Summary and Comparison of Non-Hazardous Waste Treatment Requirements

Topic Area	Current Requirements for Sites Subject to EPR-IPPC on the Basis of: Treatment of non-hazardous Waste for <u>Disposal</u> in Facilities with a Capacity > 50 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste Exemptions on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes per day
Operations			
Improvement programme	Improvement conditions reinforce the application of BAT to: Improve process performance Reduce risks to the environment	Non-standard EPR-waste may include improvement conditions to reduce risks to the environment.	No requirement.
Closure & Decommissioning	Prevention or minimisation of activities that create pollution risk on closure / decommissioning, and maintenance of site closure plan.		No requirement. The Construction (Design and Management) Regulations 2007 (CDM 2007) require operators to undertake work in a manner that reduces health and safety risks to workers, which in turn may have environmental benefits.
Site Protection & Monitoring	Submission, implementation and maintenance of site protection and monitoring programme.	EPR-waste site protection requirements	Groundwater Regulations. Contaminated Land Regulations.
Emissions & Monitoring			
Water, air or land	Point source discharges to water, air or land to not cause pollution, unless the operator has used appropriate measures, including those specified in the permit, to prevent or where that is not practicable, to minimise, those emissions. No point source emissions except from those listed in permit. Limits not to be exceeded.	No point source discharges to air, water or land associated with the waste. Other emissions to air, such as those associated with combustion of fuel, may be subject to the Clean Air Act. Discharge to sewer requires a trade effluent consent (or entry to a Trade Effluent Agreement) with the statutory sewerage undertaker (i.e. water company).	Discharge to sewer requires a trade effluent consent (or entry to a Trade Effluent Agreement) with the statutory sewerage undertaker (i.e. water company).

Table A6 (continued) Summary and Comparison of Non-Hazardous Waste Treatment Requirements

Topic Area	Current Requirements for Sites Subject to EPR-IPPC on the Basis of: Treatment of non-hazardous Waste for <u>Disposal</u> in Facilities with a Capacity > 50 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste Exemptions on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes per day
Emissions & Monitoring			
Transfers off-site	Records of all the wastes sent off site from the activities, for either disposal or recovery to be maintained.	Duty of Care requirements.	
Fugitive emissions	<p>Fugitive emissions shall not cause pollution, including a fugitive emissions management plan where appropriate.</p> <p>All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.</p>	<p>Fugitive emissions shall not cause pollution, including a fugitive emissions management plan where appropriate.</p> <p>Buildings for waste treatment shall be maintained under negative pressure and fitted with extraction systems with relevant physical control (e.g. bio-filters).</p> <p>Waste is stored and treated on an impermeable surface with sealed drainage system.</p> <p>All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.</p>	Groundwater Regulations.
Groundwater	<p>No emission from activities into groundwater of any substance in List I (in Groundwater Regulations).</p> <p>No emission from activities into groundwater of any substance in List II (in Groundwater Regulations) so as to cause pollution.</p>		
Odour	Prevention or minimisation of annoyance from odour, including an odour management plan where appropriate.		Statutory Nuisance – local council have the authority to limit or stop activities if they are causing a nuisance.
Noise & Vibration	Prevention or minimisation of annoyance from noise and vibration, including a noise and vibration management plan where appropriate.		Statutory Nuisance – local council have the authority to limit or stop activities if they are causing a nuisance.

Table A6 (continued) Summary and Comparison of Non-Hazardous Waste Treatment Requirements

Topic Area	Current Requirements for Sites Subject to EPR-IPPC on the Basis of: Treatment of non-hazardous Waste for <u>Disposal</u> in Facilities with a Capacity > 50 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes Per Day	Current Requirements for Sites Subject to EPR-Waste Exemptions on the Basis of: Treatment of Non-hazardous Waste for <u>Recovery</u> in Facilities with a Capacity > 75 Tonnes per day
Monitoring	<p>Monitoring of parameters set out in permit, maintaining records and submitting data to the competent authority.</p> <p>Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme to have either MCERTS certification or MCERTS accreditation unless otherwise agreed in writing.</p> <p>Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points.</p> <p>Collection of site reference data identified in the site protection and monitoring programme.</p>	No requirement.	No requirement.
Information			
Records	Provision of records to the competent authority in legible manner.		No requirement.
Reporting	Reporting to the competent authority in accordance with permit requirements and competent authority requests.		No requirement.
Notifications	Notifications to the competent authority.	Notifications to the competent authority.	Annual notification of exemption renewal.
Source of Information			
	Environment Agency EPR-IPPC bespoke permit template.	Environment Agency EPR-waste standard permits.	Includes Environment Agency EPR-waste exemption application form and the NetRegs website.

Environmental Issues

This section identifies the main environmental issues for EPR-waste/exempt operations and is based on the IPPC SGN S5.06⁷⁶, which identifies issues for operators previously entering into the EPR-IPPC regime.

Accident Risk

Accident risk is inherent when dealing with waste. Wastes are heterogeneous in nature and are often intrinsically aggressive to plant and equipment. Any failure in the management of the waste, from the process of characterisation and checking of wastes, to operational control for reactions and mixing of wastes, will significantly increase the risk from unwanted or runaway reactions. Combinations of inappropriate equipment and poor inspection and maintenance procedures also increase the accident risk through, for example, tank overfill situations where level indicators may not be working or have not been correctly calibrated.

Waste Hierarchy

Both IPPCD and the WFD require that appropriate measures be taken against pollution and specifically that the production of waste is avoided. Where waste is produced, the WFD requires that waste be recovered, re-used or used as a source of energy in preference to disposal.

With regard to the waste treatment activities involving recovery this raises the question of whether these activities constitute the appropriate means of dealing with the waste. Clearly, where an opportunity for higher value recovery of a waste exists, then lower value recovery treatment may not be the appropriate measure.

Waste Characterisation, Sampling and Checking

The rigour with which these aspects are conducted is essential to waste management operations. Failure to screen waste samples adequately prior to acceptance and to confirm the composition on arrival at the installation has historically led to subsequent problems, which include inappropriate storage and mixing of incompatible substances, accumulation of wastes and unexpected treatment characteristics. Operators would therefore be required to demonstrate that these activities will be carried out rigorously to ensure their effectiveness.

Selection of Appropriate Treatment Techniques

In assessing the treatment options, the effectiveness of the technique in delivering high value recovery and rendering substances suitable for release to other processes must be considered.

⁷⁶ Sector Guidance Note IPPC S5.06 Guidance for the Recovery and Disposal of Hazardous and Non Hazardous Waste.

For the waste sector in particular, because of the variable and complex composition of many waste streams, not only primary hazards but also secondary hazards must be considered. Techniques should be designed and operated to avoid deliberate or inadvertent production and/or displacement of substances that may be harmful to the environment and to prevent the transfer of such substances from one environmental medium to another.

However, it is also recognised that, to be viable, commercial waste treatment facilities must deal with variable waste streams, and it would not always be desirable or effective to over complicate the design and operation of a waste treatment process. Any determination of BAT cannot be simply seen as a means of implementing the highest available levels of technology.

Merchant waste treatment has to deal with a wide and variable range of wastes. This requires plant and equipment that is versatile and can be used for a number of wastes. This contrasts with treatment techniques used for “in-house” treatment on producer premises, where the number of waste streams is limited and well characterised. This may lend itself to the development of dedicated single-stream treatment techniques.

Accumulations of Waste

Failure to ensure adequate throughput of wastes has led to the storage of large numbers of waste containers on some sites. Wastes involved are typically unchecked and containers are left to deteriorate. Such situations are often associated with large-scale site clearances and can be accompanied by competitive pressures and customer insistence to accept additional waste streams. Typically the wastes involved are difficult to handle and/or treat and may have been transferred between various operators, with a consequent loss of information relating to original producer and composition. Under the IE(IPPC)D the operator would be required to demonstrate the efficient and effective processing of waste. A new requirement will be the need to have measures to identify a suitable disposal or recovery route prior to acceptance.

Emissions to Sewer

Most waste treatment installations have a sewer connection for the emission of aqueous effluents. Consents to discharge are set (in most cases) by sewerage undertakers. Although the consents limit the amount of pollutants dependent on the receiving STW, this can allow the release of significant quantities of pollutants. Historically, the discharge consent has effectively set the standards for the emitting activities. However, this emphasis should change under the IE(IPPC)D, where emissions are determined by applying BAT to reach the most effective standard of pollution control.

Consequently, if on-site treatment can achieve a higher level of removal of a substance from the aqueous effluent than may be required by the sewer discharge consent, on-site treatment should be used. The effect of a third-party waste water treatment plant may be taken into account when determining the emission limit values to be applied to releases to sewer from the installation provided that an equivalent level of protection of the environment as a whole is guaranteed and taking such treatment into account does not lead to higher levels of pollution.

Odour Associated with Fugitive Emissions

The handling of any substance that is or may contain odorous substances, such as mercaptans or other sulphur-containing compounds, will potentially lead to odour noticeable beyond the installation boundary, even at concentrations that may be well below benchmark emission limit values (ELV). Odours may arise from storage, transfer or bulking up of wastes containing odorous substances. Failure to adequately inspect and maintain plant and equipment is also a contributory cause to fugitive emissions, e.g. leaks from pumps.

Site Restoration (prevention of emissions to land)

The IE(IPPC)D in common with EPR-waste requires that, on completion of activities, there should be no pollution risk from the site. Like EPR-waste, prevention of both short and long-term contamination of the site requires the provision and maintenance of surfacing of operational areas, measures to prevent or quickly clear away leaks and spillages, maintenance of drainage systems and other subsurface structures. The main difference between this sector and other sectors is that the condition of the land is considered from when the original licence was issued, not from when the permit is issued.

Appendix B

Previous Regulatory Position: Treatment and Processing of Raw Materials

Environmental Impact

The environmental impacts of food and drink industries have been described in detail in a fact sheet produced on behalf of the Commission and are summarised in the table below.

Table B1 Potential Impact of Food and Drink Industry

Environmental Compartment	Potential Effect/Emission
Water	<ul style="list-style-type: none"> F&D industry is a large user of water: as an ingredient, cleaning agent, means of conveyance and feed to utility systems.
Waste Water	<ul style="list-style-type: none"> Untreated waste water is high in both chemical and biological oxygen demand (COD and BOD respectively). Can also be high in suspended solids, fats, oils and greases, depending on the type of industry.
Energy	<ul style="list-style-type: none"> Consumption can be high and is used for process heating (20% of total energy used); process cooling and refrigeration (16%).
Air	<ul style="list-style-type: none"> Associated with energy production (CO₂, NO_x, SO₂, particulates) Dust and odour (some caused by volatile organic compounds (VOC). Odour – related to the process, or storage of raw materials, by-products or waste. Refrigerant releases – NH₃, halogen Noise – from processes such as grinding in animal feed manufacture
Waste	<ul style="list-style-type: none"> The main sources of solid output are spillage, leakage, overflow, defects/ returned products, inherent loss, retained material that cannot freely drain to the next stage in the process and heated deposited waste.

The environmental performance of food and drink sites in England and Wales regulated under IPPC has improved and this trend should continue as the regulatory influence of the Environment Agency expands. Data shows that

green house gas emissions and waste production to be on the rise from this sector, but this is most likely to be a consequence of the increase in sites that now report to the Environment Agency. The releases to air and water from this sector are low (less than 5% from all industry regulated by the Environment Agency). Operator performance has improved in 2006. The proportion of sites ranked in the highest band increased from 30% to 36%; however the number of sites ranked at the lowest environmental performance increased slightly to 10, although proportionally the amount decreased. The Table below provides an overview of the environmental performance of sites regulated under IPPC in England and Wales⁷⁷.

Table B2 Environmental Performance of the Food and Drink Industry 2006

No. of PPC Permitted Sites	UK Primary Energy use (2005) Oil Equivalent	UK Electricity Use (2005)	Greenhouse Gas Emissions (CO ₂ e) (2005)	Waste Produced 2006	Water Use ⁷⁸	No. of Times Permit Conditions Breached	No. of Serious Pollution Incidents
369	3.8M tonnes oil equivalent	12,593 GWh	10.5M tonnes	3.4M tonnes	435M m ³	34	21

The most significant environmental issues associated with the food and drink manufacturing sector is water consumption and contamination. The industry is a major water user, as an ingredient, cleaning agent, means of conveyance and feed to utility systems. The sector accounts for approximately 10% of all industrial use of the public water supply. Most of the water which is not used as an ingredient ultimately appears in the wastewater stream. Typically, untreated wastewater from the sector is high in BOD and COD. Wastewater can also be high in suspended solids, fats, oils and greases which is very much dependant on the industry. A critical issue is keeping raw materials, intermediates, product and by-product out of wastewaters, by controlling product wastage and cleaning processes.

It is difficult to estimate the environmental impact of ‘mixed installations’, as these vary considerably from installations producing prepared meals, whose effluents may contain high COD and BOD to other ‘mixed installations’ producing compound animal feed for example, which generate practically no effluents although dust may be a bigger issue.

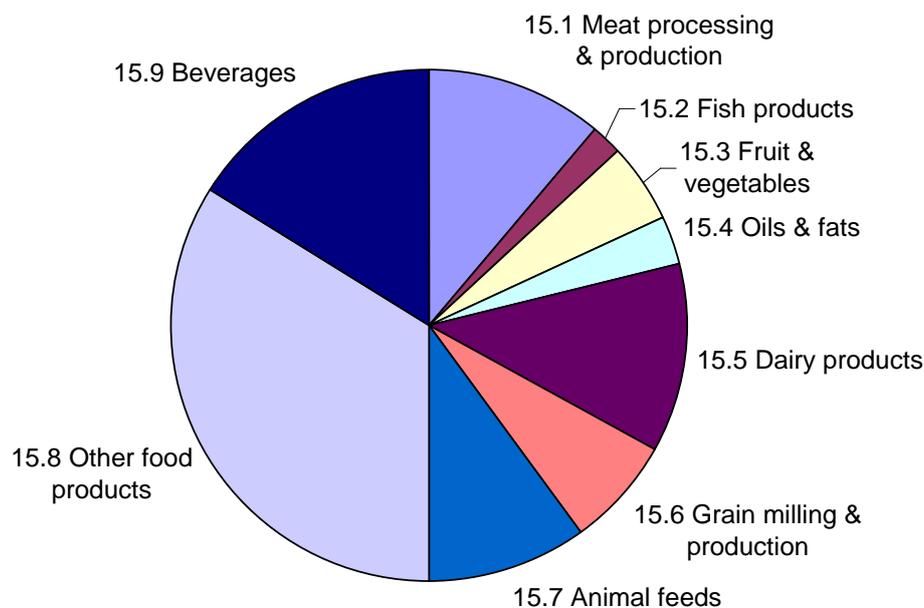
The industry is a relatively energy intensive sector accounting for 4.3% of the UK non-domestic energy consumption. According to the Defra (2007) Food Statistics Pocketbook, energy consumption in the food, drink and tobacco manufacturing industry totalled 3.8 million tonnes of oil equivalent in 2005, down 1.5% on 2004. Since 1996, energy consumption has decreased by 373,700 tonnes of oil equivalent, a fall of 8.9%. This decrease is mainly due to declining petroleum and coal consumption. Usage of electricity has increased by 11.2% over the

⁷⁷ Environment Agency (2007): *Spotlight on business - Environmental performance in 2006*.

⁷⁸ Envirowise (2006): *A Review of Water Use in the Food and Drink industry*.

same period, while usage of natural gas has increased by 2.1%. The Figure below illustrates the total energy consumption by sub-sector in 2004.

Total Energy Consumption by Sub-sector⁷⁹



Greenhouse gas emissions include carbon dioxide, methane, nitrous oxide, hydro-fluorocarbons, perfluorocarbons and sulphur hexafluoride. Greenhouse gas emissions from food and drink manufacturing have fallen by 8.1 per cent since 1990 and totalled 10.5 million tonnes of carbon dioxide equivalent in 2005⁸⁰.

Acid rain precursor emissions include sulphur dioxide, nitrogen oxides and ammonia. Acid rain precursor emissions from food and drink manufacturing have fallen by 63.4 per cent since 1990 and totalled 35.5 thousand tonnes of sulphur dioxide equivalent in 2005¹⁴.

According to the Environment Agency, the food and drink sector is the third highest producer of waste (transferred off-site) of all the sites that are regulated by the Environment Agency, contributing 3.4 million tonnes of waste in 2006. Of this waste, 68% was recovered. In 2006 there was a 30% increase in the amount of non-hazardous waste that was recovered. IPPC data from 2006 on waste for the sector indicates that 40% of the disposals of the IPPC registered food industry were to landfill. Of this landfill material, the largest component was classified as 'mixed municipal waste'.

⁷⁹ AEA report for Defra (2007): Resource efficiency scoping study for the Food and Drink industry.

⁸⁰ Defra (2007): *Food Statistics Pocketbook*.

Recovery of materials within the animal, vegetable and food sector appears advanced compared to other sectors. In total, IPPC data indicates that in England and Wales, the animal, vegetable and food industry recovers approximately twice as much waste (in tonnage) than it disposes of⁸¹.

Table B3 Total Releases (tonnes) from Animal, Vegetable and Food PPC Regulated Sites for 2005 and 2006⁸²

Waste Disposal and Recovery	2005	2006
Disposal of Non-hazardous waste (tonnes)	798,076	1,051,803
Recovery of non-hazardous waste (tonnes)	1,767,541	2,292,274
Disposal of hazardous waste (tonnes)	223	24,972
Recovery of hazardous waste (tonnes)	17,827	6,498

Discussions with a number of installation operators revealed that improvements under PPC regulation are considered to be limited. The main areas where improvements have been noted are in waste management, particularly the requirements for dealing with hazardous waste. Resource efficiency initiatives in the areas of energy and water consumption were already been undertaken before the industry came under PPC regulation. The food industry has noted considerable improvements in these areas, driven mainly by the representative trade association initiatives.

In 2004, the food, drink and tobacco manufacturing sector was one of the largest sectors in terms of expenditure on environmental protection measures, accounting for approximately £574.8 million or 17.7 per cent of the total industry expenditure. The largest spending areas for the sector were water and solid waste, accounting for 51.1% and 28% of the environmental expenditure for the sector⁸³.

There are, however, some inherent barriers to the implementation of environmental improvements by the industry. Barriers to the adoption of new technology, which could reduce water use, energy use and waste production during processing include:

- Reluctance to change when attempting to produce products to rigorous quality and hygiene specifications in a market of narrow margins;
- Lack of investment capital for new equipment;

⁸¹ NISP (2007): *Opportunity and H report*.

⁸² Environment Agency (2008): *Pollution Inventory data*.

⁸³ Defra (2007): *Food Statistics Pocketbook*.

- Sunk costs in existing technology;
- Product price vs environmental protection conflict. Price tends to win every time;
- Lack of public/government pressure to reduce resource use;
- Data quality - difficult to obtain robust data on resource consumption (especially from SMEs –which make up a large part of the industry); and
- SMEs and resource constraints⁸⁴.

Techniques for Prevention or Reduction of Environmental Impacts

The Food and Drink BREF provides BAT for the prevention and reduction of environmental impacts from the sector. The Sector Guidance Note S6.10⁸⁵ provides BAT for installations in the UK. For example, the single most important factor in reducing wastewater strength in this sector is the adoption of dry-cleaning techniques. Wherever possible, raw materials and product should be kept out of the wastewater system. BAT is to remove as much residual material as possible from vessels and equipment before they are washed and to modify, where practicable, process lines and operations that causes excessive spillage of material onto the floor.

For the control of emissions to water or sewer, an on-site biological treatment plant can be designed to deliver BOD concentrations of 10-20mg/l for any incoming load. Minimisation of water usage would therefore be important. Lower values can be achieved by filtration as secondary or tertiary treatment. To prevent accidents and minimise their harm to the environment as a whole, BAT is to, amongst others, identify and implement the control measures which may include using spillage equipment and isolating drains to minimise the impact of an accidental release of liquids.

For the control of emissions to air, energy efficient techniques such as good combustion chamber design and low NO_x burners should be used. In addition, heat recovery systems on indirect fired ovens, utilise exhaust air for pre-heating and also recycle the exhaust gas to the heater. The combustion of recycled exhaust gas should be considered as a technique for reducing NO_x emissions to atmosphere. To control dust emissions, for example from animal feed processes (e.g. grinding), abatement options such as cyclones and/or fabric filters are considered BAT.

Where odour could be a problem from effluent treatment systems, the operator may be required to prepare an odour management plan. The installation may also require further odour abatement with investment in equipment such as thermal oxidisers to reduce odorous emissions.

⁸⁴ AEA report for Defra (2007): Resource efficiency scoping study for the Food and Drink industry.

⁸⁵ Environment Agency, 'How to comply with your environmental permit. Additional guidance for: The Food and Drink Sector (EPR 6.10). .

Overview of Previous Legislation

Previous IPPC Requirements for Food and Drink Industries

The food and drink industry is regulated in England and Wales by the Environmental Permitting Regulations (EPR) 2010 (replacing the PPC (England and Wales) Regulations 2000) under section 6.8 "The Treatment of Animal and Vegetable Matter and Food Industries". The same activity definitions are contained in the Pollution Prevention and Control Regulations for Scotland and for Northern Ireland.

The regulations apply to food and drink industries that:

1. Treat and process animal raw materials with a finished product production capacity greater than 75 tonnes per day; and
2. Treat and process vegetable raw materials with a finished product production capacity greater than 300 tonnes per day.

Within Environment Agency guidance⁸⁶ the definition of what is included under the PPC is further expanded on to include mixed installations. Specifically installations where the operator processes >10% a day of animal raw materials as ingredients on any one day and where there is an output threshold from the site exceeding 75 tonnes/day.

This guidance also specifies that packaging is not to be included within the weight of the finished product.

Under the IPPC Directive, the food and drink industry is subject to integrated environmental regulation for the first time. The sector is significant not only in terms of installation numbers and environmental impact, but it also brings with it significant challenges, for example to reconcile hygiene and food safety issues and pollution prevention measures, with regards to cleaning and reuse of water.

There were 356 IPPC permitted food and drink installations in the UK in 2009. It is estimated that 25% of these are mixed installations.

The food industry is also regulated under Part A(2) of the Environmental Permitting Regulations (England and Wales only) for installations that *dispose or recycle animal carcasses or animal waste by rendering at plant with treatment capacity exceeding 10 tonnes per day of animal carcasses or animal waste or both in aggregate*. According to Environment Agency data, there is only one installation covered by Part A(2) in England and Wales.

Smaller scale industries will be controlled by the 'Part B' regime of the Regulations, which focuses on air emissions only. The industry is regulated under Part B, where installations are involved in the following activities:

⁸⁶ Environment Agency (2008): *Regulatory Guidance Series No. EPR 2 'Understanding the meaning of regulated facility', Version 1.0.*

(a) Processing, storing or drying by the application of heat the whole or part of any dead animal or any vegetable matter (other than treatment of effluent) if these activities: (i) are not covered by Part A (1) or A(2), (ii) is not an excluded activity, or (iii) which may result in releases to air of any substance in paragraph 6(3) of Part 1, or any offensive smell noticeable outside premises.

It could not be determined for this assessment how many food and drink manufacturing installations were previously regulated under Part B. However, within the animal feed sector, 76 animal compound feed installations, 17 dry pet food manufacturing installations and 14 wet pet food manufacturing installations are regulated under Part B of the Regulations.

Other Key Legislation

Hazardous Waste Regulations (Special Waste Regulations in Scotland)

These regulations affect installations that produce, handle, store, treat or dispose of substances classified as 'hazardous waste'. Installations are required to register with the regulatory body as a hazardous waste producer, segregate and safely dispose of hazardous waste at a site licensed to accept the materials, pre-treat all hazardous waste before sending it to landfill and ensure that the correct documentation for the waste transfer is retained.

Water Resources Act 1991– Discharge Consents

Installations discharging effluent to controlled waters require a discharge consent from their regulator in order to regulate the quality of the discharges to help protect water quality, the environment and human health. Discharge consent holders are allowed to discharge agreed levels of pollutants into rivers, ground waters and coasts. Untreated wastewater from the food and drink manufacturing industry is high in BOD and COD, as well as suspended solids, oil, fats and greases, depending on the type of industry.

The same activity definitions are contained in the Water Environment (Controlled Activities) (Scotland) Regulations 2005 and the Water (Northern Ireland) Order 1999.

Animal By-Products Regulations (ABPR)

The ABPR Regulations apply controls on the use, treatment, handling and disposal of animal by-products. The aim is to control the risks, including disease, to both animals and the public and affect the disposal of food waste.

Water Industry Act (as amended)

Businesses discharging anything other than domestic sewage or clean rainwater to sewer need to have a trade effluent agreement with their sewerage undertaker.

The same activity definitions are contained in the Sewerage (Scotland) Act in Scotland and the Water (Northern Ireland) Order 1999 in Northern Ireland.

Air Quality (England) Regulations

The same activity definitions are contained in the Air Quality Regulations for Scotland and for Northern Ireland.

These regulations give air quality objectives for NO_x, SO_x and PM₁₀ to be achieved by specified dates.

Climate Change Levy (CCL) Regulations

The CCL is a levy on some types of energy used by businesses. Many companies within the food and drink industry are part of a CCA which can rebate up to 80% of the levy.

Sector Association Initiatives

As well as the legislative drivers, there are a number of sector association initiatives in place which are designed to drive environmental improvement within the food and drink industry.

FDF Member's Five-Fold Ambition for the Environment⁸⁷:

- 20% reduction in CO₂ emissions by 2010 compared to 1990 and a 30% reduction in CO₂ emissions by 2020;
- Send zero food and packaging waste to landfill from 2015;
- Make a significant contribution to WRAP's work to achieve an absolute reduction (340,000 tonnes) in the level of packaging reaching households by 2010 compared to 2005 and provide more advice to consumers on how best to recycle or otherwise recover used packaging;
- An industry-wide target to reduce water use by 20% by 2020 compared to 2007; and
- Food chain to reduce environmental and social impacts by 20% by 2012 by embedding environmental standards into transport practices.

WRAP Courtauld Commitment: FDF members are working with WRAP to increase the number of food and drink manufacturers who have signed up to the Courtauld Commitment. The current Courtauld Commitment expires in 2010 and will be replaced by a new Commitment.

FDF Federation House Commitment (FHC): jointly developed by the FDF and Envirowise, the FHC aims to reduce overall water usage across the Food and Drink industry by 20% by the year 2020. The FHC is open to all

⁸⁷ FDF (2006): *The environment: making a real difference*.

food and drink manufacturing companies. Members will review their current water use, develop site specific action plans to cut water use and costs within six months of signing up to the commitment and report annually on water and cost savings made on site.

Appendix C

Typical Emissions from Non-Hazardous Waste Treatment for Recovery

Water Sector Biological Treatment

The table below summarises the typical emissions that would be expected from facilities undertaking the biological treatment of non-hazardous sewage and water treatment sludges.

Table C1 Typical Emissions from Biological Treatment of Non-hazardous Sewage and Water Treatment Sludges

Biological Treatment (anaerobic digestion)		
Air	Controlled Waters	Land
Odours	Suspended solids	Waste residues to landfill disposal.
VOCs	Heavy metals	Sludge spreading onto land.
Oxides of nitrogen	Ammoniacal-nitrogen	
Carbon dioxide	BOD	
Hydrogen sulphide	COD	
Methane	Trace metals	

Waste Management Sector Biological Treatment

The table below summarises the typical emissions that would be expected from facilities undertaking the biological treatment of non-hazardous waste. The emissions data has been compiled from the SEPA guidelines for mechanical biological treatment and anaerobic digestion⁸⁸ and the decision document from a Scottish composting facility.

⁸⁸ SEPA. http://www.sepa.org.uk/pdf/nws/promotion/Anaerobic_Digestion.pdf. Available on 22nd May 2008.

Table C2 Typical Emissions from Biological Treatment Facilities⁸⁹

Compost			Anaerobic Digestion			Mechanical Biological Treatment		
Air	Controlled Waters	Land	Air	Controlled Waters	Land	Air	Controlled Waters	Land
Micro-organisms	Untreated waste water – abatement through bunding, drainage collection and hard standing should be in place	Litter	Odours	Untreated waste water – abatement through bunding, drainage collection and hard standing should be in place	Litter	Micro-organisms	Untreated waste water – abatement through bunding, drainage collection and hard standing should be in place	Litter
Dust			VOCs			Dust		
Odour			Oxides of nitrogen			VOCs		
VOCs			Methane			Odours (hydrogen sulphide)		
Bioaerosols			Bioaerosols			Carbon dioxide		

Pre-treatment for Co-incineration

Emissions associated with pre-treatment for co-incineration arise from biological, physical and physico-chemical treatment; the previous tables in this appendix have described these emissions.

Emissions - Treatment of Slags and Ashes

In general there was a lack of data available regarding the treatment processes involved for this sector. One company identified the main environmental impact as particulates. Given that the sites are often co-located on heavy industrial sites, the issue relating to noise was not considered an issue by virtue of the assumed low sensitivity of the location and the absence of noise sensitive receptors.

Work completed as part of the Commission’s review of the IPPCD⁹⁰ estimated that dust emissions could be around 100t per million tonnes of slag treated. Across the EU emissions of dust could potentially be reduced by a factor of 10 by bringing these installations within the scope of the IE(IPPC)D. However, emissions to air from such sites are already regulated under a BAT-based permitting system so it is unlikely that the proposals would reduce emissions in the UK for this sector.

⁸⁹ Dr Mark Broomfield on behalf of Surrey County Council Environment and Economy Select Committee. *Health risks of waste management facilities*. [http://www.surreycc.gov.uk/sccwebsite/sccwspublications.nsf/b129973b443de13e80256c670041a50e/1e9895c925f0f1488025715700297b96/\\$FILE/Mark%20Broomfield%20-%20Enviros.pdf](http://www.surreycc.gov.uk/sccwebsite/sccwspublications.nsf/b129973b443de13e80256c670041a50e/1e9895c925f0f1488025715700297b96/$FILE/Mark%20Broomfield%20-%20Enviros.pdf). Available on 2nd May 2008.

⁹⁰ Data gathering and impact assessment for a review and possible widening of the scope of the IPPC Directive in relation to waste treatment activities. Fact sheet E4-Off-site treatment installations for slag and ashes for recycling. Final report by VITO and BIO, with Institute for European Environmental Policy and IVM, 2007.

Emissions - Treatment of Scrap Metal

The following table summarises the typical emissions that would be expected from facilities undertaking the recycling of scrap metal.

Table C3 Emissions from Scrap Metal Facilities⁹¹

ELV Facility	WEEE Facility	Vehicle Dismantler	Metal Recycling Site
Particulates, hydrogen chloride, cadmium and lead (as metals), VOCs and hydrocarbons, dioxins and PCBs			

⁹¹ http://www.ehsni.gov.uk/gnb2-2_pdf.pdf. Available on 2nd May 2008.

Appendix D

Overview of Additional Previous Legislation Affecting the Wood Preservation Sector

Biocidal Products Directive (BPD)

The Biocidal Products Directive concerning the placing of biocidal products on the market has been developed to control the risk of biocides at EU level. Wood preservatives substances currently in use in the UK and which are being reviewed under the BPD review programme include creosote, copper, and permethrins (12). The UK competent authority for the BPD review programme, the HSE, have concurred that chromium is an active substance with unacceptable properties and it has been removed from the market (13).

Active substances are evaluated at community level and the biocidal products are authorised at national level. Only authorised biocidal products may be placed on the market and only biocidal products containing active substances included in the Annexes I, IA or IB of the Directive may be authorised. If a substance is considered to be an active substance and it fails to get included into Annex I or IA for whatever reason, it cannot be used anymore thereafter in biocidal products as an active substance. Whereas, if a substance is not considered to be an active substance, it does not have to be listed in Annex I or IA and can be used in formulated biocidal products (provided of course that it fulfils all other requirements e.g. regarding acceptability of risks or other requirements) (21).

The inclusion of a substance in Annex I means that the substance has an environmental and human risk profile in terms of its intended use. This includes a risk assessment of the application processes to be used, including wood impregnation plants. As a result of the BPD, substances such as pentachlorophenol and tributyltin compounds have been removed from the market since 2006 and products containing lindane were removed from the market in 1990.

Environmental Protection (Controls of Dangerous Substances) Regulations, 2003

The UK Environmental Protection (Controls of Dangerous Substances) Regulations 2003 implement the provisions in the EU Directive 2003/2/EC, which introduced a partial ban on the use of CCA (copper/chrome/arsenic) as a timber treatment, as CCA is considered to be a carcinogen. The risks from CCA are considered to be very small but a very precautionary approach has been taken in this case. In Northern Ireland the EC Directive provisions were implemented through the *Marketing and Use of Dangerous Substances (No.4) Regulations (Northern Ireland) 2003*, SR 2003/548.

The main concern is over the arsenic content. These Regulations prohibit the use of timber with CCA with effect from 30 June 2004 in applications where there is likely to be repeated skin contact by users. The Regulations do not apply to CCA treated timber already in use. Concerns were raised by those involved in children's play about the implications of the Directive and the Regulations as well as the declaration of CCA as a carcinogen.

Water Framework Directive

The Water Framework Directive (WFD) is the most substantial piece of EC water legislation to date and is designed to improve and integrate the way water bodies are managed throughout Europe. It came into force on 22 December 2000, and was put into UK law (transposed) in 2003. Member States must aim to reach good chemical and ecological status in inland and coastal waters by 2015. As part of the Water Framework Directive, a European 'priority list' of substances posing a threat to or via the aquatic environment has been established.

There are currently thirty three substances on this priority list, which was agreed in 2001 (Decision 2455/2001/EC), and the list will be reviewed on a regular basis. These substances are referred to as 'priority substances', and those which are thought to pose the greatest threat are further identified as 'priority hazardous substances'.

A number of substances are listed that the wood preservation industry has, in the past, been a significant source of, such as some PAHs. However, these substances are not currently used anymore in the UK.

Hazardous Waste Regulations

The Hazardous Waste Regulations (England and Wales) 2005 set out requirements for the controlled management of hazardous waste. The Regulations set out procedures to be followed when disposing of, carrying and receiving hazardous waste.

Limitations Directive and Amendments

The Limitations Directive (76/769/EEC), which was consolidated into a single instrument - the Controls on Dangerous Substances and Preparations Regulation (2006), introduces restrictions on the marketing and use of chemicals which cause unacceptable risk to human health or the environment. Among these chemicals there are also certain biocides. Other Directives have also been introduced to restrict the use of certain biocidal products:

- Arsenic (Directive 2003/2/EC and Directive 2006/139/EC);
- Creosote (Directive 2001/90/EC);
- organic tin compounds (Directive 2002/62/EC);
- Mercury (Directive 89/677/EEC); and
- Pentachlorophenol (PCP) (Directive 1999/51/EC).

Directive 2001/90/EC concerning the marketing and use of creosote states that substances and preparations containing creosote, creosote oil, and others, may not be used in the treatment of wood. However, some specific derogations are allowed, e.g. creosote can only be used in closed pressurised systems.

Commission Directive 2003/2/EG relating to restrictions on the marketing and use of arsenic states that arsenic compounds may not be used in preservation of wood.

E-PRTR

The E-PRTR Regulation 2006, requires operators of industries regulated by the Environment Agency and falling under the activities listed in the Regulation, to report their releases and transfers to the European Commission on an annual basis starting in 2007. The relevant substances for the wood preservation industry are copper, chromium and PAHs associated with the use of creosote. Both chromium and copper are currently being reviewed under the BPD review programme on whether they will be included as active substances on Annex I of the Directive. In the UK, chromium already considered an active substance and has been removed from the UK market.

The E-PRTR succeeds the European Pollutant Emission Register (EPER). The new E-PRTR has brought in the requirement for reporting from new sectors, including the wood preservation sector.

Specific measures within the Aarhus Convention on access to environmental information are expected to enhance international reporting and consistency. These international developments will improve public awareness of environmental pollution and enhance transparency and comparability across different countries.

The E-PRTR Regulation aims to enhance public access to environmental information through the establishment of a coherent and integrated E-PRTR, thereby finally also contributing to the prevention and reduction of pollution, delivering data for policy makers and facilitating public participation in environmental decision making. Installations are required to report releases from PPC activities to the E-PRTR. The UK Pollution Inventory is being adapted to meet this reporting requirement.

Other Legislation

PAHs

The use of creosote can be a source of PAHs. Certain polycyclic aromatic hydrocarbons (PAH) are classified as carcinogenic, mutagenic and reprotoxic substances. They are also regarded as Persistent Organic Pollutants (POPs) under the UN ECE Protocol on Persistent Organic Pollutants (the 1998 Protocol to the 1979 Convention on Long Range Transboundary Air Pollution on Persistent Organic Pollutants) and are subject to reduce total annual emissions.

Restrictions on PAHs have been agreed as per Directive 2005/69/EC. It is that these provisions should commence from 1 January 2010. Defra has supported the Air Quality Framework Directive and a daughter Directive specifically addressing the need to reduce PAHs, as well as the Protocol on POPs. Support for this Directive would follow the precedent sent by these two preceding tools.

Surface Waters (Dangerous Substances) (Classification) Regulations, 1997

The Dangerous Substances Directive (76/464/EEC) was implemented into the UK through the UK Surface Waters (Dangerous Substances) (Classification) Regulations, 1997. The aim of the Directive was to control discharges of

dangerous substances to inland surface waters and groundwater's. Chemicals identified as the most hazardous to the aquatic environment are in List 1 of the Directive and the legislation requires that these substances are completely eliminated from discharges to waters. The chemicals in this list are toxic and persist in the environment and accumulate in biological systems causing harm to aquatic life. Dangerous substances in List 2 were thought to be less hazardous than those in list 1. Chemicals in List 2 have an Environmental Quality Standard (EQS) set according to a standard methodology. EQS represent a concentration limit that must not be exceeded in any controlled water in the UK and the dangerous substance is not believed to harmful to the aquatic environment at concentrations below this limit. The UK Surface Waters (Dangerous Substances) (Classification) Regulations, 1997 controls the release of substances, such as chromium, to the aquatic environment.

The UK Surface Waters (Dangerous Substances) (Classification) Regulations, 1997 controls the release of substances, such as chromium, to the aquatic environment, through EQS for hardness.

Further Requirements

Air Quality Limit Values

These only apply to solvent-based plants which are covered under Process Guidance 6/3 where BAT has set fugitive emission levels and plant cycles have been changed to comply with this. There are relatively few plants in the UK using organic solvent-based wood preservatives and these are because specific technical requirements.

Appendix E Preservatives Currently Used In the UK

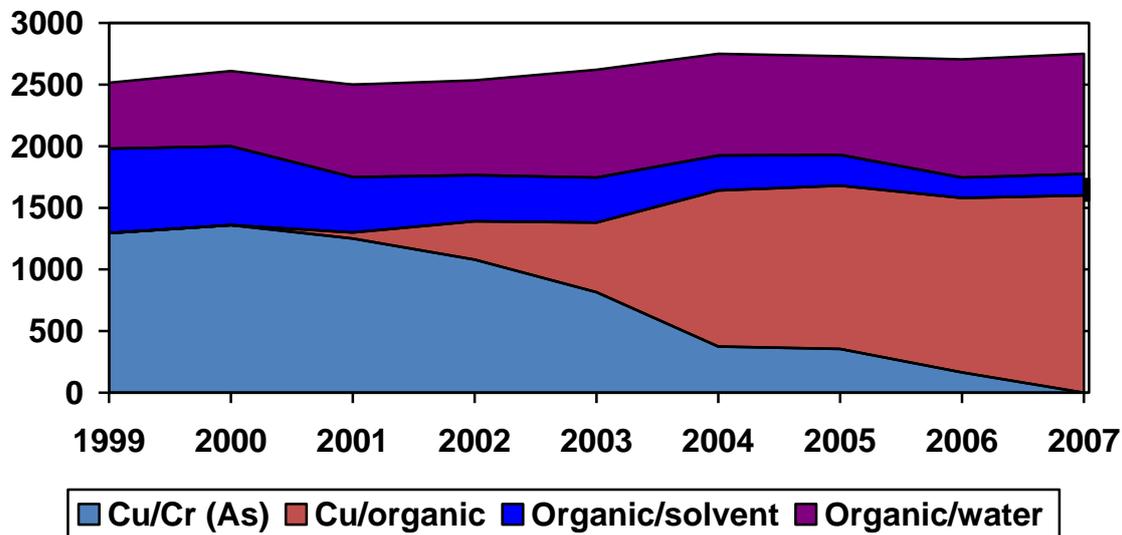
The following information was obtained from one of the UK's main suppliers of preservative products to the wood preservation industry. Table E1 lists the main types of preservatives and the annual quantities currently used in the UK.

Table E1 Main Types of Product Mix, Preservative Types and Quantities Used In UK

Product Mix	Preservative Type	Quantity Used in UK Per Annum	Quantity of Treated Wood m ³ /Year
Copper/organic – quaternary ammonium compounds (QUATS)/copper, azole/copper and copper HDO	Waterborne, copper-based	6,000 tonnes	2,000,000
Organic/solvent – azoles and permethrins white spirit	Organic solvent-based	1.2 million litres	-
Organic/water – azoles and permethrins water	Waterborne	10 million litres	-
Creosote	Creosote	Unknown	-
Copper/Chrome (originally copper/chrome/arsenic then moving to copper/chrome)	Waterborne	Not sold in UK anymore	-

There are relatively few plants using organic solvent-based preservatives currently in the UK and only three creosote plants, with the majority of preservatives used being water-based alternatives. From Figure E1, which illustrates the trends in usage of the different preservative types in the UK, it is evident that copper/organic water based preservatives are the most widely used in the UK. The use of copper/chrome preservatives has ceased. The individual preservative types are discussed in more detail in the below sections.

Figure E1 UK Preservative Product Mix Trends ('000s m³ sold/year)



Application of Preservatives

The application of the preservative may be carried out via vacuum processes, pressure processes, dipping, spraying or brushing. Vacuum processes are widely used in the UK. The vacuum process may vary slightly depending on the preservative. The application efficiency of the vacuum process, dipping and brushing is close to 90%. Spraying has a much lower efficiency i.e. form 10-50%.

Creosote

Creosote is oil prepared from coal tar distillation. Creosote is the oldest form of wood preservative and is used for external applications such as telegraph poles and railway sleepers. For the preservation of 1 m³ of wood, an average 100 kg of creosote is required. In industrial facilities, timber enters a chamber which has been pressurised with air. The chamber is flooded with hot creosote for 1-3 hours. After draining, a vacuum is applied to draw off excess creosote. The timber is left to dry in open air.

In the UK, there are three creosote plants, out of a total 500 installations. Creosote has been identified as a significant source of POPs (persistent organic pollutants) in the form of PAHs, in particular benzo[a]pyrene. Wood creosote may be released to soil and water as a result of its use in the wood preservation industry. Information on the contribution of the wood preservation industry to UK POP emissions could not be determined, however it was reported that at an EU level, the industry contributed to 30% of EU POP emissions. Creosote has been gradually replaced by less harmful water-based alternatives. Directive 2001/90/EC concerning the marketing and use of creosote has restricted the levels of benzo[a]pyrene content to 50ppm. With the exception of revised benzo[a]pyrene content, the industry no longer uses any substances which are listed as POPs. The only source of POPs from the wood preservation industry is from the use of creosote.

The UK creosote plants currently operate under the requirements of the IPPC Directive and UK Regulations. The relevant UK guidance notes (PG 6/2 (04) and PG 6/3 (04) already require BAT implementation and detailed reporting of product use in addition to detailed monitoring requirements. It can therefore be concluded that the current UK framework already recognises creosote specific issues.

The use of creosote in wood preservatives and its inclusion in Annex I to the Directive 98/8/EC, the Biocidal Products Directive (BPD) is currently being evaluated under BPD review programme. Two grades of creosote oils are presently under evaluation, namely grades B and C. The most common is Grade B and is intended for treatment of timber wood by pressure impregnation. Grade C excludes the lower boiling fraction allowable in Grade B, and because of the lower volatility, a reduction in odour is achieved. If creosote is not totally removed from the market as a result of its evaluation, it is likely that it will only be allowed for very limited applications, for example, by railways and utility companies, where very strict conditions of use are applied (1). If it should be decided that creosote cannot be included in Annex I or included with restrictions, the use of biocidal products containing creosote could eventually be prohibited and these products would have to be removed from the EU market.

Based on new data submitted to the Commission, a safe use of creosote may be able to be identified with regard to human health. Therefore the recommendation in the competent authority report to the Commission might be revised in order to propose inclusion in the Annex to the BPD Directive. However, risks have been identified for some in-service uses for creosote treated wood. Based on the data presently available it has been shown that there are risks when treated wood is used in use classes 4 and 5, i.e. wood in direct contact with soil or water (freshwater and sea water). It has been suggested by the Commission that benefits from the use of wood preservatives containing creosote should be considered before taking a final decision. In order to perform an overall risk/benefit analysis of the use of creosote as a wood preservative, the Commission services are inviting stakeholders to comment on the possible consequences of the inclusion or non-inclusion of creosote in Annex I to Directive 98/8/EC. In particular, the Commission services are inviting stakeholders to provide sound data or evidence on:

- The practical and economic consequences of the phasing out of creosote;
- The availability of less hazardous or non-hazardous alternatives to creosote or creosote treated wood;
- Advantages and/or disadvantages of the use of these possible alternatives compared to creosote or creosote treated wood;
- Practicability of these possible alternatives, in particular whether they can be used in large industrial and/or commercial scale;
- If alternatives are not yet available, estimate of the time needed to develop and make available sound alternatives to the use of creosote; and
- Whether or not alternatives can be used in connection with maintenance of cultural heritage or protected constructions.

Water-Based Preservatives

Water-based preservatives consist of solutions of metal salts in water. Copper, chromium and arsenic (CCA) were the most common types used. CCA types are no longer used in the UK and arsenic has been removed from the market (Directive 2003/2/EC and Directive 2006/139/EC). These water-based preservatives are applied in the same way as creosote. The chemicals bind with constituents in the wood and are essentially 'fixed' to the wood in a form that is resistant to leaching out by water. The treated timber is used in applications where long term protection is needed e.g. outdoor furniture, fencing and some treated timber is used in outdoor playground equipment.

The placing on the market of wood preservatives products is regulated under the Biocidal Products Directive (BPD). Releases of heavy metals to land and water are considered to be an important issue of concern for the industry (3, 6). By the introduction of water-based systems, emission relevance has moved from air to water pollution. However, as a result of various legislation restricting the use of certain substances, with the exception of copper and significantly reduced chromium use, the industry no longer uses heavy metals (8).

Some chromium compounds will be toxic to certain wildlife species although toxicity will depend on the level of exposure. In terms of local environmental impacts, certain aquatic species bioaccumulate chromium although fish do not appear to do so. Chromium (VI) compounds are relatively more toxic and are readily absorbed by organisms whereas chromium (III) compounds are less toxic and are not readily absorbed by organisms. The UK legislation controlling releases of chromium, implementing the EC Directives, are the Surface Waters (Dangerous Substances) (Classification) Regulations, 1997 through the introduction of Environmental Quality Standards (EQS) and the PPC Regulations. EQS represent a concentration limit that must not be exceeded in any controlled water in the UK. Chromium is listed as a List 2 dangerous substance and concentration limits have been set for hardness for this substance.

The regulatory status of chromium as a wood preservative is still somewhat unclear. Under the BPD review programme, the status of chromium compounds in wood preservative products was reviewed. The industry view was split, some claiming that it was an active substance and others not. The UK Competent Authority, the HSE, concluded that chromium is an active substance with unacceptable properties, and as a result all UK wood-preserving products containing chromium were required to be removed from the market as of 1 September 2006. Discussion held with one of the main preservative suppliers in the UK revealed that preservatives containing chromium are no longer in use in UK wood preservatives, having been replaced with substances less harmful to human health and the environment(3).

A number of timber treatment installations were contacted for this assessment. Four installations contacted used copper organic water-based preservatives, the main types on the market was indicated to be Tanalith E or AC 500. It has been estimated that 6 000 tonnes of copper organic preservative is used annually in the UK to treat wood, and that 2 000 000 m³ of wood treated with copper organic preservatives is produced annually.

Copper-containing wood preservatives make up a substantial part of the market. The conditions of approval set out in the authorisation of these products (by HSE as the Competent Authority for the BPD), to be placed on the market

determine the mode of operation of the timber treatment installation. Wood preservation is unlikely to be a significant source of copper to the atmosphere. The main concern is the releases to land and water.

Small amounts of copper are essential to many living organisms, including man. At much higher levels, it can be toxic to wildlife. Deposited copper in soils is toxic to certain soil micro-organisms and can disrupt processes such as nutrient cycling or inhibit other processes such as the mineralisation of nitrogen and phosphorous.

Accumulation in species varies significantly as does their ability to cope with a range of copper levels in their bodies. Toxic effects have been observed in some species of fish and in other aquatic organisms.

The European Pollutant Release and Transfer Register (E-PRTR), which replaces the European Pollutant Emissions Register (EPER), sets out reporting requirements for operators of the amounts of hazardous and non hazardous waste and also for release to air, water and soil, subject to thresholds. In the UK, releases of copper are controlled under the Environmental Permitting Regulations 2007 (replacing the PPC Regulations in England and Wales). Copper as a wood preservative is currently being reviewed under the BPD review programme with possible inclusion in Annex I of the Directive as an active substance.

Quaternary ammonium compounds (QUATS) are increasingly used in copper/organic water based preservatives. These are a complex group of substances which are currently being reviewed under the BPD review programme to determine if the substance can be considered an active substance and should be included to Annex I of the Directive.

Moves to substances less harmful to human health (in manufacture and application) have led to the use of substances such as permethrins. These substances can have high aquatic toxicity (4) and are currently being reviewed under the Biocidal Products Directive (BPD) review programme and are awaiting comments from the Member States as to their inclusion as an active substance on Annex I to the Directive.

Solvent-Based Preservatives (Light Organic)

Light organic solvent preservatives contain organic biocides such as propiconazol (which replaced pentachlorophenol), lindane, permethrin, triazoles and tributyltin compounds. These impregnation agents cause VOC emissions at production stage and during its use. Lindane, tributyltin and pentachlorophenol and chromate preservatives are banned now in the UK for use as biocides. Each cubic metre of wood requires 20kg of organic solvent-based preservative. These consist of approximately 10% active ingredient and 90% organic solvent, usually white spirit or other petroleum based hydrocarbons, with the average density being about 1mg/m^3 (4). These preservatives are used in the construction industry and applications where the precise dimensions of the product are important. In industrial installations, timber enters a chamber which is subsequently evacuated. The chamber is flooded with preservative and pressurised for 5 to 20 minutes. After draining the chamber, a final vacuum is applied to draw off excess preservative. The timber is left to dry in the open air.

Emissions can be reduced by good solvent management, enclosing the process wherever possible so that air can be extracted through abatement equipment, and using low alternative solvent coatings where possible. Fugitive emissions can occur throughout the handling, application and drying stages of the processes. Timber impregnation using the closed double vacuum process minimises the fugitive loss (5).

According to the WPA, only a small number of plants use organic-based solvents in the UK, the Defra survey 2007 revealed that the number of Part B permitted installations was approximately 43⁹². It has been estimated that 1.2 million litres of organic solvent is used annually in the UK to treat wood, mainly containing azoles and permethrins compounds. Installations using solvents already fall under the scope of the IPPC and SED. It has been estimated that approximately 91% (457 installations out of 500)⁹³ of the UK wood preservation industry use less than 25 tonnes of solvent per year. This is because most of the installations do not use solvent-based preservation agents, and therefore are not covered by the IPPC or by SED. According to the WPA, at least 250 of these installations will be affected by this option.

⁹² This for England and Wales and does not include installations in Scotland. The EHS have stated that there are no permitted installations in Northern Ireland.

⁹³ Aston, D. :Personal communications in April 2008 and August 2011.

Appendix F

Overview of Previous Legislation for Independently Operated Waste Water Treatment

The UK legislation and associated European Directives controlling the activities of waste water treatment companies is summarised in Table F1 and discussed in detail in the following sections:

Table F1 Relevant Statutory Instruments for the Permitting/Licensing of Waste Water Treatment Activities

EC Directive	Corresponding UK Statutory Instrument/Act	
Integrated Pollution Prevention and Control Directive (2008/1/EC)	England and Wales	Environmental Permitting (England and Wales) Regulations 2010.
	Scotland	Pollution Prevention and Control (Scotland) Regulations 2000, as amended.
	Northern Ireland	The Pollution Prevention and Control Regulations (Northern Ireland) 2003, as amended.
Urban Waste Water Treatment Directive (91/271/EC)	England and Wales	Urban Waste Water Treatment (England and Wales) Regulations 1994 as amended.
	Scotland	Urban Waste Water Treatment (Scotland) Regulations 1994 as amended.
	Northern Ireland	Urban Waste Water Treatment (Northern Ireland) Regulations 1995 as amended.
Waste Framework Directive (75/442/EEC)	England and Wales	Environmental Permitting (England and Wales) Regulations 2010.
	Scotland	Waste Management Licensing Regulations 1994, as amended.
	Northern Ireland	The Waste Management Licensing Regulations (Northern Ireland) 2003 as amended.

Environmental Permitting Regulations (EPR)

The EPR regime does not apply to Scotland or Northern Ireland, which still have separate PPC and waste management licensing systems.

Integrated Pollution Prevention Control (IPPC)

Waste water treatment remote from IPPC-permitted industrial activities is controlled by the Environmental Permitting Regulations in England and Wales, if it meets one of the following criteria:

- The threshold capacity for the physico-chemical and/or biological treatment is 50 tonnes/day for non hazardous wastes and 10 tonnes/day for hazardous wastes; and

- The treatment plant is a directly associated activity to a IPPC permitted industrial activity (i.e. the permitted process is the principal user, it has a technical connection to the industrial activity, can be regarded as part of the installation and is on the same site).

The same activity definitions are contained in the Pollution Prevention and Control Regulations for Scotland and for Northern Ireland.

During the implementation of IPPC within the UK, a number of independently operated waste water treatment plants were considered in order to determine if they should be included as directly associated activities. However due to various technicalities, including the review of technical connections and definition of the 'same site' rule it was ruled that these should not be permitted.

The definition of 'installation' in the IE(IPPC)D includes the technical unit and the DAAs that are on the 'same site'.

Waste Management Licensing Regulations

A number of waste water treatment plants are covered by the Environmental Permitting Regulations for waste operations, because they import or export waste. If an installation treats >100 000 m³ per annum it will require a waste management licence. In some cases waste water treatment operations will be exempt depending on the origin and quantity of waste treated. These exemptions are set out in Schedule 3 to the Regulations.

The same activity definitions are contained in Waste Management Licensing Regulations for Scotland and for Northern Ireland.

Urban Waste Water Treatment Regulations

The objectives of the Urban Waste Water Treatment Regulations are to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors, specifically food processing industries, where the waste water is biodegradable. These sectors include milk processing, fruit and vegetable product manufacturers, soft drink manufacturers, potato processors, meat industry, breweries, production of alcohol and alcoholic beverages, manufacture of animal feed from plant products, manufacture of gelatine and of glue from hides, skin and bones, malt-houses and fish-processing industries.

The regulations apply to discharges of this biodegradable industrial waste water from plants representing 4 000 population equivalent or more where the waste water does not enter an urban waste water treatment plants before discharge to receiving waters.

For urban waste water the threshold level is a population equivalent of 10 000 in respect of all discharges, and a population equivalent of 2 000 if the discharge is into freshwaters and estuaries.

Where industrial waste water is discharged into an urban waste water treatment plant, with or without pre-treatment there is a need for its flow to be monitored and the load determined in line with the requirements of the regulations in order to ensure it does not impact on the treatment of the urban waste water.

