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**Report for the Stage 3 in-depth review of emission
inventories submitted under the UNECE LRTAP
Convention and EU National Emissions Ceilings
Directive for:**

UNITED KINGDOM

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INTRODUCTION

1. The mandate and overall objectives for the emission inventory review process under the LRTAP Convention is given by the UNECE document 'Methods and Procedures for the Technical Review of Air Pollutant Emission Inventories reported under the Convention and its Protocols' (1) – hereafter referred to as the 'Methods and Procedures' document.
2. This annual review has concentrated on SO₂, NO_x, NMVOC, NH₃, plus PM10 & PM2.5 for the time series years 1990 – 2008 reflecting current priorities from the EMEP Steering Body and the Task Force on Emission Inventories and Projections (TFEIP). HMs and POPs have been reviewed to the extent possible.
3. This report covers the stage 3 centralised reviews of the UNECE LRTAP Convention and EU NEC Directive inventories of the United Kingdom coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 21 June 2010 to 25 June 2010 in Copenhagen, Denmark, and was hosted by the European Environment Agency (EEA). The following team of nominated experts from the roster of experts performed the review: generalist - Jean Pierre Chang (France), Energy - Laetitia Serveau (France), Energy / mobile - Emilia Hanley (Ireland), Industry - Kees Peek (Netherlands), Agriculture + Nature - Rocio Danica Condor (Italy), Waste - Sophie Hoenh (Switzerland). For resource constraint reasons in the ERT the Solvents estimates were not reviewed.
4. Justin Goodwin was the lead reviewer. The review was coordinated by Katarina Marečková (EMEP Centre on Emission Inventories and Projections - CEIP).

¹ Methods and Procedures for the Technical Review of Air Pollutant Emission Inventories reported under the Convention and its Protocols. Note by the Task Force on Emission Inventories and Projections. ECE/EB.AIR/GE.1/2007/16 <http://www.unece.org/env/documents/2007/eb/ge1/ece.eb.air.ge.1.2007.16.e.pdf>

PART A: KEY REVIEW FINDINGS

5. The inventory is in line with the EMEP EEA Inventory Guidebook and UNECE Reporting Guidelines. Transport emissions are calculated on the basis of base fuels used for some pollutants. Emissions reported under CLRTAP and NECD are consistent.

6. The ERT also notes that recalculations have been applied consistently through entire time series. The ERT also notes that the country applies tier 2/3 methods for most key categories which are consistent with the Inventory Guidebook.

INVENTORY SUBMISSION

7. In its 2010 submission, the United Kingdom provided national inventories for the full time series from 1980 to 2008. The ERT commends UK for its efforts in submitting the full yearly time series since 1980 and a high quality (complete, transparent, consistent and accurate) inventory and IIR following the IIR template.

8. Emissions and activity data are reported in NFR09 categories. Projection emissions and activities are provided for the year 2010, for the "with measures" scenario.

9. The ERT notes that the UK's reported national total emissions and road transport emissions are, for most pollutants, based on a fuel used (travelled traffic-based) approach - except for SO_x and heavy metal emissions which are fuel-sold based. During the review, UK explained the rationale for reporting fuel used-based emissions, and referred to the revised Guidelines (ECE/EB.AIR/97) under point 16. The ERT drew the UK's attention to point 15 of ECE/EB.AIR/97 which specifies that the reported transport emissions should be calculated and reported on the basis of the fuel sold and interprets this to mean that rows 37-41 of NFR TABLE IV 1: National sector emissions: Main pollutants, particulate matter, heavy metals and persistent organic pollutants should be used for "fuel sold"-based reporting. The ERT notes that point 15 of ECE/EB.AIR/97 clarifies that Parties may (in addition to reporting on the basis of fuel sold), report emissions from road vehicles based on "fuel used" or "kilometres driven" in the geographic area of the Party. The ERT recommends that these estimates are reported in row 143 of TABLE IV 1 for fuel use (km)-based emissions. Paragraph 16 presents instructions for accounting and allows Parties to either use the fuel-sold or fuel-used basis for their accounting, depending on the method used to derive their ceiling in the first place. For the UK, this would allow it to use the national total in row 136 of TABLE IV 1 for compliance, which includes the fuel-used estimates presented in row 143 of TABLE IV 1 (and exclude the fuel sold-based estimates in rows 37-41 of TABLE IV 1). The ERT recommends that the UK use the above approach for reporting in the NFR and to ensure that information is included on a fuel-sold basis for all pollutants in rows 37-41 of TABLE IV 1 with additional information presenting emissions on a fuel-used basis in row 143 of TABLE IV 1 to improve comparability with estimates reported by other Parties and to provide clear documentation of this in its NIR.

10. Further improvements identified during this review are presented in part B of this report.

KEY CATEGORIES

11. The United Kingdom has compiled in its IIR a level Key Category Analysis consistent with the EMEP/EEA Guidebook for all pollutants and the year 2008. The definition threshold used is higher than the specified 80% and at 95% is consistent with UNFCCC. However, table 1-3, does not show the last key categories for NMVOC and PM₁₀. The key category trend analysis is included in the IIR chapter on "Explanation of key trend". The paragraph of the IIR dealing with Key Category Analysis ("1.5 Key Source analysis") presents the KCA in terms of level but not the KCA for trend. In chapter "2. Explanation of key trend" it is not clear whether it deals with trends of key categories defined in terms of level or with both key categories defined in terms of level and trend. To clarify this issue, the ERT recommends that the UK adds in the IIR paragraph "1.5 Key Source analysis" the KCA for trend and that it includes all categories that are identified as key categories in table 1-3.

QUALITY

Transparency

12. The ERT recognises the high level of transparency in the United Kingdom inventory data and IIR report. Its high transparency enables a thorough sectoral review. Most of the information is provided (EFs, methodologies and QA/QC); however, in each sector (as indicated in the transparency paragraphs for each sector below) more information on activity data time series, data sources, emission drivers, tiers of method used, recalculations and improvements could be included in the IIR to improve transparency further.

13. The IIR includes a concise presentation of key trends (1980-2008) for the emissions. The ERT encourages the UK to include a fuller description of the drivers for the trends in future IIRs.

Completeness

14. UK provides estimations for the main pollutants for most sectors. The ERT notes that the UK does not submit TSP emission estimates and that the UK has indicated that it does not make estimates of Total Suspended Particulates as "UK legislation uses the sub-10 micron Particulate Matter (PM₁₀) and sub-2.5 micron Particulate Matter (PM_{2.5}) metrics". The UK has indicated that there are currently no plans to address this issue. The ERT invites the UK to consider reporting TSP in future submissions.

15. The ERT notes that the IIR, cf. p. 52, indicates that extending the time series back to 1980 is in progress, that the NH₃ emissions for the agriculture sector have been extended back to 1970 already and that work is ongoing to extend the rest of the pollutant estimates back to 1970 for the 2011 CLRTAP submission. The ERT notes that estimates from 1980 are included in the submission for NH₃ and commends UK for this work and encourages it to report a full 1980 – 2009 time series for future submissions for all pollutants. The ERT also notes that there are some missing sources for non-NH₃ sources in the agriculture sector and encourages

the UK to include estimates for these sources as described in the agriculture section of this report.

16. The IIR explains (p. 52) that fugitive emissions of HM are not yet estimated. During the review, UK clarified that it would investigate "industrial processes such as foundries and other metal processes where there is some potential for fugitive releases of metals". The ERT encourages UK to report on these investigations and provide possible estimates in future IIRs.

17. During the review, UK explained that it did not make explicit estimates for inland waterways and explained that "the UK does not have any major rivers and no national activity data are available", and that "the fuel/energy balance carried out in the UK inventory means that fuel consumption and emissions from this source is effectively being included elsewhere in other sources". The ERT encourages the UK to provide some explanation on this source in its IIR, including its likely magnitude and under which NFR category it is likely to be included.

18. Projection data are provided for the year 2010 for the "with measures" scenario, but not for the other years or for the "with additional measures" or "without measures" scenarios. During the review the UK explained that the UK followed the NEC directive requests on projections and only reported on the 2010 and the "with measures" scenario. The ERT encourages the UK to follow the CLRTAP reporting guidelines on projection and to provide more detail on years and scenarios.

Consistency, including recalculations and time-series

19. In the projection tables the ERT notes that some significant recalculations occurred in the 2010 inventory submission (e.g. NO_x and NMVOC). The ERT also notes that emissions for "the most recent historical year (2007)" are not consistent with related 2007 emissions in the NFR emission table (sheet "Annex IV-Table1"). During the review, the UK explained that this was due to a problem of timing and updating of projection data, taken into account the different deadlines for NECD (31 Dec.) and CLRTAP (15 February). ERT encourages the UK to update as far as possible projections for better consistency with the last emission inventories. Where this is not possible, the ERT encourages the UK to provide some explanation as to where emissions for the starting year are different to those in the submission.

20. The IIR generally provides explanations for recalculations, but the description at sub-sector level (NFR) could be more detailed, for instance for the energy and waste sectors. Concerning agriculture, the IIR does not include information related to the recalculations performed. However, during the review process clear explanations were provided. The ERT encourages the UK to provide more detailed and complete information on recalculations in the next submissions of the IIR.

Comparability

21. The ERT notes that the inventory of United Kingdom is comparable with those of other reporting Parties. The allocation of source categories follows that of the EMEP/UNECE Reporting Guidelines.

CLRTAP/NECD comparability

22. ERT notes that the United Kingdom national totals for CLRTAP and NECD are fully consistent for the years since 2004, but not before (especially 2000-2002). During the review UK explained that it only had the requirement to report 2004-2008 under NECD and therefore any comparison between NECD and CLRTAP prior to 2004 was based on NECD data from a previous inventory version. The ERT encourages the UK to provide explanations for these differences in its IIR and to try to update and provide complete comparable NECD and CLRTAP estimates.

Accuracy and uncertainties

23. ERT commends the UK for the high-tiered methods (tier 2 and 3) used for many of the UK's key categories in energy, transport, IP and agriculture. The ERT encourages the UK to further develop tier 2 methods for the waste sector. The ERT commends UK for implementing a tier 2 Monte Carlo uncertainty analysis for the national inventory, by sector and for all the pollutants.

Verification and quality assurance/quality control approaches

24. ERT commends the UK for the comprehensive descriptions in its IIR for institutional arrangements, the inventory preparation process and the QA/QC and verification procedures. UK has elaborated and implemented a wide-ranging quality assurance/quality control (QA/QC) plan in accordance with the EMEP/CORIANIR Guidebook (Inventory Management Chapter). This includes general QA/QC procedures (Tier 1) applied to the whole inventory at all times and elements of sector-specific procedures (Tier 2). The Party also defined roles and responsibilities for inventory compilation, improvement, and QA/QC.

FOLLOW-UP TO PREVIOUS REVIEWS

25. The current stage 3 centralised review has used outputs from the stage 1 and stage 2 review processes. The ERT invites the UK to also refer to these previous reviews when examining this review report, and when updating its improvement plans.

AREAS FOR IMPROVEMENTS IDENTIFIED BY THE UNITED KINGDOM

26. In section 13.7 the IIR identifies "Planned improvements" and provides a relatively long list of improvements. Noting that not all improvements will be incorporated for the next inventory, ERT commends UK for its ambitious and transparent improvement programme.

27. During the centralised review and exchanges with the ERT, some other improvements have been identified by the United Kingdom :

- (a) - Considering the need to report national and transport total emissions as fuel sold-based and additionally national totals as fuel used based for compliance purposes,

United Kingdom 2010

- (b) - Providing more clear explanations, in the chapter on projection, on the issues of timing and updating the projections versus inventories,
- (c) Providing more detail on the description of time series trends and drivers for trends, recalculations and improvements should be reported in future IIR submissions.
- (d) - Including more detail on the key source analysis and ensure that table 1-3 includes at least the key sources for up to 80% of all pollutants.

28. The ERT recognises the level of effort undertaken by the United Kingdom in providing an inventory with a high level of detail as well as a thorough review. Any questions issued by the ERT to the Party were addressed promptly and descriptive responses were provided enabling good communication during the review process and indicating good responsiveness of the Party.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS-CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

29. The ERT identifies the following cross-cutting issues for improvement:
30. The ERT encourages (as the Reporting Guidelines do) the UK to estimate and report TSP emissions, like most of the other countries, starting from 2000.
31. To ensure that transport information is reported on a fuel-sold basis for all pollutants in rows 37-41 of NFR Table IV 1 with additional information presenting emissions on a fuel-used basis in row 143 of NFR Table IV 1, to improve comparability with estimates reported by other Parties and to provide clear documentation of this in its NIR.
32. The ERT recommends that the UK tries to extend back to 1980 the NH₃ emissions for the agriculture sector.
33. The ERT recommends that the UK reports at NFR sectoral level for road transport and for the main national total emissions based on fuel sold, and additionally (in case of the UK especially for compliance purposes) national totals based on fuel used.
34. The ERT encourages the UK to further investigate identified potential fugitive emissions of HM not yet inventoried (e.g. from metal processes).
35. The ERT recommends that the UK explain, when providing the information "The UK does not make emission estimates from inland waterways" in its IIR that the related fuel emissions are nevertheless accounted for elsewhere in other sources because of the energy balance process (as explained during the review)
36. The ERT encourages the UK to update, as far as possible, projections for better consistency with the last emission inventories, and if necessary to explain more clearly in the IIR (projection chapter) the difficulty of achieving full consistent projection data with the last historical time series.
37. As requested in the CLRTAP Reporting Guidelines for Parties to the Gothenburg Protocol, ERT recommends that the UK complete furthermore, as far as possible, projections data for the different projection scenarios and years.
38. Ensuring that all the key categories for at least up to 80% of all pollutants are presented.
39. Providing more descriptions of trend drivers in the IIR when explaining the key trends.
40. The ERT encourages the UK to provide more complete and detailed information on recalculations in the next submissions of the IIR.

41. For the agriculture sector, missing sources should be estimated following the EMEP/EEA Guidebook.

42. The ERT encourages the UK to implement, as much as possible, the improvement plan described in the IIR, and to prioritise it with the other identified improvements, taking into account issues with important impacts on the national emission inventory.

43. Recommended improvements relating to specific source categories are presented in the relevant sector sections of this report.

SECTOR-SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , CO, particulates, heavy metals		
Years		1990 – 2008		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
1	total energy	X		X
1.A.1.a	public electricity and heat production	X		X
1.A.1.b	petroleum refining	X		X
1.A.1.c	Manufacture of solid fuels and other energy industries	X		X
1.A.2.a	iron and steel	X		X
1.A.2.b	non-ferrous metals	X		
1.A.2.c	chemicals	X		
1.A.2.d	pulp, paper and print	X		
1.A.2.e	food processing, beverages and tobacco	X		
1.A.2.f.i	Stationary Combustion in Manufacturing Industries and Construction: Other (Please specify in your IIR)	X		X
1.A.2.f.ii	Mobile Combustion in Manufacturing Industries and Construction: (Please specify in your IIR)		X	
1 A 3 e	Pipeline compressors?	X		
1.A.4.a.i	commercial / institutional: stationary	X		
1.A.4.a.ii	commercial / institutional: mobile ?		X	
1.A.4.b.i	residential plants	X		
1.A.4.b.ii	household and gardening (mobile)	X		
1.A.4.c.i	Agriculture/forestry/fishing. stationary	X		
1.A.4.c.ii	off-road vehicles and other machinery?		X	
1.A.4.c.iii	national fishing?		X	
1.A.5.a	other, stationary (including military)	X		
1.A.5.b	other, mobile (including military, land based and recreational boats)?		X	
1.B.1.a	coal mining and handling	X		
1.B.1.b	solid fuel transformation	X		
1.B.1.c	other fugitive emissions from solid fuels	X		
1 B 2 a i	Exploration, production, transport	X		
1 B 2 a iv	Refining / storage	X		
1 B 2 a v	Distribution of oil products	X		
1 B 2 b	Natural gas	X		
1 B 2 c	Venting and flaring	X		
1 B 3	Other fugitive emissions from geothermal energy production , peat and other energy extraction not included in 1 B 2		X	

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which pollutants have been reviewed and which have not in the respective columns.

General recommendations on cross-cutting issues

Completeness:

44. The ERT notes that the UK does not estimate emissions of TSP due to the focus of UK legislation on PM10 and PM2.5. The ERT recommends that the United Kingdom tries to estimate TSP emissions for each NFR code using simple approaches and PM10-to-TSP ratios as well as reported TSP data from operators. The ERT notes that for the NFR code 1B1a, the notation keys "NO" and "NA" are used, while table 1.2 provides information on the source of activity data and EFs. The ERT recommends that the United Kingdom verifies if the activity really exists and modifies the NFR and table 1.2 accordingly.

Transparency:

45. The United Kingdom has provided a detailed and generally transparent emissions inventory. Estimates are provided at the most detailed level for all energy sectors. The United Kingdom's methodology and emission factors in the IIR are considered by the ERT to be transparent and well described. The ERT encourages the UK to include some further details in the IIR for the NFR codes: 1A, 1A1a, 1A1b, 1A1c, 1A2a and 1A2fi.

46. The UK explains the trends for each key source clearly in the IIR. The ERT encourages the United Kingdom to continue with this level of detail when describing emission trends and the drivers for changes in emissions.

47. Concerning the emissions template, it is explained in the IIR (paragraph 4.1 - page 71) that emissions for the NFR codes 1A2b to 1A2e are included in the NFR code 1A2fi. The ERT recommends that the United Kingdom corrects the emissions template for these NFR codes by replacing the notation key "NO" or "NA" with "IE" (included elsewhere).

48. The ERT notes that in many cases, when describing methodologies, the UK refers explicitly to the 2008 estimates and does not clarify whether the methodology and assumptions also apply to earlier years of the time series. The ERT recommends that the UK provide a clear explanation of the years for which the described methods and assumptions apply in future IIRs.

Accuracy:

49. The ERT commends the UK for the high-tiered methods (tier 2 and 3) used for many of the UK's key categories. The ERT notes the tier 2 uncertainty estimates using Monte Carlo methodology. The ERT encourages United Kingdom to continue estimating its uncertainties using this approach and to maintain its high-tier methodologies for key categories.

50. The ERT notes that the QA/QC procedures are clearly explained in the IIR including energy-specific checks and verification. The ERT encourages United Kingdom to continue explaining the various QA/QC procedures used and developed.

Comparability:

51. The ERT commends the UK for following the recommendations of the Guidebook for the energy chapter and providing completed NFR tables with minimal use of notation keys. The ERT encourages the UK to split emissions under 1A2fi into the appropriate NFR codes and to improve its presentation of waste combustion for energy production under 1A1a.

Recalculations:

52. The IIR explains clearly the main recalculations. The ERT encourages the United Kingdom to expand the level of detail for the energy sector and to align the descriptions of recalculations with the NFR categories to improve transparency.

Improvement:

53. The IIR provides clear and concise details of improvements planned for the energy sector. The ERT encourages the United Kingdom to continue with the documentation of planned improvements in this way.

Sub-sector Specific Recommendations

Category issue 1: 1A: Energy sectors

54. The ERT recommends that the United Kingdom includes in its IIR the Net Calorific Values (NCV) for each fuel consummated and provides a reference for the source of data to improve transparency.

55. The ERT notes that no data about the trend in fuel consumption is given in the IIR. The ERT encourages the United Kingdom to show the trends of fuel consumption for all sectors and for each sub-sector to improve transparency.

Category issue 2: 1.A.1.a: Public power and district heat - All pollutants

56. The ERT appreciates the quality of the description of the methodology used for the NFR code 1A1a in the IIR but encourages the UK to elaborate on the description of the methodology used including details of the number of plants for landfill gas & sewage gas engines; MSW incineration with electricity generation; power stations burning fossil fuels; and the source of fuel consumption data for each year and for each sub-group.

57. The ERT also encourages the UK to clarify its description and categorisation of emissions from the combustion of MSW under NFR 1A4 to NFR 1A1a.

58. For the sub-groups MSW, for the year 1990 to 1992, emissions are not reported. The ERT recommends that United Kingdom provides some explanation as to whether all MSW are included under waste (without energy recovery).

Category issue 3: 1.A.1.b: Stationary – Petroleum refineries – All pollutants

59. The ERT notes that the NFR code 1A1b is a key source for some pollutants and encourages the UK to include in its IIR the number of plants in operation for each year. The ERT encourages the UK to describe more clearly, in a table in the IIR, for

which pollutant and years the emissions data come directly from refinery operators or regulators and for which pollutant and years the emissions are estimated by using EFs from the literature and the source of these EFs.

60. The ERT notes that site-specific fuel data are not presented due to the fact that these data are confidential. The ERT encourages the UK to provide some explanation of the checks that are undertaken to ensure that plant specific fuel used data are consistent with national statistics.

Category issue 4: 1.A.1.c: Fuel transformation and extraction – All pollutants

61. The ERT notes that the NFR code 1A1c is a key source for CO and NO_x and encourages the UK to include in its IIR the number of plant in operation for each year.

62. The ERT encourages the UK to describe more clearly, in a table in the IIR, which pollutant and years the emissions data come directly from operators or regulators and for which pollutant and years the emissions are estimated by using EFs from the literature and the source of these EFs.

Category issue 5: 1.A.2.a: Iron and steel industries – All pollutants

63. The ERT notes that this category is a key source especially for SO_x and that the description for blast furnaces does not provide enough detail to understand the methodology used. The ERT also notes that different methods are used for different pollutants and years (e.g. between 1995 and 1999, PI data are used; between 2000 and 2008, operator's data are used; and some EFs from the literature are used to determine emissions by source, by fuel and by NFR category). The ERT encourages the UK to provide additional detail on the number of plants in operation for each year, to describe more clearly, in a table in the IIR, for which pollutant and years the emissions data come directly from operators or regulators and for which pollutant and years the emissions are estimated by using EFs from the literature and the source of these EFs, and to provide further explanation for the methodology used before 1995.

Category issue 6: 1.A.2.f i: Other industries – All pollutants

64. The ERT notes that this category is a key source especially for SO_x and that the IIR does not provide enough detail to understand the methodology used. The ERT encourages the UK to provide additional detail on the origin of fuel consumption for each year and for each sub-group, and the number of plants in operation for each year.

65. The UK clearly describes the rationale for including emissions for the NFR codes A12b to 1A2e under the NFR code 1A2fi. However, the ERT notes that the EFs for boilers (depending on the power) and for furnaces, especially for non-ferrous metals, are not necessarily the same and therefore this aggregation introduces uncertainty into the estimates. The ERT recommends that the United Kingdom tries to split the 1A2fi into 1A2b and 1A2e and to apply the appropriate emission factors from the EMEP Guidebook or country-specific data.

TRANSPORT

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5}		
Years		1990 – 2008 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
1 A 2 f ii	Other: Off-road construction vehicles and machinery	x		
1 A 3 a i (i)	International Civil Aviation - LTO	x		
1 A 3 a ii (i)	Domestic Civil Aviation - LTO	x		x
1 A 3 b i	Road Transport: Passenger Cars	x		
1 A 3 b ii	Road Transport: Light Duty Vehicles	x		
1 A 3 b iii	Road Transport: Heavy Duty Vehicles	x		
1 A 3 b iv	Road Transport: Mopeds & Motorcycles	x		
1 A 3 b v	Road Transport: Gasoline Evaporation	x		
1 A 3 b vi	Road Transport: Automobile tyre and brake wear	x		
1 A 3 b vii	Road Transport: Automobile road abrasion		NA	
1 A 3 c	Railways	x		
1 A 3 d i (i)	International maritime navigation	x		x
1 A 3 d i (ii)	International Inland Waterways		NO	
1 A 3 d ii	National Navigation (Shipping)	x		x
1 A 3 e	Pipeline Compressors		NO	x
1 A 4 a i & ii	Commercial / institutional: Stationary & Mobile	x	1 A 4 a ii*	x
1 A 4 b i & ii	Residential: Household and gardening (stationary & mobile)	x		1 A 4 b i
1 A 4 c i & ii	Agriculture/Forestry/Fishing: (Stationary & Off-road vehicles and other machinery)	x		1 A 4 c i
1 A 4 c iii	Agriculture/Forestry/Fishing: National fishing		NO	x
1 A 5 a & b	Other, Stationary & Mobile (including military, land-based and recreational boats)	x	1 A 5 a*	X

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which pollutants have been reviewed and which have not in the respective columns.

**Sector reported as NO*

General recommendations on cross-cutting issues

Completeness:

66. The ERT considers the Transport sector and the other sectors including mobile sources to be complete, with no NEs for any main pollutants (TSP is an exception but the reasoning is provided clearly in the IIR).

Transparency:

67. The ERT acknowledges the great level of detail of description provided for a very advanced methodology applied to estimating mobile sources emissions in the IIR 2010 report. To enable greater understanding of techniques behind making high-level estimates, the ERT encourages the UK to include all quoted source documents in an accessible format i.e. website links, pdf document hyperlinks (The ERT notes that many, but not all, links are included in the IIR).

68. Some further explanations were sought by the ERT for time series fluctuations for certain pollutants and certain transport sub-categories. The UK provided a thorough explanation to the ERT's satisfaction. The ERT welcomes all the explanations (with attached links to the relevant source documentation) provided by the Party at a high level of detail during the review process. In order to avoid any future ambiguity about transparency of the existing dips and jumps (which are primarily driven by the change in the activity data as reported by the UK's National energy statistics) in certain sectors and pollutants, the ERT recommends that these explanations to the ERT be included as part of the Party's next IIR.

69. Inappropriate use of notation keys in three sub-categories in the NFR tables were noted by the ERT and acknowledged by the Party for future corrections.

Comparability:

70. The ERT recommends that the UK ensures that transport information is reported on a fuel-sold basis for all pollutants in rows 37-41 of NFR Table IV 1 with additional information presenting emissions on a fuel-used basis in row 143 of NFR TABLE IV 1 to improve comparability with estimates reported by other Parties and to provide clear documentation of this in its NIR.

71.

Accuracy and Uncertainty:

72. The UK uses tier 2/3 methods for many of the important key categories in transport. UK compiles a quantitative uncertainty analysis with an assessment of uncertainties estimated by both: source sector and pollutant. The ERT acknowledges the UK's method description and descriptive results presented in IIR.

Recalculations:

73. The Party presented a detailed table of 2007-2008 time series revisions with a rationale for any changes in estimates for each pollutant (and sectors affected) between the current and last year's submissions.

Improvements:

74. A number of improvements in the Party's 2010 inventory were implemented and explained in detail in a separate chapter of the UK's IIR. The ERT commends the UK for the level of detail provided. In the Transport sector, major improvements were made to the Road Transport estimates (a combination of methodological changes, emission factors revision and activity data revision). Smaller improvements were reported in the Aviation sector and future improvements are planned for the Rail sector along with a revision of the continuous development of all Transport sector emission estimates.

Sub-Sector Specific Recommendations

Category issue 1: 1.A.3.e: Industrial Combustion - Pipeline compressors, 1.A.4.c iii: Shipping – Agriculture / Forestry / Fishing - National fishing, 1.A.5.b: Off-

road Mobile - Other, Mobile (including military, land-based and recreational boats) – All main pollutants – Use of Notation Keys in NFR Table

75. In sectors: 1.A.3.e i (Industrial Combustion: Pipeline compressors) and 1.A.4.c iii (Shipping: Agriculture/Forestry/Fishing: National fishing) the notation key used in the NFR table for these categories is NO whereas in the IIR (p.32, Table 1-2, in Chapter 1.4) it reads “Reported under 1A2f” (for category 1.A.3.e i) and “Reported under 1A3d ii” (for category 1.A.4.c iii). The ERT encourages the UK to report both of these categories as IE if the categories cannot be split up according to the information given in the IIR.

76. In sector 1.A.5.b (Off-road Mobile: Other, Mobile (including military, land based and recreational boats)) in the IIR (p. 32, Table 1-2, in Chapter 1.4) the information reads “Reported under 1A4a” whereas in the NFR table there are reported emission values for this sector (there is no notation key stating IE as there should be according to the information given in the IIR).

77. In the Party’s response to the ERT’s question it was confirmed that all the three above categories should be reported under the suggested IE notation key. The UK agreed to make the corrections in the next IIR submission if they still apply under the current methodology.

INDUSTRIAL PROCESSESReview Scope

Pollutants Reviewed		See below		
Years		1990 – 2008 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
2.A.1	cement production		X	
2.A.2	lime production		X	
2.A.3	limestone and dolomite use		X	
2.A.4	Soda ash production and use		X	
2.A.5	asphalt roofing		X	
2.A.6	road paving with asphalt		X	
2.A.7.a	Quarrying and mining of minerals other than coal	PM10		X
2.A.7.b	Construction and demolition	PM10		X
2.A.7.c	Storage, handling and transport of mineral products		X	
2.A.7.d	Other Mineral products (Please specify the sources included/excluded in the notes column to the right)	PM10, SOx		X
2.B.1	ammonia production		X	
2.B.2	Nitric acid production		X	
2.B.3	adipic acid production		X	
2.B.4	carbide production		X	
2.B.5.a	Other chemical industry (Please specify the sources included/excluded in the notes column to the right)	CO, MNVOC, Cd, Pb,Hg, HCB		X
2.B.5.b	Storage, handling and transport of chemical products (Please specify the sources included/excluded in the notes column to the right)		X	
2.C.1	iron and steel production	CO, PM10, Pb, Hg, DIOX		X
2.C.2	ferroalloys production		X	
2.C.3	aluminium production	CO, Cd, Pb, B(a)P, DIOX		X
2.C.5.a	Copper Production	Pb		X
2.C.5.b	Lead Production	Cd, Pb		X
2.C.5.c	Nickel Production		X	
2.C.5.d	Zinc Production		X	
2.C.5.e	Other metal production (Please specify the sources included/excluded in the notes column to the right)	Cd, Pb, Hg		X
2.C.5.f	Storage, handling and transport of metal products (Please specify the sources included/excluded in the notes column to the right)		x	
2.D.1	pulp and paper		X	

2.D.2	food and drink	NMVOOC		X
2.D.3	Wood processing		X	
2.E	production of POPs		X	
2.F	consumption of HM and POPs (e.g. electrical and scientific equipment)		X	
2.G	Other production, consumption, storage, transportation or handling of bulk products (Please specify the sources included/excluded in the notes column to the right)	PM10		X
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which pollutants have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Completeness:

78. The ERT considers the industrial processes sector to be generally complete and comprehensive with good levels of detail in the methodology descriptions.

Transparency:

79. Although the explanation of the trends and which Tier methods have been used is missing, the current IIR is generally transparent and well organised. The ERT encourages the UK to add these missing elements in its next submission. The ERT noted the UK did not report Tables with activity data and emission factors in the Industrial processes chapter but referred to other sources for this information. The ERT encourages the UK to include Tables with activity data and emission factors in the next submission.

Accuracy:

80. The ERT commends the UK for its well developed inventory which uses a lot of country-specific tier 2/3 Emission Factors. The ERT encourages the UK to continue with its high-level methodologies and to continue to ensure that these methods, data sources and assumptions are well documented in the IIR.

81. The ERT noted that the UK has implemented a general QA/QC plan for the whole inventory. For most industrial process sources, the QA/QC procedure is covered under the general QA/QC. Additional procedures are available for 2B1 and 2B3. The ERT compliments the UK for this level of detail.

82. Uncertainty analysis is carried out using a Monte Carlo technique. The UK has informed the ERT that the UK approach currently only generates an overall uncertainty result without giving uncertainties for this sector, or per NFR-code.

83. The ERT encourages the UK to present uncertainties for the industrial processes key-sources in order to help inform the improvement process and to provide an indication of the reliability of the inventory data.

Comparability:

84. The UK's Industrial processes sector follows the recommendations from the EMEP/EEA Emission Inventory Guidebook and data are presented in the NFR 2009.

Recalculations:

85. The ERT commends the UK for estimating HCB emissions from Cement manufacture as a new source and for revisions of the POPs emissions for all sectors.

Improvement:

86. The ERT identifies a number of planned improvements for the industrial processes sector in the IIR.

87. Ongoing consultation with trade associations will continue to provide insights into factors affecting emissions of NMVOC, PM10, CO, SOx & NOx from industrial processes reported in the PI, SPRI and ISR; in some cases, fluctuations of reported emissions require specific enquiries to ensure data quality.

88. In order to better comply with GHG reporting guidance, the NAEI method is moving away from treating coke as an activity within the industrial combustion source, and towards treating it as an activity within a series of industrial processes. Some emissions from the use of coke are currently treated as process emissions but further revision of the methodology will be necessary in future cycles. The change in reporting will help to eliminate some potential double-counting of emissions.

89. The UK is working on the improvement, including the non-ferrous metal sectors, of the POPs inventory. This work will also include the development of release estimates for the nine new POPs added to the Stockholm convention.

Sector-specific Recommendations

Category issue 1: 2.C.1: Iron and steel production

90. The ERT questioned the PM10 emission increase from 4.1 Gg in 2006 to over 6 Gg in 2007 and 2008 and the Hg emission decrease from 687 kg in 2007 to 451 kg in 2008 while the other emissions and production levels remained relatively stable. The UK informed the ERT that PM10 emissions data for 2C1 were supplied by the process operator, who has a work programme to develop methodologies for estimating emissions from their processes. Emission data for recent years have been increasing for several important sources: sinter strands, basic oxygen furnaces and iron ore stockpiles. It is possible that these increases in emission estimates may be due to changes in methodology and that emission data for earlier years might therefore underestimate emissions. The ERT encourages the UK to seek clarification on this matter from the process operator and to correct estimates if necessary and report on its findings for its next submission.

Category issue 2: 2.C.3: Aluminium production

91. Emission estimates for aluminium processes are based on a bottom-up approach using emissions reported in the PI, ISR & SPRI. After consultation, the UK provided the ERT with additional detail on the sources of data for aluminium production estimates. The Scottish plants report emissions in the Scottish Pollutant Release Inventory (SPRI), the English plants report emissions to the Pollution Inventory (PI) and additional plant-specific data are obtained from the process operators. For some other pollutants, including metals, emission estimates are based on use of emission factors from the literature. The ERT compliments the UK with this approach and encourages the UK to add this more detailed description in the next submission.

Category issue 3: 2.C.4.a: Copper production

92. The ERT noted some fluctuations in Pb emissions from copper production and encourages the UK to explain this in next submission.

Category issue 4: 2:c.5.b: Lead production

93. The ERT noted some fluctuations in Cd and PCDD/PCDF emissions from lead production and encourages the UK to explain these in the next submission.

SOLVENTS (NO CHAPTER)

AGRICULTURE

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5}		
Years		1990 – 2008 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
4 B 1 a	Cattle dairy	a		Yes
4 B 1 b	Cattle non-dairy	a	-	Yes
4 B 2	Buffalo	a	-	Yes
4 B 3	Sheep	a	-	Yes
4 B 4	Goats	a	-	Yes
4 B 6	Horses	a	-	Yes
4 B 7	Mules and asses	a	-	Yes
4 B 8	Swine	a	-	Yes
4 B 9 a	Laying hens	a	-	Yes
4 B 9 b	Broilers	a	-	Yes
4 B 9 c	Turkeys	a	-	Yes
4 B 9 d	Other poultry	a	-	Yes
4 B 13	4 B 13 Other	a	-	Yes
4 D 1 a	Synthetic N fertilisers	a	-	Yes
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products	a	b	No
4 D 2 a	Off-farm storage, handling and transport of bulk agricultural products	a	-	No
4 D 2 c	N excretion on pasture range and paddock unspecified (Please specify the sources included/excluded in the notes column to the right)	a	-	Yes
4 F	Field burning of agricultural wastes	a	-	Yes
4 G	Agriculture other(c)	a	-	No
11 A	(11 08 Volcanoes)	a	-	No
11 B	Forest fires	a	-	No
11C	Other sources	a	-	No

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which pollutants have been reviewed and which have not in the respective columns.

(a) reviewed main pollutants, PM₁₀ and PM_{2.5}

(b) not reviewed POPs, dioxins, furans, HM

General recommendations on cross-cutting issues

Completeness:

94. Key sources were identified for NH₃ emissions (4B1a, 4B1b, 4D1a, 4B9d, 4B8, 4B13) and PM₁₀ emissions (4B9b). The CLRTAP submission included emissions from 1990 to 2008 for NH₃, PM₁₀ and PM_{2.5} emissions. Some sources have been identified as not estimated (see sector recommendations). The inventory is complete with respect to the most important source of emissions from agriculture (NH₃). The UK estimates emissions for the following categories: 4B, 4D, 4F and 4G. NMVOC, NO, NH₃ and particulate emissions from natural sources are estimated for 11B (forest fires) and 11C. However, the ERT has found that NO and NMVOC

emissions are not estimated for 4B, 4D and 4F. PM10 and PM2.5 emissions are not estimated for 4D and 4F sources. The ERT encourages the UK to estimate emissions for these sources and to report in its future submissions in accordance with the EMEP/EEA Guidebook.

Transparency:

95. The UK provides information on emission factors (EFs), methodologies and QA/QC checks in the IIR. UK has provided information regarding the source of activity data, EFs, methodologies and QA/QC checks. The IIR is generally transparent and well organised. The ERT notes that the UK estimates emissions using the NARSES model for the agriculture sector. The ERT requires further documentation on agricultural emission estimations using the model and encourages the UK to include the information provided during the review in the IIR in future submissions (time series of activity data, emission drivers, recalculation and improvements).

96. The Party has used the notation keys for reviewed pollutants appropriately. However, the ERT encourages the Party to include in the IIR information explaining notation keys provided in the NFR templates. During the review process additional documents (reports, publications) were provided. The ERT thanks the UK for providing detailed information upon request.

Accuracy:

97. The ERT commends the UK for its use of tier 2/3 methodologies for estimating key sources (4B, 4D). For manure application to land and from fertiliser applications the approach tends to tier 3 (EFs are derived from process-based modelling). For particulate matter default EFs from the scientific literature are used.

98. During the review the UK indicated that Monte Carlo uncertainty analysis had been carried out to estimate uncertainty in the total UK emissions for each pollutant, and that this analysis made use of the uncertainty ranges that had been calculated for the agriculture sector using Monte Carlo uncertainty analysis conducted some years ago on the basis of the NARSES model. The ERT commends the efforts carried out by the Party, and encourages the UK to report them in the IIR.

99. The Party described in the IIR that specific QA/QC checks were carried out for the agriculture sector. The ERT commends the UK for the QA/QC checks which make the submission accurate.

Comparability:

100. The UK's agriculture sector follows the recommendations from the EMEP/EEA Emission Inventory Guidebook and data are presented in the NFR 2009.

Recalculations:

101. The ERT noted that emission recalculations had been undertaken due to the revision of agricultural statistics. In the IIR no information related to recalculations is provided for the agriculture sector. The ERT has identified recalculations for the NH3

emissions. The UK has explained that for the 2010 submission the livestock numbers from 1990 – 2007 were revised according to the statistics provided by each of the Devolved Administrations (i.e. England, Wales, Scotland and Northern Ireland); therefore, the whole time series for NH₃ was recalculated. The ERT encourages the UK to provide information on recalculations in the next submissions of the IIR.

Improvement:

102. During the review, the UK explained that agricultural statistics were being discussed along with Defra statistics for improving the categorisation of livestock types and estimates of representative annual numbers. The Party has also emphasised that the agriculture inventory agency has recently conducted a review of potential missing sources for the UK Government to consider in future work programmes. The ERT encourages the Party to describe future improvements in coming IIR submissions for the agriculture sector.

Sector-specific recommendations

Category issue 1: 4.B: Manure management

103. The UK has estimated emissions for NH₃, PM₁₀, and PM_{2.5} emissions for 4B. No estimations are provided for NO and NMVOC emissions. The UK explained that emissions from NO and NMVOC were not included in the UK inventory in the past, as they had been expected to be minor sources in the UK context, and that the inclusion of these sources could be considered as inventory guidance develops. The Party clarified that the need for estimating emissions from these sources and pollutants would be discussed and prioritised along with other inventory improvements for future updates. The ERT encourages the Party to estimate these missing pollutant emissions following the EMEP/EEA Guidebook and to report them in future submissions.

104. The ERT notes that the UK relies on the 1 June annual survey and considers this to be the most robust information source for UK livestock numbers and assumes it to be representative of the whole year. The UK also explained that since 2006, all cattle had been accounted for under the Cattle Tracing Scheme, providing a very accurate estimate of cattle numbers. The ERT commends the Party for the efforts in improving activity data and encourages it to include a time series of the main animal livestock numbers for the sake of transparency in future submissions of the IIR.

105. The ERT asked for clarification on the drivers for the reduction in the number of animals. The UK has explained that the declining farm incomes due to the Common Agricultural Policy reform have led to smaller animal numbers, particularly on smaller family farms, leaving the industry as the main emission driver. The UK has also explained that improvements in livestock production efficiency have resulted in less livestock required for given levels of output (generally associated with the larger businesses). The ERT encourages the UK to provide additional detail on the drivers for trends in emissions in future IIRs.

Category issue 2: 4.D: Agricultural Soils

106. The UK estimates NH₃ emissions from the 4D1a synthetic N fertiliser source. The Party uses a tier 2/3 approach in estimating emissions from UK fertiliser use. However, no estimations are provided for NO, NMVOC, PM10 and PM2.5 emissions for 4D1a. The ERT encourages the UK to undertake estimations of these pollutants for future submissions following the EMEP/EEA 2009 Guidebook.

107. The ERT requested the UK to provide information on the drivers for the decline in emissions of 4D1a. The UK has explained that nitrogen fertiliser use has declined on grassland in particular, for a number of reasons including improved agronomic advice resulting in less oversupply; declining numbers of dairy cattle (associated with higher fertiliser use); cost-cutting measures by farmers. The ERT encourages the Party to provide information on fertiliser statistics which are accounted for in emission estimates under 4D1a Synthetic N fertilisers and to provide these explanations for emission reductions above.

108. The ERT has found that the “4 D 2 c N excretion on pasture range and paddock” NH₃ emissions are not reported. The UK has stated that emissions from grazing animals (and also from excretal returns of outdoor poultry and pigs) are included in 4B. The ERT encourages the Party to re-allocate these emissions to the appropriate NFR code (4D2c).

109. In the IIR the UK does not provide an explanation of the fertiliser statistics. During the review the Party explained that UK fertiliser use statistics are derived from the British Survey of Fertiliser Practice (BSFP), covering England, Wales and Scotland, and from DARDNI statistics for Northern Ireland. From BSFP, the annual statistics of total nitrogen use on ‘tillage’ and ‘grassland’ for the fertiliser types are derived. DARDNI statistics provide annual fertiliser deliveries to farms. The ERT encourages the Party to provide this information in the future IIR submissions to improve transparency.

Category issue 3: 4.F: Field burning of agricultural wastes

110. The UK estimates only NH₃ emissions for 4F burning of agricultural wastes. The ERT encourages the UK to estimate missing pollutants (NMVOC, NO, PM10, PM2.5) according to the EMEP/EEA 2009 guidebook recommendations.

Category issue 4: 4.G: Agriculture other

111. The ERT welcomes the UK’s estimates of particulate emissions from the 4G source from agrochemicals based on the use of EFs from the literature and national statistics. The sources of emissions come from the use of agricultural pesticides’ (chlorthalonil, chlorthal-dimethyl, quintozone and agrochemicals). The ERT encourages the Party to provide this information in the future IIR submissions to improve transparency.

Category issue 5: 11: Natural sources

112. The ERT commends the UK for its estimates for 11B (forest fires) and 11C (agrochemicals). The Party has explained that emissions estimated from natural sources (e.g. wind-blown dusts and sea spray) are excluded from the UK inventories, in accordance with the guidelines. However, the UK does report some emission

United Kingdom 2010

estimates from natural sources as memo items within the inventory for information in the LRTAP submission, but these data are not included in the national totals.

WASTE

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5} , TSP, DIOX, PAH, Hg, Pb, CO		
Years		1990 – 2008 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
6.A	Solid waste disposal on land	x		Yes
6.B	Waste-water handling	x		Yes
6 C a	Clinical waste incineration (d)	x		Yes
6 C b	Industrial waste incineration (d)	x		Yes
6 C c	Municipal waste incineration (d)	x		Yes
6 C d	Cremation	x		Yes
6 C e	Small-scale waste burning	x		Yes
6.D	Other waste (e)	x		Yes
7	Other	x		Yes

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which pollutants have been reviewed and which have not in the respective columns.

General recommendations on cross-cutting issues

Completeness:

113. The UK Waste sector is generally complete and presents emissions for major pollutants and for major activities following the EMEP Guidebook 2009. The inventory regarding Waste is missing some small sources including flaring in 6A, NMVOC in 6B. The ERT notes that improvements have been suggested by the UK during the review process and encourages the UK to implement these for the next submission.

Transparency:

114. The UK IIR provides good information about emission sources for Waste. Trends, key sources and improvements are well documented in most cases. Sources of AD's are listed and the methodology for sectors 6A, 6B, 6Cd and 7 briefly described. However, descriptions of the methodologies, AD and EFs are still missing and/or not clearly related to the NFR Code (sub-category) (e.g. 6C) to which they belong. For sector 6, several time series end before 2008 and no explanation for this is provided in the IIR. The ERT would welcome some more explanation about emissions trends, particularly for sectors where emissions decrease dramatically or end before the end of the time series. The ERT encourages the UK to continue to develop chapter 6 with elaborated explanations about activity data and methodologies and to mention clearly processes included or not included in each sub-category of 6C. The ERT also encourages the UK to provide some more explanation about emission trends, particularly for sectors where emissions decrease dramatically or end before the end of the time series.

Accuracy:

115. The UK used a Tier 1 default approach for all sources, following the EMEP/EEA Guidebook 2009. The UK has provided a clear picture of the key sources

in the IIR for the Waste sector. The UK does provide tier 2 Monte Carlo uncertainty analysis and basic QA/QC checks for the waste sector.

Comparability:

116. The IIR and NFR tables presented by the UK are easily comparable to other IIRs and NFR Tables. NFR Tables and the NECD report consistent data.

Recalculations:

117. All recalculations and improvements made in the 2010 submission are explained but not clearly presented for each sector. The ERT encourages the UK to align the description of improvements and recalculations with the NFR categories and the IIR chapters to improve transparency.

Improvement:

118. No Specific improvements were reported in the IIR for the waste sectors.

Sector-specific recommendations

Category issue 1: 6.A: Solid waste disposal on land - All pollutants but NMVOC and NH₃

119. Only NMVOC and NH₃ emissions are reported in category 6A. Following questions from the ERT, the UK confirmed that emissions of SO_x and NO_x directly from landfill sites are not estimated (coming from flaring or from open burning). As these emissions do occur, the ERT recommends that the UK estimate them for the sake of the report's completeness.

Category issue 2: 6.B: Wastewater handling - All pollutants

120. Only NH₃ emissions are reported for 6B from sewage sludge disposal (and treatment following the methodological explanation from page 130, IIR). NMVOC emissions are not reported but EFs are available in the EMEP/CORINAIR Guidebook 2009. Moreover, sector 6B also contains emissions from waste water handling and the UK does not provide any information about this process in the IIR. The ERT encourages the UK to estimate emissions for NMVOC emissions and to add information about waste water handling to the IIR.

Category issue 3: 6.C.a: Clinical waste incineration - Pb, Cu, Zn, Ni and TSP

121. The UK has reported emissions for the major pollutants. However, no Pb, Cu, Zn and Ni emissions after 2004 have been reported. During the review, the UK explained that no plants reported these emissions after 2004 and that no default EFs were used. The UK indicated that it would consider improving the estimates using default EFs (Cu, Pb, Ni are provided in the Guidebook).

Category issue 5: 6.C.c: Municipal waste incineration - All

122. The UK has reported emissions for the major pollutants. However, for some pollutants no emissions after 1996 are reported and for others none after 2000. During the review, the UK explained that the Waste Incineration Directive

(2000/76/EC) resulted in older plants either closing or upgrading their abatement measures to prevent significant emissions. In addition, emissions have moved from this sector to the energy sector as plants became energy producers utilising the waste burnt. The ERT found this explanation extremely useful for the transparency of the IIR and encourages the UK to add it in the IIR..

Category issue 6: 6.C.d: Cremation - NH₃

123. No NH₃ emissions are reported for 6Cd. However, the UK's IIR mentions (11.3 Methods for estimating emissions) animal carcasses incinerators, leading to NH₃ emissions. The ERT encourages the UK to add NH₃ emissions to its estimates in the NFR report and the IIR, following the EMEP/CORINAIR Guidebook 2009.

Category issue 7: 6.C.e: Small-scale waste burning - All pollutants

124. The UK IIR does not provide any methodological explanation, description of data sources, details of AD or EFs for this sector. The ERT encourages the UK to add this information to the IIR for the next submission to improve the transparency and the completeness of the IIR.

Category issue 8: 6.D: Other Waste(s) - All pollutants

125. The ERT noticed that the emissions for 2007 and 2008 were identical. The UK explained, during the review week, that national fire statistics were not available at the time of the inventory compilation. The ERT recommends that the UK provides similar explanations for similar difficulties with AD in future IIRs.

Category issue 9: 7: Other (new sector from Guidebook 2009) - All pollutants

126. The ERT notes that the IIR still presents emissions from nappies under sector 6D, whereas these emissions are reported in the NFR tables under 7. The ERT supports the UK's plans to improve the IIR chapter 6/7 for the next submission and encourages the UK to improve Chapter 7 with other processes; including NH₃ emissions from Cats and Dogs, from Zoo animals and human ammonia emissions etc. In addition, although the Guidebook has methods for "Car and house fires" it may be more transparent to include these under Chapter 7 as Chapter 6D is more focused on compost and sludge.

**LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING
THE REVIEW**

1. Responses to questions from the generalist reviewer during the stage 3 review: UK-General-30-06-10-Q1.doc

Energy

2. Response to preliminary question raised prior to the review: UK-Energy-14-06-10Q1_Q1-Q13_final.doc
3. A document sent by the United Kingdom : dukes1_1_2.xls
4. A document sent by the United Kingdom : AC6838_EF_LRTAP_Pollutants_NFR1_1980-2008.xls

Transport

5. Response to questions raised during the Review
6. Revision to the Method of Estimating Emissions from Aircraft in the UK Greenhouse Gas Inventory – website link to the publication

Industrial processes

7. Response to preliminary question raised prior to the review:
UK_Industrial processes_14-06-2010Q1_15-06
2010UKRESPONSE.doc

Agriculture

8. Response to preliminary question raised prior to the review: UK q1-q6 (ReviewQ&ATemplate-v2_UK 18_06_2010.doc)
9. Response to questions raised during the review: UK q7-q13 (UKagro_23 06 2010 follow upUKRESPONSE.doc).
10. Excel file with time series of fertiliser and animal numbers (AC6838_Livestock_Numbers_Fertiliser_Use.xls).
11. Word document on emission uncertainties manuscript, to be published.
12. Ammonia emission estimations, two files (nh3inv2007_finalv1_281008.pdf; nh3inv2008_final2_171109.pdf)

Waste

13. Response to preliminary question raised prior to the review:
UK_waste_18-06-10UKRESPONSE.doc /
UK_waste_220610_UKRESPONSE.doc
14. Response to questions raised during the review:
UK_waste_220610_UKRESPONSE Resolved.doc