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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:

STAGE 3 REVIEW REPORT
ROMANIA

CONTENT

Introduction

1. The mandate and overall objectives for the emission inventory review process under the LRTAP Convention are 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 SO_2, NOx, NMVOC, NH_3, plus PM_{10} & $PM_{2.5}$ for the time series years 1990 – 2011 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 Italy coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 17th to 21st June 2013 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 – Valentina Idrissova (Kazakhstan), Energy - Stephan Poupa (Austria) and Laetita Nicco (France), Transport - Michael Kotzula (Germany), Industry - Neil Passant (European Union), Agriculture + Nature - Hakam Al-Hanbali (Sweden), Waste - Intars Cakaras (Latvia). There was no expert available to review emissions from the Solvents sector.

4. Chris Dore (United Kingdom) 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 CLRTAP inventory submitted by Romania is in line with the EMEP/EEA Air Pollutant Emissions Inventory Guidebook and the UN/ECE Reporting Guidelines.

6. The ERT noted that Romania followed some recommendations of the previous review team in 2010. The ERT commends Romania for the efforts undertaken to improve its inventory (e.g. reporting longer time series, including additional sources, providing AD and EFs).

7. The ERT is sympathetic to the restrictions that result from limited resources; however, the ERT considers that significant improvements are required to the inventory, particularly as regards transparency, completeness and consistency. The ERT has provided in this report some source-specific observations, recommendations and encouragements to enable emissions inventory improvement for future submissions (see Part B of this report).

INVENTORY SUBMISSION

8. Romania has only reported emissions for 2006-2011 in the NFR09, although emissions for 1990-2005 are available as national totals or in SNAP codes. Romania also submitted an IIR report, but the IIR template has not been fully applied.

9. Romania did not report POPs and HMs emissions for 1989 (the base year for both protocols).

10. Also the ERT has noted that mostly Tier 1 methods and the default emission factors are applied to estimate emissions. This does not follow best practice as presented in the EMEP/EEA Emissions Inventory Guidebook.

KEY CATEGORIES

11. Romania reported a Tier 1 level Key Category Analysis (KCA) by pollutant and sector. This approach made it difficult to compare the Romanian KCA with the KCA undertaken by CEIP. The ERT encourages Romania to compile its key category analysis in line with the EMEP/EEA Guidebook, which indicates that the KCA analysis should be conducted on sources up to 80% of the emission total. To help with this improvement, Romania may wish to refer to work undertaken by other countries – for example the level and trend KCA undertaken by Italy.

12. The ERT strongly recommends that Romania link its KCA to the source-specific improvements (e.g. move to higher Tier methods for estimating key categories) and transparently report these in its IIR.

QUALITY

Transparency

13. Romania has reported in its IIR full time series of AD and EFs for 2006-2011. This results in an enormous amount of data being presented in the IIR, but

unfortunately this does not improve the transparency of the inventory. The ERT would like to stress that the IIR is an informative report and thus information is required on the specifics of the Romanian economy, description of industries, assumptions used when estimating emissions, uncertainty assessment, information on the consistency checks, etc. The ERT strongly recommends that Romania improve the transparency of its IIR by reporting the information indicated in the recommended structure for Informative Inventory Reports (IIR). To this end Romania may want to review examples from other Parties (e.g. Austria). The ERT also encourages Romania to report AD and EFs in Annexes to the IIR and in the IIR main text focus on the AD trend analysis and results of the IEF outlier analysis.

14. The ERT has noted extensive use of the "IE" notation keys in the NFR tables (mostly for the energy sector) with rather intransparent explanations in the IIR. The ERT encourages Romania to provide disaggregated emissions estimates where possible and to clearly explain reasons for the use of notation keys. To do so Romania may wish to refer to IIRs of other Parties (e.g. Norway).

Completeness

15. Romania has reported NFR09 tables for 2006-2011 only, despite national totals and emissions in SNAP codes being available for 1990-2005. The ERT recommends that Romania provide full time series of emission data using the NFR09 reporting templates to improve the completeness of its inventory.

16. The ERT recommends that Romania collect, estimate and report emissions for POPs and HMs for its base year (1989) to comply with the POPs and HMs reporting in the corresponding Protocols.

17. Romania used "NE" many times (especially for mobile sources). The ERT has also noted an inappropriate use of Notation keys (NA instead of NE in the energy and transport sectors) as well as "zero" values reported. The explanations presented in the IIR on the use of notation keys are not clear. The ERT recommends that Romania use NE, NA or NO for zero values as appropriate.

18. The ERT further recommends that Romania collect AD, estimate and report emissions from missing sources, where default EFs are available in the EMEP/EEA Guidebook.

19. Where emissions are considered to exist, even at a negligible level, the ERT encourages Romania to assess the contribution of these not-estimated sources to national totals and report the findings in its IIR to justify the use of notation keys rather than submitting a quantified emission estimate.

Consistency, including recalculations and time series

20. Romania has performed recalculations, but these are not documented in a sufficiently detailed nor comprehensive way in its IIR. The ERT encourages Romania to refer to the IIRs of other Parties (e.g. Norway, Italy) as examples of good practice, and to improve reporting of recalculations in future.

21. Despite the inconsistent use of some notation keys and a lack of transparency in the IIR (see para 13 above) the ERT considers the reported time series (2006-2011) to be consistent. For the other years, unfortunately, consistency could not be ascertained. The ERT strongly recommends that Romania improve its QA/QC procedures to ensure reporting of transparent, complete and consistent inventory data.

Comparability

22. The ERT noted that Romania followed the EMEP/EEA Air Pollutant Emissions Inventory Guidebook to estimate emissions of air pollutants and the UN/ECE Reporting Guidelines within the NFR09 to compile its inventory. The inappropriate use of notation keys and the aggregation of emissions made it difficult to compare the Romanian inventory to inventories from other Parties. The ERT recommends that Romania use notation keys correctly, allocate emissions to the appropriate NFR categories for all sources to ensure comparability of its inventory.

Accuracy and uncertainties

23. Due to the less than sufficient levels of transparency and the inconsistent use of notation keys, the accuracy of estimates for some sources could not be judged (see source-specific findings in paras 33, 55, 82, 96 and 99).

24. The ERT also noted that Romania used Tier 1 methods to estimate emissions in most categories. The ERT recommends that Romania use the higher Tier methods to estimate emissions from key categories based on KCA.

25. The ERT has also noted that Romania did not perform an uncertainty assessment. During the review week, Romania explained that a qualitative uncertainty assessment had not been undertaken either, due to a lack of expertise. In response to questions raised by the ERT, Romania indicated its intention to undertake an uncertainty analysis in future submissions

26. The ERT would like to stress the importance of the uncertainty analysis in assessing the accuracy of the inventory and reminds Romania that it is also a useful tool for prioritising inventory improvements (especially when resources are limited). The ERT therefore recommends that Romania undertake an uncertainty assessment and report the results in the IIR of its next submission.

Verification and quality assurance/quality control approaches

27. In its IIR Romania has indicated that the development of the QA/QC procedures, including a verification plan, is part of Romania's planned improvements for the national inventory. However, at the moment, several checks are routinely carried out in order to eliminate possible errors.

28. The ERT reminds Romania that besides accuracy, QA/QC procedures are intended to ensure overall quality of the inventory including transparency, completeness, consistency and comparability. The ERT therefore strongly recommends that Romania develop and implement its national QA/QC procedures at general activity level, and also at sector-specific level for key categories.

FOLLOW-UP TO PREVIOUS REVIEWS

29. Romania provided responses to findings on IEF outliers of the Stage 2 review annually. The ERT commends Romania for its efforts.

AREAS FOR IMPROVEMENTS IDENTIFIED BY ROMANIA

30. The IIR includes planned improvements, but not for all sectors (see paras 66, 90 and 119). In addition, during the review Romania provided information on some planned improvements to the ERT. These included:

- The implementation of a QA / QC system;
- Adding new emission sources to the inventory;
- Reporting full time series; and
- Undertaking and reporting an uncertainty assessment.

31. The ERT welcomes these planned improvements, and recommends that Romania undertake them in time for its next annual submission, as far as resources allow.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS-CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

32. Romania has reported emissions for 2006-2011 (and national totals or SNAP code emissions for 1990-2005). The ERT strongly recommends that Romania submit a complete time series of sectoral emissions in the latest NFR format.

33. The ERT has noted that mostly Tier 1 methods and default emission factors are used in the inventory. The ERT strongly recommends that Romania apply higher tier methods for key sources in time for the next submission, and where this is not possible provide a clear and detailed plan on how this will be achieved for future submissions.

34. The IIR does not follow the recommended structure, and in some sectors too much information/data is included. The ERT strongly recommends that Romania follow the recommended structure for the IIR to address the current transparency issues.

35. The ERT has noted an extensive use of the IE and NE notation keys, the inappropriate use of NA, and zero values. The explanations provided in the IIR are not considered to be sufficient by the ERT. The ERT therefore recommends that Romania review and improve the current use of notation keys throughout the inventory. The ERT further recommends that Romania collect AD, estimate and report emissions from missing sources (reported as NE) where default EFs are available in the EMEP/EEA Guidebook.

36. Romania did not perform an uncertainty assessment. Romania indicated its intention to undertake an uncertainty analysis in the future, and the ERT recommends that this uncertainty analysis be performed and reported in time for the next submission.

37. The ERT strongly recommends that Romania develop and implement its national QA/QC procedures at general activity level, and also at sector-specific level for key categories.

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed		SO_x, NOX, NMVOC, NH_3, CO, PMs, HMs, POPs		
Years		2005-2011		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
1.A.1.a	public electricity and heat production	x		x
1.A.1.b	petroleum refining	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		IE	
1.A.2.d	pulp, paper and print		IE	
1.A.2.e	food processing, beverages and tobacco		IE	
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)		NA	
1 A 3 e	Pipeline compressors ?	x		
1.A.4.a.i	commercial / institutional: stationary	x		x
1.A.4.a.ii	commercial / institutional: mobile ?	x		
1.A.4.b.i	residential plants		NE, NA	
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?		NE, NA	
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		x
1.B.1.b	solid fuel transformation	x		
1.B.1.c	other fugitive emissions from solid fuels		NE, NA	
1 B 2 a i	Exploration, production, transport	x		x
1 B 2 a iv	Refining / storage	x		
1 B 2 a v	Distribution of oil products	x		x
1 B 2 b	Natural gas	x		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		IE	

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

General recommendations on crosscutting issues.

Transparency:

38. The ERT considers the inventory of Romania to not be very transparent, because the IIR provides very little information on methodology and trend analysis. However, detailed activity data and emission factors including the source of emission factors are provided in the Annex, which allows the ERT to follow the calculations.

39. The ERT has noted that emissions from combustion of manufacturing industry are not reported in the separate NFR categories, and many sources in the Energy sector are reported using the IE notation key. Emissions that should be allocated to categories 1 A 2 c, 1 A 2 d and 1 A 2 e are included in 1 A 2 f i Stationary Combustion in Manufacturing Industries and Construction: Other. During the review Romania provided detailed activity data and main pollutant emission factors for NFR category 1 A 2 f i for the year 2011, which the ERT judged to be consistent with the NFR table.

Completeness:

40. The ERT considers the energy sector to be mostly complete. Emissions of the main pollutants, PM, heavy metals, dioxin, PAH and HCB are reported for all relevant emission sources for the years 2005 to 2011. For the year 2011 zero values are reported for category 1 A 1 c Manufacture of solid fuels and other energy industries, which is not in line with best practice as explained in the EMEP/EEA Emissions Inventory Guidebook.

41. Romania makes use of notation keys in the energy sector. Romania sometimes reports 'NE' for stationary fuel combustion sources and 1 B subcategories which according to the ERT should have been reported as 'NA' or 'NO'. For category 1 A 3 e Pipeline compressors the ERT considers that the reported 'NA' should be reported as 'NO'.

42. The ERT recognises that additionally heavy metals and POPs are estimated for all relevant emission sources.

Consistency including recalculation and time series:

43. The ERT has noted that during the period 2005-2011 most of the trends monitored do not show unreasonable dips and jumps with the exception of category 1 A 1 c Manufacture of solid fuels and other energy industries which shows a decline, with emissions in 2011 being reported as zero.

44. The ERT has noted that recalculations are not addressed in the IIR, neither as figures nor as textual information.

Comparability:

45. The ERT judges the inventory of Romania to be comparable to those of other countries. Romania uses the most up to date NFR reporting templates.

Accuracy and uncertainties:

46. Romania uses LCP data for categories 1 A 1 a Public electricity and heat production and 1 A 1 b Petroleum refining. However, for all other activities the emission factors from the EMEP/EEA Guidebook are used. For category 1 A 2 a Iron and steel fuel combustion emission factors are used rather than the EFs specific to blast furnaces (see sector specific recommendations).

47. Since Romania has widely used lower tier methods, the overall accuracy is not very high with the exception of NOX and SOX emissions from power plants where LCP data has been used.

Sub-Sector Specific Recommendations.

Category issue 1: 1.A.2 Manufacturing Industries and 1.A.4 Other - SOx

48. The ERT has noted that Tier 1 Guidebook emission factors have been used to estimate the SO2 emissions of categories 1.A.2 and 1.A.4. During the review Romania explained that it would start this year to collect information about the fuel sulphur contents in order to use a higher Tier method in the future. The ERT welcomes this planned improvement as this will increase the accuracy of SO2 estimates, and recommends that Romania undertake development work to allow a higher Tier methodology to be used for this key category in line with best practice guidance.

Category issue 2: 1.A.1.a Public power and district heat – PM10 and PM2.5

49. The ERT has noted that Romania uses PM_{10} and $PM_{2.5}$ Tier 1 emission factors to estimate emissions from power plants, although LCP data are available. Romania has explained that only TSP is used from the LCP data. The ERT strongly recommends that Romania derive PM_{10} and $PM_{2.5}$ emissions from the TSP emissions reported by the LCP, e.g. by using PM fractionation profiles for each fuel. This would significantly increase the completeness of the PM estimates while requiring little effort.

Category issue 3: 1.A.1.a Public power and district heat - boilers < 50 MW

50. During the review week the ERT has again raised an issue from the Stage 3 review undertaken in 2010, namely the allocation of public electricity and district heating boilers < 50 MW. During the current review, Romania has stated that the allocation of these boilers still cannot be clearly explained. The ERT therefore reiterates its recommendation that Romania make an effort to obtain improved data that allow the correct allocation of these boilers in the inventory.

Category issue 4: 1.A.1.c Fuel transformation and extraction of fuel

51. During the review the ERT noted that emissions from 1.A.1.c (which takes into account coke production) show a high level in 2007 and then gradually decrease to

zero in the year 2011. Romania explained that these emissions were calculated from the activity data reported in the national energy balance. The ERT encourages Romania to investigate whether this is due to a closure of a specific coke oven plant to obtain a better understanding of the reliability of these data in the national energy balance, and recommends that Romania include an explanation of the trend in the IIR of their next submission.

Category issue 5: 1.A.2.a Iron and steel – use of emission factors

52. During the review the ERT has noted that Romania uses Tier 2 emission factors of fuel combustion activities to calculate emissions from the iron and steel industry. To the understanding of the ERT the technologies of category 1.A.2.a include blast furnaces rather than combustion boilers. Romania explained that it planned to gather data from steel industry operators in order to use a higher Tier method for this category. The ERT welcomes the plan expressed by Romania to improve its estimates for this category, and recommends that they undertake the improvements and report on them in their next submission.

Category Issue 6: 1.A.2.f.i – Cement production

53. During the review the ERT asked Romania if there could be a double counting of emissions from cement production - which is based on a product specific approach - with the estimates based on fuel consumption from the national energy balance. Romania confirmed that there is a potential double counting. The ERT therefore recommends that Romania review their inventory and make improvements where necessary to ensure that there is no double counting, and report this in the IIR.

Category Issue 7: 1.A.4.b.i Residential: Stationary plants

54. During the review the ERT noted that emissions from residential fuel combustion are estimated with a Tier 1 method although they are key source for CO, NMVOC, PM_{10}, $PM_{2.5}$ and POPs. Romania explained that Ministry Order no. 3299/2012 would be in force from 2013 in order to collect more detailed data, using a questionnaire. The ERT highly appreciates the introduction of this survey and encourages Romania to use the outcome of the efforts in a future emission inventory. Irrespective of whether the questionnaire provides information, the ERT recommends that Romania use a higher Tier methodology to estimate the emissions from this key source.

Category Issue 8: 1.B.2.b Natural gas – NMVOC

55. During the review the ERT noted that NMVOC emissions from natural gas systems are rather high. Romania explained that an emission factor for the exploration, production and transport of natural gas had been used, and they planned to replace this with a lower emission factor for gas distribution in the next submission. The ERT encourages Romania to ensure that they use the most appropriate emission factor for estimating emissions from this source.

TRANSPORT

Review Scope

Pollutants Reviewed		NO_x, NMVOC, NH_3, SO_x, $PM_{2.5.}$, PM_{10}, TSP, CO, Main HM, PAH		
Years		1990, 2010, 2011		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
1.A.3.a.i.(i)	international aviation (LTO)		NE/NA	x
1.A.3.a.i.(ii)	international aviation (cruise)		NE/NA	x
1.A.3.a.ii.(i)	civil aviation (domestic, LTO)	x		x
1.A.3.a.ii.(ii)	civil aviation (domestic, cruise)	x		
1.A.3.b.i	road transport, passenger cars	x		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		NE	x
1.A.3.b.vi	road transport, automobile tyre and brake wear	x		x
1.A.3.b.vii	road transport, automobile road abrasion			
1.A.3.c	railways	x		x
1.A.3.d.i (ii)	international inland navigation		IE	x
1.A.3.d.ii	national navigation		IE	x
1.A.4.b.ii	household and gardening (mobile)	x		
1.A.4.c	agriculture / forestry / fishing		zero values	x
1.A.4.c.ii	off-road vehicles and other machinery		NE/NA	x
1.A.4.c.iii	national fishing		NE/NA	x
1.A.5.b	other, mobile (including military, land based and recreational boats)		NE/NA	x
1 A 3 d i (i)	International maritime navigation		NE/NA	x
1 A 3	Transport (fuel used)		NA	
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues.

Transparency:

56. In the NFR tables, notation keys have been used for several sectors as well as for certain pollutants or groups of pollutants. Compared to the number of notation keys provided in the NFR tables, little information is provided in Romania's IIR, namely in chapter 4. EXPLANATION ON THE USE OF NOTATION KEYS. Therefore, in order to improve not only the completeness but also the transparency of the inventory, the ERT recommends that Romania provide sufficient information on the use of notation keys in future IIRs.

57. The ERT noted that within the NFR-sectors and for the pollutants named below, the party provides zero-values in the 2011 NFR table 1 (see Sub-Sector Specific Recommendations).

- SO_x from 1.A.3.b iv - Road transport: Mopeds & motorcycles
- Pb from 1.A.3.b iii - Road transport: Heavy duty vehicles and 1.A.3.b iv - Road transport: Mopeds & motorcycles
- B(a)P & B(k)F from 1.A.3.d ii - National navigation (Shipping)

58. In addition, due to zero values in fuel consumption, zero values are provided for all pollutants reported for NFR 1.A.4.c iii for the years 2010 and 2011. (see Sub-Sector Specific Recommendations).

59. The ERT recommends that Romania revise the zero values to report only quantified estimates or notation keys.

60. Romania has provided a trend analysis for the entire energy sector in the IIR. The ERT encourages Romania to present a more disaggregated trend analysis on a category/sub-sectoral level to improve the transparency of the trends in the transport and mobile source sectors.

Completeness:

61. The ERT noted the use of notation keys "NA" and/or "NE" for various sectors where the ERT considers that emissions are likely to occur.

62. For emissions from *1.A.3.b vi - RT: Automobile tyre and brake wear* and *1.A.3.b vii - RT: Automobile road abrasion*, Romania has stated the emissions are included in the individual 1.A.3.b exhaust emission estimates reported for the different vehicle types, confirming that the notation key "IE" will be used in coming submissions. The ERT thanks Romania for providing this information and for their willingness to correct the use of notation keys, which the ERT recommends. However, the ERT encourages Romania to take steps to improve the reporting so that emissions from road abrasion and tyre and brake wear can be reported in the corresponding NFR codes, ensuring a good level of transparency for these major sources of PM.

63. The ERT has noted several issues regarding the reporting of the following pollutants where "NE" (and/or "NA") is used. For example, no emissions were reported for the entire civil aviation sector, or international navigation (see Sub-Sector Specific Recommendations).

64. In addition, there are problems regarding the reporting of ammonia emissions from:
1.A.3.d ii - National Navigation (Shipping)
1.A.4.c iii - Agriculture/Forestry/Fishing: National Fishing where "NA" has been used by mistake instead of "NE" (see Sub-Sector Specific Recommendations).

65. The ERT recommends that this issue be reviewed and addressed to improve completeness and emission factors from the 2009 EMEP/EEA Guidebook be used -

which would allow Romania to estimate emissions for some of the sectors discussed here.

66. In addition, problems seem to occur regarding the transparent and consistent reporting of POP emissions with notation keys NE or even NA being reported for several sectors where emissions are likely to occur (see Sub-Sector Specific Recommendations 3, 5, 6, and 9 below).

Consistency including recalculation and time series:

67. In NFR and IIR Romania provided data for the years 2006 and 2005 respectively with several outliers identified and discussed during the review. Unfortunately, not all issues could be fully resolved (see Sub-Sector Specific Recommendations below).

68. In addition, there is no information on recalculations. Here, the ERT warmly encourages Romania to present all the necessary information (rationales, years affected, effects on trends etc.) and data (old and new time series, absolute and relative changes in estimates) in coming IIRs.

Comparability:

69. The ERT commends Romania for providing a time series for both activity data and emissions, and a basic overview of developments and trends in the IIR. However, the time series provided are rather short, and include several dips and jumps which are not explained in the IIR. As these features of the time series are not explained in the IIR, and no methodological explanation is provided in the IIR, the ERT considered these data as not readily comparable with information reported in other national emissions inventories..

70. The ERT therefore recommends that Romania include sufficient explanatory information on data sources, methods applied, trends in AD and EF as well as underlying national circumstances in coming IIRs to ensure adequate levels of transparency and comparability.

Accuracy and uncertainties:

71. The IIR indicates that no uncertainty analysis has been carried out so far. Nonetheless, Romania has provided information that indicates that they are aware of the problems that can result from the use of inconsistent statistics, as well as the use of emission factors that are inappropriate for the national circumstances.

Improvement:

72. The IIR does not provide information on planned improvements. The ERT assumes that no national improvement plan exists, and encourages Romania to establish one in order to categorise and prioritise improvement tasks identified by the ERT during this review, and improvement tasks identified by other mechanisms.

Sub-Sector Specific Recommendations.

Category issue 1: 1.A.3.b iv - Road transport: Mopeds & motorcycles: zero SO_2 emissions 2010 and 2011

73. The ERT has noted that within the 2011 NFR table 1, emissions of 0.00 Gg have been reported for this sub-sector. The ERT asked Romania whether this was a mistake, and to provide corrected data. Romania explained that the mistake occurred during a direct export from COPERT IV, and that is was due to the small number of mopeds and motorcycles in Romania combined with the insignificant amount of sulphur in gasoline. The ERT thanks Romania for this explanation, and recommends that Romania either report numerical values or notation keys in future submissions.

Category issue 2: 1.A.3.b Road Transport Pb

74. The ERT has noted that zero values have also been provided for Pb emissions for several sub-sectors of NFR 1.A.3.b. For Pb from 1.A.3.b iv the ERT assumed that mopeds and motorcycles use the same gasoline as passenger cars and light duty vehicles, and asked Romania to verify this and to provide a non-zero value. The ERT also assumed that not all heavy duty vehicles and buses in Romania are diesel powered, and asked Romania to verify this assumption. The ERT suggested that as all exhaust lead emissions are due to the use of leaded gasoline and not due to engine wear, either an emission estimate or the notation key "NA" should be reported for HDVs and buses in Romania. Romania explained that according to national regulations, leaded gasoline has not been sold since 2005, and therefore Pb emissions arise from the “trace” value of 0.005 mg/l, the maximum lead content in unleaded gasoline according to current Romanian legislation. The zero values result from the combination of a rather small emission factor with a very small amount of gasoline consumed in mopeds and motorcycles and the small number of gasoline driven heavy duty vehicles. Romania indicated their willingness to replace the zero values with emissions calculations. The ERT welcomes this improvement and recommends that Romania implement it to improve accuracy and transparency.

Category issue 3: 1.A.3.d ii - National navigation - zero B(a)P and B(k)F emissions 2011

75. The ERT noted that emission values of 0.00 Mg have been reported in the 2011 NFR table 1 for B(a)P and B(k)F, whereas values are provided for B(b)F, I(123cd)P and the PAH 1-4 total. The ERT therefore asked Romania to provide corrected data (or a proper notation key) in future submissions. Romania explained that Tier 1 EFs for Marine Diesel Oil were used for this sector with no EF available for B(a)P and B(k)F, confirming that notation key “NE” will be used in future submissions. The ERT commends Romania's plan to improve the accuracy and transparency of the inventory, and recommends that this be undertaken.

Category issue 4: 1.A.4.c iii - National fishing - no fuel consumption reported in 2010 & 2011

76. In addition to the issues with zero values discussed above (Category Issues 1-3), the ERT asked Romania to explain the fuel consumption in national fishing, which

results in zero consumption and emissions in 2010 and 2011, and to provide explanatory information in future IIRs. Romania stated that, given the fact that small fishing motor boats mainly used bunker fuel oil, activity data was taken from the statistical bunker fuel oil consumptions for navigation, providing zero values for 2010 and 2011.

77. The ERT has noted the explanation provided by Romania, but recommends that Romania improve the reported information on all kinds of fuels used by the Romanian fishing fleet. If such data is not available, and as long as consumption data for heavy fuel oil is zero, this should be explained with the IIR in order to improve transparency.

Category Issue 5: 1.A.3.a – Civil aviation - all pollutants

78. The ERT has noted that in NFR table 1 Romania uses the notation keys "NE" and "NA" for emissions from civil aviation with no further explanation being provided in the IIR or the NFR tables. The ERT asked Romania to clarify this issue and to provide all necessary information in future submissions. In addition, the ERT has noted that for sub-sectors 1.A.3.a ii(ii) and i(ii) (cruise phase) several emissions which are likely to occur are reported as "NA" in the NFR tables (e.g. CO, $PM_{2.5}$, PM_{10}, TSP, Pb (from leaded avgas), all other HM and POPs) whereas "NE" is reported for LTO sub-sectors.

79. The ERT asked Romania to consider adjusting the reporting for LTO and cruise phase emissions wherever necessary or to provide further explanations on the use of notation keys. Romania stated that more detailed airport data is being compiled at the moment for the domestic and international LTO cycles, making it possible to disaggregate fuel consumption into the LTO and cruise phases for both domestic and international flights. Romania also stated that for historical data, statistical fuel data will be used in order to complete the missing emission estimates. The ERT welcomes Romania's plan to improve their inventory regarding aircraft emissions and recommends that they implement these improvements in time for their next submission.

Category Issue 6: 1.A.3.d i (ii) – International inland navigation - all pollutants

80. The ERT has noted that within NFR table 1 Romania uses the notation keys "NE" and "NA", whereas in the IIR, chapter 4: “Explanation on the use of notation keys” it is stated that all "navigation" consumption data available from statistics "has been allocated to 1.A.3.d.ii". Therefore, the ERT assumed that the use of notation key "IE" was appropriate, and asked Romania to check this issue and to provide all necessary explanatory information in both the NFR tables (NFR table 1: column "Notes”, and NFR table "Additional info") and future IIRs. The Party confirmed that a differentiation between national and international navigation was not possible, and that hence all reported fuel quantities were allocated to national navigation. Romania agreed to change the notations from "NE" to "IE" in the next submission. The ERT recommends that Romania amend this notation key, undertake other improvements as far as practicable, and implement incorporate them into the next submission.

Category Issue 7: 1.A.3.c Railways, 1.A.4.c ii Agriculture/Forestry/Fishing: Off-road vehicles and other machinery- "NE" for SOx emissions

81. Within the NFR-sectors 1.A.3.c, 1.A.4.c ii, Romania uses "NE" for SOx emissions. As SOx emissions are reported for other transport sectors, such as road transport and navigation, the ERT assumed that data on the sulphur content of liquid fuels is available for use in the inventory. Romania indicated that they plan to use the maximum sulphur content of 10mg/kg to derive EFs for these activities and to report the missing emissions with the next submission. The ERT commends Romania's plan, and recommends that this be undertaken for the next submission to improve the inventory's completeness.

Category Issue 8: 1.A.3.d ii National navigation (Shipping), 1.A.4.c iii 1A 4 c iii Agriculture/Forestry/Fishing: National fishing - "NA" for NH_3 emissions

82. The ERT has noted that for NFR-sectors 1.A.3.d ii, 1.A.4.c iii, Romania reports "NA" for ammonia emissions, stating that such emissions are not likely to occur from these sources. Therefore, the ERT asked Romania to either change the notation key to "NE" or make emission estimates. Romania agreed to amend the notation key to "NE" for the next submission. The ERT refers Romania to the 2009 EMEP/EEA Guidebook, chapter "Non-road mobile sources and machinery" where emission factors are provided for a broad variety of controlled and uncontrolled NRMM (table 3-10 on page 34 and following tables), and encourages Romania to make emission estimates in order to improve the inventory's completeness and accuracy.

Category Issue 9: 1.A.5.b Other, Mobile (including military, land based and recreational boats) - all pollutants

83. The ERT noted that for the NFR sector 1.A.5.b, Romania reports "NE", and provides no further explanation in the IIR or the NFR tables. The ERT asked Romania to explain this issue and to provide all necessary information in future IIR and NFR submissions. In addition, the ERT has noted that several emissions that are expected to occur are reported as "NA" in the NFR tables (e.g. CO, $PM_{2.5}$, PM_{10}, TSP, Pb (from leaded avgas), all other HM and POPs). The ERT asked Romania to check these issues, and to revise the notation keys wherever necessary and to provide further explanations on the use of notation keys.

84. The ERT acknowledges the mentioned problem with separating activity data for NFRs 1.A.5.a and 1.A.5.b. Romania has agreed, as a first step, to revise the notation keys used; the ERT recommends that correct use of notation keys is undertaken in the next submission in order to improve the transparency of the inventory.

85. The ERT encourages Romania to separate activity data for these subcategories in order to improve the transparency and comparability of the inventory.

Category Issue 10: 1.A.3.b - Road Transport: Trend for liquid fuels

86. As the AD for liquid fuels provided for NFR 1.A.3.b shows a rather strong increase between 2007 and 2008, the ERT asked Romania to provide some background information on this trend. Romania stated that for road transport COPERT 4 V9.1 was used for calculating emissions and that the different vehicle mileages were adjusted so that the calculated fuel consumptions would match the data available from the national statistics. To fully explain the issue, Romania provided to ERT data from their "IEA - Eurostat – UNECE Energy Questionnaire – Oil", including separate data for the different types of fuels. Almost no difference could be observed in the 2007 and 2008 data for gasoline consumption, whereas a small increase is visible for LPG. As diesel oil accounts for the majority of the fuel consumption Romania concluded that the total liquid fuel variation between 2007 and 2008 comes from a variation in diesel consumption. Romania agreed to include information on this issue in the next IIR, and this improvement is recommended and welcomed by the ERT.

Category Issue 11: 1.A.3.c - Railways: Trend for liquid fuels

87. In NFR table 1 and the IIR, AD for liquid fuels is available for the years 2005 to 2011. As there is no further description of the trend, the ERT asked Romania to provide some background information - especially regarding the strong decrease in fuel consumption observed in 2006. Romania informed the ERT that activity data was taken from the National Statistics Institute (INS). As the same data was reported to EUROSTAT, Romania provided their "IEA - Eurostat – UNECE Energy Questionnaire – Oil" including the relevant data. Romania confirmed that there is an error in the data reported for 2005, caused during the conversion from tonnes to TJ. As the large difference between 2006 and 2007 remained unexplained, the ERT recommends that Romania investigate this difference, and include information on the trends in all future IIRs.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		SOx, NOx, NMVOC, NH_3, PM_{10} & $PM_{2.5}$, HMs and POPs.		
Years		2006 - 2011		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
2.A.1	cement production	x		x
2.A.2	lime production	x		
2.A.3	limestone and dolomite use		NA	
2.A.4	soda ash production and use	x		
2.A.5	asphalt roofing			
2.A.6	road paving with asphalt	x		
2.A.7.a	Quarrying and mining of minerals other than coal		NA	
2.A.7.b	Construction and demolition		NA	
2.A.7.c	Storage, handling and transport of mineral products		NA	
2.A.7.d	Other Mineral products (Please specify the sources included/excluded in the notes column to the right)		NA	
2.Bb.1	ammonia production	x		
2.B.2	nitric acid production	x		
2.B.3	adipic acid production		NE, NA	
2.B.4	carbide production		NA	
2.B.5.a	Other chemical industry (Please specify the sources included/excluded in the notes column to the right)	x		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)		NA, IE	
2.C.1	iron and steel production	x		
2.C.2	ferroalloys production	x		
2.C.3	aluminium production	x		
2.C.5.a	Copper Production	x		
2.C.5.b	Lead Production	x		
2.C.5.c	Nickel Production		NA	
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)		NA	
2.C.5.f	Storage, handling and transport of metal products (Please specify the sources included/excluded in th notes column to the right)		NA	
2.D.1	pulp and paper	x		
2.D.2	food and drink	x		x
2.D.3	Wood processing	x		x
2.E	production of POPs		NA, NE	
2.F	consumption of HM and POPs (e,g. Electrical and scientific equipment)		NA	
2.G	Other production, consumption, storage,		NA	

	transportation or handling of bulk products (Please specify the sources included/excluded in the notes column to the right)			
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency:

88. The approach for estimating emissions from industrial processes is transparent. All emission estimates use national activity statistics and EMEP/EEA Guidebook default factors. However, the transparency of the IIR would be improved by the inclusion of additional information on, for example, the number and type of industrial plants and factors that might influence trends in emissions, such as plant closures or abatement of emissions. Similarly, a discussion of activity trends would be useful. The ERT therefore recommends that Romania incorporate more detailed and comprehensive information in their IIR on methodologies and trends in activity data, in order to provide an adequate level of transparency in the IIR.

89. In the emissions submission the notation key "NA" is extensively used, including cases where the ERT expects that emissions might occur. These cases include but are not necessarily limited to:

- emissions of particulate matter from quarrying and mining;
- emissions of particulate matter from construction;
- emissions of SO_x, HMs and POPs from cement production.

90. The ERT recommends that Romania review the use of NA in all cases where it is not pre-filled in the data template, and either justify the use of NA, use NO or NE as appropriate, or submit an emission estimate.

91. Romania reports NA for PM_{10} and $PM_{2.5}$ in some cases where emissions data are reported for TSP, for example NFR 2 D 3 Wood Processing. If emission estimates cannot be made for fine particulate matter where TSP emissions occur, then NE should be used or emission estimates reported. The ERT recommends that Romania corrects the use of notation keys, and reportsPM_{10} and $PM_{2.5}$ emissions where TSP emissions are reported.

Completeness:

92. The inventory does not use NE for many emission source categories. However, as previously stated, the submission does include the notation key NA in areas where emissions may be expected to arise. The ERT recommends that Romania review the completeness of the inventory and revise notation keys where appropriate and include emission estimates for any missing sources wherever possible.

Consistency including recalculation and time series:

93. The ERT noted some large dips and jumps in time series in number of categories. In response to questions from the ERT during the review week, Romania provided information that (in 3 of the 4 cases) the identified dips or jumps were the result of errors in the production of the IIR. The ERT strongly recommends that these errors are corrected in time for future submissions and that Romania improves their QA/QC procedures associated with the production of the IIR in order to minimise the likelihood of such errors occurring in the future.

Comparability:

94. The emission estimates for industrial processes are all based on the use of EMEP/EEA Guidebook factors, and so it is fully consistent with the Guidebook, and hence comparable with the estimates of other Parties. The inventory has been submitted using the most up to date reporting templates and the IIR generally follows the structure recommended in the Reporting Guidelines.

Accuracy and uncertainties:

95. The ERT notes that a number of industrial processes' source categories have been identified by Romania as key categories, and that Tier 1 methods are applied in some cases. This does not follow good practice as presented in the EMEP/EEA Emissions Inventory Guidebook and the ERT recommends that Romania use higher Tier methods to estimate emissions from key categories.

96. The inventory does not contain any uncertainty analysis for the industrial processes sector and although some basic checks on data are carried out, Romania does not have any sector-specific QA/QC procedures. The Romanian emission estimates for industrial processes rely upon the extensive use of default emission factors taken from the Guidebook and thus might be expected to be subject to high uncertainty. The ERT therefore recommends that Romania obtains information on uncertainty of AD and EFs and encourages Romania to carry out an uncertainty analysis for the industry sectors before the next submission.

Improvement

97. Romania does not list any sectoral improvements in the IIR. Since the emission estimates for industrial processes rely heavily on default EMEP/EEA Guidebook emission factors, a detailed review in the IIR of the opportunities for moving to higher tier methods and improving estimates, for example through the use of more country-specific data, would be valuable. The ERT strongly recommends that Romania provide a plan for improvements to estimates for the industrial processes sector for its next submission.

Sub-Sector Specific Recommendations.

Category issue 1: 2.A.1 Cement production

98. The ERT identified an error in the activity data presented in the IIR for 2005. Romania confirmed that the correct figure is 7,043,000 Mg, and not 70,430,000 Mg. The ERT recommends that Romania correct this in time for the next submission.

Category issue 2: 2.D.2 Food & Drink Production

99. There are errors in the activity data given for 2.D.2 as follows:

- the 2006 value should be 22,602,997 hl product, and not 2,2602,997 hl product and
- the 2010 value should be 821,442 Mg product, and not 82,442 Mg product.

The ERT recommends that Romania correct these figures in time for its next submission. In addition, the ERT has noted that the activity data units for 2.D.2 and elsewhere are not expressed in a transparent way since it is not stated exactly which kinds of food and drink are included within the scope of the 'hl' and 'Mg' figures given for each year. The ERT recommends that Romania ensure that all units are expressed in a transparent way.

Category issue 3: 2.B.5 Other Chemical Industry

100. The ERT considers that the IIR lacks transparency regarding the various NMVOC emission factors given, with at least 3 instances of emission factors (given in the Table on page 227 of the IIR) for which there is no information on the applicability of the factor i.e. the type of chemical process to which that emission factor is applied. During the review week, Romania provided explanatory information. The ERT recommends that the IIR is updated with the information provided, and that Romania check that all emission factors given in the IIR are defined fully and transparently, so that their relevance and accuracy can be properly assessed.

SOLVENTS

Review Scope

Pollutants Reviewed		SO_2, NOx, NMVOC, NH_3, PM_{10} & $PM_{2.5}$		
Years		1990 – 2006 + (Protocol Years)		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
3.A.1	Decorative coating application		x	
3.A.2	Industrial coating application		x	
3.A.3	Other coating application (Please specify the sources included/excluded in the notes column to the right)		x	
3.B.1	Degreasing		x	
3.B.2	Dry cleaning		x	
3.C	Chemical products,		x	
3.D.1	Printing		x	
3.D.2	Domestic solvent use including fungicides		x	
3.D.3	Other product use		x	
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

No solvents experts were available for the review.

AGRICULTURE

Review Scope:

Pollutants Reviewed		NOx, NMVOC, NH_3, PM_{10} & $PM_{2.5}$ and POPs		
Years		2006 – 2011		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
4 B 1 a	Cattle dairy	X		X
4 B 1 b	Cattle non-dairy	X		X
4 B 2	Buffalo	X		X
4 B 3	Sheep	X		X
4 B 4	Goats	X		X
4 B 6	Horses	X		X
4 B 7	Mules and asses	X		X
4 B 8	Swine	X		X
4 B 9 a	Laying hens	X		X
4 B 9 b	Broilers	X		X
4 B 9 c	Turkeys	X		X
4 B 9 d	Other poultry	X		X
4 B 13	4 B 13 Other	X		X
4 D 1 a	Synthetic N-fertilisers	X		X
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products			
4 D 2 a	Off-farm storage, handling and transport of bulk agricultural products			
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)			
4 F	Field burning of agricultural wastes	X		X
4 G	Agriculture other(c)	X		X
11 A	(11 08 Volcanoes)			
11 B	Forest fires			
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

101. The agriculture inventory 2013 submitted by Romania includes emissions for the time series 2006 to 2011. For these years, Romania provided information on methodologies, emission factors (EFs), key sources and activity data in the IIR. Emission estimates for NH_3, NMVOC, NOx and particulate matter (PM_{10} and $PM_{2.5}$) have been provided for the main sub-categories of manure management (4B). Emission estimates for NH_3 are also reported from agricultural soils (4D). Emissions from field burning of agricultural wastes (4F) and agriculture other (4G) are reported using notation keys: not estimated “NE” and not applicable “NA”.

102. In the previous review, Romania stated that data (use of pesticides) was available for 2008. The ERT is disappointed to note that this has not been included in the inventory, and strongly recommends that Romania improves the completeness of reporting by providing estimates of pesticide emissions (4G) in the next submission.

103. The ERT has noted that Romania uses an incorrect notation key, namely not applicable “NA” for reporting pollutants that can be actually estimated, such as PM_{10} and $PM_{2.5}$ from (4D1), use of synthetic fertilizers, (4F) field burning of agricultural wastes such as NOx, HMs and POPs and (4G) agriculture other such as POPs. The ERT recommends that the Party either estimates emissions of the main pollutants and other relevant substances, or uses appropriate notation keys (e.g. NE, NO) in their next submission.

Transparency:

104. Romania provided very little information on the methodologies used for emission estimates for NH_3, NMVOC, NOx and particulate matter (PM_{10} and $PM_{2.5}$) from the agricultural sector in its IIR, and as a result transparency is limited. The ERT recommends Romania to include a more detailed description of methods, documentation, assumptions, data sources, emission trend drivers and recalculations in the IIR of its future submissions to enhance the transparency and quality.

Completeness:

105. Emission estimates from the agriculture sector are not complete as Romania reported emissions from 2006 to 2011 only. During the previous centralised review (2010), Romania indicated that most of the data needed for the agriculture sector for 1990-2006 are available but not as detailed as required and that completing the emission time series was part of the improvement plan. The ERT noted that this improvement has not been implemented and strongly recommends that Romania provide a complete and consistent time series for the agricultural sector in future submissions.

106. The ERT recognises the efforts made by Romania to improve the use of notation keys as a result of the recommendations made during the previous review. However, the ERT recommends that Romania undertake further improvements to the use of notation keys, for example, replacing not applicable "NA" by not estimated "NE" for those pollutants that can be estimated, e.g. PM_{10} and $PM_{2.5}$ from (4D1), use of synthetic fertilizers, (4F) field burning of agricultural wastes e.g. NOx, HMs and POPs and (4G) agriculture other e.g. POPs, in its coming submissions.

Consistency including recalculation and time series:

107. Emission data from the agricultural sector is generally consistent over the reported time series (2006-2011). The ERT commends Romania for the consistency of its agricultural inventory and encourages Romania to keep its inventory consistent for the main pollutants emissions and other relevant pollutants in the coming submissions and extend the time series to at least start at the year 2000.

Comparability:

108. Romania has prepared the agriculture inventory following methodologies recommended in the EMEP/EEA Guidebook 2009 and reported pollutant emissions in accordance with the UN/ECE reporting guidelines. The ERT encourages Romania to continue with this approach.

Accuracy and uncertainties:

109. Romania has provided key sources estimates for the agricultural sector in its IIR. However, the ERT has noted that the Party does not provide an uncertainty analysis and sector-specific QA/QC checks for agriculture. Romania was encouraged in the previous review in 2010 to undertake an uncertainty analysis, implement QA/QC procedures and to use higher tier methods for all key categories where data is available. Romania has not done so. The ERT strongly recommends that Romania obtains information on the uncertainty of AD and EFs and undertakes sector specific QA/QC checks, and in particular an uncertainty analysis, in order to provide an indication of the reliability of the inventory data, and reports the findings in its next submission.

Improvement:

110. Romania explained in the previous inventory review of 2010 that the planned improvements focus on recalculations of emissions resulting from corrections of activity data (agriculture statistics), improving the collection methodology, recalculations of emissions resulting from methodology changes (including additional emission sources), and applying a higher tier methodology, especially for key sources. The ERT welcomes this and encourages Romania in its efforts to produce a complete and consistent time series of pollutant emissions (ideally starting at 1990). The ERT also encourages Romania to accelerate these efforts, to ensure compliance with the good practice guidance provided in the EMEP/EEA Emissions Inventory Guidebook in time for its next annual submission.

Recalculations:

111. Romania indicated in its IIR (submission 2013) that recalculations of the national emission estimates were made for the 2006–2011 time series. The ERT has noted that there is no reference to these recalculations in the IIR and during the review week Romania was requested to clarify this issue. Romania indicated that no recalculations had been made for the agricultural sector. The ERT strongly encourages Romania to undertake recalculations of the emission estimates for all years and pollutants as appropriate, and report on this in its next submission.

Sub-Sector Specific Recommendations.

Category issue 1: 4.B Manure management

112. Romania estimated NH_3, NO, NMVOC, PM_{10} and $PM_{2.5}$ emissions from 4B for 2006 to 2011. The ERT strongly recommends that Romania estimates emissions of these pollutants for the missing years of the time series (1990-2005) in time for their next submission.

Category issue 2: 4.B1b (non-dairy cows): Activity data

113. The ERT has noted differences between the activity data for the agricultural sector as reported in the IIR/NFR and the National Inventory Report/Common Reporting Format (NIR/CRF) for the GHG inventory. During the review week, the ERT requested that Romania clarify the reasons for the differences. Romania explained that activity data would be updated in time for its next inventory submission. The ERT strongly recommends that Romania correct this inconsistency and harmonise the activity data between the CLRTAP and UNFCCC emissions inventories in order to ensure consistency.

Category Issue 3: 4.D Agricultural Soils: NOx and PM

114. Romania estimated emissions for NH_3 from 4D1a synthetic N fertilisers. The ERT has noted that NOx, PM_{10} and $PM_{2.5}$ emissions from 4D1a are reported using the notation key not applicable "NA". The ERT encourages Romania to estimate emissions for these pollutants using the tier 1 default approach as provided in the EMEP/EEA 2009 Guidebook in time for its next submission.

Category Issue 4: 4.F Field burning of agricultural wastes

115. The ERT has noted that Romania considers emissions of NOx and CO from (4F) field burning of agricultural wastes to be insignificant and reported these pollutants as not estimated "NE". The ERT also noted that the emissions of these pollutants are reported in the UNFCCC's National Inventory Report for greenhouse gases (CRF Summary 1.A IPCC Table 7A sheet 2 of 3, submission 2013) and the reported emissions of NOx and CO correspond to about 2 % and 11 %, respectively, of the national total. The ERT considers that these estimates are significant, and noted the inconsistency between the two inventories. During the review week the ERT requested Romania to explain this inconsistency. Romania indicated their willingness to report these emission estimates in (4F) in the course of the next submission of the CLRTAP inventory.

116. The ERT strongly recommends that Romania includes these substances and if possible other relevant substances such as SO_x, NH_3, PM_{10} and $PM_{2.5}$ in its next submission to ensure completeness and consistency with the UNFCCC inventory.

Category Issue 5: 4.G Agriculture other: Pesticides

117. Romania indicated in the previous 2010 review that data on the use of pesticides is available but has not been reported. The ERT re-iterates its recommendation from the previous review, and strongly recommends that Romania report emission estimates of pesticides in the emission inventory of its next submission.

WASTE

Review Scope:

Pollutants Reviewed		All pollutants		
Years		1990 – 2011		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
6.A	solid waste disposal on land	x		x
6.B	waste-water handling	x		x
6 C a	6 C a Clinical waste incineration (d)	x		x
6 C b	Industrial waste incineration (d)	x		x
6 C c	Municipal waste incineration (d)	x		x
6 C d	Cremation	x		x
6 C e	Small scale waste burning	x		x
6.D	other waste (e)			
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues.

118. The ERT commends Romania for improved transparency of the Informative inventory report, but has identified some room for improvement relating to the completeness and comparability of the waste sector.

Transparency:

119. Romania has provided a partly transparent emissions inventory for the waste sector. Romania has reported emissions for the following NFR codes: 6A, 6B, 6Ca, 6Cb, 6Ce and 6D. For other waste categories Romania reports NO and NA.

120. No explanations are provided in the IIR on the use of methodologies, and the sources of EFs and activity data. The ERT recommends that Romania add more supporting text in the IIR, as indicated in the UN/ECE Reporting Guidelines, to ensure a sufficient level of transparency.

Completeness:

121. Romania reports emissions starting from the year 2005. The ERT recommends that Romania also estimate and report emissions for period 1990 – 2004. If it is not possible to estimate emissions for the period 1990 – 2004 due to a lack of information, then the ERT recommends that Romania sufficiently explain this for all relevant source categories in the IIR.

122. The ERT encourages Romania to review the waste sector and to include emissions from missing categories in its next inventory, in particular emission estimates for 6Cd Cremation.

Consistency, including recalculation and time series:

123. The ERT considers the data that is reported to be consistent.

Comparability:

124. The emissions reported by Romania are comparable with other countries. However, the ERT has noted that information on EFs is reported in Annex 1 in Romanian, and is hence difficult to use by ERT in comparison studies. The ERT strongly encourages Romania to report all relevant information on EFs in English.

Accuracy and uncertainties:

125. The ERT encourages Romania to undertake an uncertainty analysis and for the waste sector, and also put in place and report on sector specific QA/QC routines. The ERT also encourages Romania to include relevant information in the next IIR.

Improvement:

126. No source-specific improvements have been mentioned in the IIR. The ERT encourages Romania to include an improvement plan in the IIR, and to undertake activities to improve particularly transparency, consistency and completeness of the inventory, in particular to plan activities that will allow currently missing emission sources to be estimated and included in the next submission.

Sub-Sector Specific Recommendations.

Category issue 1: 6.A Solid waste disposal on land

127. Romania calculates NMVOC emissions from solid waste disposal. The ERT recommends that the IIR include a methodology description and EFs.

Category Issue 2: 6.C.a Clinical waste incineration and 6.C.b Industrial waste incineration

128. The ERT encourages Romania to explain the fluctuations in the amount of clinical waste incinerated. The ERT also recommends that Romania describe the calculation methodology in the IIR and provide information on EFs.

Category Issue 3: 6.C.c Municipal waste incineration

129. Romania reports NO for municipal waste incineration. The ERT recommends that Romania include a description of the national circumstances in the next IIR which would support use of this notation key.

Category Issue 4: 6.C.d - Cremation

130. Romania reports “NA” for cremation. The ERT recommends that Romania investigates the national circumstances and either reports emissions or uses the notation key “NO”. The ERT encourages Romania to include an explanation of the national circumstances in the IIR.

Category Issue 5: 6.C.e – Small scale waste burning and 6.D - Other waste

131. Romania reports emissions from these sectors. The ERT recommends that Romania sufficiently describe the methodologies in the IIR, and also report information on emissions factors to ensure a sufficient level of transparency.

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. Energy: During the review the Party submitted the following four data files:

File name	Content
Chestionar_Comercial_institutional_rezidential.xls	Questionnaire for the residential and commercial sector.
Natural Gas 1A1b 2007-2009.xlsx	LCP data of refineries for 2007 to 2009
RO energy balance 2011.pdf	Energy balance for 2011
Activity Data EF 1A2fi.xlsx	1A2fi activity data and EF for 2011