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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:

GREECE

CONTENT

INTRODUCTION

1.   The mandate and overall objectives for the emission inventory review process under the LRTAP Convention is provided 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, NO_x, NMVOC, NH_3, TSP, PM_{10} & $PM_{2.5}$ for the time-series years 1990 – 2009 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 Greece coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 27th June 2011 to 1st July 2011 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 – John van Aardenne (EEA), Energy – Emilia Hanley (Ireland), Transport – Michael Kotzulla (Germany), Industry – Valentina Idrissova (Kazakhstan), Solvents – Nadine Allemand (France), Agriculture and Nature – Jim Webb (UK), Waste –Nebojsa Redzic (Serbia).

4.   Kristina Saarinen (Finland) was the lead reviewer. The review was coordinated by Katarina Marečková, (EMEP Centre on Emission Inventories and Projections - CEIP).

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[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 partly in line with the EMEP/EEA Inventory Guidebook and the UNECE Reporting Guidelines.

6.   The ERT also found that emissions reported under the CLRTAP and NECD are not totally consistent.

7.   The data reported by Greece do not cover a complete set of pollutants, sources and years. Greece did not provide an Informative Inventory Report (IIR) to allow the review of the data.

8.   ERT also noted that recalculations have not been applied consistently through the time-series

INVENTORY SUBMISSION

9.   In 2011, Greece submitted a NECD inventory for the years 2008 and 2009 and a CLRTAP inventory for the year 2009; but the submissions did not include the time-series of emissions. Both inventories were submitted in the NFR09 format. Greece did not provide an IIR (Informative Inventory Report) in 2011 but provided some information in other documents. The ERT thanks Greece for this information, which was considered by the ERT during the review. The UNECE Reporting Guidelines request countries to submit an IIR which is designed to present information in a standard format which enables an efficient review of inventories. Providing documents in a different format than the IIR's is not in line with the Reporting Guidelines and requires extra work from the expert review teams since the information may not be easily identified, not complete and not in the requested format for the purpose of the review.

10.   The ERT appreciates the responses provided by Greece to questions raised by the ERT during the review. However, the diversity and format of the material provided together with the lack of an IIR, did not allow to perform a full review and sources reviewed could not always be reviewed to a full extent. However, some recommendations could still be made and are presented in the chapters below.

11.   In its responses to questions raised by the ERT, Greece referred to information provided in the NIR (National Inventory Report) submitted to the UNFCCC in 2011. The ERT realised that the NIR does not provide the basic information that would allow understanding the methodologies and data used in the calculation of air pollutant emissions. The ERT would like to point out that the IIR should include all information needed for the review of the air pollutant emissions inventory. It is not the duty of the ERT to reconstruct the emissions inventory data and assumptions using information other than the IIR and possibly some further clarification requests through questions sent to the Party.

12.   The methodology provided in the EMEP/EEA Guidebook (2009) should be used in the preparation of the inventory under the UNECE CLRTAP and the NECD.

Moreover, the IPCC 2006 Guidelines used to prepare inventories under the UNFCCC and the EU CO_2 Monitoring Mechanism, refer to the EMEP/EEA Guidebook for the methodologies to be used for calculating all air pollutants. The ERT recommends Greece to check the methods applied in order to be in line with the EMEP/EEA Guidebook version [2]2009. The ERT found the information provided by Greece on the methods used in the inventory to be insufficient for the review under the CLRTAP and NECD. The ERT recommends Greece to develop an IIR since the review under the UNFCCC targeting GHG emissions addresses mainly direct GHG emissions and relies on the UNECE review results for NMVOC and other air pollutant emissions. In addition, the NIR does not include any information regarding NH_3, particles, heavy metals and POPs.

13.   In its reply to the ERT, Greece referred to have ratified only the 1985 and 1994 Sulphur Protocols and the 1988 NO_x protocols as the reason for not reporting other pollutants. However, Greece has ratified the 1979 Convention on LRTAP and the 1984 EMEP Protocol. The EMEP Protocol and also the Convention on LRTAP request Parties to exchange information to enable an environmental assessment. ERT invites Greece to consider reporting of all pollutants covered by the UNECE reporting Guidelines. The ERT recommends Greece to prepare an IIR following the outline for an IIR as defined in the UNECE Reporting Guidelines (Recommended Structure for Informative Inventory Report, Annex VI to ECE/EB.AIR/97, Version: 30 Sept 2009), for the next submission.

KEY CATEGORIES

14.   Due to the absence of an IIR, the ERT was not able to evaluate the key categories analysis and whether it is used in the prioritization of improvements in the inventory.

QUALITY

Transparency

15.   The inventory is not transparent, because no IIR was provided by Greece. The lack of the IIR made it difficult to review the inventory. Greece referred to the NIR submitted to the UNFCCC Secretariat in 2011. However, information on the air pollutant inventory is rather limited in the NIR, which only provides information regarding the greenhouse gas inventory.

16.   During the review Greece provided answers to the questions raised by the ERT. The ERT thanks Greece for the responses which provided some background information to the inventory. However, the ERT strongly recommends Greece to prepare and submit the IIR in order to increase the transparency of the emission inventory.

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[2]

17.   Some cells are left blank (e.g. in the industrial processes, solvent and agriculture sectors). The use of the notation key "NE" is not explained in the NFR tables. Moreover, the use of the notation key IE is not explained either for some of the sources. The ERT recommends Greece to use the appropriate notation keys (e.g. NA, where emissions are "Not Available", NO where emissions are "Not Occurring", NE where emissions are "Not Estimated" and IE where emissions are "Included Elsewhere") for reporting emission estimates which are not available or necessary.

Completeness

18.   The inventory includes emissions of most main pollutants, i.e. SO_2, NO_x, NMVOC, NH_3 (limited to transport and agriculture) and CO. Emissions of other pollutants (particles, heavy metals and POP compounds) were not reported. The ERT acknowledges the effort Greece has gone through in order to provide estimates of emissions for all sub-sectors and all pollutants reviewed.

19.   The ERT found the inventory to be incomplete regarding the pollutants, sectors and years reported. Greece explained that the air pollutant inventory is based on the greenhouse gas inventory; therefore, only main pollutants are reported. Moreover, Greece informed the ERT that it ratified only NO_x and SO_2 protocols to the Convention. Nevertheless, the ERT recommends Greece to consider the possibility of estimating and reporting emissions of all pollutants included in the UNECE Reporting Guidelines, and to consider estimating and reporting emissions from source categories for which the inventory was found to be incomplete during the review.

20.   Due to the absence of detailed information on methodologies and data, the ERT cannot evaluate the completeness of the emission inventory.

21.   The ERT recommends Greece to report the notation key NE (not estimated) instead of blank cells in the NFR table.

Consistency, including recalculations and time-series

22.   Due to the missing IIR and the limited temporal scale reported by Greece, consistency and recalculations could not be reviewed. The ERT recommends Greece to complete the inventory with estimates for all pollutants from all source categories.

Comparability

23.   Greece reported the emissions in the NFR format which allowed some comparison to other countries. Due to the absence of an IIR, the ERT could not further examine the comparability with other inventories due to the lack of information on methodologies and data used in the calculations.

24.   The methodologies are partly consistent with the EMEP/EEA Guidebook, 2009. Based on the evaluation of additional information provided by Greece, the ERT concludes that Greece used both CORINAIR default methods and country-specific methods for estimating emissions, as well as the IPCC 1996 default methods and EFs, which actually were taken from the CORINAIR 1994 Guidebook. The ERT

recommends that Greece uses the latest 2009 EMEP/EEA Guidebook to estimate emissions or provides justification for the use of different methods in the IIR.

CLRTAP/NECD comparability

25.   The ERT noted that there are some discrepancies between the estimates provided by Greece under the CLRTAP and the NECD for the Energy sector as a result of recalculations. The ERT recommends that Greece evaluates the causes of these differences and ensures consistency in the next CLRTAP and NECD inventories.

Accuracy and uncertainties

26.   The ERT encourages Greece to undertake sector-specific quantitative uncertainty analyses for air pollutants emissions in order to perform the improvement process and to provide an indication of the reliability of the inventory data.

Verification and quality assurance/quality control approaches

27.   Greece did not provide information on the QA/QC procedures for the inventory. Therefore, the quality assurance/quality control approaches cannot be reviewed properly. As a reply to questions raised by the ERT during the review, Greece referred to the NIR submitted under the UNFCCC which provides a detailed description of the QA/QC system based on the ISO 9001:2000 standard and manual, as well as on sector-specific QA/QC procedures. Based on the NIR, is not clear to what extent QA/QC procedures applied to greenhouse gas emission calculations affect the air pollutant calculations. The ERT encourages the Party to clarify the QA/QC procedures for the air pollutant inventory in the next submission and to provide information of the QA/QC activities in the air pollutant inventory in the next IIRs.

FOLLOW-UP TO PREVIOUS REVIEWS

28.   Greece did not provide any responses to the Secretariat's S&A document related to the scope of this review.

AREAS FOR IMPROVEMENTS IDENTIFIED BY GREECE

Greece did not provide any inventory improvement plan, nor information on improvements already carried out in the inventory. The ERT recommends Greece to implement an improvement plan which would comprise issues for further inventory improvement, schedule the tasks, monitor work progress , and provide information on tasks already carried out. Information of the inventory improvement work should be included in the next IIR.

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:

a)   The ERT invites Greece to complete the inventory with estimates for all pollutants from all source categories and for all years as specified in the UNECE Reporting Guidelines and its Annexes.

b)   The ERT strongly recommends Greece to prepare an IIR for next year's emission inventory in accordance with the Recommended Structure for Informative Inventory Report (Annex VI to ECE/EB.AIR/97, Version: 30 Sept 2009).

c)   The ERT encourage Greece to undertake an uncertainty analysis in order to inform on the improvement process and to provide an indication of the reliability of the inventory data.

d)   The ERT encourage the Party to clarify the QA/QC procedures in the next submission and to provide information on a QA/QC plan and information on QA/QC activities in the next IIR.

e)   The ERT recommends Greece to ensure consistency of the methodologies with the latest version of the EMEP/EEA Guidebook and to explain discrepancies in the IIR.

f)   The ERT recommends Greece to provide information on recalculations in the IIR.

g)   The ERT encourages Greece to provide a key source analysis in the IIR.

h)   The ERT encourage Greece to provide an inventory improvement plan with a schedule for the identified improvement needed as part of the next submission.

i)   The ERT recommends Greece to complete the estimation of not estimated (NE) sources.

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

SECTOR-SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY THE ERT

ENERGY

Review Scope

NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed			SO_2, NO_x, NMVOC, CO	
Years			1990 – 2009 + (Protocol Years)	
1.A.1.a	public electricity and heat production	x		x
1.A.1.b	petroleum refining	NFR		x
1.A.1.c	Manufacture of solid fuels and other energy industries	NFR		x
1.A.2.a	iron and steel	NFR		x
1.A.2.b	non-ferrous metals	NFR		x
1.A.2.c	chemicals	NFR		x
1.A.2.d	pulp, paper and print	NFR		x
1.A.2.e	food processing, beverages and tobacco	NFR		x
1.A.2.f.i	Stationary Combustion in Manufacturing Industries and Construction: Other (Please specify in your IIR)	x		x
1 A 3 e	Pipeline compressors ?	NO_x		x
1.A.4.a.i	commercial / institutional: stationary	NFR		x
1.A.4.b.i	residential plants	x		x
1.A.4.c.i	Agriculture/forestry/fishing. stationary	x		x
1.A.5.a	other, stationary (including military)		IE	
1.B.1.a	coal mining and handling		NA	
1.B.1.b	solid fuel transformation		NO	
1.B.1.c	other fugitive emissions from solid fuels)		NO	
1 B 2 a i	Exploration, production, transport		IE	
1 B 2 a iv	Refining / storage	NFR		x
1 B 2 a v	Distribution of oil products		IE	
1 B 2 b	Natural gas		NA	
1 B 2 c	Venting and flaring		NE	
1 B 3	Other fugitive emissions from geothermal energy production , peat and other energy extraction not included in 1 B 2		NA	
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which have and which have not in the respective columns.				

General recommendations on cross-cutting issues

31.   Greece did not provide an IIR (Informative Inventory Report under the CLRTAP and NECD) for the review process. Upon request by the ERT, Greece provided instead some limited information in their NIR (National Inventory Report under the UNFCCC), in the NO_x Protocol document replied to questions raised by the ERT, provided some MsExcel files for stationary energy sources and non-standard format time-series (1990-2009) for the four main pollutants only (i.e. NO_x, SO_x, NMVOC, CO). It was not possible to review the energy sector properly because the data provided were not adequate. The ERT has only been able to make some

brief comments and observations regarding the energy sector data. The ERT thanks for the information and data provided, but recommends Greece to provide all information needed for a review in an IIR.

Transparency:

32.   As no IIR was provided with the submission, it has been difficult for the ERT to fully understand and assess the methodology used for estimating emissions in the energy sector. However, based on the information included in the Party's NIR and other information provided by the Party, the ERT notes that the calculation of emissions from energy are based on emission factors per source, fuel type and technology suggested by the IPCC Good Practice Guidance and CORINAIR.

33.   The ERT recommends Greece to provide in their next submission all this information from the compilation of the Greek inventory in an IIR. The methodology provided in the EMEP/EEA Guidebook (2009) should be used in the preparation of air pollutant emission inventories. The ERT recommends Greece to verify that the methods used are in accordance with those provided in the EMEP/EEA Guidebook version 2009.

34.   The Party has provided brief and general trend discussions for the four reported pollutants in their NIR. The ERT recommends that in the future Greece provides more detailed analysis of their full time-series energy trends for each sub-sector.

Completeness:

35.   The Energy sector report based on the collection of information from several sources (NFR, NIR, replies to ERT queries and additional spreadsheets submitted by the Party) is somewhat complete for the four reported pollutants. Yet, it was impossible to review all sub-categories individually for each pollutant and to assess the rationale behind the used IEFs and the resulting emissions. The ERT recommends that Greece addresses these shortcomings in order to provide a comprehensive inventory in the next submission.

36.   The ERT noted one source category for which emissions were not estimated (1.B.2.c). In addition, Greece has not estimated emissions for the other pollutants apart from the 4 main ones. The ERT strongly recommends that Greece improves the completeness of their inventory for the next submission.

Consistency including recalculation and time-series:

37.   Due to the lack of data it was not possible for the ERT to assess the consistency of the inventory or possible recalculations. The ERT strongly recommends Greece to report the full time-series of emissions and to provide an IIR according to the layout defined in the Reporting Guidelines.

Comparability:

38.   Due to the lack of data it was not possible for the ERT to assess the comparability of the inventory with the other countries. The ERT strongly recommends Greece to report the full time-series of emissions and to provide an IIR according to the layout defined in the Reporting Guidelines.

Accuracy and uncertainties:

No information has been provided by the Party regarding uncertainty analysis or whether QA/QC procedures had been carried out. Therefore, the ERT could not assess the completeness of these procedures. The ERT encourages Greece to undertake uncertainty analysis for the Stationary Energy Sector, and to implement QA/QC procedures according to the 2009 EMEP/EEA Guidebook.

Improvement:

39. The inventory submitted by Greece is incomplete in terms of sources and pollutants. The ERT strongly recommends Greece to complete the inventory for the next submission.

40. Greece did not indicate improvement plans in its IIR for the air pollutant emission inventory. The ERT strongly recommends Greece to develop an inventory improvement plan with a schedule for these improvements and to present it in the next IIR.

Sub-Sector Specific Recommendations.

41. The ERT noted a number of blank cells in the NFR tables provided by Greece for the year 2009 as presented below. The ERT strongly recommends Greece to complete the inventory by providing the missing data.

Category issue 1: Blank cells in NFR tables, sectors and pollutants:

1A1a	All but: NO_x, SO_x, NMVOC, CO
1A1b	All but: NO_x, SO_x, NMVOC, CO
1A1c	All but: NO_x, SO_x, NMVOC, CO
1A2a	All but: NO_x, SO_x, NMVOC, CO
1A2b	All but: NO_x, SO_x, NMVOC, CO
1A2c	All but: NO_x, SO_x, NMVOC, CO
1A2d	All but: NO_x, SO_x, NMVOC, CO
1A2e	All but: NO_x, SO_x, NMVOC, CO
1A2fi	All but: NO_x, SO_x, NMVOC, CO
1A4ai	All but: NO_x, SO_x, NMVOC, CO
1A4bi	All but: NO_x, SO_x, NMVOC, CO
1B1a	All but: NO_x, SO_x, NMVOC, CO
1B2c	All but: NO_x, SO_x, NMVOC, CO

TRANSPORT

Review Scope

Pollutants Reviewed		Main + TSP&PM		
Years		1990 – 2009		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
1.A.3.a.i.(i)	international aviation (LTO)	x		x
1.A.3.a.i.(ii)	international aviation (cruise)	x		x
1.A.3.a.ii.(i)	civil aviation (domestic, LTO)	x		x
1.A.3.a.ii.(ii)	civil aviation (domestic, cruise)	x		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		x	
1.A.3.b.vi	road transport, automobile tyre and brake wear		x	
1.A.3.b.vii	road transport, automobile road abrasion		x	
1.A.3.c	railways	x		
1.A.3.d.i (ii)	international inland navigation			
1.A.3.d.ii	national navigation	x		
1.A.4.b.ii	household and gardening (mobile)		x	
1.A.4.c	agriculture / forestry / fishing			
1.A.4.c.ii	off-road vehicles and other machinery		x	
1.A.4.c.iii	national fishing		x	
1.A.5.b	other, mobile (including military, land based and recreational boats)		x	
1 A 3 d i (i)	International maritime navigation			
1 A 3	Transport (fuel used)			
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which have and which have not in the respective columns.				

General recommendations on cross-cutting issues.

Transparency:

42.   During the review week, Greece provided methodology descriptions, and information on recalculated data as requested by the ERT. For some Transport sub-sectors the Party also referred to their NIR and to "*NO_x Report*" for more detailed data. The ERT thanks for the information and data provided, nonetheless recommending Greece to provide an IIR in its next submission in order to compile all data and background information in one document.

43.   Estimates are not provided at the most detailed level for the entire Transport sector as well as all other mobile sources. Instead, the notation key "IE" has been used frequently with only little information in the "Additional info" table provided in the NECD submission. The ERT recommends the Party to provide an IIR including all necessary information on methodologies, data sources, EFs applied and explanatory information on all notation keys used as well as on recalculations and planned improvements in its next submission.

44.   In the "Additional Info" table provided in the NECD submission, no information was provided regarding the basis for estimating emissions from mobile sources, e.g. fuel sold or used. The ERT strongly recommends the Party to provide such information in their next submission.

Completeness:

45.   The ERT noted that allocation of emissions from civil aviation (1.A.3.a) results in both under- and over-estimations (see below). Hence, for the time being the inventory cannot be considered as complete.

46.   In addition, the ERT cannot confirm the completeness of the Party's inventory given the frequent use of the notation key "IE" . Here, the ERT strongly recommends the Party to reduce the use of IE by separately reporting as many sub-sectors as data allow, or at least to provide all necessary explanations on the use of this notation key.

47.   Furthermore, the Party uses zero-values in a number of areas in the inventory where emissions are likely to occur. The ERT asked the Party to check all zero-values and to correct them i) by estimating actual emissions or ii) to use an appropriate notation key instead.

Consistency including recalculation and time-series:

48.   During the review week, information on recalculated data was provided in the "NO_x Report" and the NIR. The ERT thanks for the detailed information provided in this documents, nonetheless recommending Greece to provide an IIR in its next submission to concentrate this information in one document. According to information provided by Greece to the ERT during the review, the Party has recalculated NO_x emissions from the road transport sector based on an updated COPERT model IV 7.1. The ERT acknowledged the information provided, asking the Party to provide any necessary information on recalculations in a next IIR at sub-sector level and for each pollutant.

49.   Acknowledging the detailed information on recalculations provided in the material mentioned, the ERT asks the Party to merge this information in the next IIR. It recommends to raise the detail of information for example by providing old and recalculated new time-series as well as the absolute and relative changes and all the necessary information explaining the reasons for the recalculation.

Comparability:

50.   Estimates are not provided at the most detailed level for the entire Transport sector as well as all other mobile sources. Therefore, comparability to inventories from other countries is currently very limited.

51.   Since Greece did not provide an IIR, hardly any information on methodologies applied is available. Therefore, it is not possible for the ERT to determine if the methods used for calculation of transport sector emissions are consistent with the latest version of the EMEP/EEA Guidebook.

Accuracy and uncertainties:

52. Greece did not provide information available regarding the QA/QC system or a QA/QC plan. The ERT encourages Greece to provide this information in the next submission.

53. Greece did not provide an uncertainty analysis. The ERT encourages the Party to undertake an uncertainty analysis and to use it as a tool for prioritizing improvements in the inventory and for providing an indication of the reliability of the inventory data.

Improvement:

54. Greece did not provide an inventory improvement plan or information on improvements already carried out in the inventory. The ERT recommends the Party to implement an improvement plan to collect issues for further inventory improvement, to schedule the tasks and to monitor the progress of work, including information on tasks already carried out, and to document the inventory improvement work in the next IIR.

Sub-Sector Specific Recommendations.

Category issue 1: 1.A.2.f.ii Mobile Construction- All Pollutants

55. During the review the ERT asked the Party why they included emissions from 1.A.2.f.ii in 1.A.2.f.i since the fuels used might differ. The Party answered that the national energy balance being source of activity data (fuel consumption) does not include such disaggregated data. The ERT acknowledges the answer provided, and recommends the Party to improve the level of detail of their National Energy Balance or to investigate other data sources.

Category issue 2: 1.A.3.a Civil Aviation – all reported pollutants

56. During the review the ERT asked the Party to explain why emissions from 1.A.3.a.i (i) are included in 1.A.3.a.i (ii), resulting in an underestimation of LTO emissions in the Greek inventory. As Greece follows the UNFCCC reporting for these two source categories at the moment, the ERT warmly welcomes the plan to improve the reporting to the CLRTAP by separating LTOs from cruise emissions.

On the other hand, emissions from 1.A.3.a.ii (ii) are included in 1.A.3.a.ii (i), leading to a possible overestimation of 1.A.3.a.ii LTO emissions in the Greek inventory. Again, the ERT warmly welcomes the plan to improve the reporting of these sub-sectors following the requirements under UNECE/CLRTAP.Category issue 3: 1.A.3.b Road transport - all reported pollutants.

57. The ERT noted that emissions from Road Transport are reported aggregated under 1.A.3.b.i. As Greece already uses the COPERT model (version IV 7.1) to prepare emission estimates, the ERT recommends the Party to report the sub-sector level emissions in its next submission.

Category issue 4: Mobile Sources in 1.A.4 - all reported pollutants

The ERT noted that all emissions from mobile sources in NFR 1.A.4 are included in the corresponding sub-sectors for stationary combustion. The ERT recommends Greece to report the emissions for NFR 1.A.4 separately from emissions from stationary combustion, as the fuels used differ. Due to the Party's response, an error was identified in the template compilation because of the inclusion of 1.A.4.a ii and b ii in 1.A.3.b i and 1.A.4.c ii and ciii in the respective stationary sector. The fuel consumption reported to the energy balance is not provided in the disaggregated format. Therefore it does not allow the ERT to calculate the emissions separately and allocate them to the most "appropriate" sector. The ERT acknowledges the answer provided, asks the Party to solve the error described and to further investigate possible new data sources in order to achieve an appropriate allocation of emissions.

Category issue 5: Mobile Sources in 1.A.5 - all reported pollutants

The ERT noted that all emissions from mobile sources in NFR 1.A.5 are reported as IE ("included elsewhere") without any further information in the "Additional Info" table. Assuming that emissions might be included in NFR 1.A.3.b, the ERT asked the Party to explain this issue. The Party's response allowed to identify an error which consisted in the inclusion of 1.A.5.b in 1.A.3.a ii(i) and 1.A.3.d ii in the template compilation . Again, the ERT acknowledges the answer provided, but asks the Party to solve the error described and to further investigate possible new data sources in order to achieve a proper allocation of emissions.

INDUSTRIAL PROCESSES

Review Scope

NFR Code	CRF_NFR Name	Pollutants Reviewed: SO$_2$, NO$_x$, NMVOC, CO — Years 1990 – 2009 — 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	x		
2.A.7.b	Construction and demolition	x		
2.A.7.c	Storage, handling and transport of mineral products	x		
2.A.7.d	Other Mineral products	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	x		
2.B.5.b	Storage, handling and transport of chemical products	x		
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	x		
2.C.5.d	Zinc Production	x		
2.C.5.e	Other metal production	x		
2.C.5.f	Storage, handling and transport of metal products	x		
2.D.1	Pulp and paper	x		
2.D.2	Food and drink	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	x		

General recommendations on cross-cutting issues

Transparency:

58.   Greece provided no IIR, which made it difficult to review the inventory. In the NIR Greece submitted under the UNFCCC, information on the methodologies and

the EFs used is rather limited regarding air pollutants. During the review Greece provided answers to questions raised by the ERT. The ERT recommends Greece to prepare and submit the IIR in order to increase the transparency of the estimates.

59.   The use of notation keys "NE" and "IE" is not explained in the NFR table. In its reply, Greece revealed that emissions from cement and lime production were reported under 1A2fi, while emissions from ferroalloys production were reported under 1A2b. The ERT recommends Greece to use the appropriate notation keys for reporting of emissions and to provide explanations on the notation keys used as additional information in the NFR table.

Completeness:

60.   The ERT considers the industrial processes sector to be incomplete. Only emissions of main pollutants are reported.

61.   The following emissions in the Industrial Processes sector are reported as "NE": Emissions of NO_x from 2A6, 2A7d, 2B1and 2B5a; NMVOC emissions from 2B5a, 2B5b and 2C3; SO_x emissions from 2A6. Moreover, CO emissions were only reported from glass, ammonia, aluminium, iron and steel production. In its reply to the ERT Greece explained that no EFs were available. The ERT recommends Greece to provide estimates for these emissions, for instance, based on data reported by the plants according to their environmental permits' requirements.

62.   Emissions of other pollutants (NH_3, PMs, HMs, POPs, PCDD/F) are not reported. Instead of blank cells the notation key "NE" should be used to indicate "not estimated emissions". In its reply to the question raised by the ERT on this issue Greece explained that the CLRTAP inventory is based on the GHG inventory and thus only the main pollutants are reported. Moreover, Greece informed the ERT that it only ratified NO_x and SO_2 protocols to the Convention. The ERT invites Greece to consider the possibility of estimating and reporting emissions of other pollutants because Greece has ratified the EMEP Protocol which foresees activities to support emissions data collection.

63.   Greece has not provided a full time-series of emissions. The ERT recommends the Party to provide preferably the full time-series of emissions, at least emissions for the years 1990, 1995 and from the year 2000 onwards.

Consistency including recalculation and time-series:

64.   As Greece did not provide an IIR, no information on recalculations carried out was available for the ERT. The ERT recommends Greece to provide this information in the next submission.

Comparability:

65.   Due to lack of transparency the ERT cannot identify if the inventory is in accordance with the EMEP/EEA Guidebook methods and if the inventory is comparable with inventories from other countries.

Accuracy and uncertainties:

66.   Greece referred to information provided in the NIR submitted under the UNFCCC where it is stated that the 2007 version of the EMEP/EEA Guidebook was used to estimate emissions of indirect GHGs in addition to the IPCC 1996 default methods and EFs, which actually were taken from the CORINAIR 1994 Guidebook. In its reply to the ERT questions Greece provided additional information on the methodologies and EFs used. The ERT recommends that Greece use the latest 2009 EMEP/EEA Guidebook to estimate emissions.

67.   In the NIR Greece provided a detailed description of the QA/QC system based on the ISO 9001:2000 standard and manual, as well as included sector-specific QA/QC procedures. It is unclear, to what extent the QA/QC system is applied in the inventory for air pollutants. The ERT recommends Greece to provide this information in the future IIR.

68.   Greece did not provide an uncertainty analysis for the air pollutant inventory. Information on the uncertainty analysis for GHG emissions is provided in the NIR. Since mostly default EFs from the IPCC 1996 Guidelines and from CORINAIR Guidebook are used in the air pollutant inventory, the ERT considers the uncertainty in the Industrial Processes sector to be high. The ERT encourages Greece to undertake sector-specific quantitative uncertainty analyses for air pollutants emissions in the industrial processes in order to perform the improvement process and provide an indication of the reliability of the inventory data.

Improvement:

69.   Although Greece did not submit an IIR, Greece mentioned in its NIR the Improvement Plan of the GHG Inventories, which affects the improvements of the CLRTAP inventory. The ERT recommends Greece to provide that information in its future IIR.

Sub-Sector Specific Recommendations.

70.   Due to the lack of transparency on the emission estimation methods, it is not possible for the ERT to give any sub-sector specific recommendation.

SOLVENTS

Review Scope

Pollutants Reviewed		NMVOC		
Years		1990 – 2009		
NFRCode	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
3.A.1	Decorative coating application	NMVOC emissions	Methods	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 have and which have not in the respective columns.				

General recommendations on cross-cutting issues

71.   No IIR report has been provided by Greece. For the review of the Solvent and Other Product Use sector, the ERT used information provided in the NIR submitted under the UNFCCC in 2011. In this report the information is not sufficiently developed to understand the methodologies applied by Greece, and it does not provide references on emission factors. Although Greece replied to questions addressed by the ERT, it was difficult to undertake the review properly.

72.   Considering that Solvent and Other Product use categories are usually key sources of NMVOC emissions and that most of them can be subject to the EU Directive 1999/13 **(**on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations)**,** the EU Directive 2004/42 (on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products) and the new Directive 2010/75/EU of 24 November 2010 (on industrial emissions, integrated pollution prevention and control), the ERT recommends Greece to set up higher level methodologies (such as a Tier 2 methodology) and to produce an IIR report. This will significantly improve the transparency and accuracy of the inventory.

Transparency:

73.   Information in the NIR is not sufficiently elaborated to make the inventory transparent. The ERT recommends Greece to develop an IIR in the coming year with at least details on methodologies used, references of emission factors and information on activity data. Greece could take example from the best IIRs developed by Parties to the Convention.

Completeness:

74.   It is difficult to evaluate the completeness of the NMVOC emissions inventory for solvent uses because several activities are missing and no information is provided on their existence. The ERT recommends Greece to explain if these activities exist and to estimate NMVOCs emissions from the existing activities using the methodologies in the EMEP/EEA Guidebook. These activities are :

NFR 3A:
  060102   Car repairing
  060105 to 060108
               Coil coating, boat building, wood coating and other industrial paint
               application
NFR 3B:

060201 Degreasing

NFR 3C:
  060301   Polyester processing
  060303   Polyurethane processing
  060304   Polystyrene foam processing
  060305   Rubber processing
  060306   Pharmaceutical products manufacturing
  060307   Paints manufacturing
  060310   Asphalt blowing
  060311   Adhesive, magnetic tapes, films and photographs
               manufacturing
NFR 3D:
  060401   Glass wool enduction
  060402   Mineral wool enduction
  060405   Application of glues and adhesives
  060407   Underseal treatment and conservation of vehicles
  060409   Vehicles dewaxing
  060411   Domestic use of pharmaceutical products

75.   The time-series for NMVOC emissions provided in the NIR is complete.

76.   The ERT recommends Greece to complete the inventory by estimating emissions from the missing sources using the methodologies provided in the EMEP/EEA Guidebook.

Consistency including recalculation and time-series:

77.   Greece did not provide information of any recalculations. The ERT recommends Greece to provide this information in the next submission.

Comparability:

78.   Greece did not provide sufficient information on methodologies used in the Solvent and Other Product Use sector. Thus, the ERT cannot make an assessment of the comparability of the inventory. The ERT recommends Greece to explain methodologies applied in the preparation of the inventory in the IIR and to use methodologies that are in accordance with those provided in the EMEP/EEA Guidebook, 2009.

Accuracy and uncertainties:

79.   Due to the very simple (Tier 1) methodology for all paint applications, which uses an emission factor multiplied by the population, it is clear that the NMVOC emission inventory for the use of solvents is not accurate. The impact of the European Directives could be highlighted as well as the impact of the Greek Regulation on VOCs. However, the methodology currently used does not enable such analysis. ERT recommends that Greece sets up Tier 2 methods for at least the key sources and takes recommendations addressed here under Sub-sector specific recommendations into account.

80.   Greece did not provide an uncertainty analysis for the Solvent and Other Product Use sector. The ERT encourages Greece to undertake an uncertainty analysis to prioritize improvements in the inventory and to provide information on the reliability of the data.

81.   Greece did not provide information on QA/QC activities for the air pollutant inventory in the Solvent and Other Product Use sector. The ERT recommends Greece to provide information regarding QA/QC activities and to establish a QA/QC plan.

Improvement:

82.   Greece did not provide an inventory improvement plan, nor information on improvements already carried out for the inventory. The ERT recommends Greece to provide an inventory improvement plan and to provide information on actions taken to improve the inventory, in the future IIR.

Sub-Sector Specific Recommendations.

Category issue 1: 3.A. Paints and Coatings – NMVOC

83.   The ERT recommends Greece to estimate NMVOC emissions from industrial use of paints. According to the NIR, these emissions have not been estimated. Estimates of emissions from car repairing are also requested. This information together withthe methodologies used should be included in the future IIR.

84.   The uses of paints are key sources for NMVOC emissions. The ERT recommends Greece to set up a Tier 2 method for the estimation of emissions and to provide information on the methodologies used in the future IIR.

85.   Sector 3A3 is a key source of NMVOC emissions; therefore it is subject to the application of the EU Directive 1999/13/EC on NMVOC from certain industrial activities, Directive 2004/42/EC on the solvent content of paints and varnishes as well the new Industrial Emission Directive. The ERT recommends Greece to develop methodologies to distinguish at least the use of decorative paints for building and household applications (NFR 3A1) from the use of paints for industry and car repairing (NFR 3A2). The characteristics of the types of paints as well as the reduction techniques in each of those sectors are different. In building and general public applications, reduction of VOC emissions can be achieved by reduction of the solvent content of solvent based paints, and/or increase in the use of water based

paints. In industry, VOC emission reduction can be achieved by reduction of the solvent content of solvent based paints, increase in the use of powders, water based paints and UV paints but also reduction techniques such as oxidation and adsorption.

86.   Useful sources of information can be found by the European Paint Manufacturer Association, the Greek Federation of Paint Producers, experts from paint manufacturing and paint users.

87.   The ERT recommends Greece to consider implementation of a mandatory report of the solvent balance for the largest industrial plants .

88.   In the reporting template for NECD (2008 and 2009 as example), NMVOC emissions are provided under NFR 3A3 and no notation keys are used for NFR 3A1 and 3A2. According to the NIR, NMVOC emissions from "domestic and construction" have been estimated. The ERT recommends Greece to verify the coherence of the reporting template with the NIR and to use standardised notation keys when no data is provided.

Category issue 2: 3.B. Dry Cleaning and Degreasing – NMVOC

89.   Only emissions from dry cleaning are estimated based on an emission factor linked to population. The methodology could be improved to enhance accuracy. The ERT recommends Greece to estimate emissions from degreasing and to provide information on the methodologies used in the future IIR.

90.   A source of information for the chlorinated solvent sales can be found at the European federation ECSA (European Chlorinated Solvent Association). The Greek Chemical Industry Association could be a source of information as well.

91.   A source of information on the characteristic of machines used for dry cleaning could be found at the Greek Federation of Dry Cleaners, technical centres on the subject as well as dry cleaning machine manufacturers.

92.   In the reporting template for the NECD (2008 and 2009 for example), NMVOC emissions are provided under NFR 3B1 and the notation key "IE" is used for NFR 3B2. This is not consistent the NIR. According to the NIR, only NMVOC emissions from dry cleaning have been estimated. The ERT recommends Greece to verify the consistency of the reporting template with the NIR and to use the appropriate notation keys when no data is provided.

Category issue 3: 3.C. Chemical Products, Manufacture & Processing – NMVOC

93.   Very simple Tier 1 methodologies are used for the activities considered by Greece under NFR 3C. These methodologies could be improved to enhance accuracy, at least for activities which are covered by the EU Directive 1999/13 in order to evaluate the impact of this directive on emissions.

94.   The ERT recommends Greece to develop methodologies to estimate NMVOC emissions from the following activities, if existing in Greece and to provide information on the methodologies used in the future IIR:

060301	Polyester processing
060303	Polyurethane processing
060304	Polystyrene foam processing
060305	Rubber processing
060306	Pharmaceutical products manufacturing
060307	Paints manufacturing
060310	Asphalt blowing
060311	Adhesive, magnetic tapes, films and photographs manufacturing

95.   Sources of information can be found at the Greek Industry Federations regarding statistics of production, imports, exports (assuming the population is used for calculation as in paints).

96.   In the reporting template for the NECD, the notation key "IE" is used for NFR 3C. According to the NIR, information on activities considered under NFR 3C is available. The ERT recommends Greece to verify the consistency of the reporting template for NFR 3C with the NIR.

Category issue 4: 3.D. Other uses of products – NMVOC

97.   Very simple Tier 1 methodologies are used for these activities. The methodologies could be improved to enhance accuracy at least for activities which are covered by the EU directive 1999/13 in order to evaluate the impact of this directive.

98.   The ERT recommends Greece to develop methodologies to estimate NMVOC emissions from the following activities, if they exist in Greece and to provide information on the methodologies used in the future IIR.

060401	Glass wool enduction
060402	Mineral wool enduction
060405	Application of glues and adhesives
060407	Underseal treatment and conservation of vehicles
060409	Vehicles dewaxing
060411	Domestic use of pharmaceutical products

99.   Sources of information can be found at the Greek Industry Federations such as printer associations, statistics of production, imports and exports (assuming the population is used for estimation as for paints).

AGRICULTURE

Review Scope:

NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed		SO_2, NO_x, NMVOC, NH_3, PM_{10} & $PM_{2.5}$		
Years		1990 – 2006 + (Protocol Years)		
4 B 1 a	Cattle dairy	NH_3		
4 B 1 b	Cattle non-dairy	NH_3		
4 B 2	Buffalo	NH_3		
4 B 3	Sheep	NH_3		
4 B 4	Goats	NH_3		
4 B 6	Horses	NH_3		
4 B 7	Mules and asses	NH_3		
4 B 8	Swine	NH_3		
4 B 9 a	Laying hens	NH_3		
4 B 9 b	Broilers			
4 B 9 c	Turkeys			
4 B 9 d	Other poultry			
4 B 13	4 B 13 Other			
4 D 1 a	Synthetic N-fertilizers	NH_3		
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	NO_x		
4 G	Agriculture other(c)			
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 have and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency:

100.   The Agriculture sector inventory is not transparent due to the absence of an IIR. It is not possible to comment on the methodology, underlying assumptions and rationale for selecting the data. The ERT recommends Greece to submit a detailed IIR including: livestock numbers and the source of the emission factors used to calculate emissions.

101.   With respect to emissions of NMVOCs the notation key "NE" should be entered for all cells rather than leaving them blank. This is acceptable since the EMEP/EEA Guidebook does not provide default EFs for NMVOCs from agriculture. For NFR 4F, Field burning of agricultural wastes, emission estimates are only provided for two pollutants, while the other cells are left blank.

Completeness:

102. The agriculture sector inventory is complete with respect to the most important sources of NH_3 emissions. However, no estimates of NO_x or $PM_{2.5}$ and PM_{10} have been reported. These could be estimated using the default EFs provided by the EMEP/EEA Guidebook, the national estimates of livestock numbers and N fertilizer consumption used to calculate NH_3 emissions. The reply from Greece to the ERT question on this issue indicated that the possibility of providing accurate estimates for these types of emissions is being examined. The ERT encourages Greece to complete the inventory by estimating particle emissions.

103. Greece has not provided a full time-series of emissions. The ERT recommends Greece to provide the time-series 1990-2009 in the next submission.

104. The NFR tables contain many blank cells. The ERT recommends Greece to complete the inventory by estimating the missing sources or using the notation key "NE", or other appropriate notation keys (NO, IE, NR, NA) and to provide information explaining the use of the notation key in the future IIR.

105. Comparability: It is neither possible to determine whether the methods used are consistent with those provided by the EMEP/EEA Guidebook, nor if any country-specific methods have been used. Therefore, the ERT cannot determine if the inventory is comparable with those reported by other countries. The ERT recommends Greece to use methodologies in accordance with the EMEP/EEA Guidebook.

Consistency including recalculation and time-series:

106. Emissions of NH_3 are estimated using a Tier 1 method, hence emissions would be expected to be related to livestock numbers and N fertilizer use. Information on livestock numbers and N fertilizer use are available for each year since 1990 in the UNFCCC report. They indicate little change in numbers of the main categories contributing to the 2009 total, apart from a 25% decrease in the number of dairy cows and a 60% decrease in N fertilizer use. The graph of emissions from 1990 to 2009 does not allow detailed examination of trends. Yet, a decrease in total emissions can be noticed. It is expected to be explained by the decrease in the numbers of cattle and a decrease in N fertilizer application. There is one discrepancy related to a small increase in NH_3 emissions in 1995 which is not consistent with the trends in livestock numbers and N fertilizer use. According to Greece, this would be a mistake. The ERT recommends Greece to correct this mistake in the next submission.

107. Although dairy cow numbers have decreased by 25% since 1990, milk yield per cow (UNFCCC NIR) has doubled. Hence, NH_3 emissions per cow are likely to have increased considerably. This increase will not be accounted for when using a Tier 1 methodology. Although the adoption of a Tier 2 methodology has not been identified as a priority by Greece, the ERT recommends Greece to consider developing a Tier 2 methodology for NH_3, using guidance provided by the EMEP/EEA Guidebook, at least for dairy cattle.

108. No information is available on recalculations. The ERT recommends Greece to provide information on recalculations.

Accuracy and uncertainties:

109.   Greece has not provided an uncertainty analysis for the Agriculture sector. The ERT encourages Greece to undertake an uncertainty analysis for the Agriculture sector in order to support the improvement process and to provide an indication of the reliability of the inventory data.

110.   The estimate of NH_3 emissions for 1995, referred to in paragraph 101 is an overestimation. The ERT recommends Greece to correct this data.

111.   It is impossible to understand if QA/QC procedures have been implemented for the Agriculture Sector, or if a basic review has been conducted by third party experts not involved in the sector inventory. The ERT recommends Greece to record in any QA/QC procedures, sector review and to provide a QA/QC plan in the future IIR.

Improvement:

112.   The IIR does not provide information on any plan for sectoral improvements or improvements already carried out. The ERT recommends Greece to provide an inventory improvement plan and information on improvements carried out in the next IIR.

Sub-Sector Specific Recommendations.

Category issue 1: 4.B Manure management:- NH_3

113.   The ERT noted that there no estimates of NH_3 emissions from 4B9b, c and d could be identified. During the review Greece replied that laying hens constitute the great majority of poultry in Greece, up to 99.4% of all poultry; thus, the disaggregated estimation of NH_3 emissions for each poultry category is not expected to change significantly the accuracy of the inventory. However, the possibility of providing more detailed estimations is being examined, as soon as the availability of accurate data for all the poultry categories and for the whole of period of 1990 to 2009 is ensured. The ERT acknowledges the response by Greece and recommends Greece to undertake a review of data on poultry numbers for future submissions.

Category issue 2: 4.B Livestock: NO_x, $PM_{2.5}$ and PM_{10}

114.   The ERT recommends Greece to provide estimates of NO_x or $PM_{2.5}$ and PM_{10} which may be calculated using default emission factors provided in the EMEP/EEA Guidebook. During the review Greece informed the ERT that the possibility of providing accurate estimates for these types of emissions was under examination. The ERT acknowledges the response by Greece and recommends Greece to consider making estimates of these emissions for future submissions.

Category issue 3: 4D2c Livestock:- NH_3

115.   Although emissions from grazed pastures are calculated under animal husbandry and manure management, they should be reported separately. However, this may only be possible if emissions were calculated using a Tier 2 or Tier 3 approach. During the review Greece informed the ERT that the use of Tier 2 or Tier 3

approach requires more detailed data which are not available up to now.The ERT acknowledges that it is not feasible at this stage for Greece to develop a Tier 2 or Tier 3 method to estimate emissions of NH_3 from the livestock sector. Therefore, the ERT recommends Greece to improve the data collection and carry out the calculations when data is available.

Category issue 4: 4D1: NO_x, $PM_{2.5}$ and PM_{10}

Greece reports estimates of NH_3 emissions, but does not estimate NO_x or $PM_{2.5}$ and PM_{10} emissions, although default EFs are provided by the EMEP/EEA Guidebook. During the review Greece replied that the possibility of providing accurate estimates for these types of emissions is being examined. The ERT acknowledges the response by Greece and recommends Greece to undertake the estimation of these pollutants emissions.

Category issue 5: 4.F: NO_x, $PM_{2.5}$ and PM_{10}

116.   Greece reports estimates of NH_3 emissions, but does not estimate NO_x or $PM_{2.5}$ and PM_{10} emissions although default EFs are provided by the EMEP/EEA Guidebook. During the review Greece informed the ERT that the possibility of providing accurate estimates for these types of emissions was under examination. The ERT acknowledges the Greek's response and recommends Greece to provide estimates for these emissions in the next submissions.

WASTE

Review Scope:

NFRCode	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed		SO$_2$, NO$_x$, NMVOC, NH$_3$, PM$_{10}$ & PM$_{2.5}$		
Years		1990 – 2009		
6.A	solid waste disposal on land		x	x
6.B	waste-water handling		x	x
6 C a	6 C a Clinical wasteincineration (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)		x	x

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

General recommendations on cross-cutting issues.

117.   The NFR tables from Greece do not provide any emissions for the Waste chapter (6) and no IIR has been submitted by Greece.

118.   During the review Greece explained the ERT that   *"Greece has not yet calculated the emissions in the waste sector due to lack of appropriate methodologies for the majority of emission categories of this sector (e.g. Managed and unmanaged Solid waste disposal sites). However, Greece has planned to examine the possibility of estimating emissions from this sector based on data from the literature, experience from other parties and knowledge from relative works prepared by Greek institutes and research centres. The first target of these efforts is the estimation of emissions from the waste incineration category." Greece also stated that these emissions are expected to be minor due to the fact that waste incineration is not a common practice in Greece. Greece also informed the ERT that the notation keys in NFR 6A are used as follows:*

   (a)   "NE" (Not Estimated) is used to express the fact that the process (Managed and unmanaged SWDS) has occurred but the emissions are not estimated due to lack of an appropriate methodology.

   (b)   "NO" (Not occurring) is used to express the fact that the process (Other, non specified categories) has not occurred.

   (c)   *"NA" (Not applicable) is used to express the fact that for this process (Municipal sludge disposal on Land) there are no emissions."*

119.   . In addition to this, Greece is planning to prepare projections for the waste sector.

120.   The ERT recommends Greece to consider calculation of emissions from the Waste sector using methodologies from the EMEP/EEA Guidebook 2009.

Transparency:

121.   Greece did not submit an IIR and does not report any emissions under the Waste Sector. The ERT recommends Greece to use methodologies in accordance with EMEP/EEA Guidebook, to report these emissions in NFR tables and to document the calculations in the next IIR.

Completeness:

122.   The NFR tables from Greece do not provide any emissions for NFR 6 (Waste), nor for NFR 7 (Other). Greece did not submit an IIR. The ERT recommends Greece to estimate emissions from the Waste sector.

Consistency, including recalculation and time-series:

123.   The NFR tables from Greece do not provide any emissions for the Waste chapter (6), so the consistency issue could not be considered.

124.   The ERT recommends the Party to estimate emissions from the waste sector for the full time-series and to include in future IIRs detailed information on any recalculations carried out (absolute and relative changes) as well as the reasons for any recalculations.

Comparability:

125.   No emissions are reported for the Waste sector and NFR 7 – Other and due to the lack of an IIR, it was not possible for the ERT to analyse if the methods used are consistent with those reported in the EMEP/EEA Guidebook. The ERT recommends Greece to transparently report emissions, to describe the methodologies used - especially when country-specific - , and to provide sufficient activity data and emission factors to support the methodologies in the future IIR.

Accuracy and uncertainties:

126.   Greece did not report any emissions under the Waste sector and did not provide an IIR. Therefore, no information on issues such as an uncertainty analysis or QA/QC procedures is available. The ERT recommends the Party to estimate emissions from the waste sector and encourages Greece to undertake an uncertainty analysis for the emissions in order to feed into the improvement process and to provide an indication of the reliability of the inventory data. The ERT recommends also to provide a QA/QC plan and information on QA/QC activities carried out in the inventory.

Improvement:

127.   Greece did not report any emissions from the Waste sector.

Sub-Sector Specific Recommendations.

128.   There are no sub-sector specific recommendations due to the fact that Greece did not report any emissions under the Waste sector.

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. Responses to preliminary questions raised prior to the review:
   - GREECE-General-31-05-11-Q1_e_reply_230611.docs
   - GRC_General-10-06-2001-Q1-reply.docx
   - CLRTAP_emissions_230611.xls
   - Spread sheets for the energy sector: 20110614_trends.xls and 1A1a.xls, 1A1b_230611.xls, 1A2fi_230611.xls, 1A4b_230611.xls, 1A4b_GR230611.xls, 1B2aiv_230611.xls
   - Greece_Energy_Stationary_16.06.2011_Q1_reply230611.docx
   - GREECE-Energy-17-06-11-Q1_julien_reply230611.doc
   - Greece-Transport+Mobile-09-06-11-Q1-reply.doc
   - Greece-Transport+Mobile-09-06-11-Q2-reply.docGreece-IP-20-06-11-Q1-3_reply290611.doc
   - GREECE-IP-20-06-11-Q1_new_reply29.6.11.docx
   - Greece-Solvents-20-06-22-Q1-reply.doc
   - Gree_Agric_Quest_tem_140611_reply230611.doc
   - Greece-Waste-20-06-11-Q1-3-reply290611.doc
2. Responses to questions raised during the review:
   - Spread sheets for the energy sectorn26.6.2011: NOx_1A1a_GR-xls, 1A4b_GR-xls
   - Greece-Transport+Mobile-30-06-11-Q2_reply.doc
   - Road_Transport_Recalcs.xls
   - 1A3b_CO_NMVOC_GR.xls
   - Greece- IP-28-06-11-Q4.doc
   - 1A_Gr.xls
3. Gree_Agric_Invent_Comments.docxGreece Stage 2 S&A report
4. Greece Stage 1 report 2009
5. Greece IIR 2009
6. Greece 2011 Report, 1988 NO_x Protocol, Athens, March 2011
7. Greece NIR UNFCCC 2011