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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:**

SPAIN

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INTRODUCTION

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.

This annual review has concentrated on SO₂, NO_x, NMVOC, NH₃, plus PM₁₀ & PM_{2.5} with optional review of Cd, Pb and Hg for the time series years 1990–2007 reflecting current priorities from the EMEP Steering Body and the Task Force on Emission Inventories and Projections (TFEIP).

This report covers the stage 3 centralised reviews of the UNECE LRTAP Convention and EU NEC Directive inventories of Spain, coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 22nd June 2009 to 26th June 2009 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: Lead Reviewer – Justin Goodwin (EC), Generalist – Kevin Hausmann (Germany), Energy – Laetitia Serveau (France), Mobile – Morten Winther (Denmark), Industry and Waste – Hans Wradhe (Sweden) and Leif Hoffman (Denmark), Solvents – Nadine Allemand (France), Agriculture +Nature – Jim Webb (UK)

The review was coordinated by Justin Goodwin and Katarina Marečková, (EMEP Centre on Emission Inventories and Projections – CEIP).

The ERT acknowledged the submission of a revised IIR on 20th July 2009. Unfortunately, due to time constraints, the ERT has not had time to consider this latest version in its analysis of Spain’s submissions.

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

INVENTORY SUBMISSION

Spain has reported emissions for the base year of 1990 and a full time series to 2007 (the latest year) for its protocol pollutants in the NFR format. In addition Spain has also provided aggregated emission data for the years 1980–1989. Spain reported 2005 gridded emissions. Spain also submitted a detailed informative inventory report (IIR).

The CLRTAP inventory submitted by Spain is of good quality and is in general well documented in the IIR.

KEY CATEGORIES

Spain has compiled and presented in its IIR a “Tier 1” Key Source Category Analysis for both level and trend. All pollutants are covered. The results of the analysis are used for inventory improvement. The results differ from the analysis as carried out by the CEIP as Spain uses high level source categories in the analysis. The ERT encourages Spain to use more detailed source category splits for the Key Source Analysis in the future.

QUALITY

Transparency

The ERT recognises the level of effort undertaken by Spain in providing an inventory with a significant level of detail to undertake a detailed review. Spain's IIR is detailed and well presented for the majority of sectors. Emission factor and activity time series are presented in detail, assumptions are indicated and references are given. However, details of emission factors and activity data are missing for the IP and parts of the Waste sector and were provided in a separate document during the review. The ERT encourages Spain to extend the excellent work done on the IIR to the IP and waste sectors. During the review the ERT encouraged Spain to provide further details of methodologies for some sectors missing from the current IIR as detailed below (including for 1.B fugitive emissions) & assumptions on solvent content of paints, generally for IP and some corrections of small errors on Waste for industrial waste water.

Completeness

The ERT acknowledges the effort to which Spain has gone to provide estimates of emissions for all sub-sectors and all pollutants reviewed.

Spain's inventory for the pollutants reviewed is generally complete. In most cases the IIR provides comprehensive information on completeness and justifies omissions where they occur.

Consistency, including recalculations and time-series

Spain has undertaken a number of recalculations for their 2009 submission. These recalculations are detailed and justified in the IIR. All time series are consistent, the very few dips and jumps occurring are explained in the IIR.

Comparability

The ERT notes that the inventory of Spain is comparable with those of other reporting parties. The allocation of source categories follows that of the EMEP/UNECE reporting Guidelines. The ERT encourages Spain to continue with this approach to national inventory calculation.

CLRTAP/NECD comparability

The ERT noted that there are some differences between the estimates provided by Spain under LRTAP and NECD. The differences result from the fact that according to the legislation NECD totals exclude the Canary Islands while the CLRTAP totals include Canary Island emissions.

Accuracy and uncertainties

Spain compiled a qualitative uncertainty analysis. The outcomes of the analysis are taken into account for inventory improvement. As a result, measures have been taken to reduce inventory uncertainties for Spain. The ERT recommends elaborating on these measures and describing the details in more depth in future versions of the IIR.

For the upcoming submission Spain promised to provide a quantitative uncertainty analysis. The ERT welcomes this initiative and looks forward to seeing this development in future submissions.

Verification and quality assurance/quality control approaches

Spain has elaborated and implemented a quality assurance/quality control (QA/QC) plan in accordance with the EMEP/CORIANIR Guidebook (Inventory Management Chapter). This includes general QC procedures (tier 1) as well as source category-specific procedures (tier 2) (for key sources). The ERT also commends Spain on defining roles and responsibilities for inventory preparation, improvement, and QA/QC.

FOLLOW-UP TO PREVIOUS REVIEWS

Although Spain provided a number of responses to the stage 2 review questions, it did not respond to the questions on NH₃ agriculture emissions that were first raised in 2008. The ERT encourages Spain to respond to all questions in its responses to the stage 2 reviews.

AREAS FOR IMPROVEMENTS IDENTIFIED BY SPAIN

Spain's IIR identifies several areas for improvement (section 1.2.4 of the IIR). The ERT agrees with the goals set out. These include:

Emission value comparison with point source data.

Update of emissions factors as advanced efficiency technologies enter the market.

Adoption of more detailed estimation approaches (tier 2, tier 3) as tools and information becomes available.

The ERT adds more recommendations and actions to this list, as laid out in part B of this report.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

The ERT recommends that Spain use more detailed source category splits for the Key Source Analysis in future submissions.

The ERT encourages Spain in its goal to provide a quantitative uncertainty analysis to present and use it to as a tool to focus on planned improvements in the key categories.

The ERT encourages Spain to provide a more detailed description of the time series of key sources in the IIR

The ERT encourages Spain to provide sub category level chapters to aid navigation in the document.

The ERT encourages Spain to use the appropriate notation keys in the IP (2A1 & 2A2) sector. Following the review, the Party has indicated that this issue will be been addressed for future reporting.

To continue to develop projects for the incorporate high quality facility level data (e.g. EUETS) into the national estimates and to generate country specific emission factors.

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

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

Energy

Review scope

Pollutants reviewed		SO ₂ , NO _x , NMVOC, CO, NH ₃ , PM ₁₀ & PM _{2.5}		
Years		1990–2007 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not reviewed	Recommendation provided
1.A.1	Energy industries	x		X
1.A.2	Manufacturing industries and construction	x		
1.A.4	Commercial, residential, agriculture & forestry	x		
1.A.5	Other	x		
1.B.1	Fugitive emissions from solid fuels	x		
1.B.2	Fugitive emissions from oil and natural gas	x		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.				

General recommendations on cross cutting issues

Completeness: Spain has identified categories in its IIR that have not been estimated “NE”. These include 1A5 with a lack of activity data and for NFR 1A1b, 1A2 without 1A2fii, 1A4ai and 1A4bi with a lack of emission factors. The ERT encourages Spain to continue to indicate in its IIR these missing sources, and to continue to investigate emission factors and methods for these categories, particularly with the plants which use secondary NO_x abatement measures so that they can be included in future submissions. In response to the review Spain has indicated that these issues will be investigated and documented in the IIR for the next submission.

Transparency: The ERT notes that the methodology for each NFR codes is clearly explained in Spain's IIR. The references for activity data and for emission factors and the type of approaches used are clearly indicated. During the review, Spain provided some additional reference material (Analysis per Emitting Activities in the SNAP-97 Nomenclature). This document provided clear explanations of all methodology used by sub-sectors for energy. The ERT congratulates Spain on this excellent document and work for the part of energy and encourages Spain to make this document part of its IIR and to update it to include the latest year of the inventory.

Uncertainty: For the energy sector, the uncertainty evaluation is a qualitative one. The ERT encourages Spain to continue to investigate developing quantitative uncertainties evaluation to improve its understanding and to improve the accuracy of the inventory.

Comparability and consistency: The ERT commends Spain for explaining the geographical and the activity scopes of the Inventory for different reporting requirements. The ERT encourages Spain to continue to indicate these aspects in its IIR in order to explain the differences between the totals.

The ERT encourages Spain to explain clearly in its IIR the sectors for which, because of lack of data, the implied emission factors of the first year (where measurements are available) are used for the other years.

QA/QC procedures: The ERT notes that for the energy sector Tier 1 and Tier 2 QC procedures are used as described in the IIR.

Recalculations: The ERT notes that all principal recalculations between the last submission and the previous submission are clearly indicated in the IIR.

Improvement: Spain has identified in its IIR a list of improvements planned for the energy sector. All the improvements are clearly presented in the section 11.3 in the IIR.

Sub-sector specific recommendations

For the purpose of transparency the ERT recommends that Spain's IIR indicates for each NFR the list of sub-sectors included. During the review Spain provided a mapping table showing the SNAPs included in each NFR. The ERT encourages Spain to include this table in future IIR submissions.

The ERT notes that Spain's IIR was unclear on the use of emissions data from installations. During the review Spain provided clarification of the years, sub-sectors and pollutants that included installation data. The ERT encourages Spain to include the details of this clarification in future IIRs to improve transparency.

The ERT notes that when emissions estimates are based on data reported by the installations, Spain has extrapolated estimations for previous years (using the implied emission factors of the earliest year for which the reported installation data are available). The ERT encourages Spain to investigate the implied emission factors that are applied to earlier years to ensure that appropriate levels of abatement are assumed. In response to the review Spain indicated that it would investigate improved methodologies. The ERT encourages Spain to report on its findings/revisions in future IIR submissions.

The ERT encourages Spain to provide details of its energy balance and describes its timeseries in future IIRs.

1A1a Public electricity and heat production

The ERT notes that District Heating plants emissions are not estimated in the Spanish Inventory because Spain does not consider them significant. The ERT encourages Spain to investigate emissions from district heating plants and to consider including emissions estimates in future inventories. In response to the review Spain indicated that it would investigate approaches to estimate emissions. The ERT encourages Spain to report on its findings/revisions in future IIR submissions.

1A1ai Public electricity and heat production

For the NFR code 1A1ai and for NH₃ emissions, only 3 years have been quantified (2005, 2006 and 2007). Spain responded that these NH₃ emissions correspond to measured emissions data provided by some MSW incineration plants in these years. Spain has no estimates for previous years for the installations on which information is provided for the period 2005–2007, and no information for the remaining incinerator plants is provided. To ensure time series consistency the ERT recommends that Spain investigates activity data and emission factors for the full timeseries. In response to the review Spain indicated that it would investigate approaches to estimate emissions on a plant by plant basis. The ERT encourages Spain to report on its findings/revisions in future IIR submissions.

Mobile sources

Review scope

Pollutants reviewed		SO ₂ , NO _x , NMVOC, CO, NH ₃ , PM ₁₀ & PM _{2.5} , Cd, Hg, Pb		
Years		1990–2007 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not reviewed	Recommendation provided
1.A.2	Manufacturing industries and construction mobile sources	x		
1.A.3	Transport	x		X
1.A.4	Commercial, residential, agriculture & forestry mobile sources	x		X
1.A.5	Other mobile sources	x		X
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.				

General recommendations on cross cutting issues

Completeness: The ERT acknowledge an almost complete inventory for mobile sources. For the subsector 1A5b (Other) emission estimates are missing for all years in the Spain's inventory report (see sub sector specific recommendations). The ERT recommends that Spain make emission estimates for this sector.

Transparency: The ERT acknowledges a very good and detailed methodology description for mobile sources in the IIR 2009 report. The ERT encourages Spain to include more detail in the IIR report on the overall fuel sales statistics, and sub sectoral fuel balances applied for the different mobile sectors (see sub sector specific recommendations). In response to the review Spain indicated that it is analysing how to provide more detail on the sectoral breakdown of its inventory fuel balance for the more relevant NFR categories. The ERT encourages Spain to report on its findings/revisions in future IIR submissions.

For the subsectors 1A4a ii (Commercial/Institutional mobile), 1A4b ii (Household and gardening mobile) emission estimates are referred to as IE in the Party's inventory report for all years. The ERT encourages Spain to make separate emission estimates for these sectors (see sub sector specific recommendations). In response to the review Spain indicated that this potential improvement will be an action to be included in the medium term inventory improvement plan due to the fact that emissions are very small and the resources needed for the task are significant.

Uncertainty: The Party has provided data quality labels of the different types of emission for mobile sources on SNAP 07 and 08 levels. The ERT encourages the Party to quantify these uncertainties to make sub sectoral uncertainty estimates for all mobile sources using the methods described in the EEA/EMEP Guidebook (2009).

QA/QC procedures: The ERT notes the general QA/QC plan described by the Party in the IIR. The ERT encourages Spain to provide further details of sector specific QA/QC in future IIRs.

Recalculations: The party has made recalculations for several inventory years, involving several mobile sub sectors and emission components. The ERT acknowledges the explanations for these recalculations given in the IIR report and in the review responses given during the review. The latter responses, however, for road transport, railways and national fishing are not present in the IIR. The ERT recommends in general that all recalculation explanations be included in the IIR report.

Improvements: The ERT acknowledges the Party's intention stated in the IIR to make inventory model improvements for civil aviation (better data and methods), road transport (COPERT IV upgrade, better mileage data), navigation (better fuel data) and non road agricultural and forestry machinery (better fuel consumption/emission factors, stock and activity data). The ERT encourages the Party to make these inventory improvements.

Sub-sector specific recommendations

Spain uses a country specific methodology and emission factors for all mobile sectors, which is in agreement with EMEP/CORINAIR guidelines.

1.A.2.f ii Manufacturing industries and construction mobile

During the review the Party has supplied detailed report documentation of the model approach for this sector. Further, in the Party's response to ERT it is explained that detailed documentation of the model approach will also be given in the IIR 2010 report. The ERT supports this work plan pursued by the Party.

1.A.3.b Road transport

In the reply from Spain it is explained how fuel sales statistics are treated in relation to COPERT calculations of fuel consumption. The ERT recommends that the Party include this explanation in the next IIR. In response to the review Spain plans to include additional relevant information on how fuel sales statistics are treated in the road transport sector in its next IIR.

In Spain's reply it is explained that they will shift from the COPERT III model version and instead use COPERT IV to calculate next year's inventory for road transport. The ERT strongly supports this work plan pursued by the Party.

1A3c Railways

Railways emissions are calculated by Spain using a detailed methodology. During the review Spain supplied detailed documentation of the model approach for railways. It is, however, not totally clear from the IIR to which sector the residual amount of fuel from statistical sales not being accounted for by the bottom-up estimates is allocated. The ERT encourages the documentation of the detailed calculation method for railways in the IIR 2010 report, and recommends that Spain include an explanation regarding sales vs estimated fuel consumption,

accordingly. During the review Spain provided additional details of the methodologies used and indicated that it plans to provide, in its next IIR, further information on this reallocation of diesel among the concerned categories. The ERT encourages Spain to include this information in future IIR submissions.

1A4a ii Commercial/institutional mobile

Spain explains that the emission estimates for 1A4a ii is included in the inventory sector 1A4a i (commercial/institutional stationary). The ERT notes the medium-term plan by the Party to make separate estimates for the 1A4a ii sub sector, and the ERT encourages the Party to carry out this plan.

1A4b ii Household and gardening mobile

Spain explains that the emission estimates for 1A4b ii are included in the inventory sector 1A4b i (Residential Stationary plants). The ERT acknowledges the Party's medium-term plan to make separate estimates for the 1A4b ii sub sector, and the ERT encourages the Party to carry out this plan.

1. A.4.c ii Agriculture/forestry/fishing non road machinery

Emissions from non road agricultural and forestry machinery are calculated by Spain using a detailed methodology. During the review Spain supplied detailed documentation of the model approach for this sector. It is, however, not clear from the IIR to which sector the residual amount of fuel from statistical sales not being accounted for by the bottom-up estimates is allocated. The ERT encourages the documentation of the detailed calculation method for non road machinery in future IIR reports, and recommends that Spain include an explanation regarding sales vs estimated fuel consumption.

1.A.4.c iii National fishing

Emissions from national fishing² are calculated by Spain using a detailed methodology. During the review Spain supplied detailed documentation of the model approach for this sector. It is, however, not clear from the IIR to which sector the residual amount of fuel from statistical sales not being accounted for by the bottom-up estimates is allocated. The ERT encourages the documentation of the detailed calculation method for fishing in future IIR reports, and recommends that Spain include an explanation regarding sales vs estimated fuel consumption. During the review Spain provided additional details of the methodologies used and indicated that it plans to provide, in its next IIR, further information on this reallocation of diesel among the categories concerned. The ERT encourages Spain to include this information in future IIR submissions.

² We understand that where it was written “non road agricultural and forestry machinery” you intended to write “national fishing”.

1A5b Other

Spain explains that no specific information on mobile military equipment is available at present although Spain continues to investigate data sources. The ERT acknowledges the efforts made by Spain to provide this fuel consumption information and, if successful, the inclusion of new emission estimates for military sources in future submissions.

Industrial processes

Review scope

Pollutants reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5}		
Years		1990–2007 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not reviewed	Recommendation provided
2.A.1	Cement production	X		X
2.A.2	Lime production	X		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	Other including non fuel mining & construction (please specify in a covering note)	X		X
2.B.2	Nitric acid production	X		
2.B.3	Adipic acid production	X		
2.B.4	Carbide production	X		
2.B.5	Other (please specify in a covering note)	X		
2.C.1	Iron and steel production	X		
2.C.2	Ferroalloys production	X		
2.C.3	Aluminium production	X		
2.C.4	SF ₆ used in aluminium and magnesium foundries	X		
2.C.5	Other (please specify)	X		
2.D.1	Pulp and paper	X		
2.D.2	Food and drink	X		
2.D.3	Wood processing	X		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.				

General recommendations on cross cutting issues

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

QA/QC procedures: Spain has outlined some basic QA/QC checks in its IIR. The ERT encourages Spain to implement sector specific QA/QC procedures for Industrial processes.

Recalculations: The ERT identified recalculations in the Spanish timeseries (2A5, 2B5a and 2C1, 2 & 3), justified and explained in the IIR.

Uncertainty: The ERT noted that uncertainties are presented for each pollutant per SNAP group for the Industrial Processes Sector. The ERT encourages Spain to present the uncertainties for the industrial processes according to NFR in order to help support the improvement process when reporting emissions.

Transparency: The IIR is generally transparent and well presented/organised. However, activity data and emission factors are not provided in the Spanish NFR or IIR. Spain provided the ERT with details of emission factors and activity data during the review. The ERT noted that the allocation of emissions between the Energy and Industrial processes sectors is not clearly presented. During the review process Spain provided the ERT with this information.

In its response to the review Spain indicated that it plans to provide in its next IIR further information in parallel with documentation provided in the additional reference material “Analysis per Emitting Activities in the SNAP-97 Nomenclature“. The ERT encourages Spain to include these data in future submissions to improve transparency in future IIRs.

The ERT also noted that Spain uses notation keys inappropriately (see paragraphs under “Sector specific recommendations”). The ERT encourages Spain to use the appropriate notation keys for reporting where estimates are not available or necessary. In response to the review Spain has indicated that notation keys will be revised in the next 2010 submission and the motivation for their use will be explained in the IIR.

Comparability: The ERT notes that the emission figures are comparable in Spain’s emission reports to the EU (NECD), CLRTAP and UNFCCC respectively.

Improvement: Spain has identified improvement plans for the Industrial processes sector. The ERT encourages Spain to implement these plans and to continue to document plans for improvement in the IIR.

Sector specific recommendations

2A1 & 2A2 Cement and lime production

The ERT noted that Spain reported particulates emissions from Cement and Lime production as NE. Spain has responded that they had used the wrong notation key. It should be IE and 2A1 and 2A2 should have been included in sector 1.A.2.f. The ERT encourages Spain to try to separate these emissions and to report them under the relevant categories. Where this is not possible the ERT encourages Spain to use the right notation keys and to describe reasons for using them in the IIR. In response to the review Spain indicated that notation keys would be revised in the next 2010 submission and the motivation for their use explained in the IIR.

2. A.7.d Other mineral (battery manufacture)

The ERT found that reported data for 2.A.7.d Other mineral (battery manufacture) are noted as a mixture of NO, NA and values for Pb. Spain has responded that they have taken note of the

ERT finding and will use appropriate notation keys. The ERT encourages Spain to look at the use of notation keys. In response to the review Spain indicated that notation keys would be revised in the next 2010 submission and the motivation for their use explained in the IIR.

Solvents

Review scope

Pollutants reviewed		NMVOC		
Years		1990–2007 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not reviewed	Recommendation provided
3.A.1	Decorative coating application	3A1		x
3.A.2	Industrial coating application	3A2		x
3.A.3	Other coating application (please specify the sources included/excluded in the notes column to the right)	3A3		x
3.B.1	Degreasing	3B		x
3.B.2	Dry cleaning	3B		x
3.C	Chemical products, manufacture & processing	3C		x
3.D.1	Printing	3D1		x
3.D.2	Domestic solvent use including fungicides	3D2		x
3.D.3	Other product use	3D3		x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.				

General recommendations on cross cutting issues

Completeness: The ERT considers the solvent use sector to be complete for all Solvents categories.

QA/QC procedures: According to information provided in the IIR report, QA/QC procedures consistent with the guidelines are set up. However, solvent specific procedures are not describes in the IIR. The ERT encourages Spain to provide some descriptions of tier 2 solvent specific QA/QC in future IIRs.

Recalculations: For solvents some corrections have been made on activity levels and on EFs. Spain describes these in its IIR.

Uncertainty: Uncertainties are qualitatively assessed. The ERT encourages Spain to assess the uncertainties quantitatively in the future but to prioritise methodology developments in order to consider progress made following the implementation of different EU Directives.

Transparency: The IIR report provides a very transparent description of the methodologies used.

Improvement: Spain has scheduled a number of tasks with the main business associations to revise the basic activity variables as well as the characterisation of processes and techniques applied (no more details are provided). The ERT encourages Spain to actively implement progress options identified in the 2009 IIR and establish the links with regional authorities to improve the emissions inventory and, particularly, to better take into account the impact of the EU Directive in its future IIRs. In response to the review Spain indicated that a priority sector for improvement action is the sector of application of paints (NFR codes 3A1, 3A2 and 3A3), in collaboration with the Spanish Association of Paint and Printing Dye Manufacturers (ASEFAPI). The ERT encourages Spain to implement these improvements and provide relevant documentation on methods and recalculation in its future IIE submissions.

Key sources: The ERT encourages Spain to determine key sources using the lower level of the NFR nomenclature (such as 3A1 instead of 3A).

Sector specific recommendations

The Spanish emission inventory for NMVOC from solvent uses does not take into account, for most of activities considered, improvements in processes of production, nor the impact of regulations implemented at the European level to reduce NMVOC emissions. Two Directives are of interest for this issue: Council Directive 1999/13/EC of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations and Directive 2004/42/EC of the European Parliament and of the Council of 21 April 2004 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 amending Directive 1999/13/EC. According to the information provided, these two Directives have been translated into the Spanish legislation. Spain also ratified the Gothenburg Protocol in 2005 and as all Member States, it is affected by the NEC Directive. The ERT recommends that Spain improve its methodologies of estimations of NMVOC emissions from solvents uses for having a better picture of the present situation and of progress made in Spain to reduce emissions of VOCs. In response to the review Spain indicated that it would strive for implementing the recommendations given by the ERT as far as possible.

3.A. Paints and coatings – NMVOC

3A1: Emissions are derived from the European paint manufacturer association (CEPE) and activity data from the Spanish paint manufacturer association. The derivation of the activity level is robust. The derivation of the solvent content of paints is however just based on data provided by CEPE for 1990, 2000 and 2010 with interpolations for the years missing. This methodology is quite robust but for updates of the solvent content of paints used in building applications and domestic applications for the most recent years it is recommended by the ERT that the implementation of EU Directive 2004/42 be taken into account. The ERT encourages Spain to also consider the first report on the implementation and review of Directive 2004/42/EC of the European Commission (service contract N°070307/2007/483710/MAR/C3 carried out by OKOPOL for the Commission).

3A2: Except for car manufacturing for which a bottom approach is used, NMVOC emissions from other activities considered under this NFR source are based on constant EFs across the time series. The EFs are mainly based on the EMEP/CORINAIR Guidebook. They are robust but currently not representative of the trends in NMVOC emissions, which probably occurred in Spain due to the implementation of Directive 1999/13/EC. The ERT encourages Spain to consider developing methodology compatible with a tier 3 methodology recommended by the guidelines for key sources to better take into account the progress made in the reduction of NMVOCs emissions. Spain is also encouraged to consider its response to the Commission in its second questionnaire on the application of the EU Directive in the EU as a source of information for the inventory.

3A3: The activity is not defined in the IIR report. Only one SNAP activity is included, the 06.01.09. The ERT could not determine in which activity the paint consumption was included. In response to the review Spain indicated that SNAP 060109 has been assigned to 3A3. The ERT noted that the EF used is based on the EMEP/CORINAIR Guidebook and does not take account of Spain's implementation of Directive 2004/42/EC. The ERT encourages Spain to better take into account the penetration of low solvent based paints through the implementation of Directive 2004/42/EC for this activity.

3A3: 2000 and 2001 emissions should be completed for having a complete time series. In response to the review Spain indicated that it would check this issue. The ERT encourages Spain to provide the missing information and provide relevant documentation on methods and recalculations in its future IIE submissions.

3.B. Dry cleaning and degreasing – NMVOC

3B1: Emissions from PER, TRI and TCE are estimated from solvent producer data, which provides a robust approach to emissions estimation. However, for NMVOC Spain uses a simplified methodology for estimating emissions for 3B1 based on an emission factor per employee from the CORINAIR guidebook of 1992. SPAIN explained that metal degreasing is being investigated “to obtain a more representative estimating algorithm and background activity data”. The ERT encourages Spain to consider setting up a methodology compatible with a tier 3 methodology recommended by the guidelines for key sources to better take into account the progress made in the reduction of NMVOCs emissions. A source of information could be the response of Spain to the Commission in its second questionnaire on the application of the EU Directive in the EU.

3B2: Spain makes robust estimates of emissions based on PER consumption provided by chlorinated solvent producers and assumes that PER represents 90% of solvents used. The ERT encourages Spain to investigate and estimate emissions from consumption of solvents other than PER in order to consolidate the estimation of the consumption of non chlorinated solvents.

3.C. Chemical products, manufacture & processing – NMVOC

3C: Emissions are based on constant EFs across the time series. The EFs are mainly based on the EMEP/CORINAIR Guidebook, different versions and also surveys carried out for Spain for some sectors. These emission factors do not take into account emission reductions as a result of the implementation of Directive 1999/13/EC. Spain explained in the response to questions that a study is scheduled for paint and ink production to “raise information on processes and control techniques applied”.

The ERT encourages Spain to develop methodologies that take into account at least the impact of Directive 1999/13/EC for activities which are concerned (rubber processing pharmaceutical product manufacturing, paint, ink and glue manufacturing). For pharmaceutical product manufacturing, the ERT encourages Spain to collect plant emissions data directly from EPRTR. A source of information could be the response of Spain to the Commission in its second questionnaire on the application of the EU Directive 1999/13 in the EU.

3.D. Other solvent uses (including products containing HMs and POPs) – NMVOC

3D1 to 3D3: Emissions are based on constant EFs across the time series. The EFs are mainly based on the EMEP/CORINAIR Guidebook, different versions and also surveys carried out for Spain for some sectors. These emission factors do not take into account emission reductions as a result of the implementation of Directive 1999/13/EC. SPAIN explained in the response to questions that a study is scheduled for other solvents to “raise information on processes and control techniques applied”.

The ERT encourages Spain to develop methodologies that take into account at least the impact of Directive 1999/13/EC for activities which are concerned (Printing industries, fat edible oil manufacturing and application of glues and adhesives in industry). A source of information could be the response of Spain to the Commission in its second questionnaire on the application of the EU Directive 1999/13 in the EU. For the use of domestic products the EF could be reconsidered in the light of recent studies carried out by the Commission (the BIPRO study of 2002 for example “screening study to identify reductions in VOC emissions due to the restrictions in the VOC content of products”).

Agriculture

Review scope

Pollutants reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5}		
Years		1990–2007 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not reviewed	Recommendation provided
4.B	Manure management	NH ₃		
4.D1	Direct soil emissions	NH ₃		
4.F	Field burning of agricultural wastes	NMVOC, CO, PM ₁₀ , PM _{2.5}	NMVOCs not reported	Yes
5E	Other	CO, NMVOC		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.				

General recommendations on cross cutting issues

Completeness: The inventory is complete with respect to the most important sources of emissions. The ERT encourages Spain to include NMVOC emissions from crops in its future reporting of emissions from agriculture but acknowledges that the inclusion of these in the national inventory is still under discussion.

QA/QC procedures: The IIR report for Spain makes no mention of QA/QC checks. The ERT encourages Spain to implement sector specific OA/QC procedures for sectors 4B, 4D and 4F.

Recalculations: Recalculations for poultry and pigs are reported for 2006 in the revised IIR, as are recalculations of stubble burning and rice cultivation. The ERT commends Spain for their documentation of recalculations in the IIR.

Uncertainty: No uncertainty analysis was reported in the IIR for the Agriculture sector. The ERT encourages the Party to undertake **uncertainty** analysis for the agriculture sector in order to help support the improvement process and to provide an indication of the reliability of the inventory data.

Transparency: The IIR is very transparent and well presented/organised for the Agriculture sector. Some specific questions were raised during the review to clarify particular items, as outlined below for 4B and 4D, and satisfactory answers were received. The ERT commends Spain for the thorough presentation of the agricultural inventory and encourages Spain to include some further details explaining trends in emissions, particularly for key categories where there are upward, downward trends or dips and jumps in emissions.

Improvement: Spain has not identified any improvement plans specific to the Agriculture sector. The ERT encourages Spain to identify, in its future IIRs, improvements that are planned or could be undertaken to improve the quality of the inventory. In its response to the review Spain indicated that it plans to provide specific information on improvement plans (and hopefully achievements) in this sector in its next IIR.

Sector specific recommendations

In recent years considerable research has been carried out in Spain to quantify emissions of NH₃ from agricultural sources. Much of this work has appeared in peer-reviewed literature. The ERT encourages Spain to move toward NH₃ emission factors (EFs) derived from this work to give a more accurate estimate of NH₃ emissions than those used for the current submission which are based on default EFs provided by the EMEP/CORINAIR Guidebook. In its response to the review Spain indicated that an in-depth revision of methodology is by now well advanced and it hopes to be able to report on it in its next submission.

4.B Manure management:- NH₃

The ERT identified some dips and jumps in the time series. Spain provided a detailed clarification of these in their response to the review team's questions. The greater than pro-rata increase in emissions of NH₃ from cattle was due to an increase in the proportion of N excreted in and around buildings. Nitrogen excreted in and around buildings has a much greater NH₃ emission potential than N excreted directly to pastures. The ERT encourages Spain to include these explanations for the trends in future IIRs.

4D1 Direct soil emissions – NMVOC from crops

The ERT notes that Spain, on p28 of the IIR report, indicated that NMVOC emissions from crops are not included as 'not considered anthropogenic'. In the new EMEP/CORINAIR chapter 4D there is a default EF for NMVOC emissions from agricultural crops. The ERT acknowledges that the inclusion of these in the national inventory is still under discussion but encourages Spain to consider using these data and including these emissions in future inventory submissions as additional information.

Waste

Review scope

Pollutants reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5}		
Years		1990–2007 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not reviewed	Recommendation provided
6.A	solid waste disposal on land	x		
6.B	waste-water handling	x		X
6.C	waste incineration	x		X
6.D	other waste (e)	x		
Note: Where a sector has been partially reviewed (e.g. some of the NFR) codes please indicate which have been reviewed and which have not in the respective columns.				

General recommendations on cross cutting issues

Completeness: Spain includes all of the most important sources in its waste inventory. However, some NFR6 sources including Waste-water handling and Industrial waste incineration are not included in the estimates. The ERT encourages Spain to improve the completeness of the inventory by including these sources and to describe in its IIR where sources have not been included. In its response to the review Spain indicated that it plans to consider the new (2009 Guidebook) NMVOC emission factor for updating and recalculating the emissions of wastewater handling. Spain considers that NH₃ emissions from latrines are marginal and thus plans to code this activity as “NO” (not occurring). For industrial waste incineration, one plant has been identified and it is planned to gather its relevant background information via an individual questionnaire and estimate emissions and include these emissions estimates for the 2010 submission. The ERT encourages Spain to undertake these improvements and to provide relevant documentation on methods and recalculation in its future IIE submissions.

QA/QC procedures: Spain has identified some basic QA/QC checks in its IIR. The ERT encourages Spain to implement sector specific QA/QC procedures for the waste sector and to describe these in future IIRs.

Recalculations: The ERT identified recalculations in the Spanish timeseries (6A and 6C), justified and explained in the IIR.

Uncertainty: The ERT noted that uncertainties are presented for each pollutant per SNAP group for the waste sector. The ERT encourages Spain to present the uncertainties for the waste according to NFR in order to help support the improvement process when reporting emissions.

Transparency: The IIR is generally transparent and well presented/organised although information about emission factors used is poor for all subsectors. The ERT encourages Spain to include more details in the IIR including information on used emission factors. In its response to the review Spain indicated that there is a plan to make more exhaustive and detailed references to such emission factors and for their inclusion in the IIR.

Improvement: Spain has identified improvement plans for the waste sector. The ERT encourages Spain to implement the plans.

Sector specific recommendations

6.B Waste water handling NMVOC and NH₃

The ERT noted that Spain reported NMVOC and NH₃ emissions as NE for Waste water handling. Spain has responded that no emission factors were available when preparing the report, but that it will include emission estimates for the next reporting round. The ERT encourages Spain to calculate the emissions from 6.B using its own country specific data or the Guidebook. As in paragraph 103, Spain has indicated that it will provide estimates of these emissions in its future submissions.

6.C.b Industrial waste incineration

The ERT noted that activities with industrial waste incineration were mentioned in the IIR but no emission estimates reported. Spain has responded that activity data are not available but that there is a plan to investigate the activity. The ERT encourages Spain to estimate industrial waste incineration and present emissions in its next submission. As in paragraph 103, Spain has indicated that it will provide estimates of these emissions in its future submissions.

6.C.d Cremation Hg

The ERT noted that Hg emissions from Cremation were calculated by emission factors from the Guidebook and questioned how representative these factors were for Spain. In its response to the review questions Spain has indicated that they will carry out investigations on the matter although Spain currently has no new leads on sources of data. The ERT looks forward to seeing the results of these investigations in future IIRs.

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

1. Spain Stage 2 S&A report
2. Spain Stage 1 report 2009
3. Spain's IIR 2009:
4. One other document sent by Spain : Spain National Inventory Report 1990-2006 (SNAP Format, Vol 2).zip
5. 2009ReviewData-NoLinks-v9.xls
6. Response for the questions : Spain reply to Spain-Energy-11-06-09-PreReview1-OK to Send.doc