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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:

TURKEY

CONTENT

INTRODUCTION

1. The mandate and overall objectives for the emission inventory review process under the LRTAP Convention is given by the UNECE document 'Methods and Procedures for the Technical Review of Air Pollutant Emission Inventories reported under the Convention and its Protocols' (1) – hereafter referred to as the 'Methods and Procedures' document.

2. This annual review has concentrated on SO_2, NOx, NMVOC, NH_3, plus PM_{10} & $PM_{2.5}$ and POPs for the time series years 1990 – 2010, reflecting current priorities from the EMEP Steering Body and the Task Force on Emission Inventories and Projections (TFEIP). HMs have been reviewed where possible.

3. This report covers the stage 3 centralised reviews of the UNECE LRTAP Convention and EU NEC Directive inventories of Turkey coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 25th June 2012 to 29th June 2012 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 – Melanie Hobson (United Kingdom), Energy – Ricardo Fernandez (EU/EEA), Transport – Helen Heintalu (Estonia), Industry - Julien Jabot (France), Solvents – David Kuntze (Germany), Agriculture + Nature – Hakam Al-Hanbali (Sweden), Waste – Intars Cakaras (Latvia).

4. Anne Misra 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

2.   PART A: KEY REVIEW FINDINGS

5. This is Turkey's first Informative Inventory Report (IIR) submitted under the Convention and the first time that emission data has been provided for the years 1990 and 2010 only; in 2011, data for 2008 was submitted. The ERT are pleased to see the progress that has been made with emission inventory compilation and reporting.

6. The IIR is generally in line with the EMEP / EEA Inventory Guidebook and the UNECE reporting guidelines and the report authors have acknowledged a few shortcomings which will be included in subsequent IIRs. There are 19 NFR sub-categories listed for which not all pollutants are estimated. It is recommended that priority is given to estimating emissions from these sources in future years. In addition, it is recommended that priority is given to obtaining Turkey specific emission factors where possible as the EMEP / EEA Guidebook is heavily relied upon.

7. Turkey's national greenhouse gas inventory is compiled by TURKSTAT. Currently there are no measures in place to ensure consistency between the two inventories. The ERT fully supports closer liaisons with TURKSTAT and this should be a priority in the coming months.

INVENTORY SUBMISSION

8. Turkey, in its 2010 submission, has reported emissions for its Protocol base year (1990) and 2010 (the latest year) for NOx, SO_2, NH_3 and NMVOCs in the IIR but only provided 2010 emissions in the NFR09 template. No information on any other pollutant or activity data is provided. Turkey has also submitted a detailed IIR. It is recommended that future data submissions include the full time series from 1990 to 2010.

9. Emissions are reported in NFR 09 categories. Tables A-1 and A-2 provide a list of those categories and pollutants where notation keys IE or NE are used. Road transport emissions are calculated based on vehicle kilometres and have been scaled to match the total fuel consumed.

10. The 2010 emissions submitted by Turkey are of generally good quality and are in general well documented in the IIR.

KEY CATEGORIES

11. Turkey has compiled and presented in its IIR a Key Source Category Analysis for the following pollutants: NOx, SO_2, NMVOC and NH_3. The results are generally consistent with those provided by the CEIP in their review. The main difference is that the IIR provides the key categories which comprise more than 95% of the national total in 2010, whereas the CEIP (in accordance with Chapter 2 of the EMEP / EEA Guidebook) provides key categories that when summed together cumulatively add up to 80%. The ERT recommends that all key source categories are calculated using Tier 2 or 3 methods. As this is the first IIR to be provided, the

outcome has not been used to prioritise improvements to date, but it is recommended that the results are taken into account in subsequent inventory compilations.

QUALITY

Transparency

12. The ERT recognises the level of effort undertaken by Turkey in providing an inventory with a significant level of detail. The Party's IIR is detailed and well presented. EF and activity time series are almost always presented in detail (by NFR level), assumptions are indicated and references are given. The ERT encourages Turkey to complement the excellent work done on the IIR with some additional research on the allocation of fuels to different sectors (see below).

13. Turkey uses notation keys (NE where emissions are "Not Estimated", IE where emissions are "Included Elsewhere" and NA where emissions are "Not Applicable") for reporting where estimates are not available. To improve transparency it would be helpful to do further research to confirm the use of IE; for example, it has been assumed that the pulp, paper and print sector is included in 'other industry' (1A2fi) and likewise it has been assumed that mobile machinery is included in stationary combustion.

14. A few minor typographical errors have been found in the text in the IIR. These include the paragraph prior to Table 2.6 (page 41) where it says that "in 1990 national total NH_3 emissions were 1.19Mg and have increased 78% to 2Mg"; it is thought that this should in fact state that in 1990 national total NH_3 emissions were 527Mg and that this amount has decreased to 515 Mg. Another section that needs correcting is on page 35 following the SO_2 graph where it appears that electricity and heat production alone comprises more than 50% of the emissions. Finally, the units of emissions provided in Tables 2.3 to 2.6 need to be corrected as they currently state Mg, when in fact it should say Gg.

Completeness

15. The ERT acknowledges the effort to which Turkey has gone to provide estimates of emissions for all sub-sectors and all pollutants reviewed for 1990 and 2010.

16. Turkey's inventory for the pollutants reviewed is not complete. The ERT recommends that Turkey report the full time series back to 1990 in the NFR09 table format. Table A-1 lists the sectors for which emission estimates have not been provided. This includes estimates for international maritime and industrial waste incineration. It is recommended that priority is given to providing estimates for these sources in future inventories.

17. The CLRTAP data submission, whilst providing emission estimates for four pollutants, does not provide corresponding activity data. This section should be completed in subsequent data submissions.

18. The IIR provides emission estimates for additional pollutants not reported in the CLRTAP data submission. It is recommended that estimates for these are provided in future data submissions in the NFR tables.

Consistency, including recalculations and time series

19. Turkey has not undertaken any recalculations for their 2010 submission as this is the first inventory for which data for 1990 to 2010 is provided. In future submissions, if recalculations are undertaken, then the rationale should be provided as well as the impacts of the changes on the national estimates and the time series.

20. TURKSTAT compiles the Turkey GHG emissions inventory. As noted in the IIR, there is currently no method in place to ensure consistency between the air quality and GHG inventories. The ERT fully supports closer liaisons with TURKSTAT and this should be a priority in coming months.

Comparability

21. The ERT notes that the inventory of Turkey is partly comparable with those of other reporting parties since only 1990 and 2010 are reported. The allocation of source categories follows that of the EMEP/UNECE reporting guidelines. The ERT encourages Turkey to continue with this approach to national inventory calculation.

CLRTAP/NECD comparability

22. Turkey has no emission ceilings under the National Emission Ceilings Directive (NECD) and therefore data is only reported under CLRTAP.

Accuracy and uncertainties

23. Turkey has not compiled quantitative uncertainty estimates for their UNECE submission. The ERT encourages Turkey to compile at least Tier 1 uncertainty estimates for future submissions.

Verification and quality assurance/quality control approaches

24. Turkey has a detailed improvement plan in place and is in the process of developing a complete QA / QC process. The ERT recommends that information on this is included in future reporting.

FOLLOW-UP TO PREVIOUS REVIEWS

25. Turkey submitted their first IIR in 2012 and therefore no previous reviews have been undertaken.

AREAS FOR IMPROVEMENT IDENTIFIED BY TURKEY

Turkey mentioned in their IIR the following planned improvements:

26. Obtaining petrol and diesel consumption data on the road transport sector. Currently only total fuel consumption is available.

27. Obtaining reliable point source data to improve the NOx emission estimates. Questionnaires have been circulated and the feedback obtained will be used in the next inventory cycle.

28. Improving the sulphur content of fuel estimates (especially lignite) and information on the extent to which power plants are fitted with FGD systems.

29. Obtaining information to enable further disaggregation of stationary combustion fuel use data. For example, currently pulp, paper and print combustion is assumed to be included in 'other industry' (1A2f). Likewise, mobile machinery is included in the stationary combustion sector.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS-CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

The ERT identifies the following cross-cutting issues for improvement:

30. Emissions should be reported for the complete time series from 1990 to 2010.

31. Activity data is currently not provided in the CLRTAP submission. It is recommended that this data is included in subsequent years.

32. For a large number of sectors, emission factors from the GB have been used. It would be preferable for Turkey to use Turkey-specific emission factors where possible as this would allow for a more accurate emission inventory to be produced.

33. Fugitive emission estimates are currently not provided due to a lack of activity data. It is recommended that estimates are made for this sector in future. See the comments provided for the energy sector.

34. QA / QC procedures should be set up for future inventory compilations. In addition, it would be preferable for the IIR to include information on uncertainties.

35. There are currently some sectors which are marked as IE. It is recommended that steps are taken to minimise the number of sectors that fall in this category by asking for more detailed fuel consumption data to be provided.

36. Streamlining the activity data between the CLRTAP and UNFCCC inventories, so that consistent inventories can be produced.

ENERGY

Review Scope

NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommen dation Provided
Pollutants Reviewed		SO₂, NOx, NMVOC, PM₁₀ & CO		
Years		2010		
1.A.1.a	public electricity and heat production	X		X
1.A.1.b	petroleum refining	X		X
1.A.1.c	Manufacture of solid fuels and other energy industries	X		
1.A.2.a	iron and steel	X		X
1.A.2.b	non-ferrous metals	X		
1.A.2.c	chemicals	X		
1.A.2.d	pulp, paper and print	IE		
1.A.2.e	food processing, beverages and tobacco	X		
1.A.2.f.i	Stationary Combustion in Manufacturing Industries and Construction: Other (Please specify in your IIR)	X		
1.A.2.f.ii	Mobile Combustion in Manufacturing Industries and Construction: (Please specify in your IIR)	IE	X	
1 A 3 e	Pipeline compressors ?		X	
1.A.4.a.i	commercial / institutional: stationary	IE		X
1.A.4.a.ii	commercial / institutional: mobile ?		X	
1.A.4.b.i	residential plants	X		
1.A.4.b.ii	household and gardening (mobile)		X	
1.A.4.c.i	Agriculture/forestry/fishing. stationary	X		
1.A.4.c.ii	off-road vehicles and other machinery?		X	
1.A.4.c.iii	national fishing?		X	
1.A.5.a	other, stationary (including military)	X		
1.A.5.b	other, mobile (including military, land based and recreational boats)?		X	
1.B.1.a	coal mining and handling	NA		X
1.B.1.b	solid fuel transformation	IE		X
1.B.1.c	other fugitive emissions from solid fuels)	NA		X
1 B 2 a i	Exploration, production, transport	NA		X
1 B 2 a iv	Refining / storage	NA		X
1 B 2 a v	Distribution of oil products	NA		X
1 B 2 b	Natural gas	NA		X
1 B 2 c	Venting and flaring	NE		X
1 B 3	Other fugitive emissions from geothermal energy production , peat and other energy extraction not included in 1 B 2	NA		X
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues.

Transparency:

37. The ERT has found that Turkey's IIR is generally transparent - regarding the methods as well as the activity data and emission factors used to estimate emissions from stationary combustion. In particular, stationary combustion emissions are calculated using Tier 1 methods, activity data from the energy balance, and emission factors from the 2009 EMEP/EEA Guidebook. There is, however, some lack of transparency regarding the source of calorific values used

to convert mass to energy units. During the review, the Party explained that the calorific values were taken from a UK publication *http://www.decc.gov.uk/assets/decc/11/stats/publications/dukes/2293-dukes-2011-annex-a.pdf.* The ERT recommends that Turkey use country-specific calorific values to improve the reliability of activity data underpinning the emissions or to provide clear evidence that the UK calorific values are representative of Turkey's national circumstances in its next inventory submission.

Completeness:

38. Turkey has reported emissions of NOx, CO, NMVOC, SO_2 and PM_{10} for the year 2010. Whereas emission reporting is complete for those pollutants, the Party has not reported the underpinning activity data in the NFR template. The activity data is, however, reported in the IIR. The ERT recommends that the Party reports the underpinning activity data in the NFR, alongside with the emissions, in its next inventory submission.

39. The ERT also recommends that Turkey estimates and reports a full time series starting in 1990 or even 1980 to the extent possible, and fills the gaps where appropriate, so as to facilitate the understanding of air pollution emission trends in the country.

Consistency including recalculation and time series:

40. The ERT notes that according to the Party much of the input activity data underpinning the stationary energy-combustion emissions of air pollutants reported to CLRTAP and much of the greenhouse gases reported to UNFCCC are the same under both Conventions. During the review, the Party confirmed that the same energy balance, from the Ministry of Energy, is used by the Ministry of Environment and Urbanisation (responsible institution for the CLRTAP inventory) and TURKSTAT (responsible institution for the UNFCCC inventory) for reporting under both Conventions. The ERT commends Turkey for this coordinated effort, but notes that the Party has no means of ensuring consistency between both inventories. The ERT recommends that Turkey improves the coordination between the responsible institutions in order to ensure the consistency between air pollutants reported under CLRTAP with GHG emissions (and air pollutants) reported under UNFCCC for the energy sector.

41. The ERT cannot assess whether Turkey's inventory submission for stationary combustion is internally consistent, and whether the same methodologies have been applied to other years, reported in previous submissions. As stated in the IIR, no recalculations have been made by the Party. The ERT recommends that Turkey improves the IIR description of how it ensures consistent emission estimates for all years of the time series, as reported in different submissions.

Comparability:

42. The ERT believes Turkey's inventory estimates for stationary combustion have been calculated in a manner consistent with the methodologies described in the

2009 EMEP/EEA Guidebook. The ERT commends Turkey for following the Guidelines for Reporting Emissions Data under CLRTAP, which helps ensure the comparability of its emission estimates with those from other Parties.

Accuracy and uncertainties:

43. Turkey has not carried out an uncertainty analysis in its 2012 inventory submission. The ERT recommends that the Party quantifies the uncertainties in its emission estimates for stationary combustion, using the most appropriate methodologies available, and considering the guidance provided in the Guidebook to help prioritise inventory improvements.

Improvement:

44. The ERT commends Turkey for its first inventory submission under CLRTAP and for the generally transparent reporting of emissions, methods and activity data in its IIR.

Sub-sector Specific Recommendations.

Category issue 1: 1.A.1.a (public electricity and heat production): activity data, emission factors, emissions

45. Page 43 of the IIR states that the 'public sector' has 18 thermal power plants: 12 run by coal, 4 by natural gas and 2 by fuel-oil and diesel. Electricity generation in Turkey is divided into a public and a private sector (each approximately 50%). During the review, the Party indicated that all power plants (public and private) are reflected in the energy balance, and therefore in the estimation of emissions from public heat and electricity production. The ERT notes that these are also key source categories in Turkey. The ERT recommends that Turkey moves from Tier 1 to Tier 3 methods to estimate emissions of SO_2 and NOx from public electricity and heat consumption in future inventory submissions, where possible. The ERT notes that the Party could use the activity data, emissions, and/or emission factors directly from these plants in order to improve the accuracy of its emission estimates. The ERT also recommends that Turkey ensures that plant-specific activity data is fully reflected in the national energy balance and that the energy balance is fully reflected in the NFR reporting tables.

Category issue 2: 1.A.1.b (refineries) and 1.A.2 (manufacturing industries and construction)

46. Turkey has provided a key category analysis for 2010 (level). The ERT notes that some of the apparent non-key source categories could be key sources if the complete time period (1990-2010) is analysed. For instance, NOx emissions from petroleum refining in Turkey's six refineries are increasing rapidly. Also, emissions from all air pollutants reported in the iron and steel sector (NOx, SO_2, NMVOC, PM_{10} and CO) have doubled in the past 20 years. The ERT recommends that Turkey carries out a full key category analysis (trend and level) in its next inventory submission. In addition, the ERT recommends that Turkey moves from Tier 1 to Tier 3 methods to estimate emissions from its key sources,

by making use of plant-specific activity data, emission factors and/or emissions directly, to the extent possible, in order to improve the accuracy of the estimates.

Category issue 3: 1.B (fugitive emissions)

47. Turkey has not reported any estimates from fugitive emissions, arguing that there is a lack of activity data. The ERT notes, however, that there is primary production and imports/exports of crude oil and natural gas, on the one hand, and large volumes of primary production of lignite in the country on the other. These are reported in the energy balance. There are also refining activities in Turkey. However, no fugitive emissions from surface (and possibly underground) mining, or any other source category linked to the production, transport, storage, transmission and distribution of oil and natural gas products have been estimated and/or reported. The ERT also notes that this situation is similar to reporting under UNFCCC. The ERT recommends that Turkey estimates emissions from the relevant fugitive sources, by making use of existing energy-balance data and/or collecting new data, and to report these emissions in future inventory submissions. The ERT also recommends that Turkey ensures that the same activity data is used for reporting under the CLRTAP and UNFCCC conventions.

Category issue 4: 1A stationary combustion and fugitives

48. Turkey uses Tier 1 methods to estimate emissions from stationary combustion. The activity data comes from the national energy balance, and the emission factors are from the EMEP/EEA 'Guidebook'. Under UNFCCC (reporting under the responsibility of TURKSTAT), Turkey seems to use plant-specific data to estimate (GHG) emissions from public heat and electricity production (i.e. UNFCCC 'FCCC/ARR/2011/TUR'). During the review, however, Turkey informed the ERT that plant-specific 'data' is not used in the estimation of GHG emissions reported to UNFCCC. Turkey also mentioned that plant-specific data on stationary sources from energy industries and manufacturing industries and construction are collected by both the Ministry of Energy and the Ministry of Environment and Urbanisation. Turkey informed the ERT of the establishment of a Coordination Board between different data providers to improve the collection and reporting of emissions in future inventory submissions. The ERT commends Turkey for its plans to improve and develop effective coordination between different data providers and institutions. The ERT recommends that Turkey also ensures that inventory compilers have access to all relevant data for the estimation of transparent, accurate, comparable, consistent and complete emission estimates under both CLRTAP and UNFCCC.

Category issue 5: 1.A.4.a (commercial/institutional)

49. Turkey does not report emissions from the commercial/institutional sector, arguing that there is a lack of detailed information in the national energy balance to allocate fuels accordingly. As a result, the 'IE' notation key has been reported and the relevant emissions appear to have beeen included under the residential sector. The ERT notes, however, that Turkey reports the energy balance to Eurostat under the EU Energy Statistics Regulation. The Party's energy balance reported to Eurostat provides the amount of fuel used by the

commercial/institutional sector and the fuel used in the residential sector separately
(*http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/database*).   The ERT recommends that Turkey investigates these differences between its national energy balance and the energy balance reported to Eurostat, to ensure as much consistency as possible between national and international reporting.

TRANSPORT

Review Scope

NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed		NOx, NMVOC, SO₂, NH₃		
Years		2010		
1.A.2.f.ii	Mobile Combustion in manufacturing industries and construction: (Please specify in your IIR)	IE		X
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		X
1.A.3.b.iii	road transport, heavy duty vehicles	X		X
1.A.3.b.iv	road transport, mopeds & motorcycles	X		X
1.A.3.b.v	road transport, gasoline evaporation	X		X
1.A.3.b.vi	road transport, automobile tyre and brake wear	NA		X
1.A.3.b.vii	road transport, automobile road abrasion	NA		X
1.A.3.c	Railways	X		X
1.A.3.d.i (ii)	international inland navigation	NE		X
1.A.3.d.ii	national navigation	X		X
1.A.4.a.ii	commercial/institutional (mobile)	IE		X
1.A.4.b.ii	household and gardening (mobile)	IE		X
1.A.4.c	agriculture / forestry / fishing	X		
1.A.4.c.ii	off-road vehicles and other machinery	IE		X
1.A.4.c.iii	national fishing	IE		X
1.A.5.b	other, mobile (including military, land based and recreational boats)	IE		X
1 A 3 d i (i)	International maritime navigation	NE		X
1 A 3	Transport (fuel used)			

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

General recommendations on cross-cutting issues.

Transparency:

50. Turkey has provided a detailed and generally transparent IIR for transport. The calculation methods and emission factors are considered to be transparent and well described in the IIR. However, the NFR table only contains 2010 emissions including information on the main pollutants.

51. To further improve the transparency of the inventory, the ERT encourages Turkey to submit emissions for all pollutants for the whole period 1990 to 2010 in NFR tables and to include as much information as possible on the activity data used (fuel consumption data by fuel type, sulphur content in fuel, number of vehicles etc.).

52. Not all transport sub-sectors are reported separately. Instead, the notation key IE has been used frequently. The use of the notation key IE is consistent and explained in the IIR but no information is provided in the NFR "Additional info" table. Nevertheless, the ERT encourages the Party to make efforts to calculate

and report these emissions separately in future submission and to fill in the "Additional info" table in the NFR09 template accordingly.

Completeness:

53. The ERT considers the transport sector to be generally complete for most of the main pollutants (NOx, NMVOC, SO_2, NH_3). The other pollutants are not estimated. The ERT encourages the Party to provide such data in NFR tables in next year's submission.

54. Turkey uses the notation key IE frequently. The ERT encourages the Party to make the inventory more complete by reporting all sub-sectors separately.

Consistency including recalculation and time series:

55. Emission trends are provided for the transport sector in the IIR. Trends include emissions data for the period 1990 to 2010 and a comparison with previous year's emissions. However, as mentioned previously, Turkey has only provided data on the year 2010 in the NFR tables. The ERT recommends that the Party further explain the changes in the time series given in the IIR.

56. Turkey has not recalculated emissions for any of the pollutants reported in the inventory since this is the first time it has reported on the transport sector.

Comparability:

57. The methods are applied consistently across the time series according to the information provided in the IIR. Also, the methods and emission factors used are consistent with the EMEP/EEA Guidebook and other countries. However, the Party's submission seems to include minor data mistakes (see sub-sector specific remarks on 1A3dii). The ERT asks the Party to clarify this issue and provide corrected data in the next submission.

Accuracy and uncertainties:

58. Turkey states in its IIR that so far no quantitative uncertainty assessment has been made for any of the pollutants or pollutant groups relevant for this report. In the IIR, only emission factor uncertainties from the Guidebook are highlighted. The ERT encourages the Party to undertake an uncertainty analysis for the transport sector in order to help inform the improvement process and to provide an indication of the reliability of the inventory data.

59. Turkey has described some QA/QC activities in its IIR and stated that a quality management system will be developed over the next few years. The ERT welcomes the Party's intentions and encourages it to implement sector-specific OA/QC procedures for the transport sector.

Improvement:

60. Turkey has several plans to improve the national inventory (e.g. aviation, road transport, railways etc.), which are specified under each sub-sector. The ERT

encourages the Party to make the calculations more precise and eliminate all possible uncertain sources. In addition, the ERT commends the Party for all the work done so far.

Sub-sector Specific Recommendations.

Category issue 1: All transport sectors – PM$_{2,5}$, PM$_{10}$, TSP, CO, HMs, POPs

61. The ERT has noted that Turkey provides emission estimates only for four of the main pollutants in NFR tables. During the review, Turkey stated that they focused on four main pollutants in this year's submission, although other pollutants have also been calculated. Emissions for other pollutants will be added in next submissions. The ERT encourages the Party to provide such data in the next submission in order to make the inventory more complete.

Category issue 2: 1.A.3.d.ii: National navigation (Shipping) – SO$_2$

62. Turkey has indicated in its IIR that the emission factor for SO$_2$ which was used in the emission calculations was 20 kg/tonne. The ERT notes that this is not entirely correct and that the calculation steps provided in the Guidebook should be followed more closely (Chapter: Navigation, p 13, table 3-1, see note 1 below the table).

Category issue 3: 1.A.3.c: Railways – SO$_2$

63. The ERT identified that the SO$_2$ EF for petroleum was marked as NA in the IIR. During the review, Turkey replied that according to national legislation the sulphur content should be 1% for fuel oil, but that for other fuels it is unknown. The ERT encourages the Party to further investigate the sulphur content for other fuels (diesel etc.) and include this in future calculations.

Category issue 4: 1.A.3.a.ii.(i), 1.A.3.a.i.(i), 1.A.3.a.ii.(ii), 1.A.3.a.i.(ii) – All Pollutants

64. Turkey informed the ERT that activity data was interpolated and that this is the reason why emissions are exactly the same for the years 2009 and 2010. The ERT encourages the Party to improve the level of detail for the activity data available in order to improve data accuracy.

Category issue 5: 1A2fii, 1A3di(ii), 1A3di(i), 1A4aii, 1A4bii, 1A4cii, 1A4ciii, 1A5b – All Pollutants

65. The ERT has noted that there are many sectors marked as IE or NE. During the review, Turkey acknowledged that minimising the use of notation keys was a priority for the next submission. The ERT encourages the Party to improve the level of detail for the activity data so that emissions can be calculated separately for these sub-sectors.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		SO$_2$, NOx, NMVOC, CO, NH$_3$, TSP, PM$_{10}$ & PM$_{2.5}$		
Years		1990 – 2010		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
2.A.1	cement production	NE		X
2.A.2	lime production	NE		X
2.A.3	limestone and dolomite use	NE		X
2.A.4	soda ash production and use	NE		X
2.A.5	asphalt roofing	NE		X
2.A.6	road paving with asphalt	NE		X
2.A.7.a	Quarrying and mining of minerals other than coal	NE		X
2.A.7.b	Construction and demolition	NE		X
2.A.7.c	Storage, handling and transport of mineral products	NE		X
2.A.7.d	Other Mineral products (Please specify the source included/excluded in the notes column to the right	NE		X
2.B.1	ammonia production	X		X
2.B.2	nitric acid production	NE		X
2.B.3	adipic acid production	NE		X
2.B.4	carbide production	NE		X
2.B.5.a	Other chemical industry (Please specify the sources included/excluded in the notes column to the right)	X		X
2.B.5.b	Storage, handling and transport of chemical products (Please specify the sources included/excluded in the notes column to the right	X		X
2.C.1	iron and steel production	X		X
2.C.2	ferroalloys production	NE		
2.C.3	aluminium production	X		X
2.C.5.a	Copper Production	X		X
2.C.5.b	Lead Production	X		X
2.C.5.c	Nickel Production	NE		X
2.C.5.d	Zinc Production	X		X
2.C.5.e	Other metal production (Please specify the source included/excluded in the notes column to the right	NE		X
2.C.5.f	Storage, handling and transport of metal products (Please specify the sources included/excluded in the notes column to the right)	NE		X
2.D.1	pulp and paper	X		X
2.D.2	food and drink	X		X
2.D.3	Wood processing	X		X
2.E	production of POPs	X		X
2.F	consumption of HM and POPs (e,g. Electrical and scientific equipment)	X		X
2.G	Other production, consumption, storage, transportation or handling of bulk products (Please specify the sources included/excluded in the notes column to the right)	X		X
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

66. The ERT has noted that Turkey only submitted NECD pollutant emissions for the year 2010 in the NFR table.

67. The ERT has noted that Turkey's IIR considers not only NECD pollutants but also CO and particles (PM_{10}, $PM_{2.5}$ and TSP) for the time period 1990 – 2010. The ERT's review work relied almost exclusively on the data presented in the IIR.

Transparency:

68. The ERT has noted that the industrial processes inventory is well documented and well explained in the IIR. The methodologies, the sources of the activity data, the emission factors and their sources, the emission trends and the improvement plans are well described for activities for which emissions are estimated in the IIR. The ERT has noted that methodology descriptions and improvement plans are also available for sectors for which emissions have not yet been estimated.

69. The ERT considers Turkey's IIR to be transparent, although emissions have not yet been estimated for all sectors.

Completeness:

70. Turkey has only submitted emissions for the year 2010 in the NFR table and only NECD pollutants (SO_2, NOx, NMCOV and NH_3) are available in this table. Recommendations are made in the section "Sub-sector Specific Recommendations" for the pollutants currently not estimated.

71. A lot of activities occurring in Turkey have not yet been estimated. However, these activities have been well identified in the IIR using the notation key "NE". The IIR also provides explanations for the use of this notation key. Recommendations are made in the section "Sub-sector Specific Recommendations" for the sectors currently not estimated.

72. The ERT considers the description of the sources, for which emissions of main pollutants, CO and particles have been estimated, to be complete and well detailed in the IIR.

Consistency including recalculation and time series:

73. Turkey's inventory does not have recalculations since it is its first submitted IIR.

74. Although emissions trends are described transparently in the IIR, the ERT noticed some inconsistencies due to the time-series activity data:

   (a) NH_3, CO and NO_X emissions from 2B1: before 2003

   (b)   NMCOV emissions from 2B5a – polyethylene: before 2005 and after 2008

(c)   NMCOV and PM_{10} emissions from 2B5a – PVC: before 2005 and after 2008

(d) PM_{10} emissions from 2C5a: before 2002 and after 2008

(e) PM_{10} emissions from 2C5b: after 1999

(f) PM_{10} emissions from 2C5d: before 2002 and after 2008

(g) PM_{10} emissions from 2D1: before 2005 and after 2008

75. The ERT recommends that Turkey corrects these inconsistencies and encourages Turkey to use as much as possible data from operators.

Comparability:

76. Turkey has reported an emission inventory according to the reporting requirements. The ERT has noted that the methodologies used (or planned to be used) to estimate emission are based on the latest version of the EMEP/EEA Guidebook.

77. For most of the calculations, a Tier 1 methodology is used. The ERT encourages Turkey to collect more country-specific data and to implement a higher tier methodology, especially for the key sources.

Accuracy and uncertainties:

78. The ERT has noted that no quantitative uncertainty analysis has been performed by Turkey so far. The ERT recommends that Turkey performs an uncertainty analysis and implements sector-specific QA/QC procedures for the industrial sector in the next submission.

Improvement:

79. The ERT commends Turkey for its improvement plan for the industrial process sector. The ERT notes Turkey's intention to improve the completeness, the transparency and the consistency of its inventory.

Sub-sector Specific Recommendations.

Category issue 1: 2B1 – Ammonia production – Activity data

80. There is no activity data available on years before 2003 in the database used for this inventory. The ERT encourages Turkey to collect plant-specific data or to use official national datasets as proposed in the improvement plan. However, if data on some years is missing, Turkey should search for an available parameter on which the production trend can be based.

Category issue 2: 2B5a – Fertilizer production – $PM_{2.5}$

81. TSP and PM_{10} emissions are estimated by Turkey for this sector but $PM_{2.5}$ emissions are not. The ERT encourages Turkey to estimate also $PM_{2.5}$ emissions.

Category issue 3: 2B5a – Polyethylene manufacture – Activity data

82. There is no activity data available on the years before 2003 and after 2008 in the database used for this inventory. The ERT encourages Turkey to collect plant-specific data or to use official national datasets as it is proposed in the improvement plan. However, if data on some years is missing, Turkey should search for alternative available parameters on which the production trend can be based.

Category issue 4: 2B5a – Polyvinylchloride production – Activity data

83. There is no activity data available on the years before 2003 and after 2008 in the database used for this inventory. Then, the ERT encourages Turkey to collect plant-specific data or to use official national datasets as proposed in the improvement plan. However, if data on some years is missing, Turkey should search for alternative available parameters on which the production trend can be based.

Category issue 5: 2C1 – Iron and steel production – All pollutants

84. For this sector, only NMVOC and PM_{10} emissions are estimated by Turkey using the Tier 1 emission factors given in the EMEP/EEA Guidebook. The Guidebook gives also emission factors for other pollutants such as TSP, $PM_{2.5}$, heavy metals and POP. The ERT recommends that Turkey estimates also TSP and $PM_{2.5}$ emissions. And the ERT strongly encourages Turkey to estimate emissions of heavy metals and POP for which emission factors are available in the EMEP/EEA Guidebook.

Category issue 6: 2C3 – Aluminium production –All pollutants/Activity data

85. For this sector, NOx, SO_2, CO and PM_{10} emissions are estimated by Turkey using the Tier 1 emission factors given in the EMEP/EEA Guidebook. The Guidebook gives also emission factors for other pollutants such as TSP, $PM_{2.5}$, and POP. The ERT recommends that Turkey also estimate TSP and $PM_{2.5}$ emissions. The ERT also strongly encourages Turkey to estimate emissions of POP for which emission factors are available in the EMEP/EEA Guidebook.

86. A foreign database is used as activity data for this sector. The ERT encourages Turkey to collect plant-specific data or to use official national datasets as proposed in the improvement plan. The ERT also recommends that Turkey estimate emissions from secondary aluminium production, which is identified as a missing source in the IIR.

Category issue 7: 2C5a – Copper production –All pollutants/Activity data

87. For this sector, only PM_{10} emissions are estimated by Turkey using the Tier 1 emission factors given in the EMEP/EEA Guidebook. The Guidebook gives also emission factors for other pollutants such as TSP, $PM_{2.5}$, heavy metals and POPs. The ERT recommends that Turkey also estimate TSP and $PM_{2.5}$ emissions. In addition, the ERT strongly encourages Turkey to estimate

emissions of heavy metals and POPs for which emission factors are available in the EMEP/EEA Guidebook.

88. There is no activity data available on the years before 2002 and after 2008 in the database used for this inventory. The ERT encourages Turkey to collect plant-specific data or to use official national datasets as it is proposed in the improvement plan. However, if data on some years is missing, Turkey should search for alternative available parameter on which the production trend can be based.

Category issue 8: 2C5b – Lead production – All pollutants/Activity data

89. For this sector, only PM_{10} emissions are estimated by Turkey using the Tier 1 emission factors given in the EMEP/EEA Guidebook. The Guidebook gives also emission factors for other pollutants as TSP, $PM_{2.5}$, heavy metals and POP. The ERT recommends that Turkey also estimate TSP and $PM_{2.5}$ emissions. In addition, the ERT strongly encourages Turkey to estimate emissions of heavy metals and POPs for which emission factors are available in the EMEP/EEA Guidebook.

90. There is no activity data available on the years after 1999 in the database used for this inventory. The ERT encourages Turkey to collect plant-specific data or to use official national datasets as it is proposed in the improvement plan. However, if data on some years is missing, Turkey should search for alternative available parameter on which the production trend can be based.

Category issue 9: 2C5d – Zinc production – All pollutants/Activity data

91. For this sector, only PM_{10} emissions are estimated by Turkey using the Tier 1 emission factors given in the EMEP/EEA Guidebook. The Guidebook gives also emission factors for other pollutants as TSP, $PM_{2.5}$, heavy metals and POPs. The ERT recommends that Turkey also estimate TSP and $PM_{2.5}$ emissions. In addition, the ERT strongly encourages Turkey to estimate emissions of heavy metals and POPs for which emission factors are available in the EMEP/EEA Guidebook.

92. There is no activity data available on the years before 2002 and after 2008 in the database used for this inventory. The ERT encourages Turkey to collect plant-specific data or to use official national datasets as proposed in the improvement plan. However, if data on some years is missing, Turkey should search for alternative available parameters on which the production trend can be based.

Category issue 10: 2D1 – Pulp and paper production – Activity data /TSP & $PM_{2.5}$

93. There is no activity data available on the years before 2005 and after 2008 in the database used for this inventory. The ERT encourages Turkey to collect plant-specific data or to use official national datasets as proposed in the improvement plan. However, if data on some years is missing, Turkey should search for alternative available parameters on which the production trend can be based.

94. For this sector, only PM_{10} emissions are estimated by Turkey using the Tier 1 emission factors given in the EMEP/EEA Guidebook. The Guidebook gives also emission factors for TSP and $PM_{2.5}$. The ERT recommends that Turkey also estimate TSP and $PM_{2.5}$ emissions.

Category issue 11: 2D2 – Food and drink production – Activity data

95. There is no activity data available on the years before 2006 in the database used for this inventory. The ERT encourages Turkey to collect plant-specific data or to use official national datasets as proposed in the improvement plan. However, if data on some years is missing, Turkey should search for alternative available parameters on which the production trend can be based.

Category issue 12: 2F – consumption of HM and POP

96. This activity is not considered in Turkey's IIR. No emissions are estimated and no improvement is planned for this sector. The ERT encourages Turkey to estimate emissions from this activity. The EMEP/EEA Guidebook Tier 1 methodology can be easily set up since it provides emission factors per capita.

Category issue 13: 2 - Industrial process – Activity data/PM, HM and POP

97. For the sectors for which emissions have as yet not been estimated, the ERT encourages Turkey to focus on activity data which can be easily used with Tier 1 emission factors given by the EMEP/EEA Guidebook. Indeed, the ERT encourages Turkey to collect strong reliable activity data.

98. For most of the sectors, Turkey's inventory provides only emissions of the NECD pollutants (NOx, SO_2, NMCOV and NH_3). Since the EMEP/EEA Guidebook is used by Turkey as a baseline for inventory compilation, the ERT strongly encourages Turkey to estimate emissions of other pollutants using the available emission factor in the Guidebook.

Category issue 14: 2A – Mineral Industry - All Pollutants

99. Emissions from these activities have as yet not been estimated by Turkey. The ERT recommends that Turkey estimates emissions from this activity as planned in the improvement section.

SOLVENTS

Review Scope

NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed		NMVOC		
Years		1990 – 2010		
3.A.1	Decorative coating application	**X**		X
3.A.2	Industrial coating application	**X**		X
3.A.3	Other coating application (Please specify the sources included/excluded in the notes column to the right)	**X**		X
3.B.1	Degreasing	**X**		X
3.B.2	Dry cleaning	**X**		X
3.C	Chemical products,	X		X
3.D.1	Printing	**X**		X
3.D.2	Domestic solvent use including fungicides	X		X
3.D.3	Other product use	X		x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency:

100.   The ERT commends Turkey for reporting, for the first time, such a detailed and transparent inventory. Estimates are provided at the most detailed level for all solvent sectors. Turkey's methodology and emission factors in the IIR are considered by the ERT to be transparent and well described for the solvent sector. The ERT encourages the Party to improve information in the IIR on 3B and 3D2 and to replace the incorrect text. The ERT recognises that the Party agreed with these proposals during the review process.

Completeness:

101.   The NFR tables have empty cells for some pollutants and NFR codes. The ERT encourages the Party to fill these gaps with data or the correct notation keys.

102.   For 3D2, NE is reported. Turkey answered in the review that national data could not be collected. Data for solvent use containing inks, ink types will be collected in coming years. ERT encourages Turkey to report these emissions in the next submission.

103.   Emissions from 3D3 are also reported as NE. The ERT encourages Turkey to collect data for this sector and to report the corresponding emissions.

104.   Turkey reports emissions based on a Tier 1 method for 3A1, 3A2, 3A3 and 3B. However, these sectors are key categories and therefore Tier 2 or 3 methodologies should be used. Turkey informed the ERT during the review that

they plan to use national data for 3A1 and that the availability of data is currently being evaluated. National databases have been established for this purpose and this data will be evaluated before being used. ERT commends Turkey for having started the process of preparing a higher tier method for 3A1 and encourages the Party to continue with its plans. ERT encourages Turkey also to report the sectors 3A2, 3A3 and 3B using a higher tier level and to proceed with the improvement plans according to the priority of the sectors.

Consistency including recalculation and time series:

105.   As Turkey has submitted its first inventory there are no recalculations.

106.   Turkey has only reported data for 2010 in its NFR table. However, Turkey informed the ERT that emissions for the complete time series had been calculated but were not reported in the NFR tables due to internal problems.

107.   Turkey reports NMVOC emissions in the IIR for 3A2 on p. 183 "The drop in emissions in 2007 is due to different statistics for automobile and mini-/midibus manufacture for this year compared to the other years. The statistics will be checked and emissions corrected if relevant, for the next submission." ERT encourages Turkey to do so.

108.   In Sector 3C1, tyre manufacturing and textile industry, the time series shows a big jump between 2006 and 2008 - due to a change of the data source for activity data. The ERT encourages Turkey to obtain a consistent time series for the complete reporting period. The ERT notes that Turkey reported during the review that the data set would be checked and that the consistency with the data used in GHG emissions would be evaluated.

Comparability:

109.   Turkey uses Tier 1 methods. Sections 3A1, 3A2, 3A3 and 3B are key categories and, consequently, these should be estimated using a higher tier methodology level.

Accuracy and uncertainties:

110.   The ERT recognises the fact that it is the first time that Turkey has submitted an IIR, but it encourages Turkey to undertake an uncertainty analysis for the solvent sector to help inform the improvement process and to provide an indication of the reliability of the inventory data.

111.   The ERT also encourages the Party to implement sector-specific QA/QC procedures for the solvent sector.

Improvement:

112.   The ERT notes the Party's intention to improve reporting for key categories and encourages it to do so. The ERT also encourages the Party to provide NFR tables for all years. The ERT recommends that the chapter in the IIR for 3B and 3D2 is updated.

Sub-sector Specific Recommendations..

Category issue 1: 3D3 Other product use: - NMVOC

113.   The ERT noted that Turkey used the notation key NA in the NFR table for 3D3, but agreed with Turkey that NE should be used instead.

Sub-sector Specific Recommendations..

AGRICULTURE

Review Scope:

NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed		NOx, NMVOC, NH₃, PM₁₀ & PM₂.₅		
Years		1990–2010		
4 B 1 a	Cattle dairy	X		X
4 B 1 b	Cattle non-dairy	X		X
4 B 2	Buffalo	X		X
4 B 3	Sheep	X		X
4 B 4	Goats	X		X
4 B 6	Horses	X		X
4 B 7	Mules and asses	X		X
4 B 8	Swine	X		X
4 B 9 a	Laying hens	X		X
4 B 9 b	Broilers	X		X
4 B 9 c	Turkeys	X		X
4 B 9 d	Other poultry	X		X
4 B 13	4 B 13 Other	X		X
4 D 1 a	Synthetic N fertilizers	X		X
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products			
4 D 2 a	Off-farm storage, handling and transport of bulk agricultural products			
4 D 2 c	N excretion on pasture range and paddock unspecified (Please specify the sources included/excluded in the notes column to the right)			
4 F	Field burning of agricultural wastes	X		
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 codes have been reviewed and which have not in the respective columns.

General recommendations on cross-cutting issues

114.   Turkey has used the Tier 2 technology-specific approach presented in the EMEP/EEA Guidebook 2009 for the calculation of NH₃ emission from different manure storage systems. Turkey has shown in its report emission trends for NH₃ from manure management and from different animal categories. Emissions of NMVOC and particles from 4.B (manure management) are not reported. The ERT recommends that the Party estimates MNVOC and particle emissions from the agriculture sector and describes their respective trends in future submissions.

Specific recommendations are given in the next sections.

Transparency:

115.   The agriculture inventory for Turkey is generally transparent as the methodologies and activity data for 4. B (manure management) are provided in

the IIR. The ERT commends Turkey for its efforts to make its inventory transparent and encourages the Party to further improve the transparency of its inventory by providing activity data on synthetic fertilizer use and even more details where necessary.

116.   The use of the notation keys in the NFR tables can be further improved, e.g. by marking particle emissions with a proper notation key instead of keeping them blank and also changing NO "not occurring" to NE "not estimated" for emissions of NMVOC from 4.B (manure management), although the amount of emissions of NMVOC is relatively small. The ERT recommends that Turkey uses appropriate notation keys in future submissions.

Completeness:

117.   The CLRTAP submission of Turkey includes emissions from 1990 to 2010. The agriculture inventory covers mainly emission of NH_3. However, MNVOC emissions are only reported from 4.D (Synthetic N fertilizers). As emissions of NMVOC and particles from manure management are not reported, the ERT encourages the Party to complete its inventory by estimating these pollutants in the future submissions.

Consistency including recalculation and time series:

118.   Turkey's 2012 IIR submission is the Party's first submission and therefore recalculations of the agriculture sector are not possible at this stage. The ERT encourages Turkey to provide recalculations of its inventory emissions in future submissions.

Comparability:

119.   Turkey has prepared the agriculture inventory following the recommendations given in the EMEP/EEA 2009 Guidebook. The Party has provided sufficient information in the IIR on EFs, methodologies and key source categories. The ERT notes that the inventory of Turkey is comparable with those of other reporting parties. The ERT commends Turkey on its efforts to use the new NFR09 templates in its first 2012 submission and encourages the Party to continue with this approach.

Accuracy and uncertainties:

120.   Turkey has provided a relatively clear picture of the key sources in the IIR for the agriculture sector. However, an uncertainty analysis has not been provided. The ERT encourages the Party to undertake an uncertainty analysis and to implement QA/QC checks to help prevent errors, inform the improvement process, and provide an indication of the reliability of the inventory data.

Improvement:

121.   Turkey indicated in its report that next year the Party would undertake some improvements in sector 4.B regarding activity data and animal manure management distribution, and regarding activity data on fertilizer use in sector

4.D. The ERT commends Turkey for these improvement plans. The ERT also encourages the Party to further improve 4.B and estimate NMVOC, particles and NH$_3$ emissions from currently missing sources and to provide additional information on activity data, and to include documentation of planned and expected improvements in the IIR.

Sub-sector Specific Recommendations.

4.B (Manure management)

122.   The ERT has found that emissions of NMVOC from 4.B (manure management) are reported using the notation key NA "not applicable". The ERT recommends that Turkey completes its inventory by estimating the emissions of NMVOC or at least by using a proper notation key (NE, "not estimated") in future submissions.

123.   The ERT has also found that emissions of particles from 4.B (manure management) have been left blank in the NFR tables. The ERT recommends that Turkey completes its inventory by estimating the emissions of particles in future submissions.

124.   The ERT asked Turkey during the review process to explain why emissions of NH$_3$ from ducks and geese (4 B 9d Other Poultry) are reported as "NO", not occurred, although activity data is given in the report. The Party responded that manure from this category is solid and does not emit NH$_3$ to the air. The ERT recommends that Turkey estimates NH$_3$ emission from this category in future submissions. Emission factors for ducks and geese are available in the EMEP/EEA Guidebook 2009.

WASTE

Review Scope:

NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed		All		
Years		2010		
6.A	solid waste disposal on land	x		x
6.B	waste-water handling	x		x
6 C a	6 C a Clinical waste incineration (d)	x		x
6 C b	Industrial waste incineration (d)	x		x
6 C c	Municipal waste incineration (d)	x		x
6 C d	Cremation	x		
6 C e	Small scale waste burning	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 codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues.

125.   For Turkey, data on the year 2010 is only available in the NFR table. Turkey reports emissions for 5 (of 8) sub-sectors of the waste sector. Many cells are left blank. There are no entries for activity data in the NFR table. The ERT encourages Turkey to add necessary information to the IIR and NFR tables. The ERT also encourages the Party to provide activity data for sub-sectors where emissions are calculated. In the 2012 IIR, emission trends for the period 1990 to 2010 are presented, indicating that data is available on the years from 1990 onwards. It is not possible to comment on trend fluctuations and time series without emission data pre-2010. NMVOC emissions from solid waste disposal are reported as a key source. The ERT recommends providing more detailed explanations for emission calculations.

Transparency:

126.   Explanations in the IIR about emission calculations are not always clear. More information on activity data sources should be provided. It is not always clear which guidelines have been used for emission calculations.

Completeness:

127.   For sector 6Cb Industrial waste incineration, Turkey reports "NE", not estimated. The ERT recommends that Turkey develops an activity data collection system. A survey of the biggest industrial enterprises can help collect data on waste movements in the industrial sectors. Incineration of industrial waste could be a significant source of emissions.

Consistency, including recalculation and time series:

128.   Emission time series presented in the IIR are not consistent and the explanations of emission fluctuations are not clear. The ERT encourages Turkey

to provide more explanation of emission time series trends for 6Ca Clinical wastes and 6Ce Small scale waste burning sub-sectors. If there are gaps in activity data, interpolation between the closest years for which values are available should be used.

Comparability:

129. Emission calculation methods are explained in the IIR. Emission data are comparable with other countries.

Accuracy and uncertainties:

130. No specific QA/QC procedures are undertaken in Turkey. Some mistakes were made in the IIR figure and table headings. The ERT encourages Turkey to review and make corrections in the IIR waste section.

131. No uncertainty analysis is performed for waste data and emission calculations. The ERT recommends that the Party starts to develop an uncertainty analysis as part of the inventory compilation process.

Improvement:

132. Emission estimate improvements are mentioned in Turkey's IIR. The ERT encourages Turkey to implement the planned improvements. Detailed recommendations are given for the following sub-sectors.

Sub-sector Specific Recommendations.

6A - Solid waste disposal on land

133. NMVOC emissions are based on CH_4 emissions from solid waste disposal. The Party has explained that the increase of NMVOC emissions in this sector is mainly a result of the increasing number of controlled landfills in Turkey and, correspondingly, the availability of more secure data in this sector. The ERT recommends reviewing the data on waste landfilling, because unmanaged waste disposal sites will also emit landfill gas. Assumptions on the amount of waste disposed from 1990 onwards could be used. Blank cells should be filled with the appropriate notation keys.

6B- Waste-water handling

134. Turkey reports NMVOC and NH_3 emissions from this sector. Explanations of the increase in NMVOC emission are given. NH_3 emissions appear to be calculated in the wrong way. Population not connected to sewerage, is used as activity data for emission calculations rather than population numbers using sewerage. The ERT encourages the Party to recalculate NH_3 emissions. If the total population of the country is known then the Party needs to subtract the population connected to sewerage from the total population. In general, NH_3 emissions are expected to decrease due to sewerage systems being developed. Blank cells should be filled with the appropriate notation keys.

6Ca, 6Cb, 6Cc – Waste incineration (clinical, industrial, municipal)

135.   Turkey reports emissions in the sub-sectors 6Ca, clinical waste incineration, and 6Ce, municipal waste incineration. The Party does not provide a clear explanation of the data source used for the amounts of clinical and municipal waste incinerated. Two methods for clinical waste disposal are mentioned in the IIR. The ERT recommends that Turkey provide assumptions on how the amount of incinerated clinical waste is estimated. In the IIR, it is written that municipal waste incineration does not occur in Turkey, but in the NRF table, emissions of SO_2 for this sector are provided. The ERT encourages the party to review the situation with regard to municipal waste incineration and ensure that the NFR and IIR are consistent.

6Cd Cremation

136.   Turkey does not report emissions in this sub-sector. In the NFR tables the notation key "NO", not occurring should be used.

6Ce Small-scale waste burning

137.   Turkey reports emissions in this sector from 1990. More detailed information about the amount of open burning of waste is required. If any assumptions are made, these should be explained in the IIR. Fluctuations in SO_2 and CO emissions in the years 1998 to 2002 should be explained in more detail. The ERT recommends that further information is provided in the next IIR.

6D Other wastes

138.   Turkey does not report emissions for this sub-sector. Blank cells should be filled with the appropriate notation keys.

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

General
No questions raised

Energy
Turkey-stationarycombustion-210612-Q1_27062012.doc
Turkey-stationarycombustion-280612-Q1_A2_28062012.doc

Transport
TURKEY-Transport-13-06-2012-Q1_26062012.doc

Industry
Turkey-Industry-18062012-A1-25062012.doc

Solvent
Turkey-Solvent use-2012-06-19-A1-25062012.doc

Agriculture
Turkey_Initial questions and answers_ Agriculture Nature_26062012.doc

Waste
Turkey-Wastes-22-06-2012-Q11_26062012.doc