



FCCC/WEB/IRI(3)/2003/ITA

4 February 2004

ITALY

REPORT OF THE INDIVIDUAL REVIEW OF THE GREENHOUSE GAS INVENTORY SUBMITTED IN THE YEAR 2003¹

(Centralized review)

I. OVERVIEW

A. Introduction

1. In accordance with decision 19/CP.8 of the Conference of the Parties, the United Nations Framework Convention on Climate Change (UNFCCC) secretariat coordinated a centralized review of the 2003 greenhouse gas (GHG) inventory submission of Italy. The review took place from 8 to 13 September 2003 in Bonn, Germany, and was conducted by the following team of nominated experts from the roster of experts: Generalists – Mr. William Kojo Agyemang-Bonsu (Ghana) and Mr. Jan Pretel (Czech Republic); Energy – Mr. Audace Ndayizeye (Burundi), Mr. Poorundeo Ramgolam (Mauritius) and Ms. Karen Treanton (International Energy Agency, IEA); Industrial Processes – Mr. Jamidu Katima (Tanzania) and Mr. Jos G. J. Olivier (Netherlands); Agriculture – Ms. Tajda Mekinda-Majaron (Republic of Slovenia) and Ms. Penny Reyenga (Australia); Land-use Change and Forestry (LUCF) – Mr. Daniel Martino (Uruguay) and Mr. Nijavalli H. Ravindranath (India); Waste – Ms. Tatiana Tugui (Republic of Moldova) and Ms. Irina B. Yesserkepova (Kazakhstan). Mr. William Kojo Agyemang-Bonsu and Ms. Penny Reyenga were the lead reviewers of this review. The review was coordinated by Ms. Astrid Olsson (UNFCCC secretariat).

2. In accordance with the UNFCCC “Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention”, a draft version of this report was communicated to the Government of Italy, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Inventory submission and other sources of information

3. In its 2003 submission, Italy submitted a complete set of common reporting format (CRF) tables for the year 2001 only, except for tables 5.B and 8(a), and a national inventory report (NIR). Italy used notation keys in a limited way in some of the CRF tables. Where needed the expert review team (ERT) also used previous years’ submission, additional information provided during the review and other information. The full list of materials used during the review is provided in annex 1 to this report.

C. Emission profiles and trends

4. In the year 2001, the most important GHG in Italy was carbon dioxide (CO₂), contributing 84.5 per cent to total² national GHG emissions expressed in CO₂ equivalent, followed by nitrous oxide

¹ In the symbol for this document, 2003 refers to the year in which the inventory was submitted, and not to the year of publication. The number (3) indicates that this is a centralized review report.

² In this report, the term total emissions refers to the aggregated national GHG emissions expressed in terms of CO₂ equivalent excluding LUCF, unless otherwise specified.

(N₂O) – 8.1 per cent, and methane (CH₄) – 6.7 per cent. Perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF₆) taken together contributed 0.7 per cent of overall GHG emissions in the country. The Energy sector accounted for 83.3 per cent of total GHG emissions, followed by Agriculture (7.8 per cent), Industrial Processes (6.3 per cent) and Waste (2.4 per cent). Total GHG emissions excluding LUCF amounted to 545,358.3 Gg CO₂ equivalent and increased by 7.1 per cent from 1990 to 2001.

D. Key sources

5. Italy has reported key source analyses for tier 1 and tier 2 for both level and trend assessment as part of its 2001 submission. As a result of the use of the tier 2 methodology the analysis by the Party identified nine more key sources categories than the secretariat.³

E. Main findings

6. Italy's inventory generally conforms to the UNFCCC reporting guidelines, the *Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC Guidelines) and the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). There have been some improvements over the previous year's submission, such as the inclusion of quantitative key source and uncertainty analyses in conformity with the IPCC good practice guidance. However, further work is needed to improve the transparency of the NIR as regards methods and emission factors (EFs) in some sectors. It is also important that in future CRF tables are provided for all years back to 1990 and that recalculations are documented in CRF table 8 and in the NIR.

F. Cross-cutting topics

Completeness

7. The inventory covers the major source and sink categories for both direct and indirect GHGs included in the IPCC Guidelines. However, Italy has not provided potential emissions for PFCs. Tables 5.B and 8(a) are also not filled in. CH₄ emissions from waste incineration and N₂O emissions from solvent and other product use are not estimated (NE). Italy has not estimated emissions from limestone and dolomite use, and has not submitted complete CRF tables for the years 1990–2000.

Transparency

8. Italy's inventory is not very transparent because only limited documentation is provided, especially on the recalculations performed. The ERT recommends that Italy improve the level of transparency in its inventory preparation, in particular by providing information on any recalculations done and using notation keys consistently in the CRF tables. Notwithstanding these shortcomings, the information contained and the methods described in the NIR should allow for reconstruction of the major parts of the inventory.

Recalculations and time-series consistency

9. Comparison between the 2002 submission and the 2003 submission indicates that Italy has done a considerable amount of recalculation. However, these recalculations are not reported in table 8(a),

³ The secretariat had identified, for each individual Party, those source categories which are key sources in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC good practice guidance. Key sources according to the tier 1 trend assessment were also identified for those Parties providing a full CRF for the year 1990. Where the Party has performed a key source analysis, the key sources presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key source assessment conducted by the secretariat.

although the reasons for some of them (but not all the actual recalculations) are provided in table 8(b). This statement of the reasons is not enough to allow the ERT to assess the impact of the recalculations on the trend in emissions. The sector most affected by the recalculations is Industrial Processes: emissions in 1990 and 2000 are 15 per cent and 11 per cent higher, respectively, in the 2002 submission than in the 2003 submission. Emissions in the Waste sector decreased by 5.5 per cent and 8 per cent for 1990 and 2000, respectively. These recalculations were performed as a result of improvements in the national energy data, improved methodologies and use of the IPCC good practice guidance.

Uncertainties

10. Italy has used the tier 1 approach to estimate uncertainties and indicates that it will use the tier 2 uncertainty analysis in its 2004 submission. In table 7 of the CRF Italy provides qualitative uncertainty estimates.

Verification and quality assurance/quality control approaches

11. The Party has not performed source-specific quality assurance/quality control (QA/QC) activities as described in the IPCC good practice guidance. However, a form of verification and quality control is presented. The ERT encourages the Party to carry out QA/QC procedures as recommended in the IPCC good practice guidance for all key sources and to describe briefly in its next NIR the QA/QC procedures applied by companies that directly report emissions and EFs.

Follow-up to previous reviews

12. Since the previous review the inventory of Italy has seen a considerable improvement. This includes the submission of the first NIR, the quantitative estimation of uncertainties, and the development of tier 1 and tier 2 key source analyses. The major unresolved issues from the previous inventories include the lack of complete CRF tables for the whole time series, including the filling in of the recalculations table.

G. Areas for further improvement

Identified by the Party

13. The NIR identifies several areas for improvement. Italy is planning to undertake further investigation into all relevant sectors that make meaningful contributions to total CO₂ equivalent emissions, especially sectors that have high uncertainties. Italy also plans to establish additional national expert panels in 2004 for the Agriculture and Waste sectors.

Identified by the ERT

14. The ERT encourages Italy to complete the full time series in a consistent manner (i.e., provide full CRF tables, including the use of notation keys, and report recalculations) in its next inventory submission. The ERT further recommends the Party to put in place a national QA/QC plan.

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

II. ENERGY

A. Sector overview

16. In 2001, the Energy sector accounted for 83 per cent of total GHG emissions in Italy (excluding LUCF). The four largest key sources contributed 77 per cent of total emissions: these were CO₂ emissions from stationary sources for gas, oil and coal, and CO₂ emissions from road vehicles. Over the period 1990–2001, GHG emissions from the Energy sector increased by 8.2 per cent. Most of the growth

occurred in the energy industries (+11.6 per cent) and in transport (+23.8 per cent). Combined, these two sectors contributed 63 per cent of total GHG emissions.

17. In general, the NIR is complete and transparent for the Energy sector. Data sources for the key sources and choice of methodology tier are supplied in the NIR and are consistent with the IPCC good practice guidance. Complete CRF tables are lacking for the years 1990–2000.

18. Uncertainties were calculated using the IPCC tier 1 approach. For energy, a low value (3–5 per cent) was attributed to all those activity data (AD) that were taken from the national energy balance and statistical yearbooks, and a medium–high uncertainty (20–50 per cent) to all the data that were not directly, or only partially, derived from census or sample surveys or were estimations. A tier 2 approach will be applied in future submissions.

19. As part of the QA/QC for the Energy sector, Italy has instituted several projects to:

- (a) Improve the national energy balance;
- (b) Produce country-specific EFs for road transport;
- (c) Improve the AD needed as input into the COPERT model for road emissions;
- (d) Disaggregate aviation and marine fuel consumption published in the national energy balance into domestic and international.

20. Recalculation tables have not been completed even though there are a number of changes to data and methods for the Energy sector, for example: the revision of preliminary figures in the national energy data and their sectoral distribution; the correction of double counting; and the addition of estimates for CO₂, CH₄ and N₂O from natural gas road transport. Although the Party comments that the conservative nature of the figures for the base year (1990) has been maintained, since all the revisions to that year were downward, in the interest of transparency the ERT recommends that the Party supply CRFs for the previous years back to 1990 and complete CRF table 8.

B. Reference and sectoral approaches

Comparison of the reference approach with the sectoral approach and international statistics

21. The apparent consumption in the reference approach is 5.1 per cent higher than the data reported to the IEA. Italy has indicated that this is due to the fact that both the CRF and the IEA data were preliminary, but done at different times. The ERT recommends that the QA/QC project described above be continued so as to improve the national energy balance, which would alleviate the problem.

International bunker fuels

22. Figures for international marine bunkers are estimated as follows:

- (a) Total deliveries of fuel oil, gas oil and marine diesel oil to marine bunkers are given in the national energy balance;
- (b) Naval fuel consumption for “small boats” and ferries is also reported in the national energy balance;
- (c) Consumption connected with coastal shipping of all kinds of ships that travel between two Italian ports is estimated by APAT using navigation data and a detailed fuel consumption database for ships (EMEP/CORINAIR, 1996);
- (d) Fuel consumption associated with international marine bunkers is the marine bunkers total minus the coastal consumption. This method differs significantly from the method used to estimate marine bunkers for the IEA. Italy has indicated that, according to its understanding, only “small boats”

and ferries are reported to the IEA. The ERT recommends that this point be clarified with the IEA and the two data sets reconciled.

23. Figures for international civil aviation are estimated as follows:

(a) Data on the annual numbers and types of domestic and international landing and take off (LTO) cycles are used with default EFs to estimate LTO domestic and international emissions;

(b) Total fuel consumption within the cruise phases is calculated by subtracting LTO fuel consumption from total aviation consumption;

(c) Emissions within the cruise phase for both domestic and international aviation are calculated using an estimate for the cruise fuel consumption based on the annual number and type of flights and default EFs. Using this method, emissions from international civil aviation more than doubled between 1990 and 2001. Italy indicates in the NIR that this method may overestimate emissions from aircraft since only a few aircraft types are considered and the default factors used pertain to older models. The ERT notes that Italy is currently considering the use of a more detailed model to estimate aircraft emissions. This method also differs significantly from the method used to estimate fuel consumption for international aviation for the IEA. The ERT recommends that Italy try to reconcile the two data sets.

Feedstocks and non-energy use of fuels

24. In the reference approach, 100 per cent of the carbon was stored for the fuels reported for feedstocks and non-energy use. The Party has explained that the fraction of carbon stored derives from the “net petrochemical input”, whereas the reference in the IPCC Guidelines is to the “gross or total petrochemical input”. Detailed data on the petrochemical sector have been provided in the NIR. However, the ERT recommends that this methodology be further examined during the next in-country visit.

25. There is no additional information in the NIR as to the relationship between the Energy sector and the Industrial Processes, Solvent and Other Product Use, and Waste sectors. The ERT recommends that more documentation be provided on this issue.

C. Key sources

Stationary combustion: gas, oil and coal – CO₂

26. The ERT notes that a project is planned to evaluate the carbon content of crude oil imports in order to “close” the carbon balance in oil refineries, which represents 6.3 per cent of Italy’s CO₂ emissions from the Energy sector, and encourages Italy to start this project.

27. There are some problems in the sector allocation related to iron and steel (although this will not affect the total level of emissions from the Energy sector). Autoproduction in the iron and steel industry has been included in 1.A.1.c Manufacture of Solid Fuels and Other Energy Industries instead of in 1.A.2. Annex 3 of the 2003 NIR contains a description of the estimation of the carbon content of coals used in industry. There may also be a problem with the allocation of the inputs to blast furnaces between the transformation sector and industry. This could explain the carbon gains that are referred to in Annex 3. The ERT recommends that more work is needed on the national energy balance and possibly on the carbon EFs.

Mobile combustion: road – CO₂ and N₂O

28. The implied emission factor (IEF) for natural gas in road transport is high. Italy has indicated that the same EF as for liquefied petroleum gas (LPG) and petrol vehicles has been taken from COPERT III. The high EF may result from the higher percentage of natural gas consumed by bi-fuel (petrol–gas) cars instead of town buses. Italy suggests that from next year it will use a slightly reduced EF, using a

proportional factor taken from the nitrogen oxide (NO_x) emissions data. The ERT recommends that the Party investigate this further.

Fugitive emissions: oil and gas operations – CH₄

29. For oil, emissions are not reported and notation keys are not used for exploration, transport and distribution. Italy has indicated that these emissions should be reported as not occurring (NO). However, since there are emissions from production and refining, it is unlikely that these other emissions do not occur. For gas, the same problem occurs for exploration and other leakage. The ERT recommends that Italy review the accounting for these emissions. The Party, in response to the draft of this report, explained that CH₄ emissions from oil exploration are included in production. Emissions from transport and distribution of oil products results as not occurring. Italy also indicated that it will further investigate and clarify the CH₄ emissions from oil exploration, emissions from transport sector and distribution of product results. For gas, emissions from exploration are included in the production while other leakage emissions are included in distribution emission estimates.

30. CRF table 9 indicates that data on CH₄ from gas venting have been supplied by the relevant industries and are included with natural gas in 1.B.2.b. The ERT recommends that an attempt be made to separate out the venting and show it separately in 1.B.2.c.

III. INDUSTRIAL PROCESSES AND SOLVENT USE

A. Sector overview

31. In 2001, the Industrial Processes sector accounted for 6.3 per cent of total CO₂ equivalent emissions (without LUCF). CO₂ represented 62 per cent of the sector's emissions in 2001, N₂O 26 per cent and fluorinated gases (F-gases) 13 per cent. In the period 1990–2001, Industrial Processes CO₂ equivalent emissions increased by 7 per cent. However, CO₂ levels decreased by 7 per cent and N₂O increased by 22 per cent, whereas F-gas emissions showed a sharp increase of about 150 per cent. Emissions from the Solvent and Other Product Use sector, limited to CO₂, decreased by 27 per cent from 1990 to 2001. For 2001, both actual and potential emissions for individual F-gases were reported, except for PFCs, for which only actual emissions were provided (potential emissions for HFC-23 are zero); for other years only actual emissions per individual compound were provided in the CRF trend table. The ERT recommends that the missing potential emissions be included and encourages the Party to provide an explanation of the changes in potential and actual emissions and in EFs and IEFs in order to maintain time-series consistency.

32. For the Industrial Processes sector, in addition to three key sources identified by the secretariat, the Party also found CO₂ from ammonia production and N₂O from nitric acid production to be tier 1 trend key sources.

33. The recalculation for CO₂ from clinker instead of from cement production represents a major improvement for the sector.

34. Generally the Party has provided sufficient information on the type of methodology used, AD and emission factors, except where the AD were declared confidential by a company. In addition to IPCC methods, IPCC default factors, and country-specific and company-specific EFs, CORINAIR methodologies were used. The ERT recommends that the Party report the IPCC tier to which the CORINAIR methodology corresponds and include information on the country-specific EFs in the NIR.

35. Transparency could also be improved regarding AD not reported for sources that are accounted for in other industrial processes (e.g., CO₂ emissions from limestone and dolomite use and soda ash production). Regarding completeness, the Party has provided all data for the year 2001, except for omissions related to potential emissions of three PFCs and (minor) N₂O emissions for category 3.D. The ERT therefore encourages the Party to report AD for all sources.

B. Key sources

Nitric acid production – N₂O

36. Data on emissions from nitric acid production are only available since 1998 (see the 2003 Synthesis and assessment report (S&A), Part I). According to the S&A report, N₂O emissions have increased by 12 per cent since 1998 because of increased production (with a constant IEF). This contradicts the information in the NIR, which reports that emissions from this source have gone down as a result of a reduction in production. The ERT recommends that the Party check the consistency between the NIR and CRF data, and improve transparency in reporting the complete time series since 1990. Italy in its response to the draft of this report explained that nitric acid production decreased from 1,037 kt in 1990 to 431 kt in 1998 and after stabilized around 500 kt in the last three years and emissions follow the same trend.

Adipic acid production – N₂O

37. Italy has one producer of adipic acid, which currently has no abatement technology installed. The Party uses the IPCC default EF of 0.3 t/t for the years since 1998. However, in 2001 this was changed to 0.33 t/t, based on an EF provided by the national producer, but previous years were not recalculated. In its response to the draft of this report Italy indicated that recalculations were done for the whole time series using the emission factor of 0.33 t/t supplied by the producer. The NIR states that AD were supplied by the National Institute of Statistics (ISTAT) and by the producer. The emissions have increased by 35 per cent since 1998 (2003 S&A, Part I). The ERT recommends that Italy provide information on the QA/QC procedures used by the producer to arrive at the plant-specific EF that is reported to the inventory agency, in order to comply with the IPCC good practice guidance.

Consumption of halocarbons and SF₆ – F-gases

38. Italy uses higher-tier methods to estimate actual emissions of HFCs and PFCs, and emissions from ozone-depleting substances (ODS) substitutes (IPCC tier 2a), and to calculate SF₆ emissions (IPCC tier 3c). Activity data for potential emissions are provided by the producing company or consuming companies, except for HFC-23 and three PFCs, for which zero activity is reported for 2001. For HFC-23, Italy confirmed that this is correct (i.e., there is no production, import or export), and for SF₆ it confirms that its use in semiconductor manufacture started in 1998. Although Italy provides all information on the IEFs used in 2001, the NIR does not provide information on the EFs used in the calculations. The ERT recommends that the Party provide more information on the EFs used, including the rationale for their selection if no IPCC defaults were used, and add information on the potential emissions of all compounds involved, notably perfluoromethane (CF₄) and perfluoroethane (C₂F₆). Moreover the ERT recommends that the Party explain why the recalculation of SF₆ from electrical equipment in 1990–1994 represents an improvement, and that overall time-series consistency be maintained or improved. The Party explained, in its response to the draft of this report, that SF₆ emission estimations from electrical equipment from 1990-1994 have been improved due to the availability of activity data supplied by the producer. These data were not previously available.

Solvent and other product use – CO₂

39. CO₂ emissions for this source category are reported as tier 2 key sources because of their high uncertainty. According to the NIR, all CO₂ emissions that are due to product use are reported; however, the report does not provide a clear description of how CO₂ related to fossil fuel feedstock/non-energy use of fuels is accounted for. The ERT recommends that Italy provide in the NIR for all feedstock/non-energy product use sources of CO₂ a description of the method and factors used, and in particular that it describe in which categories these emissions are reported, how the emissions data are checked for completeness, and how double counting in the national inventory is avoided.

C. Non-key sources

Limestone and dolomite use – CO₂

40. The Party clarified that CO₂ emissions from limestone and dolomite use as defined in the IPCC Guidelines under category 2.A.3 are not included in cement and lime production, as can be inferred from the NIR, but are reported elsewhere under ceramic, glass and paper production. The ERT encourages the Party to improve the transparency and comparability of its calculating and reporting by reporting these emissions under the recommended IPCC source category 2.A.3.

Iron and steel production – CO₂

41. Most of the CO₂ emissions from this source have been reported in the Energy sector (1.A.2.a), predominantly under Solid and Gaseous Fuel Combustion. Since the CRF completeness table does not report that emissions from the reducing agent are included elsewhere (“IE”), the process emissions reported under 2.C.1 seem very low, and are probably reported in the Energy sector. Moreover, no information is provided on the methods used or the selection of the EFs used for this source. To improve transparency and comparability, the ERT recommends the Party to provide this information in the NIR and encourages Italy to try to allocate emissions from the iron and steel industry to the Industrial Processes sector for process emissions and to the Energy sector for fuel combustion emissions, as recommended in the IPCC good practice guidance. If this is not possible, it should be clearly indicated in the CRF and the NIR.

Aluminium production – PFCs

42. The EF for CF₄ from centre worked pre-baked anodes reported by the producer is much lower than the uncertainty range in the IPCC good practice guidance. The ERT recommends the Party to describe how the EF has been determined and to report whether the QA/QC procedures used by the producer to arrive at the plant-specific EF comply with the IPCC good practice guidance. In addition, the Party is recommended to describe when the plants were renovated and how the EFs for years prior to the renovation were determined.

Production of halocarbons and SF₆ – HFCs

43. Fugitive emissions of PFCs and SF₆ are reported as being constant for 1990–1995 and 1996–1998 (at different levels) and zero for 1999 onwards. The ERT recommends the Party to explain the nature of these figures (e.g., whether averages or zero have been used to conceal confidential data). In addition, Italy is encouraged to describe which technical measures have been implemented for reducing or recovery of fugitive HFC emissions. For HCFC-22 production the ERT observed that different methods are reported in the CRF country-specific (CS) and in the NIR (tier 2), and it recommends the Party to correct this.

IV. AGRICULTURE

A. Sector overview

44. The Agriculture sector contributed 7.8 per cent of Italy’s total CO₂ equivalent emissions in 2001 (it contributed 50.2 per cent of CH₄ emissions and 54.7 per cent of N₂O emissions). CH₄ emissions from agriculture decreased by 4.7 per cent over the period 1990–2001, but N₂O emissions increased by 2.8 per cent over the same period. Those changes are mostly due to changes in the animal population and changes in the use of fertilizers.

45. Emissions for 2001 are reported in the CRF tables and are mostly complete. There are some gaps in table 4.B(b) where no notation keys are used. Prescribed burning of savannas (4.E) is reported as “NO”. CRF tables from previous years are not provided.

46. The NIR does not provide sufficient information on the methodologies and EFs to allow replication of the inventory or to assist the review. Significant improvements are required to the documentation of the methods in the NIR, and the additional information boxes should be completed. The NIR states that some details are in Italy's Second National Communication and that all details are in "CRPA, 2000", but no additional information could be found in the national communication and the other publication was not listed in the references. Some new methodologies with regard to N₂O emissions from soils and CH₄ emissions from rice fields are presented, but no detailed information about them is provided. For better transparency it is essential that all information be included in the NIR.

47. Table 8(b) reports a change of methodology for the calculation of emissions from agricultural soils. However, no recalculation tables have been provided so it is not possible to determine whether recalculations have been done for previous years. Quantitative uncertainty estimates are included in the NIR but no information on QA/QC procedures for the Agriculture sector is provided. Italy responded, to the draft of this report that recalculations have been done for the whole time series.

B. Key sources

Enteric fermentation – CH₄

48. The country-specific tier 2 methodology used for cattle results in IEFs that are higher than the IPCC default value for Western Europe. During previous reviews Italy has indicated that the differences reflect national circumstances in terms of the age class distribution of animals and average daily feed intake. This information is not provided in the NIR so it is not possible to check the reasons for the differences in IEFs. For transparency the ERT recommends that information on the livestock characterization be included in the NIR and that the sectoral background and additional information tables of the CRF be completed.

49. For other animals the IPCC default values were used. Emissions from rabbits are also included. The EF for rabbits is 0.08 kg CH₄/head/year, and the NIR reports this as an IPCC default; however, no data for rabbits are included in the IPCC Guidelines. The source of this EF should be documented in the NIR. It is also recommended that the AD for rabbits be checked, as there is a large difference between the numbers reported in the NIR and the Food and Agriculture Organization (FAO) statistics (375 per cent).

Manure management – CH₄

50. A country-specific tier 2 method is used for cattle and swine. For dairy cattle the volatile solids (VS) production is higher than those reported by other Parties which have animals with similar average weights. The IEF for swine falls between the IPCC default values for cool and temperate climates, but no details are provided on the VS production or on the methane correction factor (MCF) used to enable the ERT to review the reasons for this. There is no explanation about the calculation of emissions for buffalo. The VS production and EFs for buffalo are significantly higher than the IPCC defaults for cool and temperate climates.

51. No waste is allocated to pasture range and paddock according to the additional information box of table 4.B(a). This is inconsistent with the reporting of nitrogen (N) excretion in table 4.B(b). It is not clear whether CH₄ emissions from pasture range and paddock have been estimated. The ERT recommends that the calculations of emissions be checked and that the reporting in the additional information tables be corrected. Italy in its response to the draft of this report explained that it used a conservative approach in estimating CH₄ emissions from cows considering all the waste produced, liquid and solid, as recovered and stocked. For better transparency and accuracy the additional information box of table 4.B(a) has to contain the same data about the allocation of manure as in table 4.B(b), which are used also for calculation of N₂O emissions from manure management.

52. As Italy has two climatic regions, the ERT recommends that, in the interests of greater accuracy, animals be separated by region (cool and temperate) and that emissions be calculated using the appropriate climate region MCF or EF.

Manure management – N₂O

53. The method of emissions estimation is stated as default; however, CS EFs were used in some cases. The N excretion values for cattle and swine differ significantly from the IPCC default values. The NIR indicates that the excretion rates are based on recent European literature, but no references or details are provided. The methodology and assumptions used to estimate emissions should be reported in the NIR to assist transparency.

V. LAND-USE CHANGE AND FORESTRY

A. Sector overview

54. The LUCF sector is a net sink, offsetting 18,654 Gg CO₂ equivalent, or 4 per cent of Italy's total GHG emissions in 2001. The magnitude of this sink decreased by 21 per cent during the period 1990–2001, as did its contribution to the national total, which was 5.5 per cent in 1990 and 4.0 per cent in 2001.

55. Reporting in the 2001 CRF is not complete since some tables have not been filled in and notation keys have generally not been used. Non-CO₂ emissions, which may be of a significant magnitude, are also not reported. The Party in its response to the draft of this report explained that land-use changes resulting from forest fires do not occur in Italy (as reported in the documentation box) as a result of current legislation. However, the Party indicated that non-CO₂ emissions from forest fires will be reported in 5.E in the next submissions.

56. Italy has used both the IPCC defaults and country-specific methods and EFs for estimating emissions and removals in the LUCF sector. In general, country-specific EFs and AD (e.g., CO₂ emissions due to forest fires, or estimates of area of abandoned land) are poorly documented. No estimation of uncertainties is provided.

57. Inconsistencies were detected between the NIR and the CRF: methods described in the NIR, chapter 7, are in many cases not reflected in the CRF. The CRF shows recalculated values for LUCF net removals for 1999 and 2000, but the reasons for the recalculation are not provided in table 8(b). In response to the draft of this report Italy explained that information on recalculations is included in the documentation box of table 8(b) and are due to minor modifications of the time-series or single years as a result of basic data updating. The Party was unable to find any inconsistencies that warrants explanations as indicated by the ERT.

B. Sink and source categories

Changes in forest and other woody biomass stocks

58. Only standing carbon pool is included in the report, and no reasons are given for the exclusion of the other forest pools. The NIR indicates that data are available for at least two types of forest. However, only an average value for all forests is reported in table 5.A. The ERT recommends that Italy consider reporting data for individual forest types in future submissions. To address this issue the Party responded to the draft of this report that a conservative approach is used due to lack of reliable factors to estimate other pools.

Forest and grassland conversion

59. Emissions due to forest fires are only partially reported in table 5.A (only CO₂ emissions are reported). Non-CO₂ gases emitted during forest fires are not reported for 2001, although they were reported in previous submissions in table 5.B, and a procedure for estimating these emissions was

detailed in the 2003 NIR. The Party explained that the CRF guidelines are not clear on where these emissions should be reported. The new CRF tables that are being developed will provide clear guidance in this respect. In the meantime, it is recommended that Parties include non-CO₂ gas emissions from forest fires in table 5.B. Italy, in its response to the draft of this report, informed the ERT that it will report these emissions in either table 5.B or 5.E in its next submission.

CO₂ emissions and removals from soils

60. A single value was provided in table 5.D for net changes in the carbon content of mineral soils due to cultivation, for a wide range of vegetation cover types. However, table 5.D was designed to provide information for different soil types (e.g., high-activity, sandy, volcanic, other types) rather than for vegetation cover types. The ERT recommends that the Party provide disaggregated information on the EFs used for different soil types in its future submissions, rather than applying a single EF to very different situations.

VI. WASTE

A. Sector overview

61. The Waste sector contributes 2.4 per cent of total national GHG emissions (excluding LUCF). Total emissions from the sector have increased slightly since 1990 and were 1.3 per cent higher in 2001 than in the base year (1990).

62. Reporting in the CRF tables is largely complete. Emissions from compost production are included in subcategory 6.D Other emissions. The transparency of the country-specific methods could be improved in the NIR. Quantitative estimates of uncertainty are provided but it is unclear how they were obtained (whether they are default values from the IPCC good practice guidance, or the product of expert judgements or statistical assessment). A sector-specific QA/QC plan has not been applied. However, the NIR indicates that verification and controls are done by means of different simple procedures. Recalculated data have not been provided although table 8(b) indicates a change in the EFs used and AD. There are three key sources as defined in the country NIR by level and trend assessment: CH₄ emissions from solid waste disposal sites, and CH₄ and N₂O emissions from waste-water handling. According to the secretariat's analysis only the first of these is a key source.

B. Key sources

Solid waste disposal on land – CH₄

63. CH₄ emissions from managed and unmanaged solid waste disposal sites (SWDS) are reported as 430.99 and 24.03 Gg, respectively. For the sake of transparency and completeness in reporting, the ERT recommends that Italy provide the AD for SWDS in its future submissions. In response to the draft of this report the Party has indicated that the CH₄ emissions from unmanaged SWDS refer to the waste disposed in the past years because from the year 2000 waste is not disposed in unmanaged landfills anymore. The emissions have been calculated with use of first order decay method which corresponds to IPCC tier 2.

Waste-water handling – CH₄ and N₂O

64. The 2001 value of the CH₄ IEF (0.25 kg/kg DC) for industrial wastewater handling is the highest among the reported Parties (0.0003–0.25 kg/kg DC) and it is defined as an outlier. The NIR and the CRF state that EFs and activity data are now provided by the national pulp and paper industry. As recalculation tables are not provided it is unclear whether the new EFs have been applied across the time series. The ERT recommends that CRF tables be provided for all years. The Party in its response to the draft of this report indicates that the value of 0.25kg CH₄/kg DC is the recommended default value in the IPCC good practice guidance as no country specific factors are available. This value is used for the whole time-series. Italy further explains that national data have been used in the calculation of total

COD amount produced for the chemical and pulp and paper source categories, while the IPCC good practice guidance default factors have been used for the other source categories. Furthermore, emissions have been recalculated for the whole time-series for pulp and paper.

65. N₂O emissions from human sewage are reported as “IE”. The documentation box of table 6.B indicates that these emissions are included in the domestic and commercial waste water. No information is available on the methodology or EF used to estimate emissions from this source. The ERT recommends Italy to include this information in future submissions. In response to the draft of this report the Party has indicated that more detailed information on the methodology used will be reported in the next NIR.

Waste incineration – CH₄

66. The CH₄ emissions reported from incineration of removable residues from agricultural production seem high. More detailed information on the methodology used for calculation and the composition of agricultural waste should be provided in the NIR to enable review of this source. In response to the draft of this report the Party has explained that agricultural waste contain mainly olives and wine residues. Total amount and carbon content were estimated using both IPCC and national factors.

ANNEX 1: MATERIALS USED DURING THE REVIEW

A. Support materials used during the review

2003 submission including CRF for year 2001 and an NIR.

2002 submission including CRF for year 2000.

UNFCCC secretariat. "Report of the individual review of the greenhouse gas inventory of Italy submitted in the year 2001 (Desk review)." FCCC/WEB/IRI(1)2001/ITA (available at <http://unfccc.int/program/mis/ghg/countrep/itadeskrev.pdf>).

UNFCCC secretariat. "2003 Status report for Italy" (available at <http://unfccc.int/program/mis/ghg/statrep03/ita03.pdf>).

UNFCCC secretariat. "Synthesis and assessment report of the greenhouse gas inventories submitted in 2003. Part I." FCCC/WEB/SAI/2003 (available at http://unfccc.int/program/mis/ghg/s_a2003.html and Part II – the section on Italy (unpublished).

UNFCCC secretariat. Review findings for Italy (unpublished).

UNFCCC secretariat. "Handbook for review of national GHG inventories." Draft 2003 (unpublished).

UNFCCC secretariat. "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories." FCCC/CP/1999/7 (available at <http://www.unfccc.int/resource/docs/cop5/07.pdf>).

UNFCCC secretariat. "Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention." FCCC/CP/2002/8 (available at <http://unfccc.int/resource/docs/cop8/08.pdf>).

UNFCCC secretariat. Database search tool – *Locator* (unpublished).

IPCC. *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2000* (available at <http://www.ipcc-nggip.iges.or.jp/public/gp/gpgaum.htm>).

IPCC/OECD/IEA. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, volumes 1–3, 1997* (available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>).

IISI (2002). "World steel in figures." 2002 edition (available at <http://www.worldsteel.org/media/wsif/wsif2002.pdf>).

B. Additional materials

Responses to questions during the review were received from Mr. Riccardo de Lauretis (APAT, Environmental Protection Agency) including additional material on the methodology and assumptions used.
