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THE NETHERLANDS

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 the Netherlands. The review took place from 15 to 19 September 2003, in Bonn, Germany, and was conducted by the following team of nominated experts from the roster of experts: Generalist – Mr. Joe Mangino (United States) and Ms. Inga Konstantinaviciute (Lithuania); Energy – Mr. Leif Hockstad (United States), Mr. Michael Strogies (Germany) and Mr. James Magezi-Akiiki (Uganda); Industrial Processes – Mr. Pierre Boileau (Canada) and Mr. Klaus Radunsky (Austria); Agriculture – Mr. Samuel Adejuwon (Nigeria) and Mr. Bhawan Singh (Trinidad and Tobago); Land-use Change and Forestry – Mr. Jozef Mindas (Slovakia) and Mr. Bubu Jallow (Gambia); Waste – Mr. Eduardo Calvo (Peru) and Ms. Angelina Madete (Tanzania). Mr. Radunsky and Mr. Adejuwon were the lead reviewers of this review. The review was coordinated by Ms. Rocio Lichte (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 the Netherlands, 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, the Netherlands submitted all required common reporting format (CRF) tables for the years 1990–2001 together with the national inventory report (NIR) containing background information on the methodologies and emission factors (EFs) used, including methodological changes to the inventory for each Intergovernmental Panel on Climate Change (IPCC) sector, uncertainty analysis, and key source analysis. It should be noted that the NIR follows the latest structure as outlined in the revised UNFCCC reporting guidelines adopted by decision 18/CP.8.² The full list of materials used during the review is provided in annex 1 to this report.

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 The revised UNFCCC reporting guidelines adopted by decision 18/CP.8 will be required for the inventory submissions due in 2004.

C. Emission profiles and trends

4. The time series of emissions/removals from each source and sink category are generally consistent; however, some problems identified in the inventory could affect the consistency of the time series as shown in the sectoral sections of this report. Notable annual fluctuations for national totals (e.g., changes in energy emissions between 1998 and 1999) are explained in the NIR (“Trends” section).

5. In the year 2001, the most important GHG in the Netherlands was carbon dioxide (CO₂), contributing 81.9 per cent to total³ national GHG emissions, followed by methane (CH₄) – 9.3 per cent, and nitrous dioxide (N₂O) – 7.3 per cent. Perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF₆), taken together, contributed 1.5 per cent of the total GHG emissions in the country. The Energy sector accounted for 83.2 per cent of total emissions, followed by Agriculture (7.2 per cent), Industrial Processes (5.0 per cent), Waste (4.0 per cent), and emissions reported under the IPCC sector 7 “Other” (0.6 per cent). Total GHG emissions (excluding Land-use Change and Forestry (LUCF)) amounted to 219,695 Gg CO₂ equivalent and increased by 4.1 per cent from 1990 to 2001.

D. Key sources

6. The NIR identifies 29 key source categories as compared to the 18 key source categories identified in the secretariat’s listing.⁴ The NIR identifies all the categories on the secretariat’s list as well as a number of additional ones that are identified through the tier 2 approach.

E. Main findings

7. The national inventory submitted by the Netherlands is broadly in conformity with the UNFCCC reporting guidelines with a number of exceptions, for example, the time-series consistency issues noted below that need to be improved. The methodologies for estimating GHG emissions are generally consistent with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC Guidelines). Though the expert review team (ERT) recognizes the efforts by the Netherlands to follow the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) as closely as possible, a number of improvements are still possible as shown in the numerous examples throughout the report.

8. The Netherlands uses the option of the category “Other” in the CRF to group existing IPCC categories (e.g., Waste water, Oil and natural gas, and “Other” in Fuel combustion and Industrial Processes). The extensive use of the category “Other” in this way instead of using existing categories makes comparison with other countries’ inventories difficult.

F. Cross-cutting topics

Completeness

9. The majority of the major source/sink categories and direct and indirect GHGs are reported in the inventory. The exceptions are two potentially significant subcategories in the Agricultural soils category (N₂O emissions from crop residues and indirect N₂O from atmospheric deposition) and

³ In this report, the term total emissions refers to the aggregated national GHG emissions expressed in terms of CO₂ equivalent excluding Land-use Change and Forestry, unless otherwise specified.

⁴ 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.

categories 5.B to 5.D of the LUCF sector. The Netherlands informed the ERT about its plans to improve and expand its methodology for N₂O from 4.D Agricultural Soils to include those not reported sources.

Transparency

10. The information provided in the NIR is generally complete and well documented, usually with a high level of transparency; however, the sectoral sections of this report identify a number of areas where transparency needs to be further improved. The NIR includes appendices with additional information, as well as clearly noted website references for key supporting materials.

Recalculations and time-series consistency

11. A discrepancy was noted regarding recalculations of HFC emissions for the year 2000 when the information given in the 2002 submission is compared with that given in CRF table 8(a) of the 2003 submission. The Netherlands explained that this difference was due to an error in the 2002 submission for “HFC-unspecified”. This has been corrected in the 2003 submission using the correct global warming potentials (GWP) of 3000, instead of 2900 used in the 2002 submission.

12. There are apparent gaps in the data for the years 1991–1994 (see Energy and Industrial Processes sections) that are related to the integration of the Dutch Pollutant Emission Register (PER) data set. These gaps are recognized in the NIR, but the consistency of the time series is affected by the procedures used to fill the gaps for those years. The ERT encourages the Netherlands to further improve consistency for the years 1991–1994. The Netherlands informed the ERT that it is presently elaborating methods for improving time-series consistency, transparency and completeness of CO₂ emissions from fuel combustion (in particular for subcategories 1.A.1 and 1.A.2).

13. Overall, recalculations have resulted in changes in total national GHG emissions ranging from –0.1 per cent to –1.7 per cent. These recalculations are the result of relatively minor changes in data or methods since the last submission.

14. The NIR (section ES.1) indicates that the estimates for 2001 are compiled using “preliminary statistics” and are calculated differently from the estimates for other years. In relation to this, a comment in table 8(b) of the CRF for the year 2001 states that data quality for the year 2001 is also influenced by the poor quality of the data for 2000 which form the basis for the provisional 2001 data. It was difficult for ERT to assess what the ultimate impact is on the 2001 emissions and the effect on time-series consistency until final 2001 estimates have been provided.

15. Table 8(b) for the years 1991–1994 and 1998 does not give explanatory information about significant changes which occurred in category 2.B Chemical Industry, as reported in table 8(a) of the same CRF. Though explanations for those changes are provided in the NIR, the ERT encourages the Netherlands to improve its reporting in the CRF with regard to completeness, as well as with regard to consistency between the CRF and NIR.

16. The NIR (section 10.2.1) reports that for the year 2000 recalculations result in a 0.04 per cent increase in the figures for total GHG emissions compared to the 2002 submission. However, CRF table 8(a) reports a 0.04 per cent decrease for the year 2000 as a result of the recalculation. The Netherlands clarified that the correct information is that provided in the CRF (i.e., 0.04 per cent decrease of total emissions as a result of the recalculations).

Uncertainties

17. Uncertainty estimates are based on the IPCC tier 1 method. The results of this analysis are presented both at a summary level and at the individual source category level. The uncertainty of total national emissions is estimated to be approximately 5 per cent (for CO₂ 3 per cent, for CH₄ 25 per cent, and for N₂O 50 per cent).

Verification and quality assurance/quality control approaches

18. Substantial and comprehensive documentation is provided which discusses quality assurance/quality control (QA/QC) issues and the implementation of a system for QA/QC activities in three phases. Also included is a background report on independent QA/QC evaluation of the inventory and of the CRF review and checking procedures.

19. The results of the phase I QA/QC (contained in a background report by Lloyd's Register) highlight a potentially significant QA/QC issue: as noted in this background report, the PER process does not include systematic collection of activity data (AD), nor are data collected for all years in the inventory. Issues of quality control related to the PER data are also raised in the NIR as well as in other sector sections below. Large amounts of company data are rejected because of quality problems, and this creates challenges in establishing a consistent set of data sources through the time series. While efforts to address these issues are discussed in the NIR, the ultimate implementation of the formal QA/QC plan will need to demonstrate verification of the consistency of the time series, the procedures used to fill gaps in the data, and the quality of the PER data set. In its response to the draft of this report, the Netherlands informed the ERT that the PER process does include a systematic collection of AD, but that these data are not yet stored in the database. However, the data sources used are documented in meta-data files for each source category (in Dutch) and in a report (Coenen and Olivier, 2003, in English), as described in the NIR, Section 1.6.2. The PER database system is currently upgraded and will in the future also hold the AD and auxiliary data for completing the CRF files.

20. A comparison between CRF table 10s5 (Trends) for 2001 and table ES.1 of the NIR executive summary revealed a few discrepancies that may be considered significant when looking at subsector levels. For the years 1997 and 1998, table 10s5 reports values of 19,743 and 20,222 Gg CO₂ equivalent, respectively, for the Industrial Processes sector total; but table ES.1 reports values of 19.1 and 19.8 Tg CO₂ equivalent for the same two years. Also, for 1996, emissions for the Waste sector in table 10s5 are 11,224 Gg CO₂ equivalent, while table ES.1 lists a value of 11.4 Tg CO₂ equivalent.

Follow-up to previous reviews

21. The NIR provides comprehensive documentation, including programme implementation, trend analysis, the development of a QA/QC plan and institutional arrangements. This represents a significant improvement to the Netherlands' NIR in response to past comments from ERTs on lack of documentation. However, problems with the consistency of the data provided within the submission, for example, between the various tables of the CRF, between the CRF and the NIR, and within the NIR, remain to be addressed by the Netherlands. The Netherlands expressed its intention to address those inconsistencies in its next submission.

G. Areas for further improvement

Identified by the Party

22. Among the areas identified for improvement are: the elaboration and implementation of a QA/QC system (the three-phase project to develop the QA/QC system was started in 2001); proposals for improvements resulting from the process of compiling the 2003 submission; re-evaluation of the CO₂ EFs for fuels; and the identification of non-CO₂ sources that are not yet included in the inventory.

Identified by the ERT

23. The major area identified by the ERT for improvement concerns the time-series inconsistencies related to the integration of the PER data, and the related implementation of a formal QA/QC plan that addresses verification and quality assurance of the PER data.

24. In order to improve transparency the ERT recommends that the Netherlands provide appropriate methodological descriptions as well as disaggregated data sources. For reasons of comparability,

categories as defined in the CRF should be used instead of regrouping categories under “Other” (see also paragraph 8). Though the Netherlands referenced sources (Spakman et al. (2003) and Coenen and Olivier (2003)) where such descriptions and data are provided, the ERT encourages the Netherlands to include such information in the NIR to enable the inventory to be reviewed as required by the UNFCCC reporting guidelines.

25. The ERT recommends that QA/QC be improved in order to avoid inconsistencies within the submission, for instance, between the CRF and the NIR, and within the NIR. The Netherlands expressed its intention to address those inconsistencies in its next submission.

II. ENERGY

A. Sector overview

26. Emissions from the Energy sector increased by over 12 per cent from 1990 to 2001. CO₂ emissions from energy industries and transportation were the most important contributors to this trend (CO₂ emissions from these sources increased from 1990 to 2001 by 26 and 22 per cent, respectively).

27. Emissions from stationary fossil fuel combustion in the inventory are primarily calculated using a tier 2 bottom-up approach. Although the NIR provides a large amount of detail and analysis of the inventory, there are numerous gaps in the descriptions of methodology and data sources. Most notably, AD have not been provided at a disaggregated level. The Netherlands does not generally report emissions and fuel consumption at the subsector level. The ERT recommends to correct this, as the NIR acknowledges the possibility of calculation errors in certain subsectors for certain years (when a particular subsector deviates from general sectoral trends): these include iron and steel (1996 and 1997), food processing (1997) and paper production (1999). The NIR does acknowledge data gaps and inconsistencies in the Energy sector, largely as a result of the institutional arrangements within the country. While such candour is appreciated, the ERT recommends that the Netherlands provide further details on steps being taken to improve the inventory. The Netherlands informed the ERT that it is presently elaborating methods for improving time-series consistency, transparency and completeness of CO₂ emissions from fuel combustion, in particular from subcategories 1.A.1 and 1.A.2 (see also paragraph 12 above) using sectoral energy statistics and individual company data.

B. Reference and sectoral approaches

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

28. The NIR acknowledges that there are difficulties in comparing the reference approach to the national approach. Such reasons include: differences in definitions of sources and source groups for CO₂ emissions from fuel combustion; the use of different EFs by the individual reporting firms, in particular for solid fuels; the use of different carbon storage fractions by the individual reporting firms; unclear reporting of the fraction of organic carbon CO₂ emissions in total reported CO₂ emissions; and possible double counting as a result of erroneous supplementary estimates for fossil fuel combustion in cases where data from individual companies contain only partial or no fuel use data. However, in 2001, fuel consumption in the reference approach is ~30 per cent higher than fuel consumption in the national approach, while CO₂ emissions in the reference approach are less than 1 per cent lower than CO₂ emissions calculated using the national approach. These large discrepancies are found across the whole time series: the difference in fuel consumption is 10 per cent or more in all years. In its response to the draft of this report, the Netherlands referred to the conceptual differences between the reference and the sectoral approach as well as to the practical ones listed in Annex 4 of the NIR. As the discussion in Annex 4 focuses on the differences in relation to CO₂ emissions, the ERT recommends expanding the scope of Annex 4 to provide further details on the differences observed in fuel consumption between the reference and sectoral approach.

International bunker fuels

29. The ERT identified problems in the allocation of international bunker fuels in the Netherlands. Specific examples are mentioned below under Mobile combustion: waterborne navigation.

Feedstocks and non-energy use of fuels

30. CO₂ emissions from non-energy/feedstock use of natural gas and oil products are considered to be a key source. Currently, the Netherlands uses a tier 1 methodology for estimating CO₂ emissions from this source, which does not comply with the IPCC good practice guidance. The Netherlands has calculated a country-specific storage factor for non-energy/feedstock calculations. This storage factor was developed from a 1992 analysis of the industry, which may prove to be out of date. Given the importance in the Netherlands of the chemical feedstock industry, the ERT recommends a significant revision and expansion in the discussion of the non-energy uses of fuels. The Netherlands informed the ERT that it is working on improvements in the method and data for calculating these emissions.

Country-specific issues

31. The Netherlands has implemented a temperature correction factor for natural gas use in the residential subsector (residential space heaters use natural gas almost exclusively) for policy purposes. These corrected data are provided in the NIR in addition to the data without temperature correction provided in the CRF tables.

32. The NIR acknowledges that there are problems with the fuel consumption data for 1991–1994 and seems to indicate that the problems with underlying data for these years cannot and will not be solved in the future. Total energy consumption reported in table 1.A(a)s1 in the energy industries, particularly for solid fuels and other fuels, in 2000 seems overly high and inconsistent with the data reported for the other years (e.g. for the year 2000 energy consumption is about 50% higher than for the year 2001 and even 75% higher than for the year 1999). In describing the methodology for calculating CO₂ emissions, the NIR states that 75 per cent of emissions are directly reported, while the remainder are calculated on the basis of remaining fuel consumption (the difference between national energy statistics for the sector and energy consumption reported by emissions-reporting companies). Given that only limited fuel-use data are provided with emission reports, and given the difficulties of comparing fuel consumption in the reference and the sectoral approaches, the accuracy of this methodology is unclear. In view of the importance of transparent and consistent fuel consumption data to the calculation of emissions from energy sources, the ERT recommends that the Netherlands make significant improvements in its NIR and the CRF tables.

C. Key sources

Stationary combustion: public electricity and heat production

33. The figures for CO₂ emissions in 2000 from the category 1.A.1.a Energy Industries – Public Electricity and Heat Production – Solid Fuels appear to be inconsistent with the rest of the time series (they are reported as 99 per cent less than the 2001 value). At the same time, the figures for CO₂ emissions from Other fuels were markedly higher in 2000. The NIR states that emissions reported without fuel type information are responsible for the inconsistency. It is unclear what type of QA/QC/verification procedures have been used to ensure that the EFs were properly allocated for the calculations of Other fuels. The Party should note what is being done to eliminate this problem in its future NIRs. The Netherlands explained this situation as being due to its current procedures in the database for allocating fuel data to the “other fuels” category⁵. At the same time the Party referred to a

⁵ The Netherlands explained this procedure as follows: Before the data from the national inventory are included in the CRF, the implied emission factors for CO₂ is calculated for each relevant record in the database. If the emission divided by the fuel consumption yields a value which differs more than 10 per cent from the Dutch standard emission factor, the emissions and fuel data will be allocated to the “other fuel” category in the CRF.

program it has in place that is aimed at increasing the quality of emissions and fuel data (see also comments on paragraphs 12 and 27).

34. No CH₄ or N₂O emissions are reported for solid fuels from 1.A.1.a Energy Industries – Public Electricity and Heat Production in some years. The Netherlands expressed its intention to include these estimates in the submission 2005.

35. Waste incineration is included under the Public Electricity and Heat Production category, but the source category is discussed under the Waste sector (with details on the carbon contents of combusted materials). Further details should be provided as to the contribution waste incineration makes to the Public Electricity and Heat Production category. The Netherlands expressed its intention to include such information in future NIRs.

Mobile combustion: road vehicles – N₂O

36. The key source analysis in the annexes to the NIR (table A.1 – Overview) excludes N₂O from road traffic as a key source, but this is considered to be a key source within the main body of the NIR (box 3.2). The Netherlands clarified that N₂O from road traffic was erroneously not listed in the table of key sources in the annex to the NIR. The ERT recommends the Netherlands to improve consistency within the various elements of the submission.

37. The EFs used for N₂O are partly country-specific and partly IPCC default values. The resulting implied emission factors (IEFs) are below the average IEF derived from all countries: for example, that for gasoline is 50 per cent below and that for diesel is 15 per cent below.

Mobile combustion: waterborne navigation

38. The NIR states that there are country-specific problems in the production of energy consumption figures. It states that national navigation may possibly use bunker fuels. This leads to underestimation of emissions caused by waterborne navigation. It has been noted as a key source, so this allocation problem should be solved. There is underestimation of total national CO₂ emissions, since some emissions (waterborne navigation and national fisheries) are partly allocated to international bunker activities. The NIR states that research has been started in this field.

Fugitive emissions from oil and natural gas

39. Oil and gas handling is reported as a key source in the NIR. Country-specific methodologies and EFs have been used, but not enough detail is given to allow comparison with the IPCC methodology. The present method does not fully comply with the IPCC good practice guidance; the data for production of oil and gas could not be disaggregated into the IPCC categories Exploring, Production/processing, Venting and Flaring. Thus, only totals for the production of oil and gas are available. The Party should provide more details on the methodology used and try to disaggregate the data as much as possible. The uncertainties in CH₄ emissions from gas production and gas distribution are estimated to be 25 per cent and 59 per cent for annual emissions, respectively.

40. CH₄ emissions have been fluctuating annually. However, there is a net decrease of 25 per cent from 178.8 Gg in 1990 to 134.3 Gg in 2001. This reduction is mainly attributed to the implementation of cost-effectiveness measures to prevent venting of natural gas during production. The high emissions of 1996 are attributed to the relatively low temperatures in that year which led to high gas production and consumption.

D. Non-key sources

Stationary combustion: biomass

41. The Netherlands acknowledges that the inventory of biomass emissions is of poor quality. No improvement plan or timetable has been provided in the NIR. The Netherlands however explained that

improvements of biomass emissions are planned as part of the improvement programme on CO₂ from non-energy/feedstock use (see paragraph 30).

Fugitive emissions from oil and natural gas – CO₂

42. A country-specific methodology comparable to the IPCC tier 3 methodology has been used for estimating CO₂ emissions since 1999. For earlier emissions, a tier 1 methodology has been used. Country-specific EFs have been used, but not enough detail is given to allow comparison with the IPCC methodology. CO₂ emissions increased from 308 Gg in 1990 to 460 Gg in 1991, and decreased to 190 Gg in 1994, but then rose again steadily to 1,666 Gg in 2001. This increase is attributed to the increase in non-combustion emissions as reported by the refineries. The Party should provide a more detailed explanation of the fluctuations in the emissions. The NIR lacks discussion on time-series consistency since two different methods are used. The Netherlands informed the ERT that these CO₂ emissions are part of the improvement programme on CO₂ emissions from fuel combustion and non-energy/feedstock use (see also paragraphs 12 and 27).

III. INDUSTRIAL PROCESSES AND SOLVENT USE

A. Sector overview

43. Emissions from the Industrial Processes sector decreased by 21.4 per cent between 2000 and 2001, and are now 36 per cent below the 1990 level. Total CO₂ emissions from the sector decreased by almost 29 per cent from 1990 to 2001, while CH₄ and N₂O emissions decreased by approximately 57 per cent and 13 per cent, respectively. HFC and PFC emissions decreased by 64 per cent and 40 per cent, respectively, between 1990 and 2001, while SF₆ emissions increased by 58 per cent. This sector contributed 0.6 per cent of total CO₂ emissions in 2001 and 0.15 per cent of total CH₄ emissions. N₂O emissions from Industrial Processes accounted for 40.9 per cent of total N₂O emissions.

44. The Netherlands inventory for this sector is tightly linked to the PER. The PER has a number of QA/QC elements in it to ensure the integrity of the reports submitted; however, the Netherlands recognizes that these do not completely fulfil the UNFCCC requirements. No information is provided on the areas where the QA/QC plans may differ. Data reported to the PER by industrial facilities are not necessarily disaggregated between combustion and process emissions, so that certain assumptions have been used to separate the data for the purposes of reporting under the UNFCCC requirements, but little information is provided in the NIR as to how this is done. The discussion on the use of the PER data is clear and transparent. However, there is an element missing related to how bottom-up emissions are reconciled with top-down emission estimates when coverage in a particular industrial sector is incomplete. This reconciliation process would apply for fuel combustion and industrial processes emissions. The ERT would welcome additional explanation of these issues in the NIR. The Netherlands referenced the source (Spakman et al. (2003)) where these issues are discussed and expressed its intention to include such information in future NIRs.

B. Key sources

2.B.2. Nitric acid production – N₂O

45. Recalculations from this source for all years have been included in the 2003 submission. This is an improvement with regard to the 2002 submission, in which recalculations were reported only for 1990, 1995 and 2000.

46. Emission estimates are stated as being 50 per cent uncertain. However, the methodology used includes measured emissions data from industrial facilities. The uncertainty of this approach should not be as high as this unless there is an expectation that some emissions may not be captured by this data collection process. The Netherlands acknowledges the need for integral re-evaluation of uncertainties.

47. AD and EFs are considered confidential for this source. The Party should provide more justification for listing this information as confidential.

2.E Production of halocarbons and SF₆ – HFCs, PFCs and SF₆

48. Emissions in this category decreased by more than 25 per cent between 2000 and 2001. HFC-23 emissions from HCFC-22 production are the main type of emissions here, with almost 450 Gg CO₂ equivalent in 2001. Emissions of HFCs in the “Other” category are also significant. The Other category has been labelled as “all other emissions”. This category appears to contain an error in CRF table 2(I)s2. While the HFC total for this category should be 191.7 Gg CO₂ equivalent, a figure of 140.2 Gg CO₂ equivalent has been put in manually into table 2(I)s2. The Netherlands clarified that 191.7 Gg CO₂ equivalent was the correct value. It would also be useful, to improve transparency, to specify the industrial sectors included in the “Other” category. According to the response provided by the Netherlands, these emissions result from activities that vary from year to year and originate from the company that also produces HCFC-22.

2.F Consumption of halocarbons and SF₆ – HFCs, PFCs, SF₆

49. HFC emissions in this category have been allocated to refrigeration and air conditioning equipment, and foam blowing. PFC and SF₆ emissions have been allocated under the “Other” category with no specification of which sectors contribute to these emissions for reasons of confidentiality. The NIR does not explain why confidentiality is necessary and, in the interests of transparency, it would be useful to explain why it is required (e.g., because there are fewer than three facilities reporting emissions in this category).

50. Potential emissions are reported as 0.00 for HFCs. However, actual emissions are reported as 1,584 Gg CO₂ equivalent. Potential emissions are calculated from the quantity filled in new products and reported in CRF table 2(II)s2, but it appears that these estimates have not been transferred to table 2(I)s2, so potential emissions are not shown. The ERT recommends that this oversight be corrected. The Netherlands informed the ERT that the value for potential emissions is 2.4 Gg CO₂ equivalent and that data will be included in the submission 2004.

C. Non-key sources

2.C.1 Iron and steel production – CO₂

51. Emissions from the use of coal and coke for non-energy purposes are reported in the Energy sector under category 1.A.2(f) – Other. This is inconsistent with the IPCC good practice guidance. This comment also applies to ferroalloy production and electrode use in aluminium production.

52. The NIR (table 3.24) presents feedstocks used in the Industrial Processes sector separately from those used in the Chemicals sector. These feedstocks used in industrial processes are probably mainly due to the use of coal or coke as a reducing agent in metal manufacture. Emissions are reported as 0.0 from 1991 to 1994. The ERT would welcome further work to make this time series more consistent. In its response to the draft of this report the Netherlands referred to its on-going efforts to improve time-series consistency, transparency and completeness of CO₂ emissions from fuel combustion (particularly for subcategories 1.A.1 and 1.A.2).

2.B Chemical industry – CO₂

53. As noted for iron and steel production, process-related emissions are reported in the Energy sector, in 1.A.2(c). This would not be considered consistent with the IPCC good practice guidance. AD are reported as confidential but no justification is provided. For transparency, it would be useful for the Party to show why these AD have been reported as confidential.

2.C.4 Magnesium production – SF₆

54. SF₆ emissions from magnesium production have not been reported. The Netherlands informed the ERT that this production is not occurring. The ERT recommends to use notation key “NO” in the future.

IV. AGRICULTURE

A. Sector overview

55. Emissions from the Agriculture sector decreased by 10 per cent between 1990 and 2001, mainly because of decreases in CH₄ emissions from enteric fermentation (–20 per cent) and in manure management (–15 per cent) which are due to reductions in the numbers of livestock and manure management policy relating to manure production and field application. Shifts in the proportions of animals of different sub-types in the total animal population also contribute to these decreasing trends.

56. N₂O emissions from agricultural soils represent 44 per cent of GHGs from the Agriculture sector and 3.2 per cent of total national emissions. Since 1998, N₂O emissions from agricultural soils have decreased thanks to a reduction in the use of synthetic fertilizers. Because most changes are minor, emissions estimates have remained relatively unchanged compared to the previous (2002) submission. Estimated uncertainties for CH₄ emissions from manure management from cattle, a key source, are rather high (100 per cent).

B. Key sources

4.A Enteric fermentation – CH₄

57. The ERT noted the low value of the 2001 CH₄ IEF for dairy cattle (81.2 kg CH₄/head/yr) compared to the IEFs from other Parties. The value from the Netherlands seems to correspond more closely to the IPCC default for Eastern Europe. The Party provided a reasonable explanation: the CH₄ IEFs for cattle are based on a country-specific IPCC tier 2 method developed for 1990 and applied to the following years, up to 2001. The Party also stated that specific factors are applied to four dairy and three non-dairy cattle subcategories.

58. On the basis of the data presented in the NIR (table 6.4) it seems that the CH₄ EFs as derived by Van Amstel et al. (1993) (for reference to this source see NIR) are adjusted to derive a weighted average according to the animal populations of the different subgroups, thereby resulting in CH₄ IEFs between 80.0 and 81.3 kg CH₄/head/year for dairy cattle and between 44.9 and 58.4 kg CH₄/head/year for non-dairy cattle, varying as the animal populations within the different subgroups change from year to year. The Netherlands explained that the CH₄ IEF for non-dairy cattle decreased by 17 per cent over the period 1990–2001 as a result of changes in the distribution of different types of animal between the different subgroups. However, for the purpose of transparency, the ERT would welcome further details (e.g. formula) on the calculation of the emission factors in the NIR as well as information on its uncertainties.

59. The ERT noted the relatively high value of the 2001 CH₄ IEF for goats (~8 kg CH₄/head/yr) compared to the IEFs of other Parties. The Party has responded previously to a comment on this that the IPCC default factor was used. However, the IPCC default factor is 5. The Party is encouraged to provide further information on the selection of the EF.

60. CH₄ emissions from poultry are reported as not estimated (“NE”), although AD are provided. For purposes of completeness, the ERT encourages the Party to estimate those emissions. The Netherlands informed the ERT that these emissions were not estimated due to the lack of IPCC default or national EFs.

4.D Agricultural soils: direct and indirect N₂O emissions from nitrogen used in agriculture

61. In the calculation of N₂O emission from agricultural soils, country-specific EFs have been used. These are equivalent to the IPCC tier 1b method.

C. Non-key sources4.B Manure management – CH₄

62. The CH₄ IEFs for sheep (0.49 kg CH₄/head/yr) are at the high end of the range of reporting Parties and seem high compared to the IPCC default (0.28 CH₄/head/yr) for temperate developed countries. The CH₄ IEFs for goats (2.03–2.46 kg CH₄/head/yr) are also the highest of all reporting Parties and are an order of magnitude higher than the corresponding IPCC default value (0.18 kg/CH₄/head/yr). For purposes of transparency, the Netherlands is encouraged to explain its calculation and/or choice of the EFs in the NIR.

63. The NIR states that data on CH₄ emissions from horse manure are missing because no estimates of manure production from horses have been made to date and no EFs for this source category have been defined. Because this is probably not a key source category, the Party could have used the IPCC tier 1 default methodology. For purposes of completeness in reporting, the Party is asked to provide information as to when and how CH₄ emissions from manure management of horses will be estimated.

4.B Manure management – N₂O

64. The same comment applies as for CH₄ from horse manure (see paragraph 63 above).

4.F Field burning of agricultural residues

65. Emissions from burning of agricultural residue are not estimated (reported as “NO”). This was explained by the total ban on burning residue on the field in the Netherlands. However, the ERT has inquired from the Netherlands experts how agricultural residues are taken care of.

V. LAND-USE CHANGE AND FORESTRY**A. Sector overview**

66. The LUCF sector includes CO₂ emissions and removals estimates only for category 5.A Changes in Forests and Other Woody Biomass Stocks. Net CO₂ removals were 1,413 Gg in 2001 (1,422 Gg in 1990), which corresponds to less than 1 per cent of the total national emissions. An unexplained 36 per cent annual reduction in CO₂ removals is noted between 1994 and 1995 (from 1,929 Gg to 1,232 Gg).

67. Emissions and/or removals from categories 5.B to 5.E have not been estimated (“NE” is reported) because the available data sets are inadequate. New data sets are being compiled and discussed, and a decision will be made as to how far the data can be used for reporting on these source/sink categories in the future. In addition, emissions and removals are reported for only one element (5.A.2 Temperate Forests) of category 5.A. The ERT therefore considers the LUCF inventory to be incomplete.

68. Emissions of non-CO₂ gases for this sector have not been estimated (“NE” is reported) but no explanation is provided in table 9 of the CRF. However, the Netherlands indicates in the NIR that there are plans to provide additional data for subcategory 5.A.4 Grassland/Tundra and categories 5.B to 5.E.

B. Source and sink categories

5.A Changes in forest and other woody biomass stocks – CO₂

69. The Netherlands has used the IPCC tier 1 approach to estimate CO₂ emissions and removals, and country-specific EFs. The methods used are referenced in the NIR. IPCC default values have been used for all variables except for the conversion ratio from volume to dry matter. CRF table 5.A has been completed. For the year 2001 the same data as for the year 2000 have been assumed. No comparable data were available because the old monitoring network has been discontinued, and it was therefore decided to use the data for 2000 as estimates for 2001. The statistics reported on land area variation from 1990 to 2000 are convincingly consistent.

70. The quality of the estimates of CO₂ emissions/removals is indicated as medium.

VI. WASTE

A. Sector overview

71. The major emission source in this sector was CH₄ from solid waste disposal sites (SWDS) (94 per cent of total waste emissions in 2001). A reduction in CH₄ emissions from solid waste and from waste-water handling accounts for the decreasing trend in total waste emissions and compensates for modest increases in emissions of N₂O from waste-water handling. The reduction in CH₄ emissions from solid waste is explained mainly by policies to reduce landfilling in the Netherlands.

72. The inventory is mostly complete in terms of gases. However, the sources are not standardized, the time series for CO₂ is incomplete (in particular data for 1991–1994 are missing) and data for 2001 are provisional. Plans to include CH₄ and N₂O emissions from large-scale composting are included. The N₂O emissions for 1994 reported in the CRF and the NIR do not match. The Netherlands expressed its intention to address these inconsistencies in its next submission.

73. The NIR contains information on different emissions reported under the category “Other” in the CRF. The ERT recommends the Netherlands to present the information according to the CRF categories and in line with the IPCC good practice guidance.

74. References and online documentation on methodologies and country-specific EFs, as well as additional information in the CRF tables, are provided, enhancing transparency. A QA/QC system is under development. Estimates in the sector are self-assessed in table 7 as being of medium quality only for CH₄ and of low quality for N₂O emissions. Uncertainty estimates are provided for each emission source, that for SWDS emissions being among the highest. Recalculations in the sector are reported for waste-water handling emissions but have not been included consistently in the CRF or the NIR. The Netherlands expressed its intention to address these inconsistencies in its next submission.

B. Key sources

6.A Solid waste disposal on land – CH₄

75. The Netherlands has applied an adapted tier 2 methodology considering all landfills as one. New data analysis and improved calculation of emissions may show lower figures for CH₄ emissions in future. Results are expected to be presented in the 2004 submission. This source category is among the largest sources of uncertainty in trend. The degraded organic carbon (DOC degraded, in Gg) figures for various waste streams that are disposed at SWDS are not shown in the NIR. The DOC degraded figure is not provided in table 6.A neither. The composition of waste disposed at landfills is not well established for the reporting period, although the IPCC good practice guidance requires that a CH₄ generation constant be established based on sound knowledge of the composition and conditions of the landfill sites.

6.B Waste-water handling – CH₄

76. CH₄ emissions from waste water are a key source in the trend analysis and depend largely on recovery. The documentation presented does not allow the figures to be replicated. The ERT recommends the Netherlands to expand the information provided in the NIR.

C. Non-key sources6.B Waste-water handling – N₂O

77. N₂O emissions from industrial waste water have not been estimated (reported as “NE”), while emissions from domestic and commercial waste water are stated to be included under the category Other (reported as “included elsewhere” (“IE”)). “Other” is calculated partly on the basis of nitrogen input in waterways from domestic waste water and sludge. The ERT recommends that the Party check the relations between categories in order to avoid double counting. AD are given in the CRF; no methodologies are presented in the NIR. According to the documentation box in table 6.B, an estimated 5 per cent of homes are not covered and the value has not been adjusted accordingly. The allocation of emissions from waste-water handling to surface water changes the EF from 3.1 of removed nitrogen to 1.6 of present nitrogen. The ERT recommends the Netherlands to improve the transparency of its inventory on these issues.

6.B Emissions from human sewage – N₂O

78. This category is not reported separately in the NIR or in the CRF. It is included as a miscellaneous N₂O source and is reported under the sector “Other” (IPCC sector 7). The ERT recommends the Netherlands to use the categories as established in the CRF. The Netherlands expressed its intention to assess the methodology used for adherence with the IPCC methodologies and for completeness.

6.C Waste incineration

79. Estimates are included in the Energy sector because of energy use of waste incineration.

VII. OTHER SECTORS

80. The Netherlands reports CO₂, CH₄ and N₂O emissions from various sources under this sector because of difficulties in allocating them to one of the six IPCC sectors. The emissions represent 0.6 per cent of total GHG emissions. The ERT encourages the Netherlands to allocate those emissions to the existing other IPCC source categories in order to improve comparability. The Netherlands expressed its intention to consider reallocation of emissions to the appropriate sectors, however, it also pointed to the difficulties in allocating CH₄ emissions from non-combustion sources due to the lack of provisions for reporting these emissions within the given IPCC categories.

ANNEX 1: MATERIALS USED DURING THE REVIEW

A. Support materials used during the review

2002 and 2003 Inventory submissions of the Netherlands. 2003 submissions including CRF for years 1990–2001 and an NIR.

UNFCCC secretariat (2003). “Report of the individual review of the greenhouse gas inventory of the Netherlands submitted in the year 2002 (Desk review).” FCCC/WEB/IRI(1)/2002/NLD (available at <http://unfccc.int/program/mis/ghg/countrep/nldcentrev02.pdf>)

UNFCCC secretariat. “2003 Status report for the Netherlands” (available at <http://unfccc.int/program/mis/ghg/statrep03/net03.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 the Netherlands) (unpublished).

The Netherlands’ comments on the “Draft synthesis and assessment report of the greenhouse gas inventories submitted in 2003” (unpublished).

UNFCCC secretariat. Review findings for the Netherlands (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>).

B. Additional materials

Responses to questions during the review were received from Mr. Coenen (TNO-Environment, Energy and Process Innovation) including additional material on the methodology and assumptions used.
