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**REPORT OF THE INDIVIDUAL REVIEW OF THE GREENHOUSE GAS INVENTORY
OF THE NETHERLANDS SUBMITTED IN THE YEAR 2000¹**

(Centralized review)

A. GENERAL OVERVIEW

1. Introduction

1. The Conference of the Parties (COP), at its fifth session, by its decision 6/CP.5, requested the secretariat to conduct, during the trial period, individual reviews of greenhouse gas (GHG) inventories for a limited number of Parties included in Annex I to the Convention (Annex I Parties) on a voluntary basis, according to the UNFCCC guidelines for the technical review of GHG inventories from Parties included in Annex I to the Convention.² In doing so, the secretariat was requested to coordinate the technical reviews and to use different approaches for individual reviews, including desk reviews, centralized reviews and in-country reviews.

2. In response to the mandate by the COP, the secretariat coordinated a centralized review of six national GHG inventories (Australia, Canada, Hungary, Japan, the Netherlands and New Zealand) submitted in 2000, which took place from 7 to 11 May 2001. The review was carried out by a team of nominated experts from the roster of experts working at the headquarters of the UNFCCC secretariat in Bonn. The members of the team were: Mr. Ayite-Lo Ajavon (Togo), Mr. Wiley Barbour (United States of America), Mr. Pascal Boeckx (Belgium), Mr. Jose Gonzalez Miguez (Brazil), Mr. Tomas Hernandez-Tejeda (Mexico), Mr. Klaus Radunsky (Austria), Mr. Yiannis Sarafidis (Greece), Ms. Sirintornthep Towprayoon (Thailand) and Mr. Hristo Vassilev (Bulgaria). The review was coordinated by Mr. Stylianos Pasmajoglou (UNFCCC secretariat). Mr. Wiley Barbour and Mr. Jose Gonzalez Miguez were lead-authors of this report and also served as sector experts.

3. The main overall objective of the centralized review of the GHG inventories was to ensure that the COP had adequate information on the GHG inventories. The review should further assess the progress of the Parties towards fulfilling the requirements outlined in the UNFCCC reporting guidelines on annual inventories (FCCC/CP/1999/7). In this context, the review team checked the responses of the Parties to questions raised in previous stages of the review process and the consistency of the inventory submission with the UNFCCC reporting

¹ In the symbol of this document, 2000 refers to the year the inventory was submitted, and not to the year of publication. The number (3) indicates that for the Netherlands this is a centralized review report.

² Document FCCC/CP/1999/7, in particular the UNFCCC review guidelines (pages 109 to 114), and decision 6/CP.5 (page 121 to 122).

guidelines and the *Revised 1996 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC guidelines), and identified possible areas for improvement in the inventories of the six Annex I Parties. Each inventory expert reviewed the information submitted for specific IPCC sectors and each IPCC sector was covered by two experts.

4. The review team has also assessed, to a certain degree, whether the reporting fulfils the requirements included in the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance), although the IPCC good practice guidance had not been published at the time the inventory was submitted and could not, therefore, have been used in the compilation of the inventory.

5. The UNFCCC secretariat provided the review team with all necessary technical guidance, information and data, such as national inventory data reported according to the common reporting format (CRF) submitted in the year 2000, national inventory reports (NIRs) for the year 2000, the synthesis and assessment report (S&A report) of GHG inventories prepared by the secretariat, and comments from the Parties on the S&A report.

2. Overall findings

6. The inventory submitted for the Netherlands did not meet all the standards for inventory preparation and submittal as defined by the UNFCCC reporting guidelines and the IPCC guidelines. There are significant opportunities for improvement in transparency by providing documentation for the national methods and complete reporting of activity data. In addition, complete reporting of the CRF background data tables would also improve transparency and completeness.

7. It is noted that the Summary Report (RIVM report 773201 002) does not provide sufficient information for assessing compliance with IPCC guidelines.

8. It is also recommended that future reports address, in some detail, identification of key sources in accordance with the IPCC good practice guidance.

9. Use of the subcategory "Other" rather than specific subcategories hampers detailed analysis and review.

10. The NIR discusses changes to previous inventory estimates due to changes in activity data, emission factors (EFs) and improvements in methods.

3. Completeness

11. The inventory does not include information or data on likely key sources in the industrial processes sector, such as CO₂ emissions from cement production. No information is provided on forest and grassland conversion, abandonment of managed lands and soil carbon flux. Completeness in the energy sector cannot be determined owing to incomplete reporting of background data in the energy tables.

4. Transparency

12. Transparency in the energy sector could be improved. Emissions from several categories of fuel combustion are not disaggregated by type of fuel, and activity data are not provided in the

sectoral background tables. Emission estimates for the highway mobile category and natural gas systems are based on country-specific methods, but documentation was not provided. Only aggregated emissions data are reported for the industrial processes sector, under the subcategory “Other”.

5. Data sources used for centralized review

5.1 National greenhouse gas emission inventory report

13. The NIR is entitled a summary report dated May 2000 and was available in electronic format (.doc file). The review team was informed that there were inventory reports written in Dutch language for internal use in the Netherlands that were not available for this review. Summary information is provided on methodologies, activity data, emission factors and uncertainty estimates. There is no section on industrial processes.

14. The NIR also includes information on uncertainties in the calculations of emissions from source categories and differences compared with previous submissions. It also includes a summary table (IPCC summary report table 7.A) providing data for HFCs, PFCs, and SF₆ for 1990 to 1997, and two additional tables disaggregated by compounds for potential and actual emissions of HFCs, PFCs, and SF₆ for the years 1990 to 1998 in Gg.

5.2 Common reporting format (CRF)

15. The Netherlands submitted inventory data for all years 1990 to 1998. The CRF does not contain all the required tables as noted in the S&A report. Many tables have missing subtotals or incomplete reporting. Trends tables are not provided. Total emissions in the CRF match the estimates in the NIR.

5.3 Synthesis and assessment report (S&A report)

16. The Netherlands did respond to the S&A report and the centralized review was able to take these comments into account. Time-series consistency for industrial processes was assessed in the S&A report. The findings are as follows:

- (a) 40 per cent change between 1992 and 1993 in CO₂ in mineral products;
- (b) CO₂ emissions are declining over time for other industrial processes;
- (c) CO₂ emissions from “other-miscellaneous” chemical industry reported for 1997, but for no other years (probably due to accidental double counting with “other” industry).

17. The NIR reported that “allocation of subcategories have been changed for the allocation of emissions in 1996 to 1998 only: 6 rapcodes from 1.A.2 “Industrial combustion” and 1 rapcode from 1.A.5 “Other combustion” to 2.G “Other industrial processes” and 3 rapcode from 1.A.4 “Small combustion” to 3.D “Solvent and other product use””.

B. ENERGY

1. General overview

1.1 Completeness

18. The NIR has only been submitted in summary form and a more completely developed report is needed. Frequent use of the “Other” category in the CRF tables makes it difficult to assess completeness. Details on feedstocks and non-fuel uses of petroleum products would improve transparency and possibly completeness as well.

1.2 Transparency

19. Use of the “Other” subcategory makes it difficult to assess transparency. The transportation methods and assumptions need to be documented. The sectoral background tables for energy in the CRF are incomplete, especially for stationary sources.

20. The summary NIR discusses changes to previous inventory estimates due to changes in activity data, EFs and improvements in methods.

2. Reference approach

21. Provisional calculations were made for the reference approach. The CRF and the NIR only provided totals for CO₂ emissions from liquid, solid and gaseous fuels. The preliminary calculation was done using provisional emission factors for crude oil, refinery feedstocks and natural gas liquids (NGL) based on United States’ Department of Energy (USDOE) information published in 2000.

22. The summary NIR contains explanations of the difficulties with input values for such calculations, and a sensitivity analysis for the different values for crude oil, NGL and other refinery inputs.

23. On the basis of these preliminary calculations, the reference approach estimates CO₂ emissions to be 1.48 per cent lower than the national approach. However, since no activity data or EFs are provided, no verification is possible.

24. Since only preliminary estimation of emissions of the reference approach is submitted (as indicated above) and no activity data are reported, comparison with international data is impossible.

3. Feedstocks

25. Feedstocks are not recorded in the CRF.

26. Relevant information is not provided in the NIR.

27. It is not clear whether or not these emissions are included elsewhere.

4. Key sources

4.1 Fugitive emissions from oil and gas

28. *Emission trends:* Fugitive CH₄ emissions from the oil and gas category are considered a key source category for the Netherlands based on the S&A level analysis. CH₄ emissions for the combined category are reported to have decreased from 178.8 to 149.6 Gg during the period 1990 to 1998, and CH₄ emissions from natural gas have decreased from 82 Gg CH₄ in 1996 to 64.5 Gg in 1998. The NIR mentions changes in underlying activity data for production, but the CRF values show increasing production levels. No explanation for the decreasing trend is provided.

29. *Methodology:* The Netherlands uses a country-specific methodology to estimate emissions from this category. Details are not provided to document this methodology.

30. *Emission factors:* The implied emission factor (IEF) for natural gas distribution can be calculated for 1997 and 1998 but not for other years. The IEF for other subcategories cannot be calculated owing to a lack of activity data.

31. *Activity data:* Activity data are provided for natural gas production, transmission and distribution, for the entire period. Natural gas production and transmission increased by 10 per cent over the period and distribution activity increased by 14 .

32. *Completeness:* For the oil subcategory (CRF table entry 1.B.2.a), the Netherlands does not report emissions by activity. Instead, all emissions are reported under “Other” (CRF table entry 1.B.2.a.vi). No activity data are provided, so IEFs cannot be calculated. Fugitive emissions of CH₄ from oil activities are only reported for 1996 to 1998 in the CRF. The NIR states that refinery emissions are included, but emissions are not reported at this level; these emissions may be included in the CRF subcategory 1.B.2.d “Other” since this has been labelled “All fugitive and process emissions”, but this is not clearly the case. No emissions are reported under venting and flaring.

33. *Uncertainty:* Uncertainties are discussed briefly in the NIR and estimated at about 25 per cent.

4.2 Stationary combustion – CO₂ emissions

34. *Emission trends:* The information reported in the CRF does not allow for an analysis of trends in the Netherlands. Information on trends was provided in the NIR. CO₂ emissions from stationary combustion are a key source for the Netherlands, representing approximately 60 per cent of all reported emissions in 1998. The Netherlands reports CO₂ emissions from stationary combustion increasing from 130.9 Mt in 1990 to 142.9 Mt in 1998 (a 9 per cent increase).

35. *Methodology:* Estimation of emissions is based on country-specific methods (information reported in CRF). It is noted in the NIR that “due to data limitations” the subcategories presented hereafter “are used somewhat differently from the IPCC source definitions”. These subcategories are:

- (a) Off-road transportation that is included in the transport sector; and

(b) Lubricants and waxes manufacturing as well as combustion emissions from the oil and gas production and distribution industry that are included in energy transformation. Changes in methodology are discussed in the NIR. However, most of the differences refer to a reallocation of sources.

36. *Emission factors*: The EFs used are country- and plant-specific.
37. The IEF for CO₂ for “Other fuels” seems to be too high (4,425 t/TJ). This problem could be related to missing activity data.
38. *Activity data*: There are no activity data reported in the sectoral background tables of the CRF that refer to stationary combustion (tables 1.A(a)s1, s2 and s4).
39. *Recalculations*: Recalculation tables are only provided for 1996. No explanation was provided in the CRF. Information was given in the NIR, according to which changes in the activity data had occurred (a) in the amount of fuel consumed by the petrochemical industry and refineries and (b) in the consumption of fuelwood and charcoal.
40. *Completeness*: Impossible to assess.
41. *Uncertainty*: Uncertainties are discussed briefly in the NIR and estimated at about 3 per cent for the whole sector.

4.3 Mobile combustion – CO₂ emissions

42. *Emission trends*: CO₂ emissions from road transport are a key source for the Netherlands, representing approximately 13 per cent of all reported emissions in 1998. The Netherlands reports an increase in CO₂ emissions from stationary combustion from 28.6 Mt in 1990 to 34.7 Mt in 1998 (a 21 per cent increase).
43. *Methodology*: The CRF reports that a country-specific methodology is applied. No further information is provided. (Explained in previous submissions.)
44. *Emission factors*: Country-specific.
- (a) The IEFs for gasoline and diesel oil are equal;
- (b) The IEF for N₂O from road transport is decreasing with time.
45. *Activity data*: Energy consumption data is provided in the respective sectoral table.
46. *Recalculations*: There was a recalculation of CO₂ emissions in transport that was not included in the recalculation table. This issue is discussed in the NIR, where it is stated that “this was accidentally not included in the recalculation table”.
47. *Uncertainty*: Uncertainties are discussed briefly in the NIR and estimated at about 3 per cent for the whole sector.

5. Bunker fuels

48. Emissions from combustion of bunker fuels are not included in national totals, but the Netherlands’ NIR presents annual estimates for aviation and marine bunker fuel use. CO₂

emissions from bunker fuel use amount to 27 per cent of total CO₂ emissions. International and domestic fuel consumption for navigation are reported in the NIR and in table 1.C.

49. Relevant information is available in the NIR; a reference is provided in table 3.3.

6. Weather-related adjustments

50. Weather-related adjustments in CO₂ emissions were made for policy reasons as mentioned in the NIR. A reference is provided for the correction method applied and preliminary results are presented in the NIR. The correction factor varies between -11 per cent in 1996 to +20 per cent in 1990. No final conclusion has yet been drawn.

7. Questions and issues from previous review stages

51. The Netherlands provided a response to the issues raised in the draft S&A report. The use of different source allocations for different years is highlighted. The specific comments made refer to:

(a) The consistency between the CRF and the NIR. It is stated that “an incorrect change was made when entering and checking the emissions data and this has been corrected in the latest CRF submission”;

(b) The recalculations made. It is stated that, with the exception of 1996, no other recalculation was made. Moreover, some errors in the list of comparisons with previously submitted data were identified;

(c) The high N₂O IEF for diesel in road transport. It is acknowledged that “this value of 10.14 (12.14 in 1996) may be an outlier compared to the IPCC default” but it “is correct according to the Dutch country-specific calculation method”. However, there is no presentation of the method in the submitted NIR.

8. Questions and issues from Parties’ response to draft centralized review report

52. The Netherlands did not provide written comments on the draft. Verbal comments indicated that additional Dutch-language documents do exist which would have been helpful to the review team if translated.

C. INDUSTRIAL PROCESS

1. General overview

1.1 Completeness

53. None of the key sources was reported. The CO₂ and CH₄ emissions from mineral products were reported under 2.A.7 “Other” without any further specification. No CO₂ emissions were reported for the chemical industry, only CH₄ emissions under 2.B.5 “Other” without any further specification. No emissions were reported for metal production. Emissions for CO₂, CH₄ and N₂O were reported under 2.G. “Other” with the specification “Misc”. No activity data and IEFs were reported under table 2(I).A-G. Emissions for HFCs, PFCs, and SF₆ were not reported under the CRF but were provided in tables in the appendix of the NIR. For PFCs and SF₆, it is reported in table 9 that “no recent, full survey of all possible sources has been done yet.”

1.2 Transparency

54. Only aggregated data are reported on the emissions for the industrial processes sector, reported under the subcategory “Other”. Relevant information on HFCs, PFCs, and SF₆ were provided only in tables annexed to the NIR, but were not reported under the CRF. No IEF and activity data were reported for this sector.

1.3 Recalculations

55. Recalculation was done for industrial processes for the year 1996 for HFC under “Consumption of halocarbons and SF₆”. In the NIR, some information was given and it was indicated that the changes had not been applied to all years; data for 1990 to 1995 had not been recalculated, except actual HFC emissions for 1994 and 1995.

1.4 Methodology

56. Country-specific (CS) for mineral production and other (2.D and 2.G) . Plant-specific /country-specific for EF. Not occurring (NO) for metal and chemical production. Country-specific for HFCs and PFCs and tier 1 for SF₆ consumption. Country-specific/ plant-specific for HFCs production.

1.5 Uncertainty

57. High for CO₂ (±3 per cent), medium for CH₄ (±20 per cent), and low for N₂O (±35 per cent). Medium for HFCs (±50 per cent), low for PFCs (±100 per cent) and low for SF₆ (±50 per cent).

2. Mineral sector

58. The CO₂ emissions from cement production were not reported. According to data from the Oak Ridge National Laboratory (<http://cdiac.ESD.ORNL.GOV/ftp/trends/emissions/nth.dat>), CO₂ emissions between 1990 and 1996 varied from 507 Gg C to 449 Gg C. According to information provided by the United Nations, there is activity data of 3,300 kt of cement production.

59. No lime production, limestone and dolomite use or soda ash production and consumption were reported as such. No activity data were provided. CO₂ and CH₄ emissions were reported for 2.A.7 “Other” under the specification “Misc”. No activity data or IEFs were reported.

3. Chemical sector

60. CO₂ and CH₄ emissions for ammonia production were not reported and no activity data were given. No IEF was reported. The same applies to N₂O emissions from nitric acid and adipic acid production. No information was given on carbide production or production of carbon black, ethylene, dichloroethylene or styrene. CH₄ emissions were reported for 5.G “Other” under the specification “Misc”. No activity data or IEFs were reported.

61. N₂O emissions for industrial processes were reported under 2.G. “Other” under the specification “Misc”. No further explanation was given. CO₂ and CH₄ emissions were also reported under 2.G.

4. Metal sector

62. CO₂, CH₄, PFCs and SF₆ emissions from metal production were reported as 0 Gg.
63. There is United Nations' information on activity data for iron and steel production of 6,377 kt for steel and 5,562 kt for pig iron.
64. In the NIR, additional information was reported as IPCC summary report (table 7.A) for HFCs, PFCs, and SF₆. For this sector, actual emissions for PFCs were reported for the years 1990 to 1997. No activity data were given. In addition, actual emissions for CF₄ and C₂F₆ were reported for the years 1990 to 1998. This additional information was given as tables in the appendix of the NIR, but was reported as IPCC sector 2.C without further specification.
65. Emissions from ferroalloys production, and SF₆ used in aluminium and magnesium foundries were not reported.

5. Production and consumption of HFCs and SF₆

66. HFCs, PFCs, and SF₆ emissions from halocarbons and SF₆ production and use were reported as 0 Gg.
67. In the NIR, additional information was reported as IPCC summary report (table 7.A) for potential and actual emissions of HFCs under 2.E, and potential and actual emissions for HFCs, PFCs and SF₆ under 2.F for the years 1990 to 1997. No activity data or IEFs were reported.
68. Also, in the additional information provided in the NIR for IPCC sector 2.E, actual emissions for HFC-23 and HFC-152a were reported for the years 1990 to 1998, as well as potential emissions for the years 1995 to 1998.
69. Finally, in the additional information provided in the NIR for IPCC sector 2.F, actual emissions for HFC-134a, HFC143a, HFC-125 and other HFCs, PFC use and SF₆ use were reported for the years 1990 to 1998, as well as potential emissions for the years 1995 to 1998, with additional information on potential emissions of SF₆ use being provided for the years 1990 to 1994.
70. No activity data, IEFs or further specifications were provided.

6. Other (2.G)

71. As explained above, N₂O emissions for industrial processes were reported under 2.G. "Other" under the specification "Misc". No further explanation was given. CO₂ and CH₄ emissions were also reported under 2.G.

7. Solvents

72. CH₄ and N₂O emissions for solvent production and the IPCC "Other product use" sector were reported in the NIR and in the CRF (only reporting of N₂O was possible in tables 3 and 3.A-D). These emissions were reported under 3.D "Other" under "Use of N₂O for anaesthesia". No activity data or IEF were provided.

8. Key sources

73. HFCs emissions from consumption of halocarbons and SF₆ (aggregate) (level assessment of 3 per cent).
74. PFCs emissions from consumption of halocarbons and SF₆ (aggregate) (level assessment of 1 per cent).
75. N₂O emissions from industrial processes – other (level assessment of 2 per cent).

9. Questions and issues from previous stages

76. The Netherlands did not provide a response to the S&A report. The S&A report included the findings listed below.
77. 2.B “Industrial processes”: only aggregated data were reported on the emissions from key sources, while the CRF indicated that country-specific methods were used.
78. No IEF was reported for this sector.
79. “Consumption of halocarbons and SF₆, HFCs and PFCs”: potential and actual emissions of HFCs, PFCs, and SF₆ were only reported in table 2(II) for the year 1996. For the other years, total aggregate figures were provided in the summary tables 1.A and 1.B for HFCs (1994, 1995, 1997, 1998), for PFCs (1995, 1997, 1998) and SF₆ (1990-1995, 1997, 1998).
80. As noted above, detailed information was submitted for HFCs, PFCs, and SF₆ as additional tables in the appendix of the NIR. The comments from the previous stages refer mainly to CRF reporting.
81. The CRF indicated that for PFCs and SF₆ emissions “no recent, full survey of all possible sources has been completed”. International statistics indicate the possible presence of aluminium foundries, and therefore SF₆ emissions from magnesium may be possible.
82. Again, as noted above, additional information was provided as tables in the appendix of the NIR, but reported as IPCC sector 2.C without further specification. This could be related to the presence of the aluminium foundries referred to.

D. AGRICULTURE

1. General overview

83. The sectoral background data in the agriculture sector are not complete. There appear to be inconsistencies in the CRF tables. Summary table 4s2 and other summary tables in the CRF and the NIR are reported which should be traced back in table 4.B(b) and table 4.D (see, e.g., CRF summary 1.As1). In CRF summary 3s2, it is mentioned that country-specific data are used for N₂O from soils and manure management. In table 7, “All” is mentioned for the latter sources. This is inconsistent with the empty tables 4.D and 4.B(b).
84. From the NIR it could be deduced that GHG emission trends from agriculture have levelled off since 1997. Explanations for trends between 1990 and 1998 are provided in the NIR, but the trend tables in the CRF are not complete.

2. Specific findings

Enteric fermentation (table 4.A)

85. Tier 1 methodology has been used. For all sources, the IEF was in agreement with the IPCC default EF, except for dairy cattle where the IEF was lower. No explanation could be found in the NIR.

Methane emissions from manure management (table 4.B(a))

86. Data are not available.

Nitrous oxide emissions from manure management (table 4.B(b))

87. Data are not available, but a summary is reported. This is inconsistent.

Rice cultivation (table 4.C)

88. Data are not available.

Agricultural soils (table 4.D)

89. Data are not available, but a summary is reported. This is inconsistent.

Savannah burning (table 4.E)

90. Data are not available.

Agricultural residue burning (table 4.F)

91. Data are not available.

3. Quality Assessment/Quality Control (QA/QC)

92. Information on QA/QC procedures was not reported.

4. Uncertainty

93. A semi-quantitative estimate of uncertainty is given in the NIR. This was mainly the result of expert judgements by a “large group” of Dutch emission experts. The results were estimates based on different assumptions of uncertainty in underlying data and simple, standard error propagation calculation of the overall uncertainty per GHG (tier 1 in IPCC).

E. LAND-USE CHANGE AND FORESTRY (LUCF)

1. General overview

94. There are significant opportunities for improvement in transparency by providing documentation for the national methods and complete reporting on the background data tables. No information was provided for forest and grassland conversion, abandonment of managed lands or soil carbon flux.

2. Findings

2.1 Changes in forest and other woody biomass stocks (table 5.A)

95. *Completeness:* Data have been provided on CO₂ removals in subsector 5.A.3 “Changes in forest and other woody biomass stocks - temperate forests” for all years since 1990. They show that changes in forest and other woody biomass stocks may have compensated for approximately 0.72 per cent of total GHG emissions in 1998. However, it is noted that the files relating to 1992, 1993, 1994 and 1995 specify in the header the year 1997. For all other subsectors, no information has been provided. However, harvested wood might also be relevant to the Netherlands.

96. *Consistency:* The information provided indicates that the LUCF data are internally consistent over the period since 1990 and the same methods have been used for calculations throughout this period. Data show a slight increase in net CO₂ emission/removals for sector 5.A since 1990. Owing to a lack of background information, it was not possible to check the data provided for consistency with the IPCC guidelines, e.g., with respect to the forest categories considered.

97. *Recalculations:* No recalculations have been indicated in table 11 of the CRF.

98. *Transparency:* In summary table 3, it is indicated that the IPCC tier 1 method has been used in applying country-specific EFs. However, detailed information, according to table 5.A “Sectoral background data for land-use change and forestry – changes in forest and other woody biomass stocks”, has not been provided, although the IPCC tier 1 method has been applied. This relates to all kinds of information (e.g., area of forest/biomass stocks, average annual growth rate and carbon uptake increment). Data have only been provided for net removals, but not separately for emissions and removals.

99. *Comparability:* This needs to be significantly improved by increasing completeness and transparency. At present it is difficult to assess comparability owing to the limited information provided. It is recommended that all the background tables should be completed (independently of whether or not data have yet been submitted).

100. *Methodology:* It is noted that the IPCC tier 1 method has been used together with country-specific EFs. Owing to a lack of information, the country-specific EF could not be compared with those of other countries. No explanation has been provided for the choice of a particular methodology.

101. *Emission and conversion factors:* No explanation has been provided for the choice of emission and conversion factors. Owing to lack of information, neither emission nor conversion factors could be reviewed.

102. *Activity data*: Owing to a lack of information, activity data could not be reviewed even for section 5.A for which some data have been reported. Information on the method used to estimate activity data and the institutions involved is needed, as well as short explanations of any trends.

103. *Uncertainty*: Could not be reviewed owing to a lack of information.

2.2 Forest and grassland conversion (table 5.B)

104. *Completeness*: No information has been provided for this sector. However, it is assumed that in the Netherlands there is some conversion from grassland into, e.g., cultivated land/streets/houses, as a result of urban development.

105. *Recalculations*: No recalculations have been indicated in table 11 of the CRF.

106. *Transparency*: Owing to a lack of information, nothing can be said about transparency in sectors other than 5.A.

107. *Comparability*: See discussion under 5.A above.

108. *Methodology*: Owing to a lack of data for sections 5.B-E, methodological issues for these categories could not be reviewed.

2.3 Abandonment of managed lands (table 5.C)

109. *Completeness*: No information has been provided on this category.

110. *Recalculations*: No recalculations have been indicated in table 11 of the CRF.

111. *Transparency*: Owing to a lack of information, nothing can be said about transparency in sectors other than 5.A.

112. *Comparability*: See comments under 5.A above.

113. *Methodology*: Owing to a lack of data on sections 5.B-E, methodological issues for these categories could not be reviewed.

2.4 CO₂ emissions and removals from soil (table 5.D)

114. *Completeness*: No information has been provided for this category. However, changes in soil carbon may be relevant due to agricultural activity in the Netherlands.

115. *Transparency*: Owing to a lack of information, nothing can be said about transparency in sectors other than 5.A.

116. *Comparability*: See comments under 5.A above.

117. *Methodology*: Owing to a lack of data for sections 5.B-E, methodological issues for these categories could not be reviewed.

2.5 Other

118. No information has been provided on any additional categories in the LUCF sector. However, activities like flooding, wetland drainage and surface waters as described in the IPCC guidelines (Reference Manual) may also be of some relevance to the Netherlands. It is noted that summary table 3 indicates as NO, activities related to sector 5.E.

3. Reporting

119. The summary report for 1990 to 1998 (RIVM report 773201 002) from May 2000 does not include any additional information compared with the CRF tables for sector 5.

120. It is noted that the summary report does not mention QA/QC and internal verification, nor does it provide information on inventory improvement.

121. Furthermore, the report fails to address the archiving of data. It is recommended that future reports also identify, in some detail, key sources for sector 5.

4. Areas for improvement

122. The completeness of reporting with respect both to the CRF and the NIR needs to be improved.

F. WASTE

1. General overview

123. The NIR does not contain documentation on the waste sector. Methane emissions are reported from solid waste disposal on land, and after 1995 emissions of CO₂ are reported in the "Other" subcategory. The CO₂ does not appear to be from waste from energy plants since a reporting line is provided for incinerators, but, without documentation, it is impossible to tell.

1.1 Completeness

Key source: solid waste disposal on land

124. Completeness is difficult to assess owing to a lack of documentation. Methane emissions are reported from land disposal, but CO₂ was reported for the subcategory "Other." An explanation of the CO₂ estimate and methodology is recommended.

Non-key source: wastewater handling

125. The estimates for domestic and industrial wastewater handling were omitted, however, methane emissions were reported in the "Other" subcategory which needs to be clarified. In addition, no explanation is provided for the missing activity data in table 9.

1.2 Methodology

126. Methodologies for solid waste were reported as model and country-specific but no documentation was provided.

Key source: solid waste disposal on land

127. The CO₂ emission estimate in “Other” should be accompanied by a methodology explanation, especially since there appears to be a discontinuity in the data between 1994 and 1995. The additional information fields in table 6.A are blank.

128. The amount of solid waste going to landfills was very small compared to the default waste generation rate for the Netherlands of 1.06 kg/capita/day (IPCC 1996). The value calculated from the data in the CFR is a very low 0.00096 kg/capita/day.

129. If the quantity of CH₄ released was recalculated with a more likely EF (for example 0.1 t CH₄/t of waste), the waste generation rate would be calculated at 0.7 (kg/capita/day) which is close to the IPCC default value for the Netherlands.

Non-key source: wastewater handling

130. The CH₄ emission in “Other” should be explained. No calculation is provided for industrial wastewater handling. The type of “polluted surface water” in table summary 1As2 should be clarified in terms of differences in human sewage wastewater in IPCC methodology.

1.3 Emission factor***Key source: solid waste disposal on land***

131. The implied EF of solid waste disposal systems (SWDS) was four orders higher than in other countries. The reviewers suggest that an additional explanation be provided.

Non-key source: wastewater handling

132. The IEF could not be calculated.

1.4 Activity data

133. Missing activity data hampers analysis of the inventory. The activity data in tables 6.A, 6.B and 6.C, as well as the additional information box in the CRF, are important elements in a complete inventory submittal.

1.5 Recalculation

134. No recalculations were reported.

1.6 Uncertainty

135. 50 per cent uncertainty was reported in the IDR.

1.7 Trends

136. There was no report of emission trends in the CRF; these tables were left blank.
