UNITED NATIONS
NATIONS UNIES

FRAMEWORK CONVENTION ON CLIMATE CHANGE - Secretariat
CONVENTION - CADRE SUR LES CHANGEMENTS CLIMATIQUES – Secrétariat

FCCC/WEB/IRI(1)/2001/LVA 20 March 2003

REPORT OF THE INDIVIDUAL REVIEW OF THE GREENHOUSE GAS INVENTORY OF LATVIA SUBMITTED IN THE YEAR 2001[1]

(Desk review)

I. OVERVIEW

A. Introduction

1. The Conference of the Parties (COP), at its fifth session, by its decision 6/CP.5, adopted guidelines for the technical review of greenhouse gas (GHG) inventories from Parties included in Annex I to the Convention, hereinafter referred to as the review guidelines,[2] for a trial period covering the GHG inventory submissions for the years 2000 and 2001. The COP requested the secretariat to conduct individual reviews of GHG inventories for a limited number of Annex I Parties on a voluntary basis. In so doing, the secretariat was requested to use different approaches to individual reviews by coordinating desk reviews, centralized reviews and in-country reviews.

2. In response to the mandate by the COP, the secretariat coordinated a desk review of five national GHG inventories (Bulgaria, France, Iceland, Latvia and Switzerland) submitted in 2001, which took place from 19 November 2001 to 14 December 2001. The review was carried out by a team of nominated experts from the roster of experts. The members of the team were: Mr. Jose Ramon Villarin (Philippines), Mr. Arthur Rypinski (United States of America), Professor Anthony Adegbulugbe (Nigeria), Mr. Domenico Gaudioso (Italy), Ms. Nadzeya Zaleuskaya (Belarus), Dr. Lorna Brown (United Kingdom), Ms. Punsalmaa Batima (Mongolia), Mr. Rizaldi Boer (Indonesia), Mr. Josef Mindas (Slovakia), and Mr. Charles Jubb (Australia). The review was coordinated by Ms. Astrid Olsson (UNFCCC secretariat). Professor Anthony Adegbulugbe and Mr. Charles Jubb were lead authors of this report.

3. The principle objective of the review of the GHG inventories is to ensure that the Conference of the Parties has adequate information on the inventories. The review should also further assess the progress of the Parties toward fulfilling the requirement outlined in the UNFCCC reporting guidelines[3] on annual inventories (FCCC/CP/1999/7). In this context, the review team has checked the responses of the Parties to questions raised in the previous stages of

[1] In the symbol for this document, 2001 refers to the year in which the inventory was submitted, and not to the year of publication. The number (1) indicates that this is a desk review report.

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

[3] The 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), are referred to in this report as the UNFCCC reporting guidelines.

the review process and the consistency of the inventory submissions with the UNFCCC reporting guidelines and the Revised 1996 IPCC Guidelines (hereinafter referred to as the IPCC Guidelines), and has identified possible areas of improvement in the inventories of the five Annex I Parties. Each inventory expert has reviewed the information submitted for specific IPCC sectors and each sector has been reviewed by two experts, with the exception of the general material and waste sectors which have been reviewed by one expert only.

4. The review team has also assessed to a certain degree whether the reporting fulfilled 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).[4]

5. In accordance with the UNFCCC review guidelines, a draft version of this report was communicated for comment to the Government of Latvia, which supported its publication without any further amendments. Nevertheless Latvia would like to note, that at this moment its inventory is essentially changed mainly due to the recommendations of the in-country review in September 2002. This includes improved emissions calculation based on the expert review team's suggestions. Mistakes are corrected, including changed allocations of emissions and changes in methodology in many sectors. Although many changes are necessary, Latvia will need time to include them in the inventory due to lack of capacity and time.

B. Inventory submission and other sources of information

6. Latvia submitted its national inventory report (NIR) in September 2001. Moreover, the September NIR indicates that a previous submission of the NIR was made on 16 April 2001. Common reporting format (CRF) tables for 1998 and 1999 were submitted in electronic format.

7. The materials used for this review are the NIR, Latvia's CRF submission for 1998 and 1999, the status report 2001, the preliminary key source analysis[5] and the draft synthesis and assessment (S&A) 2001 report prepared by the secretariat. The ERT also referred to Latvia's response to the draft S&A 2001 report.

8. Other sources of information used during the review include: the preliminary guidance for experts participating in the individual review of GHG inventories, the UNFCCC reporting guidelines[6] and the review guidelines.

[4] According to the conclusions of Subsidiary Body for Scientific and Technological Advice (SBSTA) at its twelfth session, the IPCC good practice guidance should be applied by Annex I Parties as far as possible for inventories due in 2001 and 2002, and should be used for inventories due from 2003. Annex I Parties with economies in transition may phase in the IPCC good practice guidance two years later than other Annex I Parties.

[5] The UNFCCC 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. The key sources presented in this report are based on the secretariat's preliminary key sources assessment. They might differ from the key sources identified by the Party itself.

[6] The 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/P/1999/7), are referred to in this report as the UNFCCC reporting guidelines.

C. Emission profiles, trends and key sources

9. Only a limited trends assessment is possible because Latvia has submitted CRF tables for only 1998 and1999. In the 1999 CRF table 10s5, emission estimates are made up to the year 2000 even where CRF tables 10s1 to 10s4 list yearly values up to 1999 only.

10. Total CO_2 (carbon dioxide) equivalent emissions in 2000 (excluding land-use change and forestry (LUCF)) indicated in CRF table 10s5 show a decrease of 67% relative to the base year 1990.

11. Net total CO_2 equivalent emissions (that is, including LUCF) show a sharp decrease in emissions from 1990 to 1998, by 117%. This trend is then reversed from –2,221 Gg in 1998 to +2,317 Gg in 1999. This sudden turn is explained as being due to a sharp change in CO_2 uptake in the LUCF sector for those two years. It is further noted that LUCF uptake levels are practically the same from 1990 to 1998. The draft S&A report 2001 points out inconsistencies in CO_2 trends in mineral production from 1992 to 1994 and methane (CH_4) levels from landfill from 1997 to 1998. The Party in its comments to the draft S&A report 2001 did not address these issues. Tables 1 and 2 show the GHG emissions by gas and by sector for the years 1990 to 1999.

Table 1. GHG emissions by gas, 1990–1999 (Gg CO_2 equivalent)

GHGs	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	CO_2 equivalent (Gg)									
Net CO_2 emissions/removals	12,702	7,665	4,049	1,993	1,065	–338	–947	–1,890	–2221	2,317
CO_2 emissions (without LUCF)[(a)]	23,527	18,491	14,924	12,861	11,911	10,145	9,550	8,619	8,287	7,545
CH_4	4,115	4,017	3,333	2,387	2,086	2,128	1,997	2,180	2,622	2,596
N_2O	3,412	2,399	2,221	1,584	1,353	1,161	1,169	1,188	1,239	1,242
HFCs	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
PFCs	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
SF_6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total (with net CO_2 emissions/removals)	20,229	14,082	9,603	5,963	4,504	2,951	2,219	1,478	1,640	6,155
Total (without CO_2 from LUCF)[(a)]	31,054	24,908	20,478	16,831	15,350	13,435	12,715	11,986	12,149	11,384

[(a)] LUCF: land-use change and forestry

Table 2. GHG emissions by sector, 1990–1999 (Gg CO_2 equivalent)

GHG SOURCE AND SINK CATEGORIES	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	CO_2 equivalent (Gg)									
1. Energy	24,629	19,310	15,713	13,586	12,417	10,711	10,007	9,328	8,879	8,004
2. Industrial processes	563	584	286	89	154	127	185	154	236	161
3. Solvent and other product use	NE	NE	NE	NE	NE	NE	NE	NE	NE	4
4. Agriculture	5,335	4,418	3,871	2,533	2,139	1,934	1,848	1,804	1,794	1,708
5. Land-use change and forestry[(a)]	–10,789	–10,789	–10,838	–10,831	–10,809	–10,437	–10,450	–10,462	–10,462	–5,144
6. Waste	491	558	571	586	603	616	628	655	1,193	1,423
7. Other	0	0	0	0	0	0	0	0	0	0

[(a)] LUCF: land-use change and forestry

12. A key source assessment according to basic levels was done by the secretariat and is shown below. Latvia did not perform such an assessment.

Table 3. Key sources Latvia 1999: Level and trend assessment (UNFCCC secretariat)[(a)]

Key source	Gas	Level assessment %	Cumulative total %
Stationary combustion – oil	CO_2	22.0	22
Stationary combustion – gas	CO_2	20.9	43
Mobile combustion – road vehicles	CO_2	15.7	59
Solid waste disposal sites (SWDS)	CH_4	11.0	70
Direct N_2O emissions from agricultural soils	N_2O	5.8	75
Enteric fermentation in domestic livestock	CH_4	5.2	81
Stationary combustion – coal	CO_2	4.7	85
Fugitive emissions: oil and gas operations	CH_4	2.8	88
Indirect N_2O from nitrogen used in agriculture	N_2O	1.8	90
Railways	CO_2	1.6	91
Non CO_2 stationary combustion – biomass	CH_4	1.5	93
Manure management	N_2O	1.4	94
Waste-water handling	CH_4	1.1	95

[(a)] See footnote 5 to this report.

D. General assessment of the inventory

1. Completeness of reporting and conformity with the UNFCCC reporting guidelines

Completeness of CRF

13. CRF tables are presented only for 1998 and 1999. No estimates are made for actual and potential hydrofluorocarbon (HFC) and perfluorocarbon (PFC) emissions. Only potential sulphur hexafluoride (SF_6) emissions are quantified (as shown in CRF table summary 1.A). CRF tables 10s4 and 10s5 show zero and not estimated (NE) values respectively. As mentioned in the status report 2001, information on methods and emission factors indicated in CRF table summary 3 is provided only at the sectoral level.

Completeness and transparency of NIR

14. Summary information on the methods and emission factors used in Latvia's inventory is contained in the NIR. It is not clear, for example, what is the basis for Latvia's use of the methane correction factor (MCF) for its waste calculation (page 11 of the NIR). It would also be helpful to know which formulae were manually entered in CRF tables 4.B, 4.D, 5.A, 6.A and 6.B as mentioned on page 12 of the NIR, and the justification for them. Some of the information can be found in documentation boxes of Latvia's CRF tables.

Conformity with the IPCC Guidelines and the IPCC good practice guidance

15. Both the NIR and the CRF tables indicate extensive use of the IPCC Guidelines. No information is given on use of the IPCC good practice guidance methodologies.

2. Cross-cutting issues

Institutional arrangements

16. Not applicable.

Verification and quality assurance/quality control (QA/QC) approaches

17. While qualitative indicators on data quality are shown in CRF table 7, the only information on QA/QC cited in the NIR (page 15) suggests that estimation of data quality was difficult and "was made according to available data".

Recalculations and changes in relation to previous years

18. Recalculations were done for the 1999 data as shown in CRF table 8(a), mainly in the LUCF sector. The modification introduced here was made in comparison with a previous submission on 16 April 2001. The updated CRF table available for this review is based on the version submitted in September 2001. The reason for the recalculation is explained in this latest submission under section 1.6 (page 9) of the NIR. As recorded in CRF table 8(a), the recalculation results in changes in Latvia's total GHG emissions which are small (1.5%) when LUCF is not taken into account but large when this sector is included (1,211%). It is suggested that the cells in table 8(b) including the documentation box be filled in to justify the recalculation in the manner in which such justification was explained in the NIR.

Uncertainties

19. Although in CRF table 7 there are some qualitative estimates of the quality of emissions data, no quantitative uncertainty analysis is presented.

3. Issues related to previous reviews

20. Not applicable.

4. Areas for further improvement

Issues identified by the Party

21. The NIR concludes by enumerating problems encountered by Latvia in compiling its inventory. The lack of human, technical and financial resources is underscored as a critical impediment to improving the accuracy and completeness of the country's inventory.

Issues identified by the ERT

22. The fact that only one or two people compiled the inventory is of serious concern. Institutional issues will also need to be addressed to sustain and regularize the inventory effort. It is suggested for future submissions of the NIR that the reliance on expert opinion be referenced and further detailed in the NIR itself.

II. ENERGY

A. Sector overview

1. Introduction

23. In 1990 (base year), Latvia's total GHG emissions from the energy sector were estimated to be 24,629 Gg of CO_2 (carbon dioxide) equivalent, representing about 79% of total GHG emissions in that year (excluding LUCF). By 1999, GHG emissions from that sector had decreased by about 69%, to 7,628 Gg CO_2 equivalent, corresponding to about 69% of total emissions, also excluding LUCF.

24. CO_2 emissions constitute by far the largest share of GHG emissions in the energy sector; in 1999 the share of GHGs is 64% for CO_2, 24% for CH_4 and 12% for N_2O (nitrous oxide).

25. No key sources are identified in Latvia's NIR and thus it has not been possible to make a comparison with those identified by the secretariat. However, of the 13 key sources identified by the secretariat, seven are in the energy sector, and these contribute up to 69.2% of total emissions in 1999.

2. Completeness

26. CRF table summary 2 identified sources that were not estimated, namely fugitive emissions of CO_2, CH_4 and N_2O associated with solid fuels, and fugitive N_2O and CO_2 emissions associated with oil and gas production. The NIR states that these emissions do not on the whole occur in Latvia. In addition, fugitive CH_4 emissions from leakage at industrial plants and power stations were not estimated. Furthermore, there are no estimates for bunker fuels because of a lack of activity data. Except for these emissions, which would add a very small amount to total emissions, it could be said that the coverage of the inventory for the energy sector is functionally complete.

3. Transparency

27. Inventory data were obtained from several publications of the Central Statistical Bureau, the Latvian Development Agency, and the Latvian Environmental Agency. The NIR, however, makes no explicit statements on the integrity of the data, or how the data were generated – whether through surveys, sampling or measurements, for instance. The NIR does not sufficiently and satisfactorily back up the data in the CRF.

4. Methodologies, emission factors and activity data

28. Methodologies used are consistent with the IPCC Guidelines. Predominantly, the emission factors employed are the IPCC default values. The CRF explains that IPCC tier 1 methods were generally used in the assessment of the energy sector, except in the transport subsector where country-specific (CS) methodologies were employed. Apart from table 14 in the NIR showing an allocation scheme for gasoline and diesel oil to different transport modes, no further explanations are given.

5. Recalculations

29. Recalculated estimates are given in table 8(a) of the CRF for 1999. The recalculation became necessary as a result of the draft S&A report 2001 on Latvia's initial submission. The recalculations, however, have no effect on emission estimates for the energy sector.

6. Uncertainty estimates

30. CRF table 7 provides some qualitative indicators for data quality, made on the basis of available information. No quantitative estimates of uncertainty are provided.

7. Verification and quality assurance/quality control (QA/QC) approaches

31. The NIR reports that no form of verification or QA/QC procedures was implemented.

B. Conformity with the UNFCCC reporting guidelines and the IPCC Guidelines

32. In general, the methodology used for the estimates of GHGs is consistent with the IPCC Guidelines and the UNFCCC reporting guidelines.

C. Reference and sectoral approach

1. Comparison between reference and sectoral approach

33. The CO_2 emissions from fuel combustion in the energy sector in 1999 were estimated using the IPCC reference approach and the sectoral approach. Both approaches agree within 0.06%.

2. Treatment of feedstocks and non-energy use of fuels

34. No estimates are reported for feedstocks and non-energy use of fuels. No reasons are provided for this in the NIR.

3. International bunker fuels

35. The NIR reports that activity data were not available for estimation of emissions resulting from international bunker fuels.

D. Key sources

36. Latvia does not identify any key sources in its NIR. The comments below are based on the key sources identified by the secretariat and entries in the CRF tables.

1. Stationary combustion: oil, coal and gas – CO_2

Trend

37. It has not been possible to give a trend analysis by fuel type for this key source category. In 1999, CO_2 emissions from stationary sources of oil, gas and coal accounted for 22.0%, 20.9%, and 4.7% of total GHG emissions respectively. When the three fuel types are grouped together, CO_2 emissions from stationary fuel combustion decreased by 69% between 1990 and 1999. This overall trend followed the general trend of total CO_2 emissions from the energy sector, which decreased by 68% over the same period. This is a steep drop, which is not typical of Annex I Parties, but is in line with the observed trend for countries undergoing the process of transition to a market economy. The NIR does not provide any explanation for the steady decline.

Completeness

38. The coverage is functionally complete.

Methodologies

39. The IPCC tier 1 methodology has been employed.

Activity data

40. As already indicated, inventory data were obtained from several publications of the Central Statistical Bureau, the Latvian Development Agency and the Latvian Environmental Agency. The NIR, however, makes no explicit statements on the integrity of the data, or how the data were generated – whether through surveys, sampling or measurements, for instance. Beyond this statement, individual activity data are not properly referenced (that is, document numbers, publication dates and so on).

Emission factors

41. The emission factors are not referenced. The NIR reports that default emission factors have been used. The implied emission factors (IEFs) for the three fuel types are within the range given in the IPCC Guidelines.

2. Mobile combustion: road transport – CO_2

Trend

42. This key source accounts for 15.7% of total emissions in 1999. Neither the NIR nor the CRF provides separate trends according to transport mode for CO_2 emissions in the transport sector. However there is information on the trend of CO_2 emissions from the transport subsector, which includes roads, railways, domestic aviation and marine transport. CO_2 emissions from the transport sector in general have decreased by 65% between 1990 and 1999.

Completeness

43. The coverage is functionally complete.

Methodologies

44. The IPCC tier 2 approach has been used for this key source. Specifically, emissions have been estimated by multiplying activity data for gasoline, diesel and natural gas-consuming vehicle stock by appropriate IPCC default emission factors.

Activity data

45. The vehicle stock is categorized into gasoline, diesel and natural gas-consuming types. Furthermore, the gasoline-consuming category is subdivided into passenger, light-duty, heavy-duty and motorcycle types. The activity data, that is, the gasoline consumption of each type of fuel is assumed to be a percentage based on the statistics for vehicle stock in 1994, (see table 14 of the NIR). For diesel-consuming vehicles, it is assumed that road transport accounts for 72% of total diesel consumption in Latvia. Again the activity data, that is, diesel consumption by vehicle type, is apportioned based on the 1994 diesel vehicle stock.

46. From the above it can be seen that the accuracy of estimation depends on the 1994 statistical balance of vehicles used. This source is not properly documented and it is therefore difficult to ascertain the methodology used in obtaining the data and hence its integrity. In

addition, the underlying assumption that the 1994 condition holds in 1999 may not be entirely accurate.

47. The activity data for natural gas-consuming vehicles is given in the CRF but the source of data is not given in the NIR.

Emission factors

48. The emission factors employed are IPCC default values. The specific default values for the different vehicle types are not documented in the NIR. The implied emission factors in table 1.A(a) of the CRF are within the range of values reported by Annex I Parties.

3. Fugitive emissions from oil and gas – CH_4

Trend

49. In Latvia, total fugitive CH_4 emissions from oil and gas decreased by 72% between 1990 and 1999 (that is, from 53.24 Gg CO_2 equivalent in 1990 to 14.93 Gg CO_2 equivalent in 1999). There is no discernable trend for this source category for Annex I Parties. The NIR does not provide any explanation for the sharp decline. However, it is evident that Latvia imports not crude oil but refined products. Hence the fugitive emissions are related only to transport and distribution of refined petroleum products, and natural gas transmission. Since overall energy consumption has decreased over the period, one would expect the fugitive emissions to also decrease correspondingly.

Completeness

50. The coverage of this key source is incomplete. CH_4 emissions from industrial plants and power plants are not estimated. Activity data associated with distribution of refined products are incomplete. Only gasoline activity data are recorded in the oil sector. Those associated with diesel and other products are not given. This does not affect overall fugitive CH_4 emissions from the oil sector, since CH_4 emissions from distributing and transporting refined products are considered to be negligible.

Methodologies

51. The IPCC tier 1 method has been employed.

Activity data

52. The CRF indicates that activity data have been taken from the 1999 energy balance produced by the Latvian Development Agency. Beyond this fact, no explicit statements are provided on the integrity of the data, or how the data were generated – whether through surveys, sampling or measurements for instance. It appears from CRF table 1.B.2 that the activity data in row 1.B.2.a.iii are for gasoline distribution, and not crude oil as would be expected. If this is the case, then the activity data should have been entered in row 1.B.2.a.vi, together with other petroleum products imported into Latvia.

53. No activity data are recorded for leakage of CH_4 at industrial plants and power stations. The effect of this is that CH_4 emissions from this key source are omitted. The Party reports that overall CH_4 emissions from these sources are considered to be negligible.

54. In the case of CH_4 leakage in the residential and commercial sectors, the activity data are recorded in weight units; it would have been better if those had been converted to energy units.

Emission factors

55. The emission factor used for estimating CH_4 emissions from transmission of natural gas is given in the NIR as 340,000 kg/PJ of gas consumed. There is no IPCC default emission factor for the former USSR or for Central and Eastern Europe for this activity. Nevertheless, this figure appears high when compared with the default factors reported in the IPCC Guidelines for other regions. There is no explanation in the NIR for the choice of this emission factor.

56. No emission factors are used for leakage of CH_4 at industrial plants and power stations. If the average value of the range of IPCC regional emission factors (2,795,000 kg/PJ) had been used to multiply the activity data then there would have been a substantial increase in estimated CH_4 emissions.

57. The IEF for the activity reported under gas is a result of the deliberate erasure of protected formulae in cell G18 in CRF table 1.B.2.

4. Mobile combustion: railway transport – CO_2

Trend

58. It has not been possible to give a trend analysis for railway transport because the historical estimates for the entire transport sector were not disaggregated. As noted earlier, CO_2 emissions from the transport sector in general decreased by about 65% between 1990 and 1999.

Completeness

59. The coverage is functionally complete.

Methodologies

60. IPCC tier 1 methodology has been employed.

Activity data

61. As already indicated, inventory data were obtained from several publications of the Central Statistical Bureau, the Latvian Development Agency and the Latvian Environmental Agency. The NIR, however, makes no explicit statements on the integrity of the data, or how the data were generated – whether through surveys, sampling or measurements, for instance. Beyond this statement, individual activity data were not properly referenced (that is, document numbers, publication dates and so on).

Emission factors

62. The emission factor is not referenced. The NIR reports that default emission factors have been used. The IEF for the liquid fuel type is within the range given in the IPCC Guidelines.

5. Non-CO_2 stationary biomass combustion – CH_4

Trend

63. Emissions from this key source declined overall by 13.6%, from 194.0 Gg of CO_2 equivalent in 1998 to 167.6 Gg of CO_2 equivalent 1999. Only two years' CRF tables are available; hence there was not enough data available to provide a trend analysis.

Completeness

64. The coverage is functionally complete.

Methodologies

65. The IPCC tier 1 methodology has been employed.

Activity data

66. The source of the activity data is not referenced in the NIR.

Emission factors

67. The emission factor is not referenced. The NIR states that default emission factors have been used. Given the wide range of fuels that Parties classify as biomass it is not possible to compare the calculated IEF for this key source with that of other Parties.

E. Non-key sources

68. The draft S&A 2001 report identified some issues concerning non-key sources which the Party has not satisfactorily dealt with.

1. Energy industries: solid fuels – CH_4

69. The IEF for CH_4 in 1999 (22.4 kg/TJ) is the highest of the reporting Parties. The explanation for this given by the Party is that emissions were calculated individually for coal and peat using IPCC default emission factors. The emission factors for coal and peat were then added to compute the IEF for solid fuels. This is not correct and the Party should look into this aspect of the calculation.

2. Mobile combustion: road transport

N_2O from gasoline combustion

70. The value of the IEF for gasoline in 1999 (1.6 kg/TJ) is very low compared to the average of 10.6 kg/TJ for all reporting Parties.

CH_4 emissions from gasoline combustion

71. The value of the IEF for CH_4 emissions from gasoline combustion in 1999 (26.4 t/TJ) for road transport is the second highest of the reporting Parties.

CH_4 emissions from diesel oil combustion

72. The value for the IEF for CH_4 for diesel oil in 1999 (6.22 t/TJ) is the fourth highest of the reporting Parties.

73. The Party commented on the above by stating that emission factors for different fuel types were included under solid fuels, and that various types of vehicles were included under road transport. The Party wanted to know whether this approach was correct. Methodologically, emission factors are not supposed to be added up to obtain the IEF. The Party needs to look into this matter and to correct emission entries in the CRF appropriately.

F. Areas for further improvement

1. Issues identified by the Party

74. The NIR enumerated problems encountered by Latvia in compiling its inventory. These include a lack of human, technical and financial resources. For instance, the inventory was compiled by only one or two people. The Party responded to most of the issues raised in the draft S&A report 2001. The Party does not specify any areas for further improvement, although the NIR makes it clear that the Party recognizes the need for improvement but is constrained by a lack of resources.

2. Issues identified by the ERT

75. Institutional and capacity building will need to be undertaken to sustain and regularize the inventory effort.

76. Specifically in this sector, the suggestions for further improvement are:

(a) All cells in the common reporting format (CRF) tables should contain a notation key or data;

(b) Data should not be overwritten on protected cells for calculating IEFs in the CRF;

(c) The practice of adding emission factors in a given subsector should be corrected.

III. INDUSTRIAL PROCESSES

A. Sector overview

77. According to the inventory for 1999, industrial processes (including solvent and other product use) account for 1.46% of Latvia's total GHG emissions, expressed as CO_2 equivalent (emissions and removals from the LUCF are not considered); the share of industrial processes is 1.42%, whereas the share of solvent and product use is 0.038%.

78. The estimations included refer to activities which were not considered as key sources in the assessment performed by the secretariat; no assessment of key sources has been performed by the Party.

79. Total GHG emissions from this sector have decreased by 70.7% from 1990 to 1999.

1. Completeness

80. The sector is covered in terms of IPCC source categories and GHGs, through the use of the notation key NO (not occurring) for several activities for which no other information has been provided.

2. Transparency

81. The information included in the NIR greatly improves the transparency of the estimates referring to this sector.

82. With regard to emission estimates, the notation key C (confidential) has been used for:

(a) CO_2 emissions from cement production, lime production and limestone and dolomite use; the sum of the emissions from the subsectors is reported under the sector mineral products;

(b) SO_2 (sulphur dioxide) emissions from cement production;

(c) NMVOC emissions from glass production;

(d) NO_X, (nitrogene oxides) CO, NMVOC and SO_2 emissions from iron and steel production.

83. Concerning activity data, the notation key C (confidential) has been used for:

(a) production of cement and lime (the relevant information is regarded as "confidential business information");

(b) production of asphalt used in the activities asphalt roofing and road paving with asphalt;

(c) production of steel.

3. Methodologies, emission factors and activity data

84. Emissions from industrial processes have been estimated using IPCC tier 1 methodologies and default emission factors.

85. Emissions from solvent and other product use, for which no IPCC methodology is available, have been estimated on the basis of solvent consumption data, using emission factors derived from the experience of neighbouring countries.

4. Recalculations

86. Information on recalculations is not provided in the CRF for the years 1990–1998. The latest submission includes a table of recalculations for 1999. However, in the case of industrial processes it has not been possible to compare the data with the previous (2000) submission because Latvia does not report much numerical data, but uses the notation key C for several of the activity data and reported 1998 emissions data for 1999 in the case of mineral products, due to the confidentiality of 1999 data.

5. Uncertainty estimates

87. Although the CRF table 7 provides some qualitative indicators for data quality, made on the basis of available information, no quantitative information on uncertainty estimates is provided.

6. Verification and quality assurance/quality control (QA/QC) approaches

88. No information is available as to whether the inventory data have been subject to any self-verification or independent review procedures

B. Conformity with the UNFCCC reporting guidelines and the IPCC Guidelines

89. Latvia provides inventory data for 1999 using the CRF. The submission encompasses all requested tables. An NIR has been submitted, which includes summary information on methodologies used for the 1998 and 1999 inventories. Notation keys are used in some CRF tables. In general, the methodology used for the estimation of GHG emissions is consistent with the IPCC Guidelines and the UNFCCC reporting guidelines.

C. Key sources

90. No key sources have been identified, either by the secretariat or by the Party.

D. Non-key sources

1. Cement and lime production and limestone and dolomite use

91. The Party provides 1998 emissions data and IEFs for 1999, as 1999 data are indicated as being confidential business information.

2. Soda ash use

92. Soda ash use is reported as not estimated (NE); however, no explanation is provided in table 9 of the CRF.

3. Asphalt roofing, road paving and other (glass production)

93. No estimates are provided as activity data are reported as being confidential.

4. Chemical industry

94. All source categories are reported as NO.

5. Steel production

95. Activity data are reported as confidential and estimates are reported as included elsewhere (IE), with an indication in table summary 3 of their inclusion in the energy sector under manufacturing and construction industries.

96. All other source categories for 2.C are reported as NO.

6. Production of halocarbons and SF_6

97. The Party reports that production of these gases does not occur (NO).

7. Consumption of halocarbons and SF_6 (actual and potential emissions)

98. Actual emissions are reported as not occurring for all gases. However, potential emissions are reported as not estimated for imported quantities of HFC-23, 32, 41, 43-10mee, 125, 134, 134a, 152a, 143 and 143a (in bulk/in products).

99. Potential emissions from electrical equipment are reported in the sectoral table 2(I) but are reported as NO in the sectoral report table 2(II).

8. Paint application, and degreasing and dry cleaning

100. NMVOC emissions from paint application are estimated on the basis of solvent consumption data, using emission factors calculated from the Polish Foundation for Energy Efficiency (FEWE). CO_2 emissions from these categories are reported as not occurring.

101. Emissions from the use of N_2O for anaesthesia are estimated on the basis of consumption data, using the same emission factor as that used by Austria.

E. Areas for further improvements

1. Issues identified by the Party

102. In 2000, within the frame of a study, "The preparation of emission data for new gases of the Kyoto Protocol, part I", HFC, PFC and SF_6 emission sources have been identified, analysed, described and grouped for the first time.

2. Issues identified by the ERT

103. The Party should focus its efforts on the availability of basic statistical information. The confidentiality of production data undermines the transparency of the inventory.

IV. AGRICULTURE

A. Sector overview

104. Agricultural emissions account for 84.5% and 25% of national emissions of N_2O and CH_4 respectively. Agricultural N_2O and CH_4 emissions have decreased by 65% and 72% respectively in the period 1990–1999.

105. A time series is given in tables 10s2 and 10s3 for CH_4 and N_2O respectively. There was a 0.8% increase in N_2O emissions from agriculture between 1998 and 1999, and a 12.6% increase in CH_4 emissions from agriculture in the same period. The increase in N_2O is due to an increase in direct soil emissions (reason not specified). For N_2O, there were large decreases between 1991 and 1992 (31%), 1992 and 1993 (16%) and 1993 and 1994 (15%).

106. The key source for CH_4 was enteric fermentation (5.2% of national GHG emissions) and for N_2O it was direct soil emissions (5.8%), indirect soil emissions (1.8%) and manure management (1.4%), as identified by the secretariat. Latvia did not identify key sources.

1. Completeness

107. Table 10s3, N_2O emissions, has not been completed for all agricultural sources for all years. Latvia submitted CRF tables for 1998 and 1999. The calculation cells in the CRF tables 4.B(a), 4.B(b) and 4.D have been overtyped. From its response to the draft S&A 2001 report, it seems that Latvia has used the CRF to calculate emissions from agriculture, and has changed the tables in order to do this. This results in the omission of some information, and comparisons between different tables are not so straightforward as they are designed to be.

108. CO_2 emissions are not reported in the agricultural sector.

109. No QA/QC information, or plans for implementation of QA/QC procedures are given.

110. There are estimates in the time series for all years for CH_4. For N_2O, emissions from agricultural soils are included for all years, but for manure management, estimates are included for 1998 and 1999 only.

111. Gaps in the tables are appropriately annotated in tables 4.A, 4.B(a), 4.B(b) and 4.D, but not in the sectoral table 4.

2. Transparency

112. The summaries of N_2O and CH_4 emissions in table 7 of the NIR accord with the values in the CRF. There are discrepancies in CH_4 emission between the CRF and the NIR (table 13), which appears to be due to a mis-specification of units in the NIR.

3. Methodology, emission factors and activity data

113. The methodology is IPCC tier 1 with default emission factors for both N_2O and CH_4 (Eastern Europe, cool), and is accurately specified in CRF summary 3.

Emission factors

114. Default emission factors and parameters are used to estimate emissions (and their use is specified in the documentation boxes of the CRF tables). The formulae of tables 4.A, 4.B(a) and 4.B(b) have been overwritten.

115. Because the animal numbers are erroneously high (see below), calculation of IEFs would not give the same value as the emission factors provided. If the unit error is corrected, this discrepancy is rectified.

Activity data

116. Animal numbers have been entered as total numbers, rather than rounded to 1000 head as the table specifies (acknowledged in Latvia's response to the draft S&A 2001 report). This would result in extreme underestimation of emission factors if the calculation were fed through as normal in these tables. The IEFs have, however, been overwritten, and so the IEF is no longer a calculation. Likewise, the sum of N excretion in each animal waste management system (AWMS) has been overwritten with a different calculation, and this sum is not given. In addition to the unit error in the tables, there is some discrepancy (15%) between the CRF/NIR and FAO (United Nations Food and Agricultural Organization) numbers of cattle (378,000 versus 434,000 for cattle and 405,000 versus 421,000 for swine).

117. If the units error is corrected for, the sum of N excretion in AWMS corresponds to N excretion calculated by animal numbers x N excretion rate. The sum of N excretion in pasture, range and paddock in table 4.B(b) does not correspond to the value in table 4.D as the former has been overwritten. If this, and the unit problem outlined above, is corrected, the two numbers are the same.

118. The source of activity data for fertilizer use and animal numbers is given (Statistical Yearbook) but no information is given on the origin of these data (survey or estimate, for example) nor by whom they are collected.

4. Recalculations

119. No recalculations have been made in the agricultural sector.

5. Uncertainty

120. The agricultural emissions of N_2O and CH_4 are specified as medium quality in table 7. No further information on the estimation of uncertainty is provided in the Latvian submission.

6. Verification and QA/QC approaches

121. No information is provided.

B. Conformity with the IPCC Guidelines and the UNFCCC reporting guidelines

122. The approach taken accords with the IPCC methodology. The CRF tables have not been used correctly in some cases. There is insufficient information in the NIR to determine the degree to which livestock classes have been disaggregated and whether sufficient data are available to specify country-specific N excretion, AWMS allocation and so on. A country-specific value would be particularly useful for emissions from mineralization following cultivation of histosols, since this represents 48% of the direct soil N_2O emissions. The IPCC good practice guidance suggests the use of an IEF from this source of 8 kg N_2O-N/ha, and Latvia should assess whether this is more appropriate than the 5 kg N_2O-N/ha in the IPCC Guidelines, which is adopted in the inventory.

123. The key sources have not been estimated using tier 2 methodology, as the decision tree approach would recommend, but this may be due to a lack of data.

C. Key sources

1. Enteric fermentation – CH_4

Trend

124. CH_4 emissions account for 4.2% of national GHG emissions, 22% of national CH_4 emissions and 88% of CH_4 emissions from agriculture.

125. For CH_4 emissions from enteric fermentation there was a 16% decrease between 1991 and 1992, a 38% decrease between 1992 and 1993, and a 17% decrease between 1993 and 1994. The reason for these changes is not given. The reduction in CH_4 emissions between 1998 and 1999 (8.8%) is attributed in the NIR to decreased animal numbers.

Completeness

126. The coverage is functionally complete.

Methodology

127. This source was estimated using the IPCC tier 1 methodology.

Activity data

128. The NIR gives the sources of agricultural data as being obtained from the Central Statistical Bureau, augmented in some cases by expert judgment, such as areas of cultivated and

total arable land. No further details are provided to indicate how specific data have been collected or the specific references used in obtaining specific data on a case-by-case basis.

Emission factor

129. IPCC default emission factors have been used.

2. Direct soil emissions – N_2O

Trend

130. Direct soil emissions account for 62% of the total N_2O emissions from the agricultural sector in 1999. They also account for 5.8% of the total GHG emissions in that year. The N_2O emissions from agricultural soil reported in the CRF are not split into direct and indirect emissions for the historical years; hence it is not possible to be accurate with regard to the trend of N_2O direct emissions. However, overall N_2O emissions from agricultural soils decreased by about 65% between 1990 and 1999.

Completeness

131. The coverage is functionally complete.

Methodology

132. The IPCC tier 1 methodology has been used.

Activity data

133. The NIR gives the sources of data as being a number of Central Statistical Bureau and Latvian Government departments. No further details are provided to indicate how specific data have been collected or regarding the specific references used in obtaining specific data on a case-by-case basis.

134. There is a wide discrepancy between the fertilizer use specified in the CRF (17,100 tonnes) and that in the FAO statistics (33,600 tonnes).

Emission factor

135. The IEF for emissions from crop residues is relatively high compared to other countries, and, because the formulae have been overwritten, it is apparent that emissions from this source have been calculated by multiplication of dry biomass production and emission factor, rather than N in biomass x emission factor. The values for fractions (for example, $Frac_R$, $Frac_{NCRBF}$) have been provided in the additional information table, and it is possible that the value given as dry biomass is in fact biomass N. No information is given to determine whether this is the case. The same applies to N fixing crops.

136. Emissions from histosols contribute 48% of the direct soils emissions. The NIR states that 7% of arable land is covered by histosols.

3. Indirect emissions – N_2O

Trend

137. Indirect N_2O emissions account for 18.8% of the total N_2O emissions from the agricultural sector. They also account for 1.8% of total GHG emissions in the same year. The

non-availability of a detailed split between direct and indirect N_2O emissions precludes the analysis of trends in this key source category.

Completeness

138. The coverage is functionally complete.

Methodology

139. Emissions have been calculated using the IPCC tier 1 methodology.

Activity data

140. The activity data used are reported as being obtained from a number of Central Statistical Bureau and Latvian Government departments. No further details are provided to indicate how specific data have been collected or regarding the specific references used in obtaining specific data on a case-by-case basis.

Emission factors

141. The IPCC default emission factors have been used.

4. Manure management – N_2O

Trend

142. Manure management accounts for 14.5% of N_2O emissions from the agricultural sector. Emissions from manure management decreased between 1998 and 1999 by 14.6%, attributed in the NIR to decreasing animal numbers.

Completeness:

143. The coverage is functionally complete.

Methodology

144. Emissions have been calculated using the tier 1 methodology.

Activity data

145. There are problems in the reporting of this source, due to discrepancies in animal numbers, and overtyping of formulae in the CRF tables (see paragraph 135 above).

Emission factors

146. The IPCC default emission factors have been used.

D. Non-key sources

147. For CH_4 emissions from manure management, there were large annual decreases between 1991 and 1992 (–24%) and between 1992 and 1993 (–40%). These are in line with the reductions in enteric emissions in the same periods.

E. Further improvements

1. Issues identified by the Party

148. No specific matters have been identified by the Party.

2. Issues identified by the ERT

149. The inventory could be improved by using country-specific rather than default parameters, such as N excretion in different AWMS. Particularly, a tier 2 calculation of CH_4 emissions from enteric fermentation would improve the accuracy of the estimate.

150. Given the importance of agriculture to national emissions of CH_4 and, particularly, N_2O, some improvements in the methodology could be made, given sufficient availability of data. The emission of N_2O from cultivated histosols is an important component of the inventory, due to the relatively large area of Latvia's arable land occupied by these soils. Research to derive country-specific emission factors for this source would enable increased accuracy of the emissions estimate.

V. LAND-USE CHANGE AND FORESTRY

A. Sector overview

151. Forests are a very important land-use category in Latvia due to the large portion of forested area, and also this category is very important for GHG emission amounts. The LUCF category represents high CO_2 removals which are comparable with emissions from the energy sector (CO_2 for 1999: energy emissions 7,545 Gg, LUCF removals –5,229 Gg). Net CO_2 emissions/removals showed high annual changes between the period 1995–1998 (–10,600 Gg) and 1999 (–5,322 Gg). This difference is connected with the changes in annual release from harvest. The estimation of CO_2 emissions and removals from soils is reported only for cultivation of organic soils and for liming of agricultural soils. Detailed information about LUCF activities is provided in the NIR.

1. Completeness

152. Estimates of GHG emissions and removals for the LUCF sector are provided for the whole period 1990–1999. CRF sectoral table 5 gives the overall data on the LUCF sector, including changes in forest and other woody biomass stocks (category 5.A) and CO_2 emissions and removals from cultivation of organic soils and from liming of agricultural soils. Individual background tables (5.A, 5.D) provide detailed relevant data. The data relating to the forest and grassland conversion as well as to abandonment of managed lands (categories 5.B, 5.C) are not reported, but in table 5.A, the category temperate forests (other), activity data for "clearing and rough afforestation" are mentioned.

2. Transparency

153. Although the Party has listed a number of statistical agencies as the source of the activity data and has presented some explicit assumptions about data on LUCF, the NIR does not sufficiently and satisfactorily back up the data in the CRF.

3. Methodology, emission factors and activity data

154. Calculation of the emissions and/or removals from the LUCF sector was carried out according to the IPCC methodology (NIR) with some national modifications.

155. Mostly country-specific factors were used, especially in source category 5.A (changes in forests and other woody biomass stocks). Some of these factors are outside the range of IPCC default values (the average annual growth rate seems to be especially high), but the sources of the data are well documented in the NIR. For non-CO_2 emissions from forest fires the IPCC default emission factors have been used.

156. The input activity data are based on results from the State Forestry Service in Latvia. For the main LUCF processes, the reported activity data are sufficient (annual increase of biomass, commercial harvest, amount of annual harvesting residues for on-site burning).

4. Recalculations

157. The recalculations are reported in table 8(a) for the year 1999. The recalculation process has been carried out for category 5.A (previous submission –10,578 Gg, latest submission –5,322 Gg). Explanations are provided in the NIR.

5. Uncertainty estimates

158. Although some qualitative estimates of the quality of data are presented in CRF table 7, the Party does not provide quantitative uncertainty analysis for any source categories.

6. Verification and QA/QC approach

159. No information is available on internal and/or external verification processes.

B. Conformity with the UNFCCC reporting guidelines and the IPCC Guidelines

160. The emission estimates are, in general, consistent with the IPCC methodology and the UNFCCC reporting guidelines. The NIR is available and includes chapter 1.6 “Land-use change and forestry” containing the main information relating to the sector.

C. Sources and sinks categories

1. Changes in forest and other woody biomass stock

161. Gross emissions and removals are reported for the period 1990–1999 in the category of temperate forests. CO_2 removals are reported for temperate forests in the removals column and the value of –5,322 Gg CO_2 (1999) as net annual removals; for previous years the values are in the range of –10,600 to –10,960 Gg. This difference is caused by changes in annual harvest (NIR). CO_2 emissions are not reported separately in table 5, but are reported in table 5.A. These reported data (gross versus net emissions/removals) should be harmonized. Average annual growth rates reported range from 5.83 to 5.87 t dm/ha/yr, for a set of temperate forests, and from 2.0 to 5.23 t dm/ha/yr, for a set of non-forest trees (gardens, parks, bushes). Highest values for growth rates are above the IPCC default values for the respective forest types. These values seem also to be very high in comparison with data for temperate forests in other countries. Net removals in this category fluctuate as a consequence of changes in harvest data (NIR). In the NIR, fuelwood consumption is mentioned, but in table 5.A in the sheet for traditional fuelwood consumed the value is not reported. This should be clarified.

2. Forest and grassland conversion

162. The data for CO_2 emissions from burning off-site biomass are not reported. Emissions of non CO_2 GHGs from on–site burning are reported only in table 5. Detailed information about these calculations is provided in the NIR. In future we recommend that this data should also be reported in table 5.B.

3. Abandonment of managed lands

163. Data for this category are not reported. Afforestation activities in Latvia are mentioned in table 5.A and carbon uptake is calculated there. Information about forest land area increase in Latvia is reported in the NIR, but CO_2 removals should also be taken into account in source category 5.D (CO_2 emissions and removals from soils – cultivation of mineral soils).

4. Emissions and removals from soil – CO_2

164. Annual changes for CO_2 emissions are identified as from 85 Gg (1992) to 134 Gg (1990, 1991) for the category cultivation of organic soils. The implied emission factor for average annual rate of soil carbon uptake/removal is one Mg C/ha/yr and corresponds with the IPCC default values. Information about activity data relating to this category is not available.

D. Areas for further improvement

1. Issues identified by the Party

165. In chapter 10 of the NIR, problems associated with sustainability of the emission inventory process are included. Problems listed include lack of adequate data, and inadequate human and financial resources to back up the process. Improvements to future inventory submissions will be very limited unless these problems are addressed. No planned or ongoing activity is reported in the NIR.

2. Issues identified by the ERT

166. Under the review process, the following areas for improvement were identified: harmonization of the land-use category data within the source and sink categories, and completion of the sectoral CRF table for source categories 5.C and 5.D. It is necessary to improve the quality and reporting of the activity data. We recommend making a calculation of CO_2 removals for abandonment of managed land (category 5.D) and clarification of the land-use category data (5.A, 5.C and 5.D) in the next submission. Any additional information on methods or technique used to estimate or develop emission factors (such as expert judgement, field measurements, remote sensing) should also be reported in order to improve the quality and clarity of the estimates.

VI. WASTE

A. Sector overview

167. Emissions from the waste sector comprised 13% of total emissions in 1999 compared with 1.6% in 1990. CH_4 emissions, the major GHG from this sector, increased by a factor of three from 1990 to 1999. The waste sector has two key sources: 6.A Solid waste disposal on land which represents 10.7% of total emissions, and 6.D Waste-water handling which comprises 1.1% of total emissions.

1. Completeness

168. All CRF tables specific to the waste sector are included in the submission. The tables are incomplete in that they do not include notation keys where there are no data entered. This means that for CH_4 recovered it is not clear whether it is not estimated (NE) or not occurring (NO). This should be rectified in future inventories. In addition, IEFs are shown as 0.00. Comment has been made on this in the S&A report 2000 and the draft S&A report 2001.

2. Transparency

169. The CRF tables read in conjunction with the Party's NIR provide a reasonable level of transparency. Methodologies used for estimating emissions from the waste sector are shown as tier 1 default methodologies (table summary 3). The notation key FE is used in table 7. It is conjectured that this indicates "full estimate", although clarification is required.

170. Data sources are summarized in the documentation boxes. The documentation box for table 6.B states that the nitrogen fraction is "from 4-19 tab". This requires explanation.

3. Uncertainties

171. The NIR notes that quantitative uncertainty analysis has not been undertaken due to a lack of resources. However, qualitative assessment of the data quality associated with the estimates presented is provided in table 7.

4. Recalculations

172. The Party has provided information on recalculations in table 8(a) for the year 1999. The data included in the table indicate that there have been no recalculations for the waste sector.

B. Consistency with the IPCC Guidelines and the UNFCCC reporting guidelines

173. The inventory is not yet fully consistent with the IPCC Guidelines and the UNFCCC reporting guidelines in that there are several omissions from tables and some tables have not been completed. The application of the IPCC default methodology for solid waste and waste-water handling appears to be consistent with the guidelines; these are tier 1 default methodologies as classified in the IPCC good practice guidance.

C. Key sources

1. Solid waste disposal on land – CH_4

174. CH_4 emissions from solid waste trebled from 1990 to 1999 and increased by 9.2% from 1998 to 1999, and by 93.7% from 1997 to 1998.

Methodology

175. CRF table summary 3 shows the methodology as being the tier 1 default methodology.

Activity data

176. Activity data are described in the NIR. Waste generation is assumed to increase each year although the basis for the increase is not explained and nor is the amount of the increase. The fraction disposed of to managed sites increases annually with a commensurate decrease in

unmanaged waste disposal. The values used are not specified or explained. The fraction of DOC is taken from Russia.

Emission factors

177. Emission factors are not relevant to the application of the IPCC default methodology.

2. Emissions from waste water – CH_4

Methodology

178. CRF table summary 3 indicates the methodology as being the tier 1 default methodology. Separate estimates are not provided for domestic and commercial waste water, and industrial waste water. The NIR notes that it is not possible to separate the emissions. However, it is not clear what assumptions are made in respect of industrial waste-water flows or how the default methodology is adjusted to reflect the inclusion of industrial waste water. More explanation is required. In addition, clarification is needed as to whether there is industrial waste water not accounted for by the methodology which gives rise to emissions that are not estimated.

Activity data

179. The CRF states that waste-water data are obtained from the Annual State Statistical Report. No further details are given in the NIR.

Emission factors

180. The IPCC default emission factor is used as a result of the application of the tier 1 default methodology.

D. Non-key sources

181. N_2O emissions from 6.B Waste-water handling is a non-key source. These emissions are estimated using the IPCC default methodology with a country-specific protein consumption per capita. The draft S&A report 2001 noted that this was the second highest protein consumption among the Parties. The Party has not commented on this observation.

E. Results from previous reviews

182. Several issues that have been referred to above were raised in the S&A report 2000 and draft S&A report 2001. Attention was drawn to the fact that the IEFs for waste are shown as 0.00 and to the large increase in emissions from solid waste, especially since 1997.

183. The Party responded:

(a) "As we do not have CH_4 recovery, no IEF is available. The default value for the fraction of CH_4 in landfill gas is used (0.5 t/t MSW);

(b) In the period from 1990–1997 CH_4 emissions gradually increased due to the use of different factors (following experts' judgement) as waste disposals do not match the ones described in the IPCC Guidelines. Since 1998 we use IPCC default factors are used, 1.0 for managed and 0.6 for unmanaged disposal sites, instead of previously used 0.6 and 0.16 respectively."

184. The Party's response does not fully address the issues. It is appreciated that CH_4 recovery has not been estimated but this of itself does not justify omission of the IEF. It is considered that both matters should be addressed in future submissions.

185. The very large increase in CH_4 emissions is stated to be the result of a change in factors. The factors should be applied from 1990 and all emissions recalculated using the IPCC default factors. This enables comparison of changes from year to year and from 1990–1999 to be made on a consistent basis.

F. Areas for further improvement

1. Issues identified by the Party

186. The Party responded to the issues raised in the draft S&A report 2001. The Party did not specify any areas for further improvement, although the NIR makes it clear that the Party recognizes the need for improvement but is constrained by a lack of resources.

2. Issues identified by the ERT

187. In future inventories it is recommended that the Party endeavour to ensure that:

(a) All cells in the CRF tables contain a notation key or data;

(b) The matter of IEFs is reconsidered;

(c) Data on CH_4 recovery are obtained;

(d) Emissions from solid waste are recalculated from 1990 incorporating the changed factors based on the IPCC methodology;

(e) The rate at which waste per capita increases is included in the NIR;

(f) Further explanation of the approach to combining domestic and industrial waste water is included in the NIR.

188. When CH_4 recovery is included, recalculations for all years should be presented so as to ensure comparability of sectors over time.

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