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Report of the individual review of the greenhouse gas inventory of Japan submitted in 2005*

* In the symbol for this document, 2005 refers to the year in which the inventory was submitted, and not to the year of publication.

CONTENTS

I. Overview

A. Introduction

1. This report covers the centralized review of the 2005 greenhouse gas (GHG) inventory submission of Japan, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with decision 19/CP.8. The review took place from 10 to 15 October 2005 in Bonn, Germany, and was conducted by the following team of nominated experts from the roster of experts: Generalists – Mr. Ignacio Sánchez García (Spain) and Mr. Audun Rosland (Norway); Energy – Mr. Scott McKibbon (Canada), Mr. Hristo Vassilev (Bulgaria) and Mr. Hongwei Yang (China); Industrial Processes – Mr. Menouer Boughedaoui (Algeria) and Mr. Manfred Ritter (Austria); Agriculture – Mr. Sergio González (Chile) and Ms. Lilian Portillo (Paraguay); Land Use, Land-use Change and Forestry (LULUCF) – Mr. Charalampos Petsikos (Greece) and Ms. María José Sanz Sánchez (Spain); Waste – Mr. Seungdo Kim (Republic of Korea) and Ms. Tatiana Tugui (Republic of Moldova). Mr. Sergio González and Mr. Audun Rosland were the lead reviewers. The review was coordinated by Mr. Sergey Kononov and Ms. Astrid Olsson (UNFCCC secretariat).

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

B. Inventory submission and other sources of information

3. In its 2005 submission, Japan submitted a complete set of common reporting format (CRF) tables for the years 1990–2003 and a national inventory report (NIR). Japan provided the LULUCF reporting tables as required by decision 13/CP.9. However, the LULUCF tables were submitted in August, 2.5 months later than the CRF tables and the NIR. Where needed the expert review team (ERT) also used previous years' submissions, additional information provided during the review and other information. The full list of materials used during the review is provided in the annex to this report.

C. Emission profiles and trends

4. In 2003, the most important GHG in Japan was carbon dioxide (CO_2), contributing 94.0 per cent to total[1] national GHG emissions expressed in CO_2 equivalent, followed by nitrous oxide (N_2O), 2.6 per cent, and methane (CH_4), 1.4 per cent. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) taken together contributed 1.9 per cent of the overall GHG emissions in the country. The Energy sector accounted for 89.5 per cent of total GHG emissions followed by Industrial Processes (5.6 per cent), Agriculture (2.5 per cent), and Waste (2.4 per cent). Total GHG emissions amounted to 1,339,130 Gg CO_2 equivalent and had increased by 12.8 per cent from 1990 to 2003. As shown, the inventory of Japan is heavily dominated by CO_2 emissions and, from the sectoral viewpoint, by Energy.

D. Key categories

5. Japan has reported a key category tier 1 analysis, both level and trend assessment, as part of its 2005 submission. The LULUCF categories are not included in this analysis. Qualitative criteria are applied in order to pay special attention to sources where mitigation techniques are implemented, or where the estimates have been obtained for the first time, and/or where the methods have changed. Since

[1] In this report, the term 'total emissions' refers to aggregated national GHG emissions expressed in terms of CO_2 equivalent excluding LULUCF, unless otherwise specified.

Japan already performs a quantitative assessment of uncertainties (see below), the ERT encourages the Party to consider conducting a tier 2 key category analysis.

6. The key category analyses performed by the Party and the secretariat[2] produced slightly different results. The Party's analysis results in more key categories. Only Semiconductor Manufacturing and Indirect N_2O from nitrogen (N) used in Agriculture are identified as key categories by the secretariat and not by Japan. During the review the Party explained that discrepancies are due to a different disaggregation of sources, as well as the fact that Japan also used a qualitative assessment to identify key categories, and announced its intention to review this in its next submission. As stated in the NIR, the key category analysis is linked to prioritization in the development of the inventory.

E. Main findings

7. In general the inventory of Japan is at a high level of development. The submission is mostly complete and transparent, although sometimes background information is only available in Japanese. The NIR and CRF are fairly consistent, although some inconsistencies related to uncertainties, use of the notation keys and recalculations remain (see paragraphs 15–16, 11 and 14).

8. Japan introduced improvements in its 2004 submission, but there are some pending issues that should be addressed in future. In its submission Japan reports negative emissions for CH_4 and N_2O in the subsectors Energy Industries, Manufacturing Industries and Construction and Other Sectors. However, during the review Japan provided revised estimates of CH_4 and N_2O emissions for these subsectors. Following the ERT's guidance, the revised estimates reported positive emissions of CH_4 and N_2O. Additional negative estimates result from adjustments made to avoid double counting in the energy statistics. In terms of completeness, estimates for HFCs, PFCs and SF_6 are not provided from 1990 to 1994. The ERT encourages Japan to address these issues as soon as possible.

F. Cross-cutting topics

1. Completeness

9. The inventory covers almost all sources for the whole period 1990–2003 and it is complete in terms of geographical coverage. In its 2005 submission Japan has included for the first time estimates for a few sources, such as CH_4 and N_2O from civil aviation (aviation gasoline) and N_2O from manure management (sheep, goats, horses).

10. The NIR includes a list of sources that are not estimated and, although Japan considers them to be small in terms of amount of emissions or because it is not clear whether or not they occur, it acknowledges that these sources should be studied. For the fluorinated gases (F-gases) (HFCs, PFCs, SF_6), estimates are not provided from 1990 to 1994; Japan acknowledged during the review that this issue needed to be resolved, although it is not clear whether estimates will be provided in the next submission. Completeness needs to be improved in the LULUCF sector, since significant categories are estimated only for 1990–1995. The ERT encourages Japan to estimate emissions/removals from the categories that are not reported.

[2] The secretariat identified, for each individual Party, those source categories which are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the Intergovernmental Panel on Climate Change *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.* Key categories according to the tier 1 trend assessment were also identified for those Parties providing a full CRF for the year 1990. Where the Party has performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

2. Transparency

11. The NIR and the CRF tables are generally transparent. Information is structured as established in 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" (hereinafter referred to as the revised UNFCCC reporting guidelines). The use of notation keys was revised throughout the inventory in the 2004 submission, and many errors were corrected. Nevertheless, in some cases the notation keys are still incorrectly used. For instance, sometimes in the NIR "not estimated" ("NE") is interpreted as "negligible". In addition, CRF table 9 is not comprehensive, since it does not cover all sources where "NE" and "included elsewhere" ("IE") are used. The ERT recommends that Japan continue to improve the use of the notation keys in the NIR and the CRF.

12. The ERT noted that background information is usually provided in Japanese. This may hinder a full assessment of methodologies and estimates. The ERT encourages Japan to provide more background information in the NIR, especially in areas where the ERTs have asked for clarification. If possible, Japan could provide short summaries in English of the background information. The rationale behind country-specific emission factors (EFs) should be included in the NIR, and trends should be better explained when large fluctuations occur.

3. Recalculations and time-series consistency

13. Recalculations for the whole period 1990–2002 have been undertaken to take account of new methods, the addition of new categories, and the refinement of data. The effect of the recalculations on the national totals is barely noticeable. The estimates of total GHG emissions (without LULUCF) in 1990 have increased by 0.003 per cent, while those for 2002 have decreased by 0.06 per cent.

14. The reasons for the recalculations are explained in the NIR, but some of the sources subject to recalculation are not addressed in chapter 10 of the NIR, for example, CH_4 from solid waste disposal on land and CO_2 from limestone and dolomite use. Consequently, CRF table 8(b) and chapter 10 of the NIR are not fully consistent. The ERT recommends that Japan address these issues.

4. Uncertainties

15. Japan provides tier 1 (level and trend) quantitative uncertainty estimates, in accordance with the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). Japan reports an overall uncertainty for the national total of 2 per cent, and a trend uncertainty of 3 per cent. The ERT noted that the overall uncertainty for the national total is very low, and that, contrary to what is reported by Japan, the trend uncertainty is typically lower. During the review Japan explained that the share of N_2O emissions from the category Agricultural Soils, which have a high uncertainty, in total GHG emissions is lower than in other countries. Also remarkable is the fact that the uncertainty for CH_4 and N_2O from Transport was identified as the highest (166 per cent) among all categories, mainly because of the very high uncertainty in Civil Aviation and Navigation. The ERT encourages Japan to investigate further whether the estimates of uncertainty levels for specific source categories are fully accurate.

16. Japan provides qualitative information on uncertainties in CRF table 7. The ERT noted that this information is not completely consistent with the quantitative assessment included in the NIR. The ERT recommends that Japan correct these inconsistencies and use its quantitative assessment of uncertainties to apply a tier 2 key category analysis.

5. Verification and quality assurance/quality control approaches

17. Japan has established a quality assurance/quality control (QA/QC) programme. A good description of QA and QC activities is included in the NIR. The NIR also presents the current

institutional arrangements in Japan for the preparation of the inventory. Numerous checks are carried out during the inventory preparation.

6. Follow-up to previous reviews

18. Japan has introduced improvements in the 2005 submission: new sources have been estimated; the new LULUCF tables have been provided; and the use of the notation keys has been thoroughly revised. Nevertheless, some issues identified in previous reviews have not been addressed, such as the negative emissions of CH_4 and N_2O within the Energy sector.

G. Areas for further improvement

1. Identified by the Party

19. Both in the NIR and in response to questions raised by the ERT during the review, Japan identified several areas for improvement. These include: calculation of estimates for F-gases in 1990–1994; revision of the negative estimates for CH_4 and N_2O in some fuel combustion sources; assessment of sources still reported as "NE"; reconsideration of estimates where default EFs are used; and consideration of the options for preparing the inventory on a calendar year basis rather than on a fiscal year basis.

2. Identified by the ERT

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

(a) For key category analysis, LULUCF categories should be included. In addition the ERT recommends that Japan implement a tier 2 key category analysis as the necessary uncertainty estimates are available;

(b) Consistency between the NIR and the CRF in relation to uncertainties, the use of the notation keys and recalculations should be improved;

(c) Efforts to use the notation keys in accordance with the revised UNFCCC reporting guidelines should continue, so that "NE" is not interpreted as meaning "negligible"; table 9 should cover all sources where "NE" and "IE" are used; and the notation keys should be applied consistently throughout the CRF tables;

(d) The provision of more background information in the NIR would improve transparency, in particular in areas where the ERTs have asked for clarification and where only references to documents in Japanese are available at present.

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

II. Energy

A. Sector overview

22. In 2003, total GHG emissions from the Energy sector in Japan amounted to 1,198,851 Gg CO_2 equivalent. This sector is the largest source of GHG emissions in the country, contributing 89.5 per cent to the national total emissions (without LULUCF) in 2003. GHG emissions from Energy Industries and Manufacturing Industries and Construction contributed 29.8 per cent and 26.4 per cent, respectively, to the national total, followed by Transport (19.4 per cent). Emissions from the sector increased by 13.3 per cent between 1990 and 2003. In contrast to the situation in many other Parties included in Annex I to the Convention, emissions from Transport in Japan have been stable since 1997.

23. The NIR provides brief information on the methodologies used, and on the choice of activity data (AD) and EFs. However, a good deal of relevant information is not directly included in the NIR but is referenced as background reports (mostly in Japanese). The ERT recommends that Japan improve the transparency of its reporting by including in the NIR explanations on methodological issues, trends for source categories with large fluctuations and a rationale for the country-specific EFs used.

24. The CRF covers almost all sources and gases, with a few small categories from Transport and Fugitive Emissions from Fuels identified as "NE", including CH_4 and N_2O emissions from natural gas vehicles, Railways – CH_4 and N_2O, Coal Mining – N_2O, Solid Fuel Transformation – N_2O, and Fugitive Emissions: Oil and Natural Gas: Venting and Flaring – CO_2, CH_4 and N_2O.

B. Reference and sectoral approaches

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

25. CO_2 emissions from fuel combustion have been calculated using the reference approach and the sectoral approach. Over the whole time series, the difference in emissions between the two approaches ranges from –1.8 per cent to +1.5 per cent. However, the difference in CO_2 emissions from gaseous fuels in 2003 is –3.4 per cent. In the documentation box Japan notes that the reasons for this are still under examination. The ERT recommends that Japan explain the difference in its next submission.

2. International bunker fuels

26. Japan has reported all fuels for international bunkers as "not applicable" ("NA") in CRF table 1.A(b) but AD are reported in table 1.C for Jet Kerosene and Heating Oil. The ERT recommends that Japan improve consistency between these tables in its next submission.

27. The consumption of jet kerosene and the relevant GHG emissions fluctuated between 1999 and 2000, and between 2000 and 2001: the consumption in 2000 is reported as 20.7 per cent lower than that in 1999 and 17.1 per cent lower than that in 2001. This happened because of an error in the AD for 2000, which should be 276,532.6 TJ (according to the background document "bunker-2005.xls" submitted) instead of the reported 219,664.9 TJ. The ERT recommends that Japan correct the estimate and also to explain the large inter-annual changes of fuel oil consumption for Marine Bunkers between 1995 and 1996 (–41.1 per cent) and between 1996 and 1997 (+33.4 per cent).

3. Feedstocks and non-energy use of fuels

28. In 2003, 99.9 per cent of the crude oil was imported in Japan. Because Japan also imported and exported secondary fuels, feedstocks and non-energy use of some secondary fuels (table 1.A (d)) are much higher than the apparent consumptions (reference approach, table 1.A (b)). During the review Japan explained that this difference is due to the fact that for the reference approach Japan has reported feedstocks and non-energy use under the primary fuel converted (e.g. crude oil). The ERT recommends that Japan explain these differences in its next submission.

4. Country-specific issues

29. Japan reports negative emissions from the category Manufacturing Industries and Construction: Other, which is a result of a duplication adjustment in the energy statistics. Japan explains in the CRF that the duplication adjustment is a quantity which rectifies an overlap of CO_2 emissions from two or more industries. The ERT recommends that Japan explain in the NIR the rationale for the duplication adjustment.

30. In its submission Japan reports negative EFs for some CH_4 and N_2O emissions from the categories Energy Industries, Manufacturing Industries and Construction and Other Sectors. However, during the review Japan provided revised estimates of the CH_4 and N_2O emissions, following the

guidance of the ERT, the estimates being positive emissions. The ERT recommends that Japan continue reporting positive estimates of CH_4 and N_2O emissions for these subsectors.

C. Key categories

1. Stationary Combustion: liquid, solid, gas – CO_2

31. The inter-annual changes in the CO_2 implied emission factors (IEFs) of liquid and gaseous fuels used for Manufacture of Solid Fuels and Other Energy Industries are relatively high. The reason is that the EFs used for coking products (coke, coke oven gases, blast furnace gas, converter furnace gases, and coal briquettes) are the weighted average of the input raw materials (coking coal, imported coal, oil coke) for coke production. Hence the CO_2 IEFs vary in accordance with the changes in the raw material mix in different years. The downward trend of the CO_2 IEFs in recent years can be explained by the decrease in oil coke use as raw material. The ERT recommends that Japan include these explanations in the NIR of its next submission.

32. The 2003 value of the CO_2 IEF for the subcategory 1.A.2.c Chemicals is 10.8 per cent lower than the 1990 value and the change between 1997 and 1998 is –9.4 per cent. The ERT found that in 1997 and earlier years emissions in 1.A.2.c Chemicals were large and emissions in 1.A.2.f Other were negative, while from 1998 onward the figures for Chemicals are much lower and emissions reported under Other are positive. The sum of the two sectors over time is reasonably constant, and this suggests an error in the allocation of solid fuel consumption between the two sectors in 1997 and earlier years. During the review, Japan explained that in the period 1990–1997 solid fuel consumption in Chemical Industry had been counted in both the Iron and Steel category and the Chemical Industry category, and the double-counted value had been subtracted from Other. The ERT recommends that Japan correct this misallocation.

33. Japan reports AD and CO_2 emissions from natural gas use in Petroleum Refining as "0" in 2003 although these emissions are reported for the years 1990—2002. During the review, Japan explained that "0" is reported because the AD were not published before the inventory submission. The ERT recommends that Japan report correct data or use an appropriate notation key (e.g. "NE") in such situations.

2. Mobile Combustion: Road Vehicles – CO_2, CH_4, N_2O

34. Notation keys are used for emissions from natural gas use in Road Transportation (CO_2 emissions are reported as "IE", and CH_4 and N_2O emissions are noted as "NE"), but no explanation is included in CRF table 9. In the NIR Japan explains that these emissions are not estimated because they are negligible (gas-fuelled cars accounted for about 0.03 per cent of the total motor vehicles owned in 2004). The ERT encourages Japan to report these estimates for its next submission.

3. Mobile Combustion: Waterborne Navigation – CO_2

35. Emissions from Residual Oil are reported as "IE" without an explanation being given in CRF table 9. According to the NIR, Japan has reported emissions from residual oil under Other Fuels by disaggregating it into three types (heating oil A, B and C). The ERT recommends that Japan provide in the CRF an explanation for the use of this notation key.

D. Non-key category

Fugitive Emissions: Solid Fuel Transformation – CH_4

36. The notation key "NE" is used in CRF table 1.B.1 for Solid Fuel Transformation – CH_4, while the NIR mentions that CH_4 emissions from coking process have been reported under the Industrial Processes sector and CH_4 emissions from coal briquettes are not estimated (negligible). Hence they

should be reported as "IE/NE" rather than "NE". The ERT recommends that Japan use the appropriate notation keys and provide in the CRF explanations on their use.

III. Industrial Processes and Solvent and Other Product Use

A. Sector overview

37. In 2003, emissions from the Industrial Processes sector in Japan accounted for 5.6 per cent of national total GHG emissions. The largest categories were Mineral Products (60.4 per cent of the emissions from Industrial Processes) and Consumption of Halocarbons and SF_6 (23.6 per cent). From 1990 to 2003, GHG emissions from Industrial Processes increased by 16.0 per cent and emissions from Solvent and Other Product Use increased by 11.8 per cent. Emissions from the Industrial Processes sector have decreased since 1996, mostly due to the decrease in Consumption of Halocarbons and SF_6, Production of Halocarbons and SF_6, and Mineral Products.

38. The following categories are reported as "NE": Soda Ash Production – CO_2; Asphalt Roofing – CO_2; Road Paving with Asphalt – CO_2; Ammonia Production – CH_4; Carbide Production – CO_2 and CH_4; Aluminium Production – CH_4; and Solvent and Other Product Use – CO_2. SF_6 used in Aluminium foundries is also reported as "NE". The ERT encourages Japan to study these sources and to include available estimates in the inventory.

39. The ERT noted that the emission trends, for the sector in total and for individual categories, could be better explained in the NIR, and encourages Japan to do so in its next submission.

B. Key category

Cement Production – CO_2

40. Japan uses a method based on consumption and composition of limestone used, thus not following the IPCC good practice guidance recommendation to use clinker consumption and composition. The reasons given are problems with the availability of data on clinker production and uncertainties linked with clinker quality variations due to the use of recycled waste products and by-products as raw materials. AD on lime consumption are taken from national statistics and the composition of limestone is plant-specific and obtained from all domestic cement manufacturers. On the basis of the information provided, the ERT considers that Japan's CO_2 estimates are correct, but no comparison with other Parties' estimates is possible. However, more information on the methodology used, such as underlying assumptions and raw materials used, is needed to allow a better understanding of how the emissions were derived. In addition, the ERT encourages Japan to estimate CO_2 emissions based on cement production, for comparison with the national methodology currently used.

C. Non-key categories

1. Nitric Acid Production – N_2O

41. Japan reports in the NIR that EFs were collected from 10 plants and they varied over the range 0.8–8.6 kg/t. The ERT recommends that the Party explain this large variation.

42. Estimated emissions of N_2O fluctuated considerably over the period 1990–2003, although, as Japan indicated during the review, no N_2O abatement technology is used. The ERT encourages the Party to explain the trend while respecting the confidentiality of AD.

2. SF_6 Used in Aluminium and Magnesium Foundries – SF_6

43. According to the Japan Aluminium Association SF_6 is not used when casting aluminium. Consumption of SF_6 in magnesium foundries increased between 1995 and 2001 and decreased drastically

between 2002 and 2003, but the quantity of molten magnesium does not decrease in parallel in 2003. The Party should explain why consumption is decreasing while the production of magnesium is stable.

IV. Agriculture

A. Sector overview

44. In 2003, emissions from the Agriculture sector in Japan amounted to 33,230 Gg CO_2 equivalent, or 2.5 per cent of total national emissions. Sectoral emissions decreased by 14.8 per cent from 1990 to 2003. In 2003, Agriculture contributed 69.6 and 57.2 per cent to total CH_4 and N_2O emissions, respectively.

B. Key categories

1. Enteric Fermentation – CH_4

45. Japan has applied a country-specific approach for cattle. A tier 1 method and country-specific EFs have been applied for sheep, goats, and swine, whereas tier 1 and default EFs are applied for all other animal species.

46. During the review, Japan provided information to justify the differences between the cattle and sheep IEFs used and the IPCC default values, as well as the trend along the time series. The ERT encourages Japan to improve the transparency of its submission by incorporating more information on these issues in its next NIR.

2. Manure Management – N_2O

47. Japan uses country-specific EFs for cattle, swine and poultry, along with IPCC default values for sheep, goats and horses. During the review, Japan explained the low value of the N_2O IEF value for Solid Storage and Dry Lot (it is one–fifth of the default). As indicated in previous reviews, Japan should also provide information to support the high N_2O IEF value for Liquid Systems (7.5 times higher than the IPCC default value); the information provided during the review did not enable the ERT to understand why the value is so high. The ERT encourages Japan to provide more information on these findings in its next NIR.

C. Non-key categories

1. Manure Management – CH_4

48. Some large differences between the IEFs used for non-diary cattle and poultry and the IPCC default values were explained by Japan during the review. The ERT encourages Japan to provide a more detailed description of these issues as part of its next submission.

2. Agriculture Soils – N_2O

49. All subcategories are included except Cultivation of Histosols, which is not included due to the lack of AD. AD for animal production and values for the fractions used to estimate emissions are reported as “NE”. The ERT encourages Japan to estimate them for its next submission.

3. Field Burning of Crop Residues – CH_4, N_2O

50. Emissions from the burning of rice straw and chaff and other cereal straw have been estimated following a country-specific approach which is not reported transparently in the NIR. The ERT encourages Japan to explain this approach in a more transparent way.

V. Land Use, Land-use Change and Forestry

A. Sector overview

51. Japan has reported emissions/removals of CO_2, CH_4, N_2O, nitrogen oxide (NO_X) and carbon monoxide (CO) for all relevant categories of the LULUCF sector for the period 1990–1995. For the period 1996–2003, only CO_2 emissions for the categories Cropland, Grassland, Settlements and Other Land, and N_2O emissions for Cropland are reported. Emissions from lime application, wildfires in croplands and grasslands, and drainage of soils have not been estimated. A key category analysis, an assessment of the uncertainties and a QA/QC plan have not been developed for the sector.

52. During the period 1990–1995, the LULUCF sector was a net sink, the size of which increased from 66,543 Gg CO_2 equivalent in 1990 to 83,309 Gg CO_2 equivalent in 1995, offsetting 5.6 per cent to 6.3 per cent of total national emissions.

53. The notation keys have been used in the CRF tables in all cases where an estimate has not been reported, but often they are inconsistent with the information provided in the NIR. The NIR states that no peat extraction occurs in Japan, and therefore the category is reported as "not occurring" ("NO"). However, the notation keys used in the relevant CRF boxes are "IE" for the area of peat extraction and "NE" for carbon stock changes in living biomass and dead organic matter. The notation key "IE" is often used in the CRF tables but no further information is provided in the documentation boxes, CRF table 9 or the NIR.

54. References to AD and emission/removal factors are generally given in the NIR. However, it is difficult to reconstruct the emissions and removals estimates with the information provided in the NIR. Apart from the NIR and the CRF tables, Japan has submitted additional Excel files with AD and background calculations of estimates. The ERT encourages Japan to incorporate the necessary information on methodologies, AD and emissions/removal factors in the NIR.

55. The ERT also encourages Japan to estimate those emissions/removals that have not been assessed, initiate QA/QC procedures, estimate uncertainties, perform a key category analysis including the LULUCF categories, and pay attention to the appropriate and consistent use of the notation keys.

56. According to the NIR, Japan is verifying the latest land area statistics and developing various LULUCF parameters, and therefore decided not to report some emissions from 1996 onwards. Japan informed the ERT that these emissions and removal estimates for the period 1996–2003 will be reported in its 2006 submission.

B. Sink and source categories

1. Forest Land

57. During 1990–1995, the Forest Land category was a net sink varying from 73,290 Gg CO_2 equivalent in 1991 to 93,149 Gg CO_2 equivalent in 1995. Japan's estimates of carbon stock changes and emissions of non-CO_2 gases are generally in accordance with the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry*. However, the description of the methodology and the definitions of parameters used to estimate carbon stock changes in living biomass from wildfires and other disturbances, as well as the derivation of the AD for timber harvested, were not clear to the ERT.

2. Wetlands

58. In the NIR the methodology used to estimate carbon stock changes in Flooded Lands Remaining Flooded Lands is described, but in the relevant boxes of the CRF the notation keys "IE" and "NE" are used, without explanation, instead of estimates being provided.

VI. Waste

A. Sector overview

59. In 2003, total GHG emissions from the Waste sector in Japan amounted to 31,615 Gg CO_2 equivalent, or 2.4 per cent of total national GHG emissions. From 1990 to 2000, these emissions increased by 33.9 per cent, but then steadily decreased and, in 2003, were 26.7 per cent above the 1990 level.

60. Emissions are reported for Solid Waste Disposal Sites (11.4 per cent of total emissions from the Waste sector), Waste-water Handling (6.4 per cent), and Waste Incineration (82.2 per cent). Japan has implemented a solid waste management scheme that includes incinerating all organic wastes that cannot be recycled and landfilling the incineration residues and non-recyclables. This explains the high CO_2 emissions from incineration and the low GHG emissions from landfills. In 2003, CO_2, CH_4 and N_2O emissions represented 73.8, 14.7, and 11.5 per cent, respectively, of total emissions from the sector.

61. Japan has developed many unique country-specific factors based on long-term measurement programmes. Some country-specific EFs have, however, been introduced with only limited supporting information. The ERT encourages Japan to provide more supporting information on how these country-specific factors were derived.

B. Key category

Waste Incineration – CO_2

62. The ERT supports the recommendation of previous reviews that CO_2 emissions from incinerators with energy recovery systems should be reported, as required by the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, under the Energy sector.

D. Non-key categories

1. Solid Waste Disposal Sites – CH_4

63. CH_4 emissions from this source fell by 11.1 per cent between 1990 and 2003. This trend was driven by the policy that favours incineration and recycling instead of landfilling.

64. Japan has used a country-specific model similar to the IPCC tier 2 methodology. The functional relationship of decomposition rates of organic wastes with time is key for this method. However, the NIR and the CRF do not provide sufficient information on how this functional relationship was obtained. The ERT recommends that Japan provide more detailed information on how the model was derived.

65. The recovery of flared CH_4 is not estimated; the ERT suggests that Japan estimate it and its impact on emissions.

2. Waste-water Handling – CH_4 and N_2O

66. Country-specific methodologies and EFs have been employed for estimating CH_4 and N_2O emissions from waste-water handling, and are adequately summarized in the NIR. However, neither the corresponding AD nor additional information has been provided in the CRF. Consequently, no IEFs have been estimated. The ERT encourages Japan to provide this information in the NIR and the CRF.

Annex

Documents and information used during the review

A. Reference documents

IPCC. Good practice guidance and uncertainty management in national greenhouse gas inventories, 2000. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english>.

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B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Tomoyuki Aizawa (National Institute for Environmental Studies, Center for Global Environmental Research, Greenhouse Gas Inventory Office of Japan).

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