COMPLIANCE COMMITTEE **CC/ERT/IRR/2007/5**
30 August 2007

Report of the review of the initial report of New Zealand

Note by the secretariat

The report of the review of the initial report of New Zealand was published on 30 August 2007. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2), the report is considered received by the secretariat on the same date. This report, FCCC/IRR/2007/NZL, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Report of the review of the initial report of New Zealand

According to decision 13/CMP.1, each Annex I Party with a commitment inscribed in Annex B to the Kyoto Protocol shall submit to the secretariat, prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later, a report (the 'initial report') to facilitate the calculation of the Party's assigned amount pursuant to Article 3, paragraphs 7 and 8, of the Kyoto Protocol, and to demonstrate its capacity to account for emissions and the assigned amount. This report reflects the results of the review of the initial report of New Zealand conducted by an expert review team in accordance with Article 8 of the Kyoto Protocol.

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I. Introduction and summary

Introduction

1. This report covers the in-country review of the initial report of New Zealand, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 19 to 24 February 2007 in Wellington, New Zealand, and was conducted by the following team of nominated experts from the roster of experts: generalist – Mr. William Irving (United States of America); energy – Mr. Dario Gomez (Argentina); industrial processes – Mr. Kiyoto Tanabe (Japan); agriculture – Mr. Steen Gyldenkaerne (Denmark); land use, land-use change and forestry (LULUCF) – Ms. Maria Jose Sanz Sanchez (Spain); waste – Mr. Eduardo Calvo (Peru). Mr. William Irving and Mr. Eduardo Calvo were the lead reviewers. In addition, the expert review team (ERT) reviewed the national system, the national registry and the calculations of the Party's assigned amount and commitment period reserve (CPR), and took note of the LULUCF parameters. The review was coordinated by Ms. Katia Simeonova and Mr. Javier Hanna (UNFCCC secretariat).

2. In accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1), a draft version of this report was communicated to the Government of New Zealand, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

Summary

2. Timeliness

3. Decision 13/CMP.1 requests Parties to submit their initial report prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later. The initial report of New Zealand was submitted on 31 August 2006, which is in compliance with decision 13/CMP.1. With the initial report New Zealand submitted a revised version of its greenhouse gas (GHG) inventory compared to its original 2006 GHG inventory submission of 13 April 2006.

3. Completeness

4. Table 1 below provides information on the mandatory elements that have been included in the initial report and revised values of the assigned amount and commitment period reserve provided by New Zealand as a result of the review process. These revised estimates are based on revisions of emissions of carbon dioxide (CO_2) from iron and steel, manufacturing industries and construction – other, commercial/institutional and residential categories (see paragraph 52), methane (CH_4) from road transportation for gasoline and diesel oil (see paragraph 55), CO_2 from cement production (see paragraph 59) and CO_2 from ammonia production (see paragraph 62) which resulted in revisions of the base year emissions from 61,892,996 tonnes CO_2 equivalent as reported originally by the Party to 61,912,947 tonnes CO_2 equivalent (see paragraphs 109 and 110).

5. The information in the initial report covers all elements as required by decision 13/CMP.1, section I of decision 15/CMP.1, and relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). The GHG inventory is complete in terms of years, geographic coverage, sectors, source/sink categories and gases and New Zealand has submitted a complete set of common reporting format (CRF) tables for the years 1990–2004 and a national inventory report (NIR).

Table 1: Summary of the reporting on mandatory elements in the initial report

Item	Provided	Value/year/comment
Complete GHG inventory from the base year (1990) to the most recent year available (2004)	Yes	Base year: 1990
Base year for HFCs, PFCs and SF_6	Yes	1990
Agreement under Article 4	Yes	Not applicable
LULUCF parameters	Yes	Minimum tree crown cover: 30 % Minimum land area: 1 ha Minimum tree height: 5 m
Election of and accounting period for Article 3, paragraphs 3 and 4, activities	Yes	No Article 3, paragraph 4, activities elected Entire commitment period accounting
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8	Yes	309 464 979 tonnes CO_2 eq.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8, revised estimate		309 564 733 tonnes CO_2 eq.
Calculation of the commitment period reserve	Yes	278 518 481 tonnes CO_2 eq.
Calculation of the commitment period reserve, revised estimate		278 608 260 tonnes CO_2 eq
Description of national system in accordance with the guidelines for national systems under Article 5, paragraph 1	Yes	
Description of national registry in accordance with the requirements contained in the annex to decision 13/CMP.1, the annex to decision 5/CMP.1 and the technical standards for data exchange between registry systems adopted by the CMP	Yes	

4. Transparency

6. The initial report is transparent. It clearly describes the individual components of the national system, national registry, activities and minimum values under Article 3, paragraph 3, of the Kyoto Protocol, and the calculation of the assigned amount. Specific aspects of transparency related to the NIR and CRF tables are described in subsequent paragraphs.

5. Emission profile in the base year, trends and emission reduction target

7. In the base year (1990 for CO_2, CH_4, nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6)), the most important GHG in New Zealand was CH_4 contributing 41.2 per cent to total[1] national GHG emissions expressed in CO_2 equivalent,[2] followed by CO_2, 41.1 per cent and N_2O, 16.8 per cent (see figure 1). HFCs, PFCs, and SF_6 taken together contributed 0.9 per cent of the overall GHG emissions in the base year. The agriculture sector accounted for 52.5 per cent of the total GHG emissions in the base year followed by energy (38.1 per cent), industrial processes (5.3 per cent), waste (4.0 per cent) and solvent and other product use (0.1 per cent) (see figure 2). Total GHG emissions amounted to 61,912.95 Gg CO_2 equivalent and increased by 21.4 per cent from the base year to 2004. The trends for the different gases are reasonable.

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

[2] In this report, the values for total and sectoral emissions for the complete time series, and in particular for the base year and in 2004, reflect the revised estimates submitted by New Zealand in the course of the review. These estimates differ from New Zealand's GHG inventory submitted in 2006.

Figure 1: Shares of gases in total GHG emissions, base year

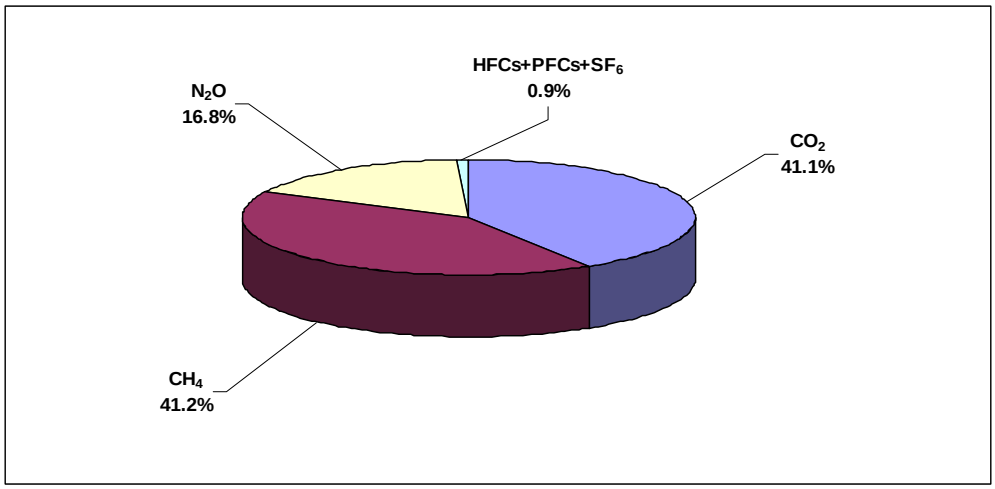
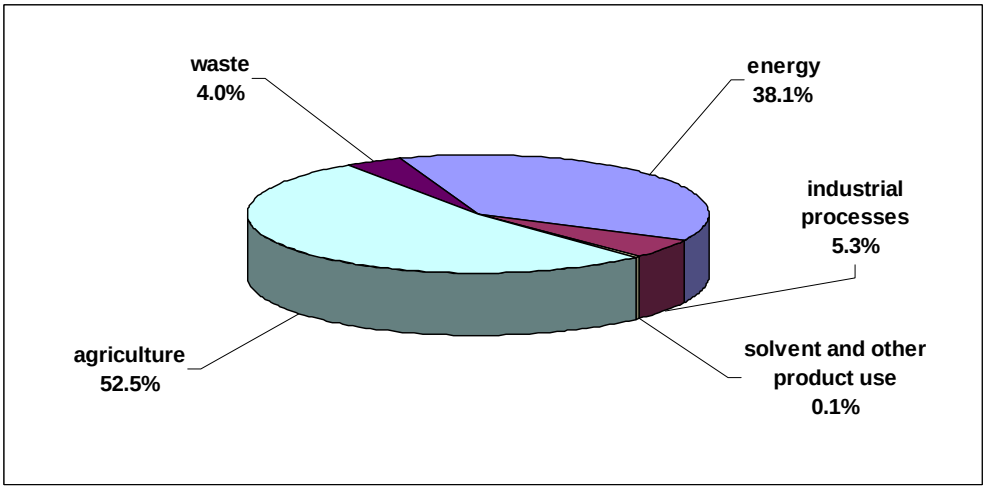


Figure 2. Shares of sectors in total GHG emissions, base year



8. Tables 2 and 3 show the GHG emissions by gas and by sector, respectively.

9. New Zealand's quantified emission limitation is 100 per cent, as specified in Annex B to the Kyoto Protocol.

Table 2. Greenhouse gas emissions by gas, 1990–2004

GHG emissions (without LULUCF)[a]	Gg CO_2 equivalent								Change
	Base year Kyoto Protocol[a]	1990	1995	2000	2001	2002	2003	2004[a]	KP BY–2004 (%)
CO_2	25 462.57	25 462.57	27 205.10	31 038.82	33 034.37	33 026.34	34 632.73	34 049.36	33.7
CH_4	25 502.45	25 502.45	25 762.39	26 846.02	27 036.62	27 073.72	27 065.50	27 154.94	6.5
N_2O	10 419.99	10 419.99	11 189.57	12 099.80	12 476.43	12 815.87	13 070.86	13 257.32	27.2
HFCs	NA NO	NA NO	145.27	246.99	440.95	619.83	728.63	597.13	NA
PFCs	515.60	515.60	147.50	59.25	59.25	88.40	93.30	87.70	–83.0
SF_6	12.33	12.33	15.01	12.19	12.31	13.15	17.52	21.49	74.2

Note: BY = Base year; KP = Kyoto Protocol; LULUCF = Land use, land-use change and forestry; NA = Not applicable; NO = Not occurring.

[a] New Zealand submitted revised estimates for the complete time series in the course of the initial review on 5 April 2007. These estimates differ from New Zealand's GHG inventory submitted in 2006.

Table 3. Greenhouse gas emissions by sector, 1990–2004

Sectors	Gg CO_2 equivalent								Change
	Base year Kyoto Protocol[a]	1990[a]	1995[a]	2000[a]	2001[a]	2002[a]	2003[a]	2004[a]	KP BY–2004 (%)
Energy	23 588.51	23 588.51	25 035.14	28 916.15	30 861.95	30 872.35	32 260.78	31 663.32	34.2
Industrial processes	3 291.24	3 291.24	3 404.98	3 590.67	3 865.13	4 066.01	4 351.65	4 197.35	27.5
Solvent and other product use	41.54	41.54	44.95	47.12	47.43	48.36	48.36	48.36	16.4
Agriculture	32 498.88	32 498.88	33 707.07	35 652.39	36 237.15	36 650.63	36 967.97	37 349.63	14.9
LULUCF	NA	–18 977.92	–15 084.32	–20 215.70	–20 513.36	–21 243.87	–22 742.19	–24 482.63	NA
Waste	2 492.77	2 492.77	2 272.70	2 096.74	2 048.28	1 999.96	1 979.78	1 909.28	–23.4
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	NA	42 935.03	49 380.52	50 087.38	52 546.58	52 393.43	52 866.35	50 685.31	NA
Total (without LULUCF)	61 912.95	61 912.95	64 464.84	70 303.07	73 059.93	73 637.30	75 608.54	75 167.94	21.4

Note: BY = Base year; KP = Kyoto Protocol; LULUCF = Land use, land-use change and forestry; NA = Not applicable.

[a] New Zealand submitted revised estimates for the complete time series in the course of the initial review on 5 April 2007. These estimates differ from New Zealand's GHG inventory submitted in 2006.

II. Technical assessment of the elements reviewed

National system for the estimation of anthropogenic greenhouse gas emissions by sources and sinks

10. New Zealand's national system is generally prepared in accordance with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The ERT notes that the national system, while strong in almost all areas, could be enhanced in the areas of quality assurance/quality control (QA/QC) implementation and staff training. These recommendations are described in further detail in subsequent paragraphs.

11. A comprehensive description of the New Zealand carbon accounting system (NZCAS) was given during the in-country visit. This description complemented the brief discussion in the Initial Report and the NIR of 2006. When fully implemented as planned and on time, the system will allow New Zealand to fulfil the reporting requirements under Article 3, paragraph 3, of the Kyoto Protocol. The ERT recommends that New Zealand continue with the implementation of the system as planned, to meet its reporting requirements for the Kyoto Protocol (e.g. decisions 13/CMP.1, 15/CMP.1, 16/CMP.1, 17/CMP.1 and 19/CMP.1) and to be consistent with the reporting requirements of 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 UNFCCC reporting guidelines).

12. Table 4 shows which of the specific functions of the national system are included and described in the initial report.

Table 4. Summary of reporting on the specific functions of the national system

Reporting element	Provided	Comments
Inventory planning		
Designated single national entity*	Yes	See section II.A.1
Defined/allocated specific responsibilities for inventory development process*	Yes	See section II.A.1
Established process for approving the inventory*	Yes	See section II.A.1
Quality assurance/quality control plan*	Yes	See section II.A.2
Ways to improve inventory quality	Yes	See section II.B.3
Inventory preparation		
Key category analysis*	Yes	See section II.B.1
Estimates prepared in line with IPCC guidelines and IPCC good practice guidance*	Yes	See section II.B.2
Sufficient activity data and emission factors collected to support methodology*	Yes	See section II.B
Quantitative uncertainty analysis*	Yes	See section II.B.2
Recalculations*	Yes	See section II.B.2
General QC (tier 1) procedures implemented*	Yes	See section II.A.2
Source/sink category-specific QC (tier 2) procedures implemented	Yes	See section II.A.2
Basic review by experts not involved in inventory	Yes	See section II.A.2
Extensive review for key categories	Yes	See section II.A.2
Periodic internal review of inventory preparation	Yes	See section II.A.2
Inventory management		
Archive inventory information*	Yes	See section II.A.3
Archive at single location	Yes	See section II.A.3
Provide ERT with access to archived information*	Yes	See section II.A.3
Respond to requests for clarifying inventory information during review process*	Yes	See section II.A.1

* Mandatory elements of the national system.

1. Institutional, legal and procedural arrangements

13. During the in-country visit, New Zealand explained the institutional arrangements, as part of the national system, for preparation of the inventory. The Ministry for the Environment (MfE) is the designated single national entity, as established under the Climate Change Response Act 2002. MfE has the responsibility for overall compilation and coordination of the inventory, including archiving and QA/QC. MfE is also responsible for specific sectors, such as non-CO_2 emissions from industrial processes, agriculture, waste and LULUCF. Other agencies are also involved in the preparation of the inventory and have defined and allocated specific responsibilities for the inventory development process. The Ministry of Economic Development (MED) is responsible for compiling estimates for the energy sector and for CO_2 emissions from the industrial processes sector. The Ministry of Agriculture and Forestry provides the majority of statistics for the agriculture sector and removals data for planted forests in the LULUCF sector, and the MfE compiles the final estimates for these sectors. Statistics New Zealand provides many of the official statistics for the agriculture and energy sectors through census and surveys. External consultants are also used for some categories in the industrial processes and solvents and other product use sectors.

14. In New Zealand there is an established process for the official consideration and approval of the inventory, including recalculations, prior to its submission and for responding to any issues raised by the inventory review. The responsible organization is the MfE, which has an internal sign-off process through the team and group manager. The UNFCCC focal point within the MfE submits the inventory to the UNFCCC secretariat.

15. New Zealand was generally able to respond immediately to requests for more information during the review. The ERT notes that, in a few cases, sectoral experts from New Zealand's current inventory team were unable to answer specific questions aimed at clarifying the rationale behind specific methodological and data choices carried out by predecessors in previous years. New Zealand was ultimately able to provide responses to these questions during the review, through contacting consultants, private companies and other data providers. The ERT believes that New Zealand could improve its response capabilities by ensuring sufficient up-to-date documentation on inventory compilation and data collection processes, and/or enhancements to the national system to ensure that specialized skills and knowledge are maintained over time.

16. Overall, the ERT believes that the institutional, procedural and legal arrangements that make up New Zealand's national system provide an effective and reliable basis for estimating GHG emissions.

2. Quality assurance/quality control

17. New Zealand has elaborated and implemented a QA/QC plan 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), and commissioned an external review of the plan by a consultant. The plan includes general QC procedures (tier 1) as well as source/sink category-specific procedures (tier 2) for key categories and for those individual categories in which significant methodological and/or data revisions have occurred. The national inventory compiler also serves as the QA/QC coordinator. Prior to submission, the inventory is reviewed by staff members within MfE who have not been involved with the preparation process. Following the annual submission, a post-inventory review is undertaken to recommend improvements.

18. The QA/QC plan indicates that all key categories undergo tier 1 QC checks each year and tier 2 procedures periodically. Non-key categories undergo tier 1 QC checks periodically as well. At least one expert QA review takes place each year, depending on the size of the category, comments from reviews

and methodological changes. In addition, Statistics New Zealand carries out its own QA/QC procedures on primary data.

19. The ERT notes that, while the QA/QC plan is in line with the IPCC good practice guidance, the existence of a number of minor errors and inconsistencies discovered in previous review stages and during the in-country review suggests that the plan has not yet been fully implemented. This conclusion is relevant for all of the sectors and for the cross-cutting requirements (e.g. key category analysis, NIR text). The ERT recommends that New Zealand intensify the time and resources directed at implementing the QA/QC plan, with the aim of reducing the number of minor errors and inconsistencies. It should be noted that the ERT does not believe that these minor errors affect the calculation of base year emissions.

20. The ERT also notes that New Zealand benefits from good relationships with data providers in the government and private industry, and with consulting firms and experts. The ERT recognizes that these data providers improve the quality of the New Zealand inventory and make it possible to implement higher tier methods. In handling information from other organizations, the ERT recommends that New Zealand request QA/QC information on these data, and conduct QA/QC where it is missing, to be fully consistent with the IPCC good practice guidance.

3. Inventory management

21. New Zealand has a centralized archiving system, which includes the archiving of disaggregated emission factors (EFs), activity data (AD), and documentation on how these factors and data have been generated and aggregated for the preparation of the inventory. The archived information also includes internal documentation on QA/QC procedures, external and internal reviews, documentation on annual key categories and key category identification, and planned inventory improvements. The national inventory compiler keeps the archive, which is located electronically on the MfE network, and backed up according to network procedures. Some components of the archive which are not available electronically, such as scientific papers and industry correspondence, are also kept in hard copy at MfE and MED. New Zealand publishes inventory information to the public through the MfE's website and distributes printed copies of the inventory. Additional information is available under the Official Information Act and can be provided to interested people on request. During the review, the ERT was given access to the archive and was provided with the requested additional archived information.

Greenhouse gas inventory

22. In conjunction with its initial report, New Zealand has submitted a complete set of CRF tables for the years 1990–2004 and an NIR. Where needed the ERT also used previous years' submissions, including the CRF tables for the 2005 submission.

23. During the review New Zealand provided the ERT with additional information sources. These documents are not part of the initial report submission but are in many cases referenced in the NIR. The full list of materials used during the review is provided in annex I to this report.

24. After the in-country review, following the recommendations of the ERT, New Zealand submitted a complete set of revised CRF tables for the years 1990–2004.

1. Key categories

25. New Zealand has reported a key category tier 1 analysis, both level and trend assessment, and applied a qualitative approach in determining its key categories as part of its initial report submission. The results of the key category analysis are a driving factor for the preparation of the inventory, particularly in the prioritization of resources and methodological complexity.

26. The key category analyses performed by the Party and the secretariat[3] produced similar results. In the base year (1990), category 1.B.2 Oil and Natural Gas – CO_2 was identified by the secretariat according to level, but not by New Zealand, although this category is already identified as key in both analyses according to the trend (2004). For 2004, category 5.G Other (combined cropland/grassland/forestland for liming) was identified by the secretariat but not by New Zealand. New Zealand indicated in its response to previous review stages that this was an omission and that it will correct the gap in the next submission. Table A1.2 of the NIR displays key category results for 2004, but is labelled incorrectly as 1990, which lead to some confusion and perceived discrepancies with the CRF. CO_2 from ammonia and urea production was designated as a key category according to qualitative criteria. New Zealand also identifies CO_2 fugitive emissions from geothermal operations as a key category, following a modification of the suggested IPCC categories disaggregation.

4. Cross-cutting issues

27. The inventory is in line with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the IPCC good practice guidance and the IPCC good practice guidance for LULUCF.

28. The inventory is compiled in accordance with Article 7, paragraph 1, of the Kyoto Protocol and decision 15/CMP.1.

Completeness

29. The inventory is complete in terms of years, geographic coverage, sectors, source/sink categories and gases. Some minor categories are reported as "not occurring" ("NO"), or "not estimated" ("NE") because emissions are assumed to be negligible (e.g. waste incineration). The absence of estimates for these categories does not indicate gaps, but the ERT recommends the inclusion of brief explanations in the NIR to indicate why according to expert judgement these categories are assumed to be negligible. This would increase transparency and provide useful information to future ERTs.

Transparency

30. The NIR provides much of the information necessary to assess the inventory. In some cases, the ERT had to request additional information and explanations in order to make a complete assessment of some categories (e.g. stationary combustion, transport, cement production, aluminium production, enteric fermentation and agricultural soils). For example, the NIR is unclear with respect to the allocation of emissions between the energy and industrial process sectors (e.g. iron and steel production, ammonia production). Also, the NIR was in some instances unclear in the identification of methodologies used for certain categories (e.g. tier identification for cement production, the nature of the use of the OVERSEER model for manure management). The ERT recommends that New Zealand follow up on questions of NIR transparency on a category by category basis, taking into consideration category-specific recommendations contained within this and previous review reports. Improved transparency of the NIR will facilitate future reviews, particularly centralized and desk reviews.

[3] The secretariat identified, for each Party, those source categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) for the base year or base year period as well as the latest inventory year. Key categories according to the tier 1 trend assessment were also identified. Where the Party 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.

31. The CRF is generally transparent, but could be improved through more consistent use of notation keys, particularly for the inclusion and allocation of emissions between the energy and industrial processes sectors.

Consistency

32. The inventory is internally consistent in all its elements with inventories of other years.

Comparability

33. The inventory is generally comparable with those of other Parties. Comparability could be enhanced through improved use of notation keys in the CRF tables.

Accuracy

34. Estimates contained in the New Zealand inventory are systematically neither over nor under likely true emissions or removals, as far as can be judged by the ERT. Appropriate methodologies are used, in accordance with the IPCC good practice guidance, particularly for key categories.

Recalculations

35. The national system can ensure that recalculations of previously submitted estimates of GHG emissions by sources and removals by sinks are prepared in accordance with the IPCC good practice guidance.

36. The ERT noted that recalculations were reported by New Zealand of the time series from 1990 (base year) to 2004. New Zealand reported the total effect of these recalculations as a 0.4 per cent increase for 2003 and a 0.6 per cent increase for 1990. The major changes include: methodological improvements (e.g. tier 2 for manure management), inclusion of previously missing categories (e.g. soda ash use), reallocation of emissions (e.g. CO_2 emissions from urea production have been allocated to the ammonia production category) and general revisions to official statistics (e.g. energy consumption). Estimates in the LULUCF sector were also recalculated because of updated carbon yield tables, leading to an 11 per cent decrease in net removals for 1990. The rationale for all of these recalculations is provided in the NIR; they have resulted in real improvements to the inventory.

Uncertainties

37. New Zealand has provided an uncertainty analysis for each source category and for the inventory in total, following the IPCC good practice guidance. New Zealand used the tier 1 uncertainty analysis, and also commissioned an external review and assessment of uncertainty. The results of the uncertainty analysis have been used by New Zealand to prioritize plans for improvements in the inventory.

38. The information provided in the NIR on uncertainties is appropriate and as required by the UNFCCC reporting guidelines. New Zealand's tier 1 uncertainty estimates have been provided according to the IPCC good practice guidance. An additional external assessment of uncertainties, which was not included in the 2006 submission but presented during the review, applied a simplified tier 2 analysis, and identified five specific data inputs for which targeted improvements could lead to maximum gains in accuracy for the total inventory: (1) N_2O from agricultural soils (EF_3, EF_{PRP}); (2) N_2O from fertilizer application (EF_1); (3) CH_4 from enteric fermentation (emission per unit food intake); (4) forest areas; and (5) AD for fuels consumed in the energy sector.

5. Areas for further improvement identified by the Party

39. The NIR identifies a general process for improvements to the inventory. New Zealand's separate National Inventory Improvement Plan 2006/2007 includes a detailed list of planned improvements.

These include: peer review assessments of recent development of EFs for emissions of N_2O and CH_4 in agriculture; QA of energy sector AD; and increased transparency of methodologies for CO_2 emissions from industrial processes (e.g. cement, and iron and steel production).

6. Areas for further improvement identified by the ERT

40. The ERT identifies the following cross-cutting issues for improvement. The Party should:

(a) Improve in general the implementation of New Zealand's QA/QC plan;

(b) Provide more precise and complete descriptions in the NIR of methodological, data and reporting choices to improve transparency;

(c) Improve the use of notation keys in the CRF to increase transparency for future review teams;

(d) Establish procedures for obtaining QA/QC information for data provided directly by companies (e.g. aluminium, cement, and other industries).

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

7. Energy

Sector overview

42. The energy sector is the second largest contributor of New Zealand's GHG emissions. In the base year (1990), emissions from this sector (23,588.51 Gg CO_2 equivalent) constituted 38.1 per cent of the total national GHG emissions. The majority of the energy sector emissions (94.9 per cent) come from fuel combustion activities, with transport (37.2 per cent) and energy industries (25.6 per cent) being the largest contributors. The sector includes six key categories, all of them for CO_2 (solid, liquid and gaseous fuels from stationary combustion, road transportation, civil aviation and oil and natural gas).

43. The CRF tables contain emission estimates for all direct and indirect GHGs from the majority of the categories of the energy sector. Fuel combustion emissions in manufacturing industries and construction are disaggregated only for iron and steel and chemicals. Certain subcategories under fugitive emissions were reported as "NE", because expert opinion considered them to be negligible. Absence of these estimates does not indicate gaps; however, the ERT recommends that New Zealand improve the explanations of the underlying expert judgement in the CRF and in the NIR.

44. Overall, methodological approaches, AD and EFs used to estimate emissions for the energy sector are presented in the NIR in a transparent manner. Tier 1 methods are used for all categories. AD is compiled by the MED, which is responsible for estimating the emissions of the energy sector, based on its own database and the data compiled by Statistics New Zealand. For estimations of CO_2 emissions, country-specific EFs are used, while for non-CO_2 gases, mostly IPCC tier 1 or tier 2 EFs are used.

45. Emissions estimates have been recalculated for all years from the base year to 2003, resulting in minor changes between the 2005 and 2006 submissions. For the base year, the reported recalculations in the original 2006 submission resulted in an increase in the total figures for the aggregated emissions of CO_2, CH_4 and N_2O of 0.3 per cent. The NIR reports that the recalculations are associated with minor rounding errors and updates to data in the New Zealand Energy Data File.

Reference and sectoral approaches

46. In the base year, the CO_2 emissions estimated in the sectoral approach are 4.6 per cent higher than those estimated in the reference approach. By fuel type, the differences between the reference and the

sectoral approaches are –0.3 per cent for liquid fuels, –14.6 per cent for solid fuels and –6.4 per cent for gaseous fuels. However, the differences in energy consumption are larger and all positive, with 14.1 per cent for liquid fuels, 27.2 per cent for solid fuels and 5.9 percent for gaseous fuels. Some explanations are provided in the CRF tables. The NIR provides explanations on the annual fluctuations in the differences between the two approaches for the period 1990–2004.

International bunker fuels

47. The allocation of fuel consumption between domestic and international transport is based on the data on fuel consumption by international transport reported in the Energy Data File (September 2006 edition), which includes coastal shipping and national air transport under domestic transport. The NIR reports that the distinction between domestic and international flights is based on refuelling at the domestic and international terminals of New Zealand airports and that there is no basis to split the domestic and international components of fuels used for international flights with a domestic leg. Although the AD associated with the domestic legs of these international flights is considered to be negligible, this approach may imply an underestimation of domestic aviation emissions for the base year. As in previous review reports, it is recommended that New Zealand make efforts to clarify the allocation of fuel consumption according to the IPCC good practice guidance recommendations.

Feedstocks and non-energy use of fuels

48. In the reference approach, the non-energy use of bitumen, the use of natural gas as feedstock for methanol production and the amount of coal used in iron and steel production are taken into account. The IPCC default value is used for the fraction of carbon stored in bitumen, and for confidentiality reasons only the total amount of carbon stored for the production of methanol is reported, while the amount of carbon present in the coal use in iron and steel is directly subtracted. In the sectoral approach, the carbon sequestered in final products is estimated on the basis of a carbon mass balance.

Country-specific issues

49. New Zealand estimated and reported the fugitive emissions of CO_2 and CH_4 from geothermal plant operations. The NIR reports that these emissions are estimated on the basis of information obtained directly from the geothermal field operators. Since no IPCC methodology exists for this emission category, it deserved particular attention during the in-country visit. The ERT assessed the information reported by New Zealand in the CRF in the context of recent publications. The implied emission factors (IEFs) reported for the period 1990–2004 are 4,113 ± 418 kg/TJ for CO_2 and 30 ± 7 kg/TJ for CH_4. The average CO_2 IEF is in the lower end of the range (1,111 to 205,556 kg/TJ) reported by Bertani and Thain (2002) in their survey of 85 geothermal plants operating in 11 countries, including New Zealand. The ratio between CO_2 and CH_4 emissions for the period 1990–2004, equal to 146 ± 39, is in line with the work by Sheppard and Mroczek (2004) that reported typical concentrations by weight in geothermal systems of up to 5 per cent for CO_2 and of up to 0.05 per cent for CH_4. In the context of the analysed information, the ERT considers these emission estimates as conservative.

Key categories

Stationary combustion: gaseous fuels – CO_2

50. In the base year the value of the CO_2 EF for natural gas (58.7 t/TJ) in New Zealand is the highest of reporting Parties and is higher than the IPCC default value (56.1 t/TJ). During the in-country visit, New Zealand provided the following information to the ERT:

(a) *The New Zealand Energy Information Handbook* (Baines, 1993), which presents an overview of the local natural gas industry and reports typical chemical compositions for natural gas sales streams of the different local gas fields, indicating relative high compositions (in per cent by

volume) of ethane (3.8 to 11.2 per cent), propane (2.9 to 11.7 per cent) and CO_2 (about 4 per cent);

(b) Typical compositions in the base year (1990) of the two major natural gas streams (Maui and treated gas from Kapuni) that accounted for practically 97 per cent of the gas supply in New Zealand in 1990. These compositions are in line with those reported by Baines and also with the CO_2 EFs used by New Zealand.

51. The ERT recommends that New Zealand archive the information on natural gas composition that was used to estimate CO_2 EFs in the base year, and include in the NIR a brief discussion on the chemical compositions of the major natural gas streams and their influence on the relative high value of the CO_2 EFs.

52. The NIR reports that the relative proportions of gas from Maui and treated gas from Kapuni that are input to the distribution system are assumed to be 50/50 for the period 1990–2004. The Energy Data File reports the annual production of the local gas fields for the period 1970–2005 and shows that the relative proportions deviate from the assumed 50/50 share. During the in-country visit, the ERT recommended that New Zealand use this information to estimate average annual CO_2 EFs that are more representative of the actual conditions. After the in-country visit, New Zealand revised the emission estimates in line with the ERT recommendations and submitted revised estimates for the period 1990–2004. For each year, New Zealand revised the average CO_2 EFs using the actual annual production information from both Maui and Kapuni treated gas fields to create a weighted emission factor, and revised the emissions using the new CO_2 EFs in 1.A.2a iron and steel, 1.A.2f other, 1.A.4a commercial/institutional and 1.A.4b residential categories. However, in the future this methodology will be revised based on the composition of gas in the main transmissions pipeline as new gas fields come on stream.

Oil and natural gas – CO_2

53. In the CRF tables, natural gas transmission is reported as included under distribution for the complete time series. During the in-country visit, New Zealand explained that a separate estimation based on information provided by natural gas transmission companies is done to estimate the fugitive emissions from transmission. The ERT encourages New Zealand to report these estimates independently from those arising from distribution, to assess the QA/QC procedures used by the data providers and to include in its future submissions a brief explanation of the estimation of the emissions from transmission.

54. All venting and flaring operations are reported under gas flaring. Emissions from natural gas production and processing are reported as "NE" in the CRF tables. During the in-country visit, New Zealand informed the ERT that these emissions also are accounted for under natural gas venting. The ERT recommends that "NE" be replaced by included elsewhere ("IE") in the CRF.

Non-key categories

Mobile combustion – road transportation: liquid fuels – CH_4

55. The CH_4 EF for gasoline (63.16 kg/TJ)[4] in the base year (1990) is the highest among reporting Parties and is higher than the IPCC default value (20 kg/TJ). This value is taken from the local study undertaken by Bone et al. (1993). From 2003 onwards, the value adopted is the IPCC default. The EFs from 1994 to 2002 are calculated using linear interpolation. The case of EFs for diesel oil is similar to that described for EFs for gasoline, with the CH_4 EF for diesel oil in the base year (13.68 kg/TJ)[4] being the second highest of reporting Parties. This approach is in line with the recommendation made in the *Review of Energy Sector Greenhouse Gas Emission Factors of New Zealand* (Hale and Twomey, 2003).

[4] In terms of net calorific value.

However, the peer review panel (Clarkson et al., 2004) that analysed the changes in energy sector EFs suggested by Hale and Twomey, concluded that if the old New Zealand specific value can be substantiated then a method of phasing in the new value should be investigated, otherwise the IPCC values suggested by the Hale and Twomey report should be adopted. During the in-country visit, the ERT recommended that New Zealand consider revising the CH_4 emissions from road transportation for gasoline and diesel oil using IPCC default EFs (20 kg/TJ for gasoline and 5 kg/TJ for diesel oil). Following the in-country visit New Zealand revised the CH_4 emissions in line with the recommendations of the ERT, and submitted revised estimates. The revised EFs used to estimate the annual emissions in the period 1990–2002 are those suggested by Hale and Twomey: 19.5 kg/TJ for gasoline and 4 kg/TJ for diesel oil. These values correspond to the mid point of the tier 2 EFs reported for United States of America vehicles (uncontrolled) in the Revised 1996 IPCC Guidelines. For gasoline, the selected CH_4 EF is 2.5 per cent lower than the tier 1 IPCC default value. For diesel oil, the selected CH_4 EF is 20 per cent lower than the tier 1 IPCC default value. This implies that the corresponding emission estimates are conservative for the base year.

8. Industrial processes and solvent and other product use

Sector overview

56. In the base year (1990), the industrial processes sector and the solvent and other product use sector accounted for 5.3 per cent and 0.1 per cent, respectively, of the total national GHG emissions of New Zealand. In the industrial processes sector the major categories in the base year were CO_2 from iron and steel production (40.4 per cent of total GHG emissions from the industrial processes sector), PFCs from aluminium production (15.7 per cent), CO_2 from aluminium production (13.9 per cent) and CO_2 from cement production (13.4 per cent). Both actual and potential emissions of HFCs, PFCs and SF_6 are reported. However, in the base year, actual and potential emissions of HFCs and potential emissions of PFCs are reported as not applicable ("NA") or "NO". The estimates for these sectors are mostly complete except for a small number of minor categories in the solvent and other product use sector which are noted as "NE" (e.g. N_2O from aerosol cans).

57. Reported recalculations have been performed for some categories (e.g. CO_2 from 2.A.4 soda ash production and use, CH_4 from 2.B.5 other (methanol production)). CO_2 from soda ash production has been estimated and included in the inventory for all years for the first time. The ERT commends and welcomes this improvement made by New Zealand. As a consequence of the recalculations reported in the NIR, the industrial processes sector total emissions in the base year have increased by 0.1 per cent. The number of companies in New Zealand with activities producing CO_2 from industrial processes is small and the estimates of CO_2 emissions supplied directly by the companies are considered to be accurate in a range of ±5 per cent. The uncertainties surrounding estimates of non-CO_2 emissions were assessed by the contractor from the questionnaires and correspondence with industry sources. They are greater than for CO_2 emissions and vary with the particular gas and category.

Key categories

Cement production – CO_2

58. The ERT found an inconsistency between the NIR and the CRF tables with regard to the key category analysis. CO_2 from cement production was identified as a key category for 1990 in the CRF tables, while it was not in the NIR. During the in-country visit, it was confirmed that CO_2 from cement production is a key category.

59. New Zealand reported in the NIR that for 1997–2004 estimates of CO_2 emissions from cement production have been calculated by multiplying the amount of clinker produced by a plant-specific EF for clinker in accordance with tier 2 methodology, while for 1990–1996, estimates of CO_2 have been

calculated using tier 1 methodology. However, during the in-country visit New Zealand explained to the ERT that the methodology used was incorrectly classified in the NIR and that emissions had actually been estimated using plant-specific EFs for clinker in accordance with tier 2 methodology for the whole time series. During the in-country visit, New Zealand provided the ERT with additional background data and supporting information, but the ERT found that those data were not consistent with the reported values. Following the in-country visit, New Zealand revised emission estimates for the whole time series based on additional detailed data and information obtained from the cement production company. According to the revised estimates, CO_2 emissions from this category in the base year are 441.67 Gg, which is higher than the original estimate by 75.01 Gg. New Zealand submitted these revised emission estimates with background data and information to the ERT within the time frame set out in the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The ERT found these estimates were calculated appropriately in accordance with IPCC tier 2 method for the whole time series. The ERT also found that the revised CO_2 IEFs for 1990–1992 were considerably higher than those reported by all the other Parties included in Annex I to the Convention, but it could be explained by the fact that a large amount of clinker was exported during this period. New Zealand expressed its intention to improve the description of methodology in its future NIRs. The ERT welcomes this and recommends that New Zealand provide more detailed explanation about the clinker export/import, as well as the cement kiln dust correction, among other information.

Ammonia production – CO_2

60. New Zealand identified CO_2 from ammonia and urea production as a qualitative key category because of the large increase in nitrogenous fertilizer use observed in the agriculture sector of the country. New Zealand reported this under the 2.B.1 ammonia production category, following the recommendations from the previous years' reviews. The ERT commends and welcomes this.

61. The trend of CO_2 emissions is unstable and fluctuates for 2000–2004. The IEFs for 2000–2004 (1.43–1.47 Gg CO_2/kt ammonia produced) are lower than the IPCC default value (1.5-1.6 Gg CO_2/kt ammonia produced). The ERT considered that New Zealand did not provide sufficient explanation of these issues in the NIR, and therefore recommends that New Zealand provide more details in its next NIR, for example, by giving more information about the characteristics of natural gas used to produce ammonia.

62. After the in-country visit, New Zealand revised the CO_2 EFs for the specific type of natural gas (i.e. a mixture of gas from Maui and treated gas from Kapuni) following the ERT's recommendation made in the energy sector chapter (see paragraph 52). New Zealand revised CO_2 emissions from ammonia production using these revised EFs. The ERT considered this revision appropriate. The revised estimate of CO_2 emissions from ammonia production in the base year is 274.53 Gg, which is higher than the original estimate by 1.62 Gg.

Iron and steel production – CO_2

63. New Zealand reported in the NIR that it used a modification of the tier 2 approach for calculating CO_2 emissions from iron and steel production. The ERT recommends that New Zealand explain more clearly the methodology used and provide more information in its next NIR, such as a reference to the paper which justifies disregarding the amount of carbon in iron sand when estimating CO_2 emissions.

64. New Zealand also reported in the NIR that, for the years before 2000, emissions from the plant operating the electric arc furnace were calculated by multiplying steel production by an emission factor based on the average implied emission factor for the plant for the years 2000–2004 (around 0.1 t CO_2/t steel). The ERT checked the background confidential data from the steel company operating the electric arc furnace, and confirmed that 0.1 kt CO_2/kt steel production was used as the emission factor for 1990–1999. However, the ERT found that implied emission factors for the plant for the years

2000–2004 range between 0.04610 and 0.05314 kt CO_2/kt steel production, with the average value being calculated at 0.05005 kt CO_2/kt steel production, which was inconsistent with the explanation in the NIR. After the in-country visit, New Zealand investigated this issue with the steel production company concerned and checked all the documentation. Consequently, New Zealand acknowledged that the background data provided to the ERT during the in-country visit were not correct, and submitted correct background data with detailed information to the ERT within the time frame set out in the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The ERT was satisfied with these estimates and explanation provided by New Zealand, and concluded that the estimate for the base year (1990) was correctly estimated.

65. The ERT found that CO_2 emissions from limestone used in steel production were included in the estimates for iron and steel production. This is inconsistent with the description in the NIR of the category 2.A.3 limestone and dolomite use, which explains that all limestone in New Zealand is used for making lime or cement. The ERT recommends that New Zealand report CO_2 emissions from limestone used as flux under the category 2.A.3 limestone and dolomite use following the IPCC good practice guidance, instead of including them in the estimates for iron and steel production. The ERT also recommends that New Zealand improve the description of relevant sections in the NIR in its future inventory submissions.

Aluminium production – CO_2

66. The ERT found an inconsistency between the NIR and CRF tables with regard to the key category analysis. CO_2 from aluminium production was identified as a key category for 1990 in the CRF tables, while it was not in the NIR. During the in-country visit, it was confirmed that CO_2 from aluminium production is a key category.

67. New Zealand stated in the NIR that the carbon consumption was multiplied by 3.812 to convert C to CO_2 (as compared with 3.666 if the standard atomic weights ratio of 44/12 is used). This number was explained in the NIR to be specific to Comalco smelters to take into account some other process losses, but it does not seem sufficiently transparent to the ERT. The ERT recommends that New Zealand provide more explanation in the next NIR, for example, by quoting the equation from the relevant paper shown to the ERT during the in-country visit.

Aluminium production – PFCs

68. The IEFs for PFCs have decreased drastically (87.8 per cent for CF_4 and 90.6 per cent for C_2F_6 between 1990 and 2004). These IEFs are very low (0.031 kg/t aluminium for CF_4 in 2004 and 0.0029 kg/t aluminium for C_2F_6 in 2004) and lower than the IPCC default value for Centre Work Pre Bake (CWPB) which is used in New Zealand (0.31 kg/t aluminium for CF_4 and 0.04 kg/t aluminium for C_2F_6). New Zealand explained in the NIR that these emissions were calculated using the tier 2 method with the IPCC default slope coefficients for CWPB technology and smelter-specific operating parameters. However, the ERT found that the ratio of IEF for CF_4 to that for C_2F_6 fluctuates over time (0.091–0.143). These fluctuations would be impossible if the tier 2 method was used with IPCC default slope coefficients (in this case the ratio must have been constant and equal to 0.129 (= 0.018/0.14) for the whole time series). New Zealand explained that this variation in IEFs was probably the result of CF_4 and C_2F_6 estimates being rounded off to one or two significant digits before being transferred into the CRF Reporter. New Zealand expressed its intention to ensure that the full estimate is entered into the CRF Reporter for future inventory submissions. The ERT welcomes this intention and recommends that New Zealand make further efforts to improve estimates in its next inventory submission.

69. The ERT considers that emission estimates for the base year in this category are conservative, because of the low IEFs (0.257 kg/t aluminium for CF_4 and 0.030 kg/t aluminium for C_2F_6) that are lower than the IPCC default values (see above), and taking into consideration the latest information obtained

from the aluminium producer which New Zealand provided to the ERT during the in-country visit. However, this issue should be addressed by New Zealand in its future submissions and particularly in the commitment period years because of the low IEFs and lack of transparency of the information provided in the NIR.

Consumption of halocarbons and SF_6–HFCs

70. The ratios of potential to actual emission of HFCs are reported to be less than 1 for 1993–2004 (ranging from 0.52 to 0.86). They are the lowest of the reporting Parties. The 1995 value of the potential to actual emission ratio of HFC-134a (0.0046) is the lowest of the reporting Parties. For 1996–2004 these values are also the lowest of reporting Parties and range from 0.032 to 0.213. This issue could not be clearly explained either in the NIR or during the in-country visit. The New Zealand inventory team indicated a higher level of confidence in the estimate of actual emissions and that the estimate of potential emissions could be an underestimate. The ERT recommends that New Zealand investigate this issue, and provide further explanation in its next NIR. The ERT also recommends that New Zealand continue making efforts to further improve the quality of estimates where possible, for example by reinforcing QC activities on data collection.

71. The ERT confirmed during the in-country visit that New Zealand reported correctly emissions from this category as "NA, NO" for the base year.

9. Agriculture

Sector overview

72. In 1990, emissions from the agriculture sector in New Zealand amounted to 32,498.88 Gg CO_2 equivalent, or 52.5 per cent of the total national GHG emissions. The agriculture sector is the largest source of emissions in the country. The national inventory submission is complete in terms of gases, years and sources. Because rice cultivation does not occur in New Zealand, the notation key "NO" has been used. Buffalo, camels, llamas, mules and asses are reported in the CRF tables as "NE" and the relevant CRF documentation boxes explain that, on the basis of the last agriculture census, they make up less than 0.05 per cent of the total livestock in New Zealand.

73. The information presented in the CRF tables is transparent and consistent, but not all the additional information tables and relevant documentation boxes in the CRF are filled in. In some cases there is an inappropriate use of notation keys, for example VS (volatile substance) excretion rate is reported for some animal categories but identified as "NA" for other important categories. The supporting information in the NIR contains some inconsistencies, for example, there are several references to the OVERSEER model which are not directly relevant to the estimations.

74. New Zealand uses enhanced livestock characterization in its calculations, which is in accordance with IPCC good practice guidance for key categories. A three-year average is used for most of the AD, which is consistent with the Revised 1996 IPCC Guidelines. All basic agricultural AD are obtained from Statistics New Zealand, and have low uncertainty.

Key categories

Enteric fermentation – CH_4

75. CH_4 emissions from enteric fermentation account for 67.1 per cent of the total agricultural emissions in the base year (1990). The estimate is generated with a country-specific model based on sound scientific principles (Clark et al. 2003). The model estimates the total dry matter intake for several different subgroups of dairy cattle, beef cattle, sheep and deer and multiplies it by a country-specific CH_4 EF. The tier 1 method is used for horses, goats, pigs and poultry. Of these animals, only goats are

ruminants, and since the goat population is small, the use of default values for these animals is appropriate. The ERT believes that estimated emissions from this category are of a good quality.

Manure management – CH_4

76. The emissions estimation of CH_4 from manure management is based on a country-specific tier 2 model (Sagger et al. 2004). In 1990 these emissions account for 1.8 per cent of the total emissions of the agriculture sector. The model is well documented in the NIR. Only 5 per cent of the manure from dairy cattle is managed in the country, and because of the relatively small population of pigs in New Zealand only small amounts of pig manure are handled. As a consequence, CH_4 emissions from this category are very low compared with other countries. The ERT believes that estimated emissions from this category are of a good quality.

Direct soil emissions – N_2O

77. The total amount of mineral fertilizer used in 1990 as reported in the CRF tables is 51.8 Gg N, increasing to 310.7 Gg N in 2004. These figures are based on data from the New Zealand Fertilizer Manufacturers Research Association and are in accordance with data from the Food and Agricultural Organization of the United Nations (FAO) and the International Fertilizer Industry Association (IFA).

78. The N excretion (Nex) for dairy cattle, non-dairy cattle, sheep and deer is calculated from feed consumption derived from the model by Clark et al. (2003) multiplied by the N content in the feed in combination with an animal nutrient turnover model. IPCC default values are used for other minor animal categories. The N content in the feed is based on 6,000 feeding samples. The basic model takes into account animals increased productivity. In 1990, the total N excreted has been estimated to be 1,436.83 Gg increasing to 1,595.24 Gg in 2004. The ERT considers Nex to be estimated properly.

79. N fixing crops such as clovers are used intensively in New Zealand pastures and New Zealand is a major producer of clover seed. The use of N fixing crops increases the N turnover in soil from dead roots and root exudates and increases the N_2O emissions compared with native soils. Sagger et al. (2004) has estimated the total N fixation in New Zealand to be approximately 1,100 Gg N/year or 69 to 77 per cent of the annually estimated Nex from animals in the period 1990 to 2004. The total N fixation reported in New Zealand's base year inventory is 5.0 Gg N or 0.5 per cent of the total N fixation. New Zealand accounts only for N-fixation based on seed yield from pulses and peas. New research (Rochette and Janzen, 2005) has shown that there are no N_2O emissions from the nitrogen fixation process itself, but emissions may occur from the breakdown of N fixing crops. New Zealand provided the ERT with information on measured N_2O emissions data from 18 field trials that gave an average emission of 0.9 kg N_2O-N/ha/year from plots not receiving nitrogen (i.e. control plots) (0.1 to 2.4 kg N_2O-N/ha/year) or 1.4 kg N_2O/ha/year. New Zealand has provided the ERT with N_2O emission data from a native forest showing no or little N_2O emission and some data from partly water logged and organic soils. The ERT believes that measurements on N_2O emissions from native unsaturated soils would be valuable in developing future inventories. The measured values are comparable with other background measurements from intensive cropping systems in the world, for example as described in Bowman et al. (1996), and therefore there is little evidence that the intensive use of clover in New Zealand pastures has increased the N_2O emissions above other intensive cropping systems. However, the ERT believes that the conversion of more native soils to improved grassland or further improvement of existing grassland is likely to increase N_2O emissions from pastures. The ERT also recognizes that New Zealand considers this increase to be accounted for in its inventory calculations through the increase in animal production that will have occurred as a result of this conversion. It is therefore recommended that New Zealand highlight this scientific question in its future inventories, specifically as it relates to including the effect of changes in its management of grassland and other leguminous crops.

80. N_2O emissions from crop residues returned to soils are estimated using the default IPCC method. The overall emissions from this category have very little impact on the total emissions from agriculture (0.1 per cent). However, the default methodology is very uncertain and improvements could be made where actual N content in crop residues (which are lower than the default values) are used as well as more precise national data on the amount of crop residues returned to soil.

Pasture, range and paddock manure – N_2O

81. The N_2O emissions from animal excreta deposited on pastures is estimated with a country specific EF (EF_{PRP}) of 0.01 kg N_2O-N/kg N, which is lower than the IPCC default value of 0.02 kg N_2O-N/kg N. The NIR explains that an EF of 0.01 kg N_2O-N/kg N is a proper value because it is based on a series of measurements that continued until the results dropped down to background emission levels. The chosen value is adequately addressed in the NIR and therefore the approach for emissions estimation is justified.

Indirect emissions – N_2O

82. Indirect N_2O emissions are a key category for New Zealand, yet New Zealand uses the default tier 1 methodology for estimating ammonia (NH_3) volatilization from consumption of mineral fertilizers, $Frac_{GASF}$. As NH_3 emission rates determine the amount of N in other compartments of the N cycle, such as leached nitrogen, uncertain $Frac_{GASF}$ will introduce high uncertainties into other N_2O emission estimates. The default $Frac_{GASF}$ for mineral fertilizers is 0.1 kg kg NH_3-N/kg N. According to the IFA, 78 per cent of the fertilizer consumption in New Zealand in 2004 was based on urea. Urea generally has a slightly higher $Frac_{GASF}$ of 0.15-0.25, which indicates that the use of the default values could be an underestimation of the ammonia emission. During the in-country visit, New Zealand made calculations using the OVERSEER model, which has not been peer reviewed, showing that the $Frac_{GASF}$ from urea is around 0.12 kg owing to low application rates in the New Zealand pastures (50 kg N/ha/application) and the volcanic ash soils. This result is not far from the default values but the ERT nevertheless recommends that New Zealand consider the use of a higher tier method for this category in its next submission.

83. For the estimation of NH_3 emissions from animal excreta, New Zealand uses the default value of 20 per cent for $Frac_{GASM}$. This default value includes emissions from stables, storages, manure application and grazing animals. The ERT is of the opinion that use of the default value in New Zealand might not be correct for the estimation of NH_3 emissions from animal excreta, because 98 per cent of Nex is excreted on grassland. The ERT notes that the 20 per cent default value for NH_3 volatilization is consistent with the IPCC good practice guidance, but may overestimate actual volatilization and underestimate the amount of nitrogen directly reaching the soil. This issue was also raised during the previous review but has not been addressed in the 2006 submission. The ERT encourages New Zealand to investigate a country-specific $Frac_{GASM}$ or document why the IPCC default value is considered appropriate for New Zealand conditions.

84. The fraction of N leached ($Frac_{LEACH}$) has been estimated to be 0.07 on the basis of calculations with the OVERSEER model. The $Frac_{LEACH}$ value is documented in a peer-reviewed article (Thomas et al. 2005) with references to New Zealand dairy farm systems. A $Frac_{LEACH}$ of 0.07 in all-year pastoral systems as in New Zealand may be a proper value of the N leaching although there are very few references to similar systems in the international literature; therefore its use could be seen as the best available value and the indirect N_2O emissions from leaching in combination with the default EF_5 of 0.025 is justified.

10. Land use, land-use change and forestry

Sector overview

85. In its 2006 inventory submission, New Zealand has applied the methods recommended by the IPCC good practice guidance for LULUCF and reported emissions and removals in all the relevant CRF tables. New Zealand's LULUCF sector in the base year (1990) represented a net sink of 18,977.92 Gg CO_2 equivalent, offsetting 30.7 per cent of total national GHG emissions. The net removals over the time series 1990–2004 show inter-annual variations between 1.5 and 13.2 per cent, which can be attributed mostly to annual variations in the forest land remaining forest land category due to variability in the extent of new plantations, increased growth rates due to breeding improvement and wood harvest rates fluctuations.

86. All the land-use categories, GHG emissions and most removals from living biomass and soil organic carbon pools are reported in the CRF tables. All the relevant CRF tables are provided, either with estimations or notation keys. Forest land and cropland represent net sinks. Forest land is the most important category by far. The forest land remaining forest land subcategory drives the trend for the whole time series (1990–2004). Emissions/removals from soil organic carbon (SOC) pool for forest land and cropland remaining cropland are assumed to be zero, although reported in the CRF tables as "IE" and "NE" for forest land and "NE" for cropland remaining cropland. All the other land-use categories are emission sources.

87. The NIR provides detailed information on the selection of adequate IPCC default or country-specific EFs and methodologies used in the inventory. Additional information is contained in the annex to the NIR on annual afforestation, forest fires and grassland burning. Calculated emissions and removals from harvesting are included in the NIR to improve transparency. Although the NIR states that the living biomass pool includes above-ground and below-ground biomass (in section 7.1.2.2), it is recommended that the titles of tables 7.1.3.2 and 7.1.3.3 (on country-specific factors) specify this as well as provide short explanations on the worksheets provided.

88. According to the NIR, the LULUCF sector is included in the key categories analysis. In the base year, forest land remaining forest land, land converted to forest land, land converted to grassland and cropland remaining cropland are key categories.

89. In its 2006 submission, New Zealand reported recalculations for the complete time series. Furthermore, the complete time series is expected to be recalculated again in future submissions once a more consistent set of data for the entire time series has been prepared based on the LUCAS (Land Use and Carbon Analysis System), presented to the ERT during the in-country visit.

90. New Zealand has used an analysis of two existing country-wide land cover maps obtained from satellite imagery for the years 1997 and 2002 to report the land transition matrix, according to approach 3 in the IPCC good practice guidance for LULUCF. In the NIR a land-use interpolation matrix between 1997 and 2002 is provided and the land-use areas for 1990–1996 and 2003–2004 are extrapolated linearly. A more detailed transition matrix is provided in annex A8.5 of the NIR, including examples for interpolation (1997 to 1998) and extrapolation (2003 to 2004). Review of the land transition matrix is foreseen after NZCAS become fully operative by the end of 2009.

91. Uncertainties estimates for CO_2 in forest land and other land-use categories and for CH_4 and N_2O across the LULUCF sector using country-specific factors and default factors taken from the IPCC good practice guidance for LULUCF are provided in the NIR (table A7.1) following the IPCC tier 1 method. The NIR states that the category forest land introduces an uncertainty of 6.5 per cent (combined uncertainty as a percentage of the national total in 2004) and about 2.2 per cent into the trend in the

national total from 1990 to 2004, having the second largest impact on the trend after CO_2 emissions from the energy sector.

92. The ERT commends New Zealand for the effort made to address completeness for the LULUCF sector and recommends improving in its next submission the descriptions of specific methodologies related to subcategories under the main land categories, with special emphasis on forest land.

93. The ERT recommends that New Zealand implement the following improvements in its future submission:

(a) Consider updating table 7.1.1 of the NIR, which contains a land-use matrix for the years 1997–2002, to complete the time series since 1990;

(b) Update the description in appendix A3.2 with a more comprehensive and integrated description of how the different components of the Carbon Monitoring System and LUCAS will be arranged, and how data management and archiving and QA/QC procedures, including a timetable for implementation, will be implemented;

(c) Since liming is reported in an aggregated way in the CRF tables, provide explanations in a specific section of the NIR, including explanations on why the increasing trend of lime use changed twice during the time series and has been decreasing since 2002.

Key categories

Forest land – CO_2

94. Emissions and removals from the forest land category (subcategory forest land remaining forest land and land converted to forest land) are the key categories identified by New Zealand in the base year. New Zealand has adopted a national definition of forest in its Initial Report consistent with the forest definition as reported in previous inventory submissions as well as with the forest definition reported to FAO, which corresponds to areas over 1 hectare with 30 per cent canopy cover and stands of 5 metres in height or more.

95. A combination of the IPCC good practice guidance for LULUCF tier 1 approach, country-specific EFs and tier 2 modelling approach (in the case of plantations) for the subcategory forest land remaining forest land have been used for calculating emissions and removals. Among the different pools, living biomass (including understorey) and dead organic matter (DOM) are estimated for plantations, whereas the SOC is not. New Zealand intends to include SOC estimates when the LUCAS is fully implemented.

96. Trends for the forest land category are dominated by the net removals (harvest versus growth) of the high productive pine plantations in the country, since natural forest is considered to be C neutral and the harvest rates are very small there.

Cropland – CO_2

97. Only tier 1 estimates for living biomass and soil C stocks for woody crops are provided, since IPCC good practice guidance for LULUCF does not provide a default method for reporting DOM pool. No information on the land-use management changes for the 20-year period prior to the inventory time series is available in the country. Therefore, carbon stocks are assumed to be constant for cropland remaining cropland. Tier 1 estimates are provided for C stock changes for living biomass and soil C for lands converted to cropland, whereas no estimates are provided for N_2O (CRF table 5(III)).

Grassland – CO_2

98. No estimates are provided for grassland remaining grassland. A tier 1 method has been applied for land converted to grassland, and only changes in living biomass and soil C stocks are provided in the CRF tables, since the IPCC good practice guidance for LULUCF allows Parties not to report DOM pool. Table 7.1.3.2 in the NIR assumes that grassland with woody vegetation has a living biomass of 63 t C per hectare (value provided for perennial crops above-ground biomass, table 3.3.2. of the IPCC good practice guidance for LULUCF), which seems to be a high value compared with the peak above-ground living biomass given in table 3.4.2 of the IPCC good practice guidance for LULUCF.

Non-key categories

Biomass Burning – CO_2, CH_4 and N_2O

99. New Zealand provides in annex A8.5 of the NIR a detailed estimate of the biomass that is burned in association with land conversions and wildfires. The estimate reported in the CRF tables (5(V)) for non-CO_2 GHGs is calculated using tier 1 methods. However, it is unclear where the CO_2 emissions from biomass burning are reported. The ERT recommends that New Zealand provide more information in its next submission to indicate where emissions from biomass burning are reported.

11. Waste

Sector overview

100. In the base year (1990), the waste sector emissions amounted to 2,492.77 Gg CO_2 equivalent and contributed 4.0 per cent of total national GHG emissions. Emissions from this sector in 2004 were 23.4 per cent below the 1990 level. In the base year, CH_4 emissions from solid waste disposal on land is identified as a key category. The waste sector has minor gaps in completeness due to the absence of statistics on waste incineration, but New Zealand considers this category to be negligible. The methodologies, AD and EFs are transparently presented in the NIR. Recalculations are reported in the 2006 submission as a consequence of the availability of new landfill CH_4 recovery estimates. The information provided in the NIR on CH_4 recovery for 1990 was lacking in clarity and transparency, but New Zealand provided follow-up information after the in-country visit, which demonstrated that no recovery took place in that year.

101. The QA/QC procedures have improved over time; they currently include a tier 2 QC check on solid waste disposal on land category. The combined uncertainty for CH_4 from solid waste disposal on land is 0.3 per cent and for N_2O emissions from wastewater handling is 1.9 per cent (combined uncertainty as percentage of the national total in 2004) and around 0.3 per cent into the trend in the national total from 1990 to 2004 for both categories. The ERT was informed by New Zealand that several improvements are forthcoming in the estimations of the sector, to take into consideration the closure of unmanaged landfills by 2010 and a new database for wastewater management.

Key categories

Solid waste disposal on land – CH_4

102. The methodologies used for the estimates correspond to tier 2 of the IPCC good practice guidance. The EFs used are a combination of country-specific and IPCC defaults. Some minor issues were identified and subsequently resolved during the review, due to additional information submitted, regarding the use of incorrect degradable organic carbon (DOC) values for textiles and the averaged value used for food and non-food waste that is higher than the average of the IPCC default values (0.15 and 0.17, respectively). The AD are generally appropriate for the sector. In the CRF table 6.A the DOC degraded was incorrectly reported. New Zealand corrected this error and revised the emission estimates during the six week period following the in-country review. The NIR did not conclusively demonstrate that there was no methane recovery occurring in the base year, but after the in-country visit the ERT was

informed by the Ministry for Environment that no methane recovery took place in 1990 and 1991. The ERT recommends that New Zealand include such information in its next NIR.

Non-key categories

Wastewater handling – CH_4 and N_2O

103. For domestic and commercial wastewater treatment, New Zealand used the emissions estimate of 2001 for the whole period from 1990 to 2004, without considering economic changes and the existence of basic studies that contain biological oxygen demand (BOD) measurements for the years 1997 and 2001. The use of up-scaling factor from chemical oxygen demand (COD) to BOD was not consistent with the IPCC good practice guidance. This factor was corrected in the revised emissions estimates provided to the ERT during the six week period following the in-country review. The effect of population increases and use of existing surveys and estimates was also incorporated into the revised estimates provided to the ERT in this period after the in-country review.

104. For industrial wastewater treatment, numerical information on AD is not provided in the CRF table 6.B. The cell notations in table 6.B use a different methodology. Because of the importance of agriculture related industry, the ERT recommended that New Zealand perform consistency checks with data from the agriculture sector.

105. For estimations of N_2O from human sewage, New Zealand used a constant EF over the entire 1990–2004 period and did not reflect changes in dietary protein consumption of the population. The ERT encourages New Zealand to check the consistency of this approach with data on protein consumption provided by New Zealand to FAO. For industrial wastewater, N_2O emissions were calculated based on an N to C ratio. As with CH_4 from industrial wastewater, the ERT recommends that the NIR include quantitative information on wastewater treatment from industrial subsectors.

Waste incineration – CO_2, CH_4 and N_2O

106. Emissions from this category are reported as "NE" in the CRF tables. There is no incineration of municipal waste in New Zealand. However, incineration of very small amounts of waste from specialized facilities, such as hospitals and research institutions, still occurs. New Zealand informed the ERT that these emissions are negligible because of the size and use of these facilities and that the quantity of material being disposed through these incinerators is not required to be measured. The ERT encourages New Zealand to make efforts to estimate and report these emissions in its future inventories.

Calculation of the assigned amount

107. The assigned amount pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol, is calculated in accordance with the annex to decision 13/CMP.1.

108. New Zealand's base year is 1990 and the Party has chosen 1990 as its base year for HFCs, PFCs and SF_6. New Zealand's quantified emission limitation is 100 per cent as specified in Annex B to the Kyoto Protocol.

109. Based on New Zealand's base year emissions, 61,892.996 Gg CO_2 equivalent, and its Kyoto Protocol emission limitation commitment of 100 per cent, the Party calculates its assigned amount to be 309,464,979 tonnes CO_2 equivalent.

110. In response to inventory issues identified during the review, New Zealand submitted revised estimates of its base year inventory, 61,912.947 Gg CO_2 equivalent, which resulted in a recalculation of the assigned amount. Based on the revised estimates, New Zealand calculates its assigned amount to be 309,564,733 tonnes CO_2 equivalent. The ERT agrees with this figure.

Calculation of the commitment period reserve

111. The calculation of the required level of the commitment period reserve is in accordance with paragraph 6 of the annex to decision 18/CP.7.

112. Based on its calculated assigned amount, 309,464,979 tonnes CO_2 equivalent, New Zealand calculates its commitment period reserve to be 278,518,481 tonnes CO_2 equivalent.

113. In response to inventory issues identified during the review, New Zealand submitted revised estimates of its base year inventory, 61,912.947 Gg CO_2 equivalent, which resulted in a recalculation of the commitment period reserve. Based on the revised estimates, New Zealand calculates its commitment period reserve to be 278,608,260 tonnes CO_2 equivalent. The ERT agrees with this figure.

National registry

114. New Zealand has provided most of the information on its national registry system, the New Zealand Emission Unit Register (NZEUR), as required by the reporting guidelines under Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1). The reported information is broadly transparent and in accordance with the requirements of the reporting guidelines under Article 7 of the Kyoto Protocol. However, the ERT noted that the following elements were not provided in the initial report: a description of the database structure and capacity of the national registry; an overview of how the security measures and procedures employed in the national registry to prevent unauthorized manipulations and to prevent operator error are kept up to date; and a list of the information that is publicly accessible. The ERT recommends that New Zealand provide more detailed information on these elements in its next inventory report under the Kyoto Protocol.

115. Table 5 summarizes the information on the mandatory reporting elements on the national registry system, as stipulated by decision 15/CMP.1 which describes how the national registry performs functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1.

Table 5. Summary of reporting on the national registry system

Reporting element	Provided / referenced	Comments
Registry administrator		
Name and contact information	Yes	
Cooperation with other Parties in a consolidated system		
Names of other Parties with which New Zealand cooperates, or clarification that no such cooperation exists	Yes	
Database structure and capacity of the national registry		
Description of the database structure	No	Information provided during the in-country visit
Description of the capacity of the national registry	No	Explained during the in-country visit
Conformity with data exchange standards (DES)		
Description of how the national registry conforms to the technical DES between registry systems	Yes	Covered in the Independent Assessment Report (IAR)[a]
Procedures for minimizing and handling discrepancies		
Description of the procedures employed in the national registry to minimize discrepancies in the transactions of Kyoto Protocol units	Yes	
Description of the steps taken to terminate transactions where a discrepancy is notified and to correct problems in the event of a failure to terminate the transaction	Yes	
Prevention of unauthorized manipulations and operator error		
An overview of security measures employed in the national registry to prevent unauthorized manipulations and to prevent operator error	Yes	Covered in the IAR
An overview of how these measures are kept up to date	No	Information provided during the in-country visit
User interface of the national registry		
A list of the information that is publicly accessible by means of the user interface to the national registry	No	Covered in the IAR
The Internet address of the interface to New Zealand's national registry	Yes	
Integrity of data storage and recovery		
A description of measures taken to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a disaster	Yes	Covered in the IAR
Test results		
The results of any test procedures that might be available or developed with the aim of testing the performance, procedures and security measures of the national registry undertaken pursuant to the provisions of decision 19/CP.7 relating to the technical standards for data exchange between registry systems	Yes	Test results covered in the IAR

[a] Pursuant to decision 16/CP.10, the administrator of the international transaction log (ITL), once registry systems become operational, is requested to facilitate an interactive exercise, including with experts from Parties to the Kyoto Protocol not included in Annex I to the Convention, demonstrating the functioning of the ITL with other registry systems. The results of this exercise will be included in an independent assessment report (IAR). They will also be included in the annual report to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

116. During the in-country review visit, New Zealand provided the ERT with additional and updated information and explanations that were not explicitly given in the initial report, such as a diagram of the database structure and information on the capacity of the national registry, an overview of how the security measures and procedures to prevent unauthorized manipulations and to prevent operator error are

kept up to date, and a list of the information publicly accessible. New Zealand also provided the ERT with documents of procedures for disaster recovery, security and time synchronization to supplement the information mentioned in the initial report.

117. The ERT was also provided with additional and updated information on the changes that had occurred in the national registry system as compared with the information submitted in the initial report. First, the ERT was informed that the registry system has been upgraded to version 2, which means that connection to the international transaction log (ITL) to allow for international trading has been developed in accordance with the data exchange standards (DES). Second, the ERT was informed that New Zealand has decided to implement digital certificates for account holders.

118. During the in-country visit, the ERT was informed that the internal operational test of the registry for network connection was completed on 16 February 2007. The initialization process was expected to be completed by 31 March 2007 and the registry to be fully operational by 30 June 2007. Information on the registry is publicly available through the Internet (http://www.nzeur.govt.nz).

119. The ERT was also informed about the procedures and security measures to minimize discrepancies, terminate transactions and correct problems. These procedures and security measures include internal checks on transactions before they are sent to the ITL (e.g. automatic checks of completion of all the mandatory fields), automatic termination of transactions upon the receipt of notification from the ITL, training of registry staff members and procedures to ensure time synchronization between the ITL and NZEUR. These procedures and measures were integrated into the NZEUR Administrator's Guide.

120. The ERT acknowledged the effort made by New Zealand to put in place adequate security measures for the registry to prevent unauthorized manipulations and to prevent operator error. For example, the NZEUR servers are physically located in secured floor space to which only authorized personnel have access. Access is via the Hypertext Transport Protocol Secure over Secure Sockets Layer security protocol. The NZEUR registry web application contains an audit log, which is triggered by every insert, update or deletion in any database table, and keeps records. The ERT gained an overall impression that New Zealand has allocated adequate resources, including human resources, to the development, operation and maintenance of the registry and is aware of its importance.

121. The ERT also acknowledged the effort made by New Zealand to put in place adequate measures to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a disaster. For example, New Zealand set up a system of hardware, software and personnel in Auckland, which is a geographically separate location from the NZEUR main system in Wellington. This system will frequently receive the log shipping from the main system and can be used when the normal environment has suffered catastrophic failure or is unavailable for an extended period.

122. The ERT took note of the results of the technical assessment of the national registry, including the results of standardized testing, as reported in the independent assessment report that was forwarded to the ERT by the administrator of the ITL, pursuant to decision 16/CP.10, on 27 July 2007.

123. The ERT reiterates the main findings of this report, including that the registry had fulfilled all of its obligations regarding conformity with the DES. These obligations include having adequate transaction procedures; adequate security measures to prevent and resolve unauthorized manipulations; and adequate measures for data storage and registry recovery.

124. Based on the results of the technical assessment, as reported in the independent assessment report, the ERT concluded that New Zealand's national registry is fully compliant with the registry requirements

as defined by decisions 13/CMP.1 and 5/CMP.1, noting that registries do not have obligations regarding operational performance or public availability of information prior to the operational phase.

Land use, land-use change and forestry parameters and election of activities

125. Table 6 shows the Party's choice of parameters for its definition of forest as well as elections for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, in accordance with decision 16/CMP.1.

Table 6. Selection of LULUCF parameters

Parameters for forest definition		
Minimum tree cover	30%	
Minimum land area	1.0 ha	
Minimum tree height	5 m	
Elections for Article 3, paragraphs 3 and 4, activities		
Article 3, paragraph 3 activities	**Election**	**Accounting period**
Afforestation and reforestation	Mandatory	Commitment period
Deforestation	Mandatory	Commitment period
Article 3, paragraph 4 activities		
Forest land management	Not elected	Not applicable
Cropland management	Not elected	Not applicable
Grazing land management	Not elected	Not applicable
Revegetation	Not elected	Not applicable

126. The parameters selected for New Zealand's definition of forest are consistent with the definition of forest included in the Global Forest Resources Assessment 2005 (FAO, 2005), which includes planted forest and indigenous forest. New Zealand did not elect activities under Article 3, paragraph 4, of the Kyoto Protocol, and noted the low cap assigned by the Appendix for Forest Management in decision 16/CMP.1. New Zealand is implementing the NZCAS for fulfilling the requirements for reporting supplementary information under Article 3, paragraph 3, of the Kyoto Protocol.

III. Conclusions and recommendations

Conclusions

127. The information in the initial report covers all elements required by paragraphs 5, 6, 7 and 8 of the annex to decision 13/CMP.1, section I of the annex to decision 15/CMP.1, and relevant decisions of the CMP.

128. New Zealand's GHG inventory is consistent with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance, and adheres to the reporting guidelines under Article 7 of the Kyoto Protocol.

129. Based on New Zealand's base year emissions (61,912,947 tonnes CO_2 equivalent, including the revised estimates provided) and its Kyoto Protocol emission limitation commitment of 100 per cent, the Party calculates its assigned amount to be 309,564,733 tonnes CO_2 equivalent and its commitment period reserve to be 278,608,260 tonnes CO_2 equivalent. The ERT agrees with these figures.

130. The ERT did not recommend any adjustments to the New Zealand GHG inventory, and notes that assigned amount and commitment period reserve, as calculated to include revised estimates during the review, are in accordance with the modalities for the accounting of assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol and decision 11/CMP.1.

131. New Zealand has also identified all required information on parameters and elections for LULUCF under Article 3, paragraph 3, of the Kyoto Protocol in accordance with decision 16/CMP.1. New Zealand's choice of the parameters to define forest includes minimum tree crown cover of 30 per cent, minimum land area of 1 ha and minimum tree height of 5 metres. New Zealand has chosen not to account for any Article 3, paragraph 4, activities and has chosen to account for Article 3, paragraph 3, activities for the entire commitment period.

132. New Zealand's national system is prepared in accordance with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol and reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol.

133. Based on the results of the in-country review and the technical assessment, as reported in the independent assessment report, the ERT concluded that New Zealand's national registry is fully compliant with the registry requirements as defined by decisions 13/CMP.1 and 5/CMP.1. The reported information is broadly transparent and in accordance with the guidelines requirements.

Recommendations

134. In the course of the review, the ERT formulated a number of recommendations relating to the completeness and transparency of New Zealand's information presented in the initial report and in the 2006 GHG inventory submission. Most of the recommendations have been implemented during the review process and the potential problems that could have led to overestimations of emissions in the base year have been resolved. The remaining key recommendations[5] are that New Zealand should:

(a) Improve the implementation of its QA/QC plan, in particular with the aim of reducing minor errors and inconsistencies;

(b) Use CRF notation keys more consistently to improve transparency and facilitate future reviews;

(c) Provide more transparency in the NIR on the choice of methods and data, paying particular attention to the task of centralized review teams that will need to make conclusions on the basis of the NIR text;

(d) Report CO_2 emissions from limestone use in steel production under category 2.A.3 limestone and dolomite use instead of category 2.C.1 iron and steel production, in accordance with the IPCC good practice guidance.

135. New Zealand responded to the identification of potential problems during the review by providing additional information and revising estimates. The ERT notes that New Zealand provided timely and thorough replies to the ERT questions concerning potential problems.

136. The ERT believes that in future reviews the following topics should be examined in depth:

(a) Progress in implementing New Zealand's QA/QC plan;

(b) Improvements in the NIR descriptions of methodological, data, and reporting choices to improve transparency;

[5] For a complete list of recommendations, the relevant sections of this report should be consulted.

(c) Progress in implementing the proposed New Zealand Carbon Accounting System for Land-Use, Land-Use Change and Forestry;

(d) Possible new information on the actual and potential emissions of fluorinated gases, particularly those used as substitutes for ozone depleting substances.

Questions of implementation

137. No questions of implementation were identified by the ERT during the initial review.

Annex I

Documents and information used during the review

A. Reference documents

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B. Additional information provided by the Party

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New Zealand National Greenhouse Gas Inventory Quality Control and Quality Assurance Plan (updated 25/01/2006).

New Zealand National Inventory Improvement Plan 2006/2007.

New Zealand's Greenhouse Gas Inventory 1990–2004: The National Inventory Report and the Common Reporting Format. Updated for Kyoto Protocol Initial Report Requirements. August 2006.

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Annex II

Acronyms and abbreviations

AD	activity data
BOD	biological oxygen demand
C	carbon
C_2F_6	hexafluoroethane
CF_4	tetrafluoromethane
CH_4	methane
CO_2	carbon dioxide
CO_2 eq.	carbon dioxide equivalent
COD	chemical oxygen demand
CRF	common reporting format
EF	emission factor
ERT	expert review team
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
GJ	gigajoule (1 GJ = 10^9 joule)
HFCs	hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
kg	kilogram (1 kg = 1 thousand grams)
kgoe	kilograms of oil equivalent
LULUCF	land use, land-use change and forestry
m^3	cubic metre
Mg	megagram (1 Mg = 1 tonne)
Mt	million tonnes
Mtoe	millions of tonnes of oil equivalent
N	nitrogen
N_2O	nitrous oxide
NH_3	ammonia
NIR	national inventory report
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control
SF_6	sulphur hexafluoride
SO_2	sulphur dioxide
Tg	teragram (1 Tg = 1 million tonnes)
TJ	terajoule (1 TJ = 10^{12} joule)
UNFCCC	United Nations Framework Convention on Climate Change

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