Report of the individual review of the greenhouse gas inventories of the Russian Federation submitted in 2007 and 2008

Note by the secretariat

The report of the individual review of the greenhouse gas inventories of the Russian Federation submitted in 2007 and 2008 was published on 28 January 2009. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/ARR/2008/RUS, 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.

UNITED NATIONS

UNFCCC **Framework Convention on Climate Change**

Report of the individual review of the greenhouse gas inventories of the Russian Federation submitted in 2007 and 2008[*]

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[*] In the symbol for this document, 2008 refers to the year in which the inventory was submitted, and not to the year of publication.

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<u>Annex</u>

I. Overview

A. Introduction

1.   This report covers the centralized review of the 2007 and 2008 greenhouse gas (GHG) inventory submissions of the Russian Federation, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. In accordance with the conclusions of the Subsidiary Body for Implementation at its twenty-seventh session the focus of the review is on the most recent (2008) submission.[1] The review took place from 1 to 6 September 2008 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Mr. Bernd Gugele (European Community) and Ms. Inga Konstantinaviciute (Lithuania); energy – Mr. Michael Strogies (Germany) and Mr. Hristo Vassilev (Bulgaria); industrial processes – Mr. Masato Yano (Japan) and Ms. Valentina Idrissova (Kazakhstan); agriculture – Mr. Paul Duffy (Ireland) and Ms. Batima Punsalmaa (Mongolia); land use, land-use change and forestry (LULUCF) – Mr. Emil Cienciala (Czech Republic) and Mr. Richard Volz (Switzerland); and waste – Mr. Sabin Guendehou (Benin) and Ms. Tatiana Tugui (Republic of Moldova). Mr. Gugele and Ms. Tugui were the lead reviewers. The review was coordinated by Ms. Ruta Bubniene (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 the Russian Federation, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

B. Inventory submission and other sources of information

3.   The 2008 inventory was submitted on 19 May 2008; it contains a complete set of common reporting format (CRF) tables for the period 1990–2006 and a national inventory report (NIR). This is in line with decision 15/CMP.1. The Party indicated that the 2008 submission is also its voluntary submission under the Kyoto Protocol.[2] In its 2007 submission, the Russian Federation included a complete set of CRF tables for the period 1990–2005 and an NIR. Where needed the expert review team (ERT) also used the 2006 submission, additional information provided during the review and other information. The full list of materials used during the review is provided in the annex to this report.

C. Emission profiles and trends

4.   In 2006 (as reported in the 2008 annual submission), the main GHG in the Russian Federation was carbon dioxide (CO_2), accounting for 72.0 per cent of total GHG emissions[3] expressed in CO_2 eq, followed by methane (CH_4) (22.0 per cent), and nitrous oxide (N_2O) (4.6 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 1.4 per cent of the overall GHG emissions in the country. The energy sector accounted for 81.6 per cent of the total GHG emissions, followed by industrial processes (9.1 per cent), agriculture (6.0 per cent), waste (3.3 per cent) and solvents and other product use (0.02 per cent). Total GHG emissions amounted to 2,190,238.69 Gg CO_2 eq and decreased by 34.0 per cent between the base year[4] and 2006.

5.   In 2005 (as reported in the 2007 annual submission), total GHG emissions amounted to 2,130,476.50 Gg CO_2 eq. The shares of gases and sectors in 2006 (2008 annual submission) were similar

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[1] FCCC/SBI/2007/34, paragraph 104.

[2] Parties may start reporting information under Article 7, paragraph 1, of the Kyoto Protocol from the year following the submission of the initial report, on a voluntary basis (decision 15/CMP.1).

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

[4] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

to those of 2005 (2007 annual submission). The emission trends by sector and by gas are comparable with those of other Parties with economies in transition.

6.   Tables 1 and 2 show GHG emissions by gas and by sector, respectively.

D. Key categories

7.   The Russian Federation has reported a key category tier 1 analysis, both level and trend assessment, as part of its 2008 submission. The key category analysis performed by the Party and that performed by the secretariat[5] produced similar results. The Russian Federation has included the LULUCF sector in its key category analysis, which was performed 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 the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF).

8.   In the 2007 submission the key category analysis was performed for the first time for the years 1990, 2004 and 2005. The same key categories were identified in the 2007 and 2008 submissions. The ERT encourages the Russian Federation to increase the accuracy of key category analysis reporting and to use key category analysis in order to prioritize improvements to the inventory and quality assurance/quality control (QA/QC) activities.

E. Main findings

9.   The inventory is generally 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. The ERT commends the Russian Federation for the improvements made since its last annual submission, in particular the inclusion of additional gases from industrial processes, such as CH_4 from carbide production.

10.   The ERT noted that the NIR still does not include all the elements and sections outlined in the structure specified by 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). Sections on general uncertainty evaluation and assessment of completeness are not included in the NIR and neither is any information on a QA/QC plan. The ERT identified several categories where emissions were not estimated. The ERT recommends that the Russian Federation include the missing elements of the NIR in its next annual submission.

11.   Transparency of the inventory has improved compared with the previous submission but the information is still not elaborated sufficiently. The ERT recommends that the Russian Federation further improve transparency as specified in this report.

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[5] The secretariat identified, for each Party, the categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the Intergovernmental Panel on Climate Change *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year. 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.

Table 1. Greenhouse gas emissions by gas, 1990–2006

Greenhouse gas emissions	Gg CO₂ eq								Change base year–2006 (%)
	Base year[a]	1990	1995	2000	2003	2004	2005	2006	
CO_2	2 497 016.00	2 497 016.00	1 572 311.53	1 469 001.51	1 518 404.19	1 520 743.04	1 521 328.69	1 577 688.88	–36.8
CH_4	578 035.65	578 035.65	452 258.73	430 737.91	458 111.49	466 389.24	470 491.51	480 941.13	–16.8
N_2O	221 004.82	221 004.82	139 767.16	107 118.20	105 375.01	104 095.15	101 440.06	100 668.90	–54.4
HFCs	6 921.99	14 802.46	6 921.99	12 604.56	8 130.12	12 241.23	13 324.01	13 586.86	96.3
PFCs	15 771.36	15 334.84	15 771.36	18 623.71	15 192.26	15 819.21	15 975.27	16 202.91	2.7
SF_6	88.74	210.25	88.74	161.45	379.54	484.89	798.99	1 150.01	1 195.9

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

Table 2. Greenhouse gas emissions by sector, 1990–2006

Sectors	Gg CO₂ eq								Change base year – 2006 (%)
	Base year[a]	1990	1995	2000	2003	2004	2005	2006	
Energy	2 707 432.85	2 707 432.85	1 772 528.03	1 660 802.29	1 721 932.97	1 726 679.07	1 730 802.83	1 786 907.78	–34.0
Industrial processes	236 849.65	244 415.11	152 392.43	168 141.66	172 922.25	183 778.36	186 730.06	198 302.45	–16.3
Solvent and other product use	561.61	561.61	511.68	522.89	532.63	534.76	531.90	531.96	–5.3
Agriculture	309 424.39	309 424.39	204 528.34	146 266.87	143 076.16	139 809.59	134 222.70	131 478.90	–57.5
LULUCF	NA	180 005.72	–156 035.13	347 708.21	–379 598.73	–217 839.77	159 196.59	287 788.54	NA
Waste	64 570.06	64 570.06	57 159.03	62 513.63	67 128.60	68 970.98	71 071.04	73 017.60	13.1
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF)	NA	3 506 409.74	2 031 084.38	2 385 955.55	1 725 993.88	1 901 933.00	2 282 555.13	2 478 027.23	NA
Total (without LULUCF)	3,318,838.57	3 326 404.02	2 187 119.51	2 038 247.34	2 105 592.61	2 119 772.76	2 123 358.53	2 190 238.69	–34.0

Abbreviations: LULUCF = land use, land-use change and forestry; NA = not applicable.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions do not include any possible emissions from deforestation; however, if applicable, these are taken into account when the assigned amount is calculated.

F. Cross-cutting topics

1. Completeness

12.   The Russian Federation has provided inventory data for the years 1990–2006 with full geographical coverage and has included all the required tables. Coverage of sources, sinks, and gases has been improved compared with previous submissions. The CRF tables are complete and notation keys are used throughout the tables. However use of notation keys should be improved, in particular in energy and industrial processes (for example in CRF table 1.A(a)s3 on activity data (AD) for gaseous fuels in navigation, emissions are reported as "not occurring" ("NO") but CH_4 and N_2O emissions are reported as "not estimated" ("NE").

13.   The ERT noted that emissions from several categories were reported as "NE". Examples include: CO_2 emissions from oil refining and storage; CO_2 emissions from other (oil); CO_2 and CH_4 emissions from exploration of natural gas; CO_2 and CH_4 emissions from venting (combined); CO_2 emissions from asphalt roofing and road paving with asphalt; and GHG emissions from land conversion to other land use. The ERT recommends that the Russian Federation estimate all missing categories and provide clarifications for the remaining reporting gaps in its next annual submission.

2. Transparency

14.   The NIR includes information on key categories, methods, data sources and emission factors (EFs). Transparency of the inventory has improved compared with the previous submission; however, the assessments made in the 2008 submission are not yet transparent enough in all parts of the inventory. Areas where more detailed information is required include methodologies and assumptions, and country specific EFs, in particular in the energy sector. The ERT recommends that the Russian Federation expand its methodological discussion in the NIR in its next annual submission and document country-specific methods and EFs in the annexes.

3. Recalculations and time-series consistency

15.   The ERT noted that recalculations reported by the Russian Federation in 1990–2005 have been undertaken in the energy and industrial processes sectors following the recommendations of the previous review, taking into account the methodologies used, updated AD, and changes in the allocation of emissions. The ERT further noted that a short description of the general reasons for recalculations is provided in the NIR but not in CRF table 8(b), and recommends that the Russian Federation include more detailed explanations of recalculations in the CRF table and the NIR in its next annual submission.

16.   The recalculations that were performed resulted in an increase of total GHG emissions in 1990 by 0.12 per cent and a decrease by 0.33 per cent of total GHG emissions in 2005. The major differences for 2005 between the 2007 and 2008 submissions is the decrease of CO_2 emissions from industrial processes (by 4.3 per cent) and HFC emissions from industrial processes (by 6.8 per cent).

4. Uncertainties

17.   Neither an uncertainty analysis for the inventory in total nor analyses for each category in accordance with the IPCC good practice guidance were provided in the 2008 submission. A tier 2 uncertainty analysis was prepared for agriculture, based on 2004 inventory data, and a tier 1 uncertainty analysis was performed for some LULUCF categories, the industrial processes sector and fugitive emissions from coal mining and from oil and gas systems. The ERT recommends that the Russian Federation provide complete uncertainty estimates for each category and for the inventory in total in its next annual submission.

5. Verification and quality assurance/quality control approaches

18.   The NIR states that the Russian Federation has elaborated a QA/QC plan; however, neither a detailed description of the plan nor a description of its implementation is included. A short explanation of general QA/QC procedure is presented. General QC procedures (tier 1) have been carried out by experts from the Institute of Global Climate and Ecology (IGCE) for all sectors. Tier 2 QC procedures are applied in the agriculture and LULUCF sectors. The NIR states that the Russian Federation is planning to implement source category-specific procedures (tier 2) in all sectors in the future. The ERT recommends that the Russian Federation continue implementing a QA/QC plan and document the performed checks and activities in its next annual submission.

19.   The ERT noted that the recommendation of the previous review that the Russian Federation develop an inventory improvement plan as part of the QA/QC procedures, which would allocate specific responsibilities, resources and timelines for the improvement of activities, has not yet been implemented. The ERT reiterates the recommendation that the Russian Federation include an inventory improvement plan in its next annual submission.

20.   The ERT further noted that the previous review recommended that the IGCE and Roshydromet identify essential inventory improvements and that Roshydromet support the IGCE in collecting the data and parameters required to carry out these improvements. The 2008 submission does not identify the institutional arrangements for data collection for the implementation of the GHG inventory improvements. The ERT reiterates the recommendation that the Russian Federation include this information in its next annual submission.

6. Follow-up to previous reviews

21.   The Russian Federation has implemented a number of the improvements suggested by previous reviews, in particular: reporting key category assessments in the NIR; providing additional information for industrial processes; revising emission estimates in the energy sector; performing QA/QC in all categories in the energy sector; treating energy data in coal equivalents instead of tonnes; and providing an overview of the conversion factors used. Completeness has been improved by reporting actual emissions from all categories within the consumption of halocarbons and SF_6. The notation keys have been corrected for fugitive emissions from production of halocarbons and SF_6 and research has started on disaggregated data for municipal solid waste composition.

22.   However, further efforts are still needed in order to improve the transparency of the NIR, especially with respect to methodology, AD and country-specific EFs as specified in the sectoral chapters. The ERT noted that several recommendations of the previous reviews have not yet been implemented. Examples of such recommendations include: involving the energy balance compilers in the national system; providing an inventory improvement plan; documenting the quality checks performed; and providing a more transparent description of the non-energy use of fuel.

G. Areas for further improvement

1. Identified by the Party

23.   The 2008 NIR identifies several areas for improvement:

(a)   Collect additional data, in particular on coal mining, and on international aviation from sources such as the International Civil Aviation Organization (ICAO);

(b)   Apply higher tier methods for key categories, especially for energy industries and other sectors in energy (e.g. the use of tier 3 methods to estimate emissions from road transportation);

(c)   Further develop country-specific EFs (e.g. EFs of CH_4 from oil and gas);

(d)   Further develop QA/QC procedures for the agriculture sector;

(e)   Further implement the IPCC good practice guidance for LULUCF.

2. Identified by the expert review team

24.   The ERT identified the following cross-cutting areas for improvement:

(a)   Include all the sections outlined in the UNFCCC reporting guidelines in the NIR, in particular missing sections on general uncertainty evaluation and assessment of completeness;

(b)   Use key category analysis to prioritize inventory improvements and QA/QC activities;

(c)   Include further information in the NIR on a QA/QC plan and its implementation;

(d)   Update and implement an inventory improvement plan through the allocation of specific responsibilities, resources and timelines for implementing improvements;

(e)   Provide quantified uncertainty estimates for all sectors, AD and EFs and for the inventory in total;

(f)   Provide more precise descriptions of methodologies to improve the transparency of the inventory, especially on country-specific EFs in the energy sector;

(g)   Improve transparency and completeness of the GHG inventory in the waste sector through the use of national AD and EFs, providing background information on the CH_4 EF from wastewater handling and including estimates from industrial waste disposal sites.

(h)   Revise GHG emissions from wastewater handling.

25.   Recommended improvements relating to specific source/sink categories are presented in the relevant sector chapters of this report.

II. Energy

A. Sector overview

26.   The energy sector is the main sector in the GHG inventory of the Russian Federation. In 2006, the energy sector accounted for 1,786,907.78 Gg CO_2 eq, or 72.1 per cent of total GHG emissions. Emissions from the sector decreased by 34.0 per cent between the base year and 2006. No major differences have been identified between the 2007 and 2008 inventory submissions. Within the sector, 77.9 per cent of the emissions were from fuel combustion activities, followed by 22.1 per cent from fugitive emissions.

27.   Within fuel combustion activities, most of the emissions came from energy industries, which accounted for 50.6 per cent of the sectoral GHG emissions, while transport accounted for 10.7 per cent, other sectors for 7.8 per cent and manufacturing industries and construction for 6.8 per cent. The remaining 2.0 per cent were from the category other (fuel combustion).

28.   The ERT noted that tier 1 and 1a methods are used for CO_2 emissions estimates from subsectors other than public electricity and heat production and for CH_4 from oil, which is not in accordance with IPCC good practice guidance for key categories. The ERT encourages the Russian Federation to consider the use of higher tier methods to estimate GHG emissions from all key categories in the energy sector in accordance with the IPCC good practice guidance.

29.   The ERT noted that the following emissions are reported as "NE": CH_4 and N_2O emissions from other fuels in manufacturing of solid fuels and other energy industries subcategories; CO_2, CH_4 and N_2O from gasoline in navigation; and CH_4 and N_2O emissions from biomass and other fuels in pipeline transport. The ERT noted further that there is no explanation in the NIR of the nature of the CH_4 and N_2O emissions that are reported as "NE" under pipeline transport. The ERT recommends that the Russian Federation make efforts to report such emissions in its next annual submission or explain the reason for not reporting them.

B. Reference and sectoral approaches

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

30.   In 2006, energy consumption figures produced by the reference approach were 11.9 higher than those produced by the sectoral approach, with a considerable difference for liquid fuels (21.6 per cent) and solid fuels (18.3 per cent). CO_2 emissions from the energy sector calculated using the reference approach were 3.4 per cent higher than those calculated using the sectoral approach. The Russian Federation does not identify reasons for the difference in estimated CO_2 emissions using the two approaches. The ERT recommends that the Russian Federation explain the difference between the approaches, including by providing in its next annual submission a transparent description of the treatment of emissions from non-energy use of fuels.

31.   The ERT noted that transparency of the types of units used in the CRF table for the reference approach is insufficient. During the review, the Party explained that the CRF table shows natural gas liquids (NGL) and crude oil produced and table 3.24 of the NIR includes NGL and oil losses. The ERT encourages the Party to provide detailed descriptions of the type of units used in its next annual submission.

2. International bunker fuels

32.   The ERT noted that emissions of CO_2 from international aviation increased by 110.8 per cent in 2006 compared with 1990; reflecting the growth in international aviation, its share of international bunker emissions increased from 37.1 per cent in 1990 to about 85.9 per cent in 2006. CO_2 emissions from international navigation decreased by 79.1 per cent between 1990 and 2006. The emissions trends are explained in the NIR.

33.   The ERT noted that the Russian Federation plans to refine the data collection for international aviation using data from the ICAO and national sources. The ERT commends the Russian Federation for this intention and encourages the Party to report on its progress in its next annual submission.

3. Feedstock and non-energy use of fuels

34.   The Russian Federation uses a default IPCC method to estimate emissions from feedstock and non-energy use of fuels. A part of CO_2 emissions from combustion is allocated under industrial processes as emissions from non-energy use (e.g. CO_2 emissions from the total quantity of blast furnace gas). The ERT noted the lack of clarity on how the CO_2 emissions from non-energy use of fuels (excluding emissions from blast furnace gas) are included in the totals for GHG emissions. The ERT reiterates the recommendation of the previous review that the Russian Federation provide a more transparent description of the non-energy use of fuel in its next annual submission. The ERT encourages the Russian Federation to include fuel quantity and emissions from non-energy use in the sectoral approach.

C. Key categories

1. Stationary combustion: solid, liquid fuels – CO$_2$

35.   The ERT noted that the Russian Federation uses a tier 1 approach to estimate CO$_2$ emissions from other sectors (manufacturing industries and combustion). As this category is key, the ERT encourages the Russian Federation to consider the use of higher tier methods for this category in accordance with the IPCC good practice guidance.

36.   The ERT further noted that the Russian Federation is making some effort to fulfil the recommendation of the previous review to estimate CH$_4$ and N$_2$O emissions from manufacturing industries and constructions. The ERT commends the Party for these efforts.

2. Road transportation – CO$_2$

37.   The ERT noted that CO$_2$ emissions from road transportation is estimated using a tier 1 approach, which is not in line with the IPCC good practice guidance for key categories. The NIR states that the Russian Federation is planning to estimate emissions from road transportation using a tier 3 approach. The ERT commends the Party for this intention and encourages it to document the development of the country-specific method in its next annual submission.

3. Oil and natural gas – CH$_4$

38.   The ERT has noted that the following categories are not estimated for the entire time series: CO$_2$ and CH$_4$ emissions from distribution of oil products; CO$_2$ emissions from oil refining and storage; CO$_2$ emissions from other (oil); CO$_2$ and CH$_4$ emissions from exploration of natural gas; CO$_2$ emissions from natural gas distribution and other leakage; and CO$_2$ and CH$_4$ emissions from venting (combined).

39.   The ERT further noted that the estimation of emissions from oil is based on a tier 1 approach and default IPCC values, which is not in accordance with the IPCC good practice guidance for key categories. The ERT recommends that the Russian Federation make efforts to estimate CH$_4$ from this category using a higher tier method.

D. Non-key categories

Stationary combustion: solid fuels – CH$_4$

40.   The ERT noted that the Russian Federation is making some efforts to fulfil the recommendation of the previous review to estimate the CH$_4$ and N$_2$O emissions from solid fuels in stationary combustion. The ERT noted that the CH$_4$ implied EF for biomass reported under iron and steel is much higher than that of other reporting Parties. In response to a request by the ERT, the Party explained that the content of the category other fuel is industrial waste, where the EF for CO$_2$ is 142.29 kg per TJ. The reason for such a high implied EF is the use of aggregated AD. The ERT encourages the Russian Federation to disaggregate the AD and report on this in its next annual inventory submission.

III. Industrial processes and solvent and other product use

A. Sector overview

41.   In 2006, the industrial processes sector accounted for 198,302.45 Gg CO2 eq, or 9.1 per cent of total GHG emissions. Emissions from the industrial processes sector decreased by 16.3 per cent between 1990 and 2006 as a result of economic decline. The key driver for the fall in emissions is a decrease in emissions from mineral products, namely from limestone and dolomite use (by 52.6 per cent), lime production (by 32.0 per cent) and cement production (by 29.1 per cent).

42.   In 2006, within the industrial processes sector, 42.3 per cent of GHG emissions were from iron and steel production, followed by 12.2 per cent from cement production, 11.4 per cent from aluminium production and 9.8 per cent from ammonia production. Limestone and dolomite use accounted for 8.7 per cent. The remaining sources were production of hydrochlorofluorocarbon-22 (HCFC-22) (5.9 per cent) and lime production (4.2 per cent). Most of the emissions came from CO_2, which accounted for 82.4 per cent of sector emissions, followed by PFCs (8.2 per cent), HFCs (6.9 per cent), N_2O (1.6 per cent), SF_6 (0.6 per cent) and CH_4 (0.4 per cent).

43.   The solvent and other product use sector accounted for 531.96 Gg CO2 eq, or 0.02 per cent of total GHG emissions. Emissions in this sector decreased by 5.3 per cent between 1990 and 2006. The Russian Federation reports only N_2O emissions from anaesthesia and non-methane volatile organic compound emissions; the remaining categories are reported as "NE" owing to the absence of IPCC methodology. The Party may wish to estimate emissions by applying methodologies identified in the European Union emissions inventory programme (CORINAIR) or in recognized international scientific literature.

44.   The reporting of the industrial processes sector is generally complete. The Russian Federation reports emissions from all sources where methodology is available. As explained by the Party during the review, emissions from other production (food and drink), and asphalt roofing and road paving with asphalt are reported as "NE" owing to the absence of IPCC methodology. Emissions from glass production were reported as "included elsewhere" ("IE") and are given under the limestone and dolomite use category.

45.   The NIR is transparent enough to allow an assessment of the data used and methodologies applied. Justifications are given for the assumptions made, methods used and AD collected. Most categories are reported with the required detail in the CRF tables and a quantitative uncertainty assessment is given for most categories. Only the AD for aluminium production have been reported as confidential ("C"); the relevant documentation for this was presented during the previous review. The ERT encourages the Russian Federation to include an additional explanation in the NIR of the estimation of HFC emissions from mobile sources in the consumption of halocarbons and SF_6.

46.   The ERT noted that the completeness and transparency of the industrial processes sector improved significantly since the previous inventory submission. Most of the recommendations made during the previous review were followed in the 2008 submission, especially for the key categories: SF_6 emissions from electrical equipment were estimated using IPCC methodology; actual emissions were reported from all subcategories for the consumption of halocarbons and SF_6; and fugitive emissions were estimated from production of halocarbons and SF_6. The Russian Federation also reported CO_2 and CH_4 emissions from carbide production. Recalculations for the whole time series were made where necessary.

B. Key categories

1. Iron and steel production – CO_2

47.   The Russian Federation estimated CO_2 emissions from iron and steel production separately, using the IPCC tier 2 methodology for pig iron and for steel. The production data for iron, steel, the export and import of "conversion pig iron", and coke used were provided by the Russian Federal Service on State Statistics (Rosstat) in its yearly reports on fuel balance and energy balance . The default IPCC EFs were used. Emissions and AD from sinter production are reported as "IE" and are included under pig iron production. The ERT encourages the Russian Federation to report CO_2 emissions from pig iron production and those from sinter production separately in its next inventory submission.

2. Cement production – CO_2

48.   The Russian Federation used the IPCC tier 2 methodology based on clinker production to estimate CO_2 emissions from cement production. The IPCC default value for lime content in clinker and the cement kiln dust (CKD) correction factor were applied. AD were provided by Rosstat. The ERT encourages the Russian Federation to apply country-specific data on lime content in clinker and on the CKD correction factor in its next annual submission in order to improve accuracy.

3. Aluminium production – PFCs

49.   PFC emissions from aluminium production were estimated using IPCC tier 1 methodology and default EFs for CF_4 and hexafluoroethane. The shares of technologies used in the process were collected from all plants and for all years. The ERT recommends that the Russian Federation make efforts to apply tier 2 methodology in order to estimate emissions from the key categories, as recommended by the IPCC good practice guidance.

4. Ammonia production – CO_2

50.   The Russian Federation uses the IPCC tier 1b approach and default EFs to estimate CO_2 emissions from ammonia production. Given that this is a key category, the ERT recommends that the Russian Federation make efforts to estimate CO_2 emissions using a higher tier methodology, based on natural gas input, and apply EFs based on the carbon content of natural gas in its next annual submission.

C. Non-key categories

Production of halocarbons and HFCs – HFC

51.   HFCs from the production of halocarbons and HFCs accounted for 85.7 per cent of the total HFC emissions in the country and for 5.9 per cent of total sectoral emissions. The ERT noted that the transparency of the reporting of emissions estimates under this category has improved significantly since the previous review. Plant-specific data were obtained on the production of HCFC-22 and on the amount of hydrofluorocarbon-23 collected and the NIR provides the AD. Based on the availability of data, the ERT encourages the Russian Federation to apply tier 2 methodology in its next annual submission.

IV. Agriculture

A. Sector overview

52.   In 2006, the agriculture sector accounted for 131,478.90 Gg CO_2 eq, or 6.0 per cent of total GHG emissions. Emissions from this sector decreased by 57.5 per cent between the base year and 2006. The key driver for the fall in emissions is the significant decline in the agricultural output of the Russian Federation, particularly in animal population numbers.

53.   Within the sector, 54.1 per cent of the emissions were from agricultural soil followed by 28.3 per cent from enteric fermentation, 16.5 per cent from manure management and 1.0 per cent from rice cultivation. Total N_2O emissions accounted for 68.4 per cent and CH_4 emissions accounted for 31.6 per cent of the total sectoral emissions.

54.   Most of the emissions (39.0 per cent) came from direct N_2O emissions from agricultural soil. CH_4 emissions from cattle (enteric fermentation) accounted for 25.1 per cent, N_2O emissions from solid storage and dry lot (manure management) for 14.2 and indirect soil emissions for 11.7 per cent. Field burning of agricultural residues is prohibited by law in the Russian Federation but some of the AD and other related information are reported as "NE" in the CRF. The ERT recommends that, in its next annual submission, the Russian Federation correct the notation keys in the CRF tables and use "NO" if the

activity is not occurring. If some illegal burning of agricultural residues occurs and has not been estimated, the Party is encouraged to estimate emissions in its next annual submission.

55. The ERT noted some improvements, and consequent recalculations, in the 2007 and 2008 submissions compared with the 2006 submission. In the 2007 submission, the Russian Federation has corrected mistakes made in the AD for nitrogen in crop residue in 2004 and in EFs for the estimation of CH_4 emissions from cattle in 2003, and revised the AD of fur farming for 1991–2004. There are no major differences between the NIRs of the 2007 and 2008 submissions. The recommendation made during the previous review that the Russian Federation document in more detail the reasons for the trends in emissions has not yet been implemented in the NIR. Uncertainty analyses were conducted using a tier 2, Monte Carlo equation, applying 2004 emissions estimates. The ERT recommends that the Russian Federation conduct an uncertainly analysis for the latest inventory year and present it in its next annual submission.

56. The Russian Federation has been planning to make a number of improvements in manure management and agricultural soils since 2006. However, the listed planned improvements have not been implemented in either the 2007 or 2008 submission. The ERT encourages the Russian Federation to implement these planned improvements in its next annual submission.

B. Key categories

1. Enteric fermentation – CH_4

57. The Russian Federation used country-specific methods equivalent to and consistent with the tier 2 methods in the IPCC good practice guidance for important livestock subcategories (cattle and swine) and tier 1 methods for the other categories of livestock. The previous ERT encouraged the Russian Federation to perform and document in its next NIR the full range of quality checks set out in the IPCC good practice guidance for this category. However, the latest NIR does not report if quality checks were conducted for the 2007 and 2008 submissions. The ERT reiterates the recommendation made during the previous review and encourages the Russian Federation to document in its next NIR the quality checks that are performed.

58. Country-specific EFs have been developed for cattle and swine and EFs for deer have been taken as an average of those from countries such as Finland, Norway and Sweden; EFs for fur farming were taken from Norway and those for rabbits from Portugal. The IPCC default EFs have been used for other animals. The ERT encourages the Russian Federation to document the accuracy and suitability for its own national circumstances of these EFs used by other Parties.

2. Manure management – N_2O

59. The Russian Federation used the tier 1 method for CH_4 emission estimates for cattle and swine, with a combination of the country-specific nitrogen intake rate and the IPCC default fraction of annual nitrogen intake. The Russian Federation has identified the types of animal waste management systems (AWMS) used in the country and uses country-specific data on the allocation of manure to different types of AWMS. The Russian Federation estimated the nitrogen excretion rate for deer, rabbits and fur animals on the basis of an analysis of NIRs from Sweden, Italy and Denmark; however, the methodologies are not described in the NIR. The ERT recommends that the Russian Federation document these methodologies in its next inventory submission.

3. Direct soil emissions – N_2O

60. A combination of country-specific and default data was used to estimate direct N_2O emissions from soil. Country-specific EFs for some soils, such as chernozem and sod-podzol, and country-specific methods were adopted for the direct soil emissions – crop residues subcategory. In accordance with the recommendations of the previous review, the Russian Federation has provided information on quality

checks to reconcile the application rates of fertilizers with market balances. The ERT welcomes these efforts made on the part of the Russian Federation.

V. Land use, land-use change and forestry

A. Sector overview

61.   In 2006, the LULUCF sector accounted for net emissions of 287,788.54 Gg CO_2 eq.
The emissions from the sector increased by 59.9 per cent between 1990 and 2006. The key driver for the rise in emissions is a decreasing sink of CO_2 from biomass carbon stock changes under forest land remaining forest land and increasing soil carbon loss from mineral soils under cropland remaining cropland.

62.   Within the LULUCF sector, 89.0 per cent of the GHG removals were from forest land, while 11.0 per cent were from grassland. GHG emissions came from cropland, which accounted for all emissions in the sector. The remaining land-use categories (wetlands, settlements and other land), were reported as "NE".

63.   The Party does not employ a complete approach for land-use representation (not all land area within the country is included in the inventory) as recommended by the IPCC good practice guidance. The national definitions of land-use categories are not fully reconciled with those of the IPCC good practice guidance for LULUCF, or they are missing. The ERT recommends that the Russian Federation reconcile its national definitions with those of the IPCC good practice guidance for LULUCF and revise land statistics to develop a consistent land-area representation. In order to improve transparency of the emissions inventory, the ERT also encourages the Russian Federation to provide a summary table on national areas under different land use and land-use change, including areas of managed and unmanaged land, which is required for QA/QC purposes. During the review, in response to the request made by the ERT, the Russian Federation confirmed that it is making an effort to improve transparency in the inventory and intends to include the land-use matrices in its next annual submission.

64.   A partial quantitative uncertainty estimate was made for the LULUCF sector in the 2008 inventory submission. The ERT recommends that the Russian Federation estimate the overall uncertainty for the sector in its next inventory submission in order to prioritize the allocation of resources for further improving the inventory.

65.   The Russian Federation has not provided a voluntary report on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. In response to a question posed by the ERT, the Party stated that information on the transmission of lands during the 1990–2007 period, pursuant to the provisions of Article 3, paragraph 3, of the Kyoto Protocol, decision 16/CMP.1 and the IPCC recommendations, will be included in the 2009 inventory submission. In accordance with the plan of improvement of the Russian national system, these data will be collected annually starting in 2008.

66.   The Russian Federation has not separately reported any emissions or removals in any mandatory categories of land-use conversion. With the exception of information on the land-use change, as mentioned in paragraph 65 above, the Russian Federation applied approach 1 of the IPCC good practice guidance for LULUCF for land representation. However, the IPCC approach 2 and/or approach 3 may be required in order to enable reporting of the mandatory land-conversion categories, reflecting the large size of the country, the high diversity of the terrestrial ecosystems and the substantial amount of unmanaged areas. The ERT recommends that the Russian Federation develop the inventory system using disaggregated data and compile the inventory using the reporting methods of the IPCC good practice guidance for LULUCF. Higher tier methods and approaches for land-use representation will also be needed for reporting LULUCF activities under Article 3, paragraph 3, of the Kyoto Protocol.

B. Key categories

1. <u>Forest land remaining forest land – CO_2</u>

67.   Following the initial review report of the Russian Federation, the ERT learned that the Party had established parameters defining forest and further clarified its definition of managed forest land. The 2008 submission does not include information on whether the adopted forest definition for reporting of the LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol would also be applied for the reporting of managed forest under the Convention. The ERT encourages the Party to provide this explanation in its next annual submission.

68.   The key AD on growing stock volumes used for estimating changes in biomass carbon pools come from forestry statistics aggregated at the national level and are reported by major species groups and age categories. No regional or other type of disaggregation was performed. Disaggregation is strongly recommended in view of the wide variation in forest types and growing conditions in the country. In addition, the information on the combined conversion and expansion factors applied for the estimation of carbon stock changes is not transparent. The ERT recommends that the Russian Federation provide additional information on how expansion factors were developed and, if appropriate, consider complementary research to develop adequate biomass functions or factors that would also include uncertainty estimates.

69.   The ERT could not fully verify the reported trends of CO_2 emissions and removals resulting from carbon stock change in biomass. During the review, in response to questions posed by the ERT, the Russian Federation confirmed that the assessed emissions from harvest, as described in the NIR, are not specifically reported in the CRF. These emissions are implicitly included through use of the stock change method for this category. The ERT noted the clarification given by the Russian Federation about AD and recommends that the Party explain this information and report it in a transparent manner in its next annual submission.

70.   The Russian Federation did not estimate emissions and removals in soils, dead wood and litter. The ERT recommends that the Russian Federation make efforts to estimate and report these categories in its future annual submissions.

2. <u>Cropland remaining cropland – CO_2</u>

71.   For cropland remaining cropland, the Party developed and applied a country-specific spreadsheet-based model to estimate emissions and removals from carbon stock changes in this land-use category. The model applies many country-specific assumptions and average values with AD that are commonly aggregated at country level. Although the model is described in some detail in the NIR, the nature and the description of the model do not allow for an assessment of its accuracy. The ERT learned that the model has been published in a Russian peer-reviewed scientific journal, while it undergoes further development and refinement. The ERT notes that it is yet to be confirmed that the model is robust and able to provide an unbiased estimate for the entire country. The ERT suggests a review and further verification of the model by the international scientific community in order to increase confidence in its use for estimating emissions and removals in this key category.

C. Non-key categories

<u>Grassland remaining grassland – CO_2</u>

72.   The Russian Federation used a country-specific spreadsheet-based model to estimate emissions and removals from carbon stock changes in grassland remaining grassland. In a similar way to the category of cropland remaining cropland, the model applies many country-specific assumptions, average parameter values and country-level aggregated AD. The ERT suggests a review and further verification

of the model by the international scientific community in order to increase confidence in its use for estimating emissions and removals in this category.

VI. Waste

A. Sector overview

73.   In 2006, GHG emissions from the waste sector accounted for 73,017.60 Gg CO_2 eq, or 3.3 per cent of total emissions, compared with 1.94 per cent in 1990. GHG emissions increased by 13.1 per cent from 1990 to 2006. In 2006, solid waste disposal on land accounted for 53.9 per cent of sectoral emissions and wastewater handling accounted for 46.1 per cent.

74.   The NIR covers emissions from solid waste disposal on land and wastewater handling. For emissions from waste incineration the notation key "IE" is used, following the recommendation made by the ERT during the previous review. The ERT noted that the NIR states that emissions from waste incineration are reported under the energy sector, although it is not clear where these emissions are reported. The ERT encourages the Party to clarify this in its next annual submission.

75.   The ERT noted that emissions reported from waste are similar in the 2007 and 2008 submissions. Most issues that were raised by the ERT during the previous review, such as waste generation in rural areas and the degradable organic carbon (DOC) value for different regions, still remain unresolved. The Russian Federation plans to obtain disaggregated data on municipal solid waste composition for establishing the DOC. The ERT reiterates the recommendations of the previous review and recommends that the Russian Federation make efforts to improve estimates from the waste sector in its next annual submission.

B. Key categories

Solid waste disposal on land – CH_4

76.   The IPCC tier 2 first order decay method and IPCC default EFs and parameters were used to estimate CH_4 from solid waste disposal on land. The AD on disposal of solid waste on landfills for 1960–1990 were taken from communal services and for 1999–2006 from Rosstat statistics. The data for 1991–1998 were interpolated, based on linear function. The ERT recommends that the Russian Federation demonstrate that the approach used is the 'best fit' approach.

77.   The ERT noted that solid waste disposal on land includes only municipal household waste and does not take into account industrial waste. This could lead to underestimation of CH_4 emissions for the entire time series given that the Russian Federation has food and beverage, pulp and paper, wood processing and other industries where organic industrial waste can be generated. The ERT recommends that the Russian Federation revise CH_4 emission estimates from solid waste disposal on land based on the share of biodegradable industrial waste. During the review, in response to a request made by the ERT, the Russian Federation stated its intention to collect AD for industrial waste and to revise estimates of emissions for managed waste disposal on land and unmanaged waste disposal sites and report them in its next annual submission.

78.   The same waste generation rate has been used for both urban and rural areas, owing to the lack of a specific waste generation rate for rural areas. The ERT noted that the explanation given by the Russian Federation that an average waste generation rate of 0.36 t per capita for 2004 year seems to be in line with the IPCC default value (0.32 t per capita), is not correct. The Revised 1996 IPCC guidelines states that the default value (in table 6-1, Country Waste Generation, Composition and Disposal Data) for developing countries and countries with economies in transition do not include data from rural areas. The ERT noted that there are no waste collection or disposal systems in rural areas in the Russian Federation. Therefore, the urban population only should be considered while estimating CH_4 emissions

from solid waste disposal on land. The ERT encourages the Russian Federation to revise the waste generation rate for rural areas in its next annual submission.

79.   The ERT noted that the constant DOC value (0.19) is used for 1990–2006 and for the whole country. In most of the reporting Parties with economies in transition, the waste composition has changed substantially since the early 1990s. The ERT believes that this parameter should therefore vary from 1990 to 2006. As climatic conditions differ in different regions of the Russian Federation, the CH_4 generation rate k should vary for different regions as well. Noting that even a small change in emission coefficients can result in substantial changes in estimates of CH_4 emissions, the ERT recommends that the Russian Federation revise the DOC and k values in order to improve the accuracy of the estimates across the time series.

C. Non-key categories

Wastewater handling – CH_4, N_2O

80.   The ERT noted that CH_4 emissions per capita from wastewater handling (9.94) in 2006 are the highest of the reporting Parties (0.2–9.94). The ERT encourages the Russian Federation to provide an explanation for this in its next annual submission.

81.   The ERT also noted that CH_4 emissions from wastewater handling have been recalculated in the 2007 submission, taking into consideration two different systems of domestic wastewater treatment (an aerobic wastewater treatment with an anaerobic sludge treatment system, and other wastewater treatment systems where wastewater is treated aerobically), which resulted in an increase in emissions by 26.3 per cent in 1990 and 19.9 per cent in 2004.

82. CH_4 emissions from wastewater and sludge from the first type of system (aerobic wastewater treatment with anaerobic sludge treatment) have been estimated based on IPCC methods and country-specific EFs. For the second type of system (other wastewater treatment systems) the IPCC check method was used. The approach used for CH_4 estimations from both systems is in line with the IPCC good practice guidance, but the applied country-specific EFs are higher than those of the other reporting Parties with similar economic and geographic conditions. The ERT recommends that the Russian Federation substantiate the value of the EFs used in its next annual submission.

83.   In the NIR, the Russian Federation stated that in the second type of system all wastewater is treated aerobically because of climatic conditions and that there is no anaerobic digestion of sludge. The ERT noted that the Russian Federation uses the IPCC default value (0.8) for the fraction of biochemical oxygen demand in sludge that degrades anaerobically (FTA). The IPCC good practice guidance states that for a country with treating sludge aerobically, the FTA value should be lower than or equal to zero. The ERT encourages the Russian Federation to revise the EFs used and provide updated estimates for this category in its next annual submission.

84.   The ERT noted that for 1990–2003, N_2O emissions from human sewage have been estimated based on data from the Food and Agriculture Organization of the United Nations on protein consumption. For 2004–2006, estimates have been made based on data from Rosstat on protein consumption; the ERT encourages the Russian Federation to explain the reasons for this change in data collection.

VII. Other issues

1. Changes to the national system

85.   The Russian Federation has not reported on any changes to its national system in the 2008 submission. In response to questions raised by the ERT during the review the Russian Federation confirmed that no changes to the national system have taken place.

86.   Following the recommendation of the previous ERT to expand the national system while including relevant private entities, the ERT asked for clarification on the cooperation among the inventory data providers within the national system. In response, the Russian Federation informed the ERT that some arrangements are being made to ensure that the inventory compilers have access to energy balance data. The ERT reiterates that the inclusion of the energy balance compilers in the national system is essential for ensuring the access to data that is required for inventory improvements, in particular in the energy and industrial processes sectors. The ERT encourages the Russian Federation to expand and institutionalize its national system for inventory preparation by including relevant stakeholders.

87.   The ERT recommends that the Russian Federation include information on the changes to its national system for inventory planning, preparation and management in its next annual submission.

2. Changes to the national registry

88.   The Russian Federation has not reported any changes to its national registry in the 2008 submission. In response to questions raised by the ERT during the review the Party confirmed that no changes to the national registry have taken place and that the national registry has been fully operational since 4 March 2008. The ERT recommends that the Russian Federation include information on the changes to its national registry and on improvements in the hardware environment with regard to a recovery plan in its next annual submission.

3. Commitment period reserve

89.   Based on its national emissions in the most recently reviewed inventory of 2006 (2,190,238.69 Gg CO_2 eq), the Party calculates its commitment period reserve to be 10,951,193,450 t CO_2 eq. The ERT agrees with this figure.

VIII. Conclusions and recommendations

90.   The inventory has been prepared generally in accordance with the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. The inventory generally covers all sectors and most categories of sources and sinks, and is generally complete in terms of years, gases and geographic coverage.

91.   The ERT identified some gaps in the reporting (e.g. energy sector). A number of categories, such as CO_2 emissions from asphalt roofing and road paving with asphalt, and GHG emissions from land conversions to other land use, are reported as "NE". Uncertainty analyses for the inventory in total and for each category, as well as a detailed description of the QA/QC plan and its implementation were not provided in the submission. The ERT also identified instances of potential underestimations of emissions, and issues of time-series consistency (e.g. waste sector).

92.   The transparency of the reporting has improved significantly compared with the last reviewed annual submission. However, a number of improvements recommended by the previous review have not yet been addressed, especially in the energy sector.

93.   In the course of the review, the ERT formulated a number of recommendations relating to the completeness, consistency, accuracy and transparency of the information presented by the Russian Federation. The main recommendations are that Russian Federation:

(a)   Maintain and enhance the operational functions of the national system, which ensure the flows of necessary data and information to the inventory agency, and expand the national system by including relevant stakeholders in order to facilitate access to the data required for inventory improvements;

(b)   Include information on changes to the national system for the planning, preparation and management of the inventory and on changes to the national registry;

(c)   Improve completeness of the reporting by providing quantified uncertainty estimates for all sectors and for the inventory in total and by providing emission estimates for all categories that have not yet been estimated;

(d)   Enhance transparency of the reporting by documenting the recalculations in the CRF tables and in the NIR and documenting the QA/QC procedures and inventory improvement plan;

(e)   Improve the time-series consistency of emission estimates, pursuant to the IPCC good practice guidance (e.g. waste sector);

(f)   Estimate emissions from all key categories using higher than tier 1 methods in accordance with the IPCC good practice guidance.

IX. Questions of implementation

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

Annex

Documents and information used during the review

A. Reference documents

Intergovernmental Panel on Climate Change. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/SBSTA/2006/9. Available at <http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>.

"Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". FCCC/CP/2002/8. Available at <http://unfccc.int/resource/docs/cop8/08.pdf>.

"Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol". Decision 19/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

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FCCC/ARR/2006/RUS. Report of the individual review of the greenhouse gas inventory of the Russian Federation submitted in 2006. Available at <http://unfccc.int/resource/docs/2008/arr/rus.pdf>.

FCCC/IRR/2007/RUS: Report of the review of the initial report of the Russian Federation. Available at <http://unfccc.int/resource/docs/2007/irr/rus.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. A. Nakhutin (Institute of Global Climate and Ecology) and Ms. Viculova Elena, (Roshydromet), including additional material on the methodology and assumptions used.

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