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Report of the centralized in-depth review of the second, third and fourth national communication of Belarus

According to decision 4/CP.8, Parties included in Annex I to the Convention are requested to submit to the secretariat, in accordance with Article 12, paragraphs 1 and 2, of the Convention, a fourth national communication by 1 January 2006, and those that have not submitted their first second or third national communication are urged to do so as soon as possible. This report presents the results of the in-depth review of the second, third and fourth national communication of Belarus conducted by an expert review team in accordance with relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

CONTENTS

I. Introduction and summary

A. Introduction

1. Belarus has been a Party to the Convention since 2000 and to its Kyoto Protocol since 2005. Under the Kyoto Protocol, Belarus does not yet have a binding target for reducing its greenhouse gas (GHG) emissions during the first commitment period from 2008 to 2012. The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP), by its decision 10/CMP.2, adopted the amendment to Annex B to the Kyoto Protocol, which states Belarus's commitment to reducing its GHG emissions by 92 per cent in relation to the base year level over the period 2008–2012. In accordance with the provisions of Article 20 of the Kyoto Protocol, the amendment will enter into force on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to the Protocol. At the time of the centralized in-depth review (IDR) of the second, third and fourth national communication (hereinafter referred to as the NC4)[1] of Belarus, this had not yet been achieved.

2. This report covers the IDR of the NC4 of Belarus, coordinated by the UNFCCC secretariat, in accordance with decision 7/CP.11. The review took place from 11 to 16 May 2009 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Amrita Narayan Achanta (India); Mr. Matjaz Cesen (Slovenia); Mr. Eric Debrabanter (Luxembourg); Ms. Svetlana Dolgikh (Kazakhstan); Mr. Gebru J. Endalew (Ethiopia); Ms. Agnieszka Janowska (European Community); Ms. Diana Harutyunyan (Armenia); Ms. Asta Mikalauskiene (Lithuania); Ms. Valia Peeva (Energy Charter); and Mr. Janis Rekis (Latvia). Ms. Achanta and Ms. Peeva were the lead reviewers. The review was coordinated by Ms. Ruta Bubniene (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each part of the NC4. The ERT also evaluated the information contained in Belarus's report demonstrating progress (RDP) in achieving its commitments under the Kyoto Protocol, and the supplementary information provided by Belarus under Article 7, paragraph 2, of the Kyoto Protocol.

4. 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 Belarus, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The ERT noted that Belarus's NC4 broadly complies with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). Supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[2] is provided in both the NC4 and the RDP.

1. Completeness

6. The NC4 covers most of the sections required by the UNFCCC reporting guidelines, except for the summary and a chapter on research and systematic observation. In its NC4, Belarus has not provided an explanation of why these mandatory elements have not been reported. Belarus's RDP contains most of the parts stipulated by decisions 22/CP.7 and 25/CP.8, except for the following reporting elements: a description of the activities, actions and programmes undertaken by the Party in fulfilment of its

[1] Belarus submitted its second, third and fourth national communications as a single document.
[2] Decision 15/CMP.1, annex, chapter II.

commitments under Articles 10 and 11; and an evaluation of how domestic measures, in light of the trends in and projections of its GHG emissions, will contribute to the Party's meeting its commitments under Article 3 (such an evaluation has been provided only for renewable energy) (see chapter III B below).

2. Timeliness

7. Belarus submitted its NC4 in Russian on 29 May 2006 and in English on 7 April 2007 and its RDP in English and Russian on 29 May 2006. Decision 4/CP.8 requested Parties to submit their fourth national communication by 1 January 2006; decision 22/CP.7 set the same date for Parties to submit their RDP.

3. Transparency

8. Belarus's NC4 provides information on all aspects of implementation. However, the ERT noted that the structure of the NC4 does not precisely follow the outline contained in the annex to the UNFCCC reporting guidelines. In the course of the review, the ERT formulated a number of recommendations that could help Belarus to further increase the transparency of its reporting, such as a recommendation to provide complete and transparent information on the coverage, results achieved and mitigation effect (individual and aggregated by sector) of any policies and measures (PaMs) currently being implemented or planned, in the relevant chapter of its next national communication. The ERT noted that the information contained in the NC4 is generally consistent with that contained in the RDP.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals

9. In its NC4, Belarus has provided a description of its national circumstances, how these national circumstances affect GHG emissions and removals in Belarus, and how national circumstances and changes in national circumstances affect GHG emissions and removals over time. Belarus has reported the following as the main drivers of its GHG emission trends: the transition to a market economy, demographic developments, changes in the structure of primary energy supply, changes in export/import and transport patterns, and the agriculture sector. Climate profiles for the country have been provided. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals for the period 1990–2006.

10. The process of economic transition in Belarus was marked by a sharp decline in gross domestic product (GDP) in the early 1990s, followed by a steady increase in GDP between 1996 and 2006. The country's GHG emissions declined between 1990 and 1995, in parallel with the decline in economic activity, and emissions have continued to decrease since 1995 despite the recovery of the economy. The ERT noted that although Belarus's GDP increased by 40 per cent between 1990 and 2006, its GHG emissions excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 37.0 per cent over the same period. The decoupling of the trends in the GDP and GHG emissions were mainly driven by: the shifts in the structure of primary energy supply owing to market forces (the shares of oil and coal in the primary energy supply decreased and were replaced by natural gas); a more than twofold reduction in transport activities; a 4.5 per cent decrease in the population; the reduction of activities in the agriculture sector; and the implementation of energy conservation measures (see chapter II B below).

11. In the NC4, Belarus has provided a summary of information on GHG emission trends for the period 1990–2005. This information is broadly consistent with its 2007 GHG inventory submission and the most recent 2009 GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO_2 eq), have not been provided as an annex to the NC4. Emission

estimates for hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) have been provided only for the period 1995–2004.

Table 1. Indicators relevant to greenhouse gas emissions and removals for Belarus

	1990	1995	2000	2006	Change 1990–2000 (%)	Change 2000–2006 (%)	Change 1990–2006 (%)
Population (million)	10.19	10.19	10.01	9.73	–1.8	–2.7	–4.5
GDP (2000 USD billion using PPP)	54.19	35.38	48.05	75.88	–11.3	57.9	40.0
TPES (Mtoe)	42.31	24.78	24.67	28.61	–41.7	15.9	–32.4
GDP per capita (2000 USD thousand using PPP)	5.32	3.47	4.80	7.80	–9.7	62.3	46.6
TPES per capita (toe)	4.15	2.43	2.47	2.94	–40.6	19.2	–29.2
GHG emissions without LULUCF (Tg CO_2 eq)	129.13	74.14	71.00	81.33	–45.0	14.6	–37.0
GHG emissions with LULUCF (Tg CO_2 eq)	107.10	47.47	43.75	55.32	–59.2	26.5	–48.3
CO_2 emissions per capita (Mg)	10.02	5.52	5.19	5.93	–48.2	14.2	–40.8
CO_2 emissions per GDP unit (kg per 2000 USD using PPP)	1.88	1.59	1.08	0.76	–42.6	–29.6	–59.6
GHG emissions per capita (Mg CO_2 eq)	12.67	7.27	7.10	8.36	–44.0	17.8	–34.1
GHG emissions per GDP unit (kg CO_2 eq per 2000 USD using PPP)	2.38	2.10	1.48	1.07	–38.0	–27.5	–55.0

Data sources: (1) GHG emissions data: Belarus's 2009 GHG inventory submission; (2) Population, GDP and TPES data: International Energy Agency, 2008 (Population, GDP and TPES data for 2007 were not available at the time of the review).
Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.
Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

12. Total GHG emissions excluding emissions and removals from LULUCF decreased by 38.0 per cent between the base year and 2007, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 48.6 per cent (see table 2). The decrease in GHG emissions was mainly attributed to CO_2 emissions, which decreased by 44.6 per cent over this period. Emissions of nitrous oxide (N_2O) decreased by 21.2 per cent, while emissions of methane (CH_4) decreased by 7.4 per cent. A major part of these decreases was experienced before 1995. The GHG emission trends stabilized in 1995 and showed small steady increases over the period 1995–2007. During this period, CO_2 emissions remained at the same level; CH_4 and N_2O emissions increased by 22.5 per cent and 47.1 per cent, respectively; and total GHG emissions increased by 7.9 per cent. Emissions of fluorinated gases accounted for 0.0038 per cent of total GHG emissions in 1995 (which was chosen as the base year for fluorinated gases), but by 2007 their share of total GHG emissions had increased by more than 10 times. Table 2 provides an overview of GHG emissions by sector from the base year to 2007 (see also the discussion of sectoral trends in chapter II B below).

B. Policies and measures

13. As required by the UNFCCC reporting guidelines, Belarus has provided in its NC4 information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and the Kyoto Protocol. During the review, Belarus provided updated information on its PaMs. Each sector, except agriculture and waste, has its own textual description of the principal PaMs, supplemented by information on framework and cross-sectoral policies related to environmental protection and climate change. However, the ERT noted that Belarus did not provide the following reporting elements required by the UNFCCC reporting guidelines: information on PaMs adopted to implement commitments under Article 4, paragraph 2 (a) and (b), of the Convention organized by sector, subdivided by gas; summary tables on PaMs by sector; and a presentation of each PaM, including information on the following subject headings: status of implementation, and implementing entity or entities. The ERT also noted that the information on how Belarus believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention, was not clear enough.

Table 2. Greenhouse gas emissions by sector in Belarus, 1990–2007

	GHG emissions (Tg CO_2 eq)						Change (%)		Shares[a] by sector (%)	
	1990	1995	2000	2005	2006	2007	1990–2007	2006–2007	1990	2007
1. Energy	102.24	57.03	52.48	55.27	57.62	55.95	–45.3	–2.9	79.2	69.9
A1. Energy industries	65.31	33.44	30.64	32.06	32.52	30.51	–53.3	–6.2	50.6	38.1
A2. Manufacturing industries and construction	7.24	6.48	6.83	8.25	8.51	8.73	20.6	2.6	5.6	10.9
A3. Transport	13.07	4.87	3.11	4.48	5.67	5.68	–56.5	0.2	10.1	7.1
A4.–A5. Other	15.38	11.00	10.44	8.89	9.26	9.42	–38.8	1.7	11.9	11.8
B. Fugitive emissions	1.23	1.23	1.46	1.59	1.67	1.60	29.9	–3.8	1.0	2.0
2. Industrial processes	2.25	1.21	1.69	2.65	2.74	3.22	43.0	17.3	1.7	4.0
3. Solvent and other product use	0.07	0.06	0.08	0.07	0.07	0.07	–2.5	7.5	0.1	0.1
4. Agriculture	21.99	13.70	13.80	14.82	15.78	15.30	–30.4	–3.0	17.0	19.1
5. LULUCF	–22.03	–26.67	–27.25	–25.09	–26.01	–24.94	13.2	–4.1	–17.1	–31.2
6. Waste	2.57	2.14	2.96	4.62	5.12	5.47	112.4	6.9	2.0	6.8
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GHG total with LULUCF	107.10	47.47	43.75	52.35	55.32	55.07	–48.6	–0.5	82.9	68.8
GHG total without LULUCF	129.13	74.14	71.00	77.43	81.33	80.01	–38.0	–1.6	100.0	100.0

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable.
Note: The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.
[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

14. Based on the information presented by the Party, the ERT has developed table 3, which provides a summary of the reported information on the climate change PaMs of Belarus.

1. Policy framework and cross-sectoral measures

15. Belarus's Ministry of Natural Resources and Environmental Protection is responsible for the implementation of the national climate change policy. In 2005, it assigned the Belarus Research Centre 'Ecology' to develop, and participate in the implementation of, measures to reduce GHG emissions. In 2006, a State Commission on Climate Change was established, aiming to coordinate climate change activities and ensure that the country meets its international commitments. The Inspectorate on Protection of Atmospheric Air, Ozone and Climate within the Ministry of Natural Resources and Environmental Protection has created a Department of State Control on Climate Impact, which aims to implement the state policy on climate change, improve legal and institutional frameworks, and serve as the Secretariat for Joint Implementation (JI) and as the Secretariat for the State Commission on Climate Change.

16. Belarus's National Sustainable Development Strategy, Socio-economic Development Strategy until 2020, and its environmental protection legislation, have formed the background to the national climate change policy. A major element of the climate change cross-sectoral policy framework is the National Climate Change Strategy (2007–2012 Strategy for Reducing Emissions and Enhancing Removals by Sinks of Greenhouse Gases in the Republic of Belarus), approved in 2006. This strategy, among others, lists measures to reduce emissions and enhance removals of GHGs, including different sectoral measures. In response to a request made by the ERT to provide an update on recent PaMs, Belarus informed the ERT that a National Programme of Provisions for Climate Change Mitigation for 2008–2012 was adopted in 2008.

17. The 2005–2012 National Plan for the Implementation of the Kyoto Protocol to the UNFCCC has become the basis for the development of the Belarusian framework for participation in the Kyoto Protocol mechanisms, including the provisions on the GHG inventory preparation system and the procedure for submission, review and monitoring of JI projects.

Table 3. Summary of information on policies and measures

Major policies and measures	Examples/comments
Framework policies and cross-sectoral measures	
Integrated climate programmes	National Sustainable Development Strategy for the Period until 2020 (2004) 2007–2012 Strategy for Reducing Emissions and Enhancing Removals by Sinks of Greenhouse Gases in the Republic of Belarus (National Climate Change Strategy) (2006) 2005–2012 National Plan for the Implementation of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) (2005) National Programme of Provisions for Climate Change Mitigation for 2008–2012 (2008) Strategy of participation of the Republic of Belarus in flexible mechanisms established by the Kyoto Protocol to the UNFCCC (2008)
Policies and measures by sector	
Energy	
Efficient energy generation, including combined heat and power generation	Main Directions of the Energy Policy of Belarus for 2001–2005 and for the period until 2015 (2000) Energy Security and Energy Independence Enhancement Concept (2005) State Comprehensive Programme for the Modernization of the Fixed Assets of the Belarusian Energy System, Energy Saving and Increased Share of Domestic Fuel and Energy Resources in Belarus in 2006–2010 (2005) Dedicated programme designed to ensure that at least 25 per cent of domestic energy production comes from local fuels and alternative energy sources for the period until 2012 (2004) National programme for conversion of boiler houses into small combined heating plants 2007–2010 (2007)
Renewable energy sources	Dedicated programme designed to ensure that at least 25 per cent of domestic energy production comes from local fuels and alternative energy sources for the period until 2012 (2004)
Energy efficiency improvements	National Energy Conservation Programme for 2001–2005 (2001) Additional Measures for the More Rational and Efficient Use of Fuel and Energy Resources (2002) 2006–2010 National Energy Saving Programme (2006) Modification and addenda to 2006–2010 National Energy Saving Programme (2007) Restructuring of the industrial sector through the Belarus Industrial Complex Development Concept and Programme 1998–2015
Transport	Production of trucks and buses of EURO 1, EURO 2 and EURO 3 emission standard Increase of custom duty on imported cars
Industrial processes	Belarus Industrial Complex Development Concept and Programme 1998–2015 (1998) National Sustainable Development Strategy for the Period until 2020 (2004)
Forestry	Strategic Forestry Development Plan for Belarus (1997)
Waste management	Law on Waste (2000)

18. The ERT noted that the climate change policy framework of Belarus has been evolving recently, especially since 2005, when the Kyoto Protocol was ratified. Since currently nearly 70 per cent of the country's GHG emissions are energy related, a short-term priority in Belarus is to reduce the consumption of fossil fuels and increase the efficiency of fuel and energy consumption. Belarus has also highlighted as a priority the development of the national system and procedures for attracting investment for climate change mitigation under the Kyoto Protocol mechanisms.

2. Policies and measures in the energy sector

19. Between 1990 and 2007, GHG emissions from the energy sector decreased by 45.3 per cent. Emissions from energy industries decreased by 53.3 per cent, mainly driven by the economic recession in the first half of the 1990s and by the massive fuel switchover from coal to natural gas in thermal power plants, combined heat and power (CHP) plants and boiler houses. The trend in GHG emissions from fuel combustion showed notable decreases in transport (56.5 per cent) and in the other sectors (38.8 per cent). The reduction in GHG emissions from transport is due to the sharp reduction in freight traffic by road. The reductions in GHG emissions from the residential and services sectors are due to the fuel switch from solid and liquid fuels to gaseous fuels and the implementation of energy efficiency measures. Over the period 2000–2006, GHG emissions from energy stabilized, with some increases reported in emissions

from transport and other sectors. These new trends are due to the recovery in economic activity and the growth in GDP.

20. ***Energy demand.*** Belarus has adopted a number of policy documents and programmes with specific quantitative targets aimed at creating a favorable framework for decreasing the energy intensity of the economy. The 2006–2010 National Energy Saving Programme has the following objectives: to reduce energy intensity within the range of 26.1–30.4 per cent of the GDP, with a mean annual GDP growth rate of 5.0–5.6 per cent; and to save energy within the range of 7.7–9.1 Mt coal equivalent. The ERT noted that Belarus has reported the successful implementation of the National Energy Conservation Programme for 2001–2005. As one of Belarus's priorities, energy efficiency is supported by a wide array of related policy programmes that appear to bring about substantial energy savings and associated reductions in GHG emissions. However, the ERT could not identify information in the NC4 on the potential of these programmes for reducing GHG emissions. The provision of more detailed information on the major individual measures implemented under these programmes would improve understanding of their coverage and impact.

21. ***Energy supply.*** Belarus has developed policies for increasing the efficiency of energy generation and decreasing its negative environmental impacts, including climate change. The State Integrated Programme for Modernizing Main Production Assets in the Power Generation Sector, Energy Conservation and Increasing the Use of Belarus's Own Fuel and Energy Resources, endorsed in 2005, is considered a fundamental document by Belarus, stipulating how the energy supply should be developed in Belarus and serving as a benchmark for the assessment of the existing opportunities to reduce GHG emissions. Estimates of expected GHG emission reductions as a result of the implementation of the PaMs stipulated in the programme are provided for various types of fuel used in power generation. Main Directions of the Energy Policy of Belarus (2001) and the dedicated programme designed to ensure that at least 25 per cent of domestic energy production comes from local fuels and alternative energy sources for the period until 2012 (2004) formed the foundations of Belarus's policy for promoting the use of renewable energy sources. During the review, in response to a request made by the ERT, Belarus provided additional information on a recently adopted national programme for the conversion of boiler houses into small CHP plants.

22. ***Transport.*** Since 1990 energy consumption in transport in Belarus has decreased substantially and growth in transport has not stimulated the development of an active energy conservation policy. However, some measures have been implemented by Belarus, such as discouraging the importation of second-hand cars by increasing the custom duty on imported cars and introducing the EURO 1, EURO 2 and EURO 3 emission standards for trucks and buses produced in the country.

23. The ERT noted the progress that Belarus has made in developing PaMs to reduce energy-related GHG emissions in selected priority areas. The ERT encourages Belarus to better structure its information on PaMs, to elaborate on the coverage and impact of the major PaMs and to report the results of the monitoring and evaluation of the progress made in implementing the PaMs in its next national communication.

3. Policies and measures in other sectors

24. Between 1990 and 2007, total GHG emissions from industrial processes (including solvent and other product use), agriculture and waste decreased by 10.5 per cent, mainly owing to the decrease in emissions from the agriculture sector. This observed decrease in emissions was partly compensated by an increase in emissions from the waste sector.

25. ***Industrial processes***. The main industrial GHG emitters are construction material producers, and the iron and steel and chemical industries. In the period 1990–2007, GHG emissions from industrial processes increased by 42.9 per cent. The biggest emitters are cement and lime producers. The National Sustainable Development Strategy for the Period until 2020 and the Belarus Industrial Complex

Development Concept and Programme 1998–2015 envisage restructuring the industrial sector. The ERT noted that there was no specific information provided in the NC4 on what impact this industrial restructuring would have on the trends in GHG emissions.

26. ***Agriculture.*** The agriculture sector is the main source of GHG emissions among non-energy sectors. In the period 1990–2007, GHG emissions from the agriculture sector decreased by 30.4 per cent. Belarus has not presented specific PaMs for the agriculture sector in its NC4. In response to a request made by the ERT, Belarus informed the ERT of its plans to apply emission reduction measures in the agriculture sector, such as the use of biogas from liquid manure treatment facilities. Belarus also informed the ERT of its intention to provide information on PaMs in the agriculture sector in its next national communication.

27. ***Forestry***. In accordance with the Strategic Forestry Development Plan for Belarus (1997), the country is preparing an information system for forestry management. Annual felling is planned to cover over 19 million m^3 by 2015. Total annual biomass growth in Belarus's forests is already 26 million m^3 and continues to increase. It is planned that, by 2015, 70,000 ha/year young tree stands will be planted in Belarus. Belarus highlighted several activities aimed at reducing CO_2 emissions from degraded wetlands. The NC4 lists the long-term aims for forest protection and conservation, namely optimizing the composition of forests, improving fire prevention, and improving management of drained and degraded forests.

28. ***Waste.*** In the waste sector, the main sources of GHG emissions are the disposal and incineration of solid waste, and wastewater treatment. GHG emissions from the waste sector constituted 6.8 per cent of total national emissions in 2007. In the period 1990–2007, GHG emissions from the waste sector increased by 112.4 per cent. In response to a request made by the ERT, Belarus explained that the reason for this increase is the respective increase in the amount of solid waste generated. The RDP mentions that Belarus intends to promote waste sorting and separation and to implement biogas technologies in landfills. No specific information on PaMs for the waste sector was presented in the NC4.

29. The ERT noted that the NC4 contains limited information on PaMs in the industrial processes and LULUCF sectors. No specific information is provided on the PaMs in the agriculture and waste sectors. In response to a request made by the ERT during the review, Belarus informed the ERT of its intention to report on its PaMs in the agriculture and waste sectors in its next national communication. Belarus provided a graph showing emission reductions resulting from PaMs implemented in all sectors. The ERT recommends that Belarus provide an elaborated textual description of each policy and measure in all non-energy sectors in its next national communication.

C. Projections and the total effect of policies and measures

1. Projections

30. In the NC4, the GHG emission projections provided by Belarus include four 'with measures' scenarios until 2020, namely: two scenarios with different macroeconomic assumptions ('Baseline scenario' and 'Intensive development scenario') and two scenarios with a nuclear option ('Baseline scenario and nuclear power plant construction' and 'Intensive development scenario and nuclear power plant construction'). In the RDP, Belarus provided a graph showing four different GHG emission projection scenarios, namely: (a) a baseline 'without measures' scenario ('Basis scenario'); (b) a 'without measures' scenario ('Intensive development basis scenario'); (c) a 'with measures' scenario ('Domestic measures plus intensive development basis scenario', including the effect of currently implemented and adopted PaMs); and (d) a 'with measures' scenario ('Additional measures plus intensive development basis scenario', including estimated effects of JI projects).

31. The NC4 presents projections on a sectoral basis (except for the waste sector), using the same sectoral categories as those used in the PaMs section, and on a gas-by-gas basis for CO_2, CH_4 and N_2O.

Projections are provided in an aggregated format for a national total, using global warming potential (GWP) values. However, the ERT noted that Belarus has not provided the following reporting elements as required by the UNFCCC reporting guidelines: projections relative to actual inventory data for the preceding years; projections for the waste sector and for perfluorocarbons (PFCs), HFCs and SF_6 (treating PFCs and HFCs collectively in each case); and projections in an aggregated format for each sector, using GWP values and projections related to fuel sold to ships and aircraft engaged in international transport. During the review, in response to a request made by the ERT, Belarus provided more recent and more complete GHG emission projections for all sectors (including the waste sector) until 2020. These projections were prepared within the framework of the United Nations Development Programme (UNDP) project 'Capacity building for implementation of flexible mechanisms of the Kyoto Protocol in Belarus'. Table 4 and the figure below provide a summary of Belarus's GHG emission projections.

Table 4. Summary of greenhouse gas emission projections for Belarus

	Greenhouse gas emissions (Tg CO_2 eq per year)	Changes in relation to 1990 level (%)
Inventory data 1990[a]	129.1	–
Inventory data 2007[a]	80.0	–38.0
'With measures' projections for 2010[b]	79.9	–38.0

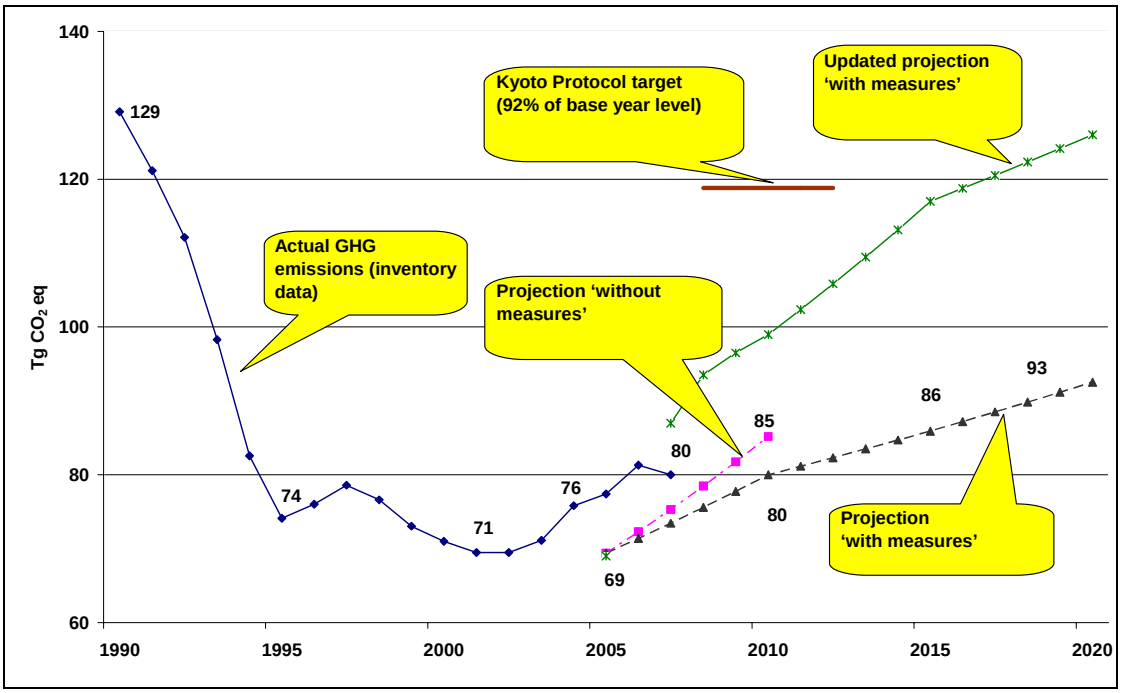
Note: The table presents changes in greenhouse gas (GHG) emissions in relation to their 1990 levels. The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, by its decision 10/CMP.2, adopted the amendment to Annex B to the Kyoto Protocol, which states Belarus's commitment to reduce its GHG emissions by 92 per cent in relation to the 1990 level over the period 2008–2012. At the time of the review, this amendment had not yet entered into force and the base year emissions for the calculation of assigned amount under the Kyoto Protocol were not reviewed.
[a] *Data source*: Belarus's 2009 GHG inventory submission; the emissions are without land use, land-use change and forestry.
[b] *Data sources*: (1) Belarus's second, third and fourth national communication; 'with measures projections for 2010' refers to 'with measures' projections under the 'Intensive development scenario'.

32. Projections of energy-related CO_2 emissions are based on the fuel consumption forecast derived from the State Integrated Programme for Retrofitting of the Fixed Assets of the Belarusian Energy System, Energy Conservation, and Increased Share of Local Fuels in Belarus, and the Energy Security Concept, as well as on the forecast of macroeconomic indicators presented in the National Sustainable Development Strategy until 2020. The NC4 gives an insight into these macroeconomic indicators and presents projections for fuel consumption by type of fuel for all four 'with measures' scenarios until 2020. The projections are prepared using the BALANCE model.

33. The ERT noted that limited details of the methodology used to project GHG emissions in various non-energy sectors have been provided. In response to a request made by the ERT during the review, Belarus explained that any inconsistencies between the projections in its NC4 and its RDP were caused by the application of different scenarios and assumptions. Some national development programmes in the energy sector have changed in the time between the submission of the NC4 and the submission of the RDP. In addition, Belarus informed the ERT of its intention to include projections of emissions from the waste sector and to provide updated information on projections for all other sectors in its next national communication.

34. According to its GHG emission projections, Belarus will meet its proposed emission reduction target under the Kyoto Protocol (92 per cent in relation to the 1990 level). Even under the 'intensive development scenario', Belarus will not exceed this target within the time frame of the projections. The updated projections, prepared within the framework of the UNDP project 'Capacity building for implementation of flexible mechanisms of the Kyoto Protocol in Belarus', include the waste sector. According to these projections, Belarus's GHG emissions in 2010 will be 23 per cent below their 1990 level. The updated projections of GHG emissions until 2020 are much higher than the projections reported in the NC4 owing to the different assumptions used.

Greenhouse gas emission projections



Note: The emissions are without land use, land-use change and forestry.
Data sources: (1) Data for the years 1990–2007: Belarus's 2009 greenhouse gas (GHG) inventory submission; (2) Data for the years 2008–2020: Belarus's second, third and fourth national communication – projection 'with measures' ('Intensive development scenario'); (3) Belarus's report demonstrating progress – projection 'without measures' (calculated by the expert review team (ERT) based on the estimated GHG reduction effects); (4) Updated information provided by the Party to the ERT during the review - updated projection 'with measures'.

35. The ERT recommends that the Party provide the following elements in its next national communication: emission projections for the waste sector, for fuels sold for use in ships and aircraft engaged in international transport, and for PFCs, HFCs and SF_6 (treating PFCs and HFCs collectively in each case);[3] emission projections in an aggregated format for each sector, using GWP values; and more detailed information on the methodologies and assumptions used for projecting emissions in the non-energy sectors.

2. Total effect of policies and measures

36. In its RDP, Belarus has presented an estimate of the effect of its PaMs in the energy sector only, in accordance with the 'with measures' definition, compared with a situation without such PaMs. Emission reductions have been presented in terms of GHG emissions avoided (on a CO_2 eq basis) in 2010. The ERT noted that Belarus has not provided the following reporting elements required by the UNFCCC reporting guidelines: the estimated and expected total effect of implemented and adopted PaMs (such an evaluation is provided only for the use of renewable energy in the power sector); and an estimate of the individual and total effect of its PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs, presented in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis) in 1995 and 2000. Table 5 provides an overview of the total effect of PaMs as reported by Belarus.

[3] The ERT noted that Belarus has reported PFCs for 1995–2007 as not applicable, not occurring and not estimated.

Table 5. Projected effects of planned, implemented and adopted policies and measures in 2010

Sector	Effect of implemented and adopted measures (Tg CO_2 eq)	Relative value (% of base year emissions)	Effect of planned measures (Tg CO_2 eq)	Relative value (% of base year emissions)
Energy	5.2	4.0	-	-
Total	**5.2**	**4.0**	**-**	**-**

Data source: Belarus's report demonstrating progress.
Note: The total effect of implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios; the total effect of planned policies and measures is defined as the difference between the 'with measures' and 'with additional measures' scenarios.

37. Belarus has reported the effects of its PaMs in the energy sector for power generation, including the use of hydropower, natural gas, wind power, biogas, solar power, utilization of landfill gas, biomass and agricultural waste. The estimated effect of these PaMs actually implemented is 5.2 Tg CO_2 eq in 2010. Based on these estimates the ERT calculated the estimate of GHG emissions 'without measures' for 2010, which is presented in the figure above. No effects of PaMs in non-energy sectors were identified. Belarus estimated that 1.5 Tg CO_2 eq of emission reductions is expected to be achieved through the implementation of JI projects.

38. The ERT encourages Belarus to assess the effects of individual PaMs and PaMs aggregated by sector in its next national communication.

D. Vulnerability assessment, climate change impacts and adaptation measures

39. In its NC4, Belarus has provided the required information on the expected impacts of climate change in the country and on adaptation options for key sectors: agriculture, water resources and water ecosystems, and human health. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC4.

40. According to comprehensive studies by national experts, agriculture, forestry and water resources are the sectors most vulnerable to climate change in Belarus. Belarus has reported that the reduction in crop yields may reach 50–60 per cent or more in some years owing to the increasing effects of extreme meteorological events. For agriculture, the negative impact of climate change could be compensated by the positive impact. In the NC4, Belarus reported on the established legal framework and the steps taken to develop adaptation measures in the agriculture sector.

41. Climate change is expected to have an overall positive impact on forests, in spite of the higher probability of droughts and fires, decreased water availability and the probable expansion of pests. Forest biomass is forecast to increase by 10 per cent by 2050. Any negative impacts may be more intensive in Belarus's southern forest. Water resources and water ecosystems are highly sensitive to climate change and water availability is likely to decrease.

42. As indicated in table 6 below, Belarus has identified human health as affected by climate change, but has not discussed related adaptation measures in the NC4. Belarus may wish to elaborate on the impact of climate change on human health in its next national communication.

43. In addition to identifying the vulnerable areas shown in table 6 below, Belarus has reported in the NC4 that the duration of the district heating period has decreased by 6–9 days and that shorter district heating periods are expected in the future. This will have a positive impact on the socio-economic system as a result of fuel and cost savings.

44. No information has been provided in the NC4 on the status of implementation of current adaptation programmes targeted at forestry, water resources and human health. The ERT encourages

Belarus to provide detailed information on the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation in its next national communication.

Table 6. Summary of information on vulnerability and adaptation to climate change

Vulnerable area	Examples/comments/adaptation measures reported
Agriculture and food security	***Vulnerability***: Worsening weather conditions during the growing season; changes in phenology and the rate of crop maturation; increase in agricultural risks attributed to climate aridization and the adverse effects of extreme meteorological events. ***Adaptation***: Soil quality conservation management; agroforestry; wider use of organic and chemical fertilizers; improvement of agricultural practices; changing the composition of the species of agricultural crops cultivated; enhancement of education and research.
Forests	***Vulnerability***: Changes in composition of tree species; increased fire risk; decrease in diversity of species in boreal forest; more intensive breeding of forest pests; risk of late spring frosts; changes in soil conditions and water availability owing to lower level of underground water. ***Adaptation***: Development and implementation of sectoral policies and programmes for adaptation to new climate conditions; revision of the regulatory framework; improvement of financial mechanism for adaptation activities; enhancement of education and research.
Water resources and water ecosystems	***Vulnerability***: Reduction in level of groundwater (especially in near-river areas); decrease in river run-off, mostly in the summer/autumn low-water period; deterioration in quality of river water; changes in composition of river species owing to the transformation of the hydrobiological regime of rivers; loss of hydro power generation; decreasing capacity to transport water. ***Adaptation***: Development of flood-control activities (first and foremost in the Polesie area); improvement of hydrological and meteorological monitoring system; expanding use of climate-related data for planning purposes; measures to regulate surface and groundwater run-off; reuse of drainage water; building of underground water reservoirs in regions where water shortages are expected; development of long-term plan for managing water resources.
Human health	***Vulnerability***: Increase in number of days and duration of periods of high temperatures could lead to an increase in cardiovascular diseases; increase in cold-related diseases owing to increase in number of thaw days; expansion of West Nile fever, Lyme diseases and tick-borne encephalitis.

E. Research and systematic observation

45. The ERT noted that Belarus has not provided any information on its actions related to research and systematic observation. No information has been provided in the NC4 on any domestic or international activities in these fields, although this was recommended in the in-depth review of Belarus's first national communication. Furthermore, no information has been provided on actions taken to support related capacity-building activities in developing countries. The ERT noted that, although Belarus is a member of the Global Climate Observing System (GCOS), it has not provided a summary of information on GCOS activities, nor does it plan to submit a national GCOS report to the UNFCCC secretariat.

46. The ERT recommends that Belarus communicate information in its next national communication on its actions related to research and systematic observation, in accordance with the UNFCCC reporting guidelines.

F. Education, training and public awareness

47. In the NC4, Belarus has provided general information on its actions related to education, training and public awareness. The Ecological Education Concept and the National Programme of Ecological Education Improvement, approved in 1999, established objectives and specified measures for education on environment matters. Belarus's Ministry of Education and Ministry of Natural Resources and Environmental Protection were assigned as the coordinators of the programme. Belarus has reported that the main measures planned for the period 2003–2005 have been implemented, but it mentioned that, in the future, the programme will have to be revised to reflect the priorities of the reformed educational system in Belarus and to place emphasis on climate change education, public awareness and the involvement of non-governmental organizations (NGOs) and the media.

48. Belarus has reported several environment-related initiatives at universities, including training programmes and courses in agriculture and forestry, ecology, environmental protection and sustainable use of natural resources, energy-efficient technologies and energy management.

49. Belarus has reported on using publications and targeted radio and, to a lesser extent, television programmes to raise public awareness. The public awareness campaign focused on the country's national environmental problems, energy efficiency, the use of renewable resources and warnings about extreme hydrometeorological events. Belarus reported on a specialized climate change website targeted at experts and the general public. This website provides information on the GHG inventory, JI projects and on climate change problems. Specialized events were organized within the framework of donor-funded projects that aimed to explore the ways that Belarus could implement the provisions of the Kyoto Protocol.

50. The ERT noted that the NC4 does not contain any information on programmes and projects which address, in a comprehensive manner, the implementation of Article 6 of the Convention, including training, education and public awareness of climate change. Although a needs assessment of further improvements in education, training and public awareness has been provided in the report, no particular measures have been suggested to implement Article 6 of the Convention and the progress made since Belarus's first national communication has been small.

51. The ERT encourages Belarus to report on the implementation of the New Delhi work programme under Article 6 of the Convention and on the extent of the public's participation in the preparation and domestic review of its future national communications and national climate change related programmes. The ERT recommends that Belarus include information on public consultations (with NGOs and relevant scientific and educational institutions) carried out during the preparation of strategic climate change documents.

III. Evaluation of information contained in the report demonstrating progress and of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

A. Information contained in the report demonstrating progress

52. Belarus's RDP includes five chapters, which contain most of the information required by decisions 22/CP.7 and 25/CP.8. The ERT noted that the following information required by decisions 22/CP.7 and 25/CP.8 has not been provided: a description of the activities, actions and programmes undertaken by the Party in fulfilment of its commitments under Articles 10 and 11; and an evaluation of how domestic measures, in light of the trends in and projections of its GHG emissions, will contribute to the Party's meeting its commitments under Article 3 (such an evaluation has been provided only for renewable energy). The ERT found the information contained in the RDP to be consistent to some extent with that provided in the NC4.

53. Since Belarus became a Party to the Convention, work has been initiated on developing a legal and institutional framework for climate change mitigation. In 2005, Belarus adopted a National Action Plan for the Implementation of the Provisions of the Kyoto Protocol to the United Nations Framework Convention on Climate Change for 2005–2012. Pursuant to this, and in line with established procedure, a number of norm-setting legal acts have been approved by the Council of Ministers of the Republic of Belarus.

54. The State Interdepartmental Commission on Climate Change coordinates action under the Kyoto Protocol mechanisms. The Department for State Control on Climate Impact of the Ministry of Natural Resources and Environmental Protection acts as the Secretariat for JI and as the Secretariat for the

Commission on Climate Change. The Ministry of Natural Resources and Environmental Protection has cooperated with potential JI partners (Great Britain, Japan, etc.).

55. The ERT encourages Belarus to provide more information regarding JI projects under the Kyoto Protocol mechanisms, and LULUCF activities under the Kyoto Protocol, in its next national communication.

B. Supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

56. Belarus has provided some of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC4 and RDP. This information reflects the steps taken by Belarus to implement the relevant provisions of the Kyoto Protocol. The supplementary information is placed in different sections of the NC4 and RDP. Table 7 provides references to the NC4 and RDP chapters in which supplementary information is provided.

Table 7. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	Reference
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	RDP, chapter 4.2, pp. 21–22 RDP, chapter 5, p. 24
Policies and measures in accordance with Article 2	NC4, chapter 3, pp. 67–89
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	NC4, chapter 3, pp. 67–68 RDP, chapter 2, pp. 4–6
Information under Article 10	RDP, chapter 5, p. 23 RDP, chapter 6, pp. 25–26
Financial resources[a]	NA

Abbreviations: NA = not applicable, NC4 = second, third and fourth national communication, RDP = report demonstrating progress.

[a] As a country with an economy in transition, Belarus does not have to report on the implementation of Article 11 of the Kyoto Protocol, including on the provision of new and additional resources.

57. Belarus has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: information on what efforts Belarus is making to implement PaMs in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT recommends that Belarus include these reporting elements in its next national communication.

58. In the NC4 and the RDP, Belarus has provided a limited description of its national inventory system, national registry system, and national legislative arrangements and administrative procedures relating to the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. During the review, in response to a request made by the ERT, Belarus elaborated on the legal and institutional framework for the national system for GHG inventory preparation in Belarus and informed the ERT of the status of the implementation of the GHG registry. The ERT noted that Belarus's registry was under development at the time of the review.

IV. Conclusions

59. On the basis of the information provided in Belarus's NC4 and RDP, the ERT gained an understanding of the state of implementation of the country's commitments under the Convention and the Kyoto Protocol. The ERT noted that, after a sharp decline in GDP over the period 1990–1995 owing to its economic transition, Belarus has been experiencing steady economic growth ever since. Despite this growth, the country has kept its GHG emissions at a relatively stable level, below 1990 levels, mostly as a result of changes in the structure of primary energy supply, which was driven by the market and policies

targeting the energy sector. In 2007, national GHG emissions were 38.0 per cent below the 1990 level without LULUCF and 48.6 per cent below including LULUCF. Although energy intensity was reduced by 55 per cent, it is still relatively high compared to other countries, which indicates that there is potential for reductions in GHG emissions through targeted domestic measures, particularly in the energy industries.

60. Belarus has made some progress in developing its climate change policy framework in order to fulfil its commitments under the Convention and its Kyoto Protocol. The ERT noted the efforts Belarus has made in developing PaMs to reduce energy-related GHG emissions as a priority in its short-term policy on climate change. The ERT also noted Belarus's progress in developing the procedures for the implementation of Kyoto Protocol flexible mechanisms.

61. In the NC4 and RDP, Belarus presented GHG projections for the period 2010–2020 for four 'with measures' scenarios. Four other scenarios up to 2020 are included in the RDP: two 'without measures' scenarios and two 'with measures' scenarios. According to its GHG emission projections presented in the NC4 and the RDP, Belarus will meet its proposed emission reduction target (92 per cent in relation to the 1990 level), adopted by the CMP, and, even under the 'without measures' scenario ('Intensive development basis scenario'), Belarus will not exceed its target within the projected time frame.

62. In the course of the IDR, the ERT formulated a number of recommendations relating to the completeness and transparency of Belarus's reporting under the Convention and its Kyoto Protocol. The key recommendations[4] are that Belarus:

- Provide more complete and transparent information on the coverage of and results achieved by PaMs currently implemented or planned, particularly those in non-energy sectors; the ERT encourages Belarus to assess the effects of the individual PaMs and the PaMs aggregated by sector for all sectors, in its next national communication;

- Provide projections relative to actual inventory data for the preceding years; provide projections for PFCs,[5] HFCs and SF_6 (treating PFCs and HFCs collectively in each case) and emission projections in an aggregated format for each sector, using GWP values; and provide projections of GHG emissions from the waste sector and for fuels sold for use in ships and aircraft engaged in international transport, as well as more detailed information on the methodologies and assumptions used to project emissions from non-energy sectors;

- Provide more detailed information on programmes containing measures to adapt to climate change, including institutional arrangements and coordination mechanisms;

- Include the executive summary and a chapter on research and systematic observation in the next national communication; the ERT encourages Belarus to elaborate on institutional arrangements and national and international cooperation as part of its reporting on research and systematic observation.

[4] The recommendations are given in full in the relevant sections of this report.
[5] The ERT noted that Belarus has reported PFCs for the years 1995–2007 as not applicable, not occurring and not estimated, and recommends, therefore, that Belarus estimate and provide projections for its PFC emissions, where applicable.

Annex

Documents and information used during the review

A. Reference documents

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"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>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

"Proposal from Belarus to amend Annex B to the Kyoto Protocol". Decision 10/CMP.2. Available at <http://unfccc.int/resource/docs/2006/cmp2/eng/10a01.pdf#page=36>.

FCCC/IDR.1/BLR. Report on the in-depth review of the first national communication of Belarus. Available at <http://unfccc.int/resource/docs/idr/blr01.pdf>.

FCCC/SBI/2006/INF.2. Synthesis of reports demonstrating progress in accordance with Article 3, paragraph 2, of the Kyoto Protocol. Available at <http://unfccc.int/resource/docs/2006/sbi/eng/inf02.pdf>.

FCCC/SBI/2007/INF.6. Compilation and synthesis of fourth national communications. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06.pdf>.

FCCC/SBI/2007/INF.7. Compilation and synthesis of supplementary information incorporated in fourth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf07.pdf>.

FCCC/ARR/2008/BLR. Report of the individual review of the greenhouse gas inventory of Belarus submitted in 2007 and 2008. Available at <http://unfccc.int/resource/docs/2009/arr/blr.pdf>.

Second, third and fourth national communication of Belarus. Available at <http://unfccc.int/resource/docs/natc/blrnc02.pdf>.

Report demonstrating progress of Belarus. Available at <http://unfccc.int/resource/docs/dpr/blr1.pdf>.

2009 greenhouse gas inventory submission of Belarus. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/4771.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Vladimir Tarasenko (Department of State Control on Climate Impact of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus) including additional information on policies and measures, projections of greenhouse gas (GHG) emissions, the national registry and the national system for the preparation and management of the GHG inventory.

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