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**Report of the centralized in-depth review of
the fourth national communication of Poland**

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. This report presents the results of the in-depth review of the fourth national communication of Poland conducted by an expert review team in accordance with relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. Poland has been a Party to the Convention since 1994 and to its Kyoto Protocol since 2002. Under the Kyoto Protocol, Poland committed itself to reducing its greenhouse gas (GHG) emissions by 6 per cent in relation to the 1988 level during the first commitment period from 2008 to 2012.
2. This report covers the centralized in-depth review (IDR) of the fourth national communication (NC4) of Poland, 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. Eglantina Bruçi (Albania), Mr. Ture Hammar (Denmark), Ms. Erika Hasznos (Hungary), Ms. Eva Jernbäcker (Sweden), Ms. Inga Kindsigo (Estonia), Mr. Guy Midgley (South Africa), Mr. Dennis Rudov (Belarus), Mr. Evren Turkmenoglu (Turkey), Ms. Katalin Zaim (United Nations Development Programme) and Mr. Ji Zou (China). Ms. Bruçi and Mr. Hammar were the lead reviewers. The review was coordinated by Mr. Harald Diaz-Bone (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 Poland's report demonstrating progress (RDP) in achieving its commitments under the Kyoto Protocol, and the supplementary information provided by Poland 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 Poland, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The ERT noted that Poland's NC4 complies in general 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). As required by decisions 22/CP.7 and 25/CP.8, the RDP provides clear information on the progress made by Poland in achieving its commitments under the Kyoto Protocol. Supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol¹ is provided both in the NC4 and the RDP. This information reflects the steps taken by Poland to implement the relevant provisions of the Kyoto Protocol.

1. Completeness

6. The ERT noted that the NC4 covers all sections required by the UNFCCC reporting guidelines. The ERT also noted that Poland's RDP contains all parts stipulated by decisions 22/CP.7 and 25/CP.8. Furthermore, the ERT noted that Poland has provided the supplementary information required under Article 7, paragraph 2.

2. Timeliness

7. The ERT noted with concern that the NC4 and the RDP were both submitted on 29 December 2006. Decision 4/CP.8 requested Parties to submit their NC4 by 1 January 2006; decision 22/CP.7 set the same date for Parties to submit their RDP.

¹ Decision 15/CMP.1, annex, chapter II.

3. Transparency

8. The ERT acknowledged that Poland's NC4 is comprehensive, transparent, well structured and concise. The NC4 provides clear information on most aspects of implementation of the Convention. The ERT noted that the information contained in the NC4 is 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, Poland has provided a description of its national circumstances. However, the ERT noted that Poland did not provide the following reporting elements required by the UNFCCC reporting guidelines: a description of how these national circumstances affect GHG emissions and removals in Poland, and how national circumstances and changes in national circumstances affect GHG emissions and removals over time. The description of national circumstances covers population profile, geographic profile, climate profile, economic profile and energy, industry, transport, construction of housing, agriculture, forestry and waste. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals.

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

	1988	1995	2000	2007	Change 1988–2000 (%)	Change 2000–2007 (%)	Change 1988–2007 (%)
Population (million)	37.86	38.28	38.26	38.07	1.1	-0.5	0.6
GDP (2000 USD billion using PPP)	311.89	310.26	403.80	531.80	29.5	31.7	70.5
TPES (Mtoe)	127.71	99.76	89.40	98.62	-30.0	10.3	-22.8
GDP per capita (2000 USD thousand using PPP)	8.24	8.11	10.55	13.97	32.4	69.6	28.1
TPES per capita (toe)	3.37	2.61	2.34	2.59	-30.7	10.9	-23.2
GHG emissions without LULUCF (Tg CO ₂ eq)	569.50	446.40	389.00	398.90	-31.7	2.5	-30.0
GHG emissions with LULUCF (Tg CO ₂ eq)	536.60	425.70	364.80	358.40	-32.0	-1.8	-33.2
CO ₂ emissions per capita (Mg)	12.40	9.57	8.38	8.62	-32.4	2.9	-30.5
CO ₂ emissions per GDP unit (kg per 2000 USD using PPP)	1.51	1.18	0.79	0.62	-47.3	-22.2	-59.0
GHG emissions per capita (Mg CO ₂ eq)	15.04	11.66	10.17	10.48	-32.4	3.0	-30.3
GHG emissions per GDP unit (kg CO ₂ eq per 2000 USD using PPP)	1.83	1.44	0.96	0.75	-47.2	-22.1	-58.9

Data sources: (1) GHG emissions data: Poland's 2009 greenhouse gas inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

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.

10. Poland has provided a summary of information on GHG emission trends for the period 1988–2004 in its NC4. This information is broadly consistent with the 2006 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO₂ eq) (given in the common reporting format (CRF)), are also provided in an annex to the NC4.

11. According to Poland's 2009 GHG inventory submission, total GHG emissions excluding net removals from land use, land-use change and forestry (LULUCF) decreased by 30.0 per cent between the base year and 2007, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 33.2 per cent (see table 2). This decrease was mainly attributed to carbon dioxide (CO₂) emissions, which decreased by 30.1 per cent over this period. Emissions of methane (CH₄) and nitrous oxide (N₂O) also decreased by 38.5 and 24.4 per cent, respectively. A major part of these decreases was experienced between 1988 and 1990, as a result of Poland's transition from a centralized to a market economy. Emissions of fluorinated gases (F-gases) accounted for about 0.05 per cent of total GHG emissions in 1988 and 0.9 per cent in 2007. 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).

Table 2. Greenhouse gas emissions by sector in Poland, 1988–2007

	GHG emissions (Tg CO ₂ eq)						Change (%)		Shares ^a by sector (%)	
	1988	1990	1995	2000	2006	2007	1988–2007	2006–2007	1988	2007
1. Energy	469.6	369.7	368.9	322.2	324.6	321.7	-31.5	-0.9	82.5	80.7
A1. Energy industries	269.6	229.1	191.5	177.8	184.2	183.6	-31.9	-0.3	47.3	46.0
A2. Manufacturing industries and construction	42.8	42.7	62.9	47.7	33.0	34.9	-18.4	5.9	7.5	8.8
A3. Transport	22.3	25.4	29.1	33.2	38.6	38.8	74.3	0.5	3.9	9.7
A4.–A5. Other	112.9	54.5	68.9	48.3	55.0	50.7	-55.1	-7.7	19.8	12.7
B. Fugitive emissions	22.0	18.0	16.5	15.2	13.9	13.6	-38.1	-1.5	3.9	3.4
2. Industrial processes	33.5	24.3	23.8	23.0	31.5	33.3	-0.6	5.6	5.9	8.3
3. Solvent and other product use	1.0	0.6	0.5	0.6	0.7	0.7	-27.2	3.9	0.2	0.2
4. Agriculture	51.2	50.0	37.8	34.6	34.5	35.0	-31.6	1.6	9.0	8.8
5. LULUCF	-32.9	-23.0	-20.7	-24.2	-40.5	-40.5	23.0	0.0	-5.8	-10.2
6. Waste	14.2	14.8	15.4	8.6	7.9	8.1	-42.9	2.3	2.5	2.0
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GHG total with LULUCF	536.6	436.4	425.7	364.8	358.8	358.4	-33.2	-0.1	94.2	89.8
GHG total without LULUCF	569.5	459.5	446.4	389.0	399.3	398.9	-30.0	-0.1	100.0	100.0

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

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.

12. The significant decrease in emissions from the energy sector between 1988 and 1990 is related to economic changes in heavy industry. This decrease in emissions continued until 1993. Emissions started to rise thereafter, reaching a peak in 1996 as a result of the implementation of modernization processes in heavy industry, and dynamic economic growth.

13. The ERT recommends that Poland include information on how its national circumstances affect GHG emissions and removals in Poland and how these national circumstances and changes in national circumstances affect GHG emissions and removals over time, in its next national communication. In its response to the draft review report, Poland stated that it intends to follow this recommendation and provide all elements as stipulated by the UNFCCC reporting guidelines in its next national communication.

B. Policies and measures

14. As required by the UNFCCC reporting guidelines, Poland has provided in its NC4 well-organized information on its package of policies and measures (PaMs) implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. During the review, Poland also provided updated information on its PaMs. Each sector has its own textual description of the principal PaMs. However, a table summarizing the PaMs by sector and describing each policy or measure, as required by the UNFCCC reporting guidelines, has not been provided in the NC4.

15. Table 3 provides a summary of the reported information on the PaMs of Poland.

Table 3. Summary of information on policies and measures

Major policies and measures	Examples/comments
Framework policies and cross-sectoral measures	
Integrated climate change programmes	Poland's Climate Policy. Strategies for greenhouse gas emission reductions in Poland until 2020; State Environmental Policy for 2007–2010, considering perspectives for 2011–2014; National Reform Programme for 2005–2008 for the Implementation of the Lisbon Strategy.
Energy/electricity/emission taxation	Exemption from excise tax on electricity production based on methane from hard coal mines.
Emissions trading	European Union emissions trading scheme.
Support for research and development	Improvement of innovation development systems in production and maintenance processes in 2004–2008; Safety of exploitation of the technical infrastructure threatened by corrosion effects.
Energy	
Energy sector transformation	Energy Policy of Poland until 2025 (2005).
Combined heat and power (CHP)	Promotion of CHP production (33.5 Tg CO ₂ eq per year); the use of methane from mines for heat generation (0.4 Tg CO ₂ eq).
Renewable energy sources (RES)	Strategy for renewable energy development (2001); introduction of financial mechanisms supporting energy production from RES (2.8 Tg CO ₂ eq per year); introduction of 'green certificates' – certificates of origin for electric power produced from RES.
Energy efficiency improvements	Modernization of existing energy production technologies and enhancement of energy transformation efficiency (2.5 Tg CO ₂ eq per year); introduction of a system of incentives for enterprises and the public sector to undertake investments leading to energy savings and rational energy consumption; introduction of requirements concerning energy efficiency of new water-heating boilers fired with liquid and gaseous fuels and of cooling equipment; energy-efficiency labelling (approx. 0.08 Tg CO ₂ eq per year); improvement of the efficiency of electrical household appliances; introduction of energy standards in the construction sector; thermo-modernization of buildings; raising the awareness of the users and owners of buildings with regard to energy saving.
Transport	
Integrated transport planning	State Transport Policy for 2006–2025; promotion and use of biofuels and environmentally sound motor vehicles; improvement of the infrastructure for vehicles, cyclists and pedestrians; promotion of public transport.
Vehicle and fuel taxes	Introduction of road tax; introduction of differentiated fee rates for driving on domestic roads depending on the level of exhaust gas emissions from vehicles.
Industry	
Integrated pollution prevention and control	Improvement of technical standards for equipment and facilities; implementation of best available technologies (BAT) (240 Gg CO ₂); reduction of methane emissions from production processes and fuel distribution; technological modernization in industrial plants (iron and steel industry) (3 Tg CO ₂ eq during the period 2001–2004); implementation of regulation to reduce emissions of fluorinated gases.
Agriculture	
	Strategy for the development of rural areas and agriculture for 2007–2013; rational use of fertilizers, including nitrogenous fertilizers; improvement of systems for raising farm animals; reduction of methane emissions from animal excrement; application of methods for removing methane in the litter-free raising of ruminants (51 Tg CH ₄ and 750 Mg N ₂ O).
Waste management	
	National Waste Management Plan for the period 2003–2014; recovery and recycling of waste; modernization of the landfilling of solid waste; utilization of landfill gas and biogas for energy production; implementation of biological wastewater treatment processes based on BAT.
Forestry	
	National Forest Policy; rational forest management, incentives and measures supporting afforestation, preservation of environmental stability of forests; development of a plan for the utilization of wood for energy purposes; research on the level of carbon removal.

1. Policy framework and cross-sectoral measures

16. In Poland, climate change related PaMs are coordinated by the Ministry of Environment in cooperation with other ministries, including the Ministry of Infrastructure and the Ministry of Economy, and are based on Poland's 2005 Climate Policy.² This climate policy was further elaborated upon in the State Environmental Policy for 2007–2014 and the National Reform Programme for 2005–2008 for the Implementation of the Lisbon Strategy. Specific programmes and regulations are established within the

² Ministry of Environment. 2005. *Poland's Climate Policy. Strategies for greenhouse gas emission reductions in Poland until 2020*. Warsaw.

individual ministries; for example, the energy-related policies are mainly maintained by the Ministry of Economy.

17. As a member of the European Union (EU) since 2004, Poland has adopted the EU legislation which is relevant to climate change, with measures including the European Commission's mechanism for monitoring Community GHG emissions and for implementing the Kyoto Protocol, and the EU emissions trading scheme (EU ETS). The EU ETS covers more than half of Poland's GHG emissions. The total allowance allocated by the European Commission for 2008–2012 was lower than Poland's proposed cap. Poland is also hosting a number of joint implementation (JI) projects and has signed related memorandums of understanding with Canada, Denmark, Finland, some Baltic States and the International Bank for Reconstruction and Development.

2. Policies and measures in the energy sector

18. Between 1988 and 2007, GHG emissions from the energy sector decreased by 31.5 per cent. This reduction was mainly due to a fall in total energy supply from 128 Mtoe in 1988 to 99 Mtoe in 2007 and to a fuel shift from coal to oil and gas during that period. The trend in GHG emissions since 2003 has been for modest growth; however, the recent economic developments may imply new reductions.

19. The energy industries saw a similar reduction in GHG emissions, by 31.9 per cent, as the use of coal was reduced and the efficiency of energy generation improved. Other sectors, such as residential and services, showed an even larger reduction in emissions, of 55.1 per cent, as a result of the fuel switch and improved thermal insulation. Emissions from transport grew substantially, by 74.3 per cent, mainly owing to increased car ownership and the expansion in road transport. PaMs in the energy sector were estimated to reduce GHG emissions by 9.9 Mt CO₂ eq in 2005 and by 67.0 Mt CO₂ eq in 2020.

20. **Energy supply.** In adopting the EU energy market regulation, the **energy markets** have been under transformation over a long period. In power generation, the use of domestic coal resources has been reduced. This process has involved considerable government intervention. The gas market is dependent upon imports. The ERT encourages Poland to further explore opportunities for reducing GHG emissions from coal-fired power stations by expanding the use of combined heat and power (CHP), by carbon capture and sequestration processes, or by other innovative means. According to information provided by Poland during the review, actions in these areas are outlined in the new draft Energy Policy for Poland until 2030.

21. The share of **renewable energy sources (RES)** in Poland is around 7.2 per cent of total primary energy supply. In order to achieve the EU target for 2020, Poland is committed to increasing this share to 15 per cent, or by 0.8 per cent annually. According to the NC4, the share of **biomass** in the fuel balance should increase further, leading to further emission reductions from 21.5 Mt CO₂ in 2005 to 34.8 Mt CO₂ in 2020. The development of RES in Poland today is dependent upon two different policies: green certificate schemes and preferential treatment of RES in the electricity market. Today, only around 10 per cent of Poland's electricity production is included in the green certificate scheme. Therefore, achieving the 2020 target for RES will require substantial effort on the part of Poland, and the ERT encourages Poland to continue focusing on further actions. Poland has not yet taken into account the potential of RES other than biomass.

22. Poland has established a separate policy framework for **CHP promotion**, by using a red certificate system, issuing guarantees of origin. This framework is part of the electricity law and follows transposition of the EU directive on CHP from 2004 into national law. Since 2007, electricity companies have been obliged to buy guarantees of origin at a price set by the Polish energy regulator on the basis of market prices and cost-based estimates. These certificates are tradable. As of 2009, the installed capacity of high-efficient CHP is 17 per cent of the total power capacity. As Poland has extensive district heating systems and access to biomass, the ERT noted significant potential for further increasing this share and achieving GHG emission reductions. The ERT encourages Poland to explore this potential more

extensively. During the review, Poland indicated to the ERT a related emission reduction potential of 33.5 Mt CO₂ annually.

23. According to information provided during the review, Poland is considering the possibility of building **nuclear energy** capacity in the longer term. The ERT noted that, while the related effect on GHG emissions has been discussed in the new draft Energy Policy for Poland until 2030, it was not discussed in the NC4.

24. **Energy demand.** A number of **energy efficiency** PaMs are already in place, such as minimum standards and requirements for equipment, appliances and buildings. These measures may be further strengthened as a result of the EU-wide PaMs such as promoting eco-design, energy renovation programmes and performance standards.

25. In 2007, Poland set up a **National Energy Efficiency Action Plan (NEEAP)** in order to achieve its targets for energy savings by 2020. The target for 2016 is a 9 per cent reduction in energy intensity compared to current levels. The plan outlines a number of PaMs, including a 'white certificate' system to stimulate actions for energy saving and obligate energy companies to buy white certificates. NEEAP also includes information campaigns and educational projects on energy.

26. In the **residential sector**, NEEAP includes a system for auditing the energy used in buildings and arrangements for raising awareness in relation to energy use in buildings. The thermo-modernization fund for the renovation of existing buildings has been expanded and will continue until 2016. The ERT draws Poland's attention to the new opportunities offered by the Covenant of Mayors and the European Investment Bank to step up such investments.

27. In the **services sector**, a number of new programmes are proposed, including a programme to promote energy services carried out by energy service companies. For industry, energy management programmes could be carried out.

28. The ERT recognizes that a significant number of the PaMs in the field of energy efficiency are relatively new and have not yet been implemented. This is also illustrated by the fact that their mitigation effect has not yet been estimated in the section in the NC4 on policies and measures and projections.

29. **Transport.** PaMs in the transport sector aim at introduction of management systems for traffic and transport infrastructure, the promotion of sustainable transport systems and efficient use of fuel in the transport sector.

30. The State Transport Policy for 2006–2025 includes the following climate related measures: promotion of biofuels; general requirements for the improved efficiency of cars and other modes of transport; improved infrastructure for all modes of transport; and differentiated eco-tax systems and road pricing. In particular, a regulation on the promotion of biofuels has been adopted in Poland to ensure that, by the end of 2010, the share of biofuels in the country will be at least 5.75 per cent of transport fuels used.

31. As transport is the fastest growing sector in terms of its GHG emissions, the ERT encourages Poland to focus on how to mitigate GHG emissions from transport in an efficient and effective manner.

3. Policies and measures in other sectors

32. GHG emissions from the non-energy sectors accounted for 17.5 per cent of the total GHG emissions in 1988 and 19.3 per cent in 2007. Between the base year and 2007, GHG emissions from industrial processes decreased by 0.6 per cent, while emissions from agriculture and waste decreased by 31.6 and 42.9 per cent, respectively.

33. GHG emissions from **industrial processes** fluctuated throughout the 1990–2007 period. The rapid decrease in emissions in the early 1990s was explained by the collapse of most of Poland's industrial production. The overall fluctuation is due mostly to changes in emissions from cement and lime production, ammonia production, and iron and steel production. Poland has improved the technical standards for its equipment and facilities, which will result in improved energy efficiency. The promotion of the use of best available techniques (BAT) in iron and steel industry has led to a reduction in CO₂ emissions by 240 Gg. In addition, Poland has implemented certain regulations to reduce CH₄ emissions from its production processes and fuel distribution. Technological modernization in the mineral industry led to a decrease in CO₂ emissions of 3,000 Gg over the period 2001–2004. Furthermore, Poland is in the final stage of transposing EC Regulation No 842/2006 into national law, with a view to reducing emissions of F-gases.

34. The decrease in emissions from **agriculture** is mainly due to the decrease in the livestock population, the decrease in the use of nitrogen fertilizers and the decrease in the area sown by nitrogen-fixing crops. The strategy for the development of rural areas and agriculture for 2007–2013 aims to improve the living and working conditions of the inhabitants of rural areas through economic growth, taking into account environmental requirements. Poland has rationalized the use of fertilizers, by limiting the doses of natural fertilizers and restricting the use of fertilizers in flooded soils, soils in mountain slopes and soils that are covered with snow or are frozen.

35. Poland has reduced CH₄ emissions by 51,000 Gg CO₂ eq by improving its systems for raising farm animals, reducing CH₄ from animal excrement and applying methods of removing CH₄ in the litter-free raising of ruminants. Meanwhile, N₂O emissions have increased by 750 Mg.

36. In the **LULUCF** sector, removals increased by 23 per cent between 1988 and 2007. The increase in timber resources is a result of the expansion of the forest area and the decline in the harvest of timber. Within the **National Forest Policy**, Poland is planning to: increase forest cover to 30 per cent in 2020 and to 33 per cent by the middle of the century; reinstate and rehabilitate forest ecosystems; and regenerate the devastated and neglected treestands in private forests. All these targets should lead to an increase in net CO₂ removals. Poland's approach to forest management limits the enlargement of standing timber stocks to the level of 50–60 per cent of the annual biomass growth, and also includes afforestation of non-forest land and reforestation.

37. Emissions from the **waste** sector originate mainly from solid waste disposal on land. The decrease in the sectoral emissions is due mainly to the decline in CO₂ emissions from waste incineration (–46.22 per cent between the base year and 2007). Poland's main objectives in terms of waste management are: to prevent the generation of waste 'at source'; to recover the resources and reuse waste; and also to dispose of waste in an environmentally friendly way. Poland is planning to modernize its landfills and has made identification and ranking lists for this purpose. In addition, some municipal waste landfills in Poland are using landfill gas and biogas for energy production. In the field of wastewater treatment, the implementation of BAT has increased the share of high-efficiency treatment in biological treatment plants and decreased the energy consumption of wastewater treatment plants.

C. Projections and the total effect of policies and measures

1. Projections

38. The GHG emission projections provided by Poland in the NC4 include a ‘with measures’ and a ‘without measures’ scenario until 2020. Projections are presented on a sectoral basis, although the sectors used do not fully correspond with the sectors used in the PaMs section. Projections are presented on a gas-by-gas basis for the following GHGs: CO₂, CH₄ and N₂O. Estimates are also provided for perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF₆). In addition, projections are provided in an aggregated format for each sector as well as for the national total. Emission projections related to fuel sold to ships and aircraft engaged in international transport were not reported separately (para. 36 of the UNFCCC reporting guidelines). The ERT also noted that Poland did not include a ‘with additional measures’ projection; the Party explained that, since it is sure to achieve its emission reduction target under the Kyoto Protocol, no such measures are planned.

39. The emission projections in the NC4 were prepared using the methodology of the International Atomic Energy Agency. In order to forecast energy demand, the end-use MAED model was applied, following a bottom-up approach. The energy demand is determined using the MAED model on the basis of statistical data for 1994–2004 and the economic development scenario which has been prepared jointly with the population projections of the Central Statistical Office of Poland. The results of the MAED model provide input to the energy-environmental simulation model BALANCE, which defines the final energy demand, disaggregated by energy carrier, defines the national energy balance and provides estimates for the amounts of air pollutants emitted. The optimal pathways from an economic point of view for sources of electrical energy in the national grid were determined using the WASP-IV model.

40. The NC4 explained which gases and sectors the models were used for and described the main characteristics of the models. Taking into account that multiple models were used, the ERT recommends that Poland provide, in its next national communication, more explanation on the models, including their strengths and weaknesses and useful references, to enable review experts to gain a better understanding of the models.

41. The ERT noted some differences between the projections provided in the NC4 and those in the NC3. In particular, there are remarkable differences between the emission levels projected for certain sectors, including transport. In response to a question raised by the ERT, Poland explained that it was difficult to compare data from the NC3 with the new data, owing to the limited scope of the sectors. Also, the scenarios used in the NC3 showed dissimilarities to those used in the NC4. The ERT encourages Poland to provide more explanation, so that comparisons can be made, should such a situation arise in its future national communications.

42. Poland also provided information on variables, such as growth in gross domestic product and population growth, but no information was provided on tax levels and international fuel prices.

43. NC4 presents two scenarios for GHG emission projections: a ‘with measures’ scenario and a ‘without measures’ scenario for the years 2005, 2010, 2015 and 2020. The key scenario is the ‘with measures’ scenario, which includes implemented PaMs. In both scenarios, total GHG emissions are expected to increase during the 2005–2020 period. In 2020, the projected difference between the two scenarios is approximately 38 Mt of CO₂ eq. Under both scenarios, the projected emissions for 2020 remain below the base year level, by 15.8 per cent and 9.1 per cent, respectively.

44. During the review the Party provided the ERT with an updated set of projections, as contained in a 2008 report of the European Environment Agency. Table 4 and the figure below provide a summary of GHG emission projections for Poland. According to this updated information, total GHG emissions are projected to amount to 403.0 Tg CO₂-eq. in 2010, or 28.4 per cent below the base year level. The ERT noted that, according to Poland’s latest GHG emission projections, the national GHG emission reduction target will be met by Poland in the first commitment period without applying additional measures.

Table 4. Summary of greenhouse gas emission projections for Poland

	Greenhouse gas emissions (Tg CO ₂ eq per year)	Changes in relation to base year level (%)
Inventory data 1988 ^a	564.71	-19.50
Inventory data 2007 ^a	401.56	-28.89
Kyoto Protocol base year ^b	563.44	NA
Kyoto Protocol target ^b	529.64	-6.00
'With measures' projections for 2010 ^c	403.00	-28.40
'With additional measures' projections for 2010 ^c	NA	NA

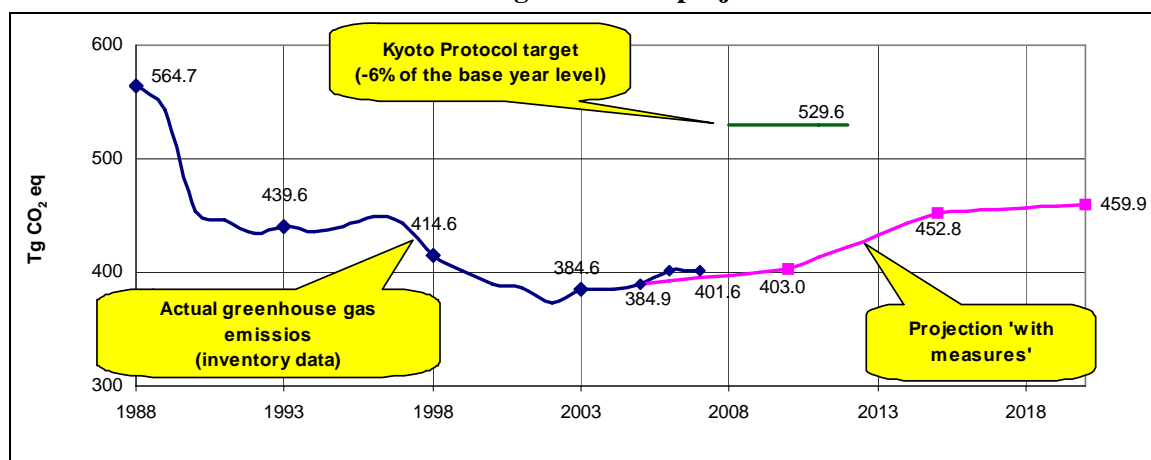
^a *Data source:* Poland's 2009 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry.

^b Based on the initial review report contained in document FCCC/IRR/2007/POL.

^c *Data source:* European Environment Agency report 2008.

Abbreviation: NA = not applicable.

45. NC4 section 5.4 on Poland's participation in the EU ETS provides some information on its domestic emission reduction potential. The ERT acknowledges this information and encourages Poland to continue its efforts in investigating these reduction potentials and to report on this important issue in its future national communications. The ERT welcomes the efforts made by Poland to address many of the problems identified during the IDR of the NC3, in particular by providing projections for the entire economy and for all gases. The ERT notes, however, that differences between the NC3 and the NC4 are not sufficiently explained and that more transparency would be necessary in order to facilitate comparisons.

Greenhouse gas emission projections

Data sources: (1) Data for the years 1990–2005: Poland's 2009 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry; (2) Data for the years 2006–2020: European Environment Agency report 2008; the emissions are without land use, land-use change and forestry.

2. Total effect of policies and measures

46. In the NC4, Poland presents an estimate of the impact of its implemented PaMs and offers a comparison between the ‘without measures’ and ‘with measures’ scenarios in terms of an estimate of the total effect of its PaMs, in accordance with the ‘with measures’ definition, compared with a situation without such PaMs. It also presents relevant information on factors and activities for each sector for the years 1990 to 2020. However, the ERT noted that Poland did not provide the following reporting element required by the UNFCCC reporting guidelines: an estimate of the 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 CO₂ eq basis) in 1995 and 2000 (para. 40). Table 5 provides an overview of the total effect of PaMs as reported by Poland.

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 (without CO ₂ from transport)	NA	NA	NA	NA
Transport – CO ₂	NA	NA	NA	NA
Industrial processes	NA	NA	NA	NA
Agriculture	NA	NA	NA	NA
Land-use change and forestry	NA	NA	NA	NA
Waste management	NA	NA	NA	NA
Total	52	9.26	NA	NA

Data source: European Environment Agency report 2008.

Abbreviation: NA = not available.

Note: The total effect of implemented and adopted policies and measures is defined as the difference between the ‘without measures’ and ‘with measures’ scenarios.

47. Based on a comparison between the ‘without measures’ and ‘with measures’ scenarios from the NC4, the ERT found that the adopted and implemented PaMs yielded a difference of approximately 52 Mt CO₂ eq in 2010 and 38 Mt CO₂ eq in 2020, respectively. The ERT noted, however, that NC4 section 5.3 provides an estimate of the impact of three of its current PaMs (i.e. projected increase of biomass use, fuel conversion (excluding biomass) and increased cogeneration), which suggested that the total reduction in CO₂ emissions as a result of these PaMs should exceed 67 Mt CO₂ eq in 2020. The ERT recommends that Poland present its GHG emissions projections and its estimate of the total effect of PaMs in a more consistent and transparent manner, in order to allow for a good assessment of the total effect of Poland’s PaMs by expert reviewers. The ERT also reminds the Party that, according to the UNFCCC reporting guidelines, it should present the estimated and expected total effect of all its implemented and adopted PaMs.

48. During the review, Poland made reference to the 2008 country profile prepared by the European Environment Agency in its report. This report provides a ‘top-down’ calculation (52.4 Mt) of the total effect of Poland’s policies. It attributes the reduction in emissions entirely to the energy sector and remarks that a ‘bottom-up’ calculation was not possible in the absence of the quantified effects of the individual policies. The ERT recommends that Poland include information on the total effect of its PaMs, when available.

49. The ERT encourages Poland to establish a clear link between the PaMs and their quantified effects, on the one hand, and the total effect of the PaMs as reflected in the projection scenarios, on the other. The ERT acknowledges the information provided by Poland on activities in the different sectors; it recommends the Party, however, to provide more information on the background to the projected changes and on the driving forces for increases or decreases in emissions from these sectors.

D. Vulnerability assessment, climate change impacts and adaptation measures

50. In its NC4, Poland has provided the required information on the expected impacts of climate change in the country and on adaptation actions to be taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Four sectors have been identified as most vulnerable: agriculture, coastal zone, water resources and forestry. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC4.

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

Vulnerable area	Examples/comments/adaptation measures reported
Agriculture	<p>Vulnerability: Mixed impacts, including positive effects owing to an extended period of agricultural productivity, greater potential for thermophilous crop yields, shorter crop ripening periods and increased primary production; and negative effects owing to reduced yields resulting from increased prevalence of pests and diseases, inhibition of germinating processes as a result of temperature rise, reduced soil moisture and increased cost of animal production</p> <p>Adaptation: Changes in plant cultivation; agri-technology modifications; changes in the selection of plant species grown and places of cultivation; implementation of the regional programme for the adaptation of agriculture in north-eastern Poland, with guidelines on good agricultural practice under changing climate conditions</p>
Coastal zones	<p>Vulnerability: Potential rise in sea level</p> <p>Adaptation: Building, reconstruction and maintenance of a system to protect coastal areas against flooding; monitoring of the sea coast; modernization of hard coastal defences; artificial nourishment of beaches; modernization of bank strengthening or conservation of the flood embankment</p>
Water resources	<p>Vulnerability: Changes in water balance (outflow and evaporation); changes in inland water quality; increased frequency of extreme hydrological events (droughts and floods)</p> <p>Adaptation: Monitoring of changes in the water balance; scientific research aimed at predicting potential changes in the water balance and changes in the biological, chemical and physical characteristics of aquatic ecosystems; enhancement of the effectiveness of protection against the effects of floods and drought; implementation of multi-functional retention reservoirs; development of small water retention reservoirs as well as building of new retention reservoirs of broader regional value</p>
Forestry	<p>Vulnerability: Changes in the biotic environment; limited capabilities for retaining groundwater and mitigating extreme surface water flows; soil degradation and erosion, and landscape steepening; reduction in genetic resources of flora and fauna; losses of biodiversity and natural landscape; frequency and spatial range of fires; effects of pests and pathogens</p> <p>Adaptation: Establishment of a system of natural corridors to allow natural migration of species of flora and fauna; enrichment of the composition of forest species (increase of the share of broadleaf species); monitoring of forests</p>

51. The ERT noted that the likely impacts of climate change are not clearly discernible in the NC4 and that the time frames for the scenarios and impact assessments remain unclear. During the review, Poland informed the ERT that a national adaptation strategy is planned for elaboration and implementation within the next few years.

52. As in the previous (third) national communication, the assessment of climate change impacts on human health, tourism, energy and ecosystems in Poland has not been reported. During the review, Poland informed the ERT that there is ongoing research on the impact of climate change on agriculture, water resources, coastal zones, and biodiversity. The Party also informed the ERT on the research programmes launched recently in Poland, which deal with more comprehensive assessments of climate change impacts. The ERT encourages Poland to include a description of an integrated assessment of climate change impacts in its future national communications.

E. Research and systematic observation

53. Poland has provided information on its actions relating to research and systematic observation, and addressed both domestic and international activities, including the World Climate Programme, the International Geosphere–Biosphere Programme, the Global Climate Observing System (GCOS), the European Programme for the Global Ocean Observing System and the Intergovernmental Panel on Climate Change. The NC4 does not reflect any action taken to support related capacity-building in developing countries. Poland has provided a summary of information on GCOS activities (in accordance with para. 64 of the UNFCCC reporting guidelines).

54. The ERT noted that detailed information has been provided about funding of research, in the form of the National Framework Programme, climate policy, fields of research activity and funding needs of these research fields. A number of institutes and research organizations in Poland are engaged in research on climate change. Key research activities are focused on historical research on climate change, modelling climatic processes, the development of climate change scenarios, and climate change impact assessment. Socio-economic analysis and research and development on mitigation and adaptation technologies have been reported as future priorities. Detailed information is provided in the NC4 on Poland's activities with respect to meteorological and atmospheric observation, terrestrial observation, and space-based observation programmes. During the review, Poland informed the ERT on data availability and exchange in the GCOS implementation, indicating that both structural and institutional improvements in this context could be made.

F. Education, training and public awareness

55. In the NC4, Poland has provided information on its actions relating to education, training and public awareness, as required by the UNFCCC reporting guidelines (para. 65).

56. An extensive description of Poland's educational policy on climate change issues has been provided in the NC4. Mandatory educational programmes follow the Programme basis for nursery school level and all school-type education, issued by the Ministry of National Education in 2002. Government legislation includes provisions on providing a broad environmental education, which are laid down in the Act on Environmental Protection Law, the National Environmental Education Strategy and Poland's Climate Policy. A broad spectrum of environmental aspects is also covered both by state high schools and universities and by private high schools in Poland as part of their education on hazards to the environment, including climate.

57. The Ministry of Environment has implemented a programme to raise the qualifications of environmental personnel, including a Training Centre for Environmental and Water Management Personnel. Ministerial research institutes also undertake educational activities, mainly through the training of graduate students and actions for post-secondary school and high school students.

58. The Ministry of Environment provides information on environmental protection and water management in branch-related mass media and facilitates free public access to information on climate change via a web portal. Promotional and information campaigns, such as European Mobility Week, Car-free Day and POLEKO International Ecological Fair in 2006, have been reported in the NC4. Non-governmental organizations are involved in many areas of legislation development and environmental education.

59. Significant attention is paid in Poland to financing international environmental education programmes. Poland has provided assistance for master's, postgraduate and doctoral studies as well as post-doctoral programmes for participants from over 90 countries.

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

60. Poland's RDP includes four chapters, which contain all the information required by decisions 22/CP.7 and 25/CP.8. The ERT found the information contained in the RDP to be consistent with that provided in the NC4.

61. The National Administration of the Emissions Trading Scheme (NAETS) was established at the Institute of Environmental Protection in Warsaw. One of the main responsibilities of NAETS is to maintain the national registry. Since 2006 the National Emission Centre, responsible for compiling the

GHG inventories, has been located within NAETS. The Ministry of Environment is responsible for approving the GHG inventories. NAETS is also responsible for monitoring the activities related to the implementation of JI and clean development mechanism projects.

62. Poland's target under the Kyoto Protocol is to reduce GHG emissions by 6 per cent of the 1988 level during the first commitment period. According to the projections in the NC4, Poland will meet its target under the Kyoto Protocol without any additional measures.

63. The comprehensive measures for reducing GHG emissions in Poland include the emissions trading scheme and the JI mechanism. Poland's GHG trading registry under the EU is operational and its National Allocation Plan for 2008–2012 has been approved by the European Commission. Poland's national registry went live in October 2008. Poland is hosting a number of JI projects. Poland has notified its designated JI focal point and submitted national JI guidelines to the UNFCCC secretariat.

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

64. Poland has provided most 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 Poland to implement the relevant provisions of the Kyoto Protocol. The supplementary information is placed in different sections of the NC4 and the 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, p. 34 and pp. 36–38
Policies and measures in accordance with Article 2	NC4, pp. 38–54 RDP, pp. 5–22
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	RDP, pp. 39–41
Information under Article 10	NC4, p. 71 RDP, p. 39 and p. 44
Financial resources	NC4, p. 71 RDP, p. 44

Abbreviations: NC4 = fourth national communication, RDP = report demonstrating progress.

65. Poland has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: (a) a description of the national inventory system; (b) a description of the national registry; and (c) a description of national legislative arrangements and enforcement and administrative procedures. However, Poland did provide information regarding its national system and registry during the review week. The ERT recommends that Poland include these reporting elements in its next national communication.

IV. Conclusions

66. Over the 1988–2007 period, total GHG emissions decreased by 30.0 per cent in Poland. A substantial proportion of this reduction took place between 1988 and 1990 and is related to Poland's transition to a market-based economy. Further reductions in the GHG emissions resulted from the shift from coal to natural gas, and from the modernization of and structural changes in Poland's industrial sector. Based on a comparison between the 'with measures' and 'without measures' scenarios, the ERT noted that the adopted and implemented PaMs are estimated to reduce GHG emissions in 2010 by 52 Mt CO₂ eq, and by 38 Mt CO₂ eq in 2020, respectively.

67. In its NC4 and RDP, Poland presents GHG projections for the period from 2005 to 2020. Two scenarios are included: a baseline ('without measures') scenario and a 'with measures' scenario (including the effect of currently implemented and adopted PaMs). Under both scenarios, total GHG emissions are projected to remain well below the base year level until 2020. Thus, the projections

indicate that Poland is likely to meet its target for reducing emissions under the Kyoto Protocol (which is a 6 per cent reduction in relation to the base year level) during the first commitment period, even under the baseline scenario. This is confirmed by an updated set of projections, as contained in a 2008 report of the European Environment Agency.

68. In the course of the IDR, the ERT formulated a number of recommendations relating to the completeness and transparency of Poland's reporting under the Convention and its Kyoto Protocol. The key recommendations³ are that Poland, in its next national communication:

- (a) Include information on how its national circumstances affect GHG emissions and removals and how the national circumstances and changes in the national circumstances affect GHG emissions and removals over time;
- (b) Present the estimated and expected total effect of the implemented and adopted PaMs, in accordance with the UNFCCC reporting guidelines;
- (c) Provide an integrated assessment of the climate change impacts;
- (d) Provide complete supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, including a description of the national inventory system, a description of the national registry and a description of national legislative arrangements and enforcement and administrative procedures; and
- (e) Ensure timely submission towards the due date 1 January 2010.

³ The recommendations are given in full in the relevant sections of this report.

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>>.

FCCC/IDR.3/POL. Report on the in-depth review of the third national communication of Poland. Available at <<http://unfccc.int/resource/docs/idr/pol03.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/POL. Report of the individual review of the greenhouse gas inventories of Poland submitted in 2007 and 2008. Available at <<http://unfccc.int/resource/docs/2009/arr/pol.pdf>>.

FCCC/IRR/2007/POL. Report of the review of the initial report of Poland. Available at <<http://unfccc.int/resource/docs/2007/irr/pol.pdf>>.

Fourth national communication of Poland. Available at <<http://unfccc.int/resource/docs/natc/polnc4.pdf>>.

Report demonstrating progress of Poland. Available at <<http://unfccc.int/resource/docs/dpr/pol1.pdf>>.

2009 greenhouse gas inventory submission of Poland. 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 Ms. Maria Klokočka (Ministry of Environment), including additional material on updated PaMs, the national registry, the national system and recent developments in Poland's Climate Policy. The following documents were also provided by Poland:

Ministry of Environment. 2005. *Poland's Climate Policy. Strategies for GHG emission reductions in Poland until 2020*. Warsaw.

European Environmental Agency. 2008. *Greenhouse gas emission trends and projections in Europe 2007 (report No5/2007)*. Copenhagen. Available at <http://www.eea.europa.eu/publications/eea_report_2007_5/Poland.pdf>.

European Environmental Agency. 2008. *GHG trends and projections. Extended country profiles: Poland*. Available at <<http://www.eea.europa.eu/themes/climate/ghg-country-profiles/extended-country-profiles/poland-greenhouse-gas-extended-profile.pdf>>.
