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**Report of the centralized in-depth review of
the third and fourth national communication of Lithuania**

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I. Introduction and summary

A. Introduction

1. Lithuania ratified the UNFCCC in March 1995 and the Kyoto Protocol in January 2003. Its quantified emission limitation and reduction commitment under the Kyoto Protocol (Kyoto Protocol target) is to keep its total greenhouse gas (GHG) emissions below 92 per cent of the base year (1990) level during the first commitment period (2008–2012).
2. This report covers the centralized in-depth review (IDR) of the third and fourth national communication (NC3&4) of Lithuania, coordinated by the UNFCCC secretariat, in accordance with decision 7/CP.11. The review took place from 5 to 10 June 2006 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Amit Garg (India), Mr. Brett Longley (New Zealand), Mr. Miroslav Maly (Czech Republic), Mr. Markus Nauser (Switzerland), Ms. Batimaa Punsalmaa (Mongolia) and Ms. Tatiana Tugui (Republic of Moldova). Mr. Garg and Mr. Nauser were the lead reviewers. The review was coordinated by Mr. Harald Diaz-Bone (UNFCCC secretariat).
3. During the IDR, the review team examined each part of the NC3&4. It also evaluated the information contained in Lithuania's report demonstrating progress (RDP) in achieving its commitments under the Kyoto Protocol, and the supplementary information provided by Lithuania 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 Lithuania, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The expert review team (ERT) noted that Lithuania's NC3&4 complies broadly with the UNFCCC reporting guidelines.¹ In accordance with decision 22/CP.8, the RDP provides information on the progress made in achieving the commitments of Lithuania under the Kyoto Protocol. Supplementary information under Article 7, paragraph 2, of the Kyoto Protocol² is provided in both the NC3&4 and the RDP.

1. Completeness

6. The ERT noted that Lithuania's NC3&4 contains all the sections of a national communication stipulated by the reporting guidelines. The ERT also noted that Lithuania's RDP contains all parts stipulated by decisions 22/CP.7 and 25/CP.8. Furthermore, the ERT noted that the supplementary information provided by Lithuania under Article 7, paragraph 2, of the Kyoto Protocol is complete, except for three reporting elements (see section III.B).

¹ "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications." Document FCCC/CP/1999/7, pages 80–100.

² See document FCCC/KP/CMP/2005/8/Add.2, decision 15/CMP.1, annex, chapter II.

2. Timeliness

7. The NC3&4 was submitted on 28 December 2005, and the RDP was submitted on 6 February 2006. Decision 4/CP.8 requested the submission of the NC3&4 by 1 January 2006. Decision 22/CP.7 set the same date for Parties to submit their RDPs.

3. Transparency

8. The ERT noted that the NC3&4 provides information on all aspects of implementation. It is structured following the outline contained in the annex to the reporting guidelines. Still, the ERT noted that transparency in the reporting of past and future emission trends could be enhanced, for example, by providing a complete time series of GHG emissions inventory data since 1990 and a complete “with measures” scenario for all sectors and GHGs up to 2020. Furthermore, the ERT noted that no clear distinction is made between policies and measures implemented and those adopted or planned, as required by the UNFCCC reporting guidelines. The ERT noted that, while the information contained in the NC3&4 and RDP is broadly consistent, in some cases the RDP provides an update of information contained in the NC3&4 (see also section IV).

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals

9. In its NC3&4, Lithuania has provided a comprehensive description of its national circumstances and how these national circumstances affect GHG emissions and removals. However, the ERT noted that the information was not complete as regards the ways in which national circumstances and changes in national circumstances affect GHG emissions and removals over time, in particular for the period 1990–1998, which is when the majority of the emission reductions are reported to have taken place. The ERT noted that the most important drivers of the emission trends in Lithuania include the process of transition to a market economy and changes in energy production and use. Table 1 provides an overview of the values of indicators (and changes in these values over time) which partly reflect these national circumstances.

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

	1990 ^a	1998	2001	2003	Change 1990–1998 (%)	Change 1998–2003 (%)	Change 1990–2003 (%)
Population (million)	3.70	3.56	3.48	3.45	-3.9	-2.8	-6.6
GDP (billion USD 2000 PPP)	31.3	30.1	32.4	38.2	-4.0	26.9	21.9
TPES (Mtoe)	11.0	9.3	7.9	8.9	-15.5	-4.1	-19.0
GDP per capita (thousand USD 2000 PPP)	8.5	8.5	9.3	11.1	0.0	30.6	30.6
TPES per capita (toe)	3.0	2.6	2.3	2.6	-12.1	-1.3	-13.2
GHG emissions without LULUCF (Tg CO ₂ eq)	50.9	21.8	20.4	17.2	-57.2	-21.1	-66.2
GHG emissions with LULUCF (Tg CO ₂ eq)	45.5	14.3	21.5	10.2	-68.8	-28.2	-77.5
CO ₂ emissions per capita (Mg)	10.5	4.4	3.8	3.6	-58.1	-19.3	-66.2
CO ₂ emissions per GDP unit (kg per USD 2000 PPP)	1.24	0.52	0.41	0.32	-58.1	-38.2	-74.1
GHG emissions per capita (Mg CO ₂ eq)	13.8	6.1	5.8	5.0	-55.4	-18.8	-63.8
GHG emissions per GDP unit (kg CO ₂ eq per 2000 USD PPP)	1.63	0.73	0.63	0.45	-55.4	-37.8	-72.3

Sources: GHG emissions data are from the 2004 and 2005 inventory submissions of Lithuania (available for the inventory years 1990, 1998, 2001 and 2003 only); population, GDP and TPES data are from the IEA (available for the years 1992–2003 only).

Notes: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF. For the abbreviations used, see annex II.

^a In the absence of data on population, GDP and TPES for 1990, 1992 data were used instead.

10. In its NC3&4, Lithuania has provided a summary of information on GHG emission trends for the period 1990–2003, but covering the years 1990, 1998, 2001, 2002 and 2003 only. The summary tables (given in the common reporting format (CRF)) are provided for all five available inventory years in an

annex to the NC3&4. The ERT noted that the data for the inventory years 1990, 1998 and 2001 as presented in the NC3&4 are based on the 2004 inventory submission, while the data for the inventory years 2002 and 2003 are taken from the 2005 inventory submission. In the interests of consistency and in order to use the best available data, the ERT decided to base its analysis on data from the 2005 inventory submission and, where necessary, from the 2004 submission. In its NC3&4, the Party recognizes the incomplete and potentially inconsistent nature of its inventory data for GHG emissions, which presented a challenge to the ERT in trying to analyse the emission trends and the underlying drivers.

11. In 2003, total GHG emissions (excluding emissions and removals from land use, land-use change and forestry (LULUCF)) are reported to be 66.2 per cent lower than the 1990 level, while the figures for total GHG emissions including net LULUCF indicate a decrease by 77.5 per cent. This is mainly attributed to reductions in CO₂ and N₂O emissions, which are both reported to be approximately 68 per cent lower in 2003 than in 1990. Emissions of CH₄ decreased by 54.6 per cent over the same period. Most of these decreases are attributed to the period before 1998, when total GHG emissions were 57.2 per cent lower than the 1990 level. The ERT noted that emissions have been estimated for all sectors except solvent and other product use. It also noted that actual emissions of fluorinated gases have not been estimated; and data on potential emissions are available only for HFCs and from 2001 onwards. The reported potential HFC emissions correspond to about 0.1 per cent of total national GHG emissions in 2003. Table 2 provides an overview of GHG emissions by sector during the years 1990–2003.

Table 2. Greenhouse gas emissions by sector for Lithuania, 1990–2003

	GHG emissions (Tg CO ₂ equivalent)					Change (%)		Share by sector ^a (%)	
	1990	1998	2001	2002	2003	1990–2003	2002–2003	1990	2003
1. Energy	37.7	14.9	12.6	11.6	12.0	-68.0	3.3	74.0	69.9
A1. Energy industries	16.5	6.9	6.0	5.1	5.4	-67.2	5.5	32.4	31.4
A2. Manufacturing industries and construction	5.4	2.3	1.8	1.1	1.2	-78.4	6.2	10.7	6.8
A3. Transport	5.9	4.0	3.6	3.7	3.6	-38.3	-1.2	11.5	21.1
A4–5. Other	9.3	1.7	1.3	1.3	1.4	-85.4	3.0	18.3	7.9
B. Fugitive emissions	0.5	0.0	0.0	0.4	0.5	-15.3	9.9	1.1	2.7
2. Industrial processes	2.6	2.7	3.2	2.8	1.6	-39.0	-41.6	5.2	9.3
3. Solvent and other product use	NE	NE	NE	NE	NE	-	-	-	-
4. Agriculture	7.1	2.5	3.0	3.7	2.1	-70.4	-42.4	14.0	12.3
5. LULUCF	-5.5	-7.6	1.2	1.2	-7.0	27.5	-677.7	-10.8	-40.6
6. Waste	3.5	1.7	1.6	1.5	1.5	-57.9	-3.3	6.8	8.5
GHG total with LULUCF	45.5	14.3	21.5	20.8	10.2	-77.5	-50.8	-	-
GHG total without LULUCF	50.9	21.8	20.4	19.6	17.2	-66.2	-12.1	-	-

^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 which was offset by GHG removals through LULUCF.

Note 1: 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.

Note 2: For the abbreviations used, see Annex II. NE = not estimated.

B. Policies and measures

12. Lithuania has provided ample information on policies and measures related to the implementation of its commitments under the Convention and its Kyoto Protocol, and has organized the reporting of policies and measures by sector. Each sector has its own textual description on the principal policies and measures, partly supplemented by summary tables on policies and measures by sector. Lithuania has also provided information on how it believes its policies and measures are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention.

13. As in the previous in-depth review, the ERT noted that in many cases the status of implementation (planned, adopted or implemented) of policies and measures reported in the NC3&4 remains unclear. The ERT recommends that Lithuania follow the relevant provisions of the UNFCCC reporting guidelines (para. 14) in its next national communication.

14. The ERT recommends that the Party provide a complete and consistent picture of emission trends by sector and the drivers behind those trends for the entire time period since the base year in order to facilitate the assessment of measures and their effects.

15. Table 3 provides a summary of information on the domestic policies and measures reported by Lithuania.

Table 3. Summary information on policies and measures

Major policies and measures	Examples / comments
Framework policies and cross-sectoral measures	
NSDS (2003)	Framework policy document addressing, inter alia, energy efficiency and use of RES, cleaner fuels and waste management, as well as international GHG emission commitments
Second (updated) National Strategy for the Implementation of the UNFCCC	In preparation (to be adopted in 2006)
Law on the Ratification of the Regional Testing Ground Agreement for Flexible Mechanisms (2004)	Regulates participation in JI energy projects in the Baltic Sea region
ECCP	Has given rise to several executive orders on the implementation of Kyoto Protocol commitments and the EU Directive on Emissions Trading at the national level
Energy sector	
NES (1999, updated in 2002)	Framework policy document addressing reform and development of the energy sector, including decommissioning of a nuclear power plant, promotion of energy efficiency measures and use of RES. Targets: raising the share of RES in TPES to 12 per cent by 2010; increasing the share of RES in electricity generation to 7 per cent by 2010 (through fixed feed-in tariffs); raising the share of combined heat and power (CHP) in electricity generation to 35 per cent by 2020
Energy taxation	The Law on Pollution Taxes (as amended in 2001 and again in 2006) introduced the "polluter pays" principle; promotes the use of RES through exemption from value added tax. Directive 2003/96/EC (implemented in the amended Excise Law of 2004) increases excise duties on fossil fuels (with various exemptions); tax exemption for electricity from RES
Housing Strategy (2004)	Programme for Refurbishing Multifamily Buildings
NEEP (2001, updated in 2006)	Addressing energy saving potentials in industry through research and information (implementation pending)
Transport	
NEEP (2001, updated in 2006)	Addressing energy saving potentials in transport through research and information (implementation pending)
Directive 2003/30/EC (implemented in the context of the NES)	Increase the share of biofuel use in transport to 12 per cent by 2010 through tax exemptions and preferential market access
Industry	
Industry Sustainable Development Programme	To be implemented under the Long-Term Economic Development Strategy to 2015. Measures include introduction of best available technologies under the EC IPPC programme, reform of pollution charges, emissions trading, product charges and deposit refund systems in waste management, green procurement in the public sector, and devolving responsibility for environmental control to local level
Agriculture	
Agricultural and Rural Development Strategy	Main elements are training programmes on the EU Code of Good Agricultural Practice; demonstration farms with emphasis on pollution prevention methods; regulations relating to the storage and disposal of manure and slurry; and regulations/guidelines to limit nitrate pollution
Waste management	
State Strategic Waste Management Plan (2002); Law on Packaging and Packaging Waste Management (2003); Law on Pollution Tax (2002); and Ministerial Orders	Implemented through rules relating to waste management; and permits for utilization of natural resources and environmental pollution; and for construction, operation, closure, and after-care of landfills; waste incineration; and use of sewage sludge
Forestry	
Agricultural and Rural Development Strategy; Rural Development Plan	Include measures to increase the area of forest (including afforestation of agricultural land), improve species structure, ensure variety of types of ownership, develop private-sector competitiveness, and increase forest productivity

Note: For the abbreviations used, see annex II.

1. Policy framework and cross-sectoral policies and measures

16. Since gaining independence from the Soviet Union in 1990, Lithuania has undergone a fundamental process of restructuring from a planned towards a market economy. This transition process affected all sectors of its economy and resulted in considerable reductions in GHG emissions. However, Lithuania reports in its NC3&4 that the processes of modernization and economic restructuring and revitalization are likely to entail an increase in the use of resources in the near future. One of Lithuania's answers to this challenge is its 2003 National Sustainable Development Strategy (NSDS), which aims to balance economic, social and environmental objectives. Coordinated implementation of this strategy is assisted by the National Sustainable Development Commission which was established in 2000.

17. With regard to the implementation of policies and measures for GHG mitigation contained in the NSDS, a National Climate Change Committee was established in 2001 and reorganized in 2004. This committee, inter alia, is to coordinate the implementation of the Convention and ensure compliance with the provisions of the Kyoto Protocol and relevant European Union (EU) directives. Furthermore, Lithuania's NC3&4 refers to an updated national strategy for the implementation of the UNFCCC, including sectoral action plans, which is expected to be approved by the government in 2006. The ERT recommends that Lithuania illustrate the relationships and linkages between its strategies and programmes relevant for climate policy, as well as the human and financial resources allocated to ensure their timely and effective implementation.

18. As an EU member State, Lithuania is bound by EU legislation, including regulations related to climate change. Its policies and measures are therefore developed in close relation to EU-wide common and coordinated policies and measures, particularly within the framework of the European Climate Change Programme (ECCP). In this context, preparatory work for participation in the EU Emissions Trading Scheme (ETS) plays a central role, and steps have been taken to comply with EU requirements. Furthermore, the Party has implemented a number of EU directives in the area of environmental protection. The major emphasis has been on establishing the legal framework, institutional arrangements and national plans. The Party recognizes that much still remains to be done, including monitoring and evaluation of policies and measures.

19. The ERT noted that in recent years the Lithuanian government has undertaken a number of initiatives relevant for climate policy at the strategic and programmatic level, as described below. In this context, a number of medium- and long-term targets have been defined. However, on the basis of information provided in the NC3&4, it remained unclear to the ERT whether these targets are likely to be met by the policies and measures currently in place. The ERT recommends that the Party provide more detail on the methods used to estimate the mitigation effects of individual policies and measures.

2. Policies and measures in the energy sector

20. In 2003, emissions from the energy sector represented almost 70 per cent of total GHG emissions (excluding LULUCF). In 1990, the corresponding share was 74.0 per cent. Of the subsectors, energy industries and transport accounted for the largest shares in total GHG emissions (of 31.4 and 21.1 per cent, respectively) in 2003, whereas energy use in industry and other sectors accounted for only minor shares (of 6.8 and 7.9 per cent, respectively). Compared to the 1990 figures reported by Lithuania, GHG emissions in 2003 were 85.4 per cent lower in the residential/commercial sector, 78.4 per cent lower in the manufacturing and construction industries, and 67.2 per cent lower in the energy industries. Data reported since 2001 indicate that the emissions of most of the energy sub-sectors have stabilized at lower levels.

21. Lithuania adopted a national energy strategy in 1999 (amended in 2002). The strategy includes measures relating to EU directives which need to be translated into national law as a consequence of

Lithuania's accession to the EU in 2004. Implementation of measures is reported to be under way regarding tax exemptions for renewable energy sources, an increase in excise duties on fossil fuels, and fixed feed-in tariffs (i.e. guaranteed prices for producers of electricity from RES) to increase the share of renewable electricity (see table 3).

22. As an element of the national energy strategy and in line with an agreement with the EU, Lithuania started the decommissioning of its Ignalina nuclear power plant (NPP) in 2005, with a second phase of decommissioning announced for 2009. According to Lithuania's NC3&4, Ignalina contributed 78.4 per cent to total electricity production in the country in 2004, while thermal power plants accounted for 17.3 per cent of the electricity produced. As already noted in the previous IDR report, an International Atomic Energy Agency (IAEA) study (referenced by Lithuania in its NC2) calculated the increase in emissions that would follow from replacement of the full Ignalina production capacity by fossil fuel-based power plants to 4–5.5 Tg CO₂ emissions per year (corresponding to 35–50 per cent of total CO₂ emissions from the energy sector in 2003), depending on the type of technology used. In parallel with the decommissioning of the Ignalina NPP, rehabilitation of thermal and hydroelectric production facilities is foreseen. However, the ERT noted that the NC3&4 does not contain any updated information on the state of affairs in this regard. The ERT encourages Lithuania to provide additional information on this matter in its next national communication.

23. Although a National Energy Efficiency Programme (NEEP) addressing energy-saving potential in the industry sector as well as the transport sector was adopted in 2001, the ERT noted that no information on the implementation of related measures is reported in the NC3&4.

24. In the *transport* sector, emissions in 2003 are reported to be 40 per cent below the 1990 level. In contrast with this figure, the NC3&4 indicates that the number of vehicles more than doubled over the last decade. Additional information provided by Lithuania indicates that vehicle fleet statistics may be overestimating actual vehicle numbers in the country, while fuel smuggling from neighbouring countries may have resulted in an underestimation of actual fuel consumption in recent years.

25. On the basis of the inventory data provided by Lithuania, the ERT noted a marked decrease in CO₂ emissions in the *residential and commercial sector* – by more than 80 per cent between 1990 and 2003. At the same time, the population fell by only 6.6 per cent. The ERT noted that additional information provided by Lithuania on reduced use of coal, heavy fuel oil and biomass, as well as gains in energy efficiency, partly explain this development. According to the NEEP, the energy-saving potential in buildings has been estimated at 45 per cent. Given this large efficiency potential, the ERT encourages Lithuania to substantiate in more detail the factors and measures driving the development of emissions in this sector in its next national communication.

26. Lithuania reports modernization in the residential and commercial sector as a priority field of action in the national sustainable development strategy. The ERT considered the related housing strategy and the housing and urban development facility mentioned in the NC3&4 to be potentially important tools with respect to the application of minimum energy efficiency standards in this sector. Additional information provided by Lithuania indicates that, in the context of the housing strategy, the Programme for Refurbishment of Multi-family Buildings may lead – for example, through state grants – to a substantial improvement in energy efficiency in multi-family buildings built before 1994.

3. Policies and measures in other sectors

27. Emissions from non-energy sectors constituted 30.1 per cent of total GHG emissions (excluding LULUCF) in 2003. In 2003, emissions from industrial processes, agriculture and waste taken together were reported to be 60.9 per cent below the base year (1990) level. The largest contribution to this reduction was from agriculture (62 per cent), followed by waste (25 per cent) and industrial processes

(13 per cent). Estimated net removals from LULUCF increased by 27.5 per cent between 1990 and 2003, with high fluctuations in the intermediate years for which data are available.

28. **Industrial process** emissions are dominated by the cement and lime and chemical industries. A reduction in CO₂ emissions from the cement and lime industries (by 82.3 per cent) between 1990 and 2003 has been partially offset by a rise in N₂O emissions from the chemicals industry (by 16.4 per cent). Following large decreases between 1990 and 2001, industrial process emissions are rising again, but are still well below the level reported for 1990. The ERT noted that, given the absence of reported data or other information in the NC3&4 relating to the period 1991–1997, the nature and causes of some of the significant changes in the economy and in emissions over that period remain unclear.

29. Emissions from the **agriculture** sector are dominated by CH₄ and N₂O, both of which declined markedly between 1990 and 2003 (by 61.9 per cent and 80 per cent, respectively). Data from the 2004 and 2005 GHG inventory submissions show that the decrease was due primarily to a reduction in livestock (cattle) numbers, from 2.32 million in 1990 to 0.812 million in 2003. Cattle numbers increased by 60,000 between 2001 and 2003 but are projected to decline between 2005 and 2020. The main measures to control these emissions are the application of the EU Nitrate Directive, the European Community (EC) Directive on Integrated Pollution Prevention and Control (IPPC), the State Programme for Reduction of Water Pollution, and the EU Code of Good Agricultural Practice (CGAP).

30. **Land use, land-use change and forestry**. During the period 1998–2003, the forest area increased by 94,000 hectares (or nearly 5 per cent). While harvesting has also increased, it has amounted to less than the total increment. The Rural Development Plan delivers EU financial support to rural areas for forestry development through forest planting, improved tree species structure (avoiding vulnerable monocultures), further development of private ownership, and improved forest productivity and health.

31. **Waste** sector emissions decreased by 57.9 per cent between 1990 and 2003. CH₄ emissions from solid waste disposal constitute the largest proportion (60.6 per cent) of emissions in the sector. The greater part of non-hazardous waste is disposed of in landfills and the remainder stored (primarily sludge from waste-water treatment), exported, incinerated or recycled. In 2003, 737 landfills were identified, of which 42 were either closed or renovated.

32. Measures to reduce waste and improve treatment include actions under EU Directive 1999/31/EC and national regulations to reduce the amount of biodegradable waste generated by 50 per cent by 2005, and by a further 25 per cent by 2010 (compared with the 1993 level), and to collect and combust CH₄ from all new and existing landfills. To facilitate this, all landfills will be organized into 10 regional waste management systems which meet EU standards. The Party estimates that improved collection and combustion of landfill gas has the potential to deliver reductions of 0.475 Mt CO₂ equivalent per year by 2012. For the principal measures adopted to achieve these reductions, see table 3.

C. Projections and the total effect of policies and measures

1. Projections

33. The projections provided by Lithuania in its NC3&4 include a “with measures” and a “without measures” scenario up to 2020, and are presented relative to actual inventory data for 1990, 1998, 2001, 2002 and 2003. These projections are presented for the energy sector (including transport) only and on a gas-by-gas basis for the three main GHGs (CO₂, CH₄ and N₂O). Projections of emissions from other sectors, including agriculture, industrial processes (cement and lime production only), LULUCF and waste (landfills only), are provided in a separate scenario, by sector, for the same three GHGs. However, the ERT noted that Lithuania has not provided the following reporting elements required by the UNFCCC reporting guidelines (para. 35): projections on fluorinated gases (PFCs, HFCs and SF₆) and projections in an aggregated format for each sector as well as for a national total, using global warming potential (GWP)

values. Table 4 provides a summary of GHG emission projections for Lithuania for the energy sector only.

Table 4. Summary of energy sector emission projections for Lithuania

	GHG emissions (Tg CO ₂ equivalent per year)	Changes compared to base year level (%)
Inventory data 1990 ^a	37.2	—
Inventory data 2003 ^b	12.0	-67.7
"With measures" projections for 2010 – energy	22.2	-40.3
"Without measures" projections for 2010 – energy	27.3	-26.6

^a Source: Lithuania's 2004 GHG inventory submission; the emissions are without LULUCF.

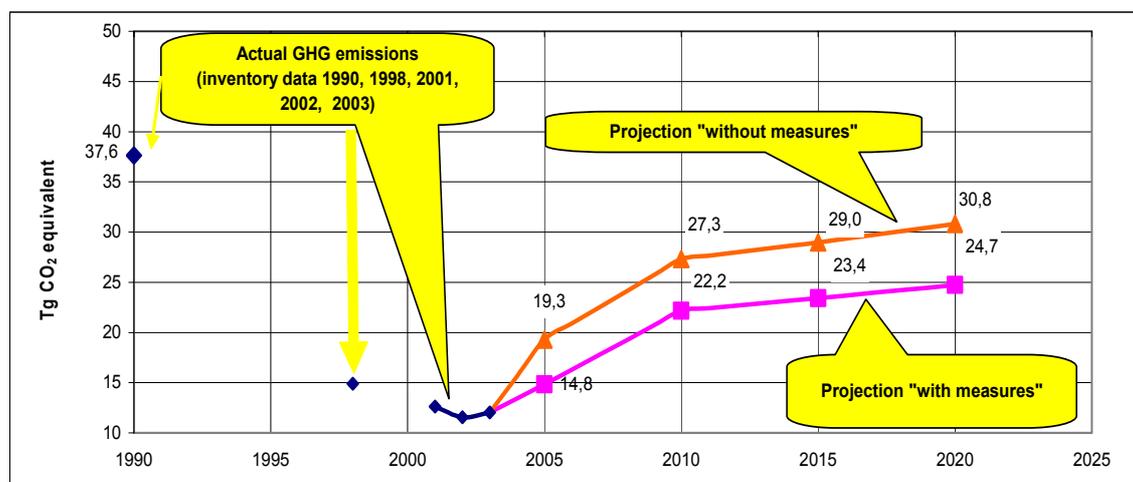
^b Source: Lithuania's 2005 GHG inventory submission, the emissions are without LULUCF.

Note: For the abbreviations used, see annex II.

34. In its NC3&4 Lithuania presents for the first time a description of the methodology used for the development of GHG emission projections. The methodology is based on a combination of various modelling tools and approaches. The projections for GHG emissions from the energy sector are based on the outcomes of the EU-funded project EUROPAE/AID/112892/D/SV/LT/4. Energy demand projections were prepared by applying the Model of Analysis of Energy Demand (MAED). Energy supply projections were developed applying the MESSAGE Model (a linear optimization model) adjusted to specific Lithuanian conditions. The inventory year 2000 was taken as the base year for GHG emission projections.

35. The projections of GHG emissions from industrial processes and agriculture are based on activity data calculated within the context of the EU Clean Air for Europe (CAFÉ) programme and on a baseline scenario developed by the International Institute for Applied Systems Analysis (IIASA) and local experts. The ERT noted that projections for emissions from industrial processes covered CO₂ emissions from cement and lime production only, despite the fact that emissions from the chemical industry account for two-thirds of emissions from the sector. The projections of emissions from the waste sector cover CH₄ from solid waste disposal, by using a simplified spreadsheet model (the Microsoft-Excel tabular processor) and the Intergovernmental Panel on Climate Change (IPCC) methodology (for the anticipated decrease in biodegradable waste disposal). The ERT noted that emissions from waste-water handling have not been taken into account. Figure 1 provides a summary of GHG emission projections for the energy sector, including transport, for Lithuania.

Figure 1. GHG emission projections for the energy sector in Lithuania



Source: Lithuania's NC3&4.

36. The ERT acknowledged that, in comparison with the NC2, considerable progress has been made in both the methodology applied for developing projections of GHG emissions and the quality of their presentation in the NC3&4. It recommends that Lithuania fill the remaining gaps in the coverage of sectors and sources, particularly in industrial processes and waste management. It also recommends that the Party follow the UNFCCC reporting guidelines and provide projections in an aggregated format for each sector as well as for the national total using GWP values. Furthermore, the ERT encourages the Party to increase the transparency of its projections by presenting the national totals in both tabular and graphical format for all GHG emissions.

2. Total effect of policies and measures

37. In its NC3&4, Lithuania presents the estimated and expected total effect of implemented and adopted policies and measures, in accordance with the “with measures” definition, compared to a situation without such policies and measures (the “without measures” scenario), in terms of GHG emissions avoided on a CO₂ equivalent basis for the years 2005, 2010, 2015 and 2020 for the energy sector (including transport). It also presents relevant information on factors and activities for the energy sector in the years 2000–2020. Projections of CO₂ removals from sinks are also presented for the period 2005–2020. However, the ERT noted that Lithuania has not provided the estimated and expected total effect of implemented and adopted policies and measures in the agriculture, waste management and industrial processes sectors.

38. The ERT noted that, although policies and measures are already reported in the NC3&4 for the year 2000, with a total effect of 2.4 Mt (see table 5-5 of the NC3&4), these effects are not reflected in the “without measures” scenario for the year 2000 (see figure 5-4 of the NC3&4). The ERT noted some inconsistencies in the reporting on the total effect of policies and measures, as some effects are reported to have occurred prior to the implementation phase of the related policies and measures, for example, an increase in electricity production in 2000 is included under the requirements of EU Directive 2001/77/EC and as resulting from the implementation of the 2002 National Energy Strategy (see also table 5-5 of the NC3&4, year 2000). Table 5 below provides an overview of the total effect of policies and measures reported by Lithuania.

Table 5. Total effect of policies and measures estimated for 2005 and projected for 2010

	Absolute value (in Mt CO ₂ equivalent)	Relative value (in % of base year emissions)
Total effect of implemented policies and measures in 2005	4.3	8.4
Total effect of implemented policies and measures in 2010	4.8	9.4
Total effect of planned policies and measures in 2010	0.3	0.6
Total effect of implemented and planned policies and measures in 2010	5.1	10.0

Note: The total effect of policies and measures is defined in the NC3&4 as the effect of selected GHG emission mitigation policies and measures in energy use and production in the following sectors: energy, transport, industry, and households.

39. The ERT noted that the most effective policies and measures are reported in the fields of energy efficiency improvements, the promotion of renewable energy sources and the installation of CHP. These policies and measures are projected to partly offset an expected increase in total emissions due to the decommissioning of the Ignalina NPP.

D. Vulnerability assessment, climate change impacts and adaptation measures

40. In its NC3&4, Lithuania has provided information on the expected impacts of climate change in the country and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. Table 6 summarizes the information on vulnerability and adaptation to climate change.

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

Vulnerability area	Examples / comments / adaptation measures reported
Agriculture and food security	Vulnerability: increased spread of local pests and plant/animal diseases, frost risks economic impacts may include need for increased investment to expand irrigation and drainage systems Adaptation: develop agricultural technology and varieties for drier climate
Biodiversity and natural ecosystems	Vulnerability: habitats and species are expected to move northwards, loss of value of protected areas, eutrophication, changes in the populations and migrating habitats of water birds Adaptation: increased research, environmental protection and ecological farming
Coastal zones	Vulnerability: flooding is likely to increase as a result of rising sea levels Adaptation: defence measures, land-use planning, coastal management
Forests	Vulnerability: some species are expected to benefit from increased CO ₂ concentration, but there will be a negative effect of increased pests and diseases Adaptation: afforestation
Human health	Vulnerability: increased spread of diseases (e.g. tick-borne encephalitis and Lyme disease) and allergy symptoms Adaptation: education and public awareness-raising
Infrastructure and the economy	Vulnerability: economic impacts may include reduced winter tourism, reduced forest, fishery and hunting resources, and costs associated with damage caused by extreme weather events Adaptation: building regulations, protection against natural disasters
Water resources	Vulnerability: changes in the seasonal distribution of run-off and more frequent and intense localized flooding Adaptation: water resource management

41. According to climate scenarios for the 21st century, both temperature – with an increase by 4–6°C in February by 2080 – and precipitation are projected to increase in Lithuania, and the rate of increase will be greater in winter than in warmer seasons. Accordingly, the Lithuanian climate is likely to change towards a more marine type by the end of this century. Lithuania has provided quantitative results of modelling on changes in agriculture, such as the length of the growing season and the occurrence of frost. By 2080, the growing season would be almost 100 days longer than the average for 1961–1990. Due to the longer growing season and increased moisture, some positive effects, such as increased wheat yield, are expected. The sea level by the Lithuanian coast is projected to rise by 6.5 mm per year, which could increase the risks of flooding and ecosystem loss. Expected climate change would greatly affect the migratory flyways and stop-over areas of water birds, and both the number and the composition of their populations.

42. The ERT noted that, in the adaptation part of its chapter on vulnerabilities, impacts and adaptation, Lithuania has provided mitigation options rather than adaptation measures, which is not in line with the UNFCCC reporting guidelines. The ERT also noted that Lithuania recognizes the need for more research on vulnerability and adaptation to climate change, particularly with respect to coastal zones and human health. The ERT encourages the Party to provide information on more specific adaptation measures and to concentrate its reporting on mitigation options in the chapter on policies and measures of its next national communication. The ERT noted with interest that Lithuania has plans for activities on public awareness and education on the impacts of, and vulnerability and adaptation to, climate change.

E. Research and systematic observation

43. In its NC3&4, Lithuania has provided information on its actions relating to both domestic and international research and systematic observation.

44. Various institutions, such as the University of Vilnius, the Institute of Geology and Geography, the Energy Institute, the Institute of Agricultural Engineering and the Hydrometeorological Service under the Ministry of the Environment, conduct climate change-related research to fulfil the commitments under the UNFCCC. In 2002, the Government approved national research priorities, including financial support to research on changes in ecosystems and climate, in line with the related activities under the EU 6th

Framework Programme for Research. In 2003, three new research priorities at Vilnius University were approved and financed by the Lithuanian government. Lithuanian non-governmental organizations (NGOs) take an active part in the development and implementation of climate research and policy.

45. The climate-related systematic observations network in Lithuania comprises 18 meteorological, three aviation and 59 water gauging stations, all of which are operated by the Hydrometeorological Service. The Environmental Protection Agency is responsible for, inter alia, monitoring environmental quality and managing, processing and reporting information under the Convention. Lithuania participates actively in various international programmes on environmental monitoring that are indirectly related to climate observing systems, such as the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP), the Baltic Marine Environment Protection Commission Programme (HELCOM) and the International Cooperative Programme on Integrated Monitoring (ICPIM).

46. The ERT encourages the Party to provide more specific and detailed information on its actions relating to the World Climate Programme, the International Geosphere–Biosphere Programme, the Global Climate Observing System and the IPCC.

F. Education, training and public awareness

47. In its NC3&4, Lithuania reports that public awareness of climate change and related mitigation and adaptation options is still limited. This is in spite of actions recently initiated by several stakeholders, including non-governmental organizations (NGOs) and scientific institutions. The ERT noted that Lithuania does not have plans to develop a systematic approach to activities under Article 6 of the Convention.

48. The ERT noted that Lithuania has integrated global climate change into its long-term goals for education and science, as set out in the national strategy for sustainable development. Global climate change and related topics are covered by a number of study programmes of higher education institutions, and several conferences have been organized by the Ministry of the Environment and some universities.

49. In order to improve its environmental monitoring capacities, Lithuania plans to raise the qualifications of the private company specialists and environmental protection inspectors, adopt new information technologies, and introduce advanced disaster prevention and mitigation methodologies. Lithuania also intends to train specialists on the issues relating to climate change, in order to meet its commitments under the Convention.

50. Lithuania's RDP notes that public awareness has increased considerably in recent years thanks to special publications and advertising campaigns, supported mainly through the United Nations Development Programme (UNDP), the Global Environment Facility (GEF) Small Grants Programme, the Lithuanian Bureau of the Regional Environmental Center (REC) and the Embassy of the United Kingdom of Great Britain and Northern Ireland in Lithuania.

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

51. Lithuania's RDP includes five chapters which contain all the parts stipulated by decisions 22/CP.7 and 25/CP.8. The ERT found the information contained in the RDP to be largely consistent with that provided in the NC3&4.

52. Given the development of GHG emissions since 1990, Lithuania is expected to be able to achieve its emission reduction commitment without making use of the flexible mechanisms of the Kyoto Protocol. Present projections indicate that emissions from the energy sector will be 27 to 40 per cent below the 1990 level in 2010. Emissions from other sectors in 2003 are also far below 1990 levels, supporting the assumption that the overall GHG emissions level in 2010 will be significantly below the 8 per cent reduction target to which Lithuania is committed (see para. 1). According to information provided in the RDP, net removals by sinks are expected to increase by 2010 and beyond.

53. Lithuania has ratified the Testing Ground Agreement for Flexible Mechanisms in the Baltic Sea region and, as a member of the EU, is participating in the first phase of the EU ETS. The ERT reiterates the comment of the review of Lithuania's NC2 to the effect that compliance with reporting requirements is a precondition for use of the flexible mechanisms of the Kyoto Protocol.

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

54. Lithuania has provided supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC3&4 and RDP. The ERT noted that some of the supplementary information under Article 7, paragraph 2, is reported in different sections of these documents. Table 7 provides a reference to the sections 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	–
Policies and measures in accordance with Article 2	NC3&4, chapter 4; RDP, chapter 2
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	NC3&4, chapter 4.1; RDP, pp. 8ff, 32–33
Information under Article 10	RDP, chapter 5; NC3&4, chapter 3.1
Financial resources	not applicable ^a

^a As an EIT country, Lithuania does not have to report on the implementation of Article 11 of the Kyoto Protocol, including on the provision of new and additional resources.

Note: For the abbreviations used, see annex II.

55. Lithuania has not reported the following elements of the additional information under Article 7, paragraph 2, of the Kyoto Protocol: (a) a description of the national registry; (b) information on the efforts Lithuania is making to implement policies and measures to minimize adverse effects, including 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; and (c) a description of national legislative arrangements and administrative procedures relating to the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. The ERT recommends that Lithuania include these reporting elements in its next national communication.

IV. Conclusions and recommendations

56. The ERT noted that, mainly as a result of the transition process from a planned to a market economy, GHG emissions (excluding LULUCF) in Lithuania in 2003 were 66.2 per cent below the 1990 level. Lithuania is expecting to meet its Kyoto commitments by domestic actions alone. Nonetheless, as an EU member State, Lithuania is bound by EU legislation, including regulations related to climate change. Its energy and climate policies are therefore developed in close interaction with EU common and coordinated policies. Lithuania recognizes that much still remains to be done, including monitoring and regular evaluation of policies and measures.

57. On the basis of the information provided in Lithuania's NC3&4 and RDP, the ERT developed an understanding of the Lithuanian approach to climate policy and the state of its implementation of commitments under the UNFCCC and its Kyoto Protocol. Lithuania has presented a comprehensive list of strategies, programmes, policies and measures; however, the relationship between the national-level plans, legislation, regulations and other measures was not always clear to the ERT.

58. The ERT commends Lithuania for the progress it has made in presenting information in its NC3&4. However, the ERT also identified considerable potential for further improvement. It noted the importance of completeness and transparency in providing information, as required by the reporting guidelines, if Lithuania wishes to participate in the use of the flexible mechanisms under the Kyoto Protocol. In the context of the national communication, this relates in particular to the way in which policies and measures and projections are presented, but also to the need for complete and consistent inventory data and supplementary information under Article 7, paragraph 2, of the Kyoto Protocol.

59. In the course of the IDR, the ERT formulated a number of recommendations relating to the completeness and transparency of Lithuania's reporting under the Convention and the Kyoto Protocol. The list includes the following key recommendations:³

- The ERT recommends that the Party provide a complete and consistent picture of emission trends by sector and the underlying drivers for the entire time period since the base year.
- As in the previous in-depth review, the ERT noted that, in many cases, the status of implementation (planned, adopted or implemented) of policies and measures reported in the NC3&4 remained unclear. The ERT recommends that Lithuania follow the relevant provisions of the UNFCCC reporting guidelines (paragraph 14) in its next national communication and provide information on the status of implementation of policies and measures, including the introduction of new electricity generation capacity as a consequence of the decommissioning of the Ignalina NPP.
- The ERT acknowledged that, in comparison with the NC2, considerable progress has been made in both the methodology applied for developing projections of GHG emissions and the quality of their presentation in the NC3&4. The ERT recommends that Lithuania fill the remaining gaps in the coverage of sectors and sources by the projections, particularly in industrial processes and waste management. It also recommends that the Party follow the UNFCCC reporting guidelines and provide projections in an aggregated format for each sector as well as for the national total, using GWP values.
- The ERT recommends that Lithuania provide all reporting elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol in its next national communication.

³ For a complete list of recommendations, the relevant sections of this report should be consulted.

Annex I

Documents and information used during the review

A. Reference documents

UNFCCC. 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>>.

UNFCCC. Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, decision 15/CMP.1. FCCC/KP/CMP/2005/8/Add.2. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>>.

UNFCCC. Guidelines for the review under Article 8 of the Kyoto Protocol, decision 22/CMP.1. FCCC/KP/CMP/2005/8/Add.3. Available at <<http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>>.

UNFCCC. Lithuania: Report on the in-depth review of the second national communication of Lithuania. Available at <<http://unfccc.int/resource/docs/2005/idr/eng/ltu02.pdf>>.

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

UNFCCC. Lithuania: Report of the individual review of the greenhouse gas inventory submitted in the year 2005. FCCC/ARR/2005/LTU. Available at <<http://unfccc.int/resource/docs/2006/arr/ltu.pdf>>.

Republic of Lithuania. Lithuania's third and fourth national communication on climate change. Available at <<http://unfccc.int/resource/docs/natc/ltnc4.pdf>>.

Republic of Lithuania. Lithuania's report on demonstrable progress. Available at <<http://unfccc.int/resource/docs/dpr/lit1.pdf>>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Jolanta Kotvickaja (Ministry of the Environment of the Republic of Lithuania) including additional material on pollution taxation, Lithuania's vehicle fleet statistics, the use of fossil fuels and biomass in the commercial and residential sector, and policies and measures in the building sector and the non-energy sectors.

Annex II**Acronyms and abbreviations**

CAFÉ	Clean Air for Europe	IPCC	Intergovernmental Panel on Climate Change
CGAP	Code of Good Agricultural Practice	IPPC	Integrated Pollution Prevention and Control
CH ₄	methane	kg	kilogram (1 kg = 1 thousand grams)
CHP	combined heat and power	JI	joint implementation
CO ₂ eq	carbon dioxide equivalent	LULUCF	land use, land-use change and forestry
CO ₂	carbon dioxide	Mg	megagram (1 Mg = 1 tonne)
CRF	common reporting format	Mtoe	millions of tonnes of oil equivalent
EC	European Community	MAED	Model of Analysis of Energy Demand
ECCP	European Climate Change Programme	N ₂ O	nitrous oxide
EMEP	Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe	NC2	second national communication
ERT	expert review team	NC3&4	third and fourth national communication
ET	emissions trading	NEEP	National Energy Efficiency Programme
ETS	emissions trading scheme	NES	National Energy Strategy
EU	European Union	NGO	non-governmental organization
GDP	gross domestic product	NPP	nuclear power plant
GEF	Global Environment Facility	NSDS	National Sustainable Development Strategy
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs and SF ₆ without GHG emissions and removals from LULUCF	PFCs	perfluorocarbons
GWP	global warming potential	PPP	purchasing power parities
HELCOM	Baltic Marine Environment Protection Commission Programme	RDP	Report demonstrating progress under the Kyoto Protocol
HFCs	hydrofluorocarbons	REC	Regional Environmental Center
IAEA	International Atomic Energy Agency	RES	renewable energy sources
ICPIM	International Cooperative Programme on Integrated Monitoring	SF ₆	sulphur hexafluoride
IDR	in-depth review	Tg	teragram (1 Tg = 1 million tonnes)
IEA	International Energy Agency	toe	tonnes of oil equivalent
IIASA	International Institute for Applied Systems Analysis	TPES	total primary energy supply
		UNDP	United Nations Development Programme
		UNFCCC	United Nations Framework Convention on Climate Change
