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

*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 reflects the results of the in-depth review of the fourth national communication of Latvia 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. Latvia has been a Party to the UNFCCC since 1995 and to its Kyoto Protocol since 2002. Under the Kyoto Protocol, Latvia committed itself to reducing its greenhouse gas (GHG) emissions by 8 per cent compared to the base year level during the first commitment period from 2008 to 2012. Latvia's base year under the Kyoto Protocol is 1995 for fluorinated gases and 1990 for all other GHGs.
2. This report covers the centralized in-depth review (IDR) of the fourth national communication (NC4) of Latvia, coordinated by the UNFCCC secretariat, in accordance with decision 7/CP.11. The review took place from 15 to 21 October 2006 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Imran Habib Ahmad (Pakistan), Mr. Mohamed El Raey (Egypt), Mr. Domenico Gaudio (Italy), Mr. Niklas Höhne (Germany), Mr. Normand Tremblay (Canada) and Mr. Paulus Agus Winarso (Indonesia). Mr. El Raey and Mr. Gaudio 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 Latvia's report demonstrating progress (RDP) in achieving its commitments under the Kyoto Protocol, and the supplementary information provided by Latvia under Article 7, paragraph 2, of the Kyoto Protocol.
4. In accordance with relevant provisions for review under the Convention and 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 Latvia, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

### B. Summary

5. The ERT noted that Latvia's NC4 complies in general with the UNFCCC reporting guidelines.<sup>1</sup> The RDP provides detailed information on the progress made by Latvia in achieving its commitments under the Kyoto Protocol. Supplementary information under Article 7, paragraph 2, of the Kyoto Protocol<sup>2</sup> is provided in both the NC4 and the RDP.

#### 1. Completeness

6. The ERT noted that the NC4 covers all sections required by the UNFCCC reporting guidelines. The ERT also noted that Latvia's RDP contains all parts stipulated by decisions 22/CP.7 and 25/CP.8. Furthermore, the ERT noted that Latvia has provided the supplementary information required under Article 7, paragraph 2, except for two reporting elements (see section III.B below).

#### 2. Timeliness

7. The NC4 and the RDP were both submitted on 24 May 2006. Decision 4/CP.8 requested the submission of the NC4 by 1 January 2006, and decision 22/CP.7 set the same date for Parties to submit their RDPs.

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<sup>1</sup> "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.

<sup>2</sup> Decision 15/CMP.1, annex, chapter II (FCCC/KP/CMP/2005/8/Add.2).

### 3. Transparency

8. The ERT acknowledged that Latvia's NC4 is comprehensive. The NC4 provides information on all aspects of implementation. It is structured following the outline contained in the annex to the UNFCCC reporting guidelines. In the course of the review, the ERT formulated a number of recommendations that could help Latvia to further increase the transparency of its reporting, for example, by providing more detailed information on activities within the land use, land-use change and forestry (LULUCF) sector. The review team noted that the information contained in the NC4 and the RDP is consistent.

## II. Technical assessment of the reviewed elements

### A. National circumstances relevant to greenhouse gas emissions and removals

9. In its NC4, Latvia has provided a description of its national circumstances, how these circumstances affect GHG emissions and removals in Latvia, and how national circumstances and changes in these circumstances affect GHG emissions and removals over time. The ERT noted that the most important drivers of emission trends in Latvia include the process of transition from a centrally planned towards a market economy, demographic developments (a considerable decline in population), the process of accession to and integration into the European Union (EU), trends in overall economic activity (strong growth in gross domestic product (GDP) and in foreign direct investment) and a reduction in total primary energy supply (TPES), partly due to improvements in energy efficiency. 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 Latvia**

	1990 <sup>a</sup>	1995	2000	2004	Change <sup>a</sup> 1990–2000 (%)	Change 2000–2004 (%)	Change <sup>a</sup> 1990–2004 (%)
Population (million)	2.632	2.515	2.372	2.313	-9.9	-2.5	-12.1
GDP (billion USD 2000 PPP)	15.035	14.422	18.748	24.770	24.7	32.1	64.7
TPES (Mtoe)	5.909	4.638	3.888	4.598	-34.2	18.3	-22.2
GDP per capita (thousand USD 2000 PPP)	5.712	5.734	7.904	10.709	38.4	35.5	87.5
TPES per capita (toe)	2.245	1.844	1.639	1.988	-27.0	21.3	-11.4
GHG emissions without LULUCF (Tg CO <sub>2</sub> eq)	25.893	12.184	9.929	10.746	-61.7	8.2	-58.5
GHG emissions with LULUCF (Tg CO <sub>2</sub> eq)	5.223	-5.465	-4.181	-3.158	-180.1	-24.5	-160.5
CO <sub>2</sub> emissions per capita (Mg)	7.066	3.500	2.912	3.236	-58.8	11.1	-54.2
CO <sub>2</sub> emissions per GDP unit (kg per USD 2000 PPP)	1.237	0.610	0.368	0.302	-70.2	-18.0	-75.6
GHG emissions per capita (Mg CO <sub>2</sub> eq)	9.838	4.845	4.186	4.646	-57.5	11.0	-52.8
GHG emissions per GDP unit (kg CO <sub>2</sub> eq per USD 2000 PPP)	1.722	0.845	0.530	0.434	-69.2	-18.1	-74.8

*Sources:* GHG emissions data are from Latvia's 2006 inventory submission; population, GDP and TPES data are from the IEA. In the absence of IEA data for 1990, data for 1992 were used instead.

*Note 1:* 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.

*Note 2:* For the abbreviations used, see annex II.

<sup>a</sup> For emissions, base year data are used instead of 1990 data, whereas GDP, TPES and population data are for 1992, which leads to some inconsistency in the calculation of GHG emissions per capita and per GDP unit (see paragraph 1).

10. Latvia has provided summary information on GHG emission trends for the period 1990–2003. This information is consistent with the 2005 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide (CO<sub>2</sub>) equivalent (given in the common reporting format (CRF)), are also provided in an annex to the NC4.

11. Total GHG emissions excluding emissions and removals from LULUCF decreased by 58.5 per cent between the base year and 2004, whereas total GHG emissions including net emissions/removals from LULUCF decreased by 160.5 per cent (see table 2). This was mainly attributed to CO<sub>2</sub> emissions, which decreased by 59.8 per cent over this period. Emissions of methane (CH<sub>4</sub>) and

nitrous oxide (N<sub>2</sub>O) also decreased, by 47.6 and 62.2 per cent, respectively. A major part of these decreases was experienced during the first half of the 1990s (trend for total GHG emissions during the period 1990–1995: –52.8 per cent), reflecting the major changes Latvia experienced during the transition process. Emissions of fluorinated gases accounted for about 0.005 per cent of total national GHG emissions in the base year (1995) and 0.2 per cent in 2004. Table 2 provides an overview of GHG emissions by sector from the base year to 2004 (see also the discussion of sectoral trends in section II.B below).

**Table 2. Greenhouse gas emissions by sector for Latvia, 1990–2004**

	GHG emissions (Tg CO <sub>2</sub> equivalent)					Change (%)		Shares <sup>a</sup> by sector (%)	
	1990 <sup>b</sup>	1995	2000	2003	2004	1990 <sup>b</sup> –2004	2003–2004	1990 <sup>b</sup>	2004
1. Energy	18.690	9.196	7.206	7.740	7.778	–58.4	0.5	72.2	72.4
A1. Energy industries	8.614	3.317	2.471	2.287	2.107	–75.5	–7.9	33.3	19.6
A2. Manufacturing industries and construction	3.731	2.091	1.204	1.132	1.085	–70.9	–4.1	14.4	10.1
A3. Transport	2.585	1.959	2.276	2.802	2.897	12.1	3.4	10.0	27.0
A4–5. Other	3.487	1.610	1.089	1.387	1.559	–55.3	12.4	13.5	14.5
B. Fugitive emissions	0.274	0.219	0.167	0.132	0.130	–52.4	–1.1	1.1	1.2
2. Industrial processes	0.526	0.168	0.202	0.247	0.266	–49.5	7.6	2.0	2.5
3. Solvent and other product use	0.056	0.046	0.049	0.054	0.055	–0.7	2.3	0.2	0.5
4. Agriculture	5.939	2.129	1.728	1.907	1.859	–68.7	–2.5	22.9	17.3
5. LULUCF	–20.670	–17.650	–14.110	–13.635	–13.905	–32.7	2.0	–79.8	–129.4
6. Waste	0.683	0.645	0.743	0.757	0.787	15.3	4.0	2.6	7.3
GHG total with LULUCF	5.224	–5.465	–4.181	–2.930	–3.158	–160.5	7.8	–	–
GHG total without LULUCF	25.894	12.184	9.929	10.705	10.746	–58.5	0.4	–	–

*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.

<sup>a</sup> 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.

<sup>b</sup> Base year data are used instead of 1990 data (see paragraph 1).

12. In 2004, transport was the main contributor to total GHG emissions (27.0 per cent), followed by energy industries (19.6 per cent), agriculture (17.3 per cent) and energy use in other sectors (14.5 per cent). Net removals from LULUCF amounted to 13.9 Tg CO<sub>2</sub> equivalent and more than compensated for total GHG emissions of 10.7 Tg CO<sub>2</sub> equivalent from the other sectors.

## B. Policies and measures

13. In its NC4, Latvia has provided comprehensive information on its package of implemented, adopted and planned policies and measures. Each sector has its own textual description of the principal policies and measures, supplemented by summary tables on policies and measures by sector. However, the ERT noted that Latvia has not provided the following reporting elements required by the UNFCCC reporting guidelines: estimated mitigation effects of individual policies and measures (paragraph 17 and footnote a to table 1); and information on how Latvia believes its policies and measures are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention (paragraph 25).

14. In the absence of estimated effects of individual policies and measures, the ERT was unable to review the mitigation impacts of these policies and measures. The ERT recommends the Party to follow the UNFCCC reporting guidelines and provide complete and transparent information on the mitigation effect of individual policies and measures in the relevant chapter of its next national communication. Table 3 provides a summary of the information reported on Latvia's policies and measures.

**Table 3. Summary information on policies and measures**

<b>Major policies and measures</b>	<b>Examples / comments</b>
<b>Framework policies and cross-sectoral measures</b>	
Climate Change Mitigation Programme 2005–2010	National climate change strategy
Emissions trading	Transposition of the EU ETS Directive (2003/87/EC) into national legislation
Kyoto Protocol flexibility mechanisms	Liepaja municipal waste management project under implementation and other JI projects planned in the near future, e.g. biogas collection in farms
<b>Energy sector</b>	
Promotion of renewable energy sources (RES)	A policy mix based on standards, tariff policy, subsidies and information that was adopted to increase the share of RES in TPES. The policy mix includes:
Biogas Generation and Development Programme	Promotion of biogas use, pilot project to generate biogas from by-products in 2006
Energy Law	Promotion of small hydropower plants through guaranteed feed-in tariffs during the period 2003–2011 at double the average tariff for electricity
Support for wind power generation	New regulation on the establishment of wind farms
Promotion of solar energy use	Dissemination of information on the implementation of pilot projects
Increase of efficiency in energy industry	Energy-efficiency projects in thermal energy generation and transmission, construction of CHP generation plants
Increase of energy performance of buildings	Projects involving end-users to reduce energy consumption in the residential sector
<b>Transport</b>	
Law on Biofuels	Support for the production of biofuels and the promotion of biofuel use. Directive 2003/30/EC sets a target for biofuels of 5.75 per cent of TPES in the transport sector by 2010
Optimization of traffic flow in cities	Improve the penetrability of streets and provide a competitive public transport system
Riga Traffic Concept for 1999–2003	Facilitation of public transport use in Riga through the renovation of the rolling-stock, development of the infrastructure of the stops and passenger transport
National Development Programme for Bicycle Transport for 1999–2015	Development of bicycle transport infrastructure through training and dissemination of information
<b>Industry</b>	
Integrated pollution prevention and control (IPPC)	Transposition of the EU IPPC Directive (96/61/EC) (adoption of best available technologies and cleaner production methods)
Establishment of environmental and energy management systems	Transposition of EMAS – EU Regulations (EEC) nos 1836/93 and 761/2001
<b>Agriculture</b>	
Manure management	Improve manure management facilities and animal rearing farms
Good agricultural practices	Promote sustainable use of agricultural resources and good agricultural practices
<b>Waste management</b>	
Renewal of waste management facilities	Development of 11 comprehensive waste management projects
Recycling of packaging waste	Promote the recycling of packaging waste through partial refund of the tax on natural resources
<b>Forestry</b>	
Law on Protected Belts, Law on Specially Protected Areas	Forest conservation through restrictions on other activities
Improvement in the management of existing forests	Financial support to investment projects
Afforestation of abandoned agricultural land	Direct payments

Note: For the abbreviations used, see annex II.

### 1. Policy framework and cross-sectoral measures

15. **Institutional arrangements.** The Ministry of the Environment is responsible for the coordination of all national activities to ensure that Latvia complies with its obligations under the Convention and the Protocol. Since the emissions mitigation policy covers most sectors of the economy, a number of other ministries play an important role in the development and implementation of mitigation policies and measures, including the ministries of Foreign Affairs, Economic Affairs, Agriculture, Transport, Education and Science, Finance, Regional Development and Local Government, and the state Housing Agency.

16. In response to a question raised by the ERT during the review, Latvia clarified that its mechanism for coordinating the development and implementation of climate change policies and

measures was established by the Cabinet of Ministers Ordinance no. 220 approving the Climate Change Mitigation Programme 2005–2010. Following a decision by the Cabinet of Ministers, this programme is subject to revision every two years.

17. The main objective of the Climate Change Mitigation Programme 2005–2010 is to ensure that the commitment made under the Kyoto Protocol is achieved at the end of the first commitment period (2012), with a focus on: the implementation of policies and measures, such as an increase in the share of renewable energy sources (RES) in the national energy balance; more efficient and rational use of energy resources; the development of an environmentally friendly transport system; and participation in the EU emissions trading scheme (EU ETS) and the Kyoto Protocol flexibility mechanisms.

18. **Policy mix and priorities.** In order to effectively implement policies and measures and to monitor progress in achieving its mitigation targets, Latvia uses a wide mix of policy instruments, including regulations (e.g. environmental impact assessment procedures, environmental permits and standards, restrictions and prohibitions); economic and fiscal instruments (a natural resources tax, an excise tax for energy resources, user's charges (tariffs)); and voluntary agreements and public awareness raising.

19. The ERT noted the emphasis Latvia puts on promoting the production and use of biomass and biofuels as substitutes for fossil energy resources in the national energy balance. The NC4 reports that Latvia's dependence on energy imports was reduced from 86 per cent of TPES in 1990 to 69 per cent in 2004, mainly as a result of increased use of fuel wood.

20. **EU legislation.** As an EU member State, Latvia is bound by EU legislation, and the EU Climate Policy is a main driver for national policy making in the field of climate change. The EU directives that have been transposed into national law include Directive 2991/77/EC on the promotion of electricity from RES, Directive 2003/30/EC on the promotion of the use of biofuels for transport, and Directive 2003/87/EC on the EU ETS, which started in 2005.

21. The main objective of the EU ETS is to provide a cost-effective means for EU member States to meet their Kyoto Protocol targets. For the first phase of the EU ETS, during the three years 2005–2007, a total of 13,706,012 emission allowances<sup>3</sup> will be issued by Latvia, and 91 major installations in the energy industry and industrial processes sectors are covered. Installations with smaller production capacities or lower output may opt to participate in the EU ETS on a voluntary basis. Latvia estimates the mitigation effect of national implementation of the EU ETS at 260 Gg CO<sub>2</sub> equivalent for the period 2005–2007.

22. **International cooperation.** Latvia has signalled interest in proceeding with the development and implementation of joint implementation (JI) projects in Latvia. In 2002 it adopted the Concept on the Implementation of JI Projects under the Kyoto Protocol to the United Nations Framework Convention on Climate Change, 2002–2012, and the Strategy for JI Projects under the Kyoto Protocol to the United Nations Framework Convention on Climate Change for 2002–2012.

## 2. Policies and measures in the energy sector

23. In 2004, GHG emissions from the energy sector accounted for 72.4 per cent of total emissions (see table 2). Within the energy sector, transport (27.0 per cent of total national GHG emissions) and energy industries (19.6 per cent) were the largest contributors, followed by energy use in other sectors (14.5 per cent), manufacturing industries and construction (10.1 per cent), and fugitive emissions (1.2 per cent). During the period 1990–2004, sectoral emissions decreased by 58.4 per cent, mainly due to the transition process and a considerable reduction in fuel consumption in industry.

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<sup>3</sup> Including 1,572,037 emission allowances for new entrants that would start operation after 2005.

24. Between 1990 and 2004, GHG emissions from energy industries decreased by 75.5 per cent, mainly driven by a significant reduction in energy demand, an increase in energy efficiency, and a transformation of the fuel structure (fuel switching from liquid fuels to natural gas and biomass). Over the same period, GHG emissions from fuel combustion in transport increased by 12.1 per cent, by much less than the increase in the number of registered passenger cars and heavy-duty vehicles (by 95.5 per cent and 52.2 per cent, respectively, between 1990 and 2003).

25. Latvia's energy-related policies and measures can be divided into three categories: increasing the share of RES in TPES; the promotion of an efficient and rational use of energy resources; and the development of an environmentally friendly transport system.

26. **Increasing the share of renewable energy sources.** The objective is to increase both the total amount of installed capacity and the shares of all types of RES power generation. Over the period 1990–2004, consumption of domestic RES (mainly fuel wood) in Latvia increased by 56.8 per cent (from 44 to 69 PJ). In 2003, RES was already contributing more than one-third (34.2 per cent) to TPES. Key measures in this field include the promotion of the production of all types of RES, including biomass, biofuels, biogas, electricity generation from small hydropower plants, wind and solar energy, and the promotion of the use of biomass and biofuels. During the review the ERT was informed that, in October 2006, the Cabinet of Ministers adopted a Strategy on Renewable Energy Sources for 2006–2013. Four months earlier, it adopted the Strategy on Energy Development for 2007–2016, which also puts emphasis on renewable energy sources.

27. **Promotion of the efficient and rational use of energy resources.** As a signatory to the European Energy Charter, Latvia is committed to increase its overall energy efficiency in every phase of the energy cycle. In order to promote energy performance measures, Latvia approved the National Energy Efficiency Strategy in 2000. The aim of this strategy is to establish a set of energy efficiency measures to reduce the energy intensity of the economy (measured in TPES per unit of GDP) by 25 per cent up to 2010. Key measures in this field include support for the construction of combined heat and power (CHP) plants, energy efficiency projects, and projects for improving the energy performance of buildings.

28. **Combined heat and power.** The share of (public and private) CHP in thermal energy production increased from 23 per cent in 1990 to 48 per cent in 2004. The NC4 reports that a total of 23 projects to increase energy efficiency in energy generation and transmission were implemented in Latvia over the four years 2000–2003, including 19 environmentally friendly heat supply projects whereby fossil fuels were substituted by biomass, biofuels or biogas, thermal energy distribution systems were renovated, and new boiler-houses were constructed. The implementation of these projects resulted in considerable reductions in GHG emissions over the period 2000–2003, with no adverse effect on the availability or the quality of the service. The NC4 reports an ex post estimate for the mitigation effect of these projects of 95 Gg CO<sub>2</sub> equivalent per year.

29. **Development of an environmentally friendly transport system.** In 2004, transport policy in Latvia focused on ways of limiting the use of cars in cities as well as ways to improve the public transport system in cities such as the capital Riga. Key measures in this sector included the optimization of traffic flows in cities and the prioritization of public transport above motorized individual transport in the centre of Riga through implementation of the Riga Traffic Concept for 1999–2003. In February 2005, the Riga City Council approved the Riga Traffic Concept for 2005–2018, encompassing measures to further enhance the operation of urban public transport by the years 2010 and 2018.<sup>4</sup>

30. The ERT commended Latvia for its ambitious plans and activities to promote RES and energy efficiency, and encourages the Party to ensure high-quality monitoring and evaluation of the progress

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<sup>4</sup> Further information on the Riga Traffic Concept for 2005–2018 is available at <<http://www.mfa.gov.lv/en/news/Newsletters/CurrentLatvia/2005/february/595/>>.

made in implementing them over time. The ERT noted, however, that the current portfolio of transport-related policies and measures is less ambitious, and encourages Latvia to address this sector more comprehensively, as it has the highest share in total national GHG emissions (27.0 per cent) and the highest growth in GHG emissions (12.1 per cent over the period 1990–2004).

### 3. Policies and measures in other sectors

31. In 2004, the non-energy sectors accounted for 27.6 per cent of total national GHG emissions, comprising emissions from agriculture (17.3 per cent), waste (7.3 per cent) and industrial processes (including solvent use) (3.0 per cent). Net removals from LULUCF more than compensated for total GHG emissions from the other sectors and equalled 129.4 per cent of total GHG emissions. Between the base year and 2004, GHG emissions from industrial processes (including solvent and other product use) and agriculture decreased by 44.7 per cent and 68.7 per cent, respectively, whereas emissions from waste increased by 15.3 per cent. Net removals from LULUCF decreased by 32.7 per cent over the same period.

32. **Industrial processes.** The ERT noted that the decrease in sectoral emissions is mainly the result of the decline in industrial output and the overall restructuring of industry in the country. Sectoral policies and measures include the 2001 Law On Pollution, which regulates the environmental impact of industrial enterprises through the issuing of integrated pollution permits. This system of permits promotes and stimulates the implementation of best available technologies, environmentally friendly technologies and cleaner production systems. Moreover, in 2003, the Baltic States and Poland initiated the Green Industry programme, which combines environmental management systems (e.g. ISO 14001 or EMAS) with energy management systems into an integrated energy and environment management system. Financed by the Norwegian Ministry of Foreign Affairs, the programme is managed by the Norwegian Energy-Efficiency Group (NEEG).

33. **Agriculture.** The ERT noted that the decrease in sectoral emissions was mainly due to the transition process and the resulting reduced agricultural activity. Policies and measures in the sector include national regulations to promote improved manure management facilities and animal rearing farms. Since 2001, EU pre-accession measures for agriculture and rural development have supported the promotion of the sustainable use of agricultural resources and of good agricultural practices. Funding is now available from the Rural Development Plan, approved by the European Commission in 2004.

34. **Forestry.** The long-term objectives and principles of the forestry development strategy are stated in the Latvian Forest Policy, approved in 1998. The task of the forest policy is to balance community interest with the benefits of economic development, by creating favourable conditions for economic development while at the same time preserving the ecological value of forest and its capacity to perform a social function. The main principles of sustainable forest management are analysed in several programmes and projects that have been developed in recent years, including the National Program of Biological Diversity, and the Law on Forest and associated secondary legislation provide for their implementation.

35. To promote these objectives and principles, Latvia uses a mix of instruments, including restrictions for other activities (the Law on Protected Belts, and the Law on Specially Protected Areas), financial support to investment projects for improved management of existing forests (tree nurseries, ameliorations), and direct payments for the afforestation of abandoned agricultural land. Although the NC4 provides extensive information on forestry issues, the ERT was unable to analyse the role of the LULUCF sector in the national climate strategy. The ERT recommends Latvia to provide clear and detailed information on its LULUCF activities under the Kyoto Protocol, starting from the supplementary information required under Article 7, paragraph 2, for the implementation of the provisions of Article 3, paragraphs 3 and 4, of the Kyoto Protocol (see also section III.B).

36. **Waste management.** The ERT noted that an increase in the amount of waste being disposed on anaerobic landfills may explain the increase in sectoral emissions. In accordance with the National Plan for Waste Management for 2003–2012, several municipal waste management projects are being implemented, partly funded through the EU Cohesion Fund (previously also the Instrument for Structural Policies for pre-Accession resources). In various regions of the country, 11 waste management projects have been developed to improve existing facilities, promote separated collection and recycling, and collect biogas from landfills. The recycling of packaging waste is promoted through an 80 per cent refund of the natural resources tax. At the municipal level, efforts have been undertaken to rehabilitate small dump sites which do not meet environmental requirements.

### C. Projections and the total effect of policies and measures

#### 1. Projections

37. The GHG emission projections provided by Latvia in the NC4 include a “with measures” and a “with additional measures” scenario up to 2020, and are presented relative to actual inventory data for the period 1990–2003. Projections are presented on a sectoral basis, using the same sectoral categories as are used in the policies and measures section, and on a gas-by-gas basis for CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF<sub>6</sub>). In addition, projections are provided in an aggregated format for each sector as well as for a national total, using global warming potential (GWP) values. However, the ERT noted that Latvia has not provided the following reporting elements required by the UNFCCC reporting guidelines: projections for perfluorocarbons (PFCs) (paragraph 35); and emission projections related to fuel sold to ships and aircraft engaged in international transport, which are reported separately and not included in the totals (paragraph 36). In response to questions raised by the ERT during the review, Latvia provided projections for international transport for the years 2010, 2015 and 2020, and clarified that PFCs have never been used and are not expected to be used or produced in Latvia. Table 4 and figure 1 provide a summary of the GHG emission projections for Latvia.

38. Latvia based its projections on long-term macroeconomic projections developed by the Ministry of Economics. Energy-related emissions were prepared using the MARKAL model, a technology-oriented bottom-up optimization model for the national energy system. Projections of emissions from other sectors were prepared using a variety of approaches, ranging from statistical analysis and trend extrapolation to detailed analysis of future production of various products.

**Table 4. Summary of greenhouse gas emission projections for Latvia**

	GHG emissions (Tg CO <sub>2</sub> equivalent per year)	Changes compared to base year level (%)
Inventory data 1990 <sup>a</sup>	25.9	0.0
Inventory data 2004 <sup>a</sup>	10.7	-58.5
Kyoto Protocol base year <sup>b</sup>	25.3	0.0
Kyoto Protocol target	23.3	-8.0
“With measures” projections for 2010 <sup>b</sup>	13.7	-46.1
“With additional measures” projections for 2010 <sup>b</sup>	13.0	-48.6

<sup>a</sup> Source: Latvia’s 2006 GHG inventory submission; the emissions are without LULUCF.

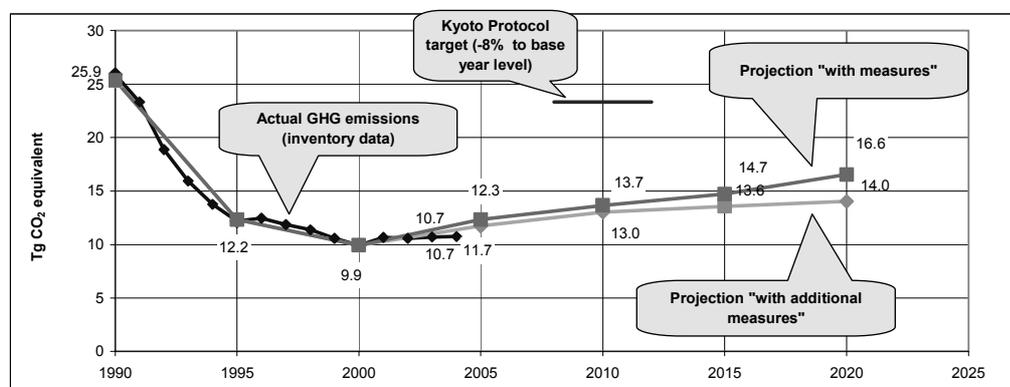
<sup>b</sup> Source: Latvia’s NC4; the projections are for GHG emissions without LULUCF.

Note: For the abbreviations used, see annex II.

39. The ERT noted that Latvia’s total GHG emissions projected for 2010 are well below its Kyoto Protocol target for the first commitment period. Emissions more than halved during the period 1990–2003 and are projected to be 10–12 per cent above 2003 levels in 2010. The projected increase during the period 2003–2010 is mainly due to increases in emissions from energy use, in particular energy use in transport.

40. Emissions from international transport decreased by 57.5 per cent over the period 1990–2004 and, according to the “with measures” scenario provided by Latvia during the review, are projected to decrease continuously, to 93.7 per cent below the 1990 level by 2010.

**Figure 1. Greenhouse gas emission projections for Latvia**



Source: Latvia’s NC4; the projections are for GHG emissions without LULUCF.

41. The ERT recommends Latvia to provide projections for PFCs, as required by the UNFCCC reporting guidelines (paragraph 35), and to provide emission projections related to fuel sold to ships and aircraft engaged in international transport, reported separately, in its next national communication.

#### 4. Total effect of policies and measures

42. In its NC4, Latvia presents the estimated and expected total effect of planned policies and measures. It also presents relevant information on factors and activities for each sector for the years 1990–2020. However, the ERT noted that Latvia has not provided the following reporting elements required by the UNFCCC reporting guidelines: the estimated and expected total effect of implemented and adopted policies and measures (paragraph 39); and an estimate of the total effect of its policies and measures, in accordance with the “with measures” definition, compared to a situation without such policies and measures, presented in terms of GHG emissions avoided or sequestered, by gas (on a CO<sub>2</sub> equivalent basis), in 1995 and 2000 (paragraph 40). Table 5 provides an overview of the total effect of policies and measures as reported by Latvia.

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

	Effect of implemented and adopted measures (Gg CO <sub>2</sub> equivalent)	Relative value (% of base year emissions)	Effect of planned measures (Gg CO <sub>2</sub> equivalent)	Relative value (% of base year emissions)
Energy (without transport)	NA	NA	48.0	0.3
Transport	NA	NA	661.0	26.0
Industrial processes	NA	NA	0.0	0.0
Solvents	NA	NA	0.0	0.0
Agriculture	NA	NA	-75.0	-1.5
Waste	NA	NA	9.0	1.1
<b>Total</b>	NA	NA	<b>643.0</b>	<b>2.5</b>
Land use change and forestry	NA	NA	-113.0	-0.6

Source: Latvia’s NC4.

Note 1: The ERT assumed that the total effect of planned policies and measures is the difference between the “with measures” and “with additional measures” scenarios.

Note 2: For the abbreviations used, see annex II.

43. The total effect of planned policies and measures equals 2.5–2.8 per cent of base year emissions. More than 90 per cent of this total effect is attributed to measures in the transport sector. The ERT noted

that these measures aim to slow the increase in sectoral emissions projected for the period 1990–2010 from 57.7 per cent (under the “with measures” scenario) to 31.6 per cent (under the “with additional measures” scenario). The ERT noted that negative values, as shown in table 5 above, for projected effects of planned measures in agriculture (–75.0 Gg CO<sub>2</sub> equivalent) and LULUCF (–113.0 Gg CO<sub>2</sub> equivalent) result from several factors, including increased production and use of domestic bioenergy and afforestation of ‘unmanaged agricultural land’ or ‘unconventional land’.

44. The ERT recommends that Latvia report the effect of its implemented policies and measures in its next national communication.

#### D. Vulnerability assessment, climate change impacts and adaptation measures

45. In the NC4, Latvia provides some information on the expected impacts of climate change in the country. However, the ERT noted that Latvia has not provided an outline of the action taken to implement Article 4, paragraph 1(b) and (e), with regard to adaptation (paragraph 49). Latvia’s vulnerability to a changing climate is only presented for coastal zones and vegetation (see table 6).

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

Vulnerable area	Examples / comments / adaptation measures reported
Coastal zones	<b>Vulnerability:</b> Increase of sea level in the coastal areas and consequently overflowing and erosion of the coastal zone <b>Adaptation:</b> NA
Vegetation	<b>Vulnerability:</b> Changes in vegetation. Rapid increase of the ratio of unstable forest pioneer stands (birch, aspen and grey alder) and the degradation of stable or so-called climax forest stands (stands of spruce, oak and ash) <b>Adaptation:</b> NA

Note: For the abbreviations used, see annex II.

46. The NC4 elaborates on the adverse impact of climate change on the factors on which it impacts, such as temperature, precipitation and the appearance of ice. However, the ERT noted that these impact assessments do not extend to an assessment of the vulnerability of the environment.

47. The NC4 states that Latvia, being aware of its vulnerability to the expected climate change impacts in the Baltic Sea region (changes in precipitation, temperature, river run-off, the ice regime and the growing period; increased frequency of severe storms and flooding; changes to flora and fauna, etc.), will develop a national adaptation programme. Given the country’s potentially high level of vulnerability, the ERT encourages Latvia to implement such a programme and to report on the outline of actions taken to implement Article 4, paragraph 1(b) and (e), with regard to adaptation, as required by the UNFCCC reporting guidelines (paragraph 49).

#### E. Research and systematic observation

48. The NC4 provides some information on Latvia’s activities relating to research and systematic observation, both on the domestic and on the international level. However, the ERT noted that Latvia has not provided summary information on its Global Climate Observing System (GCOS) activities (in accordance with paragraphs 59 and 64 of the UNFCCC reporting guidelines).

49. Research on technologies for the use of various alternative energy sources (biomass, solar, wind power) and on potential technological solutions to improve energy performance is carried out at the universities, research institutes, ministries and agencies, state environmental institutions, research and consulting companies, and non-governmental organizations. The NC4 states that research funding is very limited and is mainly provided from the government budget, the National Investment Programme and the Latvian Environmental Protection Fund, as well as international programmes and projects.

50. The Latvian Council of Science allocates funding for fundamental and applied research projects on an annual basis, thereby increasing the support to scientific research on climate change impacts and adaptation.

#### **F. Education, training and public awareness**

51. In the NC4, Latvia provides information on its actions relating to education, training and public awareness, as required by the UNFCCC reporting guidelines (paragraph 65).

52. Environmental education in Latvia has been developed at all levels. Relevant guidelines approved by the Ministry of Education and Science define environmental education as an interdisciplinary subject, integrated with other subjects. Some university curricula in Latvia cover subjects that identify and analyse processes related to climate change.

53. Access to environmental information and information on global climate change in Latvia is provided through the mass media, the Internet, non-governmental and international organizations, and special programmes dedicated to environmental issues. Public awareness and information campaigns are implemented with the help of both state institutions and non-governmental environmental organizations.

### **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**

54. Latvia's RDP includes all the sections required by decisions 22/CP.7 and 25/CP.8. However, the ERT noted that the following information has not been provided: its programmes for domestic compliance and enforcement; and a description of the activities, actions and programmes undertaken by the Party in fulfilment of its commitments under Article 10. The ERT found the information contained in the RDP to be consistent with that provided in the NC4.

55. The RDP and NC4 provide some information on Latvia's legislative arrangements in place and enforcement and administrative procedures. Pursuant to amendments in the Law On the Kyoto Protocol to the United Nations Framework Convention on Climate Change, the Cabinet of Ministers' draft Regulations on the Order in which the Project Mechanisms under the Kyoto Protocol to the United Nations Framework Convention on Climate Change are Developed, Approved, Implemented and Monitored have been elaborated. During the review the ERT was informed that, in February 2006, the Cabinet of Ministers adopted a regulation (no. 115) on this law. These regulations define the issues related to the implementation of JI and clean development mechanism (CDM) projects, including the procedures for assigning units specified in the Kyoto Protocol. The ERT noted that Latvia's total GHG emissions are projected to be well below its Kyoto Protocol target in 2010.

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

56. Latvia has provided most of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol in its NC4 and RDP. This information reflects the steps taken by Latvia to implement the relevant provisions of the Kyoto Protocol. The supplementary information is placed in different sections of the NC4 and the RDP. Table 8 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**

<b>Supplementary information</b>	<b>Reference</b>
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	RDP, pp. 21–22
Policies and measures in accordance with Article 2	RDP, pp. 22–23 NC4, pp. 68–69
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	NC4, pp. 69–71; RDP, pp. 22–23
Information under Article 10	RDP, p. 51
Financial resources	not applicable <sup>a</sup>

<sup>a</sup> As an EIT country, Latvia 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.

57. The ERT noted that Latvia has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: a description of the national registry; and 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 Latvia include these reporting elements in its next national communication.

#### IV. Conclusions

58. During the period 1990–2004, total GHG emissions in Latvia, excluding emissions and removals from LULUCF, decreased by 58.5 per cent. A major part of these decreases was experienced during the first half of the 1990s (trend for total GHG emissions during the period 1990–1995: –52.8 per cent), reflecting the major changes experienced by Latvia during the process of transition towards a market economy. Net removals from LULUCF accounted for 80 per cent of total GHG emissions from the other sectors in 1990, and more than compensated for total GHG emissions from other sectors in 2004.

59. In the NC4 and RDP, Latvia presents GHG projections for the period 2003–2020 in a “with measures” and a “with additional measures” scenario. Under both scenarios, Latvia’s emissions are projected to be well below its Kyoto Protocol target in 2010. Total GHG emissions more than halved between 1990 and 2003 and are projected to be 10–12 per cent above the 2003 level in 2010. The ERT therefore noted that Latvia is likely to meet its Kyoto Protocol target (see paragraph 1) under all scenarios, as GHG emissions are not expected to exceed the Kyoto Protocol target for the first commitment period even by 2020.

60. Nevertheless, Latvia intends to slow the more recent increase in emissions from transport and energy use in other sectors, mainly through the introduction and promotion of biomass and biofuels, which is seen as an ambitious but viable option, given the large agricultural and forest resources in the country.

61. In the course of the IDR, the ERT formulated a number of recommendations relating to the completeness and transparency of Latvia’s reporting under the Convention and its Kyoto Protocol. The key recommendations<sup>5</sup> are that Latvia provide, in its next national communication:

- Emission projections related to fuel sold to ships and aircraft engaged in international transport (separately);
- An estimate for the total effect of its implemented policies and measures;

<sup>5</sup> For a complete list of recommendations, the relevant sections of this report should be consulted.

- A description of the national registry and 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.

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 of Annex I Parties. FCCC/SBSTA/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 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. Report on the in-depth review of the third national communication of Latvia. FCCC/IDR.3/LVA. Available at <<http://unfccc.int/resource/docs/idr/LVA03.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. Report of the individual review of the greenhouse gas inventory of Latvia submitted in the year 2005. FCCC/ARR/2005/LVA. Available at <<http://unfccc.int/resource/docs/2006/arr/LVA.pdf>>.

Latvian Ministry of the Environment. Fourth National Communication of the Republic of Latvia under the United Nations Framework Convention on Climate Change. Available at <<http://unfccc.int/resource/docs/natc/latnc4.pdf>>.

Latvian Ministry of the Environment. Report of the Republic of Latvia on Demonstrable Progress under the Kyoto Protocol to the United Nations Framework Convention on Climate Change. Available at <<http://unfccc.int/resource/docs/dpr/lva1.pdf>>.

**B. Additional information provided by the Party**

Responses to questions during the review were received from Ms. Linda Leja (Ministry of the Environment) including projections for GHG emissions from international transport.

Annex II**Acronyms and abbreviations**

CDM	clean development mechanism	ISO	International Organization for Standardization
CH <sub>4</sub>	methane	JI	joint implementation
CHP	combined heat and power	kg	kilogram (1 kg = 1 thousand grams)
CO <sub>2</sub>	carbon dioxide	kWh	kilowatt hour
CO <sub>2</sub> eq	carbon dioxide equivalent	LULUCF	land use, land-use change and forestry
CRF	common reporting format	Mg	megagram (1 Mg = 1 tonne)
EC	European Community	mg	milligram (1000 mg = 1 gram)
EIT	economy in transition	Mtoe	millions of tonnes of oil equivalent
EMAS	Environmental Management and Audit Scheme	N <sub>2</sub> O	nitrous oxide
ERT	expert review team	NA	not available
ETS	emissions trading scheme	NC3	third national communication
EU	European Union	NC4	fourth national communication
GCOS	Global Climate Observing System	PFCs	perfluorocarbons
GDP	gross domestic product	PPP	purchasing power parities
GEF	Global Environment Facility	RDP	Report demonstrating progress under the Kyoto Protocol
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the weighted sum of CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFCs, PFCs and SF <sub>6</sub> without GHG emissions and removals from LULUCF	RES	renewable energy sources
GWP	global warming potential	SF <sub>6</sub>	sulphur hexafluoride
HFCs	hydrofluorocarbons	SO <sub>2</sub>	sulphur dioxide
IDR	in-depth review	Tg	teragram (1 Tg = 1 million tonnes)
IEA	International Energy Agency	toe	tonnes of oil equivalent
IPCC	Intergovernmental Panel on Climate Change	TPES	total primary energy supply
		UNFCCC	United Nations Framework Convention on Climate Change
		USD	US dollar

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