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Report of the centralized in-depth review of the fourth national communication of Belgium

According to decision 4/CP.8, Parties included in Annex I to the Convention are requested to submit to the secretariat, in accordance with Article 12, paragraphs 1 and 2, of the Convention, a fourth national communication by 1 January 2006. This report presents the results of the in-depth review of the fourth national communication of Belgium 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. Belgium has been a Party to the Convention since 1996 and to its Kyoto Protocol since 2002. Within the burden-sharing agreement of the European Union (EU) for meeting commitments under the Kyoto Protocol, Belgium committed itself to reducing its greenhouse gas (GHG) emissions by 7.5 per cent in relation to the 1990 level during the first commitment period from 2008 to 2012.

2. This report covers the centralized in-depth review (IDR) of the fourth national communication (NC4) of Belgium, coordinated by the UNFCCC secretariat, in accordance with decision 7/CP.11. The review took place from 12 to 17 May 2008 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Maryse Courchesne (Canada), Ms. Jane Ellis (Organisation for Economic Co-operation and Development), Ms. Fatou Ndeye Gaye (Gambia), Mr. Knut Vrålstad (Norway), Mr. Abdelkrim Ben Mohamed (Niger), Mr. Bhawan Singh (Trinidad and Tobago) and Mr. Vlad Trusca (Romania). Ms. Ellis and Mr. Ben Mohamed were the lead reviewers. The review was coordinated by Ms. Ruta Bubniene (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each part of the NC4. The ERT also evaluated the information contained in Belgium's report demonstrating progress (RDP) in achieving its commitments under the Kyoto Protocol, and the supplementary information provided by Belgium 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 Belgium, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The ERT noted that Belgium's NC4 broadly complies with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). As required by decisions 22/CP.7 and 25/CP.8, the RDP provides clear and detailed information on the progress made by Belgium in achieving its commitments under the Kyoto Protocol. Limited supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[1] is provided in the NC4. The ERT commended Belgium for its clear reporting.

1. Completeness

6. The ERT noted that the NC4 covers all sections required by the UNFCCC reporting guidelines and that Belgium's RDP contains all parts stipulated by decisions 22/CP.7 and 25/CP.8. Belgium has provided some of the supplementary information required under Article 7, paragraph 2, but has not provided information on its efforts to implement policies and measures (PaMs) in such a way as to minimize adverse effects.

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

2. Timeliness

7. The NC4 and the RDP were submitted on 23 December 2005. Decision 4/CP.8 requested Parties to submit their NC4 by 1 January 2006. Decision 22/CP.7 set the same date for Parties to submit their RDPs.

3. Transparency

8. The ERT acknowledged that Belgium's NC4 is well structured and provides clear information on all aspects of implementation of the Convention. It is structured following the outline contained in the annex to the UNFCCC reporting guidelines. In the course of the IDR, the ERT formulated a number of recommendations that could help Belgium to further increase the transparency of its reporting, such as a recommendation to quantify the effect of the PaMs described. The review team noted that the information contained in the NC4 is consistent with that contained in the RDP.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals

9. In its NC4, Belgium has provided a description of its national circumstances and how these national circumstances affect GHG emissions and removals in Belgium. It has also described how national circumstances and changes in national circumstances affect GHG emissions and removals over time, although the ERT encourages Belgium to provide more detailed analysis on these changes.

10. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals. The ERT noted that the main drivers of emission trends in Belgium includes:

(a) Demographic developments (high and increasing population density, increase in the number of households, an ageing society, increase in urban population);

(b) Overall economic activity (increase in gross domestic product, growth in the road transport, residential, commercial, agriculture and waste sectors);

(c) Changes in primary energy use (switch from solid to gaseous fuels in all sectors, development of biomass fuels, rational use of energy);

(d) Increase in annual mean surface temperatures (decrease in a number of heating degree days).

11. Belgium has provided a summary of information on GHG emission trends by gas and by sector for the period 1990–2003. This information is consistent with the 2005 national GHG inventory submission. Summary tables, including trend tables for emissions by gas and by sector in carbon dioxide equivalent (CO_2 eq), using the common reporting format, are also provided in the NC4.

12. Total GHG emissions excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 5.2 per cent between the 1990 and 2006, and total GHG emissions including net emissions and removals from LULUCF decreased by 5.0 per cent (see table 2). Methane (CH_4) and nitrous oxide (N_2O) emissions decreased over the period 1990–2006 by 31.9 per cent and 16.9 per cent, respectively. The main GHG in Belgium is CO_2, which accounted for 81.2 per cent of the total GHG emissions in the base year and 86.2 per cent in 2006, and increased by 0.6 per cent between the base year and 2006. Emissions of perfluorocarbons, hydrofluorocarbons and sulphur hexafluoride (SF_6) (hereinafter referred to collectively as fluorinated gases) accounted for 3.1 per cent of total GHG emissions (excluding LULUCF) in 1990 and 1.3 per cent in 2006. GHG emissions in Belgium rose

during the 1990s, but have been dropping slowly since 2000. The most important factor is the decline in GHG emissions in the manufacturing industries, energy industries and waste sectors. Table 2 provides an overview of GHG emissions by sector from 1990 to 2006 (see also discussion of sectoral trends in chapter II B below).

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

	1990	1995	2000	2006	Change 1990–2000 (%)	Change 2000–2006 (%)	Change 1990–2006 (%)
Population (million)	9.97	10.14	10.25	10.54	2.8	2.9	5.7
GDP (2000 USD billion using PPP)	228.18	246.94	282.19	313.97	23.7	11.3	37.6
TPES (Mtoe)	49.72	55.88	61.89	60.98	24.5	–1.5	22.6
GDP per capita (2000 USD thousand using PPP)	22.89	24.36	27.54	29.79	20.3	8.2	30.1
TPES per capita (toe)	4.99	5.51	6.04	5.79	21.1	–4.2	16.0
GHG emissions without LULUCF (Tg CO_2 eq)	144.53	150.20	145.51	136.97	0.7	–5.9	–5.2
GHG emissions with LULUCF (Tg CO_2 eq)	143.10	148.81	143.96	135.91	0.6	–5.6	–5.0
CO_2 emissions per capita (Mg)	11.92	12.20	12.08	11.30	1.3	–6.5	–5.2
CO_2 emissions per GDP unit (kg per 2000 USD using PPP)	0.52	0.50	0.44	0.38	–15.8	–13.5	–27.1
GHG emissions per capita (Mg CO_2 eq)	14.50	14.82	14.20	13.00	–2.1	–8.5	–10.4
GHG emissions per GDP unit (kg CO_2 eq per 2000 USD using PPP)	0.63	0.61	0.52	0.44	–18.6	–15.4	–31.1

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

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

	GHG emissions (Tg CO_2 eq)					Change (%)		Shares[a] by sector (%)	
	1990	1995	2000	2005	2006	1990–2006	2005–2006	1990	2006
1. Energy	112.74	116.35	116.39	115.23	110.86	–1.7	–3.8	78.0	80.9
A1. Energy industries	30.17	29.79	28.38	29.39	27.69	–8.2	–5.8	20.9	20.2
A2. Manufacturing industries and construction	33.26	32.52	32.90	27.92	27.63	–16.9	–1.0	23.0	20.2
A3. Transport	20.60	22.63	24.91	26.55	26.10	26.7	–1.7	14.3	19.1
A4.– A5. Other	27.76	30.78	29.57	30.86	28.89	4.1	–6.4	19.2	21.1
B. Fugitive emissions	0.94	0.62	0.63	0.51	0.55	–41.8	7.1	0.7	0.4
2. Industrial processes	16.40	18.74	15.20	15.17	14.46	–11.9	–4.7	11.3	10.6
3. Solvent and other product use	0.25	0.24	0.25	0.25	0.25	1.1	–0.2	0.2	0.2
4. Agriculture	11.75	11.85	1.35	10.28	10.18	–13.4	–0.9	8.1	7.4
5. LULUCF	–1.43	–1.39	–1.55	–0.37	–1.06	–25.9	186.6	–1.0	–0.8
6. Waste	3.40	3.02	2.32	1.42	1.22	–64.0	–13.7	2.3	0.9
GHG total with LULUCF	143.10	148.81	143.96	141.98	135.91	–5.0	–4.3	99.0	99.2
GHG total without LULUCF	144.53	150.20	145.51	142.35	136.97	–5.2	–3.8	100.0	100.0

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

B. Policies and measures

13. As required by the UNFCCC reporting guidelines, Belgium has provided in its NC4 well-organized information on its package of PaMs implemented, adopted and planned at federal and regional levels in order to fulfil its commitments under the Convention and its Kyoto Protocol.

Each sector has its own textual description of the principal PaMs relating to that sector. However, the ERT noted that Belgium has not provided the following reporting elements required by the UNFCCC reporting guidelines: summary tables on PaMs by sector; and information on how Belgium believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention. Information on which body is responsible for implementing PaMs was usually presented.

14. Climate change policy in Belgium evolved substantially between the publication of the third national communication and the NC4, and it has been developed further since the publication of the NC4. Several types of policy are used to mitigate GHG emissions, including regulations, financial incentives, voluntary or negotiated agreements, education and information. Table 3 provides a summary of the reported information on the PaMs of Belgium.

Table 3. Summary of information on policies and measures

Major policies and measures	Examples/comments
Framework policies and cross-sectoral measures	
Integrate climate programme	National Climate Plan 2002–2012; Federal Plan for Sustainable Development (2004–2008)
Taxation instruments	Green tax system for buildings, companies, and the transport and electricity sectors; reform of taxation system (shift from taxation of work towards taxation of resource consumption)
Emissions trading	European Union (EU) emissions trading scheme
Policies and measures by sector	
Energy	
Combined heat and power generation	Green certificates; tax deduction; demonstration projects; "awareness-raising events"
Renewable energy sources	Promotion of alternative energy sources (fiscal incentives, research and promotion of biofuels)
Energy efficiency improvements	Financial incentives for investment in energy efficiency; energy audits; public service obligations for electricity distribution grid operators; estimation of energy performance in buildings and energy efficiency certification of buildings; energy labelling for household appliances
Transport	
Environmental strategy for the motor vehicle industry	Improvement of the quality of public transport; promotion of public transport for daily mobility; promotion of bicycle use and car sharing; reduction in emissions from vehicles
Integrated transport planning	Improvement of multimodal systems (European Marco Polo Programme, Diabolo Plan); mobility plans at the local level; promotion of "eco-driving" to lessen emissions; traffic regulation and improvement of traffic flow on main roads; green procurement rules for public service vehicle fleets
Industrial processes	
Pollution prevention and control	"Branch agreements" – agreements with industrial sectors for reducing emissions or improving energy efficiency; inclusion of energy efficiency criteria in environmental permits; covenant to reduce nitrous oxide emissions from nitric acid production; regulations limiting the use of fluorinated gases
Agriculture	EU Common Agricultural Policy; agri-environmental measures; financial incentives
Waste management	Reducing waste through an eco-tax system; waste elimination obligations; reinforcement of regulations on the use of gas from landfills; improvement of energy efficiency of existing and new waste incineration plants
Forestry	Preservation of the ecological stability of forests; reforestation and prohibition of deforestation; Wood Energy Plan (2001); harmonization of forest and climate policies; promotion of energy crops

1. Policy framework and cross-sectoral measures

15. Responsibilities for climate change related policies in Belgium are spread throughout different levels of government, and Belgium's three regions (the Brussels-Capital Region, the Flemish Region and the Walloon Region each have authority for energy, agriculture, forestry, housing, the environment, research and development and transport (with the exception of the national railway) in that region. This implies that many GHG mitigation policies and measures are developed and implemented at the regional level.

16. Climate plans of the three regions are described in the NC4. The Flemish Climate Plan (2002–2005) was updated in 2007, and has a budget of EUR 700 million financed mainly from the regional government's budget. Regulatory and educational instruments are the main policy instruments in this plan. The Walloon Region's Action Plan for Climate Change, adopted in 2001 and updated in March 2008, involves various policy types, including regulatory measures, financial support, education and audits. The ERT noted that EUR 100 million is allocated for the implementation of the updated plan and that the financing comes from the various ministries involved. The Brussels-Capital Region adopted a 10-year Air and Climate Plan in 2002. In addition, two new plans have been adopted, namely the Energy Efficiency Action Plan, which aims at lowering primary energy consumption by 9 per cent in 2016, and the "Bruxell'Air" plan for reducing traffic pollution in Brussels.

17. The federal and regional governments cooperate in developing their climate policies. The NC4 states that in 2002, a National Climate Plan 2002–2012 was agreed by the federal and regional governments. The National Climate Commission, established in 2003, is responsible for some tasks relating to national implementation of climate policies, including implementing and monitoring the National Climate Plan. Several structures have been created to promote consultation and cooperation between decision makers on climate policy in Belgium. These include an Interministerial Conference for the Environment (ICE), which focuses on matters for which intergovernmental cooperation is required; and the Coordination Committee for International Environment Policy (CCIEP) is the main body responsible for coordinating international environment policy (with the exception of the EU environment policy). Working groups that implement decisions by the ICE are answerable to the CCIEP. Some coordination structures are specific to particular sectors. Both the federal Government and the regional governments plan to procure credits from the clean development mechanism and joint implementation.

18. The federal Government has also established policies and actions relating to climate change. The core of federal policies on climate change are set out by decisions from the Council of Ministers. The Council of Ministers sessions of 20–21 March 2004 and 16–18 March 2007 approved a set of measures for reducing GHG emissions. These measures constitute the core of the federal climate policy, and as a whole this set of measures should guarantee a reduction in annual national GHG emissions of up to 4.8 Mt CO_2 eq for the period 2008–2012. The Federal Plan for Sustainable Development (2004–2008) was adopted in 2004, and includes measures such as a green tax system and promotion of the use of alternative energy sources. However, this plan is not binding. At the time of the IDR, the plan was under revision.

19. EU policies also play an important role in Belgian climate policy. Belgium takes part in the EU emissions trading scheme – participation is by region – and the European directive on the energy performance of buildings has been implemented, again by each of the three regions. The federal Government has implemented the EU directive on the promotion of biofuels in transport.

20. The ERT recommends that Belgium include a summary table of PaMs in future national communications, and also encourages Belgium to quantify the expected effects of these PaMs.

2. Policies and measures in the energy sector

21. Between 1990 and 2006, GHG emissions from the energy sector decreased by 1.7 per cent (1.9 Tg CO_2 eq). This decrease was mainly driven by a reduction in emissions from manufacturing industries and construction (by 16.9 per cent, 5.6 Tg CO_2 eq) and energy industries (by 8.2 per cent, 2.4 Tg CO_2 eq), counterbalanced by a rise in emissions from the transport sector (by 26.7 per cent, 5.5 Tg CO_2 eq) over the time series. Fuel switching in the energy-intensive industries has led to a drop in emissions, even though energy consumption increased by 4 per cent in 2003. The surge in transport sector emissions is due to a steady increase in all types of road transportation. According to the NC4,

the number of cars and number of vehicle-kilometres increased by 30 and 32 per cent, respectively, in 1990–2003.

22. Belgian authorities vary in the approach they have taken in their PaMs to reducing GHG emissions in the energy sector. The NC4 presents the PaMs in a clear and structured manner, but an accurate comparison of their importance is not possible, given that estimates of their mitigation effects were not provided. The NC4 summarizes the three main PaMs implemented and adopted for "energy" (comprising energy industries and energy efficiency) and for "transport".

23. ***Energy industries***. Emissions from energy industries were reduced by 8.2 per cent in the period 1990–2006. This reduction was mainly achieved by the closure of four coke plants, fuel switching and technological improvements in electricity production. The main PaMs for energy industries are financial incentives for renewable energy production in the form of "green certificates", and support for investment in renewable energy and combined heat and power plants.

24. ***Energy efficiency***. The NC4 reports that energy efficiency has increased in the energy-intensive industries, but does not report separately on the building sector. However, the 2008 inventory submission shows an increase in "other" energy emissions, in particular in the residential and commercial sector, of 4.1 per cent, or 1.1 Tg CO_2 eq. PaMs to improve energy efficiency have been put in place for the industrial sector, through voluntary agreements with energy-intensive industries, for the building sector, through investment support and labelling schemes, and for appliances, in the form of labelling.

25. ***Transport sector***. The growth rate of emissions from the transport sector has slowed since 2000, and emissions even decreased slightly in 2005–2006. The main PaMs for this sector concern improving public transport systems, promoting alternative means of transport and reducing pollution from vehicles.

26. ***International transport***. According to the NC4, limiting or reducing GHG emissions from international aviation and marine bunker fuels is one of the main objectives of Belgium's transport policies. Relevant work of the International Civil Aviation Organization and the International Maritime Organization is highlighted in the NC4. A single measure to address emissions from international transportation – improvement of multimodal systems – is reported. This measure includes the Marco Polo programme, whose objective is to shift international transport of freight to short-distance maritime freight services, rail and inland waterways.

27. The ERT encourages Belgium to provide cost estimates and cost-efficiency indicators for PaMs across all sectors in future national communications, as well as to quantify the effects of the most important measures.

3. Policies and measures in other sectors

28. According to Belgium's 2008 inventory submission, in 2006 the non-energy sectors (excluding LULUCF), accounted for 19.1 per cent of total GHG emissions (excluding LULUCF), where the industrial processes sector accounted for 10.6 per cent, solvents for 0.2 per cent, agriculture for 7.4 per cent and waste for 0.9 per cent. In the base year (1990), emissions from non-energy sectors were slightly higher (22.0 per cent of total GHG emissions). The LULUCF sector was a net sink and offset 0.8 per cent of total GHG emissions in 2006 (1.1 Tg CO_2 eq) and 1.4 Tg CO_2 eq in 1990. Between 1990 and 2006 GHG emissions from industrial processes decreased by 11.9 per cent (1.9 Tg CO_2 eq), from agriculture by 13.4 per cent (1.6 Tg CO_2 eq) and from waste by 64.0 per cent (1.8 Tg CO_2 eq).

29. ***Industrial processes***. In 2006, GHG emissions from the industrial sector came mainly from the manufacture of mineral products, in particular from cement and lime production (36.4 per cent of industrial sector emissions), and from the chemical industry, in particular from nitric acid and ammonia

production (22.9 per cent). Metal production accounted for 11.6 per cent of total emissions in this sector, and production and consumption of halocarbons and SF_6 for 12.6 per cent. The NC4 reports regulations and voluntary or negotiated agreements designed to reduce industrial non-energy-related GHG emissions. Such agreements can address any GHG; for example, in the Flemish Region, an agreement was made with a company to reduce its emissions of N_2O from nitric acid production. The NC4 also indicates that Belgium's three regions have adopted, or will soon adopt, EU regulations limiting the use of fluorinated gases.

30. ***Agriculture***. GHG emissions from the agriculture sector decreased by 13.4 per cent in 1990–2006. GHG emissions from enteric fermentation decreased mainly because of a reduction in livestock numbers and a shift to farming different breeds of cattle. Lower livestock numbers also led to a decrease in emissions from agricultural soils, together with more effective use of mineral fertilizer. Measures to address GHG emissions from agriculture focus on CH_4 and N_2O, primarily in the form of regulations.

31. ***Forestry***. Measures to curb GHG emissions from forestry mainly consist of regulations to encourage reforestation and prohibit deforestation. In the Flemish Region, these include a purchasing policy designed to create new forested areas, and the provision of financial support for afforestation and reforestation initiatives by local authorities and individuals. Flemish regulations on deforestation (2001) aim to preserve wooded areas, and deforestation on land outside residential and industrial areas is now prohibited unless a special exemption is obtained. In addition, the rural development plan (2000–2006) of the Flemish Region provides compensation for owners who practice forest conservation. The Natura 2000 Network policy in the Walloon Region and the sustainable forest management policy in the Flemish Region support land preservation and the limiting of land-use changes, and consequently help to limit the loss of soil carbon.

32. ***Waste***. Solid waste disposal on land contributes 55.7 per cent of the GHG emissions from the waste sector. The remaining emissions come from three sources: waste incineration, wastewater handling and composting. At the federal level, a policy of reducing waste through an "eco-tax" system is being developed. At the regional level, PaMs mostly involve regulation, for example, on recovering gases from landfill sites and improving the efficiency of existing and new incineration plants. Each region has developed a waste policy or a waste management strategy.

33. The ERT noted that the NC4 contains a detailed description of the effects of PaMs in the non-energy sectors. However, the NC4 and the RDP include abbreviations and acronyms that are not always defined. The ERT recommends that Belgium provide an explanation of abbreviations and acronyms in its next national communication.

C. Projections and the total effect of policies and measures

1. Projections

34. The GHG emission projections provided by Belgium in its NC4 include a 'with measures' and a 'with additional measures' scenario until 2020, and are presented relative to actual inventory data for 1990 and 2000. Projections are presented on a sectoral basis, using the same sectoral categories used in the PaMs section, and on a gas-by-gas basis for CO_2, CH_4, N_2O, and the fluorinated gases. In addition, projections are provided in an aggregated format for each sector as well as for a national total, using global warming potentials. However, the ERT noted that Belgium has not provided the following reporting elements required by the UNFCCC reporting guidelines: the total effect in 1995 and 2000, by gas, of PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs (para. 40 of the guidelines); and emissions projections relating to fuel sold to ships and aircraft engaged in international transport reported separately and not included in totals (para. 36).

35. The national projections reported in the NC4 are based on the sum of the projections developed by the three regions as part of their respective climate strategies. Assumptions and key parameters were harmonized across the regions in early 2005. The resulting GHG emission projections were validated by an extensive comparison with the national projections prepared by the Federal Planning Bureau. This comparison resulted in amendments to some assumptions and/or parameters used in the regional projections. Table 4 and the figure below provide a summary of GHG emission projections for Belgium.

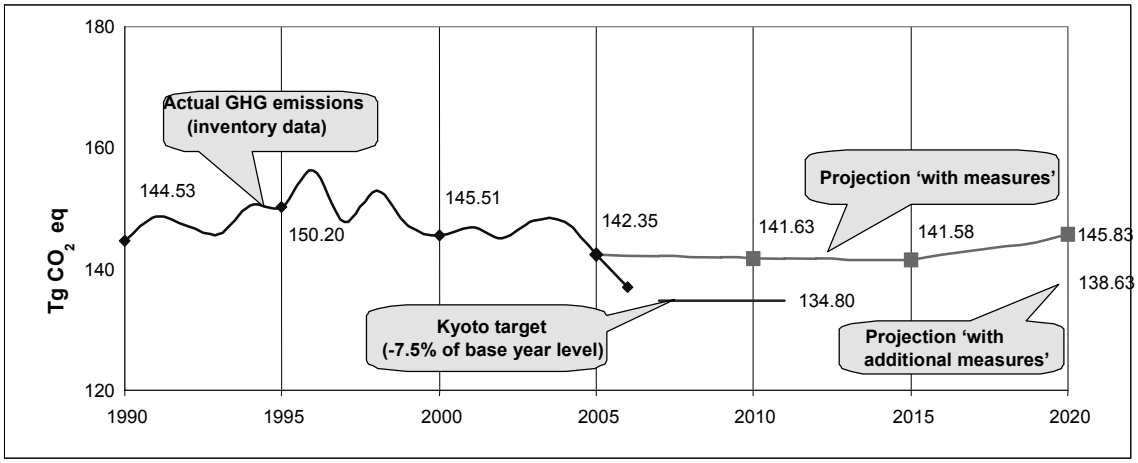
Table 4. Summary of greenhouse gas projections for Belgium

	Greenhouse gas emissions (Tg CO_2 eq per year)	Changes in relation to base year level (%)
Inventory data 1990[a]	144.53	–0.8
Inventory data 2006[a]	136.97	–6.0
Kyoto Protocol base year[b]	145.73	-
Kyoto Protocol target[b]	134.80	–7.5
'With measures' projections for 2010[c]	141.63	–3.6

[a] *Data source:* Belgium's 2008 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry.
[b] *Data source:* Based on the initial review report contained in document FCCC/IRR/2007/BEL.
[c] *Data sources:* (1) Belgium's fourth national communication; (2) European Environment Agency. 2007. *Greenhouse Gas Emission Trends and Projections in Europe 2007 – Country Profile: Belgium*.

36. Under its 'with measures' scenario, Belgium expects to reduce its GHG emissions by 3.6 per cent below the 1990 level by 2010. Under the 'with additional measures' scenario, Belgium expects to achieve greater reductions, and possibly reach the Kyoto target. However, the ERT noted that this scenario has only been quantified for 2020, not for 2010. By using the flexible mechanisms of the Kyoto Protocol in addition, Belgium expects to exceed its Kyoto target by 1.29 Mt CO_2 eq.

Greenhouse gas emission projections



Data sources: (1) Data for the years 1990–2006: Belgium's 2008 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry; (2) Data for the years 2006–2020: Belgium's fourth national communication; updated projections provided by the Party during the in-depth review; the emissions are without land use, land-use change and forestry.

2. Total effect of policies and measures

37. In the NC4, Belgium presented only limited information on factors and activities for each sector as required by the UNFCCC reporting guidelines, but more comprehensive information from the European Environment Agency (EEA) was provided during the review (EEA, 2007). The ERT noted that Belgium has not presented the estimated and expected total effect of implemented and adopted PaMs

in accordance with the 'with measures' definition, compared with a situation without such PaMs – it has presented only the impact of 'additional measures' on emissions of fluorinated gases

38. Table 5 presents an overview of the projected effects of implemented and adopted PaMs based on EEA data. The table does not present the effect of total planned (additional) measures because these data were not available. Under the 'with measures' scenario Belgium is expected to reduce GHG emissions by 24.6 Tg CO_2 eq in 2010, in relation to the baseline (scenario 'without measures'), which corresponds to 16.7 per cent of the 1990 level. About half of the emission reductions would be achieved in the energy sector.

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

Sector	Effect of implemented and adopted measures (Tg CO_2 eq)	Relative value (% of base year emissions)
Energy (without CO_2 from transport)	12.3	13.3
Transport – CO_2	4.9	24.0
Industrial processes	6.4	36.0
Agriculture	1.0	7.7
Total	**24.6**	**16.7**

Data source: European Environment Agency. 2007. *Greenhouse Gas Emission Trends and Projections in Europe 2007 – Country Profile: Belgium*.
Note: The total effect of implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios.

39. The ERT recommends that Belgium, in its next national communication, report separately the emission projections relating to fuel sold to ships and aircraft engaged in international transport. The ERT also recommends that the Party provide (1) more relevant information on factors and activities for each sector; (2) emissions projections under the 'with measures' scenario, by sector and by gas, for 1995, 2000, 2005, 2010, 2015 and 2020; (3) emissions projections under the 'with additional' measures scenario, by sector and by gas, for 2005, 2010, 2015 and 2020; and (4) a 'without measures' scenario.

D. Vulnerability assessment, climate change impacts and adaptation measures

40. In its NC4, Belgium has provided the required information on expected impacts of climate change in the country and on adaptation actions. To assess the likely impacts of climate change, Belgium used the Intergovernmental Panel on Climate Change *Special Report on Emissions Scenarios* (SRES) scenarios A2 and B2 (without any inclusion of climate policy), and applied the results from five global models (ECHAM4, HadCM3, GFDL-R30, CGCM1 and CSIRO-Mk2b) and one regional model (PRUD-EU). The mean climate change impact over an area approximating to Belgium is reported in terms of average temperature and precipitation changes for the period 2071–2100 (reference period 1961–1990). Three levels of vulnerability have been defined (high, medium and limited) depending on the importance of the impacts for socio-economic and environmental sectors. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC4.

41. Some negative impacts are expected from the projected warmer climate. Belgium has already experienced serious heat waves, in 2003. The ERT noted that the identified measures are likely to enable the country to cope with the adverse effects of climate change.

42. The ERT commends Belgium for the support that it has given to developing countries in the area of adaptation, and for integrating adaptation into its development cooperation plans and strategy.

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

Vulnerable area	Examples/comments/adaptation measures reported
Water resources	***Vulnerability:*** The following are expected: more evaporation and possibly less precipitation in summer, leading to lower groundwater levels; increased winter precipitation with the opposite effect (water availability is already limited in parts of the country) ***Adaptation***: Information campaign on water savings; measures to improve water quality
Human health	***Vulnerability:*** The following are expected: heat waves (increased mortality and a number of heat strokes); consequences of more frequent ozone peaks; probable contribution to increased prevalence of Lyme disease; possible contribution to increase in pollen-associated allergies ***Adaptation:*** Federal plan on heat waves and ozone; regulation for structural protection of buildings
Agriculture and forestry	***Vulnerability:*** The following are expected: increased frequency of dry summers and heat waves may damage crops, grasslands and forests; wider distribution of pests; increased decomposition of organic matter, reducing soil fertility; increased salinity of soil in polders; increased damage to forests due to extreme storms ***Adaptation:*** A change in the crop selection and agricultural practices may become necessary; plantation of tree species adapted to mild and rainy winters such as Douglas fir and broad-leaved trees
Floods	***Vulnerability:*** The following are expected: increased river flooding in winter; probable increased risk of flooding due to heavy rain ***Adaptation:*** Monitoring of river flows; ban on construction in flood-sensitive areas; improvement of water infiltration in soils; better use of natural ponds and rivers to retain water in urban areas (Brussels-Capital Region); building of storm basins
Ecosystems and terrestrial life	***Vulnerability***: Some species could move northwards, and existing species may have to compete with newly arriving/invasive ones; complex perturbation of ecosystems ***Adaptation***: Reduction in all non-climate stresses to maintain healthy ecosystems; further creation of protected areas and migration corridors; active and adaptable management that responds to observed changes
Coastal areas	***Vulnerability:*** The following are expected: increased coastal erosion; storm-related floods; deterioration of natural ecosystems (indirect or long-term) ***Adaptation:*** Protection of low-level rivers on the basis of the recently updated Sigma Plan; beach nourishments (i.e. addition of sand)
Industry, energy and transport	***Vulnerability:*** The following are expected: lower demand for energy for warming in winter; increased demand for energy for cooling in summer; probable (but not certain) increase in damage due to the heaviest storms; possible difficulties for industries and sectors that developed in a colder climate (e.g. power stations cooled by river water)
Tourism	***Vulnerability:*** The impact of a moderate temperature rise should be positive, but there may be reduced river flow in summer, which would have an impact on river sports and other outdoor activities

E. Financial resources and transfer of technology

1. Financial resources

43. In its NC4, Belgium has provided comprehensive information on measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention. Belgium has also provided detailed information on direct bilateral aid given to 18 countries (African countries and least developed countries) to help them meet the costs of adaptation to the adverse effects of climate change. The NC4 indicates that Central Africa receives more than 60 per cent of the bilateral aid provided by Belgium.

44. Furthermore, Belgium has provided information on other financial resources relating to the implementation of the Convention provided through bilateral and regional and other multilateral channels. However, the ERT noted that Belgium did not specify what "new and additional" financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention, and recommends that Belgium provide this information in its next national communication. Table 7 summarizes information on financial resources.

Table 7. Summary of information on financial resources

Official development assistance (ODA)	USD 4.76 billion (2003–2005)
Climate-related aid in bilateral ODA	EUR 46.8 million (2003–2004)
Climate-related support programmes	EUR 82 million (2001–2004)
Contributions to the Global Environment Facility	USD 4.88 billion (1991–2003)
Other (bilateral/multilateral)	EUR 144,990 (2003–2004)

2. Transfer of technology

45. In its NC4, Belgium has provided details of measures relating to the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies. The NC4 also indicates that the Directorate-General for Development Cooperation (DGDC) as well as federal entities have included technology transfer and capacity-building in bilateral agreements. Belgium has also reported activities relating to technology transfer, and its activities for financing access by developing countries to 'hard' or 'soft' environmentally sound technologies. However, it was not possible for the ERT to determine which developing countries were supported, especially in the areas of forestry, agriculture, water and the environment. The ERT encourages Belgium to include a list of the countries supported in its next national communication.

46. The NC4 provides a clear distinction between activities undertaken by the public sector and those undertaken by the private sector. The private sector participates in training programmes and some enterprises are encouraged through incentives, such as subsidies, to reduce their energy consumption. The private sector also contributes to meeting Belgium's commitments under Article 4, paragraphs 3, 4 and 5, of the Convention through indirect bilateral cooperation under programmes co-financed by the DGDC and implemented by different stakeholders.

47. The ERT noted that Belgium supports training activities relevant to environmentally sound technologies/technology transfer, both in developing countries and in Belgium, as well as international training programmes at Belgian universities, where foreign students are supported.

F. Research and systematic observation

48. Belgium has provided information on its actions relating to research and systematic observation, and addressed both domestic and international activities, including the World Climate Research Programme and the International Geosphere–Biosphere Programme.

49. On research, the NC4 presents a detailed list of national and international programmes, including federal and regional research activities. The ERT noted that climate research in the Federal Science Policy Office is mostly integrated into the Scientific Support Plan for Sustainable Development Policy which is presently in its third five-year term. The ERT also noted that the Party is not involved in developing climate models.

50. On global observation, Belgium takes part in various climate-related monitoring activities, but has no particular policy yet with respect to the Global Climate Observing System (GCOS). The NC4 provides detailed information on the Party's activities with respect to meteorological and atmospheric observation, terrestrial observation, and space-based observation programmes. The ERT noted, however, that the report does not provide information on data availability and exchange.

51. The RDP provides information on contributions by Belgium to general climate-related capacity-building activities in developing countries. The ERT noted, however, that the relevant chapter of the NC4 does not include information on specific actions taken to support the establishment and maintenance

of observing systems in developing countries, in accordance with paragraph 58 of the UNFCCC reporting guidelines. The ERT encourages the Party to fully participate in GCOS activities.

G. Education, training and public awareness

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

53. The education policies that have been reported focus on the areas of energy and transport. There are a substantial number of projects at different levels, in schools and other institutions. The ERT noted that Belgium has implemented campaigns, workshops, courses, bicycle tours, games and other activities. Environmental education is not confined to formal education, but is also carried out in a wide range of formats and contexts at home and at work, such as a website for environmental education that makes available a variety of information materials. Since 2001, several projects have been launched to encourage pupils to make their schools more environmentally friendly. Belgium has also described a number of climate change related publications produced for the private sector.

54. The ERT noted the activities and resources allocated by Belgium for education, training and public awareness in the energy and transport sectors. The ERT further noted that the NC4, does not provide specific information on the development and implementation of education and training programmes, including the strengthening of national institutions, and it encourages Belgium to provide further details on these issues in its next national communication.

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

55. Belgium's RDP includes four chapters, which contain all the sections required by decisions 22/CP.7 and 25/CP.8. The ERT noted that Belgium's RDP contains detailed information regarding: domestic measures (including legal and institutional steps for implementing commitments under the Kyoto Protocol to mitigate GHG emissions); programmes for domestic compliance and enforcement; trends in, and projections of, GHG emissions; evaluation of the effects of domestic measures in the light of trends and projections; and activities, actions and programmes undertaken by Belgium in fulfilment of its commitments under Articles 10 and 11 of the Kyoto Protocol. The ERT found the information contained in the RDP to be consistent with that provided in the NC4.

56. Under the EU burden-sharing agreement, Belgium is obliged to reduce its GHG emissions by 7.5 per cent in relation to the 1990 level in the period 2008–2012. In order to meet this target, Belgium established, in 2004, an internal burden-sharing agreement to distribute efforts among the Flemish Region (which must reduce emissions by 5.2 per cent of the 1990 level), the Walloon Region (which must reduce emissions by 7.5 per cent), the Brussels-Capital Region (which may increase emissions by 3.4 per cent) and the federal Government (which intends to acquire emission allowances; see para. 57 below).

57. Belgium's total GHG emissions in 2006 excluding LULUCF were 5.2 per cent lower than those in 1990. Based on the projections presented in the RDP, Belgium is not projected to meet its Kyoto target with the existing and additional PaMs envisaged. However, the federal Government intends to use the flexible mechanisms of the Kyoto Protocol to acquire credits for the equivalent of 2.46 Mt CO_2 eq per year in the period 2008–2012. This will compensate for the shortfall resulting from the distribution of the GHG reduction burden among the three regions outlined in paragraph 56 above. The ERT

recommends that Belgium include more information in its next national communication on the supplementarity regarding the use of the flexible mechanisms.

58. The NC4 indicates that the effects of the current and additional domestic PaMs, together with the use of the flexible mechanisms, will enable Belgium to meet its target under the Kyoto Protocol. The ERT noted that Belgium has made significant progress towards achieving its GHG emission reduction commitments.

59. There is limited information in the RDP (and the NC4) on LULUCF activities under the Kyoto Protocol. However, Belgium stated in its initial report under the Kyoto Protocol that no LULUCF activities under Article 3, paragraph 4, of the Kyoto Protocol had been elected for accounting. The ERT encourages Belgium to elaborate on legislative arrangements and administrative procedures that seek to ensure the implementation of activities under Article 3, paragraph 3, and also contribute to the conservation of biodiversity and the sustainable use of natural resources.

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

60. Belgium has provided some of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC4 and the RDP. This information partially reflects the steps taken by Belgium 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 8. 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	NC4, chapter 4, pp. 69–70 RDP, chapter 3, p. 9
Policies and measures in accordance with Article 2	NC4, chapter 4, pp. 41–70 RDP, chapter 1, pp. 2–5
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	NC4, chapter 2, pp. 12–14 NC4, chapter 4, pp. 42–44 RDP, chapter 1, pp. 2–5
Information under Article 10	NC4, chapter 7, pp. 107–109 RDP, chapter 4, pp. 10–13
Financial resources	NC4, chapter 7, pp. 102–107 RDP, chapter 4, p. 13

61. The ERT noted that the information on activities to limit GHG emissions from international bunkers is limited in the NC4. Furthermore, Belgium 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 inventory system; a description of the national registry; information on what efforts it is making to implement PaMs in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention; 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; and information on the supplementarity regarding the use of the flexible mechanisms. The ERT recommends that Belgium include these reporting elements in its next national communication. It also encourages Belgium to provide more information about its cooperation with other countries in implementing PaMs.

62. In the absence of information in the NC4, the ERT took note of the conclusions of the 2007 review report of the initial report of Belgium that the national system meets the requirements for

the implementation of general and specific functions and that the national registry is fully compliant with the registry requirements.[2]

IV. Conclusions

63. Belgium reduced overall GHG emissions by 5.2 per cent between 1990 and 2006. The energy sector contributed by far the largest share (80.9 per cent) of total GHG emissions (excluding LULUCF) in 2006. This share increased from 78.0 per cent in 1990, which is explained by significant emission reductions in non-energy sectors in the period.

64. In its NC4 and RDP, Belgium has presented GHG emission projections under a 'with measures' scenario for the period from 2005 to 2020. According to this scenario, GHG emissions are projected to be reduced by 3.6 per cent in 2010 compared to base year emissions. Thus, the projections indicate that Belgium can meet its Kyoto Protocol target only by using the flexible mechanisms of the Protocol in addition to the domestic PaMs. The projected impact of implemented and adopted PaMs in 2010, compared to the baseline (scenario 'without measures') is not presented in the NC4, but is included in the updated information provided by the Party to the ERT during the review (EEA, 2007). As the NC4 does not present a 'without measures' scenario or indicate the expected effect of measures, the ERT was unable to assess accurately the total effect of PaMs.

65. In the course of the IDR, the ERT formulated a number of recommendations relating to the completeness and transparency of Belgium's reporting under the Convention and its Kyoto Protocol. The key recommendations[3] are that Belgium include in its next national communication summary tables of PaMs by sector, information on efforts to implement PaMs in such a way as to minimize adverse effects, and information on the supplementarity of the use of the flexible mechanisms.

66. The ERT encourages Belgium, in its next national communication, to:

- Quantify the mitigation effect of individual PaMs (or clusters of PaMs);
- Provide (as in EEA, 2007) the impact of the 'with measures' scenario, by sector and by gas, in 1995, 2000, 2005, 2010, 2015 and 2020; the impact of the 'with additional' measures scenario, by sector and by gas, in 1995, 2000, 2005, 2010, 2015 and 2020; and a 'without measures' scenario;
- Provide more detailed information on the changes in national circumstances that affect GHG emissions and removals over time;
- Provide all supplementary information required by Article 7, paragraph 2, of the Kyoto Protocol, including descriptions of its national inventory system, its national registry system, and its national legislative arrangements and administrative procedures relating to the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

67. The ERT also encourages Belgium to fully participate in GCOS activities and to include an explanation of acronyms in its next national communication.

[2] FCCC/IRR/2007/BEL.
[3] The recommendations are given in full in the relevant sections of this report.

Annex

Documents and information used during the review

A. Reference documents

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

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

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

FCCC/IDR.3/BEL. Report on the in-depth review of the third national communication of Belgium. Available at <http://unfccc.int/resource/docs/idr/bel03.pdf>.

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

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

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

FCCC/ARR/2006/BEL. Report of the individual review of the greenhouse gas inventory of Belgium submitted in 2006. Available at <http://unfccc.int/resource/docs/2007/arr/bel.pdf>.

FCCC/IRR/2007/BEL. Report of the review of the initial report of Belgium. Available at <http://unfccc.int/resource/docs/2007/irr/bel.pdf>.

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Report demonstrating progress of Belgium. Available at <http://unfccc.int/resource/docs/dpr/bel1.pdf>.

2008 GHG inventory submission of Belgium. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/4303.php>.

EEA (European Environment Agency). 2007. *Greenhouse Gas Emission Trends and Projections in Europe 2007 – Country Profile: Belgium*. Available at <http://reports.eea.europa.eu/eea_report_2007_5/en/Belgium.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Etienne Hannon (Federal Public Service Health, Food Chain Safety and Environment), including additional material on updated policies and measures, greenhouse gas projections, the national greenhouse gas registry and recent climate policy developments in Belgium.

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