



United Nations

FCCC/TRR.2/LUX



Framework Convention on
Climate Change

Distr.: General
28 September 2016

English only

Report of the technical review of the second biennial report of Luxembourg

According to decision 2/CP.17, developed country Parties are requested to submit their second biennial reports by 1 January 2016, that is, two years after the due date for submission of a full national communication. This report presents the results of the technical review of the second biennial report of Luxembourg, conducted by an expert review team in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”.

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I. Introduction and summary

A. Introduction

1. This report covers the centralized technical review of the second biennial report (BR2)¹ of Luxembourg. The review was organized by the secretariat in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”, particularly “Part IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention” (annex to decision 13/CP.20). In accordance with the same decision, a draft version of this report was communicated to the Government of Luxembourg, which provided comments that were considered and incorporated with revisions into this final version of the report.

2. The review took place from 6 to 11 June 2016 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Marta Andrea Alfaro (Chile), Mr. Daniel Bouille (Argentina), Mr. Amit Garg (India), Mr. Leonidas Osvaldo Girardin (Argentina), Ms. Kema Kasturiarachchi (Sri Lanka), Ms. Thelma Krug (Brazil), Mr. Asger Strange Olesen (Denmark), Mr. Nasimjon Rajabov (Tajikistan), Mr. Erik Rasmussen (Denmark), Ms. Sirinthornthep Towprayoon (Thailand), Mr. Goran Vukmir (Bosnia and Herzegovina) and Ms. Christina Davies Waldron (United States of America). Mr. Garg and Mr. Rasmussen were the lead reviewers. The review was coordinated by Ms. Xuehong Wang and Mr. Nalin Srivastava (UNFCCC secretariat).

B. Summary

3. The expert review team (ERT) conducted a technical review of the information reported in the BR2 of Luxembourg in accordance with the “UNFCCC biennial reporting guidelines for developed country Parties” (hereinafter referred to as the UNFCCC reporting guidelines on BRs). During the review, Luxembourg provided the following additional relevant information: reasons for the delay in submitting its BR2 and common tabular format (CTF) tables; estimates of mitigation impacts of its policies and measures (PaMs); confirmation that there had been no changes in its domestic institutional arrangements since the first biennial report (BR1); economic and social consequences of its response measures; assumptions and methodology used for its projections; exchange rates used; and the project level support provided for creating CTF table 7(b).

1. Timeliness

4. The BR2 was submitted on 6 June 2016, after the deadline of 1 January 2016 mandated by decision 2/CP.17. The CTF tables were submitted on 10 February 2016 and resubmitted on 31 May 2016. Luxembourg informed the secretariat about its difficulties with submitting its BR2 on 15 January 2016. The ERT noted with great concern the delay in the submission of the BR2 and CTF tables, which mirrored the delay in the submissions of the BR1 and the sixth national communication (NC6).

5. During the review, Luxembourg explained that the CTF tables were resubmitted on 31 May 2016 because the greenhouse gas (GHG) projections had been revised with new data on road fuel sales up to 2020, which were much lower than previously estimated. With

¹ The biennial report submission comprises the text of the report and the common tabular format (CTF) tables. Both the text and the CTF tables are subject to the technical review.

regard to the delay in the submission of the BR2, Luxembourg referred to resource constraints and competing deadlines and priorities for the small climate team of Luxembourg in 2015, especially its involvement in the Presidency of the Council of the European Union (EU) and other EU coordination work as well as its preparation for the Conference of the Parties at its twenty-first session. Submission of the BR2 was not given top priority. The ERT, while understanding the time and resource constraints on Luxembourg, strongly recommends that Luxembourg submit its next biennial report (BR) on time.

2. Completeness, transparency of reporting and adherence to the reporting guidelines

6. Issues and gaps related to the reported information identified by the ERT are presented in table 1 below. The information reported by Luxembourg in its BR2 is partially in adherence with the UNFCCC reporting guidelines on BRs as per decision 2/CP.17.

Table 1

Summary of completeness and transparency issues related to mandatory reported information in the second biennial report of Luxembourg

<i>Chapter of the biennial report</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Paragraphs with recommendations</i>
Greenhouse gas emissions and trends	Complete	Transparent	NA
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Complete	Transparent	NA
Progress in achievement of targets	Mostly complete	Partially transparent	21, 24, 39, 45, 46, 47
Provision of support to developing country Parties	Partially complete	Mostly transparent	68, 69, 71, 73, 83, 87

Note: A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III.

Abbreviation: NA = not applicable.

II. Technical review of the reported information

A. All greenhouse gas emissions and removals related to the quantified economy-wide emission reduction target

7. Luxembourg has provided a summary of information on GHG emission trends for the period 1990–2014 in its BR2 and CTF tables 1(a)–(d). The BR2 makes reference to the national inventory arrangements, which are explained in more detail in the national inventory report included in Luxembourg’s 2015 annual inventory submission (in chapters 1.1 to 1.8). The national inventory arrangements were established in accordance with the reporting requirements related to national inventory arrangements contained in the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories” that are required by paragraph 3 of the UNFCCC reporting guidelines on BRs. Further, Luxembourg provided information on changes in the national inventory arrangements since its BR1. The information reported in the BR2 on emission trends is consistent with that reported in the 2016 annual inventory submission of Luxembourg, from which it is extracted (see chapter 1 of the BR2).

8. Total GHG emissions² excluding emissions and removals from land use, land-use change and forestry (LULUCF) decreased by 16.3 per cent between 1990 and 2014, whereas total GHG emissions including net emissions and removals from LULUCF decreased by 20.2 per cent over the same period. The decrease in the total GHG emissions can be attributed mainly to carbon dioxide (CO₂) emissions, which decreased by 17.8 per cent (excluding LULUCF) between 1990 and 2014. Over the same period, emissions of methane (CH₄) decreased by 8.0 per cent, while emissions of nitrous oxide (N₂O) increased by 2.5 per cent. The combined fluorinated gases, such as perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF₆), increased by 8,364.1 per cent over the same period. During the period 1990–1998, emission trends were driven by a decrease in CO₂ emissions from the industrial processes sector that resulted from a change from using blast furnaces to using electric arc furnaces in the period 1994–1998. During the period 1999–2014, the increase in emissions was driven by CO₂ emissions from the transport sector, which saw an increase in mobility – including road vehicles in transit, cross-border commuters and fuel tourism from bordering countries – as a result of low fuel prices, as well as CO₂ emissions from the country’s gas-fired power plant, in operation from 2002.

9. The ERT noted that, during the period 1990–2014, Luxembourg’s gross domestic product (GDP) per capita increased by 61.9 per cent, while GHG emissions per GDP and GHG emissions per capita decreased by 64.5 and 42.6 per cent, respectively. Luxembourg is a small country characterized by both high demographic and high economic growth, and is located at the heart of the main Western Europe transit routes for both goods and passengers. Due to its small size and open economy, a new industrial project, a technological change, a closure or close down of a production unit might have significant impacts on the GHG emissions. Table 2 below illustrates the emission trends by sector and some of the economic indicators relevant to GHG emissions for Luxembourg.

Table 2

Greenhouse gas emissions by sector and some indicators relevant to greenhouse gas emissions for Luxembourg for the period 1990–2014

Sector	GHG emissions (kt CO ₂ eq)					Change (%)		Share by sector (%)	
	1990	2000	2010	2013	2014	1990–2014	2013–2014	1990	2014
1. Energy	10 411.19	8 177.38	10 817.32	9 887.16	9 403.04	–9.7	–4.9	80.9	87.3
A1. Energy industries	35.64	120.17	1 207.30	686.10	721.42	1 924.0	5.1	0.3	6.7
A2. Manufacturing industries and construction	6 306.82	1 453.13	1 421.13	1 166.05	1 090.64	–82.7	–6.5	49.0	10.1
A3. Transport	2 688.26	4 837.74	6 372.17	6 371.75	6 096.72	126.8	–4.3	20.9	56.6
A4.–A5. Other	1 361.08	1 736.35	1 762.75	1 622.51	1 455.79	7.0	–10.3	10.6	13.5
B. Fugitive emissions from fuels	19.39	29.98	53.96	40.74	38.47	98.5	–5.6	0.2	0.4
C. CO ₂ transport and storage	NO	NO	NO	NO	NO	–	–	–	–

² In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of carbon dioxide equivalent excluding land use, land-use change and forestry, unless otherwise specified. Values in this paragraph are calculated based on the 2016 inventory submission, version 1.

Sector	GHG emissions (kt CO ₂ eq)					Change (%)		Share by sector (%)	
	1990	2000	2010	2013	2014	1990–2014	2013–2014	1990	2014
	2. IPPU	1 648.46	782.33	672.53	609.68	645.78	–60.8	5.9	12.8
3. Agriculture	715.22	696.35	669.54	659.66	671.93	–6.1	1.9	5.6	6.2
4. LULUCF	52.13	–701.85	–152.97	–538.62	–460.44	–983.2	–14.5	NA	NA
5. Waste	96.08	86.57	61.81	50.79	49.83	–48.1	–1.9	0.7	0.5
6. Other	NO	NO	NO	NO	NO	–	–	–	–
Total GHG emissions without LULUCF	12 870.95	9 742.63	12 221.20	11 207.30	10 770.58	–16.3	–3.9	100.0	100.0
Total GHG emissions with LULUCF	12 923.08	9 040.78	12 068.22	10 668.68	10 310.14	–20.2	–3.4	NA	NA
<i>Indicators</i>									
GDP per capita (thousands 2011 USD using PPP)	56.44	80.73	90.79	89.89	91.37	61.9	1.6	–	–
GHG emissions without LULUCF per capita (t CO ₂ eq)	33.71	22.33	24.11	20.63	19.36	–42.6	–6.1	–	–
GHG emissions without LULUCF per GDP unit (kg CO ₂ eq per 2011 USD using PPP)	0.60	0.28	0.27	0.23	0.21	–64.5	–7.7	–	–

Sources: (1) GHG emission data: Luxembourg’s 2016 annual inventory submission, version 1; (2) GDP per capita data: World Bank.

Note: The ratios per capita and per GDP unit as well as the changes in emissions and the shares by sector are calculated relative to total GHG emissions without LULUCF using the exact (not rounded) values, and may therefore differ from the ratio calculated with the rounded numbers provided in the table.

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring, PPP = purchasing power parity.

B. Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target

10. In its BR2 and CTF tables 2(a)–(f), Luxembourg reported a description of its target, including associated conditions and assumptions. CTF tables 2(a)–(f) contain the required information in relation to the description of the Party’s emission reduction target. In CTF table 2(d), the contribution of LULUCF is reported as “NA” (not applicable) as emissions and removals from the LULUCF sector are not included in the 2020 target for EU member States (see para. 13 below). The ERT noted that Luxembourg does not report the use of market-based mechanisms for the achievement of its quantified emission reduction target. In CTF table 2(e)I, certified emission reductions (CERs), emission reduction units (ERUs) and assigned amount units (AAUs) are all reported as “NE” (not estimated) or “NA”.

11. During the review, Luxembourg informed the ERT that the EU made a declaration when adopting the Doha Amendment that EU legislation concerning the EU 2020 climate and energy package for the implementation of its emission reduction objectives for the period 2013–2020 does not allow the use of surplus AAUs carried over from the first commitment period of the Kyoto Protocol to meet these objectives. In addition, the use of CERs and ERUs cannot be estimated by Luxembourg until 2018. Further information on

the target and the assumptions, conditions and methodologies related to the target is provided in chapter 2 of the BR2.

12. For Luxembourg, the Convention entered into force on 7 August 1994. Under the Convention, Luxembourg committed to contributing to the achievement of the joint EU economy-wide emission reduction target of 20 per cent below the 1990 level by 2020. The EU offered to move to a 30 per cent reduction on the condition that other developed countries commit to a comparable target and developing countries contribute according to their responsibilities and respective capabilities under a new global climate change agreement.

13. The target for the EU and its member States is formalized in the EU 2020 climate and energy package. This legislative package regulates emissions of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ using global warming potential (GWP) values from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) to aggregate the GHG emissions of the EU up to 2020. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms as well as new market mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Companies can make use of such units to fulfil their requirements under the EU Emissions Trading System (EU ETS).

14. The EU 2020 climate and energy package includes the EU ETS and the effort-sharing decision (ESD) (see chapter II.C.1 below). Further information on this package is provided in chapter 2 of the BR2. The EU ETS covers mainly point emissions sources in the energy, industry and aviation sectors. For the period 2013–2020, an EU-wide cap has been put in place with the goal of reducing emissions by 21 per cent below the 2005 level by 2020. Emissions from sectors covered by the ESD are regulated by targets specific to each member State, which leads to an aggregate reduction at the EU level of 10 per cent below the 2005 level by 2020.

15. Under the ESD, Luxembourg has a target to reduce its total emissions to 20.0 per cent below the 2005 level by 2020 from sectors covered by the ESD (non-ETS sectors). National emission targets for non-ETS sectors for 2020 have been translated into binding quantified annual emission allocations (AEAs) for the period 2013–2020. Luxembourg's AEAs change following a linear path from 9,450 kt of carbon dioxide equivalent (CO₂ eq) in 2013 to 8,145 kt CO₂ eq in 2020.³

C. Progress made towards the achievement of the quantified economy-wide emission reduction target

16. This chapter provides information on the review of the reporting by Luxembourg on the progress made in reducing emissions in relation to the target, mitigation actions taken to achieve its target, and the use of units from market-based mechanisms and LULUCF.

³ European Commission decision 2013/162/EU of 26 March 2013 “on determining member States’ annual emission allocations for the period from 2013 to 2020 pursuant to Decision No. 406/2009/EC of the European Parliament and of the Council” and European Commission implementing decision 2013/634/EU of 31 October 2013 “on the adjustments to member States’ annual emission allocations for the period from 2013 to 2020 pursuant to Decision No. 406/2009/EC of the European Parliament and of the Council”.

1. Mitigation actions and their effects

17. In its BR2 and CTF table 3, Luxembourg reported on its progress in the achievement of its target and the mitigation actions implemented and planned since its NC6/BR1 to achieve its target. Luxembourg has provided information on mitigation actions introduced to achieve its target. The BR2 includes information on mitigation actions organized by sector and by gas. Further information on the mitigation actions related to the Party's target is provided in chapters 3.1, 3.2 and 3.3 of the BR2 and in CTF table 3.

18. The ERT commends Luxembourg for acting on a recommendation in the report of the technical review of the BR1 (TRR/BR1) to increase the transparency of its reporting by describing in detail each of the PaMs and their implementation status in the BR2. Luxembourg reported on 51 implemented, adopted and planned mitigation actions individually, describing for each its type and the sectors and gases affected. All the measures are included in Luxembourg's second Action Plan for Reducing CO₂ Emissions (2013), which is the formal policy framework that guides the country towards the achievement of its emission reduction obligations.

19. In its BR2, Luxembourg provided information on the institutional, legal and procedural arrangements for its national GHG inventories. It provided a detailed overview of the domestic institutional arrangements in place, and the roles and responsibilities of each institution involved in GHG inventory planning and management. However, Luxembourg did not provide any information on changes in its domestic institutional arrangements, including institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target.

20. During the review, Luxembourg provided additional information, confirming that there have been no changes in its domestic institutional arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of progress made towards its target since its NC6/BR1. Luxembourg further explained that regulations for the national inventory system are currently being revised, with the aim of developing a national system for projections and PaMs as well as for inventories and projections of non-GHG (e.g. for the Convention on Long-range Transboundary Air Pollution).

21. The ERT reiterates the recommendation made in the previous review report that Luxembourg include in its next BR information on changes in its domestic institutional arrangements for the evaluation of the progress made towards its target.

22. The BR2 and CTF table 3 include estimates of a few mitigation actions only. The BR2 does not include the information required by the UNFCCC reporting guidelines on BRs on the estimated mitigation effects for most of the PaMs. In addition, the information that is reported by Luxembourg on the estimated effects of a limited number of individual PaMs is not transparent. The Party described in detail 51 individual PaMs in the BR2; however, in CTF table 3 these PaMs are placed in 20 groups, making it impossible to identify the estimated effect of individual PaMs.

23. During the review, Luxembourg provided additional information, elaborating on the reasons for not providing the estimated mitigation impacts for all of its PaMs. According to Luxembourg, some PaMs overlap and are therefore evaluated together, while the impacts of other PaMs, such as training and education activities, cannot be quantified. Luxembourg further explained that the mitigation potential of many of the PaMs has not been assessed yet (neither *ex ante* nor *ex post*). Luxembourg expressed its intention to substantially improve the evaluation of its PaMs in its next reporting obligation to the EU, in March 2017. During the review, in response to the question raised by the ERT, the Party provided a draft version of a report on the estimated mitigation impacts of its PaMs (in French) and

acknowledged the need to improve the transparency of its reporting on the estimated impacts of PaMs by including the above explanation in footnotes to the CTF tables.

24. The ERT reiterates the recommendation in the TRR/BR1 that Luxembourg adhere to the UNFCCC reporting guidelines on BRs and enhance the completeness and transparency of its CTF table 3 by providing the estimated effect of each mitigation action, or in cases where this is not feasible, providing justification for not estimating the mitigation effect.

25. The BR2 does not include the information on the assessment of the economic and social consequences of response measures. However, during the review, in response to the question raised by the ERT, Luxembourg provided relevant information. According to Luxembourg, the country is unlikely to generate significant negative impacts abroad as a result of its policy choices because of its small economy. However, as part of its second Action Plan for Reducing CO₂ Emissions, the Party has a range of measures to ensure minimization of the consequences of response measures. Luxembourg diversifies its measures to reduce GHG emissions, and the use of market mechanisms (mainly the clean development mechanism and the green investment scheme) must align with sustainability criteria. The promotion of biofuels is the only policy that the Party considers could have negative indirect effects, potentially leading to the destruction of (or adverse shifts in) natural resources. To tackle the potential problem, Luxembourg follows the relevant EU legislation, which ensures that biofuels imported from developing countries are produced in accordance with the principles of sustainable development. Further, Luxembourg supports the EU directive on the promotion of the use of energy from renewable sources and the EU directive on fuel quality. The ERT encourages Luxembourg to report on the assessment of the economic and social consequences of response measures in its next BR.

26. Luxembourg did not report any information on the domestic arrangements established for the process of self-assessment of compliance with emission reductions required by science, and on the progress made in the establishment of national rules for taking action against non-compliance with emission reduction targets. The ERT encourages Luxembourg to report this information in its next BR.

27. The EU 2020 climate and energy package is supplemented by the EU renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO₂ emissions from cars and vans, the carbon capture and storage directive, and the general programmes for environmental conservation, namely the 7th Environment Action Programme and the clean air policy package (see table 3 below).

28. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities), which produce 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N₂O emissions from chemical industries, PFC emissions from aluminium production and CO₂ emissions from industrial processes (since 2013).

29. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture, waste and other sectors, together accounting for 55–60 per cent of the GHG emissions of the EU. The ESD aims to decrease GHG emissions in the EU by 10 per cent below the 2005 level by 2020 and includes binding annual targets for each member State for 2013–2020, which are underpinned by the national policies and actions of the member States (see para. 14 above).

30. The BR2 highlights the EU-wide mitigation actions under the EU 2020 climate and energy package, which in Luxembourg are translated into national actions through the

second national Action Plan for Reducing CO₂ Emissions. That plan includes 51 implemented, adopted or planned measures and actions that are regulatory, fiscal, economic, informational, training, awareness-raising or land-planning in nature, all with the goal of complying with the EU commitment by 2020.

31. At the national level, Luxembourg introduced policies described in the second national Action Plan for Reducing CO₂ Emissions to achieve its targets under the ESD and domestic emission reduction targets. The key policies reported in the BR2 are focused on increasing energy efficiency (in the housing sector and of public and commercial services) as well as promoting the use of alternative and renewable energy sources (e.g. biomass or biogas for heating or solar thermal installations), which can replace fossil fuel consumption in Luxembourg.

32. Other policies that have delivered significant emission reductions are those related to the reduction of energy consumption, primarily through increased energy efficiency in the housing sector and the increased use of energy from renewable sources. The mix of measures includes direct allowances and payments for the installation of energy-saving devices (e.g. household appliances, home heating systems), cashback schemes and other financial incentives (e.g. partially refunding the purchase of a low-energy electrical appliance or a low-CO₂ emitting vehicle), and subsidy schemes for the production of 'green' energy (i.e. feed-in tariffs for electricity production).

33. The BR2 highlights the planned domestic mitigation actions that are under development, such as fuel taxation. Among those mitigation actions that provide a foundation for significant additional impacts, the following actions are critical for Luxembourg to attain its 2020 emission reduction targets: the increased use of biofuels; alternative means of propulsion; a fuel taxation scheme; the increased use of alternative and renewable sources of energy; and energy efficiency in the housing sector.

34. Table 3 below provides a concise summary of the key mitigation actions and estimates of their mitigation effects reported by Luxembourg to achieve its target.

Table 3

Summary of information on mitigation actions and their impacts reported by Luxembourg

<i>Sector affected</i>	<i>List of key mitigation actions</i>	<i>Estimate of mitigation impact (kt CO₂ eq)^a</i>
Policy framework and cross-sectoral measures	EU ETS	NA
	Innovation and research	NA
	Education, information, awareness-raising and advice	NA
	Climate pact initiative for municipalities	NA
Energy, including:		
Transport	Promoting the use of biofuels	550.60
	Increasing the share of vehicles using alternative fuels	172.65
Renewable energy	Promoting the use of alternative and renewable sources of energy	10.18

<i>Sector affected</i>	<i>List of key mitigation actions</i>	<i>Estimate of mitigation impact (kt CO₂ eq)^a</i>
Energy efficiency	Increasing energy efficiency in the housing sector	102.37
	Improving energy efficiency of public and commercial services	1.17
Agriculture and LULUCF	Increasing carbon storage by forests and in cultivated land	NE

Note: The estimates of mitigation impact are estimates of emissions of carbon dioxide or carbon dioxide equivalent avoided in a given year as a result of the implementation of mitigation actions, unless otherwise specified.

Abbreviations: EU ETS = European Union Emissions Trading System, LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated.

^a Luxembourg did not report estimates of mitigation impacts for any particular year, but instead reported the overall mitigation potential of some of its policies and measures.

35. Based on the limited information provided on the effects of mitigation actions, it is difficult for the ERT to assess the extent to which each of Luxembourg's mitigation actions could contribute to achieving the Party's target, hence making it impossible to assess the overall combined contribution of all the mitigation actions to the achievement of the target.

2. Estimates of emission reductions and removals and the use of units from the market-based mechanisms and land use, land-use change and forestry

36. Luxembourg reported in its BR2 and CTF tables 4, 4(a)I, 4(a)II and 4(b) its use of units from market-based mechanisms under the Convention and the contribution of LULUCF to achieving its target. Further relevant information on emissions and removals and the use of units is provided in chapters 3.3 and 3.4 of the BR2.

37. In its BR2, Luxembourg explained that contributions from the LULUCF sector are not included in CTF table 4(a)I because the LULUCF sector is not included in the EU target, and that the use of market-based mechanisms could not be quantified in CTF table 4(b) as the compliance assessment for 2013 under the ESD will be undertaken in 2016.

38. Luxembourg further explained that since 2013, it has not been possible to track the use of market-based mechanisms in the EU ETS through the public website of the EU transaction log. CERs and ERUs are converted to EU emission allowances and cannot be tracked after that conversion until they become public at the installation level two years after they have been conducted.

39. The ERT noted an inconsistency in the reported amount of total GHG emissions for the base year and the reporting years between CTF table 4 and the 2016 annual inventory submission of 15 April 2016, on which CTF table 4 was based. During the review, in response to the ERT request, Luxembourg acknowledged the inconsistency, noting that the annual GHG inventory data are correct. The ERT recommends that Luxembourg improve the transparency of its reporting by ensuring the consistency of information reported in the CTF tables and the annual GHG inventory in its next BR.

40. For 2014, Luxembourg reported in CTF table 4 annual total GHG emissions excluding LULUCF of 10,770.58 kt CO₂ eq, or 16.3 per cent below the 1990 base-year level. In 2014, emissions from the non-ETS sectors relating to the target under the ESD were 8,850 kt CO₂ eq. Table 4 below illustrates Luxembourg's total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 4

Summary of information on the use of units from market-based mechanisms and land use, land-use change and forestry as part of the reporting on the progress made by Luxembourg towards the achievement of its target

<i>Year</i>	<i>Emissions excluding LULUCF (kt CO₂ eq)</i>	<i>Contribution from LULUCF (kt CO₂ eq)^a</i>	<i>Emissions including contribution from LULUCF (kt CO₂ eq)</i>	<i>Use of units from market-based mechanisms (kt CO₂ eq)</i>
Base year (1990)	12 870.95	NA	NA	NE
2010	12 221.20	NA	NA	NE
2011	12 091.45	NA	NA	NE
2012	11 771.84	NA	NA	NE
2013	11 207.30	NA	NA	NE
2014	10 770.58	NA	NA	NE

Sources: Luxembourg's second biennial report and common tabular format tables 1, 4, 4(a)I, 4(a)II and 4(b).

Abbreviations: LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated.

^a The European Union's unconditional commitment to reduce greenhouse gas emissions by 20 per cent below the 1990 level by 2020 does not include emissions/removals from LULUCF.

41. To assess the progress towards the achievement of the 2020 target, the ERT noted that Luxembourg's emission reduction target from sectors not covered by the EU ETS under the ESD is 20 per cent below the 2005 level (see para. B.15 above). As discussed in chapter II.B above, in 2013 and 2014 Luxembourg's emissions from the sectors not covered by the EU ETS are 1.9 per cent (180 kt CO₂ eq) and 5.2 per cent (490 kt CO₂ eq), respectively, below the AEAs under the ESD for the same years (see para. 15 above).

42. The ERT noted that Luxembourg is making progress towards its emission reduction target under the ESD by implementing mitigation actions that delivered some emission reductions during the period 2013–2014. The ERT took note of information provided by Luxembourg which indicates that beyond this period the Party may face challenges in meeting the ESD target by 2020. A combination of additional PaMs and the use of units from market-based mechanisms may be needed for Luxembourg to achieve the target.

3. Projections

43. Luxembourg reported in its BR2 and CTF table 6(a) updated projections for 2020 and 2030 relative to actual inventory data for 2013 under the 'with measures' (WEM) scenario. Projections are presented on a sectoral basis, except for the LULUCF sector, using the same sectoral categories as used in the chapter on mitigation actions. Projections are also provided in an aggregated format for each sector as well as for a Party total, using GWP values from the IPCC AR4. Luxembourg reported on factors and activities influencing emissions for each sector. Further information on the projections is provided in chapter 4 of the BR2.

44. The BR2 and CTF table 6(a) do not include the information required by the UNFCCC reporting guidelines on BRs on: projections for the LULUCF sector (see para. 45 below); projections on a gas-by-gas basis for CO₂ and HFCs only (see para. 45 below); and emission projections related to fuel sold to ships and aircraft engaged in international transport (see para. 46 below). In addition, information reported by Luxembourg on factors and activities influencing emissions for each sector is not transparent (see para. 47 below).

45. During the review, Luxembourg provided additional information on projections by gas and by sector. Luxembourg explained that it conducted projections for CO₂ or CO₂ eq emissions only, depending on the source categories, as CO₂ emissions represent more than 90.0 per cent of the total GHG emissions of the country. In addition, Luxembourg did not generate projections for the LULUCF sector as this sector is not included in the EU emission reduction target. The ERT reiterates the recommendation in the TRR/BR1 that Luxembourg report projections for the LULUCF sector and projections by gas in its next BR in order to improve the completeness of its reporting.

46. In its BR2, Luxembourg reported GHG projections for international aviation. These were reported separately and not included in national totals. During the review, Luxembourg clarified that it calculated projections for emissions related to fuel sold to aircraft engaged in international transport but not for fuel sold to ships, as emissions from fuel sold to ships are below the threshold of significance compared with the total emissions excluding or including LULUCF. The ERT recommends that Luxembourg improve the completeness of its reporting by providing projections for fuel sold to ships and aircraft engaged in international transport, to the extent possible, in its next BR and specify the rationale for not providing relevant information.

47. Luxembourg provided a list of variables and key assumptions used for the projections and in CTF table 5. However, Luxembourg does not elaborate in its BR2 on factors and activities used in the projections for each sector, in order to better understand the emission trends during the periods 1990–2020 and 2020–2030. During the review, in response to the ERT request, Luxembourg provided additional information on the assumptions used for the projections, which are included in reports prepared by Econotec⁴ and Komobile⁵ (in French and German, respectively). Luxembourg also referred to studies conducted by the European Topic Centre on Air Pollution and Climate Change Mitigation. The ERT recommends that Luxembourg increase the transparency of its reporting by explaining key factors and activities influencing emissions trends for each sector in its next BR.

48. The BR2 and CTF tables 5, 6(b) and 6(c) do not include the information on projections for the ‘without measures’ (WOM) scenario and ‘with additional measures’ (WAM) scenario as well as on the sensitivity analysis. During the review, Luxembourg explained that it considers that the WOM scenario is too complicated to be produced by Luxembourg and expressed its intention to develop a WAM scenario in the future. The ERT noted that the BR1 included projections under the WAM scenario, and thus encourages Luxembourg to report on the WAM and WOM scenarios in its next BR.

49. During the review, in response to the ERT request, Luxembourg provided additional information on the sensitivity analysis. According to Luxembourg, because emission projections are produced by sector, parameters related to GDP growth and fuel prices are not very relevant for the sensitivity analysis. Luxembourg mentioned that the factors that play a role in emission projections in Luxembourg are population growth and its associated needs (housing, infrastructure) and employment structure (the share of cross-border commuters versus workers that reside in Luxembourg), and that these are driven by anticipated economic development. Luxembourg also explained that in the case of road transportation, the sensitivity analysis should be conducted on price differentials with neighbouring countries but not on overall fuel price. The ERT considers that the sensitivity

⁴ ECONOTEC Consultants. July 2015. “Projections d’émissions de CO₂, CH₄, N₂O, NO_x et PM_{2.5} à l’horizon 2035 au Luxembourg, rapport final”.

⁵ Komobile und FVT Graz. December 2014. “BAU-Prognose zum Kraftstoffexport und der zugehörigen Emissionen von klimarelevanten Gasen und Luftschadstoffen des Verkehrssektors in Luxemburg von 2015 - 2030 und Ausblick bis 2050, Endbericht”.

analysis can be performed using these key factors and encourages Luxembourg to include this information in its next BR.

Overview of projection scenarios

50. The WEM scenario reported by Luxembourg includes implemented and adopted PaMs up to the year 2013. Luxembourg provided a definition of its scenarios, explaining that its WEM scenario includes national PaMs and, to the extent possible, its plan to address transit vehicles and their impacts on emissions. The definition indicates that the scenario has been prepared according to 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”.

Methodology and changes since the previous submission

51. Luxembourg provided limited information in the BR2 on methodologies used for projections. The methodology used in the BR2 is identical to that used for the preparation of the emission projections for the NC6/BR1. Projections were calculated using a bottom-up approach, with a few key parameters such as anticipated population growth and energy demand by main sectors. Projections were calculated for the ETS and non-ETS sectors separately, where applicable, and the methodology used for these projections is mostly based on the report prepared by Econotec. The ERT reiterates the encouragement in the TRR/BR1 that Luxembourg report on changes in the model or methodologies used for the preparation of projections between consecutive submissions and assess the effects of any changes.

52. To prepare its projections, Luxembourg relied on the following key underlying assumptions: GDP growth, population growth, and energy demands. During the review, Luxembourg provided additional information on the assumption of one key parameter: the number of passengers per kilometre. To increase the transparency of its reporting on projections, the ERT encourages Luxembourg to provide more information in its next BR on the methodology and key assumptions used for projections.

Results of projections

53. Luxembourg’s total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 10,341.02 and 10,306.62 kt CO₂ eq, respectively, under the WEM scenario, which represents a decrease of 19.6 and 19.9 per cent, respectively, below the 1990 level. The 2020 projections suggest that Luxembourg will continue contributing to the achievement of the EU target under the Convention (see para. 15 above).

54. Luxembourg’s target for the emissions from sectors covered by the ESD (non-ETS sectors) is to reduce its total emissions by 20 per cent below the 2005 level by 2020 (see para. 15 above). Luxembourg’s AEAs, which correspond to its national emission target for non-ETS sectors, change linearly from 9,450.00 kt CO₂ eq in 2013 to 8,145.00 kt CO₂ eq in 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 8,630.00 kt CO₂ eq by 2020. The projected level of emissions under the WEM scenario is 6.0 per cent above the AEAs allocated for 2020. The ERT noted that this suggests that Luxembourg may face challenges in meeting its target under the WEM scenario with domestic measures only.

55. During the review, Luxembourg elaborated on what was reported in the BR2, explaining that during the period 2013–2020, Luxembourg might generate a surplus of emission reductions from the non-ETS sectors equivalent to 880.00 kt CO₂ eq compared with the total AEAs for the same period. This suggests that Luxembourg will be able to achieve the ESD target.

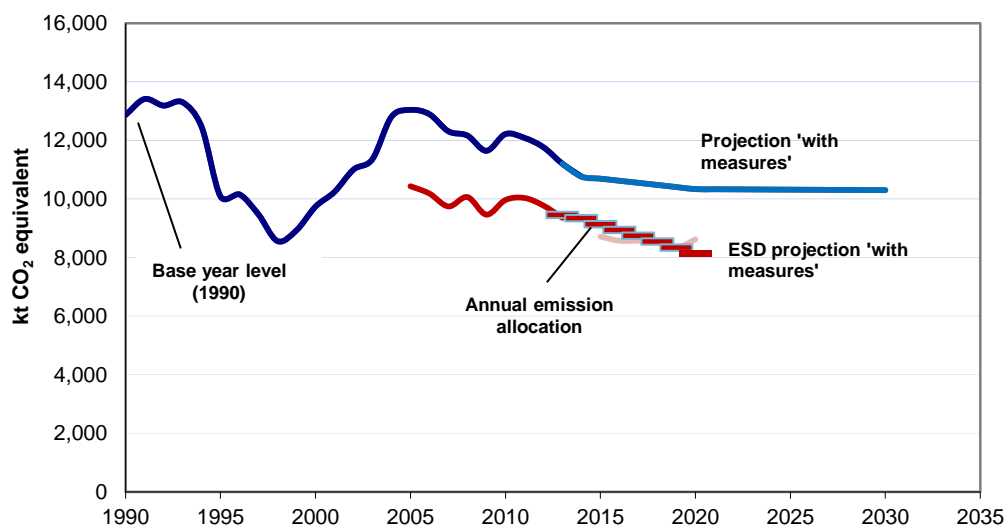
56. In addition to its target for non-ETS sectors, Luxembourg committed itself to achieving a domestic target of a 20 per cent reduction in emissions below the 2005 level by 2020. The projections indicate that Luxembourg expects to meet its domestic target. The 2020 emissions (10,341.02 kt CO₂ eq) under the WEM scenario are about 20.7 per cent below the 2005 level (13,045.45 kt CO₂ eq).

57. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy and industrial processes sectors, amounting to projected reductions of 4,526.72 kt CO₂ eq (58.6 per cent) and 1,005.95 kt CO₂ eq (61.0 per cent) between 1990 and 2020, respectively. The pattern of projected emissions reported for 2030 under the same scenario remains largely the same. Nevertheless, an increase in emissions from transportation is projected for both 2020 and 2030. Emissions from the transport sector are projected to be more than double the level of 1990, increasing by 3,114.35 kt CO₂ eq (115.9 per cent) and 3,443.80 kt CO₂ eq (128.1 per cent) in 2020 and 2030, respectively. This increase arises from the increase in mobility, including road vehicles in transit, cross-border commuters and fuel tourism from bordering countries. Luxembourg, however, noted the high uncertainty in projections for the transport sector because of factors such as road fuel sale prices, taxation in neighbouring countries, mobility options at the EU level and technological developments.

58. Luxembourg reported projections only for CO₂ or CO₂ eq emissions, depending on the source categories, and all fluorinated gas emissions as a whole. Compared with the 1990 level, CO₂ emissions are projected to be reduced by 1,731.02 kt CO₂ eq (14.5 per cent) in 2020 and 1,776.30 kt CO₂ eq (14.9 per cent) in 2030. The insignificant further decrease in CO₂ emissions between 2020 and 2030 is mainly because of the difficulty of implementing road transport policies and hence their marginal effects. Compared with the 1995 level, HFC emissions are projected to increase by 92.64 kt CO₂ eq (517.5 per cent) in 2020 and 103.52 kt CO₂ eq (578.3 per cent) in 2030.

59. The projected emission levels under the different scenarios and Luxembourg's quantified economy-wide emission reduction target are presented in the figure below.

Greenhouse gas emission projections by Luxembourg



Sources: (1) Data for the years 1990–2014: Luxembourg's 2016 annual inventory submission, version 1; total GHG emissions excluding land use, land-use change and forestry; (2) Data for the

years 2014–2020: Luxembourg’s second biennial report; total GHG emissions excluding land use, land-use change and forestry; updated projections provided by the Party during the review.

Abbreviations: ESD = effort-sharing decision, GHG = greenhouse gas.

D. Provision of financial, technological and capacity-building support to developing country Parties

60. In its BR2, Luxembourg reported information on the provision of financial, technological and capacity-building support required under the Convention. The BR2 includes information on delivery mechanisms used and allocation channels tracked. Luxembourg reported a description of the methodology used to report financial support, including underlying assumptions.

61. Luxembourg provided details on what new and additional support it has provided and clarified how this support is new and additional (see para. 65 below). Further information on the Party’s provision of support to developing country Parties is provided in chapter 5 of the BR2 and paragraphs 76 and 77 below.

62. The BR2 does not include the information required by the UNFCCC reporting guidelines on BRs on: the national approach to tracking the provision of financial, technological and capacity-building support to Parties not included in Annex I to the Convention (non-Annex I Parties), and indicators for tracking the provision of support. In addition, information reported by Luxembourg on the following elements is not transparent: determination of “new and additional” for the financial resources provided in both textual and tabular format, and support for the development and enhancement of endogenous capacities and technologies of non-Annex I Parties.

63. Luxembourg reported the financial support it provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support. Luxembourg made reference to its NC6 in which more detailed information was reported and pointed out the changes made since that submission.

64. The BR2 does not include the information to be reported, to the extent possible, in CTF tables 8 and 9 as required by the UNFCCC reporting guidelines on BRs. Further, the BR2 does not include the information required for private financial resources leveraged; PaMs that promote the scaling up of private investment in mitigation and adaptation activities in developing country Parties; and provision of capacity-building support that responds to the existing and emerging capacity-building needs identified by non-Annex I Parties in the areas of mitigation, adaptation, and technology development and transfer. In addition, information reported by Luxembourg on the following elements is not transparent: capacity-building elements of financial resources provided, and changes to the national approach, as indicated in the NC6, to tracking the provision of financial, technological and capacity-building support to non-Annex I Parties.

65. Luxembourg explained how it determines how much of its support is new and additional. Luxembourg’s definition is that resources it commits to deliver are not taken from earlier commitments (and are thus “new”), and that they are “additional” to Luxembourg’s official development assistance (ODA) commitments and thus are not double counted and do not drain other resources dedicated to poverty eradication.

1. Finance

66. In its BR2 and CTF tables 7, 7(a) and 7(b), Luxembourg reported information on the provision of financial support required under the Convention, including on financial

support provided, committed and pledged, allocation channels and annual contributions (see paras. 77–79 below). The summary information was reported for 2013 and 2014.

67. Luxembourg described how its resources address the adaptation and mitigation needs of non-Annex I Parties. It also described how those resources assist non-Annex I Parties to mitigate and adapt to the adverse effects of climate change, facilitate economic and social response measures, and contribute to technology development and transfer and capacity-building related to mitigation and adaptation (see chapters II.D.2 and II.D.3 below).

68. The BR2 does not include the information required by the UNFCCC reporting guidelines on BRs on the national approach to tracking of provision of financial, technological and capacity-building support to non-Annex I Parties or changes therein since the BR1/NC6. During the review, in response to a question raised by the ERT, Luxembourg explained that for ODA, Luxembourg uses the same figures as those reported for the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee, for which rules are established to ensure that there is, normally, no double counting. For other official flows (OOF), however, Luxembourg uses a different system for which it did not provide details. The ERT recommends that Luxembourg provide information on the national approach to tracking financial, technological and capacity-building support to non-Annex I Parties or changes therein since its previous report in its next BR.

69. The BR2 and CTF tables 7, 7(a) and 7(b) also do not include the information required by the UNFCCC reporting guidelines on BRs on indicators for tracking the provision of support. Luxembourg did not provide clarification on this in response to the question raised by the ERT during the review. The ERT recommends that Luxembourg improve the completeness of its reporting by including information on indicators in its next BR.

70. Even though Luxembourg provided a definition of new and additional financial resources (see para. 65 above), information on how Luxembourg has determined each climate-specific financial resource provided as new and additional is not transparent in the BR2 and CTF tables 7, 7(a) and 7(b). Clarification was sought by the ERT during the review on how each individual resource is considered new and additional, following the definition provided in the BR2. Luxembourg explained that each amount reported has not been diverted from ODA or OOF for other aspects of development aid, such as health and education. As such, all figures in CTF tables 7(a) and 7(b) should be considered as additional to ODA commitments.

71. Luxembourg indicated that it is possible that climate change related ODA has declined between 2013 and 2014 because the Party has not set a target for this type of ODA (i.e. a percentage of ODA dedicated to climate change mitigation, adaptation or remediation) and public authorities do not have total control of this aid. Support has declined from one year to the next, even if there is a broad political commitment to provide more climate change related financial support. While acknowledging the explanation provided by Luxembourg, the ERT recommends that Luxembourg improve the transparency of its reporting on how the financial resources provided have been determined as new and additional in its next BR.

72. According to the UNFCCC reporting guidelines on BRs, sectoral information shall be provided on annual financial support provided for the purpose of assisting non-Annex I Parties. In the BR2 and CTF tables 7, 7(a) and 7(b), however, the information provided on the sectoral distribution of financial resources across grouped projects is not transparent. For instance, row 22 of CTF table 7(b) for 2014 indicates EUR 13,437,037 as the total financial support provided for projects in Burkina Faso (BFK/016, BFK/017 and BFK/019

– for pastoral activity and forestry) and the Niger (NIG/017 and NIG/019 – for training and education). These projects address two different sectors and associated activities, and how much support is provided for each is not indicated. There are many such examples in CTF table 7(b) for the years 2013 and 2014.

73. During the review, in response to a question raised by the ERT, Luxembourg indicated time and resource constraints as the reason for not being able to compile CTF table 7(b) per finance, technology and capacity-building support related project from the large amount of background data on the projects. During the review, Luxembourg also submitted background tables used to compile CTF table 7(b), which include detailed descriptions of the projects, including the information required by the UNFCCC reporting guidelines on BRs. The ERT recommends that Luxembourg improve the transparency of its reporting by providing information on the sectoral distribution of financial resources across grouped projects in its next BR.

74. Luxembourg provided information on the types of instrument used in the provision of its assistance. The BR2 does not include the information required by the UNFCCC reporting guidelines on BRs on the Party's private financial flows from bilateral sources directed towards mitigation and adaptation activities in non-Annex I Parties. Luxembourg explained that as a public department primarily concerned with development policies and the management of ODA, the Ministry of Foreign and European Affairs, Directorate for Development Cooperation, does not report on private sector investments. Nevertheless, for publicly funded (bilateral or non-governmental organization (NGO)) projects in the field of technology transfer, the Ministry does rely on the private sector as a skilled and specialized technical partner. In this context, Luxembourg provided two examples of private sector participation. The ERT encourages Luxembourg to provide information on its private financial flows from bilateral sources directed towards mitigation and adaptation activities in non-Annex I Parties in its next BR.

75. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, Luxembourg reported that its climate finance has been allocated on the basis of targeted interventions in a limited number of partner countries, five out of nine of which are least developed countries (LDCs). These interventions are mainly through NGO-supported actions that prioritize: the integration of sustainable development into countries' policies and programmes; reduction in biodiversity loss; agriculture; energy-efficient buildings; solar energy; and cross-cutting actions, such as integrated development, organic farming and waste recycling.

76. Luxembourg reported on its climate-specific public financial support provided in 2013 and 2014, totalling EUR 5.07 million in 2013 and EUR 9.39 million in 2014. With regard to the future financial pledges aimed at enhancing the implementation of the Convention by developing countries, Luxembourg committed itself to providing EUR 120 million in the period 2014–2020 for the International Climate Fund, including an annual contribution of EUR 5 million to the Green Climate Fund. During the reporting period, Luxembourg placed a focus on Burkina Faso, Cabo Verde, Mali, the Niger, Senegal (all LDCs in sub-Saharan Africa), El Salvador, the Lao People's Democratic Republic, Nicaragua and Viet Nam.

77. The BR2 includes detailed information on the financial support provided through multilateral channels, and bilateral and regional channels in 2013 and 2014. More specifically, Luxembourg contributed through multilateral channels, as reported in its BR2 and in CTF table 7(a), EUR 6.01 and 10.26 million for 2013 and 2014, respectively. These contributions were made to specialized multilateral climate change funds, such as the International Union for Conservation of Nature and its work for small island developing States (IUCN-SIDS), the United Nations Development Programme, the United Nations Environment Programme and the United Nations Collaborative Programme on Reducing

Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD). The BR2 and CTF table 7(b) also include detailed information on the total financial support provided through bilateral (EUR 17.19 and 25.12 million) and regional (EUR 6.16 and 6.52 million) channels in 2013 and 2014, respectively. Table 5 includes some of the information reported by Luxembourg on its provision of financial support.

Table 5
Summary of information on provision of financial support in 2013–2014 by Luxembourg

(Euros, except where otherwise indicated)

<i>Allocation channel of public financial support</i>	<i>Years of disbursement</i>	
	<i>2013</i>	<i>2014</i>
Official development assistance ^a (million USD)	429.32	423.22
Climate-specific contributions through multilateral channels, including:	5 073 795	9 389 078
Green Climate Fund		5 000 000
Trust Fund for Supplementary Activities		
Financial institutions, including regional development banks	1 728 795	2 141 170
United Nations bodies	3 345 000	2 247 908
Other		
Climate-specific contributions through bilateral, regional and other channels	23 353 239	31 637 300
Other		

^a Source: Query Wizard for International Development Statistics, available at <<http://stats.oecd.org/qwids/>>.

78. The BR2 provides information on the types of support provided. In terms of the focus of public financial support, as reported in CTF table 7 for 2013, the shares of total public financial support allocated for mitigation and adaptation projects corresponding to these channels were 49.3 and 34.1 per cent, respectively. Altogether, 17.8 per cent of the total public financial support was allocated through multilateral channels and 82.2 per cent of it was through bilateral, regional and other channels. In 2014, the shares of total public financial support allocated for mitigation, adaptation and cross-cutting projects corresponding to these channels were 32.0, 14.8 and 53.2 per cent, respectively. In total, 22.9 per cent of the total public financial support was allocated through multilateral channels and 77.1 per cent of it was through bilateral, regional and other channels.

79. The ERT noted that the highest level of financial support went to projects in cross-cutting sectors followed by those in the agriculture sector. In 2013, 19.7 per cent of financial contributions made through multilateral channels were allocated to energy, 39.7 per cent to forestry, 24.1 per cent to activities that are cross-cutting across mitigation and adaptation, and the remaining 16.7 per cent to funding for other activities, such as multisectoral and disaster preparedness activities, as reported in CTF table 7(a). The corresponding figures for 2014 were 10.7 per cent for energy, 21.3 per cent for forestry, and the remaining 68.0 per cent for other sectors such as training, health, biodiversity, agriculture and water. Hence, most of the multilateral funding is being allocated to cross-cutting and other sector activities. In 2013, 59.3 per cent of bilateral and regional support was provided to agriculture and related activities, 31.4 per cent to multisectoral activities, 7.2 per cent to forestry and 2.1 per cent to energy. In 2014, these shares were 70.2 per cent for agriculture, 29.5 per cent for multisectoral activities and 0.3 per cent to energy.

80. CTF tables 7(a) and 7(b) include information on the types of financial instrument used in the provision of assistance to developing countries, which are all grants.

81. In its BR2, Luxembourg clarified that private finance is mainly related to exports of goods, technologies and services in the environment, solar energy, agriculture, energy efficiency and clean technologies sectors. It also reported on how it promotes the provision of financial support to developing countries from the private sector through public funds, which it sees as pivotal to effectively increasing both mitigation and adaptation efforts in developing countries, by collaboration in training and by provision of goods and services.

2. Technology development and transfer

82. In its BR2, Luxembourg provided information on measures and activities related to technology transfer, access and deployment benefiting developing countries, including information on activities undertaken by the public and private sectors. Luxembourg provided examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties.

83. CTF table 8 was not filled in. Luxembourg explained in its BR2 that CTF table 8 was not filled in, as Luxembourg does not apply an OECD marker for technology development, and this information is difficult to disaggregate from the existing national statistics. The ERT recommends that Luxembourg improve transparency and populate data in CTF table 8 in its next BR.

84. The ERT noted that, in its BR2, Luxembourg reported on its PaMs as well as success and failure stories in relation to technology transfer, and in particular on measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. In its BR2, Luxembourg provided information on measures taken to support the development and enhancement of the endogenous capacities and technologies of non-Annex I Parties (see para. 90 below).

85. The ERT took note of the information provided in the BR2 on recipient countries, target areas, measures and focus sectors of technology transfer programmes (see para. 90 below).

3. Capacity-building

86. In its BR2, Luxembourg supplied information on how it provided capacity-building support for mitigation, adaptation and technology that responds to the existing and emerging needs identified by non-Annex I Parties.

87. CTF table 9 was not provided. Luxembourg explained in its BR2 that as the information required for the table can be retrieved using the OECD capacity-building marker, CTF table 9 was not provided in this BR. The ERT recommends that Luxembourg improve the transparency of its reporting by populating data in CTF table 9 in its next BR.

88. Luxembourg described individual measures and activities related to capacity-building support in textual and tabular format in the BR2.

89. Luxembourg reported that it supported climate-related capacity development activities relating to adaptation, mitigation, climate financing and other sectors such as the development of renewable energy. Luxembourg also reported that it responded to the existing and emerging capacity-building needs of non-Annex I Parties in the areas of mitigation, adaptation and technology development and transfer by following the principles of national ownership and stakeholder participation.

90. The BR2 includes a description of a number of individual capacity-building measures and activities carried out during the reporting period. Luxembourg illustrated its

approach to involving the private sector through four stories of successful collaboration: knowledge transfer in energy-efficient public building design in Cabo Verde; the establishment of the Tunis International Centre for Environmental Technologies in Tunisia; the evaluation by private entity LuxDev of a water hyacinths and biogas project in Viet Nam; and providing solar panels or more complex solar container systems.

III. Conclusions

91. The ERT conducted a technical review of the information reported in the BR2 and CTF tables of Luxembourg in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information is partially in adherence with the UNFCCC reporting guidelines on BRs and provides an overview on: emissions and removals related to the Party's quantified economy-wide emission reduction target; assumptions, conditions and methodologies related to the attainment of the target; progress made by Luxembourg in achieving its target; and the Party's provision of support to developing country Parties.

92. Luxembourg's total GHG emissions excluding LULUCF related to its quantified economy-wide emission reduction target were estimated to be 16.3 per cent below its 1990 level, whereas total GHG emissions including LULUCF are 20.2 per cent below its 1990 level for 2014. The emission decrease was driven by a decrease in CO₂ emissions from the industrial processes sector before 1998 that resulted from a process change from using blast furnaces to using electric arc furnaces, and an increase in CO₂ emissions from the transportation sector since 1998 as well as from the country's gas-fired power plant, in operation since 2002.

93. Under the Convention, Luxembourg is committed to contributing to the achievement of the joint EU quantified economy-wide target of a 20 per cent reduction in emissions below the 1990 level by 2020. The target covers all sectors and the gases CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, expressed using GWP values from the AR4. Emissions and removals from the LULUCF sector are not included in the quantified economy-wide emission reduction target under the Convention. The EU generally allows its member States to use units from the Kyoto Protocol mechanisms as well as new market mechanisms for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. Companies can make use of such units to fulfil their requirements under the EU ETS.

94. Under the ESD, Luxembourg has a target to reduce its emissions by 20 per cent below the 2005 level by 2020. Luxembourg's AEAs, which correspond to its national emission target for non-ETS sectors, change linearly from 9,450 kt CO₂ eq in 2013 to 8,145 kt CO₂ eq in 2020. In addition, Luxembourg committed itself to achieving a domestic target of a 20 per cent reduction in emissions below the 1990 level by 2020.

95. Luxembourg's main policy framework relating to energy and climate change is the EU 2020 climate and energy package, which in Luxembourg is translated into actions through the second national Action Plan for Reducing CO₂ Emissions. Key legislation supporting Luxembourg's climate change goals includes 51 implemented, adopted or planned PaMs that are regulatory, fiscal, economic, informational, training, awareness-raising or land-planning in nature, all with the goal of complying with the EU commitment by 2020. The mitigation actions with the most significant mitigation impacts are the measures related to the transport, energy supply, energy consumption and agriculture sectors.

96. For 2014, Luxembourg reported in CTF table 4 total GHG emissions excluding LULUCF at 10,770.58 kt CO₂ eq, or 20.2 per cent below the 1990 level. Luxembourg did

not report on its use of the units from market-based mechanisms to achieve its target because of the current difficulty in tracking the conversion of CERs and ERUs to EU emission allowances (see para. 38 above). Luxembourg plans to report on its use of market-based mechanisms in the future.

97. The GHG emission projections provided by Luxembourg in its BR2 are those for the WEM scenario. Under this scenario, emissions are projected to be 19.6 per cent below the 1990 level in 2020. Further, according to the projections under the WEM scenario, the projected level of emissions from non-ETS sectors is 6.0 per cent above the AEAs allocated for 2020. However, during the period 2013–2020, Luxembourg might generate a surplus of emission reductions from the non-ETS sectors equivalent to 880.00 kt CO₂ eq compared with the total AEAs for the same period. This suggests that Luxembourg will be able to achieve the ESD target.

98. The ERT noted that Luxembourg is making progress towards its emission reduction target by implementing mitigation actions that deliver some emission reductions. The ERT noted that Luxembourg will face challenges in meeting its national domestic target and has plans in place to use the units from market-based mechanisms and to introduce new PaMs in order to ensure that it achieves its emission reduction target.

99. Luxembourg continues to allocate climate financing in line with the climate finance programmes such as the Global Environment Facility, IUCN-SIDS, UN-REDD and the Trust Fund for Participation in the UNFCCC Process in order to assist developing country Parties to implement the Convention. Luxembourg's public financial support in 2013 and 2014 totalled EUR 28.42 and 41.03 million per year, respectively. For these years, Luxembourg's support provided for mitigation action was higher than support provided for adaptation. The highest level of financial support went to projects in cross-cutting sectors followed by those in the agriculture sector. In addition, Luxembourg provided support for the deployment and enhancement of endogenous capacities and technologies, especially in Cabo Verde, Tunisia and Viet Nam.

100. In the course of the review, the ERT formulated the following recommendations for Luxembourg to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR:⁶

- (a) Improve the completeness of its reporting by:
 - (i) Providing information on changes in its domestic institutional arrangements (see para. 21 above);
 - (ii) Providing the estimated effect of each mitigation action (see para. 24 above);
 - (iii) Providing projections on a gas-by-gas basis (see para. 45 above);
 - (iv) Providing projections for all sectors, including the LULUCF sector (see para. 45 above);
 - (v) Providing projections for emissions related to fuel sold to ships and aircraft engaged in international transport, to the extent possible (see para. 46 above);
 - (vi) Providing information on the national approach to tracking the provision of financial, technological and capacity-building support to non-Annex I Parties, if appropriate, or changes therein since its previous submissions (see para. 68 above);

⁶ The recommendations are given in full in the relevant chapters of this report.

- (vii) Providing information on indicators for the provision of financial, technological and capacity-building support to non-Annex I Parties (see para. 69 above);
- (b) Improve the transparency of its reporting by:
 - (i) Providing justification for not estimating the mitigation effect of each mitigation action in cases where estimating the effect is not feasible (see para. 24 above);
 - (ii) Ensuring the consistency of information reported in the CTF tables and the annual GHG inventory in its next BR (see para. 39 above);
 - (iii) Explaining key factors and activities influencing emission trends for each sector (see para. 47 above);
 - (iv) Providing clearer information on how the financial resources provided have been determined as new and additional (see para. 71 above);
 - (v) Providing information on the sectoral distribution of financial resources across grouped projects (see para. 73 above);
 - (vi) Populating CTF tables 8 and 9 with relevant data (see paras. 83 and 87 above);
- (c) Improve the timeliness of its reporting by submitting its next BR on time (see para. 5 above).

Annex

Documents and information used during the review

A. Reference documents

“UNFCCC biennial reporting guidelines for developed country Parties”. Annex I to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=4>.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories”. Annex I to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf#page=2>.

“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 technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”. Annex to decision 13/CP.20. Available at <http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf>.

FCCC/IDR.6/LUX. Report of the technical review of the sixth national communication of Luxembourg. Available at <http://unfccc.int/resource/docs/2014/idr/lux06.pdf>.

FCCC/TRR.1/LUX. Report of the technical review of the first biennial report of Luxembourg. Available at <http://unfccc.int/resource/docs/2014/trr/lux01.pdf>.

2015 greenhouse gas inventory submission of Luxembourg. Available at http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php.

2016 greenhouse gas inventory submission of Luxembourg. Available at http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php.

Sixth national communication of Luxembourg. Available at http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/dev_nc6_final.pdf.

First biennial report of Luxembourg. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/br1_lux_18314.pdf.

Common tabular format tables of the first biennial report of Luxembourg. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/br_ctf_lux_2014_v1.0_formatted.pdf.

Second biennial report of Luxembourg. Available at http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/dev_br2_draft_160605.pdf.

Common tabular format tables of the second biennial report of Luxembourg. Available at <http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/lux_2016_v2.0_formatted.pdf>.

B. Additional information used during the review

Responses to questions during the review were received from Mr. Eric De Brabanter (Ministry of Sustainable Development and Infrastructure of Luxembourg), including additional material.
