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## Report of the technical review of the second biennial report of Canada

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 Canada, 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)<sup>1</sup> of Canada. 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 Canada, 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 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 Mr. Nalin Srivastava and Ms. Xuehong Wang (UNFCCC secretariat).

### B. Summary

3. The expert review team (ERT) conducted a technical review of the information reported in the BR2 of Canada in accordance with the “UNFCCC biennial reporting guidelines for developed country Parties” (hereinafter referred to as the UNFCCC reporting guidelines on BRs).

4. During the review, Canada provided the following additional relevant information: clarification on the contribution of land use, land-use change and forestry (LULUCF) to the achievement of its target; clarification on the information reported in or missing from common tabular format (CTF) tables 2, 2(a)–(f), 4 and 4(a)–(f), including the choice of global warming potential (GWP) values and the contribution of LULUCF; the mitigation impacts of and gases affected by policies and measures (PaMs); the sectoral coverage of reported mitigation actions; a description of the methodology and assumptions related to the model used for the projections and how Canada accounts for synergies and overlaps between PaMs; projections for 2015; the drivers of the emission projections for the transport, and oil and gas sectors; clarification on the projections of bunker fuel emissions and on whether normalized data were used in the projections; how Canada responds to the capacity-building needs identified by Parties not included in Annex I to the Convention (non-Annex I Parties) and how its technology transfer supports the endogenous capacities and technologies of developing country Parties; the indicators and delivery mechanisms used for tracking the support provided to developing country Parties; and how Canada ensures that the resources provided effectively address the needs of non-Annex I Parties.

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<sup>1</sup> 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.

## 1. Timeliness

5. The BR2 was submitted on 10 February 2016, after the deadline of 1 January 2016 mandated by decision 2/CP.17. The CTF tables were submitted later on 25 April 2016. In response to a question raised by the ERT during the review, Canada informed the ERT that this was due to political, policy and technical reasons. In late 2015, there was a federal election that saw a change in federal leadership. In addition, significant new climate change actions were announced by both the federal and provincial governments in late 2015. Canada took the time to ensure that these new initiatives were described in its biennial report (BR). Canada also sought inputs from provinces and territories to its BR before formally submitting it to the secretariat. The ERT noted with concern the delay in the submission of the BR2 and CTF tables and recommends that Canada submit its next 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 Canada in its BR2 is mostly 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 Canada**

<i>Section of the biennial report</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Paragraphs with recommendations</i>
Greenhouse gas emissions and trends	Complete	Transparent	–
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target	Mostly complete	Transparent	14
Progress in achievement of targets	Mostly complete	Mostly transparent	21, 33, 39, 40
Provision of support to developing country Parties	Mostly complete	Partially transparent	61, 67, 69, 82, 83, 90

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

## II. Technical review of the reported information

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

7. Canada has provided a summary of information on greenhouse gas (GHG) emission trends for the period 1990–2013 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 Canada’s 2015 annual inventory submission (in chapter 1.2). 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” (hereinafter referred to as the UNFCCC Annex I inventory reporting guidelines) that are required by paragraph 3 of the UNFCCC reporting guidelines on BRs.

Further, in response to a recommendation made in the report of the technical review of the first biennial report (BR1) of Canada,<sup>2</sup> the Party reported that there have been no changes in the national inventory arrangements since its BR1, which improved the completeness of its reporting in the BR2.

8. The information reported in the BR2 on emission trends is consistent with that reported in the 2015 annual inventory submission of Canada. To reflect the most recently available data, version 1.0 of Canada's 2016 annual inventory submission has been used as the basis for discussion in chapter II.A of this review report.

9. Total GHG emissions<sup>3</sup> excluding emissions and removals from LULUCF increased by 19.5 per cent between 1990 and 2014, whereas total GHG emissions including net emissions and removals from LULUCF increased by 53.0 per cent over the same period.<sup>4</sup> The increase in the total GHG emissions can be attributed mainly to carbon dioxide (CO<sub>2</sub>) emissions, which increased by 23.9 per cent (excluding LULUCF) between 1990 and 2014. Over the same period, emissions of methane (CH<sub>4</sub>) increased by 13.7 per cent, while emissions of nitrous oxide (N<sub>2</sub>O) decreased by 6.7 per cent. Emissions of perfluorocarbons (PFCs) decreased by 85.6 per cent and emissions of hydrofluorocarbons (HFCs) increased by 829.8 per cent, while emissions of sulphur hexafluoride (SF<sub>6</sub>) decreased by 88.8 per cent and emissions of nitrogen trifluoride (NF<sub>3</sub>) decreased by 53.5 per cent over the same period.

10. The emission trends were driven mainly by the increase in emissions from the energy sector, including those from fuel combustion and fugitive emissions from fuels, which experienced an increase of 23.2 per cent between 1990 and 2014. These were offset, albeit to a limited extent, by the 8.8 per cent decrease in emissions from the industrial processes and product use sector over the same period. Between 2005 and 2014, Canada's emissions declined by 2.0 per cent, first decreasing by 6.8 per cent in the period 2005–2009 following the global financial crisis, before increasing by 5.2 per cent in the period 2009–2014 as a consequence of the subsequent economic recovery. Emissions from nearly all sources increased in this period, with the exception of those from energy industries, which have consistently decreased since 2005, primarily owing to lower emissions from the electricity sector, stemming from the shift away from coal-fired power production, including Ontario's phase-out of coal-fired power plants.

11. The ERT noted that, during the period 1990–2014, Canada's gross domestic product (GDP) per capita increased by 37.3 per cent, while GHG emissions per GDP unit and GHG emissions per capita decreased by 31.9 and 6.6 per cent, respectively. These changes are consistent with global economic growth trends alongside increasing energy efficiency and technology advancements across economic sectors during this period. Table 2 below illustrates the emission trends by sector and some of the economic indicators relevant to GHG emissions for Canada.

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<sup>2</sup> FCCC/TRR.1/CAN.

<sup>3</sup> In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of carbon dioxide equivalent excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated based on the 2016 inventory submission, version 1.0.

<sup>4</sup> In its comments on the draft version of this report, the Party noted that, as explained in its national inventory report for 2016 (pp. 142 and 143), the LULUCF sector displays high inter-annual variability, attributable to the inclusion of the impacts of natural disturbances in its emission estimates for forests (e.g. wildfires and insect infestations). Therefore, the change in total GHG emissions including LULUCF should not be interpreted as a trend.

Table 2  
Greenhouse gas emissions by sector and some indicators relevant to greenhouse gas emissions for Canada for the period 1990–2014

Sector	GHG emissions (kt CO <sub>2</sub> eq)					Change (%)		Share by sector (%)	
						1990–	2013–	1990	2014
	1990	2000	2010	2013	2014	2014	2014		
1. Energy	481 950.69	603 466.34	570 145.50	589 946.04	593 816.61	23.2	0.7	78.6	81.1
A1. Energy industries	145 891.61	199 824.49	165 218.10	156 280.05	153 641.49	5.3	–1.7	23.8	21.0
A2. Manufacturing industries and construction	64 901.83	69 467.55	78 115.72	95 074.84	97 076.67	49.6	2.1	10.6	13.3
A3. Transport	147 614.57	181 350.00	198 809.56	203 502.44	202 916.90	37.5	–0.3	24.1	27.7
A4.–A5. Other	74 739.63	82 973.19	73 603.12	76 652.54	80 597.79	7.8	5.1	12.2	11.0
B. Fugitive emissions from fuels	48 803.05	69 851.01	54 398.91	58 436.08	59 583.66	22.1	2.0	8.0	8.1
C. CO <sub>2</sub> transport and storage	NO	0.09	0.09	0.09	0.10	NA	18.0	NA	0.0
2. IPPU	55 879.64	53 523.95	50 481.99	52 675.67	50 989.24	–8.8	–3.2	9.1	7.0
3. Agriculture	49 007.78	58 503.03	56 805.25	60 370.99	59 095.53	20.6	–2.1	8.0	8.1
4. LULUCF	–87 189.36	–81 615.91	54 632.65	–29 632.16	71 793.30	–182.3	–342.3	NA	NA
5. Waste	26 027.94	28 747.40	28 970.14	28 431.39	28 517.50	9.6	0.3	4.2	3.9
6. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indirect CO <sub>2</sub>	4 042.06	1 750.32	11 775.21	5 999.05	14 752.99	265.0	145.9	NA	NA
<b>Total GHG emissions without LULUCF</b>	<b>612 866.05</b>	<b>744 240.71</b>	<b>706 402.87</b>	<b>731 424.09</b>	<b>732 418.88</b>	<b>19.5</b>	<b>0.1</b>	<b>100.0</b>	<b>100.0</b>
<b>Total GHG emissions with LULUCF</b>	<b>525 676.69</b>	<b>662 624.80</b>	<b>761 035.53</b>	<b>701 791.93</b>	<b>804 212.19</b>	<b>53.0</b>	<b>14.6</b>	<b>NA</b>	<b>NA</b>
<b>Total GHG emissions without LULUCF, including indirect CO<sub>2</sub></b>	<b>616 908.11</b>	<b>745 991.03</b>	<b>718 178.08</b>	<b>737 423.14</b>	<b>747 171.87</b>	<b>21.1</b>	<b>1.3</b>	<b>100</b>	<b>100</b>
<b>Total GHG emissions with LULUCF, including indirect CO<sub>2</sub></b>	<b>529 718.75</b>	<b>664 375.12</b>	<b>772 810.73</b>	<b>707 790.98</b>	<b>818 965.18</b>	<b>54.6</b>	<b>15.7</b>	<b>NA</b>	<b>NA</b>
<i>Indicators</i>									
GDP per capita (thousands 2011 USD using PPP)	31.16	37.31	40.77	42.22	42.77	37.3	1.3	NA	NA
GHG emissions without LULUCF per capita (t CO <sub>2</sub> eq)	22.05	24.19	20.77	20.81	20.61	–6.6	–1.0	NA	NA
GHG emissions without LULUCF per GDP unit (kg CO <sub>2</sub> eq per 2011 USD using PPP)	0.71	0.65	0.51	0.49	0.48	–31.9	–2.2	NA	NA

Sources: (1) GHG emission data: Canada's 2016 annual inventory submission, version 1.0; (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**

12. In its BR2 and CTF tables 2(a)–(f), Canada reported a description of its target, including associated conditions and assumptions. CTF tables 2(a)–(f) contain some of the required information in relation to the description of the Party's emission reduction target, such as the base year, sectors and gases covered and GWP values, and a discussion of improvements to the method used for accounting for emissions and removals from LULUCF. Further information on the target and the assumptions, conditions and methodologies related to the target is provided in chapter 1 of and annex 1 to the BR2.

13. The ERT noted that some of the information reported by Canada on its target is not transparent. CTF tables 2(a)–(f) do not provide the following elements, although they are reported in the BR2 (annex 1): (1) the emission reduction target as a percentage of the base year level (CTF table 2(a)); (2) the base year for each gas (CTF table 2(b)); (3) the GWP values used (CTF table 2(c)); and (4) the approach used for accounting for emissions and removals from the LULUCF sector (CTF table 2(d)). In its BR2 (annex 1), Canada explained that, although it intends to account for the contribution from LULUCF, its accounting of emissions from managed forests will exclude the impacts of natural disturbances (such as wildfires and insect infestations) because these impacts are non-anthropogenic. Canada is currently working on developing estimates for the LULUCF sector that focus on anthropogenic emissions and removals as a basis for improved reporting and accounting of LULUCF.

14. During the review, in response to a question raised by the ERT, Canada explained that the above-mentioned required reporting elements were not reported in CTF tables 2(a)–(f) due to an oversight. Canada further elaborated on its reason for not reporting in CTF table 2(d) its approach to accounting for emissions and removals from the LULUCF sector. It explained that, pending improvements to its estimation methodology for the LULUCF sector (see para. 13 above), it chose to leave the CTF tables relating to the LULUCF sector blank in order to avoid confusion resulting from large recalculations in the next BR. The ERT recommends that Canada improve the completeness of its reporting by providing, in the next BR, complete information in CTF tables 2(a)–(f). The ERT noted the need for improvement in Canada's quality control and quality assurance processes to avoid such oversight in the future.

15. For Canada, the Convention entered into force on 21 March 1994. Under the Convention, Canada made a commitment to reduce its GHG emissions by 17 per cent below the 2005 level by 2020. This target includes all GHGs included in the UNFCCC Annex I inventory reporting guidelines, namely CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub>. It also includes all Intergovernmental Panel on Climate Change (IPCC) sources and sectors included in the annual GHG inventory. The GWP values used are from the IPCC Fourth Assessment Report (AR4). Emissions and removals from the LULUCF sector are included in the target, although the accounting approach is not described in the BR2. In its BR2, Canada reported that it will consider the use of market-based mechanisms to achieve its target, but has not yet made a decision in that regard (see para. 32 below). In absolute terms, this means that under the Convention Canada has to reduce emissions from 749,030.35 kt CO<sub>2</sub> eq (in the base year)<sup>5</sup> to 621,695.19 kt CO<sub>2</sub> eq by 2020.

<sup>5</sup> Canada chose 2005 as the base year for its 2020 target. The emission level in the base year was calculated on the basis of Canada's CTF table 1s2.

16. In the BR2, Canada provided information on the context for its 2030 target. In May 2015, Canada submitted its intended nationally determined contribution (INDC) to the secretariat. The submission included an economy-wide target to reduce GHG emissions by 30 per cent below the 2005 level by 2030. In the context of developing a pan-Canadian framework on climate change with provinces and territories, the Government of Canada will be reviewing the INDC.

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

17. This chapter provides information on the review of the reporting by Canada 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.

### **1. Mitigation actions and their effects**

18. In its BR2 and CTF table 3, Canada reported on its progress in the achievement of its target and the mitigation actions implemented and planned since its sixth national communication (NC6) and BR1. 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 chapter 4 of and annex 2 to the BR2 and in this report (see paras. 27–30 below).

19. This report highlights the changes made since the publication of the Party's NC6 and BR1. In its BR2, Canada provided 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. Key changes in the institutional arrangements include: the introduction of the Canadian Energy Strategy, a framework that seeks to expand collaboration among provinces and territories with regard to Canada's energy future, with climate change as a key consideration; the adoption of the Quebec Climate Change Summit Declaration, which outlines a set of key principles to guide the national collaboration on climate change; and the agreement between federal, provincial and territorial ministers to discuss climate change on an ongoing basis at the Canadian Council of Ministers of the Environment.

20. The ERT noted that Canada has not reported mitigation impacts for the majority of the mitigation actions (82 out of the 127 mitigation actions) reported in CTF table 3. In addition, CTF table 3 does not include information on gases affected for many of the mitigation actions (24 out of the 127 mitigation actions). In response to a question raised by the ERT during the review, Canada explained that some mitigation actions (e.g. Canada's regulations to address methane emissions and the Government of Alberta's Climate Change Plan) are very recent and there is insufficient information to report on their mitigation impacts. Canada also mentioned that the federal Government will continue to work with provinces and territories to enhance the completeness of the information provided in CTF table 3 in future reports under the Convention.

21. The ERT recommends that Canada improve the completeness of its reporting by reporting mitigation effects and the respective gases affected for its mitigation actions reported in CTF table 3 in its next BR, or include transparent explanations for not reporting them.

22. CTF 3 table does not specify the year for which the mitigation impacts have been estimated. In response to a question raised by the ERT during the review, Canada clarified that the mitigation impacts have been estimated for 2020, and it referred to annex 2 to the

BR2 for detailed information on mitigation measures. Canada further clarified that the error is due to an incorrect functionality in the CTF Reporter software.

23. Canada provided, to the extent possible, detailed information on the assessment of the economic and social consequences of its response measures. Canada's Cabinet Directive on Regulatory Management<sup>6</sup> sets out guidance on the federal regulatory process that applies to all federal departments and agencies and requires all federal regulatory authorities to conduct detailed analysis of all regulations through a regulatory impact analysis statement. Published in the *Canada Gazette* as part of the public consultation on proposed regulations, the regulatory impact analysis statement includes: an analysis of the Government's objectives in relation to the regulation; any associated costs and benefits; who will be affected by the regulation; and how the implementation of the regulation will be evaluated and measured. The regulatory impact analysis also considers the international impacts of the regulation, where applicable.

24. In addition, according to Canada's BR2, for federal policy, planning and programme proposals, departments and agencies are required to conduct a strategic environmental assessment to examine the scope and nature of any likely environmental effects, the need for mitigation to reduce or eliminate any adverse effects, and the significance of any likely adverse environmental effects. Canada is also taking steps to assist developing countries with the transition to low-carbon, climate-resilient economies, in order to maximize the effect of actions taken to address climate change.

25. In annex 4 to its BR2, Canada reported, to the extent possible, 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. According to the BR2, the Commissioner of the Environment and Sustainable Development provides objective and independent analysis of, as well as recommendations on, whether federal government departments are meeting their sustainable development objectives, including on climate change.

26. Canada's Federal Sustainable Development Act provides a legal framework for developing and implementing a Federal Sustainable Development Strategy every three years that ensures transparency and accountability in environmental decision-making. At the federal level, regulations to reduce GHG emissions are established under the Canadian Environmental Protection Act (1999) and are enforced in collaboration with provincial and territorial governments and national and international agencies and organizations.

27. Cross-sectoral PaMs reported in the BR2 include the Canadian Energy Strategy and the Quebec Climate Change Summit Declaration. During the review, Canada also provided information on the Vancouver Declaration, in accordance with which a pan-Canadian framework on clean growth and climate change is currently being developed through partnership between the federal Government, provinces and territories and indigenous peoples.

28. In its BR2 and CTF table 3, Canada has reported information on mitigation actions organized by economic sector (transport, oil and gas, electricity, building, agriculture, LULUCF, emission-intensive and trade-exposed industries, cross-cutting, waste and others) in addition to cross-cutting actions (e.g. education). The majority of implemented mitigation actions are regulatory in nature, with relatively fewer based on economic instruments and voluntary agreements. However, provinces and territories such as British

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<sup>6</sup> Available at <<http://regulatoryreform.com/wp-content/uploads/2015/02/Canada-Cabinet-Directive-on-Streamlining-Regulation-E-2007.pdf>>.

Columbia, Quebec, Ontario and Manitoba are increasingly applying PaMs based on carbon pricing in their jurisdictions. Examples of key cross-cutting economic instruments include British Columbia's carbon tax, Manitoba and Ontario's announced cap-and-trade initiatives and Quebec's cap-and-trade system. Ontario's coal phase-out regulation and the federal regulation for reducing emissions from coal-fired generation of electricity are key regulatory measures that have contributed to reducing Canada's GHG emissions. Owing to the significance of emissions from oil and gas production in the national emission profile, Canada has put in place many mitigation actions focusing on reducing emissions from oil and gas production (e.g. reducing venting and flaring in the oil and gas sectors) and fossil fuel combustion. There are also mitigation actions targeting the promotion of renewable energy sources and energy efficiency, the promotion of biofuels, carbon dioxide capture and storage, the reduction of GHG emissions from shipping and aviation, and sustainable forest management.

29. The key implemented mitigation actions reported in the BR2 include: Quebec's cap-and-trade system; the British Columbia carbon tax; Nova Scotia's cap on electricity emissions; Ontario's coal phase-out; Alberta's specified gas emitters regulation; Alberta's directive 060 on upstream petroleum industry flaring, incinerating and venting; the federal regulations on the reduction of CO<sub>2</sub> emissions from the coal-fired generation of electricity; Ontario's natural gas demand-side management; the ecoENERGY Efficiency Programme; the ecoENERGY for Renewable Power Programme; federal renewable fuel regulations; light-duty vehicle GHG regulations, phases 1 and 2; Metrolinx – the Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area (Ontario); and heavy-duty vehicle GHG regulations. The mitigation effects of Ontario's coal phase-out are the most significant of those reported in the BR2. Other mitigation actions with the potential to deliver significant mitigation impacts are the light-duty vehicle GHG regulations, phases 1 and 2, and Alberta's specified gas emitters regulation.

30. The BR2 highlights the mitigation actions that are under development, including: Manitoba and Ontario's cap-and-trade systems; the Alberta Climate Leadership Plan; regulations to address methane in the oil and gas sector; the Saskatchewan regulation on management and reduction of GHGs; carbon dioxide standards for aviation; energy efficiency requirements for Canadian marine vessels that serve domestic trade; the New Brunswick air quality regulations; regulations of HFCs; the British Columbia Great Bear Rainforest (Forest Management) Act; and the Quebec Afforestation and Reforestation Offset Protocol.

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

Table 3

**Summary of information on mitigation actions and their impacts reported by Canada**

<i>Sector affected</i>	<i>List of key mitigation actions</i>	<i>Estimate of mitigation impact by 2020 (kt CO<sub>2</sub> eq)</i>
Policy framework and cross-sectoral measures	Alberta Climate Leadership Plan	NE
	Ontario's cap-and-trade system	NE
	Quebec's cap-and-trade system	NE
	HFC regulations	NE
	Alberta's specified gas emitters regulation	10 000

<i>Sector affected</i>	<i>List of key mitigation actions</i>	<i>Estimate of mitigation impact by 2020 (kt CO<sub>2</sub> eq)</i>
	Sustainable Development Technology Canada – Sustainable Development Tech Fund	NE
	British Columbia's carbon tax	3 000
	Clean Energy Fund	2 800
Energy, including:		
Energy supply	Ontario's coal phase-out	30 000
	Reduction of carbon dioxide emissions from the coal-fired generation of electricity regulations	3 100
	Newfoundland and Labrador Lower Churchill Project (Muskrat Falls)	1 200
	Nova Scotia's electricity sector regulations	2 500
Transport	Light-duty vehicle GHG regulations: phases 1 and 2	13 000
	Federal renewable fuel regulations	4 000
	Carbon dioxide standards for aviation	NE
	Heavy-duty vehicle GHG regulations	3 000
Renewable energy	ecoENERGY for Renewable Power Programme	6 240
	British Columbia's Clean Energy Act: clean or renewable electricity requirement	3 000
	Ontario's feed-in tariff programme and large renewable procurement	NE
Energy efficiency	Ontario's natural gas demand-side management programme	5 706
	Ontario's building-related initiatives	1 890
	Nova Scotia's electricity efficiency regulations	1 300
	Quebec's EcoPerformance Program	NE
IPPU	Alberta's directive 060 on upstream petroleum industry flaring, incinerating and venting	4 000

<i>Sector affected</i>	<i>List of key mitigation actions</i>	<i>Estimate of mitigation impact by 2020 (kt CO<sub>2</sub> eq)</i>
	Alberta's Carbon Capture and Storage Funding Act	2 760
	Regulations to address methane emissions in the oil and gas sector	NE
Agriculture	Agricultural GHG programme	NE
	Growing Forward 2 programmes	NE
LULUCF	British Columbia's Great Bear Rainforest (Forest Management) Act	2 000
Waste	Ontario's waste- and agriculture-related actions	1 800

*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.

*Abbreviations:* GHG = greenhouse gas, HFC = hydrofluorocarbon, IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NE = not estimated.

## 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

32. Canada reported in its BR2 that it may consider using international market-based mechanisms to meet its emission reduction targets under the Convention, but it had not taken a decision on their use at the time of preparing the BR2. Canada further reported that, within the context of negotiations to elaborate the details of the Paris Agreement, it will continue to work with other countries to explore the best options for the use of international mechanisms. In addition, in its BR2 Canada explained that, while it would account for the contribution from LULUCF towards the achievement of its target, it has not been able to provide the estimates in the BR2 owing to the ongoing work on the development of an estimation methodology that captures anthropogenic emissions and removals (see para. 14 above). Hence, CTF tables 4, 4(a)I, 4(a)II and 4(b) are blank. Although Canada has provided the relevant explanations in the BR2, it has not done so in the CTF tables. This issue was also noted in the previous review report.

33. The ERT reiterates the recommendation in the previous review report that Canada improve the completeness of its reporting by including, in its next BR, estimates of the contribution from LULUCF and the use of market-based mechanisms. If the information required to complete the CTF tables is not available, for example due to a pending decision about the use of market-based mechanisms or ongoing work on methodological improvements to the reporting on the LULUCF sector, in order to increase transparency the ERT recommends that Canada provide transparent explanations not only in the BR but also in the CTF tables using a custom footnote or notation key.

34. Table 4 below illustrates Canada's progress towards the achievement of its target; it does not contain information on Canada's use of market-based mechanisms or the

contribution of LULUCF towards the achievement of target because Canada did not report this information in its BR2.

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 Canada towards the achievement of its target**

<i>Year</i>	<i>Emissions excluding LULUCF (kt CO<sub>2</sub> eq)</i>	<i>Contribution from LULUCF (kt CO<sub>2</sub> eq)</i>	<i>Emissions including contribution from LULUCF (kt CO<sub>2</sub> eq)</i>	<i>Use of units from market-based mechanisms (kt CO<sub>2</sub> eq)</i>
1990	612 752.70	NE	NE	NE
Base year <sup>a</sup>	749 030.35	NE	NE	NE
2010	707 038.12	NE	NE	NE
2011	709 228.45	NE	NE	NE
2012	715 220.26	NE	NE	NE
2013	726 050.66	NE	NE	NE

*Sources:* Canada'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, NE = not estimated.

<sup>a</sup> Emissions and removals are reported for the base year 2005.

35. To assess the progress towards the achievement of the 2020 target, the ERT noted that Canada's emission reduction target under the Convention is 17 per cent below the base year (2005) level (see para. 15 above). In 2014, Canada's annual total GHG emissions excluding LULUCF were 0.9 per cent (6,725.71 kt CO<sub>2</sub> eq) below its base year level. The ERT further noted that Canada's 2014 annual total GHG emissions excluding LULUCF were 19.5 per cent (119,552.83 kt CO<sub>2</sub> eq) above the 1990 level.

36. The ERT noted that Canada's GHG emissions excluding LULUCF have decreased by a relatively small amount compared with its target. The ERT further noted that Canada's GHG emissions excluding LULUCF have risen considerably since 1990 and have also followed an upward trend in recent years (GHG emissions excluding LULUCF increased by 1.6 per cent in the period 2013–2014). In the limited time remaining until 2020, Canada faces the challenge of putting in place mitigation actions that deliver the emission reductions necessary to make progress towards its target.

37. The ERT noted that Canada's ability to achieve its target will depend on several factors, including: how rapidly its major PaMs are able to achieve results; the contribution of LULUCF, quantified using the methodology currently under development; Canada's decision on the use of units from market-based mechanisms; and future changes in the national economy, in particular the oil and gas industry.

### 3. Projections

38. Canada 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, using the same sectoral categories as used in the section on mitigation actions, and on a gas-by-gas basis for the following GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, HFCs and SF<sub>6</sub>. Projections are also provided in an aggregated format for each sector as well as for a Party total, using GWP values from the AR4. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and not included in the totals. Canada reported on many factors and

activities influencing emissions for its economic sectors. Further information on the projections is provided in chapter 5 of and annex 3 to the BR2.

39. The ERT noted that CTF table 6(a) does not include the required information on LULUCF sector projections for 2020 or 2030. Canada explained in its BR2 that it would be misleading to report projections for LULUCF since it is in the process of developing a new estimation methodology that would significantly affect projected LULUCF emissions as it removes the impacts of natural disturbances from the estimates of managed forest emissions and removals. The ERT recommends that Canada improve the completeness of its reporting by including, in its next BR, the information on projections for the LULUCF sector.

40. The ERT noted that Canada did not provide information on factors and activities influencing emissions for the agriculture, transport or waste sectors for the years 1990–2020. During the review, in response to a question raised by the ERT, Canada provided additional information on the factors and activities used in the projections for each of these sectors and how they are modelled within the Energy, Emissions and Economy Model for Canada (E3MC) framework. The ERT recommends that Canada improve the completeness of its reporting by including, in its next BR, information on factors and activities influencing emissions for each sector in order to provide the reader with an understanding of the emission trends for the years 1990–2020.

41. In the BR2, Canada provided information on the changes since the submission of its NC6/BR1 in the assumptions, methodologies, models and approaches used and on the key variables and assumptions used in the preparation of the projection scenarios using CTF table 5 (see para. 48 below). Canada also provided information on the sensitivity analysis.

42. The ERT noted that Canada did not report projections under the ‘with additional measures’ (WAM) or ‘without measures’ (WOM) scenarios in the BR2 or in CTF tables 6(b) and 6(c). During the review, Canada confirmed its decision not to report projections under the WAM or WOM scenarios. The ERT encourages Canada to include in its next BR projections under the WAM and WOM scenarios.

43. In its BR2, Canada did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides and non-methane volatile organic compounds or for sulphur oxides. During the review, in response to a question raised by the ERT, Canada explained that it did not prepare projections for indirect GHGs. The ERT encourages Canada to provide, in its next BR, projections of indirect GHG emissions.

44. In its BR2, Canada did not provide diagrams illustrating its emission projections under the WEM scenario by sector and by gas together with unadjusted inventory data for the period 1990–2020. The ERT encourages Canada to do so in its next BR.

45. The ERT noted that Canada did not provide sufficiently transparent information on the models and approaches used for the projections to allow the reader to obtain a basic understanding of such models and/or approaches, including: the models used for the different sectors and gases; a description of the type of model or approach used and its characteristics (e.g. top-down model, bottom-up model, accounting model or expert judgement); a description of the original purpose for which the model or approach was designed and, if applicable, how it has been modified for climate change purposes; the strengths and weaknesses of the model or approach used; and an explanation of how the model or approach used accounts for any overlaps or synergies that may exist between different PaMs.

46. During the review, in response to a question raised by the ERT, Canada clarified that the E3MC framework is used for all sectors except LULUCF and provided additional information on the technical characteristics of the E3MC modelling framework. In addition,

Canada provided detailed information on how the model addresses overlaps and synergies between different PaMs. In response to the draft review report, the Party further clarified that, since Canada's modelling framework has not substantially changed since its BR1, in its BR2 it has only included a reference to *Canada's Emissions Trends Report 2014*, which updates the information contained in Canada's BR1. The ERT, however, noted that Canada's BR2 did not clearly indicate that the required information on the models and approaches used for the projections is contained in the above-mentioned document. The ERT encourages Canada to provide in its next BR sufficient information on the models and approaches used for the projections or to provide relevant references indicating clearly where the relevant information is provided to allow the reader to obtain a basic understanding of such models and/or approaches.

#### Overview of projection scenarios

47. The WEM scenario reported by Canada includes implemented and adopted PaMs and reflects actions taken by governments, consumers and businesses up to 2013 as well as the future impacts of existing PaMs that had been put in place as at September 2015. The BR2 identifies the major federal, provincial and territorial measures included in the WEM scenario and provides a clear understanding of the criteria used to determine their inclusion. The definition provided by the Party indicates that the WEM 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

48. The methodology used in the BR2 is based on the same modelling framework as that used for the preparation of the emission projections for the NC6/BR1. The methodology used for the projections for all sectors, other than LULUCF, is based on the E3MC framework. It uses the latest statistics on GHG emissions and energy use and key assumptions from both public and private expert sources.

49. The E3MC modelling framework has two components: Energy 2020, which incorporates Canada's energy supply and demand structure; and the in-house macroeconomic model of the Canadian economy. E3MC undergoes annual data updates and periodic modelling methodology improvements. The BR2 (annex 3) describes the key improvements since the BR1, including: the change in the economic driver for HFC projections from population to GDP; the revision of historical passenger and freight efficiency variables; the downward revision of energy inputs for liquefied natural gas; the adjustment of the relative quantities of electricity and natural gas; the revision of the growth rate of oil sands cogeneration; the inclusion of non-combustion related emissions from liming and urea application in agriculture; and the incorporation of GWP values from the AR4.

50. To prepare its projections, Canada relied on the following key underlying assumptions: oil and natural gas prices, GDP, GDP per capita, the consumer price index and population growth. These variables and assumptions are reported in CTF table 5. The assumptions have been updated on the basis of the most recent economic development trends known at the time of the reporting of the projections. The BR2 states that GHG emissions are driven by economic growth and oil and natural gas prices. The WEM scenario assumes average economic growth and level of oil prices throughout the period 2013–2030. While the GDP growth rate has been assumed to be 1.8 per cent for the period 2013–2030 (2.2 and 1.6 per cent in the periods 2013–2020 and 2020–2030, respectively), the price of oil assumed for 2020 and 2030 is USD 75 and 96 per barrel, respectively.

51. The BR2 presents the results of sensitivity analyses conducted as per the National Energy Board's 'high' and 'low' scenarios based on variability in two key assumptions: future economic growth, and oil and natural gas prices and production. The 'high' scenario assumes higher than average values for GDP growth (2.3 per cent in the period 2013–2030) and oil prices (USD 97 and 114 per barrel in 2020 and 2030, respectively). The 'low' scenario is based on lower than average values for growth of 1.1 per cent in the period 2013–2030 (1.5 and 0.8 per cent in the periods 2013–2020 and 2020–2030, respectively) and oil prices of USD 52 and 66 per barrel in 2020 and 2030, respectively.

52. The results of Canada's sensitivity analysis indicate that emissions will continue to increase up to 2030 under both scenarios. Under the 'low' scenario, total GHG emissions in 2020 are projected to remain at the same level as in 2005, whereas they are projected to increase by 2.1 per cent (16,000 kt CO<sub>2</sub> eq) above the 2005 level by 2030. Under the 'high' scenario, Canada's total GHG emissions are projected to increase by 5.5 per cent (41,000 kt CO<sub>2</sub> eq) and 16.8 per cent (126,000 kt CO<sub>2</sub> eq) above the 2005 level by 2020 and 2030, respectively.

#### Results of projections

53. Canada's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 767,500 and 813,900 kt CO<sub>2</sub> eq, respectively, under the WEM scenario, which is an increase of 25.3 (154,747.30 kt CO<sub>2</sub> eq) and 32.8 per cent (201,147.30 kt CO<sub>2</sub> eq), respectively, above the 1990 level.<sup>7</sup> Canada's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 2.5 (18,469.65 kt CO<sub>2</sub> eq) and 8.7 per cent (64,869.65 kt CO<sub>2</sub> eq), respectively, above the 2005 level.

54. The 2020 projections under the WEM scenario suggest that Canada is likely to face significant challenges in achieving its 2020 target under the Convention and needs to put in place PaMs that deliver the emission reductions required to achieve its target by 2020 (see para. 53 above). The ERT noted that many additional PaMs have recently been announced or are being planned at every level of government. These PaMs underpin the statement in the BR2 that over the last year Canada has experienced a number of significant advancements in its approach to climate change. However, in view of the limited time remaining until 2020, Canada's ability to achieve its target will depend on a range of factors (see para. 37 above).

55. According to the projections reported for 2020 under the WEM scenario, based on the IPCC sector categories (for additional discussion of projections based on Canada's economic sectors, see para. 58 below), emission reductions are expected to occur in the waste management/waste sector, amounting to projected reductions of 3,000 kt CO<sub>2</sub> eq (12.5 per cent) between 1990 and 2020, primarily as a consequence of a range of federal, provincial and territorial PaMs promoting improved solid waste management. The ERT, however, noted that emissions from all other sectors are projected to increase between 1990 and 2020, with those from the energy, industrial processes and product use and agriculture sectors projected to increase between 1990 and 2020 by 136,000 kt CO<sub>2</sub> eq (22.4 per cent), 11,000 kt CO<sub>2</sub> eq (28.0 per cent) and 11,000 kt CO<sub>2</sub> eq (20.0 per cent) respectively. The pattern of projected emissions reported for 2030 under the same scenario remains the same, with emissions from all sectors other than the waste sector projected to further increase between 2020 and 2030.

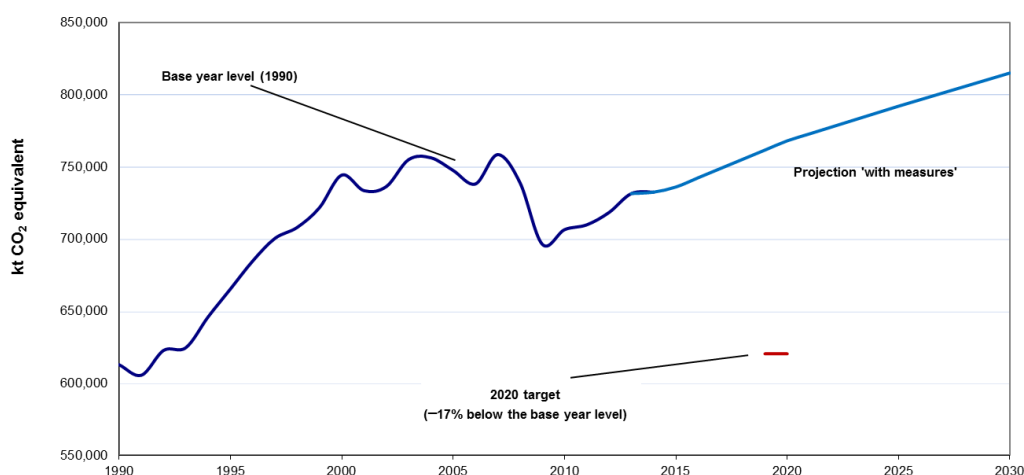
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<sup>7</sup> Source: Canada's CTF table 6(a).

56. In 2020, the most significant reductions are projected for PFC emissions, amounting to 5,800 kt CO<sub>2</sub> eq (76.3 per cent), while emissions of SF<sub>6</sub> and N<sub>2</sub>O are projected to decrease by 2,900 kt CO<sub>2</sub> eq (90.6 per cent) and 2,000 kt CO<sub>2</sub> eq (4.8 per cent) between 1990 and 2020, respectively. The ERT, however, noted that emissions (excluding LULUCF) of all other gases are projected to increase between 1990 and 2020, with CO<sub>2</sub>, CH<sub>4</sub> and HFCs projected to increase by 145,000 kt CO<sub>2</sub> eq (31.3 per cent), 13,400 kt CO<sub>2</sub> eq (1340.0 per cent) and 7,000 kt CO<sub>2</sub> eq (7.3 per cent), respectively. Under the same scenario, the pattern of projected emissions of gases reported for 2030 remains the same, with emissions of all gases projected to increase further.

57. The projected emission levels under the WEM scenario and Canada's quantified economy-wide emission reduction target are presented in the figure below.

#### Greenhouse gas emission projections by Canada



*Sources:* (1) Data for the years 1990–2014: Canada's 2016 annual inventory submission, version 1.0; total GHG emissions excluding land use, land-use change and forestry; (2) Data for the years 2020 and 2030: Canada's second biennial report; total GHG emissions excluding land use, land-use change and forestry.

*Abbreviation:* GHG = greenhouse gas.

58. The BR2 presents detailed projections for Canadian-specific economic sectors (see para. 28 above), providing additional insight into the emission trends for the years 2005–2020. For example, while Canada's projections by IPCC sector show a 23.7 per cent increase in emissions from the energy sector between 1990 and 2020 (which includes energy-related emissions in the electricity, and oil and gas sectors), looking at Canada's economic sectors, emissions from the electricity sector are projected to decline significantly by 38.8 per cent (47,000 kt CO<sub>2</sub> eq), while emissions from the oil and gas sector are expected to increase by 33.8 per cent (53,000 kt CO<sub>2</sub> eq). Further, CO<sub>2</sub> emissions are projected to increase by 2020 and 2030 relative to the base year level in all of Canada's economic sectors except the electricity sector. For example, while CO<sub>2</sub> emissions from the oil and gas sector are projected to increase by 96.4 and 131.3 per cent above the 2005 level by 2020 and 2030, respectively, CO<sub>2</sub> emissions from the electricity sector are projected to decrease by 25.5 and 41.8 per cent below the 2005 level by 2020 and 2030, respectively. The ERT noted that this trend reflects Canada's efforts to increase the share of renewable energy sources in its electricity production.

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

59. In its BR2, Canada reported information on the provision of financial, technological and capacity-building support required under the Convention. The BR2 includes information on its national approach to tracking the provision of support.

60. Canada provided details on what new and additional support it has provided and clarified how this support is new and additional (see para. 63 below). Further information on Canada's provision of support to developing country Parties is provided in chapter 6 of the BR2.

61. The ERT noted that, although the BR2 includes generic information on Canada's approach to tracking its financial support, it does not provide a description of the underlying assumptions, indicators and delivery mechanisms used for tracking the provision of financial, technological and capacity-building support to non-Annex I Parties. In response to a question raised by the ERT during the review, Canada provided additional information on the tracking of support, including on Canada's internal climate finance database tool, which enables the Party to track the specific results achieved by each individual project. The ERT reiterates the recommendation made in the previous review report that, in order to enhance the transparency of its reporting, Canada provide, in its next BR, a transparent description of the assumptions, indicators and delivery mechanisms used for tracking the provision of financial, technological and capacity-building support to non-Annex I Parties.

62. Canada 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.

63. Canada explained how it determines how much of its support is new and additional. It defines the provision of financial, technological and capacity-building support to developing countries over the reporting period as new and additional if it is above what was planned prior to the Copenhagen Accord in 2009.

64. Canada included in its BR2 information on the approach to tracking climate support and provided additional information during the review. The Party applies a results-based management approach to effectively manage its climate finance and tracks and reports on overall government international climate change financing. In order to strengthen its climate finance reporting, Canada works with its international partners through the UNFCCC as well as other organizations such as the Organisation for Economic Co-operation and Development. It has also developed a database tool<sup>8</sup> to help track and support the reporting of its climate finance. This tool facilitates the online provision of detailed project-by-project information.

### **1. Finance**

65. In its BR2 and CTF tables 7, 7(a) and 7(b), Canada 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 para. 74 below). The summary information was reported for 2013 and 2014.

66. Canada 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

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<sup>8</sup> Available at <<http://www.climatechange.gc.ca/finance>>.

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). Canada explained that its support for adaptation primarily targets the needs of the poorest and most vulnerable countries towards food security and sustainable development. In response to a question raised by the ERT during the review, Canada clarified that, through its climate finance, it responds to the priorities identified by bilateral partners in the context of ongoing and long-standing development partnerships, which include addressing climate change issues as part of the development objectives set by the partners.

67. Canada provided in the BR2 information on the new and additional support it has provided during the reporting period, which is defined as support beyond what was planned prior to the Copenhagen Accord. However, the ERT noted that the BR2 does not include information on the level of support that was planned prior to the Copenhagen Accord, which is necessary for the ERT to make a meaningful assessment of the new and additional support provided. During the review, in response to a question raised by the ERT, Canada provided information clarifying that the climate finance provided by Canada annually prior to the Copenhagen Accord averaged around USD 75 million, while in 2009 limited climate finance was planned for the periods 2013–2014 and 2014–2015. The ERT recommends that, in order to enhance the transparency of its reporting, Canada provide, in its next BR, specific information on the new and additional financial support provided, including the level of support that was planned prior to the Copenhagen Accord.

68. The ERT noted that the amount of public financial contribution provided through bilateral, regional and other channels in 2014 (USD 67.30 million) reported in the BR2 is not consistent with the figure reported for the corresponding item in CTF table 7(b) for 2014 (USD 68.11 million).

69. During the review, in response to a question raised by the ERT, Canada explained that these inconsistencies were due to errors in data input in the CTF application and assured the ERT that this would be corrected in a resubmission of the CTF tables. The ERT noted that the transparency of the reported information would be greatly enhanced through the inclusion in the documentation boxes of CTF tables 7, 7(a) and 7(b) of information on the exchange rates used in the BR2 and on how Canada defines the funds as being climate-specific. The ERT further noted in this regard that Canada provided some information on exchange rates in its BR2 and information on the climate-specific nature of its finance in the custom footnotes of CTF table 7(b). In order to enhance the transparency of its reporting, the ERT recommends that Canada ensure the accuracy of the information on new and additional finance reported in the BR and its consistency with that reported in the CTF tables in its next BR.

70. Canada provided information on the types of instrument used in the provision of its assistance (see para. 79 below).

71. In its BR2, Canada has not reported, to the extent possible, information on its private financial flows leveraged by bilateral climate finance towards mitigation and adaptation activities in non-Annex I Parties. During the review, in response to question raised by the ERT, Canada informed the ERT that, as detailed in the BR2, a significant portion of its fast-start finance reported in the BR1 (for the years 2010–2011 to 2012–2013) was aimed at establishing Canadian facilities at multilateral development banks, designed to catalyse private-sector investments. According to Canada's estimate, this support, together with co-financing from multilateral development banks and other public sources, has collectively mobilized approximately USD 1.44 billion of private climate finance over the same period. Repayable contributions of approximately USD 2.49 million in the period 2013–2014 and USD 3.96 million in the period 2014–2015 have been returned to Canada from multilateral agencies. While noting the information provided by Canada, the ERT encourages the Party to report this information in its next BR to enhance its reporting.

72. The ERT noted that Canada's BR2 does not include transparent information on PaMs that promote the scaling up of private investment in mitigation and adaptation activities in developing country Parties. The BR2 briefly mentions catalysing private finance as one of the objectives of Canada's fast-start finance. In response to a question raised by the ERT during the review, Canada provided additional information on this reporting element (see para. 80 below). The ERT encourages Canada to report, in the next BR, on PaMs that promote the scaling up of private investment in adaptation and mitigation projects in developing countries, to enhance its reporting.

73. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, Canada reported that its climate finance has been allocated on the basis of the key priority areas of its international development assistance, such as food security and increasing environmental sustainability. These priority areas are predominantly addressed through adaptation projects. In November 2015, Canada pledged a financial contribution of 2.65 billion Canadian dollars (CAD) to be made over the next five years to support developing countries' transition to more climate-resilient, low-carbon economies through climate change adaptation and mitigation programmes. As part of this pledge, Canada announced the following contributions: CAD 30 million to the Least Developed Countries Fund to address some of the most urgent and immediate needs of the least developed countries; CAD 10 million to the World Meteorological Organization to support the improvement of early warning systems in some of the most vulnerable communities; CAD 50 million to the Group of Seven (G7) Initiative on Climate Risk Insurance to help people in developing countries protect themselves against the economic consequences of more intense and increasingly frequent natural catastrophes due to climate change; CAD 150 million to the G7 African Renewable Energy Initiative to accelerate the deployment of renewable energy in Africa; and CAD 35 million to combat short-lived climate pollutants like black carbon and CH<sub>4</sub>, including CAD 10 million to the Climate and Clean Air Coalition.

74. Canada reported on its climate-specific public financial support provided in 2013 and 2014, totalling USD 67.40 million in 2013 and USD 70.31 million in 2014. During the reporting period, Canada placed a particular focus on the most vulnerable and poor countries in Africa and Latin America and the Caribbean, to which it allocated USD 54.30 and 60.53 million, corresponding to 92.0 and 88.9 per cent of the total contribution through bilateral, regional and other channels in 2013 and 2014, respectively.

75. The BR2 includes information on the financial support provided through multilateral channels, bilateral and regional channels in 2013 and 2014. More specifically, Canada contributed through multilateral channels, as reported in its BR2 and in CTF table 7(a), USD 8.39 and 2.20 million in 2013 and 2014, respectively. These contributions were made to specialized multilateral climate change funds, such as the Consultative Group on International Agricultural Research Fund and the Trust Fund for Supplementary Activities, as well as to multilateral financial institutions, including the International Finance Corporation and the Asian Development Bank.

76. The BR2 and CTF table 7(b) include information on the total financial support provided through bilateral (USD 32.57 and 48.85 million) and regional (USD 26.45 and 19.26 million) channels in 2013 and 2014, respectively. Table 5 includes some of the information reported by Canada on its provision of financial support.

Table 5

**Summary of information on provision of financial support in 2013–2014 by Canada**  
(Millions of United States dollars)

<i>Allocation channel of public financial support</i>	<i>Years of disbursement</i>	
	<i>2013</i>	<i>2014</i>
Official development assistance	4 947.24	4 240.04
Climate-specific contributions through multilateral channels, including:	8.39	2.20
Trust Fund for Supplementary Activities	0.24	–
Financial institutions, including regional development banks	5.18	2.20
United Nations bodies	0.05	–
Other	2.91	–
Climate-specific contributions through bilateral, regional and other channels	59.02	68.11

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

77. 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, adaptation and cross-cutting projects corresponding to these channels were 7.3, 82.1 and 10.6 per cent, respectively. In total, 12.4 per cent of the total public financial support was allocated through multilateral channels and 87.6 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 4.4, 90.0 and 5.6 per cent, respectively. Altogether, 3.1 per cent of the total public financial support was allocated through multilateral channels and 96.9 per cent of it was through bilateral, regional and other channels.

78. The ERT noted that, as reported in CTF table 7(a), in 2013, 41.6 per cent of financial contributions made through multilateral channels were allocated to cross-cutting activities, 34.7 per cent to agriculture, 23.1 per cent to other and 0.6 per cent to transport, while in 2014 all of the financial contributions made through multilateral channels were allocated to cross-cutting activities. In 2013, 69.1 per cent of the financial contributions made through bilateral and regional channels were allocated to cross-cutting activities, 16.4 per cent to other (coastal zone management, disaster prevention and preparedness and other), 9.1 per cent to agriculture and 5.4 per cent to forestry. In 2014, 53.2 per cent of the financial contributions made through bilateral and regional channels were allocated to cross-cutting activities, 34.1 per cent to agriculture, 10.7 per cent to other, 1.1 per cent to forestry and 0.9 per cent to energy.

79. 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 include grants and loan guarantees. The ERT noted that the share of grants provided in 2013 and 2014 was 100.0 per cent and 99.1 per cent of the total public financial support, respectively. Canada used only one loan guarantee in 2014, corresponding to 0.9 per cent of the total public financial support provided in that year.

80. In the BR2, Canada mentioned that a significant portion of its fast-start finance (from 2010–2011 to 2012–2013) was used to establish Canadian facilities at multilateral development banks to catalyse private-sector investments, which proved to be a successful experiment. In response to a question raised by the ERT during the review, Canada

elaborated that it works collaboratively with a number of multilateral organizations to establish Canadian climate facilities that aim to scale up the mobilization of private-sector investment in climate change related sectors in developing countries, targeting both mitigation and adaptation. Canada's International Development Research Centre is working to engage with private-sector investors in supporting adaptation initiatives through its Mobilizing the Private Sector for Adaptation Finance project in Africa. Export Development Canada supports businesses that are active in protecting the environment and mitigating climate change by providing financing and insurance through instruments such as green bonds.

## **2. Technology development and transfer**

81. In CTF table 8, Canada 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. Canada provided, to the extent possible, information on the recipient countries, the target area of mitigation or adaptation, the sector involved and the sources of technology transfer from the public or private sectors, and distinguished between activities undertaken by the public and private sectors.

82. The ERT noted that in its BR2 Canada did not report information on measures taken to support the development and enhancement of the endogenous capacities and technologies of non-Annex I Parties. During the review, in response to a question raised by the ERT, Canada provided specific examples of the support it provides for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties (see para. 85 below). The ERT reiterates the recommendation made in the previous review report that, in order to enhance the completeness of its reporting, Canada include, in its next BR, information on the measures taken to support the development and enhancement of the endogenous capacities and technologies of non-Annex I Parties.

83. The textual summary of the measures and activities related to technology transfer and capacity-building presented in the BR2 (chapter 6.3) complements CTF table 8 by providing an overview of the specific initiatives. However, the BR2 does not indicate which measures and activities related to technology transfer were implemented or planned since the last national communication or BR as required by the UNFCCC reporting guidelines on BRs. The ERT recommends that Canada clearly indicate in its next BR which measures and activities related to technology transfer have been implemented or planned since the last national communication or BR, to enhance the transparency of its reporting.

84. In its BR2, Canada did not report information on success and failure stories regarding measures taken to promote, facilitate and finance the transfer of, access to and deployment of climate-friendly technologies for the benefit of non-Annex I Parties. During the review, in response to a question raised by the ERT, Canada provided examples of success stories, namely: the provision of RETScreen<sup>9</sup> expertise to the Clean Energy Solutions Center "Ask an Expert" service (see para. 85 below); and the development of nationally appropriate mitigation action plans in Colombia and Mexico (see para. 86 below). While noting the information provided by Canada, the ERT encourages the Party to include, in its next BR, such examples of success and failure stories, to enhance its reporting.

85. During the review, Canada provided examples of the support it provides for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties, including RETScreen (clean energy decision-making software developed by

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<sup>9</sup> See <[www.retscreen.net](http://www.retscreen.net)>.

Canada), which provides no-cost clean energy expert policy assistance to developing countries around the world. Canada also supports the use of its software and tools by developing countries for REDD-plus<sup>10</sup> implementation and mitigation actions in the forest sector. Canada also supported the development of a small-scale utility merchant solar photovoltaic project in Chile that helped to demonstrate that small-sized renewable energy plants can compete with fossil fuel based power generation, thereby encouraging a deep penetration of solar energy into the Chilean energy market.

86. The ERT took note of the information provided in CTF table 8 on the eight reported measures and activities related to Canada's support for technology development and transfer. These comprise both global and country-specific measures and activities targeting both mitigation and adaptation in the energy, forestry and other sectors, including: the transfer of its Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3)<sup>11</sup> software for GHG mitigation and forest management adaptation; the development and dissemination of the RETScreen clean energy management software; the development of nationally appropriate mitigation action plans for the energy sector in Colombia and Mexico; and the development of regional and national fire early warning systems. Canada implements technology transfer through: the transfer of software and capacity-building (see para. 92 below); consultation and advice; data sharing; and workshops on innovation.

### 3. Capacity-building

87. In its BR2 and CTF table 9, Canada supplied information on how it provided capacity-building support for mitigation, adaptation and technology.

88. Canada did not provide in its BR2 information required by the UNFCCC reporting guidelines on BRs on how the capacity-building support provided 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.

89. In response to a question raised by the ERT during the review, Canada explained that it is actively engaged in technology and capacity-building activities with developing country partners through bilateral and multilateral channels. It also provided some examples of how its capacity-building support responds to the needs identified by non-Annex I Parties. For example, Canada supports the work of the Climate Technology Centre and Network, an operational arm of the Technology Mechanism that provides tailored advice and technical assistance to developing countries to support the implementation of technology actions, including activities and requests arising from developing countries' technology needs assessments.

90. The ERT reiterates the recommendation made in the previous review report that Canada report, in its next BR, on how the capacity-building support provided responds to the existing and emerging capacity-building needs identified by non-Annex I Parties, to enhance the completeness of its reporting.

91. The ERT noted that the textual description of individual measures and activities related to capacity-building provided in the BR2 lacks transparency, as measures related to both technology transfer and capacity-building are described together without a clear identification of their primary objectives. The ERT encourages Canada to report transparent information on individual measures and activities related to capacity-building in textual

<sup>10</sup> In decision 1/CP.16, paragraph 70, the Conference of the Parties encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities: reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks.

<sup>11</sup> See <<http://www.nrcan.gc.ca/forests/climate-change/carbon-accounting/13107>>.

format, consistent with the UNFCCC reporting guidelines on BRs in its next BR, to enhance the transparency of its reporting.

92. Canada reported nine projects/programmes related to capacity-building, most of which are related to multiple areas, with only one project related to mitigation and one to adaptation. Most of the capacity-building support targets training in and support for the software provided by Canada (CBM-CFS3 and RETScreen) as part of its technology transfer activities (see para. 86 above) to countries in Africa, Asia, Asia-Pacific, Latin America and the Caribbean, and Europe.

93. CTF table 9 includes information describing a number of individual capacity-building measures and activities carried out during the reporting period. The most significant component of Canada's support for capacity-building is the training and support related to the CBM-CFS3 software provided through training workshops for students and GHG inventory experts, the hosting of visiting scientists, and scientific and technical collaboration.

94. Canada provides RETScreen software for clean energy decision-making free of charge, including comprehensive training materials in multiple languages. It supports the International Model Forest Network<sup>12</sup> (IMFN) through training, research extension and communication. IMFN supports the sustainable management of natural resources through a participatory, landscape-level approach that reflects environmental and socioeconomic issues. Another initiative launched in 2014, Integrated Climate Change Modelling and Policy Linkages for Adaptive Planning,<sup>13</sup> helps research teams funded by the International Development Research Centre to deliver policy-relevant and demand-driven assessments that are informed by climate and hydrological modelling.

### III. Conclusions

95. The ERT conducted a technical review of the information reported in the BR2 and CTF tables of Canada in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information is mostly in adherence with the UNFCCC reporting guidelines on BRs and provides an overview of: 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 Canada in achieving its target; and the Party's provision of support to developing country Parties.

96. Canada's total GHG emissions excluding LULUCF related to its quantified economy-wide emission reduction target were estimated to be 19.5 per cent above its 1990 level, whereas total GHG emissions including LULUCF were 53.0 per cent above its 1990 level in 2014. The emission increase was driven primarily by economic growth and oil and gas development.

97. Under the Convention, Canada committed itself to achieving a quantified economy-wide emission reduction target of 17 per cent below the 2005 level by 2020. This target covers the following GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub>, expressed using GWP values from the AR4, and covers all sources and sectors included in the annual GHG inventory. Although emissions and removals from the LULUCF sector are included in the target, Canada informed the ERT that the approach and methodology by which Canada would account for the LULUCF sector towards its target is currently under development.

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<sup>12</sup> See <<http://www.imfn.net/international-model-forest-network>>.

<sup>13</sup> See <<https://www.idrc.ca/en/project/integrated-climate-change-modelling-and-policy-linkages-adaptive-planning>>.

Canada also reported that it has not yet made a decision on the use of market-based mechanisms to achieve its target. In absolute terms, this means that under the Convention Canada has to reduce emissions from 749,030.35 kt CO<sub>2</sub> eq (in the base year) to 621,695.19 kt CO<sub>2</sub> eq by 2020.

98. Canada's cross-sectoral PaMs relating to energy and climate change include the recent Canadian Energy Strategy and the Quebec Climate Change Summit Declaration. In accordance with the Vancouver Declaration, a pan-Canadian framework on clean growth and climate change is currently being developed through partnership between the federal Government, provinces and territories and indigenous peoples. Provinces and territories such as British Columbia, Quebec, Ontario and Manitoba are increasingly applying PaMs based on carbon pricing in their jurisdictions.

99. Canada's mitigation policies focus on regulatory mechanisms in the energy and transport sectors, two of the highest-emitting sectors in Canada. The key implemented mitigation actions reported in the BR2 include: Quebec's cap-and-trade system; Nova Scotia's cap on electricity emissions; Ontario's coal phase-out; Alberta's specified gas emitters regulation; Alberta's directive 060 on upstream petroleum industry flaring, incinerating and venting; federal regulations on the reduction of CO<sub>2</sub> emissions from the coal-fired generation of electricity; Ontario's natural gas demand-side management; the ecoENERGY Efficiency Programme; the ecoENERGY for Renewable Power Programme; federal renewable fuel regulations; light-duty vehicle GHG regulations, phases 1 and 2; Metrolinx – the Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area (Ontario); and heavy-duty vehicle GHG regulations. The mitigation effects of Ontario's coal phase-out are the most significant of those reported. Other mitigation actions with the potential to deliver significant mitigation impacts are the light-duty vehicle GHG regulations, phases 1 and 2, and Alberta's specified gas emitters regulation.

100. Canada did not report on the contribution of LULUCF and use of market-based mechanisms towards the achievement of its target. While Canada has not yet decided on its use of market-based mechanisms, it did not report on the contribution of LULUCF owing to the ongoing work on the development of the accounting methodology for LULUCF. Therefore, it is currently not possible to assess Canada's use of units from market-based mechanisms and LULUCF towards the achievement of its target.

101. The GHG emission projections provided by Canada in its BR2 are for the WEM scenario. Under this scenario, emissions are projected to be 25.3 (154,747.30 kt CO<sub>2</sub> eq) and 32.8 per cent (201,147.30 kt CO<sub>2</sub> eq) above the 1990 level in 2020 and 2030, respectively. Canada's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 2.5 (18,469.65 kt CO<sub>2</sub> eq) and 8.7 per cent (64,869.65 kt CO<sub>2</sub> eq), respectively, above the base year (2005) level. On the basis of the reported information, the ERT concluded that Canada is likely to face challenges in achieving its 2020 target under the WEM scenario.

102. The ERT noted that, while Canada is making some progress towards its emission reduction target by implementing mitigation actions, it faces challenges in this regard. Further, on the basis of the results of the projections for 2020 under the WEM scenario, the ERT noted that Canada is likely to face significant challenges in achieving its target and needs to put in place additional PaMs that deliver the required emission reductions while further strengthening the existing PaMs. In this regard, Canada indicated in its BR2 that it is considering the use of units from market-based mechanisms and has also introduced new PaMs in order to achieve its emission reduction target.

103. Canada continues to allocate climate financing in line with its climate finance programmes in order to assist developing country Parties to implement the Convention. As reported in the BR1, Canada's total public climate-specific financial support in the period

2011–2012 was USD 884.25 million, while its support in the period 2013–2014 was USD 137.71 million. Its public climate-specific financial support in 2013 and 2014 totalled USD 67.40 and USD 70.31 million per year, respectively. For these years, Canada's support provided for mitigation action was lower than the support provided for adaptation. The highest level of financial support went to cross-cutting projects, followed by the agriculture sector and other projects.

104. Canada has been providing technology transfer and capacity-building support through training in and support for the use of software for forestry and land-use management and clean energy decision-making in developing countries. During the reporting period, most of Canada's technology transfer and capacity-building activities centred on the use of the CBM-CFS3 software.

105. In the course of the review, the ERT formulated the following recommendations for Canada to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR:<sup>14</sup>

- (a) Improve the completeness of its reporting by:
  - (i) Reporting complete information in CTF tables 2(a)–(f) (see para. 14 above);
  - (ii) Reporting the mitigation effects and respective gases affected for all mitigation actions reported in CTF table 3, or including a transparent explanation for not reporting them (see para. 21 above);
  - (iii) Including estimates of the contribution from LULUCF and the use of market-based mechanisms, or including a transparent explanation for not reporting this information using a custom footnote or notation key in the CTF tables (see para. 33 above);
  - (iv) Including the information on projections for the LULUCF sector (see para. 39 above);
  - (v) Including the required relevant information on factors and activities influencing emissions for each sector, in order to provide the reader with an understanding of the emission trends for the years 1990–2020 (see para. 40 above);
  - (vi) Including information on measures taken to support the development and enhancement of the endogenous capacities and technologies of developing country Parties (see para. 82 above);
  - (vii) Reporting on how the capacity-building support provided responds to the existing and emerging capacity-building needs identified by non-Annex I Parties (see para. 90 above);
- (b) Improve the transparency of its reporting by:
  - (i) Providing a more transparent description of the methodology it applies to track financial support, including assumptions, indicators and delivery mechanisms used (see para. 61 above);
  - (ii) Including more detailed information on new and additional financial support, including the level of support that was planned prior to the Copenhagen Accord (see para. 67 above);
  - (iii) Ensuring the accuracy of the information on new and additional finance reported in the BR and CTF tables (see para. 69 above);

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<sup>14</sup> The recommendations are given in full in the relevant chapters of this report.

- (iv) Reporting information on measures and activities related to technology transfer implemented or planned since the last national communication or BR (see para. 83 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 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 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/ARR/2015/CAN. Report on the individual review of the inventory submission of Canada submitted in 2015. Available at <<http://unfccc.int/resource/docs/2016/arr/can.pdf>>.

FCCC/IDR.6/CAN. Report of the technical review of the sixth national communication of Canada. Available at <<http://unfccc.int/resource/docs/2015/idr/can06.pdf>>.

FCCC/TRR.1/CAN. Report of the technical review of the first biennial report of Canada. Available at <<http://unfccc.int/resource/docs/2015/trr/can01.pdf>>.

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<[http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/items/8812.php](http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php)>.

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<[http://unfccc.int/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/items/7742.php](http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/7742.php)>.

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<[http://unfccc.int/national\\_reports/biennial\\_reports\\_and\\_iar/submitted\\_biennial\\_reports/items/9356.php](http://unfccc.int/national_reports/biennial_reports_and_iar/submitted_biennial_reports/items/9356.php)>.

Common tabular format tables of the first biennial report of Canada. Available at

<[http://unfccc.int/files/national\\_reports/biennial\\_reports\\_and\\_iar/submitted\\_biennial\\_reports/application/pdf/can\\_br1\\_ctf\\_2014\\_v1.0\\_resubmission.pdf](http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/can_br1_ctf_2014_v1.0_resubmission.pdf)>.

Second biennial report of Canada. Available at

<[http://unfccc.int/national\\_reports/biennial\\_reports\\_and\\_iar/submitted\\_biennial\\_reports/items/7550.php](http://unfccc.int/national_reports/biennial_reports_and_iar/submitted_biennial_reports/items/7550.php)>.

Common tabular format tables of the second biennial report of Canada. Available at <[http://unfccc.int/files/national\\_reports/biennial\\_reports\\_and\\_iar/submitted\\_biennial\\_reports/application/pdf/can\\_2016\\_v1\\_0\\_formatted.pdf](http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/can_2016_v1_0_formatted.pdf)>.

## **B. Additional information used during the review**

Responses to questions during the review were received from Ms. Laurence Ahoussou (Climate Change International Directorate, Environment and Climate Change Canada), including additional material and the following documents<sup>1</sup> provided by Canada:

Canada climate change policy – international and domestic.

Vancouver declaration on clean growth and climate change, of 3-3-2016.

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<sup>1</sup> Reproduced as received from the Party.