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# Report of the technical review of the second biennial report of the United States of America

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 the United States of America, 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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# Contents

# I. Introduction and summary

## A. Introduction

1. This report covers the centralized technical review of the second biennial report (BR2)[1] of the United States of America. 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 the United States, which provided comments that were considered and incorporated with revisions into this final version of the report.

2. The review took place from 30 May to 4 June 2016 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Buket Akay (Turkey), Ms. María Gutiérrez (Mexico), Ms. María José Lopez (Belgium), Ms. Aglaila Obrekht (Canada), Ms. Anna Romanovskaya (Russian Federation), Mr. Muzaffar Shodmonov (Tajikistan) and Ms. Dalia Streimikiene (Lithuania). Ms. Gutiérrez and Ms. Romanovskaya were the lead reviewers. The review was coordinated by Mr. Daniel Hooper and Mr. Davor Vesligaj (UNFCCC secretariat).

## B. Summary

3. The expert review team (ERT) conducted a technical review of the information reported in the BR2 of the United States 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, the United States provided the following additional relevant information: the status of implementation and availability of mitigation impact assessments of some of the policies and measures (PaMs) reported in the BR2; its domestic arrangements for the process of self-assessment of compliance with emission reduction targets; methodologies used for greenhouse gas (GHG) emission projections; its approach to the assessment of economic and social consequences of response measures; and technology transfer and capacity-building activities and measures undertaken since the first biennial report (BR1).

### 1. Timeliness

4. The BR2 was submitted on 31 December 2015, before the deadline of 1 January 2016 mandated by decision 2/CP.17. The common tabular format (CTF) tables were submitted on 31 December 2015.

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

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

[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.

Table 1
**Summary of completeness and transparency issues related to mandatory reported information in the second biennial report of the United States of America**

| *Chapter of the biennial report* | *Completeness* | *Transparency* | *Paragraphs with recommendations* |
|---|---|---|---|
| Greenhouse gas emissions and trends | Complete | Transparent | |
| Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target | Complete | Transparent | |
| Progress in achievement of targets | Complete | Mostly transparent | 18 and 19 |
| Provision of support to developing country Parties | Mostly complete | Mostly transparent | 54, 70 and 76 |

*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

6. The United States has provided a summary of information on 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 the United States' 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.

7. The ERT used the information on GHG emissions and removals for the period 1990–2013 provided in the national inventory report included in the United States' 2015 annual inventory submission to check the consistency of the emission trends, as required by the UNFCCC reporting guidelines on BRs. The ERT concluded that the emission trends reported in the BR2 are consistent with those reported in the national inventory report for 2015 of the United States.

8. Total GHG emissions[2] excluding emissions and removals from land use, land-use change and forestry (LULUCF) amounted to 6,649,701.10 kilotonnes of carbon dioxide equivalent (kt $CO_2$ eq) in 2013 and increased by 5.8 per cent between 1990 and 2013, whereas total GHG emissions including net emissions and removals from LULUCF amounted to 5,791,223.73 kt $CO_2$ eq and increased by 4.8 per cent over the same period. The increase in the total GHG emissions can be attributed mainly to $CO_2$ emissions, which increased by 7.4 per cent (excluding LULUCF) between 1990 and 2013. Over the same period, emissions of methane ($CH_4$) decreased by 15.1 per cent, while emissions of nitrous

[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 CTF tables in the Party's BR2, version 1.0.

oxide ($N_2O$) increased by 6.6 per cent. Perfluorocarbons (PFCs) decreased by 76.0 per cent, hydrofluorocarbons (HFCs) increased by 249.8 per cent and sulphur hexafluoride ($SF_6$) decreased by 77.7 per cent over the same period. Nitrogen trifluoride ($NF_3$) emissions increased by 1,070.1 per cent between 1990 and 2013, but remained negligible, accounting for only 0.008 per cent of total GHG emissions in 2013. The ERT noted that after a peak in 2007 the total GHG emissions started to decline. In 2013, total GHG emissions including LULUCF were 10.1 per cent below the 2005 level (the base year for the United States' 2020 target under the Convention).

9. The emission trends reported in the BR2, particularly in the period after 2007 in which emissions reached their peak, were driven by a combination of economy-wide and key sector-specific drivers: a structural change in the economy (i.e. a shift from a manufacturing-based to a service-oriented economy); a shift from using coal to natural gas and an increased share of renewable energy sources in power generation; an increase in fuel efficiency in the transport sector; fuel switching and energy efficiency improvements in industry; and improvements in the waste management sector.

10. The ERT noted that, during the period 1990–2013, the United States' gross domestic product (GDP) per capita increased by 38.4 per cent, while GHG emissions per GDP unit and GHG emissions without LULUCF per capita decreased by 39.7 and 16.6 per cent, respectively. This could be considered an important step towards the decoupling of GHG emissions from economic development and population growth. Table 2 below illustrates the emission trends by sector and some of the economic indicators relevant to GHG emissions for the United States.

Table 2
**Greenhouse gas emissions by sector and some indicators relevant to greenhouse gas emissions for the United States of America for the period 1990–2013**

| | *GHG emissions (kt $CO_2$ eq)* | | | | | *Change (%)* | | *Share by sector (%)* | |
|---|---|---|---|---|---|---|---|---|---|
| *Sector* | *1990* | *2000* | *2010* | *2012* | *2013* | *1990–2013* | *2012–2013* | *1990* | *2013* |
| 1. Energy | 5 290 461.89 | 6 141 937.80 | 5 854 631.00 | 5 482 175.58 | 5 636 633.61 | 6.5 | 2.8 | 84.1 | 84.8 |
| A1. Energy industries | 1 828 515.53 | 2 306 929.30 | 2 277 315.67 | 2 040 416.01 | 2 059 287.44 | 12.6 | 0.9 | 29.1 | 31.0 |
| A2. Manufacturing industries and construction | 848 574.42 | 860 370.32 | 781 508.46 | 790 116.83 | 823 155.40 | –3.0 | 4.2 | 13.5 | 12.4 |
| A3. Transport | 1 490 863.21 | 1 830 772.47 | 1 734 383.23 | 1 702 259.23 | 1 720 210.74 | 15.4 | 1.1 | 23.7 | 25.9 |
| A4.–A5. Other | 766 060.84 | 825 327.49 | 755 121.63 | 659 208.52 | 736 741.36 | –3.8 | 11.8 | 12.2 | 11.1 |
| B. Fugitive emissions from fuels | 356 448.45 | 318 538.66 | 306 303.32 | 290 178.63 | 297 239.71 | –16.6 | 2.4 | 5.7 | 4.5 |
| C. $CO_2$ transport and storage | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2. IPPU | 342 119.85 | 397 226.17 | 353 588.60 | 361 181.13 | 359 101.75 | 5.0 | –0.6 | 5.4 | 5.4 |
| 3. Agriculture | 448 703.83 | 459 578.03 | 524 807.49 | 523 017.10 | 515 658.18 | 14.9 | –1.4 | 7.1 | 7.8 |
| 4. LULUCF | –762 053.16 | –608 809.02 | –851 312.10 | –840 608.11 | –858 477.36 | 12.7 | 2.1 | NA | NA |
| 5. Waste | 205 985.98 | 181 540.11 | 145 486.45 | 138 938.65 | 138 307.55 | –32.9 | –0.5 | 3.3 | 2.1 |

| Sector | GHG emissions (kt $CO_2$ eq) | | | | | Change (%) | | Share by sector (%) | |
|---|---|---|---|---|---|---|---|---|---|
| | *1990* | *2000* | *2010* | *2012* | *2013* | *1990–2013* | *2012–2013* | *1990* | *2013* |
| 6. Other | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **Total GHG emissions without LULUCF** | **6 287 271.56** | **7 180 282.11** | **6 878 513.55** | **6 505 312.45** | **6 649 701.10** | **5.8** | **2.2** | **100.0** | **100.0** |
| **Total GHG emissions with LULUCF** | **5 525 218.40** | **6 571 473.09** | **6 027 201.45** | **5 664 704.35** | **5 791 223.73** | **4.8** | **2.2** | **NA** | **NA** |
| *Indicators* | | | | | | | | | |
| GDP per capita (thousands 2011 USD using PPP) | 37.06 | 45.99 | 49.37 | 50.55 | 51.28 | 38.4 | 1.4 | NA | NA |
| GHG emissions without LULUCF per capita (t $CO_2$ eq) | 25.19 | 25.45 | 22.24 | 20.71 | 21.01 | –16.6 | 1.4 | NA | NA |
| GHG emissions without LULUCF per GDP unit (kg $CO_2$ eq per 2011 USD using PPP prices) | 0.68 | 0.55 | 0.45 | 0.41 | 0.41 | –39.7 | 0.0 | NA | NA |

*Sources*: (1) GHG emission data: common tabular format tables in the United States of America's 2016 annual inventory submission, version 1.0 (the United States submitted its common reporting format tables on 15 April 2016; however, the Party made a request that they not become publicly available because of display issues with the CRF Reporter software); (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, PPP = purchasing power parity.

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

11. In its BR2 and CTF tables 2(a)–(f), the United States reported a description of its target, including associated conditions and assumptions. CTF tables 2(a)–(d) contain the required information in relation to the description of the Party's emission reduction target. Further information on the target and the assumptions, conditions and methodologies related to the target is provided in chapter 4 of the BR2.

12. The ERT noted that information on the possible scale of contributions from market-based mechanisms under the Convention was not provided in CTF tables 2(e)I and 2(e)II but in a footnote to CTF table 2(f) and in chapter 2 of the BR2, which indicates that the United States does not currently intend to use international market-based mechanisms to meet its target; therefore CTF tables 2(e)I and 2(e)II have been left unfilled. The ERT considers that the transparency of the reporting could be improved by the Party including an explanatory footnote under CTF tables 2(e)I and 2(e)II on the use of market-based mechanisms for achieving its target.

13. For the United States, the Convention entered into force on 21 March 1994. Under the Convention, the United States made a commitment to reduce its GHG emissions in the range of 17.0 per cent in 2020 below the 2005 level. This target includes all GHGs included in the UNFCCC Annex I inventory reporting guidelines, namely $CO_2$, $CH_4$, $N_2O$, HFCs, PFCs, $SF_6$ and $NF_3$. It also includes all Intergovernmental Panel on Climate Change (IPCC) sources and sectors included in the annual GHG inventory. The global warming potential (GWP) values used are from the IPCC Fourth Assessment Report (AR4). Emissions and removals from the LULUCF sector are included in the target and accounted for using a land-based approach. The United States reported that it does not plan to make use of market-based mechanisms to achieve its target (see para. 31 below). In absolute terms, this means that, under the Convention, the United States has to reduce emissions from 6,438,280.99 kt $CO_2$ eq (in the base year)[3] to 5,343,773.30 kt $CO_2$ eq in 2020.

14. The ERT noted that the BR2 of the United States contains information about its target of a 26.0 to 28.0 per cent reduction below the 2005 level in 2025, consistent with the intended nationally determined contribution (INDC) submitted to the UNFCCC on 31 May 2015.[4]

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

15. This chapter provides information on the review of the reporting by the United States 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

16. In its BR2 and CTF table 3, the United States 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 to achieve its target. The United States 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 chapter 3 of the BR2 and in this report (see paras. 22–26 below).

17. In its BR2, the United States indicated that, since its NC6/BR1, no changes had occurred 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.

18. While the BR2, in chapter 3 and appendix 2, provides the information on planned measures required by the UNFCCC reporting guidelines on BRs, this information is not found in CTF table 3. The information provided describes key measures, such as Phase II of the National Program for Heavy-Duty Vehicle GHG Emissions and Fuel Economy Standards, actions to further reduce emissions of HFCs, the Strategy to Reduce Methane Emissions, state actions in the electricity sector, and other planned measures that are included in the 'with additional measures' (WAM) scenario. During the review, the Party explained that the information was not included in CTF table 3 because these proposed PaMs could undergo changes between proposal and finalization. To improve the

[3] The United States chose 2005 as the base year for its 2020 target. The emission level in the base year is based on BR2 CTF table 1.

[4] Available at <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>.

transparency of the reporting, the ERT recommends that the United States list the planned measures in CTF table 3 alongside the implemented and adopted measures and include corresponding descriptions as well as emission reduction estimates, if available.

19. The ERT noted that for most of the PaMs listed in CTF table 3 an estimate of mitigation impact was provided; however, for a number of the PaMs listed in CTF table 3 an estimate of mitigation impact was not included (i.e. the estimates were reported as "NA" (not applicable)), with no explanation as to why. During the review, in response to a question raised by the ERT, the United States explained that it has performed rigorous quantitative estimates for the most significant mitigation programmes, and the impacts of these PaMs are accounted for in the macroeconomic modelling for the 'with measures' (WEM) and WAM scenarios. The United States further explained that these estimates were not provided for a number of reasons, including that the impacts of some policies were not individually estimated by agencies, unavailability of data, and uncertainties related to commercial and economic trends and fluxes in terrestrial ecosystems. To improve the transparency of the reporting, the ERT recommends that the United States, in its next BR, provide the missing estimates of the impacts of mitigation actions in CTF table 3, or explain in the BR in more detail the reasons why those impacts could not be estimated, in line with the additional information provided during the review.

20. The BR2 does not include the information required by the UNFCCC reporting guidelines on BRs on the assessment of the economic and social consequences of response measures. During the review week, the United States informed the ERT that this information was prepared but inadvertently omitted from the BR2, and it provided the ERT with the relevant information. The ERT thus learned that the United States assesses and considers the potential impacts that certain mitigation actions may have on other countries as prescribed by its domestic law. In addition, the United States considers that helping less developed countries transform their economies in line with a low-emission, climate-resilient future is the most appropriate way to maximize the positive and minimize the negative social and economic impacts of its response measures on other countries. The ERT encourages the United States to improve the completeness of its reporting by including, to the extent possible, this information in its next BR.

21. The BR2 does not include the information required by the UNFCCC reporting guidelines on BRs on the domestic arrangements established specifically for the process of self-assessment of compliance with emission reductions required by science, other than a general explanation of institutional arrangements, or on the progress made in the establishment of national rules for taking local action against non-compliance with emission reduction targets. During the review, the Party provided additional information, elaborating on federal rules and federal government support to facilitate, inter alia, consistent measurement and policy approaches. The ERT encourages the United States to improve the completeness of its reporting by providing, to the extent possible, information on these two matters in its next BR.

22. The key overarching cross-sectoral policy reported in the BR2 is the President's Climate Action Plan 2013. The PaMs established under the Climate Action Plan set the framework and direction for future climate policy and are aimed at putting the United States on the path towards reaching its emission reduction targets for 2020 and 2025 (see paras. 13 and 14 above). A large number of policies that were planned at the time of preparation of the BR1 have now been implemented, leading towards meeting the target. In particular, since the BR1, the United States has: finalized carbon pollution standards for both new and existing power plants; adopted measures for the phase-down of the use of HFCs; finalized the renewable fuel standard; finalized efficiency standards; and taken steps to reduce emissions from land use and increase the $CO_2$ sequestering capacity of forests and other lands.

23. The ERT noted the significant contribution to emission reductions of a number of PaMs, including: the National Program for Light-Duty Vehicle GHG Emissions and Corporate Average Fuel Economy Standards, which apply to new light-duty vehicles produced for sale in the United States; appliance, equipment and lighting energy efficiency standards; the Significant New Alternatives Policy programme; and landfill air regulations (see table 3 below).

24. The first phase of the National Program for Light-Duty Vehicle GHG Emissions and Corporate Average Fuel Economy Standards covers 2012–2016 model vehicles, whereas the second phase will establish more stringent standards for 2017–2025 model vehicles. The programme will achieve about 35,000 kt $CO_2$ eq emission reductions in 2013 and 236,000 kt $CO_2$ eq by 2020. Other policies that are already delivering and are expected to further contribute significantly to emission reductions in relation to energy efficiency are the appliance, equipment and lighting energy efficiency standards for more than 60 categories of appliance and equipment: the mitigation effect is estimated at 173,000 kt $CO_2$ eq in 2013 and 216,000 kt $CO_2$ eq by 2020. Among the policies targeting non-$CO_2$ emissions are the Significant New Alternatives Policy programme, transitioning from the use of ozone-depleting substances in the industrial and consumer sectors (estimated mitigation impact of 217,949 kt $CO_2$ eq in 2013 and 316,868 kt $CO_2$ eq by 2020); and the landfill air regulations, limiting emissions from large landfills (estimated mitigation impact of 251,762 kt $CO_2$ eq in 2013 and 261,885 kt $CO_2$ eq by 2020).

25. The Clean Power Plan recently adopted in the United States is one of the most significant actions that the Government of the United States has taken pursuant to the Clean Air Act to limit $CO_2$ emissions from power plants. The Clean Power Plan is expected to start delivering emission reductions after 2020 and it is expected to reduce $CO_2$ emissions by 32 per cent from the 2005 level by 2030. The Clean Power Plan sets interim (starting in 2022) and final $CO_2$ emission performance rates on a per megawatt-hour basis of electricity generated for fossil fuel fired electric steam generating units and for natural gas fired combined cycle generating units. In addition, states, tribes and territories have the flexibility to design their own plans in order to meet these targets.

26. The BR2 highlights a number of mitigation actions that were not yet finalized at the time of the development of the projections and thus have not been included in the WEM scenario. Among the mitigation actions that provide a foundation for significant additional actions, the following are critical for the United States to achieve its 2020 emission reduction target: an amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer for the phase-down of the production and consumption of HFCs; $CH_4$ standards for the oil and natural gas sectors and for landfills; and Phase II of the National Program for Heavy-Duty Vehicle GHG Emissions and Fuel Efficiency Standards.

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

Table 3
**Summary of information on mitigation actions and their impacts reported by the United States of America**

| *Sector affected* | *List of key mitigation actions* | *Estimate of mitigation impact in 2020 (kt $CO_2$ eq)* |
|---|---|---|
| Policy framework and cross-sectoral measures | Climate Action Plan | NE |
| | Clean Air Act | NE |
| Energy, including: | Clean Power Plan | NA[a] |

| *Sector affected* | *List of key mitigation actions* | *Estimate of mitigation impact in 2020 (kt $CO_2$ eq)* |
|---|---|---|
| | Clean energy supply programmes | 73 300 |
| Transport | National Program for Light-Duty Vehicle GHG Emissions and Corporate Average Fuel Economy Standards | 236 000 |
| | National Program for Heavy-Duty Vehicle GHG Emissions and Fuel Efficiency Standards (Phase I) | 37 700 |
| | National Program for Heavy-Duty Vehicle GHG Emissions and Fuel Efficiency Standards (Phase II) | NE |
| Renewable energy | Renewable fuel standard | 138 400 |
| | Onshore Renewable Energy Development Program | 41 500 |
| Energy efficiency | Appliance, equipment and lighting energy efficiency standards | 216 000 |
| | ENERGY STAR labelled products | 141 200 |
| | ENERGY STAR commercial buildings | 93 500 |
| | Building energy codes | 56 100 |
| IPPU | Significant New Alternatives Policy programme | 316 868 |
| | Federal Air Standards for Oil and Natural Gas Sector | 47 500 |
| | Natural gas STAR programme | 31 800 |
| | Strategy to Reduce Methane Emissions | NE |
| | Amendment to the Montreal Protocol | 63 000 |
| Agriculture and LULUCF | Conservation Reserve Program | 39 800 |
| | Natural Resources Conservation Service | 27 600 |
| Waste | Landfill air regulations | 261 885 |

*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*: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated.

[a] Since the implementation of the Clean Power Plan starts in 2022, emission reductions are not expected to occur by 2020. Therefore, the estimate of mitigation impact in 2020 is "NA" (not applicable).

28. The ERT noted that the United States has made progress towards its target since the BR1 by following through on the implementation of planned measures and planning new ones. The implemented and planned measures are likely to be sufficient to meet the 2020 target (see para. 35 below).

29. With regard to the 2025 target, the United States noted in its BR2 the likely need for additional PaMs to meet it. The BR2 provides an uncertainty range for the impacts of the planned PaMs and for the contribution of the LULUCF sector, and the projections for the WAM scenario fall within the uncertainty range below and above the 2025 target.

30. The ERT noted that in the BR2 the textual description of the PaMs includes estimates of emission reductions in various units: sometimes million tonnes of carbon pollution (Clean Power Plan), sometimes million metric tonnes of carbon pollution (National Program for Light-Duty Vehicle GHG Emissions and Corporate Average Fuel Economy Standards) and sometimes Mt $CO_2$ eq (phase-down of HFCs). The ERT noted that the United States could improve the transparency of its reporting by providing emission reduction estimates in consistent units (i.e. kt $CO_2$ eq).

### 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

31. The United States, in CTF table 1, reported on the contribution of LULUCF to achieving its target. It also stated in CTF table 2(f) that currently it does not intend to use units from market-based mechanisms under the Convention; consequently, CTF tables 4 and 4(a) were not filled in. The ERT noted that a reference to CTF table 1 on the contribution from LULUCF was provided in a footnote to CTF table 4 (footnote d to CTF table 4 allows Parties for which all relevant information on the LULUCF contribution is reported in CTF table 1 to refer to that table).

32. The ERT noted that the BR2 does not provide information about the use or treatment of emission credits purchased or sold under subnational emissions trading schemes involving other countries, such as that between California, United States, and Quebec, Canada. During the review, in response to a question raised by the ERT, the United States confirmed its intention of not counting traded units towards the achievement of its 2020 target at the national level, noting that the state Governments of California and Quebec were aware of this decision.

33. For 2013, the United States reported in CTF table 1 annual total GHG emissions excluding LULUCF of 6,649,701.10 kt $CO_2$ eq, or 5.8 per cent above the 1990 level and 9.2 per cent below the 2005 level. On accounting for LULUCF activities, the United States reported in CTF table 1 that in 2012 and 2013 the sector had a net carbon sequestration of 840,608.11 kt $CO_2$ eq and 858,477.36 kt $CO_2$ eq, respectively, offsetting 12.9 per cent of the United States' total GHG emissions in 2012 and 2013. Table 4 below illustrates the United States' total GHG emissions, the contribution of LULUCF and the use of units from market-based mechanisms to achieve its target.

Table 4
**Summary 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 the United States of America towards the achievement of its target**

| *Year* | *Emissions excluding LULUCF (kt $CO_2$ eq)* | *Contribution from LULUCF (kt $CO_2$ eq)* | *Emissions including contribution from LULUCF (kt $CO_2$ eq)* | *Use of units from market-based mechanisms (kt $CO_2$ eq)* |
|---|---|---|---|---|
| 1990 | 6 287 271.56 | –762 053.16 | 5 525 218.40 | NA |
| 2005 | 7 324 691.21 | –886 410.32 | 6 438 280.99 | NA |
| 2010 | 6 878 513.55 | –851 312.10 | 6 027 201.45 | NA |
| 2011 | 6 740 586.36 | –844 938.16 | 5 895 648.20 | NA |
| 2012 | 6 505 312.45 | –840 608.11 | 5 664 704.35 | NA |
| 2013 | 6 649 701.10 | –858 477.36 | 5 791 223.73 | NA |

*Sources*: United States of America'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.

34. To assess the progress towards the achievement of the 2020 target, the ERT noted that the United States' emission reduction target under the Convention is in the range of 17.0 per cent below the 2005 level in 2020 (see para. 13 above). As discussed in chapter II.B above, in 2013 the United States' annual total GHG emissions excluding LULUCF were 9.2 per cent (6,649,701.10 kt $CO_2$ eq) below the base year level. In addition, the ERT noted that in 2013 the contribution from LULUCF was 858,477.47 kt $CO_2$ eq.

35. The ERT noted that the United States is making progress towards its emission reduction target by implementing domestic mitigation actions that are delivering emission reductions and through the contribution of LULUCF. In 2013 the United States' GHG emissions including LULUCF were 5,791,223.73 kt $CO_2$ eq. This represents an approximate 10.0 per cent reduction below the 2005 level. Despite continued economic growth, annual net emissions have decreased by 1.3 per cent on average since 2005 – a reversal of past trends of annual increases of 1.1 per cent from 1990 to 2005. If the reduction trend continues, it will be sufficient to achieve the United States' 2020 target. However, the ERT noted that, as reported in the Party's national inventory report for 2016, annual GHG emissions have had an increasing trend since 2012 and increased by 1.1 per cent from 2013 to 2014. Based on the results of the projections (see para. 45 below), the ERT also noted that the Party may face challenges in the achievement of its target under the Convention and would need to further strengthen domestic mitigation actions, including the expected contribution of the so-called 'high' sequestration scenario in relation to LULUCF.

### 3. Projections

36. The United States reported in its BR2 and CTF table 6(a) updated projections for 2020 and 2030 relative to actual inventory data for 2013 under a 'current measures' scenario, which matches the definition of the WEM scenario in the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines on NCs). 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: $CO_2$, $CH_4$, $N_2O$, PFCs, HFCs and $SF_6$ (treating PFCs, HFCs and $SF_6$ separately in each case). Projections for $NF_3$ are not provided. Projections are also provided in an aggregated format for each sector as well as for national total GHG emissions, using GWP values from the AR4.

37. The ERT noted that, owing to the sector-specific uncertainties associated with the GHG emissions and removals from the LULUCF sector, projections for the WEM scenario were reported in the BR2 as a range between 'low' and 'high' sequestration levels in relation to LULUCF. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and were not included in the national total GHG emissions. The United States reported on factors and activities influencing emissions for each sector. Further information on the projections is provided in chapter 4 of the BR2 and in this report (see paras. 45–50 below).

38. In addition to the WEM scenario, the United States reported in its BR2 an 'additional measures' scenario, which matches the definition of the WAM scenario in the UNFCCC reporting guidelines on NCs. The projections are prepared in ranges for 2020 and 2025 for: $CO_2$; $CH_4$ and $N_2O$ combined; and HFCs. No emission projections for other F-gases, indirect GHGs, such as carbon monoxide, nitrogen oxides and non-methane volatile organic compounds, or sulphur oxides were provided. The ERT noted that the WAM scenario was not reported in CTF table 6(c). The United States stated in the BR2 that it did not include the WAM scenario in the CTF tables because of difficulties in disaggregating

the projected emissions across sectors and gases, given that the measures are still under development and also because the CTF tables do not allow for entering ranges of values.

39. The ERT noted that the United States did not provide a 'without measures' scenario in its BR and CTF tables and encourages the Party to provide one in the next BR.

40. The United States 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. 43 below). To explain the changes, the United States provided supporting documentation.[5] The United States also provided information on the sensitivity analysis. Further information can be found in chapter 4 of the BR2 and in this report (see paras. 42–44 below).

Overview of projection scenarios

41. The WEM scenario reported by the United States includes the effects of all PaMs that had been implemented or adopted up to mid-2015 under the President's Climate Action Plan 2013, but does not include additional reductions resulting from any further measures that may be formulated or implemented from mid-2015 to 2025. The WAM scenario includes planned PaMs that have been proposed, but not finalized, and other measures that fall under the initiatives laid out in the President's Climate Action Plan 2013. The definitions indicate that the scenarios were prepared according to the scenario definitions specified in the UNFCCC reporting guidelines on NCs.

Methodology and changes since the previous submission

42. The methodology used for the BR2 is similar to that used for the preparation of the emission projections in the NC6/BR1. The United States reported supporting information in appendix 2 to the BR2 further explaining the methodologies and the changes made since the NC6/BR1. The main methodological changes related to the projections for the LULUCF sector, for which the synthesis of modelling results from a multi-year land-use modelling effort between the United States Department of Agriculture and the Environmental Protection Agency were included. These new estimates for LULUCF reflect more detailed modelling than that presented in the NC6/BR1. In this regard, key modelling uncertainties were identified that underlie the range of potential future emissions and removals from the LULUCF sector.

43. To prepare its projections, the United States relied on the following key underlying variables: population trends; GDP; energy intensity; natural gas, petroleum and coal consumption; and vehicle miles travelled. These variables and assumptions are reported in CTF table 5. The assumptions have been updated on the basis of the most recent economic developments known at the time of the reporting on projections. It is expected that population will grow by 5.4 and 13.2 per cent by 2020 and 2030, respectively, compared with the 2013 level, and that GDP will increase by 19.7 and 52.1 per cent by 2020 and 2030, respectively. At the same time, energy intensity will decrease by 12.9 and 32.3 per cent by 2020 and 2030, respectively, while total primary energy consumption will increase by 3.3 per cent by 2020 and thereafter remain stable. Further description of factors and activities affecting specific sectors can be found in chapter 2 of the BR2.

44. Sensitivity analyses were conducted for a number of assumptions in preparing the LULUCF projections, such as population dynamics, macroeconomic variables, climate

[5] Woodall CW et al. 2015. *The U.S. Forest Carbon Accounting Framework: Stocks and Stock Change, 1990–2016.* USDA Forest Service. Available at <http://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs154.pdf>.

change, forest product markets and land sector response. To reflect uncertainties, LULUCF projections through to 2030 were presented as a range. This range was developed by applying various modelling techniques that represent different perspectives on GDP, population, forest product demand, and forest characteristics and management trends. Projections for $CO_2$ sequestration from LULUCF through to 2030 under the WEM scenario in the BR2 are presented as a range based on 'low' and 'high' sequestration scenarios. However, because the CTF tables cannot accommodate a range of values for a particular sector, only the 'high' sequestration scenario, deemed more reliable (given optimistic recent trends and the undertaking of a broad set of activities designed to enhance carbon sinks), was included in CTF table 5 (information on both scenarios in the LULUCF sector was provided in chapter 4 of the BR2).

Results of projections

45. The United States' total GHG emissions in 2020 and 2030 are projected to be 6,612,000 and 6,363,000 kt $CO_2$ eq, respectively, under the WEM scenario, which is an increase of 5.2 and 1.2 per cent, respectively, above the 1990 level and a decrease of 9.7 per cent and 13.1 per cent, respectively, below the 2005 level (base year). If emissions and removals from LULUCF are included, under the WEM scenario the projected emissions for 2020 are 15.4 and 13.1 per cent lower than in 2005 for 'high' and 'low' sequestration levels in the LULUCF sector, respectively, while the projected emissions for 2030 are 18.1 and 11.4 per cent lower than in 2005. Under the WAM scenario the range of potential emission reductions additional to those under the WEM scenario in 2020 is estimated to be 202,000–446,000 kt $CO_2$ eq, which results in a decrease of 18.5–22.3 per cent below the 2005 level, assuming the 'high' sequestration scenario for LULUCF.

46. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector excluding transport, amounting to projected reductions of 485,000 kt $CO_2$ eq (11.2 per cent), followed by the transport sector (249,000 kt $CO_2$ eq or 12.9 per cent) and the waste sector (51,000 kt $CO_2$ eq or 27.0 per cent) between 1990 and 2020. GHG emissions from industrial processes and product use and from the agriculture sector are projected to increase by 63,000 kt $CO_2$ eq (17.2 per cent) and by 10,000 kt $CO_2$ eq (2.0 per cent), respectively.

47. According to the projections reported for 2030 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector excluding transport (688,000 kt $CO_2$ eq or 15.8 per cent), followed by the transport (351,0000 kt $CO_2$ eq or 18.2 per cent) and waste (52,000 kt $CO_2$ eq or 27.5 per cent) sectors. GHG emissions from industrial processes and product use are projected to increase by 130,000 kt $CO_2$ eq (35.4 per cent), while GHG emissions from agriculture are expected to decrease and reach the 2005 level, owing mainly to a decrease in agricultural production.

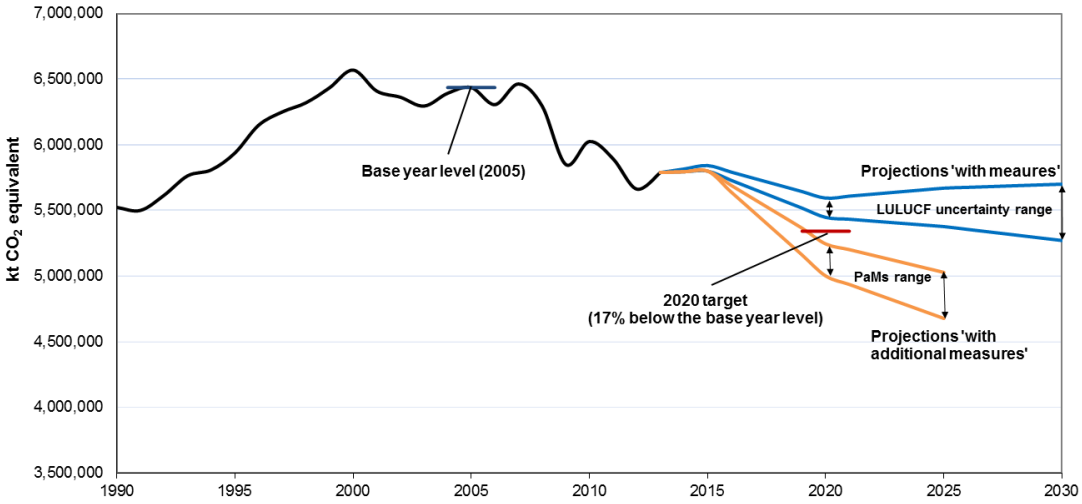
48. In 2020, the most significant reductions are projected for $CO_2$, $CH_4$ and $N_2O$ emissions: 726,000 kt $CO_2$ eq (11.9 per cent), 39,000 kt $CO_2$ eq (5.6 per cent) and 19,000.00 kt $CO_2$ eq (5.5 per cent) between 1990 and 2020, respectively. HFC emissions are projected to increase by 80 000 kt $CO_2$ eq (61.0 per cent) during the same period. In 2030, projected $CO_2$ emission reductions are 1,041,000 kt $CO_2$ eq (17.0 per cent); $CH_4$, 27,000 kt $CO_2$ eq (3.9 per cent); and $N_2O$, 23,000 kt $CO_2$ eq (6.6 per cent). In 2030 HFC emissions are expected to increase by 134,000 kt $CO_2$ eq (102.3 per cent) (see CTF table 6 (a)).

49. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by gas slightly change, owing to significant additional policies for the non-$CO_2$ gases, such as $CH_4$ and $N_2O$, as well as for HFCs. Under the WAM scenario, $CO_2$ emissions will decrease by 761,000–960,000 kt $CO_2$ eq (12.4–15.7 per cent) by 2020 compared with the 2005 level, while $CH_4$ and $N_2O$ emissions

will decrease by 162,000–207,000 kt $CO_2$ eq (20.1–26.6 per cent) and HFC emissions will increase by 17,000 kt $CO_2$ eq (13.0 per cent) during the same period.

50. The projected emission levels under the WEM and WAM scenarios and the United States' quantified economy-wide emission reduction target are presented in the figure below.

**Greenhouse gas emission projections by the United States of America**




*Sources*: (1) Data for the years 1990–2013: the United States 2015 annual inventory submission; total GHG emissions excluding land use, land-use change and forestry; (2) Data for the years 2013–2030: the United States' second biennial report; total GHG emissions including land use, land-use change and forestry.

*Abbreviations*: LULUCF = land use, land-use change and forestry, PaMs = policies and measures.

51. The ERT noted that, while $NF_3$ emissions are included in the United States' quantified economy-wide emission reduction target and in the GHG emission trends, they are not included in the GHG emission projections. During the review, the United States explained that it recognizes the importance of understanding $NF_3$ emissions and trends and is investing efforts via the Greenhouse Gas Reporting Program and GHG inventory to include $NF_3$ projections in future BRs, depending on resource availability and policy priorities. The ERT therefore encourages the United States to include $NF_3$ in the GHG emission projections in its next BR.

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

52. In its BR2, the United States reported information on the provision of financial, technological and capacity-building support required under the Convention. The BR2 includes information on the national approach to tracking the provision of support, indicators, delivery mechanisms used and allocation channels tracked. The United States also reported a description of the methodology used to report financial support, including underlying assumptions.

53. The United States provided details on what new and additional support it has provided and clarified how this support is new and additional (see para. 56 below). Further

information on the Party's provision of support to developing country Parties is provided in chapter 5 of the BR2.

54. The BR2 does not include the information required by the UNFCCC reporting guidelines on BRs on the financial support that the United States has provided, committed and pledged for the purpose of assisting Parties not included in Annex I to the Convention (non-Annex I Parties) in adapting to any economic and social consequences of response measures. During the review, the United States explained that this information was inadvertently omitted from the final version of the BR2 and the Party submitted the relevant text (see para. 20 above). The text elaborates on the approach followed by the United States, which focuses on the support of policy development and advancement of local private sectors, and provides examples of relevant programmes. To improve the completeness of the reporting, the ERT recommends that the United States include in its next BR information on the financial support that it has provided, committed and pledged for the purpose of assisting non-Annex I Parties in adapting to any economic and social consequences of response measures.

55. The United States reported on the financial support that it provided to non-Annex I Parties, distinguishing between support for mitigation and adaptation activities and recognizing the capacity-building elements of such support, and on its allocation channels and annual contributions for the period 2013–2014, without overlapping with the previous reporting period (2011–2012), as required by the UNFCCC reporting guidelines on BRs (see paras. 61 and 62 below).

56. The United States explained how it determines how much of its support is new and additional. New funding is sought from Congress by the United States Administration on an annual basis. In the 2013 and 2014 financial years, this totalled USD 5.5 thousand million. In its BR2 the United States noted its pledge of USD 3 thousand million to the Green Climate Fund. The United States has delivered a USD 500 million grant to the Green Climate Fund, the first step towards meeting its USD 3 thousand million pledge.

57. The United States included in its BR2 information on how it has refined its approach to tracking climate support and methodologies. It provided, in appendix 1 to the BR2, information on the methodology that it adopted for tracking finance for adaptation and mitigation, including for determining which funds are 'climate specific' and 'committed'. For tracking and reporting private finance mobilized by public intervention, the United States expects to build on the framework developed by the Research Collaborative on Tracking Private Climate Finance[6] to develop a common approach and methodology that will be used by its institutions and agencies. The ERT commends the United States for including this information in its BR and thoroughly addressing the recommendations made in the report of the technical review of the BR1.

### 1. Finance

58. In its BR2 and CTF tables 7, 7(a) and 7(b), the United States 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. 61 and 62 below for further information on financial resources). The summary information was reported for 2013–2014.

59. The United States described how the resources that it provided address the adaptation and mitigation needs of non-Annex I Parties, stressing its support for country-

[6] Hosted by the Organisation for Economic Co-operation and Development. See <https://www.oecd.org/env/researchcollaborative/>.

driven approaches and its preference for working with national institutions whenever possible. It also described how those resources assist non-Annex I Parties in mitigating and adapting to the adverse effects of climate change and contribute to technology development and transfer and capacity-building related to mitigation and adaptation (see paras. 69–77 below). The focus of support is often on information dissemination and policy assessment tools, including for the development of low-emission development strategies, in the context of countries' broader policy frameworks.

60. With regard to the most recent financial contributions aimed at enhancing the implementation of the Convention by developing countries, the Party's climate finance supports activities across three main pillars identified in the United States' Global Climate Change Initiative: adaptation, clean energy and sustainable landscapes. Furthermore, since the BR1, particular attention has been placed on integration, with an Executive Order calling for, inter alia: integration of climate resilience considerations into the core of foreign assistance work; an end to public support for new coal-fired power plants located abroad, except in rare circumstances; and integration of climate change into the country's Quadrennial Diplomacy and Development Review. The United States thus seeks to ensure that all work undertaken by the United States Agency for International Development (USAID) is climate resilient and, where possible, leads to a reduction in GHG emissions.

61. The United States reported on its climate-specific public financial support provided in 2013 and 2014, totalling more than USD 5.5 thousand million (USD 2.7 thousand million in 2013 and USD 2.8 thousand million in 2014), through a range of financial instruments and interventions, including grants, risk mitigation tools (such as guarantees and insurance) and loans. During the reporting period, about 42.0 per cent of United States' grant-based congressionally appropriated assistance went to Asia, 36.0 per cent to Africa, 19.0 per cent to Latin America and the Caribbean, and the rest to developing economies in Europe and the Middle East. All public financial support is reported as 'committed'.

62. The BR2 includes detailed information on the financial support provided though multilateral channels and bilateral and regional channels in 2013 and 2014. More specifically, the United States contributed through multilateral channels, as reported in its BR2 and CTF table 7(a), more than USD 476 million and 442 million for 2013 and 2014, respectively. These contributions were made to specialized multilateral climate change funds, particularly the Clean Technology Fund and the Least Developed Countries Fund, as well as the Global Environment Facility and the Pilot Program for Climate Resilience. The BR2 and CTF table 7(b) also include detailed information on the total financial support provided though bilateral and regional channels, amounting to approximately USD 4.5 thousand million (USD 2.2 thousand million in 2013 and USD 2.3 thousand million in 2014). Table 5 includes some of the information reported by the United States on its provision of financial support.

Table 5
**Summary of information on provision of financial support in 2013–2014 by the United States of America**
(Billions of United States dollars)

| | *Years of disbursement* | |
|---|---|---|
| *Allocation channel of public financial support* | *2013* | *2014* |
| Climate-specific contributions through multilateral channels, including: | 476.48 | 442.34 |
| Global Environment Facility | 62.40 | 71.90 |
| Least Developed Countries Fund | 27.00 | 26.18 |

| *Allocation channel of public financial support* | *Years of disbursement* | |
|---|---|---|
| | *2013* | *2014* |
| Special Climate Change Fund | 10.00 | 0 |
| Trust Fund for Supplementary Activities | 2.75 | 2.75 |
| Other multilateral climate change funds | 331.50 | 298.95 |
| Specialized United Nations bodies | 42.83 | 42.57 |
| Climate-specific contributions through bilateral, regional and other channels | 2 219.99 | 2 328.59 |

63. The BR2 provides information on the types of support provided. While support provided for mitigation actions continues to be higher than support provided for adaptation, the latter increased by 8.0 per cent in 2014 compared with in 2013. In terms of the focus of public financial support reported in CTF table 7 for 2013, the shares of total public financial support allocated for mitigation, adaptation and cross-cutting projects were 82.6, 14.7 and 2.7 per cent, respectively. In total, 17.7 per cent of the total public financial support was allocated through multilateral channels and 82.3 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 81.6, 15.4 and 3.0 per cent, respectively. In total, 16.0 per cent of the total public financial support was allocated through multilateral channels and 84.0 per cent of it was through bilateral, regional and other channels.

64. The ERT noted that, in 2013, 50.9 per cent of financial contributions made through multilateral channels were allocated to the energy sector, 25.9 per cent to cross-cutting sectors addressing adaptation activities, 15.4 per cent to sectors cross-cutting mitigation and adaptation, and 7.7 per cent to the agriculture and forestry sectors, as reported in CTF table 7(a). The corresponding figures for 2014 were 56.9 for the energy sector, 22.8 per cent for cross-cutting sectors addressing adaptation, 18.7 per cent for sectors cross-cutting mitigation and adaptation, and 1.6 per cent for the agriculture and forestry sectors.

65. The BR2 reported that congressionally appropriated climate finance supported activities in relation to the three main thematic pillars (see para. 60 above) as follows: about 49.0 per cent for clean energy, 34.0 per cent for adaptation and 17.0 per cent for sustainable landscapes. Finance committed through more demand-driven climate finance channels, such as the Overseas Private Investment Corporation and the Export–Import Bank of the United States, typically supported clean energy activities.

66. 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, concessional loans, insurance, loan guarantees and others. The ERT noted that the shares of the grants, loans and other instruments provided in 2013 and 2014 were approximately 45.1, 15.1 and 39.8 per cent of the total public financial support, respectively. In terms of the number of projects supported, the vast majority of bilateral initiatives were supported by grants, while projects and programmes that required a larger amount of funding were financed via other non-grant-based finance.

67. In its BR2, the United States 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 allowing public resources to be concentrated in areas and sectors that the private sector is less likely to invest in on its own. The focus of support from the United States is on technical assistance to address barriers to mobilizing private finance, including

barriers relating to poor incentives, perceived risk and engaging with host government regulatory processes.

68. The United States explained its approach to reporting on private financial flows leveraged by bilateral climate finance for mitigation and adaptation activities in non-Annex I Parties, elaborating on the methodology, principles and limitations. As noted in the BR2, the accounting approach tracks support on an activity basis and excludes the share of private finance mobilized by developing countries for the same purpose. In the BR2 the United States also noted progress made towards adopting a common approach and methodology under the Research Collaborative on Tracking Private Climate Finance, stating that its institutions and agencies will endeavour to use this framework going forward and will work with others to harmonize approaches over time.

### 2. Technology development and transfer

69. In its BR2 and CTF table 8, the United States 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. The United States provided examples of support provided for the deployment and enhancement of the endogenous capacities and technologies of non-Annex I Parties.

70. Both the BR2 and CTF table 8 provide examples of numerous initiatives and programmes on technology transfer, including a description of their aims and objectives. The BR2 also includes brief information on changes in policies and activities since the BR1, with reference to reports made under the Agreement on Trade-Related Aspects of Intellectual Property Rights. The BR2 is less clear, however, on which measures or activities have taken place since the BR1. During the review, the United States submitted additional information with specific examples of activities undertaken since the previous report. While the ERT acknowledges that the Party's programmatic priorities and, more specifically, individual projects and initiatives do not change every two years, the ERT reiterates the recommendation made in the previous review report that the United States identify in its next BR measures and activities related to technology transfer implemented or planned since its previous BR, to improve the transparency of its reporting.

71. The BR2 contains success stories related to technology transfer and development and, although it does not include specific failure stories, it elaborates on the challenges in implementation; for example, the relatively low number of requests being made to the Climate Technology Centre and Network (CTCN). The report also notes measures undertaken by the United States to address these challenges, including a formalized partnership between the Clean Energy Solutions Center and the CTCN and the launch of a new service to assist countries in designing clean energy finance measures to help mobilize investment in priority technologies. The ERT reiterates the encouragement made in the previous review report for the United States to include, where feasible, in its next BR its experience with technology transfer, and in particular failure stories, if available, in order to share relevant experience internationally and increase learning opportunities for the success of future activities.

72. The ERT noted that, in its BR2, including CTF table 8, the United States reported on measures taken to promote, facilitate and finance the transfer and deployment of climate-friendly technologies. In its BR2, the United States provided information on measures taken to support the development and enhancement of the endogenous capacities and technologies of non-Annex I Parties. The United States focuses its support on the development of policies, regulations and the institutional scaffolding required to enhance technology transfer. A considerable number of the programmes involve exchange of information and collaboration at the global and regional levels.

73. The ERT took note of the information provided in CTF table 8 on the target areas, measures and focus sectors of technology transfer programmes. While most support focuses on mitigation and clean energy, the BR2 includes examples of support targeting adaptation. The BR2 highlights the global work of the CTCN and that of the Global Lighting and Access Partnership. In terms of bilateral support, the BR2 draws attention to a high-level partnership with India, which was expanded in 2014 to further advance research, deployment and access in relation to clean energy technologies.

74. Given the United States' focus on technology transfer support through enabling environments, the ERT noted an understandable overlap between technology transfer and capacity-building activities. The suggestion made in the previous review report to disaggregate activities into components when reporting (distinguishing, for example, between vulnerability studies, monitoring and assessment techniques, enhanced access to information, policy design, technical assistance and infrastructure resilience) could contribute to an improvement in the transparency and value of the reporting, particularly if these components are further linked to needs identified by developing countries within the framework of capacity-building, as specified in decision 2/CP.7 (see para. 75 below).

### 3. Capacity-building

75. In its BR2 and CTF table 9, the United States 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. The examples provided in the BR2 indicate that the Party's capacity-building addresses needs identified in the framework for capacity-building in developing countries established under decision 2/CP.7, such as: the enhancement and/or creation of an enabling environment; research and systematic observation, including meteorological, hydrological and climatological services; vulnerability and adaptation assessment; and capacity-building for the implementation of adaptation measures.

76. The ERT noted that capacity-building needs of non-Annex I Parties are addressed throughout all of the United States' support activities, and that the list of activities and projects presented in the BR2 is of an illustrative nature, providing information on the aims and objectives of the various programmes and projects. Yet, for the activities referred to under technology transfer, it is not clear which activities have taken place in the period covered by the BR2. During the review, the United States complemented the submission with more specific information on capacity-building activities and examples of results from 2014 to 2015. The ERT recommends that, to improve the transparency of its reporting, the United States identify in its next BR, to the extent possible, individual measures and activities related to capacity-building activities that have taken place since the previous BR.

77. In an attempt to further build local capacity and increase stakeholder participation, USAID missions awarded 16.9 per cent of their funding to local institutions in 2014, a slight increase from the 14.3 per cent allocated in 2012. The ERT noted the plan of the United States, referred to in the report of the technical review of the BR1, to double the funding provided to local institutions in developing countries by 2015 compared with the 2012 level.

## III. Conclusions

78. The ERT conducted a technical review of the information reported in the BR2 and CTF tables of the United States 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 the United States in achieving its target; and the Party's provision of support to developing country Parties.

79. The United States' total GHG emissions excluding emissions and removals from LULUCF increased by 5.8 per cent between 1990 and 2013, whereas total GHG emissions including emissions or removals from LULUCF increased by 4.8 per cent over the same period. The ERT noted that, after a peak in 2007, the upward trend in overall emissions changed to a downward trend, and total GHG emissions including LULUCF in 2013 reached 10.1 per cent below the 2005 level. The downward emission trends after 2007 were driven by a combination of economy-wide and key sector-specific drivers: a structural change in the economy (i.e. a shift from a manufacturing-based to a service-oriented economy); a shift from using coal to natural gas and an increased share of renewable energy sources in power generation; an increase in fuel efficiency in the transport sector; fuel switching and energy efficiency improvements in industry; and improvements in the waste management sector.

80. Under the Convention, the United States committed itself to achieving a quantified economy-wide emission reduction target in the range of 17.0 per cent below the 2005 level in 2020. This target covers the following GHGs: $CO_2$, $CH_4$, $N_2O$, HFCs, PFCs, $SF_6$ and $NF_3$, expressed using GWP values from the AR4, and covers all sources and sectors included in the annual GHG inventory. Emissions and removals from the LULUCF sector are included in the target and the United States reported that it does not plan to make use of market-based mechanisms to achieve its target.

81. The United States' main policy framework and key legislation relating to energy and climate change is the President's Climate Action Plan 2013. The mitigation actions with the most significant mitigation impact are those in the energy and waste sectors, namely: the Clean Power Plan; the National Program for Light-Duty Vehicle GHG Emissions and Corporate Average Fuel Economy Standards; appliance, equipment and lighting energy efficiency standards; the Significant New Alternatives Policy programme; and landfill air regulations.

82. For 2013, the United States reported in CTF table 1 total GHG emissions excluding LULUCF at 6,649,701.10 kt $CO_2$ eq, or 5.8 per cent above the 1990 level and 9.2 per cent below the 2005 level. The United States reported on its use of units from market-based mechanisms and on the contribution of LULUCF to achieve its target. The United States reported in CTF table 1 that emissions and removals from the LULUCF sector resulted in net carbon sequestration of 858,477.47 kt $CO_2$ eq in 2013, offsetting 12.9 per cent of the United States' total GHG emissions and leading to total GHG emissions including LULUCF of 5,791,223.73 kt $CO_2$ eq in 2013.

83. The GHG emission projections provided by the United States in its BR2 cover the WEM and WAM scenarios. Under the WEM scenario, total GHG emissions in 2020 and 2030 are projected to be 6,614,000.00 and 6,364,000.00 kt CO2 eq, respectively, which is an increase of 5.2 and 1.2 per cent, respectively, compared with the 1990 level and a decrease of 9.7 per cent and 13.1 per cent, respectively, compared with the 2005 level. If emissions and removals from LULUCF are included, under the WEM scenario the projected emissions for 2020 are 15.4 and 13.1 per cent lower than in 2005 for the 'high' and 'low' sequestration levels in relation to LULUCF, respectively. Under the WAM scenario, emissions in 2020 are projected to be lower than those under the WEM scenario by 202,000.00–446,000.00 kt $CO_2$ eq, which results in a decrease of 18.5–22.3 per cent below the 2005 level, assuming the 'high' sequestration scenario in relation to LULUCF.

84. The ERT noted that the United States is making progress towards its emission reduction target by implementing domestic mitigation actions and through the expected contribution of LULUCF; however, based on the results of the projections, the ERT also noted that the Party may face challenges in the achievement of its target under the Convention under the WEM scenario and would need to further implement planned domestic mitigation actions under the President's Climate Action Plan 2013, including the expected contribution of the 'high' sequestration scenario in the LULUCF sector.

85. The United States continues to allocate climate financing in line with climate finance programmes such as the Global Climate Change Initiative, which identified climate change as one of the three priority development initiatives for the United States, in order to assist developing country Parties in implementing the Convention, and to integrate climate change into its foreign development assistance work. The United States has maintained its contributions at the same level since its NC6/BR1 and its public financial support in 2013 and 2014 totalled USD 5.5 thousand million (approximately USD 2.7 thousand million per year). While support provided for mitigation action continues to be higher than support provided for adaptation, the latter increased in 2014 compared with in 2013. The highest level of financial support went to projects in the energy sector, followed by other cross-cutting sectors. The United States has also continued to provide support for a large number of technology transfer initiatives, focusing on the development of policies, regulations and the institutional scaffolding to enable such transfer. Capacity-building is addressed and integrated well throughout the United States' support activities.

86. In the course of the review, the ERT formulated the following recommendations for the United States to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR:[7]

(a) Improve the completeness of its reporting by including information on the financial support that it has provided, committed and pledged for the purpose of assisting non-Annex I Parties in adapting to any economic and social consequences of response measures (see para. 54 above);

(b) Improve the transparency of its reporting by:

(i) Providing information on planned measures in CTF table 3 (see para. 18 above);

(ii) Providing missing estimates of the impacts of mitigation actions in CTF table 3, or providing a more detailed explanation of why those impacts could not be estimated (see para. 19 above);

(iii) Identifying measures and activities related to technology transfer implemented or planned since its previous BR (see para. 70 above);

(iv) Identifying measures and activities related to capacity-building implemented or planned since its previous BR (see para. 76 above).

[7] The recommendations are given in full in the relevant chapters of this report.

# 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/IDR.6/USA. Report of the technical review of the sixth national communication of the United States of America. Available at <http://unfccc.int/resource/docs/2014/idr/usa06.pdf>.

FCCC/TRR.1/USA. Report of the technical review of the first biennial report of the United States of America. Available at <http://unfccc.int/resource/docs/2014/trr/usa01.pdf>.

2015 greenhouse gas inventory submission of the United States of America. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php>.

2016 greenhouse gas inventory submission of the United States of America. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/9492.php>.

Sixth national communication of the United States of America. Available at <http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/usa_nc6.pdf>.

First biennial report of the United States of America. Available at <http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/usa_br1.pdf>.

Common tabular format tables of the first biennial report of the United States of America. Available at <http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/usa_2014_v1.0_formatted.pdf>.

Second biennial report of the United States of America. Available at <http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/usa_br2-final.pdf>.

Common tabular format tables of the second biennial report of the United States of America. Available at <http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/usa_2016_v1_0_formatted.pdf>.

Second Biennial Report Methodologies for Quantified Policies and Measures. Available at <http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/second_biennial_report_methodologies_for_quantified_policies_and_measures.pdf>.

## B. Additional information used during the review

Responses to questions during the review were received from Mr. Andrew Rakestraw (United States Of America Department of State), including additional material and the following documents[1] provided by the United States:

Erratum for the second biennial report of the United States of America.

United States Energy Information Administration. 2015. *Annual Energy Outlook 2015*. Washington, DC: DOE/EIA. Available at <http://www.eia.gov/forecasts/archive/aeo15/pdf/0383(2015).pdf>.

United States Environmental Protection Agency. 2013. *Methodologies for U.S. Greenhouse Gas Emissions Projections: Non-$CO_2$ and non-Energy $CO_2$ Sources.* Washington, DC: EPA. Available at <http://www.state.gov/documents/organization/219472.pdf>.

United States Environmental Protection Agency. 2014. *Global Mitigation of Non-$CO_2$ Greenhouse Gases: 2010–2030*. EPA-430-S-14-001. Washington, DC: EPA. Available at <https://www3.epa.gov/climatechange/Downloads/EPAactivities/MAC_Report_2013.pdf>.

The White House, Office of the Press Secretary. 2014. *United States Support for Global Efforts to Combat Carbon Pollution and Build Resilience.* Fact Sheet. Washington, DC: The White House. Available at <https://www.whitehouse.gov/the-press-office/2014/11/15/fact-sheet-united-states-support-global-efforts-combat-carbon-pollution->.

[1] Reproduced as received from the Party.