Ministre de l'Environnement et
du Changement climatique

Minister of Environment
and Climate Change

Ottawa, Canada K1A 0H3

MAY 2 4 2022

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Dear Mr. Saul and Ms. Simard:

As Minister of Environment and Climate Change, I am writing in response to your Environmental Petition No. 463 to the Commissioner of the Environment and Sustainable Development concerning forest carbon quantification and accounting. Environment and Climate Change Canada received your petition on January 24, 2022.

Environment and Climate Change Canada's mandate is to preserve and enhance the quality of the natural environment, including water, air, soil, flora and fauna; conserve Canada's renewable resources; conserve and protect Canada's water resources; forecast daily weather conditions and warnings, and provide detailed meteorological information to all of Canada; enforce rules relating to boundary waters; and co-ordinate environmental policies and programs for the federal government.

The Government of Canada is committed to continual improvement of forest carbon accounting and reporting. Due to the nature of your query and the issues raised in the petition, the enclosed response has been prepared jointly by Environment and Climate Change Canada and Natural Resources Canada. The latter has reviewed this response and concurs with its conclusions.

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I appreciate this opportunity to respond to your petition, and I trust that you will find this information helpful.

Sincerely,

The Honourable Steven Guilbeault, P.C., M.P. (il/lui/he/him)

Enclosure

c.c.: The Honourable Jonathan Wilkinson, P.C., M.P.
Mr. Jerry V. DeMarco, Commissioner of the Environment and Sustainable Development

Response to Environmental Petition 463 regarding forest carbon quantification and accounting

Question 1: Will you establish a process within the government, also involving independent experts, (i) to determine the changes required in the policy framework for forest carbon to address the entire set of concerns raised in our technical report cited above, and (ii) to adopt those changes before the end of 2022, in time for Canada's Fifth Biennial Report to the United Nations Framework Convention on Climate Change?

Response: The Government of Canada has processes and partnerships in place to collaborate with independent experts (non-governmental organization, universities, provinces and territories, and other government organizations) on forest carbon, and will continue to rely on these relationships in improving Canada's calculations and approach. This collaboration includes the following:

- partnering closely with provinces and territories on forest carbon-related developments, and data and evidence relevant to forest carbon;
- research collaborations with universities and non-governmental organizations (currently, the federal government has research projects with McMaster University, the World Wildlife Fund, Université Laval, University of British Columbia and the University of Michigan); and
- international collaborations with the United States Forest Service, American Forests, Michigan State University, the Northern Institute for Applied Climate Science, and the Joint Research Centre of the European Commission.

Canada's reports to the United Nations Framework Convention on Climate Change (UNFCCC) are subject to an international review process, co-ordinated by the UNFCCC Secretariat and conducted by international expert review teams. These detailed reviews include specific recommendations for Canada on how to improve its approach.

As per usual practice, a biennial report is based on projections from the preceding year. Hence Canada's Fifth Biennial Report on Climate Change to the UNFCCC will be based on projections from Canada's National Inventory Report (NIR) submitted on April 15, 2022. As such, no amendments will be made before the end of 2022.

Question 2: Will you commit to convening, in consultation with NRCan, an expert stakeholder group to provide independent, regular scrutiny of the forest carbon calculations undertaken for Canada's GHG inventory, and to recommend additional detail to be included in, and/or changes to, Canada's GHG inventory reporting?

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Response: As noted in the response to question 1, the Government of Canada sees value in facilitating regular consultation with recognized external experts in forest carbon cycling and quantification. The Government is always open to suggested improvements that are based in sound, peer-reviewed science. This includes those provided through ongoing dialogue with senior departmental officials such as the meetings they have been holding with your organization in recent months.

As described in the response to question 1, the federal government has processes and partnerships in place to collaborate externally and to seek independent, expert advice on forest carbon calculations. These collaborations focus on a variety of issues, including on additional data and evidence to be included in Canada's calculations. The Government of Canada will continue to rely on these and new partnerships, as well as UNFCCC reviews, to meet its objective for the continual improvement of forest carbon calculations and reporting.

The Government of Canada welcomes the opportunity to undertake targeted, scientific validation studies as resources allow. It is committed to continuously improving Canada's NIR approaches, including through the federal government's Improvement Plan for Forest and Harvested Wood Products Greenhouse Gas Estimates. In addition, scientists, researchers and experts can also contribute to improving inventory methods and data by entering into agreements to provide activity data, and by participating in the preparation of Intergovernmental Panel on Climate Change (IPCC) methodological reports.

Question 3: Do you agree that (i) Canada's 2021 GHG inventory does not comply with the managed land proxy, but that (ii) such compliance is, in contrast, a requirement of IPCC inventory guidelines? If not, please explain.

Response: Canada's greenhouse gas inventory complies with the IPCC inventory guidelines.

In the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, the IPCC provides guidance to countries on good practices for estimating greenhouse gas emissions and removals. These guidelines provide a framework for developing estimates based on a tiered approach where the default assumption is that all emissions and removals from managed land are "a proxy for anthropogenic effects" (i.e. they reflect changes caused by human activities).

Canada's approach for the Land Use, Land-Use Change and Forestry (LULUCF) reporting uses the managed land proxy. For forest reporting, Canada's approach employs more advanced country-specific methods (IPCC Tiers 2 and 3) to

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estimate forest carbon emissions from human and natural disturbances and carbon removals from the atmosphere that are the result of regrowth after disturbances.[1]

These more advanced methods employed by Canada include, for example, the disaggregation of emissions and removals into those occurring on lands affected by severe natural disturbances and those on the remaining managed forest. This change quantifies the annual emissions and removals associated with human activities and their changes, for example in response to increased harvest or reduced harvest following conservation measures. Without this disaggregation, the changes in emissions due to human activities are completely hidden within the interannual variability of emissions caused by wildfires. Wildfire emissions can be two orders of magnitude larger than the changes in emissions due to human activities. Having a clear understanding of direct human impacts can inform how this country develops approaches to reduce carbon emissions and increase the carbon sequestered by its forests.

The Government of Canada will continue to follow IPCC guidance, to adapt and to improve estimates of emissions.

Question 4: Do you agree that (i) some of the commercially mature post-fire stands whose carbon removals Canada's 2021 GHG inventory deems to be anthropogenic are not subject to fire suppression, and therefore that (ii) the regrowth of these trees involved no human decision-based actions either before or after the stands reached commercial maturity? If not, please explain.

Response: With regard to question 4(i) as to whether it is possible to find, within the managed forest boundaries, mature stands that have originated from fire and have not since experienced fire suppression, please note the following:

- In Canada, the area designated for wildfire suppression corresponds to the managed forest (i.e. it is referred to as the full suppression zone). However, some areas of commercially mature timber might not receive active fire suppression. For a given fire, decisions are made taking into consideration available suppression resources, land management objectives, and potential impacts to values-at-risk. In some cases, suppression efforts are not successful.

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[1] According to the IPCC: "A tier represents a level of methodological complexity. Usually three tiers are provided. Tier 1 is the basic method, Tier 2 intermediate and Tier 3 most demanding in terms of complexity and data requirements. Tiers 2 and 3 are sometimes referred to as higher tier methods and are generally considered to be more accurate."

- Forest stands subject to wildland fire have their emissions reported under natural disturbance. Post-fire carbon removals from the atmosphere are also reported under natural disturbances. Hence an accurate record of the history of forest stand disturbance is important for Canada's NIR.
- It is true that once forest stands are commercially mature, subsequent removals are reported as anthropogenic carbon.

Regarding question 4(ii), post-fire forest stands could have received other anthropogenic activities that constitute forest management. Please also note the following:

- Within the managed forest, all trees are subject to forest management to achieve timber and non-timber resource objectives, including wildlife habitat and recreation values. The process of forest stewardship planning is undertaken to evaluate the social, economic and environmental benefits and costs of various management options (including no management intervention) to achieve these objectives. Through the implementation of forest stewardship plans (i.e. plans that are approved by the forest regulator), the managed forest provides for the sustainable supply of multiple resource values, from timber to the conservation of ecological values in parks and protected areas.
- According to the IPCC, "…forest management is the process of planning and implementing practices for stewardship and use of the forest aimed at fulfilling relevant ecological, economic and social functions of the forest...a managed forest is a forest subject to forest management (IPCC, 2006).

The Government of Canada welcomes further discussion on this topic.

Question 5: Do you agree that (i) parts of the managed forest area used in Canada's 2021 GHG inventory have never been industrially logged, and (ii) the methodology used in Canada's 2021 GHG inventory to exclude stand-replacing wildfires would, if applied to an idealized primary (never-logged) forest as described above, determine it to be a carbon sink even though such a forest is neither source nor sink? If not, please explain.

Response: With respect to question 5(i), the Government of Canada agrees that part of the managed forest area used in Canada's greenhouse gas inventory may never have been industrially logged. As stated above, the definition of "managed forest" does not imply that stands have been previously logged. Regions that have never been logged include parks or protected areas set aside for ecological conservation, cultural values, or public enjoyment.

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Regarding statements in question 5(ii), Canada has not conducted NIR analysis of such a scenario. Greenhouse gas removals and emissions are tracked separately for anthropogenic and natural disturbances, and both are reported via Canada's NIR.

Question 6: Do you agree that if the managed forest area used in Canada's 2021 GHG inventory had been shrunk to exclude the parts that have never been industrially logged, the inventory's reported net emissions from forest land and associated wood products would have been higher? If not, please explain.

Response: The Government of Canada does not agree with the proposed definition of "managed forest." All managed forest lands are subject to forest stewardship. This includes wildfire suppression, insect and disease management, and the conservation of forests for ecological biodiversity as well as social, cultural and economic uses. Forest management is not limited to industrial logging.

Canada's forest-related greenhouse gas inventory quantifies the impact of human land use and management on trends in emissions and removals. Therefore, all managed forest lands are included in the greenhouse gas inventory and, as noted above, this includes areas that have never been logged.

The Government of Canada's interpretation of managed forest is consistent with the IPCC's definition. Canada's approach is similar to other developed countries with similar natural and anthropogenic disturbance regimes such as Australia.

Question 7: Apart from the argument based on stand ages made in *Can. J. For. Res.* 48: 1227–1240 (2018), please provide any other reasoning that you believe supports the notion that the methodology used in Canada's 2021 GHG inventory to exclude stand-replacing wildfires achieves balance between disaggregated emissions and disaggregated subsequent removals, as required by the 2019 IPCC guidelines (see IPCC text cited above).

Response: Canada agrees that the IPCC requires that emissions and removals balance out over time.

For Canada and for other countries experiencing an increase in natural disturbances, emissions and removals are unlikely to balance out in the short term. The bulk of wildfire emissions, for example, happen within a given year, yet regeneration and the growth of burnt forest stands and their associated removals occur and are tracked in Canada's NIR over decades. Hence, the Government of Canada's NIR methodology conforms to the IPCC guidelines and uses the best

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available historic, current and highest resolution data available in the country. The federal government is committed to continuously improving Canada's approaches, including through the Improvement Plan for Forest and Harvested Wood Products Greenhouse Gas Estimates.

Question 8: Do you agree that there is no international agreement or requirement that Canada use reference level accounting for forest carbon for purposes of meeting its 2030 GHG target under the Paris Agreement, and that Canada would be free to use standard "net-net" accounting instead, if it so chose? If not, please explain.

Response: Under the Paris Agreement, countries can apply specific forest carbon accounting approaches as long as they are consistent with the rules of this agreement and are reported in a transparent manner. Reference level accounting is one of several approaches used by countries for forest carbon accounting that is consistent with the Paris Agreement.

In the 2021 update to Canada's Nationally Determined Contribution (NDC), the Government of Canada re-affirmed its intent to use the reference level approach for forest land and the harvested wood products obtained from it. Nonetheless, the Government is committed to continuously improving its approaches to accounting and reporting.

Natural Resources Canada and Environment and Climate Change Canada periodically assess alternatives, including the net-net approach. However, moving from the application of one approach to another takes years. The European Union, for example, recently announced its intent to transition from using a reference level approach to a net-net approach, and it expects this to transpire over the next five or more years. Such a transition requires a principled approach, robust quantitative analysis and modelling, consideration for one's NDC, and the engagement of contributors and stakeholders.

Question 9: Do you agree that for forest carbon, (i) even in the absence of any new policies affecting forests, the reference level approach is currently projected to make a bigger contribution to meeting Canada's 2030 GHG target than the net-net approach, and (ii) under the same assumptions, the reference level approach would result in the government considering Canada's 2030 GHG target to be achieved, even while actual national GHG emissions are reduced by LESS than 40–45% during 2005–2030? If not, please explain.

Response: Canada has not completed a comprehensive assessment of applying the net-net approach. While implementing a simple net-net approach could be relatively easy, there are a variety of net-net options that need to be considered

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and analyzed, including in consultation with partners like provinces and territories. Current analysis is under way and the Government of Canada continuously monitors developments in this area.

Emissions and removals in any sector, including forests, reflect many factors, and can change even in the absence of new climate policies. The COVID-19 pandemic provided an example of this, where the decrease in economic activity in many parts of the world over 2020 and 2021 has led in some cases to decreases in emissions.

Assessing progress toward Canada's 2030 greenhouse gas emission reduction target is not sector specific; rather, it is economy-wide and covers all sectors and gases. The Government of Canada will consider the 2030 target to be achieved if the national total net emissions that year, including the contribution of LULUCF, is 40 to 45 percent below the country's 2005 emissions.

Question 10: Do you agree that if Canada switched to net-net accounting for "forest land remaining forest land and associated harvested wood products", this sector would, according to your current projections, still make a positive contribution to meeting Canada's target – i.e., a reduction in net emissions or increase in net removals during 2005–2030 – even in the absence of any new policies affecting forests? If not, please explain.

Response: Yes, if Canada switched to simple net-net accounting for managed forests and harvested wood products (comparing 2030 emissions to 2005 emissions to determine the accounting contribution), the sector would still make a positive contribution to meeting the country's 2030 target. This is because the harvest level in Canada in the last decade, and as projected over the next decade, is well below the harvest level through most of the 1990s and up to 2005. However, methodological revisions to historical emissions and removals in the forest sector could result in significant changes to the LULUCF accounting contribution over time, especially if a net-net approach is used.

The Government of Canada is committed to continuous improvement in forest carbon accounting and reporting, as data and scientific understanding allows. It is continually monitoring developments in this area as part of its ongoing engagement with other countries under the UNFCCC and other channels of co-operation on climate change.

Question 11: Will you make a commitment to initiate the regulatory process required for mandatory corporate-level reporting of biological forest carbon flows, including all emissions/removals on forest land as well as emissions from all wood products?

Response: The Government of Canada has a program for reporting, namely the Greenhouse Gas Reporting Program, which focuses on collecting information on greenhouse gases that are generated and directly released to the atmosphere from on-site activities at individual facilities (i.e. point sources). The types of large greenhouse gas-emitting operations covered include facilities engaged in pulp and paper and wood product manufacturing if they meet the emissions reporting criteria. Activities within the forest industry such as individual harvesting and logging operations are outside the scope of this program.

Tracking and reporting of biological forest carbon flows is a complex science, requiring significant technical capacity to capture land-use and land-use changes over time and across geographical areas. Given there is facility-level reporting currently in place via the Greenhouse Gas Reporting Program, and Canada's NIR provides estimates of greenhouse gases related to forestry and harvested wood product uses, there are presently no plans to initiate mandatory corporate-level reporting of biological forest carbon flows.

The Government of Canada is committed to continuously improving Canada's NIR methodologies, including through the Improvement Plan for Forest and Harvested Wood Products Greenhouse Gas Estimates.

Question 12: Please provide all reasons why you believe forest (biological) carbon should continue to be exempted from mandatory carbon pricing.

Response: The federal carbon pricing system follows the convention applied in Canada's National Greenhouse Gas Inventory Report where carbon dioxide emissions from the combustion of biomass as a fuel are part of the carbon balance captured in LULUCF emissions and not accounted for as industrial sources of emissions.

The federal greenhouse gas offset system is being designed to complement the Output Based Pricing System (OBPS). The federal greenhouse gas offset system will generate credits that can be used by covered OBPS facilities to compensate for excess emissions, and create an incentive for activities not covered by regulations or carbon pollution pricing that reduce emissions or increase carbon sequestration, particularly in the agriculture, waste and forestry sectors. All offset credits issued will represent permanent, incremental, and real greenhouse gas reductions or removals.

Question 13: Please provide an approximate estimate, including full details of how it has been calculated, of the annual emissions resulting from the creation of logging scars and other narrow/small instances of long-term forest cover loss that are currently omitted from Canada's GHG inventory.

Response: Canada's NIR includes all emissions associated with commercial timber harvest, but uncertainties exist in the estimates of post-harvest regeneration and regrowth on "logging scars."

In order to improve those estimates, the Government of Canada would need better data. For example, calculating regeneration delays and rates of regrowth on logging scars would require very high resolution data, with capacity to identify disturbances less than three metres wide (i.e. seismic lines) or 10 meters wide (i.e. logging scars) over the full extent of Canada's managed forest (which covers an area of 226 million hectares).

Natural Resources Canada and Environment and Climate Change Canada have a multi-year improvement plan for carbon accounting and modeling. As described below in the response to question 14, decisions on which improvements to implement depend on many factors such as data availability, but also data interpretation (e.g., interpretation of satellite imagery through field work) or the capacity to compute large amounts of data. In this case, the Government of Canada has identified "logging scars" as an area for future improvement, as resources and data allow, although there are other improvements that may be more consequential for improving the accuracy of Canada's estimates. These include, for example, reconciling differences in estimates from remote sensing and forest inventories.

Question 14: If you have provided an estimate in response to request 13, please explain, with reference to this estimate, the priority you assign to remedying this omission from the GHG inventory relative to other planned improvements to the inventory. If you have not provided an estimate in response to request 13, please explain how you have arrived at the decision not to prioritize remedying this omission.

Response: Natural Resources Canada and Environment and Climate Change Canada oversee the development and implementation of an annual greenhouse gas improvement plan (specific to forest-related greenhouse gases). This plan lays out the work for the next three annual greenhouse gas NIRs.

Key criteria for prioritizing forest-related greenhouse gas improvements in the NIR include the following:

- the magnitude of the uncertainty,
- the resources required to improve the estimate,
- the availability of data to improve the estimates, and
- the current scientific understanding to support the improvement.

Chapter 8 of the NIR currently includes a list of planned improvements to the inventory, including improvements related to forestry estimates. The Government of Canada will be enhancing Chapter 8 to further clarify improvements and ensure additional details of the forest-related Improvement plan are published. Henceforth, Environment and Climate Change Canada and Natural Resources Canada will also publish their greenhouse gas improvement plan annually.

The Government of Canada welcomes further discussion on this topic.