



Lost in the Woods:

Canada's Hidden Logging Emissions Are Equivalent to Those from Oil Sands Operations

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INTRODUCTION: CANADA'S HIGH-EMISSIONS LOGGING SECTOR

A glaring omission in Canada's climate policy is undermining the rigour and integrity of the government's climate commitments, leaving unaddressed the net greenhouse gas (GHG) emissions from one of the country's highest-emitting sectors: the logging industry. A new analysis of government data conducted by Nature Canada and the Natural Resources Defense Council (NRDC)¹ shows that the logging industry is one of Canada's major GHG emitters, with a footprint that's equal to more than 10 percent of Canada's overall emissions. This figure, which is a conservative estimate, places the logging sector's GHG emissions on par with oil sands production² and higher than emissions from electricity generation.³ However, Canada does not clearly report the logging sector's emissions. Instead, logging emissions can only be calculated through a complex process of piecing together official data dispersed across various government sources (some of which are available only upon request). In addition, unlike its approach to all other high-emitting sectors, the Government of Canada has not articulated a clear strategy to reduce this sector's emissions, effectively exempting the logging industry from its keystone climate policies.

The exclusion of this high-emitting sector jeopardizes Canada's climate ambition. The government's achievement of its commitment to reduce Canada's emissions to 40 to 45 percent below 2005 levels by 2030 depends on a full and accurate accounting of — and effective actions to reduce — emissions from all sectors of the economy. The lack of recognition of the logging sector's significant emissions also leads to a fundamentally flawed basis for forest sector policy decisions, including forest carbon regulation, perpetuating policy decisions grounded in the myth of logging's carbon neutrality and exempting the industry from accountability.

Canada's climate leadership depends on a comprehensive accounting and mitigation of impacts across all sectors. The atmosphere does not distinguish between emissions from logging and those from fossil fuels and, by the government's own numbers, the logging industry ranks among Canada's greatest climate liabilities. Canada should transparently and accurately report logging emissions, addressing them alongside emissions from all other high-emitting sectors in its 2030 Emissions Reduction Plan (ERP) and other policies.

This report outlines the key findings from the new Nature Canada and NRDC technical report, and proposes key policy recommendations for the Government of Canada to address the high level of GHG emissions from the logging sector. These recommendations include: 1.) Transparently report the logging industry's emissions; 2.) Develop a strategy for reducing these emissions; 3.) Directly regulate the sector's emissions; and 4.) Address biases, flaws, and omissions in Canada's logging emissions accounting.



Boreal forest in Ontario
Credit: River Jordan for NRDC

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LOGGING EMISSIONS RIVAL THOSE FROM OIL SANDS PRODUCTION

International scientists, including the Intergovernmental Panel on Climate Change (IPCC), have increasingly sounded the alarm about the devastating climate ramifications of continuing to destroy primary forests (forests that have never been industrially disturbed).⁴ Logging of primary forests, which have unique climate value, incurs a carbon debt that persists for centuries, long past the timeframe for averting catastrophic climate impacts.⁵

Each year, the logging industry clearcuts more than 550,000 hectares of forest across Canada,⁶ equivalent to more than six NHL hockey rinks every minute, much of this in primary forest areas.⁷ Over decades, industrial logging has reduced the average age of Canada's forests⁸ and eroded primary forest areas,⁹ decreasing the overall carbon Canada's forests store¹⁰— with the atmosphere seeing the difference.



Clearcut in Ontario
Credit: River Jordan for NRDC

Despite having some of the most carbon-dense and expansive primary forests in the world,¹¹ as well as one of the largest logging industries, Canada is failing to transparently report the net GHG emissions from its net logging emissions. Within its annual GHG reporting to the United Nations and its 2030 ERP,¹² Canada discloses its net emissions from all other high-emitting sectors, but does not report any such figure for industrial logging.

However, as outlined in a new technical analysis,¹³ the government's own underlying data, when pieced together, generates a clear picture of the true scope of the logging industry's climate impact—one that identifies the logging sector as one of Canada's major GHG emitters.

While the numbers to determine the sector's impact are contained in government materials, piecing them together to calculate logging's net annual emissions is exceedingly and unnecessarily complex. The data are scattered across an expansive array of materials, with some only available upon request. In addition, the government uses confusing, misleading, and inconsistent terminology, making the process of calculating net emissions even more challenging.

To represent net GHG emissions from logging, the technical analysis calculates three components that, together, feed into the final number: First, it compiles the total amount of forest carbon that is emitted or taken out of the forest upon logging. Second, from that figure, it subtracts the net carbon that is not immediately released to the atmosphere because it is stored in long-lived wood products. Third, it subtracts forest carbon removals (i.e. the carbon the forest removes from the atmosphere) as the forest regrows.¹⁴

According to the above calculations, using the government’s own data, Canada’s logging industry is a high-emitting sector. In 2020, the logging sector emitted 75 megatonnes of carbon dioxide equivalent (Mt CO₂e), which is equal to more than 10 percent of Canada’s total GHG emissions (see Figure 1).¹⁵ In fact, net logging emissions in Canada were higher than emissions from oil sands operations in every year from 2005 to 2018 (the average annual net emissions of logging were 82 Mt CO₂e between 2015 and 2020, while the average annual emissions of oil sands production were 78 Mt CO₂e over that same period — see Figure 2).

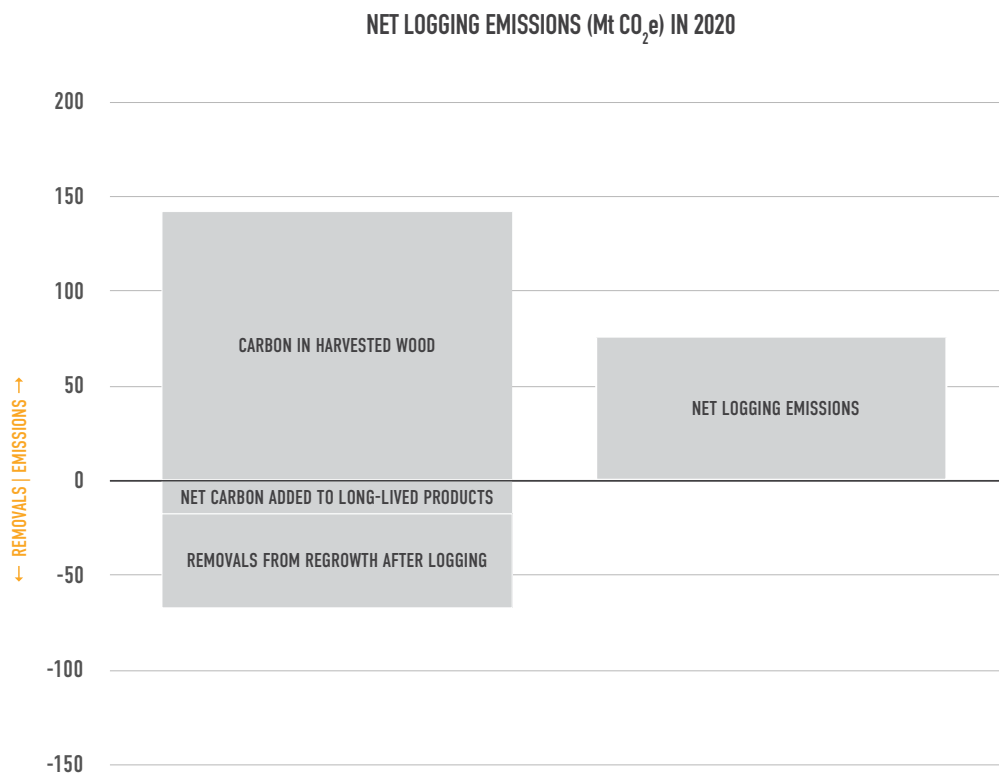


Figure 1: Canada’s 2020 net logging emissions. The left column depicts emissions and removals associated with logging (emissions are positive, removals are negative). The right column depicts the net (sum of) emissions and removals in the left column, showing logging as a large net source of emissions in 2020.

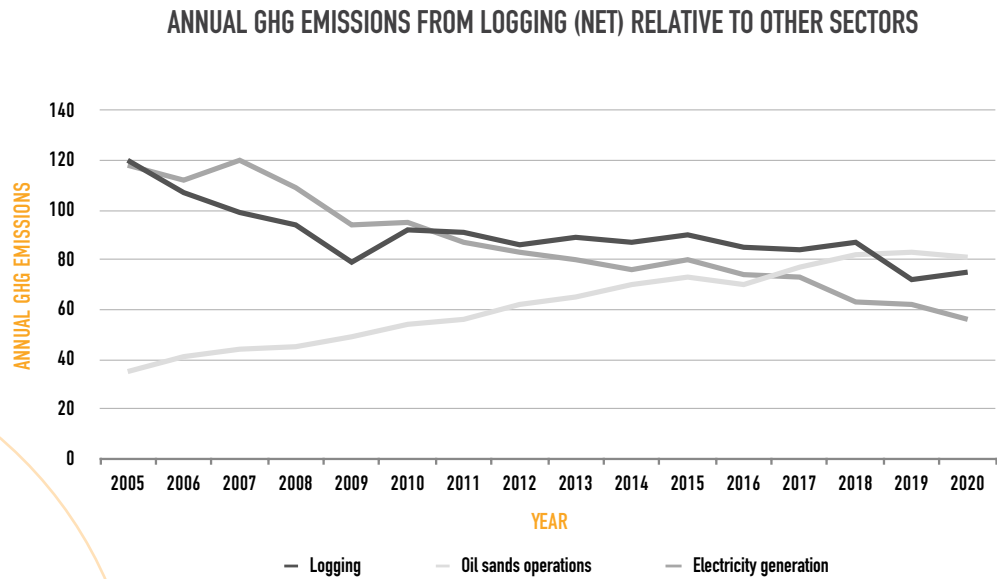


Figure 2: A comparison of Canada’s net logging emissions (black line) with emissions from oil sands operations (light grey) and electricity generation (dark grey) from 2005 to 2020.

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BIASES AND GAPS IN THE GOVERNMENT’S ACCOUNTING OBSCURE AND DOWNPLAY EMISSIONS

Instead of clearly reporting the logging industry’s net emissions as a stand-alone figure, the Government of Canada provides calculations for forest-wide carbon emissions, which it refers to as “combined net flux from Forest Land and Harvested Wood Products.”¹⁶ This number includes forest GHG emissions and removals (i.e. carbon removed from the atmosphere) from never-before-logged forest areas that are entirely independent from the logging sector’s impact.

In calculating these forest-wide emissions, the government takes an inconsistent approach to how it integrates the GHG emissions and removals from wildfires and subsequent regrowth on non-logged forest land, which further obscures the logging industry’s emissions impact. The result is a large, artificial carbon sink that, when

combined with the logging industry's emissions to generate a forest-wide emissions calculation, effectively buries the industry's impact. As a result, Canada can report its "combined net flux" as roughly carbon neutral, with the logging industry's emissions a hidden subset of that figure.¹⁷

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TRUE LOGGING EMISSIONS ARE LIKELY UNDERESTIMATED

When assembled, the government's data paints a clear picture of the logging industry's climate footprint, which should be addressed in the government's climate strategy. However, it should be noted that the net logging emissions, as calculated above, likely understate the industry's full climate impact. Government data omit a number of factors essential to a comprehensive emissions profile. For example, the calculations above are based on logging data from provinces and territories, which recent whistleblower testimony has called into question.¹⁸ The government's inventory also excludes key forest and logging dynamics essential to a comprehensive emissions calculation. For example, the government does not include the carbon impact of "logging scars," areas where the forest remains essentially barren even 20 to 30 years following logging.¹⁹ It also does not include non-CO₂ GHG emissions from logging, such as methane.²⁰



Logging scars from a clearcut from 1989, with scars covering approximately 13% of the clearcut area.
Credit: © Google Earth, with original site documentation from Trevor Hesselink, Wildlands League

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POLICY RECOMMENDATIONS: ACCURATELY REPORT LOGGING EMISSIONS AND ACT TO REDUCE THEM

Canada's failure to transparently and accurately report the logging sector's net GHG emissions has perpetuated inaccurate claims about logging's carbon neutrality, undermined the integrity of the government's 2030 Emissions Reduction Plan (ERP), and spurred broader policy choices that unjustifiably approach logging's climate impact as fundamentally different from that of the fossil fuel industry. The erasure of logging's climate impact has also obscured the opportunities for Canada to advance its 2030 climate goals with regulations that incentivize emissions reductions through forest protection and more sustainable logging practices.

The following policy recommendations would help the Government of Canada to align its reporting and regulation of emissions from the logging industry with its stated climate goals:

1. TRANSPARENTLY REPORT THE LOGGING INDUSTRY'S NET ANNUAL GHG EMISSIONS

Canada should transparently report in its annual inventory the net annual emissions from the logging industry, as it does for all other high-emissions sectors.

2. DEVELOP A STRATEGY TO REDUCE THE LOGGING INDUSTRY'S EMISSIONS IN ALIGNMENT WITH THE GOVERNMENT'S BROADER EMISSIONS REDUCTION COMMITMENTS

Canada should develop a strategy for reducing emissions from the logging industry, as it has done for all other high-emitting industries. This entails accurately representing the logging sector in its ERP, ensuring that these emissions, like those from all other high-emitting sectors, are addressed in Canada's strategy to lower its emissions to 40-45 percent below 2005 levels by 2030. Doing so will not only ensure that Canada is truly achieving its stated goal, but will hold the logging industry to the same standard as all other sectors. It will also help to incentivize companies to adopt climate-friendlier logging practices, creating opportunities for Canada to lead globally as a source for more sustainable forest products, and will more accurately value primary forest protection (including through Indigenous Protected and Conserved Areas) within Canada's policy frameworks.

3. PURSUE LOGGING INDUSTRY EMISSIONS REDUCTIONS THROUGH DIRECT REGULATION OF THE SECTOR

Canada's strategy to address the climate impact from industrial logging should encompass direct regulation of its emissions, including the pricing of emissions from the burning of biomass under the Output-Based Pricing System (OBPS). This would align the biomass sector with Canada's approach to all other energy sources. The current exclusion of wood combustion from the OBPS effectively functions as an industry subsidy, allowing the biomass sector,²¹ which produces plants and plant by-products to be burned for energy, to externalize the climate cost of its operations.

The prioritization of direct regulation would also entail a reexamination by the federal government of its regime for forest-based carbon offsets under the Greenhouse Gas Offset Credit System. Given that the logging industry is itself a significant contributor to Canada's emissions, avoided logging operations or removals from tree planting following logging should not be offered up as credits to "cancel out" emissions from other industries, but rather should be treated as part of the overall emissions footprint Canada needs to reduce. In other words, just as the high-emitting oil and gas industry is not allowed to claim credits from leaving oil and gas reserves unexploited, the high-emitting logging industry should not be allowed to claim credits from unexploited or replanted forests.

4. FIX BIASES, OMISSIONS, AND OTHER FLAWS IN FOREST CARBON ACCOUNTING

In reporting the logging industry's emissions, Canada should align its accounting practices with IPCC guidelines, correcting the bias in how it accounts for natural disturbances in its current "combined net-flux" figure. Canada should also address other gaps in its forest carbon accounting to improve the accuracy of its reported annual logging emissions, for example by including the carbon impact of logging scars, integrating methane and other non-CO₂ GHGs, and ensuring the accuracy of logging rates reported by provinces.

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CONCLUSION

The obfuscation of the carbon impact from industrial logging doesn't change the industry's climate cost—it simply places it on other sectors, the public, and the global community. It also stymies meaningful solutions to achieving a climate-safe future. Acknowledging and regulating logging emissions will create new emissions reduction pathways and build in the proper incentives for mitigating climate impacts and driving economic innovation. In recognizing the true climate cost of business-as-usual logging, Canada will not only fill a critical gap in its climate plan, but also open up opportunities for climate mitigation and more sustainable economies—creating critical new pathways for Canada to lead.

ENDNOTES

- 1 Matthew J. Bramley and Graham Saul, *What Are the Net Greenhouse Gas Emissions from Logging in Canada?* October 2022, <http://naturecanada.ca/report/what-are-net-ghg-emissions-from-logging-in-canada>.
- 2 Oil sands production emissions include “Stationary combustion, onsite transportation, electricity and steam production, fugitive and process emissions from: ... crude bitumen mining and extraction; ... in-situ extraction of crude bitumen including primary extraction, cyclic steam stimulation (CSS), steam-assisted gravity drainage (SAGD) and other experimental techniques; [and...] crude bitumen and heavy oil upgrading to synthetic crude oil.” Environment and Climate Change Canada, *National Inventory Report 1990–2020: Greenhouse Gas Sources and Sinks in Canada*, 2022, part 3, Table A10–1, <https://unfccc.int/documents/461919>.
- 3 Electricity emissions include “Combustion and process emissions from utility electricity generation, steam production (for sale) and transmission” but exclude “utility owned cogeneration at industrial sites.” Environment and Climate Change Canada, *National Inventory Report 1990–2020*, part 3, Table A10–1, <https://unfccc.int/documents/461919>.
- 4 See D.A. DellaSala et al. “Primary forests are undervalued in the climate emergency.” *Bioscience* 70, no. 6, 2020, <https://academic.oup.com/bioscience/article/70/6/445/5828585>; S. Luyssaert et al. “Old-growth forests as global carbon sinks,” *Nature*, 455(7210), 213–215, 2008. <https://doi.org/10.1038/nature07276>; “Letter from Scientists to Prime Minister Justin Trudeau Regarding the Protection of Canada’s Primary Forests,” March 2022, https://www.nrdc.org/sites/default/files/media-uploads/primary_forest_scientist_letter-final.pdf; Intergovernmental Panel on Climate Change (IPCC) Working Group 3, *Climate Change 2022: Mitigation of Climate Change*, https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Full_Report.pdf.
- 5 Jay Malcolm et al, “Forest Harvesting and the Carbon Debt in East-Central Canada,” *Climatic Change*, 161 (2020), 433–449, <https://link.springer.com/article/10.1007/s10584-020-02711-8>.
- 6 National Forestry Database (Canada), “Forest Area Harvested on Private and Crown Lands,” <http://nfdp.ccfm.org/en/data/harvest.php>, accessed September 21, 2022.
- 7 Maxence Martin et al., “Compared to Wildfire, Management Practices Reduced Old-Growth Forest Diversity and Functionality in Primary Boreal Landscapes of Eastern Canada,” *Frontiers in Forests and Global Change*, March 2021, <https://www.frontiersin.org/articles/10.3389/ffgc.2021.639397/full>; K. Price et al., “Conflicting Portrayals of Remaining Old Growth: The British Columbia Case,” *Canadian Journal of Forest Research*, 2021, <https://cdnsciencepub.com/doi/full/10.1139/cjfr-2020-0453>.
- 8 Dominic Cyr et al., “Forest Management Is Driving the Eastern North American Boreal Forest Outside Its Natural Range of Variability,” *Frontiers in Ecology and the Environment* 7, no. 10, December 2009, <https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/080088>.
- 9 Ibid.; Martin et al., “Compared to Wildfire, Management Practices Reduced Old-Growth Forest Diversity and Functionality in Primary Boreal Landscapes of Eastern Canada.”
- 10 W.A. Kurz et al., “Carbon in Canada’s boreal forest — A synthesis”, *Environmental Review*, 21, 2013 <https://cdnsciencepub.com/doi/full/10.1139/er-2013-0041>.
- 11 C.F. Kormos et al., “Primary Forests: Definition, Status and Future Prospects for Global Conservation,” in Dominick A. DellaSala, and Michael I. Goldstein (eds.), *The Encyclopedia of the Anthropocene*, vol. 2, p. 31–41, 2018, Oxford: Elsevier; Peter Lee, “The Boreal Forest: Trouble in Canada’s Great Wilderness,” in *State of the Wild 2010–2011: A Global Portrait*, Eva Fearn, ed., 2010, Washington, DC: Island Press; Ross W. Gorte, *Carbon Sequestration in Forests*, Congressional Research Service, 2009, <https://fas.org/sgp/crs/misc/RL31432.pdf>; Matt Carlson, Jeff Wells, and Dina Roberts, *The Carbon the World Forgot*, Boreal Songbird Initiative and Canadian Boreal Initiative, 2009, <https://www.borealbirds.org/sites/default/files/pubs/report-full.pdf>.
- 12 Government of Canada, *2030 Emissions Reduction Plan: Clean Air, Strong Economy*, 2022, <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030-plan.html>.
- 13 Bramley and Saul, *What Are the Net Greenhouse Gas Emissions from Logging in Canada?*

- 14 The calculations do not include the emissions from the logging industry's use of fossil fuels in the transportation and production of forest products. Our calculation of logging emissions only includes those from on-the-ground forest industry practices.
- 15 In 2020, logging extracted 142 megatonnes of CO₂ equivalents (Mt CO₂e) from Canada's forests. The net emissions are therefore 142 Mt CO₂e minus the amount of net carbon that was added to long-lived wood products and therefore not released to the atmosphere (18 Mt CO₂e), minus the removals from the regrowing forest (49 Mt CO₂e). This leaves 75 Mt CO₂e of net emissions.
- 16 Environment and Climate Change Canada, *National Inventory Report 1990–2020: Greenhouse Gas Sources and Sinks in Canada*, 2022, part 1, p. 11, 170, <https://unfccc.int/documents/461919>.
- 17 It is important to note that how the government decides to account for natural disturbances in its “combined net flux” does not actually have any bearing on the calculations for the emissions from industrial logging. The biased approach to accounting for natural disturbances further obscures the logging industry's emissions, generating an artificial sink that, when combined with these emissions, “covers them up,” but does not affect the underlying logging emissions numbers themselves.
- 18 Martin Movilla, “Le ministère des Forêts du Québec est-il à la solde de l'industrie?” *Radio-Canada*, March 4, 2021, accessed September 27, 2021, <https://ici.radio-canada.ca/nouvelle/1774723/foresterie-mesurage-terres-publiques-complaisance-gouvernement>.
- 19 Trevor Hesselink, *Boreal Logging Scars: An Extensive and Persistent Logging Footprint in Typical Clearcuts of Northwestern Ontario, Canada*, Wildlands League, December 2019, <https://loggingscars.wpengine.com/wp-content/uploads/MyUploads/LOGGING-SCARS-PROJECT-REPORT-FINAL-Dec2019-Summary-LR.pdf>.
- 20 J. Vantellingen and S.C. Thomas. “Skid trail effects on soil methane and carbon dioxide flux in a selection managed northern hardwood forest,” *Ecosystems*, 24, 1402-1421, 2021, <https://doi.org/10.1007/s10021-020-00591-8>; J. Vantellingen and S.C. Thomas, S.C. “Log Landings Are Methane Emission Hotspots in Managed Forests,” *Canadian Journal of Forest Research*, 51, 1916-1925, 2021, <https://doi.org/10.1139/cjfr-2021-0109>.
- 21 Biomass may be a beneficial or necessary fossil fuel substitute in select contexts, such as for remote communities dependent on diesel power. However, its primary destination, for international export and large-scale commercial use, is incompatible with clean energy pathways under the Paris Agreement.