Independent limited assurance report on selected subject matter areas presented within the Canadian National Railway Company's 2020 Greenhouse Gas Emissions Report

Prepared in accordance with:

International Standard on International Standard on Assurance Engagements 3410, Assurance Engagements on Greenhouse Gas Statements ('ISAE 3410')

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SECTION I: Independent practitioner's limited assurance report on the Canadian National Railway Company's 2020 Greenhouse Gas Emissions Report

To the Board of Directors and Management of Canadian National Railway Company

We have undertaken a limited assurance engagement of the following selected subject matter areas (the "subject matter"), presented in the accompanying Canadian National Railway Company's Greenhouse Gas Emissions Report, for the year ended December 31, 2020.

Scope and subject matter

Our limited assurance engagement was performed on the following indicators for the year ended December 31, 2020:

Indicator	Unit	2020 Values	Mathematical Accuracy of the Variance 2020 vs 2019
Scope 1 emissions from diesel (locomotive) fuel consumption	Tonnes of CO_2e	4,475,588	-9.8%
Scope 2 emissions from electricity	Tonnes of CO_2e	163,363	-0.8%
Scope 3 emissions from diesel (locomotive) fuel production	Tonnes of CO_2e	1,416,350	-12.0%
Scope 3 emissions from purchased goods & services	Tonnes of CO_2e	230,783	-40.0%
Scope 3 emissions from capital goods	Tonnes of CO_2e	409,966	-8.1%
Scope 3 emissions from upstream transportation and distribution	Tonnes of CO_2e	52,251	-7.3%
Energy consumption from diesel (locomotive) fuel consumption	Megawatts	16,317,548	N/A
Energy consumption from electricity	Megawatts	557,151	N/A

We were not engaged to report on comparative figures for the prior years and we were not engaged to report on trends, variances and any other additional information not specifically mentioned in the table above.

The organizational boundaries and the applicable criteria for the determination of these metrics have been disclosed in the 2020 Greenhouse Gas Emissions Report, included in Section II.

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Management's responsibility

Management is responsible for the preparation of the subject matter following the methodology outlined in the *Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) and the GHG Protocol Scope 3 Guidance* (the "criteria"), applied as explained in the Candian National Railway Company's 2020 Greenhouse Gas Emissions Report, included in Section II. Management is also responsible for such internal control as management determines necessary to enable the preparation of the subject matter that is free from material misstatement.

Inherent Uncertainty

Non-financial data is subject to more inherent limitations than financial data, given both the nature and the methods used for determining, calculating, sampling or estimating such data. Qualitative interpretations of relevance, materiality and the accuracy of data are subject to individual assumptions and judgments.

Greenhouse Gas quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases.

Our responsibility

Our responsibility is to express limited assurance conclusion on the subject matter based on the evidence we have obtained. We conducted our limited assurance engagement in accordance with the International Standards on Assurance Engagements 3410, *Assurance Engagements on Greenhouse Gas Statements ("ISAE 3410")*, issued by the International Auditing and Assurance Standards Board. This standard requires us to conclude whether anything has come to our attention that causes us to believe that the 2020 Greenhouse Gas Emissions Report is not fairly prepared, in all material respects.

A limited assurance engagement involves performing procedures (primarily consisting of making inquiries of management and others within the entity, as appropriate, and applying analytical procedures) and evaluating the evidence obtained. The procedures are selected based on our professional judgment, which includes identifying areas where the risks of material misstatement in preparing the selected subject matter in accordance with the criteria are likely to arise.

The extent of our procedures included but was not limited to inquiries, observation of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records. Given the circumstances of the engagement, in performing the procedures listed above we:

- Through inquiries, obtained an understanding of Canadian National Railway Company's control environment and information systems relevant to GHG emissions quantification and reporting;
- Analytical reviews and trend analysis of reported data for selected key performance measures;
- Evaluated whether Canadian National Railway Company's methods for developing estimates are appropriate and had been consistently applied. However, our procedures did not include testing the data on which the estimates are based or separately developing our own estimates against which to evaluate Canadian National Railway Company's estimates;

- Reconciled the data back to underlying records for a limited sample of items for the selected subject matter;
- Checked the mathematical accuracy of the calculation related to the GHG emission variations on the comparative periods January 1, 2019 to December 31, 2019. This did not imply any assurance procedures on GHG emissions for the periods January 1, 2019 to December 31, 2019; and
- Reviewed the selected subject matter disclosure in the appendices to ensure consistency with the evidence obtained.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for a reasonable assurance engagement and, consequently, the level of assurance obtained is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

Our independence and quality control

We have complied with the relevant rules of professional conduct/code of ethics applicable to the practice of public accounting and related to assurance engagements, issued by various professional accounting bodies, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

The firm applies Canadian Standard on Quality Control 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements* and, accordingly, maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that Canadian National Railway Company's selected subject matter prepared in accordance with the criteria for the year ended December 31, 2020, is not fairly stated, in all material respects.

Purpose of statement and restriction on distribution and use of our report

This report has been prepared for the Board of Directors and Management of Canadian National Railway Company to assist Management in reporting on the Company's performance and activities. As a result, the selected subject matter may not be suitable for another purpose. Our report is intended solely for the use of Canadian National Railway Company. We neither assume nor accept any responsibility or liability to any third party in respect of this report.

PricewaterhouseCoopers LLP[1]

Partnership of Chartered Professional Accountants

Montréal (Québec)

June 30, 2021

[1]CPA auditor, CA, permit no T146079

SECTION II: GREENHOUSE GAS (GHG) EMISSIONS REPORT

2020 Greenhouse Gas Emissions Report

Introduction

This 2020 Greenhouse Gas (GHG) emissions report was prepared following the methodology outlined in the Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard (Revised Edition) and the GHG Protocol Scope 3 Guidance, and has been used to report CN's GHG emissions to the CDP and other corporate disclosures.

Using an operational control approach, Canadian National Railway Company (hereafter 'CN') has determined its GHG emissions and energy consumption for the calendar year ended December 31, 2020 as outlined in the following table:

GHG inventory - January 1, 2020 to December 31, 2020			
Scope	**GHG sources**	**GHG (tCO2e)**	**Energy (MWh)**
Scope 1	Diesel (locomotive) fuel consumption	4,475,588	16,317,548
Scope 2	Electricity	163,363	557,151
Scope 3	Diesel (locomotive) fuel production	1,416,350	
Scope 3	Purchased goods & services	230,783	
Scope 3	Capital goods	409,966	
Scope 3	Upstream transportation & distribution	52,251	

In addition, CN calculated the following year over year changes in emissions:

GHG inventory - Year over year changes				
Scope	**GHG Sources**	**2020**	**Change vs previous year**	**2019**
		GHG (tCO2e)		**GHG (tCO2e)**
Scope 1	Diesel (locomotive) fuel consumption	4,475,588	-9.8%	4,962,923
Scope 2	Electricity	163,363	-0.8%	164,641
Scope 3	Diesel (locomotive) fuel production	1,416,350	-12.0%	1,609,712
Scope 3	Purchased goods & services	230,783	-40.0%	384,934
Scope 3	Capital goods	409,966	-8.1%	445,895
Scope 3	Upstream transportation & distribution	52,251	-7.3%	56,373

Methodology and Assumptions

Scope 1

These emissions are calculated based on the actual volumes of diesel consumed in relation to locomotives as follows:

- Volumes of diesel fuel consumed (liters) in 2020 by CN were extracted from the fuel data in SAP inventory records.
- Volumes of biomass-based diesel consumed (liters) in 2020 were obtained from fuel suppliers.
- Emissions were calculated by multiplying these fuel volumes by the diesel train and biomass-based diesel emission factors (combustion) taken from the Environment Canada National Inventory Report (National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada, Part 2).
- The total emissions, in tonnes of CO_2 equivalent, were then calculated by multiplying the masses of each gas (N_2O, CH_4 and CO_2) by its global warming potential (GWP) and summing them. GWPs used are from the IPCC Fifth Assessment Report, 2013, excluding climate-carbon feedbacks (GWP of CO_2 = 1, GWP of CH_4 = 28 and GWP of N_2O = 265).

Scope 2 (emissions and energy consumption)

Scope 2 emissions are calculated based on the best estimate of the electricity consumption for all the CN sites and buildings and is determined as follows:

- The cost data was provided by Accounting covering electricity invoices by process date and by specific address.
- Due to COVID-restrictions, some invoices normally processed in December 2020 were processed in January 2021. In alignment with CN's financial reporting, the associated cost was not accrued in the SAP cost for 2020 and will be reported in the 2021 electricity cost. As a result, emissions from electricity consumption are understated in 2020. The total understatement of the electricity costs is estimated at 1.8% by CN.

- The cost data was summarized by province or state based on the address.
- The summarized cost data by province or state was then converted to estimated energy consumption (MWh) using average electricity prices for the province or state. Canadian average prices by province were obtained from the Hydro Quebec comparison report - April 1, 2020, using the General Service (large power) 5,000 kW, 3,060,000 kWh, 25 kV rates. US average prices by state were obtained from the EIA electric power monthly report with data to January 2021, average price by state in US$ (table 5.6b) - Industrial price.
- The energy consumption numbers by province or state were then converted to estimated CO_2e emissions using average emission factors for the province or state. Canadian emission factors were sourced from the National Inventory Report - (1990-2018 - part 3, Annex 13). U.S. emission factors were sourced from the eGrid2019 edition, eGRID Summary Tables 2019 file, Table 3.

Scope 3 (locomotive diesel fuel production)

These emissions are calculated based on the actual volumes of diesel fuel purchased in relation to locomotives as follows:

- CN's diesel fuel purchases were summed by region of purchase. A percentage by region was then derived based on the total diesel purchase volume.
- The GHGenius model (Version 5.01a) was used to calculate the life cycle GHG emissions for diesel purchased from various locations across Canada and the US.
- The model was run for each geographic region. A weighted average diesel production emission factor of 929.89 g CO_2e/L was calculated by multiplying the percent purchased in each region by the emission factor for each region. This production emission factor was multiplied by the total volume of diesel fuel consumed by CN in 2020.
- The same approach was used to establish the emissions from the production of biomass-based diesel consumed in 2020. Using well-to-pump emissions of Biodiesel from Canola oil, the most prevalent Biodiesel in Canada in 2020, a weighted average biodiesel production emission factor of 405.13 gCO_2e/L was calculated.

Scope 3 (purchased goods and capital goods)

These emissions are calculated based on the actual quantities and weight of goods purchased:

- CN's key goods purchases were identified based on spend and value to the business. These include: locomotives, freight cars, containers, rail ties, ballast, and rail and other track materials.
- Quantities and weights of goods purchased by source location were calculated by summing supplier invoice data from SAP.
- Representative materials for each type of good were identified. Emissions factors for each material and source location were then applied to the corresponding total weight of goods purchased. Emissions factors applied were taken from various sources including: GREET 2020, ICE V3.0, Athena Sustainable Materials Institute, and studies on primary aluminum production in China (Han Hao, Yong Geng and Wen Hang), and railroad cross ties (Christopher Bolin and Stephen Smith).
- The Scope 3 emissions breakdown between capital goods and other goods purchased was derived using the capital and operating expenses 2020 extract from the accounting records in SAP.

Scope 3 (purchased services and upstream transportation and distribution)

Emissions from purchased services are quantified following a spend-based methodology as follows:

- 2020 spend by vendor was extracted from SAP for vendors with spend greater than $2 million to capture top areas of spend.
- From this extract, spend dollars for purchased services were categorized by industry sector which was then mapped to a relevant economic sector.
- Economic input-output emission factors were developed based on emissions and GDP per economic sector for Canada from the World Input Output database. GDP data was adjusted for inflation and converted to Canadian dollars.
- These emission factors were applied to the 2020 CN spend by economic sector to calculate the estimated CN scope 3 emissions from purchased services.
- Emissions from the "Inland transport" economic sector were separated from other purchased services into the "Upstream transportation and distribution" scope 3 category.

Locomotives diesel fuel energy consumption

The energy consumption in MWh related to diesel fuel consumed by CN's locomotives is calculated as follows:

- Volumes of diesel fuel consumed (liters) in 2020 by CN were extracted from the fuel data in SAP. Volumes of biomass-based diesel consumed (liters) in 2020 were obtained from fuel suppliers.

- The diesel energy conversion factor in TJ/ML was taken from the Environment Canada National Inventory Report (National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada, Part 2, Table A4-2). The biomass-based diesel energy conversion factor in TJ/ML was taken from the Fuel Characteristics Table in GHGenius 5.01a. These factors were converted into MWh/L by multiplying by 277.8 (International Energy Agency unit converter, https://www.iea.org/reports/unit-converter-and-glossary).
- Energy consumption in MWh was calculated by multiplying the diesel fuel volumes in liters by the diesel energy conversion factor in MWh/L.

Year on year changes in emissions

The year on year changes in emissions are calculated as follows:

- The Scope 1 locomotive fuel emissions in 2019 were subtracted from the Scope 1 locomotive fuel emissions in 2020 to determine the year on year absolute difference. This number was then divided by the Scope 1 locomotive fuel emissions in 2019 to determine the year on year percent change in emissions.
- The Scope 2 electricity emissions in 2019 were subtracted from the Scope 2 electricity emissions in 2020 to determine the year on year absolute difference. This number was then divided by the Scope 2 electricity emissions in 2019 to determine the year on year percent change in emissions.
- The Scope 3 emissions for Diesel (locomotive) fuel production, Purchased goods & services, Capital goods, and Upstream transportation & distribution in 2019 were subtracted from the corresponding Scope 3 emissions in 2020 to determine the year on year absolute differences. These numbers were then divided by the corresponding Scope 3 emissions in 2019 to determine the year on year percent changes in emissions.

Chantale Despres, Assistant Vice-President Sustainability

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Date: June 1, 2021