Independent limited assurance report on selected subject matter areas presented within the Canadian National Railway Company’s 2021 Greenhouse Gas Emissions Report

Prepared in accordance with:

Table of contents

SECTION I: Independent practitioner’s limited assurance report on the Canadian National Railway Company’s 2021 Greenhouse Gas Emissions Report ........................................... 1

SECTION II: GREENHOUSE GAS (GHG) EMISSIONS REPORT ......................................................... 5

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, 2021.

Scope and subject matter

Our limited assurance engagement was performed on the following indicators for the year ended December 31, 2021:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>2021 Values</th>
<th>Mathematical accuracy of the variance 2021 vs 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1 emissions from diesel (locomotive) fuel consumption</td>
<td>Tonnes of CO2e</td>
<td>4,413,456</td>
<td>-1.9%</td>
</tr>
<tr>
<td>Scope 2 emissions from electricity</td>
<td>Tonnes of CO2e</td>
<td>149,402</td>
<td>-8.5%</td>
</tr>
<tr>
<td>Scope 3 emissions from diesel (locomotive) fuel production</td>
<td>Tonnes of CO2e</td>
<td>1,379,283</td>
<td>-2.6%</td>
</tr>
<tr>
<td>Scope 3 emissions from purchased goods &amp; services</td>
<td>Tonnes of CO2e</td>
<td>157,816</td>
<td>-7.6%</td>
</tr>
<tr>
<td>Scope 3 emissions from capital goods</td>
<td>Tonnes of CO2e</td>
<td>422,558</td>
<td>3.1%</td>
</tr>
<tr>
<td>Scope 3 emissions from upstream transportation and distribution</td>
<td>Tonnes of CO2e</td>
<td>53,314</td>
<td>-21.8%</td>
</tr>
<tr>
<td>Energy consumption from diesel (locomotive) fuel consumption</td>
<td>Megawatts</td>
<td>16,211,053</td>
<td>N/A</td>
</tr>
<tr>
<td>Energy consumption from electricity</td>
<td>Megawatts</td>
<td>554,461</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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 2021 Greenhouse Gas Emissions Report, included in Section II.
Management’s responsibility

Management is responsible for the preparation of the subject matter in accordance with the methodology established 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 Canadian National Railway Company’s 2021 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, whether due to fraud or error.

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 that we plan and perform this engagement to obtain limited assurance about whether the 2021 Greenhouse Gas Report is free from material misstatement.

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. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the decisions of users of our report. The procedures are selected based on our professional judgment, which includes identifying areas where the risks of material misstatement, whether due to fraud or error, in preparing the Greenhouse Gas Report in accordance with the applicable 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 of the variance between GHG emissions for the period January 1, 2021 to December 31, 2021 compared to the restated GHG emissions for the period January 1, 2020 to December 31, 2020; 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, 2021, is not fairly stated, in all material respects, in accordance with the applicable criteria.

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

This subject matter has been prepared in accordance with the applicable criteria to report 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 acknowledge the disclosure of our report, in full only, by Canadian National Railway at its discretion, to Board of Directors and Management of Canadian National Railway Company without assuming or accepting any responsibility or liability to Board of Directors and Management of Canadian National Railway Company or any other third party in respect of this report.

PricewaterhouseCoopers LLP

Partnership of Chartered Professional Accountants

Vancouver, British Columbia

June 29, 2022
SECTION II: GREENHOUSE GAS (GHG) EMISSIONS REPORT
**Introduction**

This 2021 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, 2021, as outlined in the following table:

<table>
<thead>
<tr>
<th>Scope</th>
<th>GHG sources</th>
<th>GHG (tCO2e)</th>
<th>Energy (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1</td>
<td>Diesel (locomotive) fuel consumption</td>
<td>4,413,456</td>
<td>16,211,053</td>
</tr>
<tr>
<td>Scope 2</td>
<td>Electricity</td>
<td>149,402</td>
<td>554,461</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Diesel (locomotive) fuel production</td>
<td>1,379,283</td>
<td></td>
</tr>
<tr>
<td>Scope 3</td>
<td>Purchased goods &amp; services</td>
<td>157,816</td>
<td></td>
</tr>
<tr>
<td>Scope 3</td>
<td>Capital goods</td>
<td>422,558</td>
<td></td>
</tr>
<tr>
<td>Scope 3</td>
<td>Upstream transportation &amp; distribution</td>
<td>53,314</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Scope</th>
<th>GHG Sources</th>
<th>2021 GHG (tCO2e)</th>
<th>Change vs previous year</th>
<th>2020 GHG (tCO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1</td>
<td>Diesel (locomotive) fuel consumption</td>
<td>4,413,456</td>
<td>-1.9%</td>
<td>4,499,867</td>
</tr>
<tr>
<td>Scope 2</td>
<td>Electricity</td>
<td>149,402</td>
<td>-8.5%</td>
<td>163,363</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Diesel (locomotive) fuel production</td>
<td>1,379,283</td>
<td>-2.6%</td>
<td>1,416,438</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Purchased goods &amp; services</td>
<td>157,816</td>
<td>-7.6%</td>
<td>170,816</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Capital goods</td>
<td>422,558</td>
<td>3.1%</td>
<td>409,966</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Upstream transportation &amp; distribution</td>
<td>53,314</td>
<td>-21.8%</td>
<td>68,138</td>
</tr>
</tbody>
</table>

**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 2021 by CN were extracted from the fuel data in SAP.
- Canadian biodiesel estimates were calculated using the provincial/jurisdictional level diesel purchase data scaled accordingly to the volume of diesel consumed. Each provincial/jurisdictional diesel volume consumed was then multiplied by the current provincial/jurisdictional blend mandate. The Renewable Fuel Standard of 2% in Canada was applied across all Canadian provinces where a clean fuel standard is not in affect. US biodiesel is the total quantity of biodiesel known to be purchased in the US. For example, the fuel coded as “B5” and “B5 (partial).”
- 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 1990-2020 Greenhouse Gas Sources and Sinks in Canada, Part 2). These Canadian locomotive and biodiesel emission factors were applied to the volumes of fuel, regardless of location (i.e., to US and Canadian locomotives).
- The total emissions, in tonnes of CO2 equivalent, were calculated by multiplying the masses of each gas (N₂O, CH₄ and CO₂) by its global warming potential (GWP) and summing the total. GWPs used are from the IPCC Sixth Assessment Report, 2021, excluding climate-carbon feedbacks (GWP of CO₂ = 1, GWP of CH₄ = 27.9 and GWP of N₂O = 273).

**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:
- SAP cost data was provided by Accounting covering electricity invoices by process date by specific address. Data for TransX has not been integrated into CN’s accounting system and was provided by the TransX’ accounting function.
- The cost data was summarized by province or state based on the address.
- Invoice cost data 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, 2021, 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 December 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 CO2e emissions using average emission factors for the province or state. Canadian emission factors were sourced from the National Inventory Report - (1990-2020 - part 3, Annex 13). U.S. emission factors were sourced from the egGrid2020 - released 1/27/2022.

**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 5.01g) was used to calculate the upstream 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 918.35 g CO2e/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 2021.
- The same approach was used to establish the emissions from the production of biomass-based diesel consumed in 2021. Using well-to-pump emissions of Biodiesel from Canola oil, the most prevalent Biodiesel in Canada in 2021, a weighted average biodiesel production emission factor of 398.31 gCO2e/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 split of Scope 3 emissions between capital goods and other goods purchased was derived based on 2021 capital vs operating expenses extract from SAP.TransX emissions are included as a separate line item.

**Scope 3 (purchased services and upstream transportation and distribution)**
Emissions from purchased services are quantified following a spend-based methodology as follows:

- 2021 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.
- 2020 data for purchased services was restated to reflect the updated information in the 2016 WIOD database (2014 Data).
- These emission factors were applied to the 2021 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 2021 by CN were extracted from the fuel data in SAP. Volumes of biomass-based diesel consumed (litres) in 2021 were obtained by applying regulatory/provincial clean fuel standard requirements for each province. See Scope 1 details above.
- The diesel energy conversion factor in TJ/ML was taken from the Environment Canada National Inventory Report (National Inventory Report 1990-2020: 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 5.01g. 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 2020 were subtracted from the Scope 1 locomotive fuel emissions in 2021 to determine the year-on-year absolute difference. This number was then divided by the Scope 1 locomotive fuel emissions in 2020 to determine the year-on-year percent change in emissions.
- The Scope 2 electricity emissions in 2020 were subtracted from the Scope 2 electricity emissions in 2021 to determine the year-on-year absolute difference. This number was then divided by the Scope 2 electricity emissions in 2020 to determine the year-on-year percent change in emissions.
- The Scope 3 fuel production emissions in 2020 were subtracted from the Scope 3 fuel production emissions in 2021 to determine the year-on-year absolute difference. This number was then divided by the Scope 3 fuel production emissions in 2020 to determine the year-on-year percent change in emissions.

Chantale Despres, Assistant Vice-President Sustainability

Signature: [Signature Image]

Date: 6/29/2022 | 12:24 PDT