

2023-2030

MEMORANDUM OF UNDERSTANDING BETWEEN TRANSPORT CANADA AND THE RAILWAY ASSOCIATION OF CANADA FOR REDUCING LOCOMOTIVE EMISSIONS

1.0 Objectives

The purpose of this Memorandum of Understanding (MOU) is to establish a framework through which the Railway Association of Canada (RAC), its member companies, and Transport Canada (TC) will collaborate to decarbonize the rail sector.

The MOU supports the following objectives to align government and industry efforts to reduce emissions from the Canadian rail sector:

- Align government and industry actions to develop the necessary framework to achieve net-zero by 2050.
- Advance decarbonization research and development including government-industry cooperation on technology trials.
- Continue to advance efficiency measures in the Canadian rail sector to reduce greenhouse gas (GHG) emissions.
- Improve collaboration and information sharing to address emerging challenges, exchange best practices, support climate modelling, and inform the development of policies that support locomotive emission reductions.
- Explore modal shift to rail opportunities to reduce GHG emissions from the transportation sector.
- Continue to report locomotive emissions data and initiatives through the Locomotive Emissions Monitoring (LEM) Program.
- Increase the shared knowledge of emerging climate-related issues facing rail infrastructure through government-industry cooperation.

As the Government of Canada is taking a whole-of-government approach towards emission reduction efforts, the MOU recognizes Environment and Climate Change Canada (ECCC) and Natural Resources Canada (NRCan) as partners in several of the objectives described above.

2.0 Governance of the Memorandum

The following sections outline the governance structure for this MOU.

2.1 *Management Committee*

The MOU will be governed by a Management Committee comprised of senior officials (director or above) from the parties to the MOU, other federal government departments (including ECCC and NRCan), representatives from railway companies, and a representative of an environmental non-governmental organization. The Management Committee will be co-chaired by a representative from TC Environmental Policy and RAC. As the lead federal department for the MOU, TC commits to keeping other federal departments informed with respect to relevant activities and initiatives that result from the MOU.

The RAC and TC will select the environmental non-governmental organization representative. Other individuals (e.g., subject matter experts) may be invited to attend meetings from time to time, as required and agreed upon by the Management Committee. The Management Committee will meet at least once a year, beginning in January 2024, to exchange information, discuss progress and issues, complete a year-end review of activities, and set out priorities for the year. RAC and TC may schedule additional meetings as needed.

The functions of the Management Committee will include, but not be limited to, the following:

- Regularly meet to discuss policy issues, share priorities on research and development, oversee the work of the Technical Review Committee, and approve work plans for achieving the objectives of this MOU.
- Participate in the development of the Rail Climate Action Plan as appropriate, such as providing direction on content and reviewing stakeholder commitments.
- Make recommendations and review the MOU when necessary (e.g., following the publication of the Rail Climate Action Plan), in consideration of developments in the rail industry or the Canadian economy's impact on the MOU.
- Work together to identify and overcome barriers and implement action on opportunities to support rail sector decarbonization.
- Review and approve the annual LEM Reports and any other generated outputs.
- Review and approve communication strategies associated with the dissemination of MOU products.
- Provide direction on the scope, mandate, and publication of the audit, as described in Section 10.0.

2.2 *Technical Review Committee*

The Technical Review Committee membership will be determined and agreed upon by the Management Committee co-chairs. The Technical Review Committee will be co-chaired by a representative from TC Environmental Policy and RAC, and is responsible for the following:

- Support the Management Committee through development and implementation of work plans to advance MOU objectives.
- Meet on a quarterly basis, at a minimum, to review progress, discuss policy issues, set research and development priorities, and initiatives supporting the MOU objectives.
- Share information, evaluate technology trials, and support modelling of sector emissions and target setting approach.
- Support the production of the annual LEM Reports and suggest improvements to the LEM Program, including emission estimation methodologies as needed, and oversee and evaluate other reporting activities for products resulting from the MOU.
- Support the development of communication strategies associated with the dissemination of MOU products.

TC and RAC will serve as a liaison between the TRC, the Railway Research Advisory Board (RRAB) Decarbonization Task Team, the Railway Ground Hazard Research Program, and other relevant committees to help inform climate-related research priorities.

3.0 Context

Dating back to 1995, the Government of Canada and the RAC have collaborated to reduce locomotive emissions from the rail sector. This successful partnership has been governed through four consecutive MOUs (1995-2005; 2006-2010; 2011-2017; 2018-2022).¹

3.1 Global Climate Change

The Intergovernmental Panel on Climate Change (IPCC) found that current GHG commitments still leave a substantial gap to net zero, and it's likely that warming will exceed 1.5°C during the 21st century – making it more difficult to limit warming below 2°C. Human-caused climate change has already contributed to the planet's warming of about 1.1°C above pre-industrial levels in 2011–2020.²

Modelled pathways that limit warming to 1.5°C or 2°C involve rapid and deep and, in most cases, immediate GHG emission reductions in all sectors this decade. While some

¹ Please contact Transport Canada or the Railway Association of Canada for previous iterations of the MOU. The latest can be found here: https://www.railcan.ca/wp-content/uploads/2019/12/TC-RAC_MOU_2018-22.pdf.

² On March 20, 2023, the IPCC released its latest report, “AR6 Synthesis Report: Climate Change 2023,” summarizing the current state of climate change and its widespread impacts and risks.

future impacts of climate change are unavoidable and/or irreversible, they can be limited by deep, rapid and sustained global GHG emissions reduction.

The transportation sector must play a key role in achieving these reductions. In 2021, transportation accounted for approximately 22% of Canada's GHG emissions, with the rail sector accounting for approximately 1% of total GHG emissions in Canada. While the on-road transportation sector represents the bulk (79%) of transportation emissions³, it will be essential to drive down emissions from all modes, including rail.

3.2 Government of Canada's Climate Response

Canada has committed to reducing GHG emissions by 40-45% below 2005 levels by 2030. Canada also committed to achieving a net-zero emission economy by 2050, enshrined in the *Canadian Net-Zero Emissions Accountability Act*.

Most recently, in March 2022, the Government of Canada released its [2030 Emissions Reduction Plan \(ERP\)](#), a roadmap outlining a sector-by-sector path for Canada to meet its 2030 and 2050 emission reduction goals, including a commitment to develop a Rail Climate Action Plan.

Canada recognizes that rail is an efficient mode of transport that supports climate ambitions, economic prosperity, and well-being, and that encouraging a modal shift to rail, where possible, creates immediate GHG reduction opportunities within the transportation sector.

3.3 Canadian Rail Sector Climate Actions

Rail accounts for less than 4% of Canada's transportation GHG emissions.⁴ Yet, the rail sector moves nearly 70% of intercity ground freight and more than 100 million people annually (pre-pandemic)⁵, making it the least GHG intensive mode of ground transportation.

Canada's rail sector is committed to doing its part to improve its fuel efficiency, enhance the resiliency of rail infrastructure, and reduce emissions. Since 2005, the freight rail industry has improved its fuel efficiency by more than 25%, and intercity passenger rail fuel efficiency improved by over 30% as of 2019.⁶ As the most fuel-efficient mode of ground transportation, the rail sector is working to attract new passengers and encourage freight traffic to rail.

³ National Inventory Report (2023), https://publications.gc.ca/collections/collection_2023/ecccc/En81-4-2021-1-eng.pdf

⁴ National Inventory Report (2023), https://publications.gc.ca/collections/collection_2023/ecccc/En81-4-2021-1-eng.pdf

⁵ Railway Association of Canada, *Rail Trends 2020*, p.13-14.

⁶ *Railway Association of Canada, Locomotive Emissions Monitoring Report 2021.*

Rail is one of the sectors in which emissions are difficult to abate, requiring major transformational and technological change (i.e., low-carbon fuels and alternative propulsion) to achieve substantive emission reductions. To date, Canadian railways have made significant investments in infrastructure, fleet modernization, innovative fuel saving technologies, operational improvements, and the piloting of various low-carbon fuels and alternative propulsion technologies. The rail sector acknowledges the importance in mitigating the impacts of climate change through the reduction of locomotive emissions over the next decade, and the need to ensure that Canada's rail system is resilient to climate related impacts, including wildfires, flooding, and extreme heat and cold.

4.0 Reducing Greenhouse Gas Emissions

The rail sector is committed to continuing to improve its emissions intensity. For the duration of the Memorandum, the RAC will encourage its members to improve their GHG emissions intensity from railway operations.

TC and the RAC agree to work together to identify opportunities and address barriers to reducing GHG emissions in the rail sector. Forms of collaboration can include but are not limited to:

- collaboration on research, information sharing and dissemination on decarbonization technologies;
- collaborative clean technology research, development, and demonstration projects;
- policy development; and
- engagement on design and implementation of support programs.

Specific topics of collaboration may include, but are not limited to, the following areas:

- advance research and knowledge of rail infrastructure climate resiliency approaches; options to support modal shift; low-carbon fuels, alternative propulsion, and other clean technology; identify gaps in current funding opportunities for rail to inform government strategies for advancing rail sustainability;
- develop government supports for rail emission reductions and improve GHG reporting accuracy through year specific GHG emissions factors;
- promote the environmental benefits and strong emission performance of Canada's railways through reports, education campaigns, and other methods of communications; and
- engage with the passenger and shortline railway sectors to identify support requirements to advance decarbonization.

4.1 Net-Zero Vision

This MOU represents a shared vision of working towards net-zero GHG emissions by 2050 for the Canadian rail sector. Both parties understand the significance of monitoring, reporting on, and reducing rail sector emissions, and are committed to collaborating on emission reduction opportunities.

Under this MOU, TC and RAC and its members intend to pursue short-term emission reduction opportunities (2023-2030); by taking action to improve low-carbon fuels use and advance trials of zero-emission technologies; improve fuel efficiency; and explore other decarbonization strategies. The Government of Canada invites individual railway signatories to join the Government of Canada's Net Zero Challenge, and other net-zero initiatives as appropriate.

4.2 Modelling Pathways to Net-Zero

The Government of Canada recognizes the efforts of RAC members to disclose emissions and encourages a continuation of these efforts as the industry plans for 2030 and beyond.

To develop well-informed GHG reduction targets that are ambitious and reasonably achievable, TC and the RAC will work together to provide data to:

- develop modelled pathway(s) to net-zero for the sector, including low-carbon fuels uptake by 2030;
- better understand the policy, investment and incentive requirements to enable the adoption of zero-emission technologies;
- and support the development of additional rail decarbonization initiatives, such as the Rail Climate Action Plan.

4.3 Key Milestones on the Path to Net-Zero

This MOU sets the following aspirational goals to help guide TC and the RAC in transforming Canada's rail sector into a sustainable, net-zero mode of travel and freight. These aspirational goals will evolve and be updated as the collaborative work of the MOU advances. With these aspirational goals, TC and the RAC are committed to a journey of innovation, environmental stewardship, and leadership in rail decarbonization.

4.3.1 Reducing Greenhouse Gas Emissions by 2030:

While recognizing that modal shift from on-road to rail could increase rail emissions while reducing overall transportation sector emissions in the years to come:

- Class 1 freight railways commit to reducing emissions intensity in accordance with their Science Based Targets (SBTi) targets, and to achieve absolute

emission reductions by 2030 aligned with SBTi-modelled pathways.

- Passenger railways, shortline and regional railways, and Transport Canada will continue to work with other federal departments, provincial and municipal governments, academia, and other key stakeholders to reduce emissions by 2030.

4.3.2 Advancing Low-Carbon Fuels in the Canadian Rail Sector:

This MOU commits the parties to exploring the feasibility of achieving 10 to 20% of low-carbon fuels use within the rail sector by 2030, to send a clear signal that the rail sector will require significant volumes of sustainable low-carbon fuels.

Achievement of this goal is dependent on policy that enables the competitive availability and price of low-carbon fuels in the Canadian marketplace, as well as trials to advance rail sector technical and operational knowledge. In support of this goal, TC and the rail industry will aim to increase investments in locomotive engine testing and trials for low-carbon fuels, and broadly share the results within the sector, investigate the availability of low-carbon fuels for rail transport use, and potential policy drivers for rail sector decarbonization.

4.3.3 Advancing Zero-Emission Locomotives in Canada's Rail Sector:

This MOU recognizes the importance of accelerating the adoption of zero-emission locomotives over the coming decades to reach net-zero. To support this transition:

- TC and RAC members propose to work together to accelerate the retrofitting and upgrading of locomotives to advance net-zero technology.
- TC will explore options for new or existing federal policy drivers, measures, and support programs to assist in the transition to a net-zero rail sector.

4.3.4 Promoting Modal Shift Opportunities:

This MOU sets an aspirational goal of achieving rail's potential to reduce transportation sector emissions through modal shift, both for passengers and freight. In support of this goal:

- TC and RAC members will seek to increase investments to modernize and expand the services of the rail network, such as increasing intermodal hubs and freight rail access to industries.
- TC will work to increase passenger rail ridership on existing routes through new, more efficient options (e.g., High Frequency Rail), and in working with stakeholders including other levels of government to promote coordinated operations that complement Canada's passenger rail network.

5.0 Reducing Criteria Air Contaminant Emissions

The RAC will continue to encourage its members, including those not covered by the *Locomotive Emissions Regulations* (LER), to improve their criteria air contaminant emissions performance.

Through this Memorandum, the RAC will continue to report on annual CAC emissions, in a manner and format that is agreeable to all parties, with a view to leverage the data railways provide to enable collaboration on future initiatives, tools, or actions that address air quality knowledge gaps.

6.0 Research, Development & Demonstration Commitments

Research, development, and demonstration (RD&D) are vital for decarbonization. TC and the RAC commit to working together to prioritize research and share, where possible, generated evidence in line with this MOU's objectives.

Through this MOU, TC and the RAC commit to the following items:

- TC will provide an annual update on rail RD&D projects and programs related to rail decarbonization to the Management Committee.
- RAC and its members will provide an annual update on research priorities that support the MOU objectives to the Management Committee.
- TC will establish Rail Decarbonization Task Team under the Railway Research Advisory Board (RRAB) in which RAC members are invited to participate, as a mechanism for enhancing rail decarbonization-related research collaboration between research bodies, industry, and federal departments, including coordinating strategic research direction and results sharing between the RRAB and the Management Committee.
- TC and the RAC will work with other federal government departments and agencies to support alignment of research with priority areas identified by the Management Committee.
- TC and the RAC will collaborate to advance knowledge of climate risks to rail infrastructure and identify and promote collaborative mechanisms to enhance climate and supply chain resiliency of Canada's rail network.
- TC, ECCC, NRCan, and RAC will collaborate on a research project to develop an understanding of the GHG and air quality impacts of modal shift towards rail, including a quantification and a policy analysis where possible.
- TC, ECCC, NRCan, and RAC will collaborate on a research project to assess the gaps in current knowledge and reporting on CAC emissions profile of the rail sector.
- TC, NRCan and RAC will collaborate to advance knowledge regarding low carbon fuels relevant to the sector.

- TC, NRCan and RAC will collaborate to advance knowledge regarding low carbon fueling infrastructure.

7.0 Rail Climate Action Plan

This MOU recognizes the need for government-industry collaboration to advance decarbonization technologies for the rail sector. Collaboration under the previous MOU included technology assessments and a decarbonization roadmap, and an emphasis on fuel efficiency improvements.

As a next step, TC will lead the development of a Rail Climate Action Plan, which will set out additional actions and measures to support the decarbonization of the rail sector in line with Canada's net-zero by 2050 commitment, along with supporting GHG reductions by 2030.

The collaborative activities set out in this MOU will be important enablers for the development of the Rail Climate Action Plan, including through working together to inform the development of ambitious and achievable GHG reduction targets.

TC's role includes fostering partnerships among rail stakeholders, coordinating efforts across transportation modes, and leveraging infrastructure and energy synergies. In developing the Rail Climate Action Plan, TC will explore options to overcome barriers and accelerate the rail system's sustainability transition.

8.0 Annual Reports

The following sections outline the reporting and verification requirements for this MOU. The first report will be for calendar year 2023 and the last report will be for the year 2030.

8.1 *Contents and Production of Annual Reports*

The RAC and the Technical Review Committee will be responsible for developing a Locomotive Emissions Monitoring (LEM) report for each year of the agreement. Each report will include:

- General information about the rail sector (reporting railways, network map, etc.); the sector's contribution to transportation-related emission reductions; and RD&D and other actions taken by the RAC, its members, and the Government of Canada (including an overview of funded/supported rail projects) to reduce GHG and CAC emissions from locomotives, advance new zero-emission technologies, and climate change adaptation efforts.

- Detailed information about the composition of the domestic locomotive fleet (OEM, model, tier level, engine, horsepower, year of manufacture, type of operation); names of the reporting railways and their province(s) of operation; freight and passenger traffic levels (gross tonne-kilometres, revenue tonne-kilometres, intercity passenger-kilometres); fuel consumption; fuel efficiency; and GHG and CAC emissions.
- Progress towards the aspirational goals listed in section 4.3.

The RAC will be responsible for the production, design and coordination of materials to produce the annual reports, and TC will be responsible for the translation of the annual reports. As part of the review process, the data workbooks used to prepare the annual reports (excluding company-specific information) will be circulated to the Technical Review Committee.

The final report under the Memorandum (i.e., 2030 reporting year) will include a summary of the parties' accomplishments over the total reporting period including GHG and CAC emission reductions, and TC and other departments' contributions towards achieving the objectives of the MOU.

8.2 *Review and Approval of Annual Reports*

The Technical Review Committee will support the production of each annual report.

Each annual report will be approved by the Management Committee.

8.3 *Dissemination of Annual Reports*

Each annual report shall be made available by the parties to the Memorandum and released to the public as soon as possible, once approved. The parties will jointly develop a communications strategy to maximize outreach and disseminate annual reports. As part of this strategy, TC will share the annual reports with ECCC and other relevant federal departments and agencies.

The RAC will be the copyright holder of all rights in, and to, the annual reports. TC will hold a royalty free license in perpetuity of any copyrighted materials included in the annual report.

9.0 *Duration*

The MOU will come into force upon signing by the duly authorized representatives of TC and the RAC and will endure until December 31, 2030, unless it is terminated at an earlier date. The party that is terminating the MOU will give six months prior formal written notice to each signatory.

10.0 Third Party Verification

A qualified auditor will be given access at least once over the duration of the MOU to audit the processes and supporting documentation pertaining to the MOU. Parties to the MOU will select the appropriate auditor and will share audit costs equally. The scope, mandate, and publication of the audit will be decided by the Management Committee.

11.0 General Provisions and Signatures

This MOU is a voluntary initiative that expresses in good faith the intentions of the parties. It is not intended to create nor does it give rise to legal obligations of any kind whatsoever, nor establish a partnership or joint venture between signatories. As such, it is not enforceable by law. The government reserves the right to develop and implement regulatory or other measures it deems appropriate to achieve clean air and climate change goals. Conversely, signatory parties reserve the right to review and reassess performance targets in correspondence with evolving government policies, operating procedures or market conditions. This Memorandum will not constrain the parties from taking further actions relating to GHG and CAC emissions or fuel use that are authorized or required by law.

The parties recognize that the information provided pursuant to the Memorandum will be governed by the applicable legislation concerning protection and access to information.

Dated at Ottawa this 5 day of December 2023.



Minister of Transport



President and CEO, Railway Association of Canada

Appendix A

RAC MEMBER COMPANIES

(As of December 5, 2023)

Agawa Canyon Railroad, ULC

Alberta Prairie Railway

ArcelorMittal Infrastructure Canada s.e.n.c.

Barrie-Collingwood Railway

Battle River Railway, NGC Inc.

BCR Properties Ltd.

Big Sky Rail Corp

Boundary Trail Railway Co.

Cape Breton & Central Nova Scotia Railway

Capital Railway

Carlton Trail Railway

Central Manitoba Railway Inc.

Chemin de fer Arnaud Québec

CN

Compagnie du Chemin de Fer Lanaudière inc.

CPKC

Essex Terminal Railway Company

exo

GIO Rail Holdings Corporation

Goderich-Exeter Railway Company Limited

Great Canadian Raitour Company Ltd.

Great Western Railway Ltd.

Hudson Bay Railway

Huron Central Railway Inc.

Immeuble VDS Inc.

Keewatin Railway Company

Knob Lake and Timmins Railway

Last Mountain Railway

Metrolinx

New Brunswick Southern Railway Company Limited

Nipissing Central Railway Company

Ontario Northland Transportation Commission

Ontario Southland Railway Inc.

Orangeville Brampton Railway

Ottawa Valley Railway

Prairie Dog Central Railway - Vintage Locomotive Society Inc.

Québec Gatineau Railway Inc.

Québec Iron Ore Inc.

Québec North Shore and Labrador Railway Company Inc.

Roberval and Saguenay Railway Company, The

Romaine River Railway Company

Société du chemin de fer de la Gaspésie

South Simcoe Railway

Southern Ontario Railway

Southern Railway of British Columbia Ltd.

St. Lawrence & Atlantic Railroad (Québec) Inc.

Toronto Terminals Railway Company Limited, The

Train Touristique de Charlevoix Inc.

Tshiuetin Rail Transportation Inc.

VIA Rail Canada Inc.

West Coast Express Ltd.