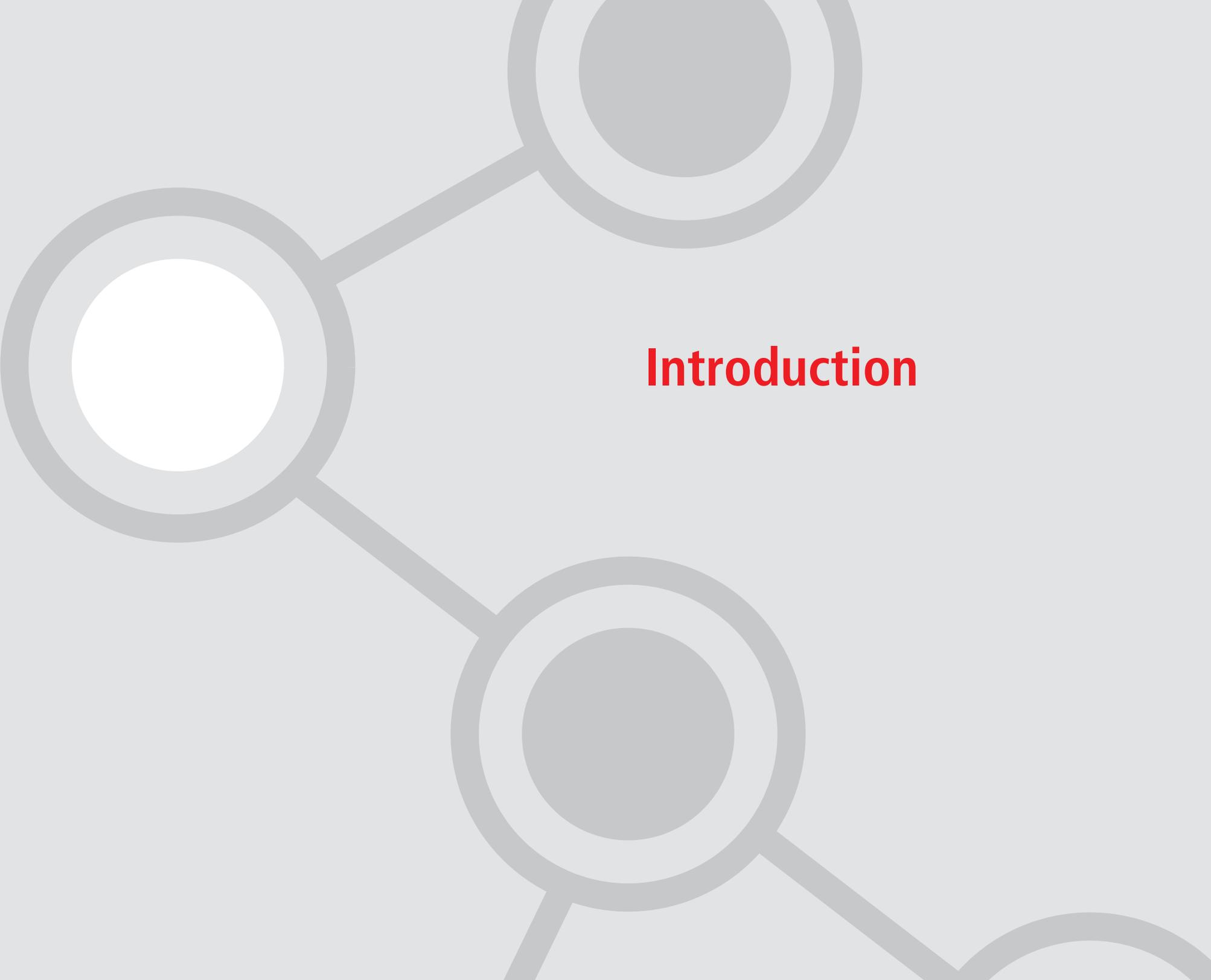


# **Carbon Disclosure Project 2019**



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# Introduction

# Introduction

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**CN is a leading North American transportation and supply chain company engaged in the rail and related business. Our network of approximately 20,000 route miles of track spans Canada and mid-America, uniquely connecting three coasts: the Atlantic, the Pacific and the Gulf of Mexico. We have a strong track record of operational and service excellence, driven by end-to-end supply chain solutions that drive growth – for CN, for our valued customers, and for our supply chain partners.**

**Our freight revenues are derived from seven commodity groups representing a diversified and balanced portfolio of goods transported between a wide range of origins and destinations, positioning us to handle economic fluctuations and enhance our potential for growth opportunities. On an annual basis, we handle over C\$250 billion worth of goods and carry more than 300 million tons of cargo, serving exporters, importers, retailers, farmers and manufacturers. Some of these goods are being transformed into sustainable products, enabling us to play a key role in the transition to a lower carbon economy and the lifeblood of healthier communities.**

By providing our customers with one of the most environmentally friendly ways to move their goods, we not only contribute by moving the economy, but also by driving its efficiency. As a pioneer of Scheduled Railroading, CN continues to lead the North American rail industry in terms of operational efficiency, consuming approximately 15% less fuel per gross ton-mile than the industry average. With almost 90% of our direct GHG emissions generated from rail operations, our focus is to continuously improve our locomotive fuel efficiency and reduce our carbon emissions. Our emission reductions take place on several levels, from our asset lean Scheduled Railroading initiatives to our Fuel Management Excellence program, which includes the use of new, fuel-efficient locomotives, promoting fuel-efficient train handling behaviours, and investing in new innovative technology applications such as Horsepower Tonnage Analyzer (HPTA), Trip Optimizer and Distributed Power. As a result of these programs, we have reduced our rail locomotive GHG emissions intensity (tCO<sub>2</sub>e/GTM) by 40% over the past 25 years.

In support of keeping the global temperature increase below 2 degrees Celsius compared to pre-industrial temperatures, we continue to work towards our science-based target to reduce our GHG emission intensity (tCO<sub>2</sub>e/million tonne kilometres) by 29% by 2030 based on 2015 levels. This target covers emissions from all aspects of our business, including rail locomotives, other fleets, and our buildings and yards.

In addition to providing a fuel-efficient transportation service, we believe that rail can be an integral part of the climate change solution offering both environmental and economic advantages. Compared to other transportation modes, rail is the most fuel efficient method of moving freight over land – on average, trains are approximately four times more fuel efficient than trucks. To leverage these benefits, we offer our customers intermodal freight shipping, which combines the resources of different transportation modes, such as trucking and rail – allowing each mode to be used for the portion of the trip to which it is best suited. As a result, intermodal shipping helps lower transportation costs, reduce emissions, traffic congestion, accidents, and the burden of an overstressed public road transportation infrastructure. In support of the growing demand for our intermodal and rail services, we are investing in our network and fleet to increase capacity and resiliency. In 2018, we ramped up our capital investments to a record C\$3.5 billion, taking on the largest number of infrastructure projects in CN's history, including expanding yards, adding new sidings and doubling sections of track. We are also investing in expanding our service offerings, successfully acquiring TransX, one of Canada's most established and largest transportation companies. In addition, we continue to educate our network of 25,000 employees through our EcoConnexions Employee Engagement program, giving them practical knowledge and tools to reduce our carbon footprint, while adapting to a changing climate.

2019 marks CN's 100th anniversary. As we move into our next century, we are strengthening our resiliency for the long haul, focused on adding network capacity to accommodate our solid pipeline of growth opportunities in very diverse markets, deploying technology on our schedule railroad operations to improve productivity and fluidity, and renewing our locomotive fleet to ensure we handle our customers' business efficiently and responsibly. As a true backbone of the economy, CN is committed to playing a key role in the transition to a lower carbon economy.

*CN - Canadian National Railway Company and its operating railway subsidiaries - spans Canada and mid-America, from the Atlantic and Pacific oceans to the Gulf of Mexico, serving the ports of Vancouver, Prince Rupert, B.C., Montreal, Halifax, New Orleans, and Mobile, Ala., and the key metropolitan areas of Toronto, Buffalo, Chicago, Detroit, Duluth, Minn./Superior, Wis., Green Bay, Wis., Minneapolis/St. Paul, Memphis, and Jackson, Miss., connections to all points in North America. For more information on CN, visit the company's website at [www.cn.ca](http://www.cn.ca). Information on delivering responsibly, including climate change is available at: <http://www.cn.ca/en/delivering-responsibly>*

## Boundary

0.5  
Our reporting boundary

CN's climate-related impacts are reported using a consolidated approach within an operational control reporting boundary.

## Operational activities

0.7  
Transport modes

The transport modes for which we are providing data are:

- Rail
- Marine
- Heavy Duty Vehicles (HDV)



**Governance**

# 1. Governance

## Board oversight

1.1 - 1.1b  
Board level responsibility for climate-related issues and details on board oversight

The Environment, Safety and Security (ESS) Committee of the Board of Directors (which is made up of seven Board members) has the highest level of responsibility for climate related issues in the Company. The ESS Committee is responsible for providing oversight on strategic environmental issues and reviewing the progress of the Company's environmental strategy, management and performance. This role is important in ensuring we provide the right level of oversight on environmental risks and opportunities.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	<ul style="list-style-type: none"> <li>Monitoring progress against goals and targets for addressing climate-related issues</li> <li>Reviewing climate-related corporate disclosures</li> </ul>	<p>On a quarterly basis, the Environment, Safety and Security (ESS) Committee of the Board of Directors, meets to review performance on environmental compliance, strategies, risks, and performance. Board members also review CN's sustainability report, which includes specific information on the company's carbon management strategy and performance.</p> <p>In addition, all Board directors receive regular updates on the company's climate change and fuel efficiency strategies and performance towards targets as part of briefing materials provided prior to each Board meeting.</p>

## Management responsibility

1.2 - 1.2a  
Highest-level management position with responsibility for climate-related issues below board level

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Executive Vice-President and Chief Operating Officer	Both assessing and managing climate-related risks and opportunities	Quarterly
Vice-President Financial Planning	Both assessing and managing climate-related risks and opportunities	Quarterly

The Executive Vice-President and Chief Operating Officer (COO), is the highest-level management position with direct responsibility for climate-related issues. As part of the Executive Leadership Team, the COO reports directly to the President and Chief Executive Officer and the Board on climate-related risks and opportunities, including fuel efficiency, winter readiness plans and rail network resiliency and safety.

With almost 90% of our direct greenhouse gas emissions generated from fuel consumption during rail operations, it is important that the COO's responsibilities include fuel and carbon efficiency as part of the existing responsibility to drive operational and service excellence. Specific to climate-related issues, the COO is responsible for ensuring we establish programs to meet fuel efficiency targets and enable the company to run a safe, fluid, reliable, and efficient railroad. This includes providing executive management oversight on the fuel efficiency strategy which aligns with the Canadian rail industry emission intensity reduction target of 6% by 2022 from a 2017 baseline, as well as the company's longer-term science based target. This responsibility has also included oversight on our investments in innovative rail technologies, as well as fuel conservation practices, such as locomotive shutdowns in yards, streamlined railcar handling, train pacing, coasting and braking strategies.

Furthermore, in 2018, this included oversight on record capital investments of C\$3.5 billion, a portion of which was focused on the purchase of fuel efficient locomotives, improving the rail network capacity, resiliency and fluidity, and reducing winter-related bottlenecks.

In parallel, the Vice-President Financial Planning (synonymous with a Chief Sustainability Officer function) provides executive management oversight on our carbon strategies. With constantly changing climate-related risks and opportunities impacting the business, it is important for the Financial Planning and Sustainability function to have direct responsibility for ensuring CN proactively identifies climate-related risks and opportunities, and for ensuring the company establishes the right policies and programs to meet regulatory compliance obligations, corporate targets, and effectively mitigate potential risks. For example, in 2018, the Vice-President Financial Planning continued to play an important role in ensuring we took a strategic approach to understanding the impact of carbon pricing in Canada on our business, as well as the impact of emerging clean fuel regulations. The Vice-President also ensured the development of strategies to mitigate these risks and to capitalize on longer-term opportunities by supporting the use of renewable fuels and by collaborating with Transport Canada on a study of the freight rail sector electrification.

# 1. Governance

## Employee incentives

1.3 - 1.3a  
Incentives for management of climate-related issues, including attainment of targets

Who is entitled to benefit from these incentives?	The type of incentives	Activity incentivized	Comments
Chief Operating Officer	Monetary reward	Efficiency target	The Executive Vice President and Chief Operating Officer has included in his Employee Performance Scorecard (EPS) improvements in CN's fuel efficiency, in line with the Canadian rail industry medium-term emission intensity reduction target of 6% by 2022 from a 2017 baseline and also in line with the company's long-term science based target to reduce GHG emission intensity (tCO <sub>2</sub> e/million tonne kilometres) by 29% by 2030, based on 2015 levels.
Vice-President Financial Planning	Monetary reward	Emissions reduction target	At the executive level, the Vice-President Financial Planning has included in her EPS direct performance on our climate-related objectives and target to reduce our GHG emission intensity (tCO <sub>2</sub> e/million tonne kilometres) by 29% by 2030, based on 2015 levels. This includes fuel consumption from locomotives, shipping vessels, trucks, company vehicles and operating equipment, and buildings and yard energy consumption. Oversight for managing potential climate-related risks and opportunities to the business, such as climate change policy impacts, renewable fuel use and stakeholder engagement is also included.
Management group	Monetary reward	Energy reduction target	<p>Various management employees are responsible for executing our emissions and energy efficiency strategy. Performance indicators are included in their respective EPS objectives. For example:</p> <p>The Fuel management team performance score is tied to the company's Canadian rail industry emission intensity reduction target of 6% by 2022 from a 2017 baseline. The Facility management team performance is tied to the year over year target of reducing our overall energy spend by 2%.</p> <p>Both these targets align with our overall science based target to reduce our GHG emission intensity (tCO<sub>2</sub>e/million tonne kilometres) (which includes fuel consumption from locomotives, shipping vessels, trucks, company vehicles and operating equipment, and buildings and yard energy consumption) by 29% by 2030, based on 2015 levels.</p> <p>Our Sustainability management team's performance is tied to the implementation of our emissions and energy efficiency strategy and the execution of our climate change communications.</p> <p>The achievement of the above performance indicators are linked to employee recognition as well as the individual's annual compensation and bonus reward.</p>
All employees	Recognition (non-monetary)	Energy reduction target	<p>All employees are responsible for cost control, which includes energy efficiency, and are educated on energy management best practices through our EcoConnexions employee engagement program.</p> <p>Fuel efficiency, emission and energy reduction initiatives can be recognized through CN's People Awards for Excellence within the Rail Operations and Supply Chain Service Excellence category. Employees are also recognized for their efforts through the CN EcoConnexions program and many other internal communications.</p>



# **Risks and opportunities**

## 2. Risks and Opportunities

### Time horizons

2.1  
Our definition of short-, medium- and long-term horizons

Time horizon	From (years)	To (years)	Comments
Short-term	1	2	Includes annual performance targets
Medium-term	2	3	Includes targets in our 3-year strategic plan
Long-term	3	15	Includes our science-based target

### Management processes

Our processes are integrated into multi-disciplinary, company-wide risk identification, assessment, and management processes.

2.1 - 2.2a  
Frequency and time horizon for identifying and assessing our climate-related risks

Frequency of monitoring	How far into the future are risks considered?	Comment
Six-monthly or more frequently	greater than 6 years	<p>We conduct quarterly assessments of risks, including those related to climate-related issues, and more frequently when events occur that could impact our business. For example, given the changing regulatory carbon pricing landscape in Canada, we undertake more frequent assessments of the impact of various jurisdictional carbon pricing regulatory regimes (i.e. carbon market and carbon taxes) on our business.</p> <p>We also continuously assess the impacts of physical climate risks on our business. In early 2018, CN productivity and network fluidity were adversely impacted by harsh cold winter conditions. In September and October, early and continued snowfall in the grain-growing areas of the prairies, along with persistent rain, caused unprecedented harvest delays, impacting the entire Western Canadian grain supply chain.</p> <p>When considering climate-related risks, we take a long-term perspective that is greater than 6 years, which is consistent with our science-based target of 2030.</p>

## 2. Risks and opportunities

### Management processes (continued)

#### 2.2b Our processes for identifying and assessing climate-related risks

In order to inform our risk assessment process, climate-related risks and opportunities are identified and assessed at both the company and asset level.

#### **Asset level perspective**

At the asset level, departmental assessments of climate risk are reviewed on an ongoing basis as the risks occur, and more formally on an annual basis as part of the enterprise risk management process. The departmental assessments are more specific in nature and related to the risks and opportunities that could occur from a functional, business unit and regional perspective.

For example, our Network Transportation and System Engineering function considers the risks of natural disasters and severe weather conditions that could impact CN's rail infrastructure, yards and operations on CN's network. The Sales & Marketing function considers climate-related opportunities from positioning CN's low carbon rail freight transportation solution. The CN Financial Planning and Sustainability function considers risks relating to the changing carbon pricing schemes in Canada; and the Procurement & Supply Management function considers the risks of sourcing renewable fuels. The results of these assessments are communicated to Financial Planning and Sustainability, who in turn communicates our climate risks to the internal audit team for inclusion in the enterprise risk management process.

#### **Company level perspective**

At the company level, climate change risks and opportunities are assessed annually by the Financial Planning and Sustainability function, taking into consideration the information from our various departmental functions, including a broad range of climate-related physical and transition risks and opportunities that could impact the entire company. Examples of company level risks include reputational impacts from more carbon disclosure investor requests, business continuity and network fluidity from extreme weather events, new cleaner fuel efficient technologies, changing policies and regulations on emission limits, carbon markets / pricing and the uptake of cleaner fuel alternatives. The assessment results are communicated to our internal audit team to be considered for inclusion into the enterprise risk management process.

#### **Process for assessing the size and scope of the risks**

To determine the relative size of the risks, we take into consideration the likelihood and severity of the impact on our business. With respect to likelihood we consider the percentage likelihood of occurrence. With respect to assessing climate risks impact, we consider a broad scope of potential impacts, including financial, market capitalization, operational, physical, and reputational and other organizational issues.

#### **Relative significance of the risks**

To assess the relative significance of climate risks, we rate each risk based on its likelihood and magnitude of impact using rating of low, moderate and high. The risks are mapped on a heat map to determine their relative significance.

#### **Definition of a substantive financial risk**

When identifying or assessing a climate risk, the determination of whether it has a substantive financial impact is aligned with our corporate enterprise risk management framework.

The substantive financial risks are integrated into the enterprise-wide risk management process and re-assessed. Climate change information that could be material is presented in the MD&A section of our annual report. Strategic programs are established to ensure risks are mitigated, and follow-up action plans are tracked and monitored through the sustainability committee's action plan.

## 2. Risks and opportunities

### Management processes (continued)

2.2c  
Types of risks considered  
in our climate-related risk  
assessments

Risk type	Relevance & inclusion	Explanation • Through our climate-related risk assessment process:
Current regulation	Relevant, always included	We take into consideration current regulatory requirements including locomotive emission standards, Canadian and U.S. carbon markets and taxes, GHG reporting and verification requirements, carbon offset project eligibility requirements and the renewable fuel legislation. In 2018, CN was impacted by the Quebec, Ontario and Nova Scotia GHG Cap and Trade systems, and in British Columbia and Alberta, CN was impacted by carbon taxes. We assessed our exposure to the current climate change legislation by working with our Fuel Procurement and Taxation teams to determine our risk levels and define effective risk mitigation strategies.
Emerging regulation	Relevant, always included	We assess relevant emerging regulatory requirements, including emerging carbon markets and pricing and clean fuel standards in Canada. For example, in 2018 we assessed the Federal Carbon Backstop which took effect on April 1, 2019, imposing a carbon price on fossil fuels in jurisdictions without their own carbon pricing system, making CN subject to new carbon taxes in Saskatchewan, Manitoba, Ontario and New Brunswick. The tax started at \$20 per tonne and will increase to \$50 by 2022. Also, the Federal government is developing a Clean Fuel Standard to reduce Canada's greenhouse gas emissions through the increased use of lower carbon fuels, energy sources and technologies. A draft regulatory design paper was released in December 2018 for comments, with final regulations to be released in 2020, coming into force in 2022. We are working to assess the impacts of increasing renewable fuel blend rates in our locomotive diesel fuel supply to determine impacts on locomotive fuel efficiency as well as impacts on fuel costs. To help better assess the impacts on CN's fuel supply and operations, our Fuel Procurement team is working with suppliers to gain greater transparency into blend rates for the fuel we receive.
Technology	Relevant, always included	We assess technology risks in the context of stringent locomotive air emission standards set by the U.S. Environmental Protection Agency (EPA), and Canada that require newly manufactured and re-manufactured off-road engines to be Tier 4 compliant and have idle emission controls. We assess our technology risks and use the information to inform our strategy to acquire, upgrade and retire locomotives. We also assess technology risks in the context of fuel efficiency improvements, taking into consideration the financial costs associated with installing technologies on our locomotives with enhanced analytical capabilities, such as Trip Optimizer, Automatic Engine Start / Stop devices, Locomotive Telemetry, which wirelessly communicates operational data from locomotives to a central system, and Horse Power Tonnage Analyzer (HPTA) which uses the data collected by Locomotive Telemetry to optimize a locomotive's horsepower-to-tonnage ratio.
Legal	Relevant, always included	We assess our risk exposure to increasing legal costs related to defending and resolving legal claims that may occur from litigation related to climate change. This includes potential non-compliance with Greenhouse Gas (GHG) reporting and verification requirements and potential risks from the inability to meet compliance requirements related to offsetting our carbon emissions and purchasing renewable fuel compliance units.
Market	Relevant, always included	We consider climate-related risks that could impact the markets we serve. Specifically, we assess the extent to which climate change legislation could affect our customers, making it difficult for our customers to produce products in a cost-competitive manner. For example, through our assessments we have identified certain commodities moved by CN that could be adversely affected, including our utility coal customers due to coal capacity being replaced with natural gas generation and renewable energy.
Reputation	Relevant, always included	We consider the reputational risks of a lack of disclosure on climate-related impacts from increasing stakeholder requests, including customers, governments, investors, NGOs, among others. We recognize that with increasing public and investor concerns over climate change, a lack of disclosure on how we identify and manage climate change risks could expose us to potential reputational risk. For example, over the past few years, there has been an increase in investor interest on environmental, social and governance factors, which includes responding to and mitigating climate risks. As a result, we have been strengthening the transparency and credibility of the information we publish publicly on climate-related issues, including with respect to governance, risks, opportunities and performance.
Acute Physical	Relevant, always included	We consider risk exposure to extreme weather events, including flooding, heat and cold extremes, cyclones and tornadoes. For example, we assess the impacts of extreme cold on our operations. Below 25 degrees Celsius, railway technologies (steel rail, steel wheels, and long compressed air brake systems) become more vulnerable to problems that can disrupt normal operations. We also assess the impact of episodes of flash flooding, which could result in landslides in unstable mountainous regions and mudslides further damaging rail bed support structures and cause overflows onto our tracks. Vulnerability and risks of tornado and cyclones are also assessed, particularly at our sites and network within the US Tornado Belt, the Midwest and New Orleans area.
Chronic Physical	Relevant, always included	We consider exposure to changes in chronic physical impacts, including shifts in climate patterns such as gradually warming temperatures or increasing/decreasing precipitation, on the markets and commodities we move. For example, in September and October of 2018, early and continued snowfall in the grain-growing areas of the prairies, along with persistent rain and poor drying conditions, caused unprecedented harvest delays, impacting the entire Western Canadian grain supply chain. Through resiliency planning, CN and its supply chain partners were able to adapt to move historically strong grain shipment volumes in November when the crop was finally harvested and ready to ship.
Upstream	Relevant, always included	We consider exposure to upstream impacts, including the sourcing of fuel from our suppliers. Specifically, CN is susceptible to the volatility of fuel prices due to fluctuations from supply chain disruptions. Fuel shortages could be impacted by climate-related events, which could in turn result in rising fuel prices that could materially adversely affect the results of our operations, financial position or liquidity. We are also assessing the risks associated with the availability and accessibility to renewable fuel compliance units that we need to purchase as part of our compliance obligations under the Federal Renewable Fuel Regulations. Furthermore, we are also working with our locomotive manufacturers to assess the potential risks of sourcing and using renewable fuels for our locomotives.
Downstream	Relevant, always included	We consider the downstream risks of climate-related events on our customers. Specifically, we assess the extent to which climate-related physical and transition risks could affect our customers, making it difficult for our customers to produce products in a cost-competitive manner that would in turn impact the markets we serve. For example, through our assessments we have identified certain commodities moved by CN that could be adversely affected, including our utility coal customers due to thermal coal capacity being replaced with natural gas generation and renewable energy.

## 2. Risks and opportunities

### Management processes (continued)

#### 2.2d How we manage climate-related risks and opportunities

#### Process for managing climate-related risks

Through our integrated risk management process, we assess both inherent (without controls and mitigation measures) and residual (with existing controls and mitigation measures) risks. Where residual risks are substantive to our business based on an assessment of severity and likelihood, we will assess our risk appetite and determine the relevant controls to effectively manage the risks. When determining the appropriateness of controls, we review the economic, technical and financial feasibility of proposed mitigation measures taking into consideration the results of economic modelling and sensitivity analysis testing, where relevant.

#### Physical risk example

We assess the risks of severe weather such as extreme temperatures, flooding, hurricanes, and tornados with the potential to disrupt operations and railroad service. Specifically in 2018, CN productivity and network fluidity were adversely impacted by harsh cold winter conditions at the beginning of the year, wildfires in Northern Ontario in the summer, and early and continued snowfall in the grain-growing areas of the prairies. To manage these risks, we put in place a number of programs, including enhancing our extreme weather readiness plans and emergency response planning, and increasing the frequency of inspections. We also spend considerable funds towards the maintenance of our infrastructure to protect our assets from wear and tear. In 2018, between C\$ 50-100 Million of our operating expenditures was directed towards proactive inspections, maintenance, readiness plans, emergency response and network infrastructure upgrades.

#### Transition risk example

We regularly assess the impact of climate change legislation on our operating costs and revenue potential from the commodities we move. In 2018, we identified regulatory risks related to the Quebec, Ontario and Nova Scotia reporting, verification and Cap and Trade requirements, as well as the carbon taxes in B.C., Alberta and Manitoba. To manage our carbon price risk, we established a flow-through carbon surcharges to our customers, based on economic modelling. Specifically, in B.C. our current fee is C\$0.047 per mile shipped and C\$6.50 per intermodal unit; and, in Alberta, our fee is C\$0.040 per mile shipped and C\$4.00 per intermodal unit.

Furthermore, to manage our regulatory risks associated with emerging cleaner fuel standards, we are developing a renewable fuel strategy for the short to medium-term (less than three years), which we expect will enable us to meet our 2030 science based target.

#### Process for managing climate-related opportunities

We assess the potential opportunities driven by climate related events through our respective business functions as part of our annual planning cycle. We review the impact opportunities may have on our operating costs, revenues and reputation using various economic models, where relevant. Where opportunities are considered substantive for the business, we establish strategies to maximize the benefits supported by operational and capital expenditure allocations.

#### Transition opportunity example

With growing customer pressures to reduce supply chain carbon impacts, we identified opportunities to grow revenue within our carload and intermodal business segments by promoting strategies to shift freight from truck to rail. Specifically, between 2017 and 2018, revenues from our intermodal business segment grew by 8%, representing C\$265 million of which a portion was attributable to truck to rail conversion. Over time, this number could continue to increase. To maximize the opportunity, we collaboratively engage with customers to position the environmental benefits that rail offers for long haul shipments of freight over other modes of transport. We are also investing significantly in the growth of our intermodal business. This investment includes spend on infrastructure as well as equipment. In 2018, intermodal equipment investment included the addition of 100 new refrigerated containers to our CargoCool service fleet to transport temperature-sensitive goods quickly and cost-competitively and handle growth opportunities in this market. In addition, CN is continuing with plans to build a C\$250 million intermodal and logistics hub in Milton, Ontario, to increase CN's capacity to efficiently handle growing intermodal traffic. Beyond capital investment, we are looking at strategic acquisitions that will allow CN to deepen its supply chain flexibility. For example, in 2018 we launched our bid to acquire TransX, one of Canada's most established and largest transportation companies.

## 2. Risks and opportunities

### Risk disclosure

#### 2.3 - 2.3a

Climate-related risks with potential for substantive financial or strategic impact on our business

ID • Where in the value chain the risk occurs	Risk type • Risk driver	Financial impact type	Company-specific description	Time horizon • Likelihood	Magnitude of impact • Potential financial impact	Explanation of financial impact	Cost of management • Management method
Risk 1 • Direct Operations	Transition • Policy and Legal: Increased pricing of GHG emissions	Increased operating costs	In Canada, we are subject to various provincial and Federal GHG reporting, verification, and carbon market regulations. Specifically, in 2018, CN was impacted by the Quebec, Ontario and Nova Scotia GHG Cap and Trade systems, and in B.C. and Alberta, CN was impacted by carbon taxes.  These carbon pricing mechanisms have direct impact on the operational costs of CN, as well as the flow-through cost for CN to customers.	Current • Virtually certain	Medium • C\$60 million	We have estimated the cost impact of climate-related regulations to be approximately C\$60 million in 2018. This cost estimate was calculated by computing the flow-through costs from fuel distributors, carbon taxes, and Cap and Trade allowance purchases associated with the import of fossil fuels.	C\$170,000  • We manage the costs of these climate-related regulations through carbon surcharges for customers and by allocating resources to meet our compliance objectives.  With respect to carbon surcharges, the costs vary by province. For example, within B.C., our current surcharge is C\$0.047 per mile and C\$6.50 per intermodal unit. In Alberta, our surcharge is C\$0.040 per mile and C\$4.00 per intermodal unit. In Quebec, our surcharge is C\$0.025 per mile and C\$0.90 per intermodal unit. In Nova Scotia, our surcharge is C\$0.018 per mile and C\$ 0.90 per intermodal unit. Together, these surcharges cover our financial costs of approximately C\$60 million.  With respect to meeting our compliance obligations, in 2018 we spent approximately C\$170,000 through our Sustainability and Fuel Procurement functions to comply with the respective carbon pricing regulations, through professional services relating to mandatory GHG reporting and third party verification, as well as the purchase of compliance units.
Risk 2 • Customer	Transition • Market: Changing customer behaviour	Reduced demand for goods and/or services due to shift in consumer preferences	Increasing consumer preference for cleaner energy sources to limit the impacts of climate change could affect certain commodities moved by CN, including its utility coal customers due to coal capacity being replaced with natural gas generation and renewable energy.	Medium term • About as likely as not	Medium-high • C\$500 million	In the event that consumer preference was to impact our thermal coal customers to the extent that all coal shipments ceased, it would reduce our rail freight revenues by approximately 4%, equivalent to an estimated C\$500 million in 2018.	C\$500,000  • From a commodity perspective, CN freight revenues are derived from the movement of a diversified and balanced portfolio of goods, including petroleum and chemicals, grain and fertilizers, coal, metals and minerals, forest products, intermodal and automotive. This commodity and geographic diversity better position the Company to face changing GHG regulations.  To manage this risk we continue to maintain a diversified and balanced portfolio of goods. For example, in 2018, no individual commodity group accounted for more than 25% of total revenues.  Furthermore, we also engage with existing and potential customers to promote the environmental benefits of rail and increase our market share in other commodity groups.  The costs associated with communicating with our customers, and exploring opportunities to position CN's carbon efficient rail service is included in the marketing and sustainability functional budgets. Specifically, we have estimated the costs associated with internal resource time, advertising, and consultants to be approximately C\$500,000.

## 2. Risks and opportunities

### Risk disclosure (continued)

ID • Where in the value chain the risk occurs	Risk type • Risk driver	Financial impact type	Company-specific description	Time horizon • Likelihood	Magnitude of impact • Potential financial impact	Explanation of financial impact	Cost of management • Management method
Risk 3 • Direct Operations	Physical • Acute: Increased severity of extreme weather events such as cyclones and floods	Increased capital costs	Extreme temperatures can present a risk to our network and infrastructure. For example, rail misalignments and track buckling are possible from thermal rail expansion, and extreme cold can result in track freezing leading to greater frequency of broken rails, frozen switches, and high rates of wheel replacements. Further, flash floods can result in landslides and mudslides, and cause overflows damaging the rail bed support structures and tracks. Temperature extremes can also impact our sites and networks in the U.S. Tornado Belt, Midwest and New Orleans area, making us vulnerable to increases in tornado occurrences and intensity.	Current • Virtually certain	High • Between C\$75 million and C\$100 million	We calculate the financial costs we have incurred from extreme weather events (e.g. harsh winter conditions, flooding, and wildfires) on our business, including damage to our assets, infrastructure and operations.  In 2018, the financial impact of extreme weather events on our business was estimated to be between C\$75 million and C\$100 million. Specifically, our network was impacted by harsh cold weather conditions adversely affecting network fluidity and productivity, flooding and washouts requiring infrastructure repairs and in some cases relocation of the entire track infrastructure, and one of the busiest wildfire seasons in Ontario in a decade.	C\$100 million  •  To manage the risk, we have in place a number of programs to respond to the physical impacts from climate change, including extreme weather readiness plans, an emergency response planning program, inspection programs and strategies to deploy non-rail modes of transport. For example, for the 2018-2019 winter, we have established rapid-deployment teams to quickly take action when a service disruption occurs. These teams include staff to rework train schedules, as well as develop work and contingency recovery plans to deploy and manage needed equipment and repair crews. Year over year, we expend considerable costs towards the maintenance of our infrastructure to protect the company assets from wear and tear that could be attributable to changes in climate.  For example, in 2018, between C\$50-100 million of our operating expenditures were directed towards proactive inspections, maintenance, readiness plans, emergency response planning, and network infrastructure upgrades to manage the risks of extreme weather events.

## 2. Risks and opportunities

### Opportunity disclosure

2.4 - 2.4a  
Climate-related opportunities with potential for substantive financial or strategic impact on our business

ID • Where in the value chain the opportunity occurs	Opportunity type • Opportunity driver • Type of financial impact	Company-specific description	Time horizon • Likelihood	Magnitude of impact • Potential financial impact	Explanation of financial impact	Strategy to realize opportunity	Cost to realize opportunity • Comments
Opp 1 • Direct Operations	<ul style="list-style-type: none"> <li>Products and Services</li> <li>Development and/or expansion of low emission goods and services</li> <li>Increased revenue through demand for lower emission products and services</li> </ul>	<p>The movement towards carbon pricing in North America coupled with the growing pressures on CN customers to reduce their supply chain carbon emissions present important opportunities for us to position the environmental benefits of rail.</p> <p>Specifically, positioning the environmental benefits of shipping heavy freight by rail over long distances versus by other more carbon intensive modes, such as transport trucks, could present opportunities to grow revenue within our intermodal and carload segments, with customers looking to reduce their transportation supply chain emissions.</p> <p>Railroads are the most environmentally sound way to move freight over land. Shipping freight by rail instead of truck can reduce GHG emissions by up to 75% on average according to the Association of American Railroads (AAR).</p>	<ul style="list-style-type: none"> <li>Current</li> <li>Virtually certain</li> </ul>	<ul style="list-style-type: none"> <li>Medium-high</li> <li>C\$265 million</li> </ul>	<p>Modal shift provides an opportunity to grow revenues within our intermodal and carload business segments, with customers looking to reduce their supply chain emissions by shifting freight shipments from truck to rail.</p> <p>We calculated the C\$265 Million financial impact based on the revenue growth from our intermodal business segment of which a portion was attributable to truck to rail conversion.</p> <p>Specifically, between 2017 and 2018, overall intermodal revenues increased by 8%, representing C\$265 million of which a portion was attributable to truck to rail conversion.</p> <p>Overtime, revenues from this business segment could continue to increase as we grow our market share from truck to rail freight.</p>	<p>We actively engage with existing and potential customers to position the environmental benefits that rail offers for long haul shipments of freight over other modes of transport. We also invest significantly in the growth of our intermodal business, which is part of the overall 2018 C\$3.5 billion in spend allocated to our capital program and includes both infrastructure and equipment investments.</p> <p>Specifically, in 2018 we added 100 new refrigerated containers to our CargoCool service fleet, to transport temperature-sensitive goods quickly and cost-competitively and handle growth opportunities in this market. In addition, CN is continuing with plans to build an intermodal and logistics hub in Milton, Ontario, to further increase CN's capacity to efficiently handle growing intermodal traffic.</p> <p>Also, in 2018, we launched our bid to acquire TransX, one of Canada's most established and largest transportation companies.</p>	<ul style="list-style-type: none"> <li>C\$250 million</li> <li>The cost to realize the opportunity is included in the company's spend allocated to our capital program. Specifically, we estimate the cost of building our Milton intermodal and logistics hub to be C\$250 million</li> </ul>

## 2. Risks and opportunities

### Opportunity disclosure (continued)

ID • Where in the value chain the opportunity occurs	Opportunity type • Opportunity driver • Type of financial impact	Company-specific description	Time horizon • Likelihood	Magnitude of impact • Potential financial impact	Explanation of financial impact	Strategy to realize opportunity	Cost to realize opportunity • Comments
Opp 2 • Customer	Markets • Access to new markets • Increased revenues through access to new and emerging markets	<p>With increasing pressure to reduce our reliance on non-renewable sources of energy, opportunities exist for CN to become the backbone of the clean economy by moving more sustainable energy sources.</p> <p>For example, our revenues in the forest products market segment could increase from demand for wood pellets as an energy source. Similarly, our revenues in the petroleum and chemical markets could increase from demand for biodiesel, and our revenues from the grain market could increase from demand for ethanol. Shipments of wind turbine parts are another potential source of revenue growth, as are shipments of lithium and aluminium for use in electric passenger vehicles.</p>	Current • Virtually certain	Medium • C\$98 million	<p>Moving more sustainable energy sources, as well as the equipment required to generate clean energy, has the potential to positively impact our revenues.</p> <p>Specifically, in 2018, revenues in CN's Forest Product business unit grew by \$98 million vs 2017, a portion of which is related to increased wood pellets demand.</p>	<p>We are working closely with our customers to further develop these business opportunities. This includes proactively engaging with these customers to market the environmental benefits of shipping by rail.</p> <p>For example, in 2018 we worked with Pinnacle Renewable Energy to open its seventh wood pellet plant on CN rail lines in September. Pinnacle's Canadian mills are all situated on CN rail lines, providing an efficient, environmentally friendly mode of transportation for shipping to their terminals on the British Columbia coast.</p>	<p>C\$500,000</p> <ul style="list-style-type: none"> <li>The costs associated with communicating with our customers, and exploring opportunities to position CN's service is included in the Marketing and Sustainability functional budgets.</li> <li>The total costs associated with internal resource time, advertising, and consultants are estimated to be approximately C\$500,000.</li> </ul>
Opp 3 • Direct operations	Energy source • Use of supportive policy incentives • Increased capital availability	<p>Opportunities exist from the increasing availability of government and utility company subsidies for the implementation of energy efficiency projects such as building and technology retrofits.</p> <p>CN's Sustainability and Facilities Management teams leverage subsidies to implement technology retrofit projects in buildings and yards. The projects increase operational efficiency, reduce energy consumption and contribute to lowering emissions and reducing capital and operating costs. Specific types of projects implemented include Heating Ventilation and Cooling (HVAC) system upgrades, installation of more efficient air compressors and yard air lines to charge our train braking systems, and lighting upgrades to LED in our yards and buildings.</p>	Current • Virtually certain	Medium • C\$600,000	<p>In 2018 CN received approximately \$600,000 in subsidies from various government and utility company programs for energy efficiency projects.</p>	<p>In order to maximize the opportunity, we continue to monitor funding opportunities from government and utility company subsidy programs. We actively submit project proposals and continue to collaborate with key utilities on identifying energy efficiency project opportunities.</p> <p>Specifically, in 2018, CN received subsidies from BC Hydro, Manitoba Hydro, Efficiency Nova Scotia, and Commonwealth Edison for energy efficiency projects implemented across our network. These projects mainly involved indoor and outdoor lighting upgrades from older technology to energy-efficient LED.</p>	<p>C\$100,000</p> <ul style="list-style-type: none"> <li>The costs associated with this opportunity are integrated into CN's Sustainability and Facilities Management department budgets, which are estimated at C\$100,000.</li> </ul>

## 2. Risks and opportunities

### Business impact assessment

2.5  
Where and how the identified risks and opportunities have impacted our business

Area and impact	Description
<p>Products and services Impacted</p>	<p><b>Increased revenue from the demand for lower emission products and services</b> The movement towards carbon pricing in North America, coupled with growing pressures on our customers to reduce their supply chain carbon emissions has presented important opportunities for us to position the environmental benefits of shipping freight by rail. By encouraging our customers to shift freight from truck to rail, we are increasing our revenues from our carload and intermodal business segments.</p> <p><b>Magnitude of the Impact</b> We estimate the magnitude of this impact in 2018 to be approximately C\$265 Million based on the revenue increase in our intermodal business segment vs 2017, an increase of 8%, of which a portion is attributable to truck to rail conversion. Over time, revenues from this business segment could continue to increase as we grow our market share from truck to rail freight.</p> <p>Every year, we allocate significant investments in the growth of our intermodal business, which is part of the overall 2018 C\$3.5 billion in spend allocated to our capital program and includes both infrastructure and equipment investments. Specifically, in 2018 we added 100 new refrigerated containers to our CargoCool service fleet, to transport temperature-sensitive goods quickly and cost-competitively and handle growth opportunities in this market. In addition, CN is continuing with plans to build an intermodal and logistics hub in Milton, Ontario, to further increase CN's capacity to efficiently handle growing intermodal traffic. We also look at strategic acquisitions and in 2018, we launched our bid to acquire TransX, one of Canada's most established and largest transportation companies.</p>
<p>Supply chain and/or value chain Impacted</p>	<p><b>Increased operating costs due to increased pricing of GHG emissions</b> CN is susceptible to the volatility of fuel prices due to changes in the economy, supply disruptions that may result from climate-related events, and the implementation of climate change regulations, including carbon pricing on fossil fuels. In 2018, carbon pricing regulations caused fuel suppliers to increase fuel prices in order to flow through cost impacts to their customers. Specifically, in 2018, CN was impacted by the Quebec, Ontario, and Nova Scotia GHG Cap and Trade systems, and in British Columbia and Alberta, CN was impacted by carbon taxes.</p> <p><b>Magnitude of the Impact</b> The magnitude of this impact was contained within the C\$370 million increase in CN's fuel costs in 2018, representing a 27% increase vs 2017. This cost increase was due to a combination of business volume growth, as well as higher fuel prices, a portion of which is attributable to the implementation of carbon pricing on diesel fuel in Canada.</p>
<p>Adaptation and mitigation activities Impacted</p>	<p><b>Increased operating costs due to extreme weather events</b> Adapting to acute weather events, including extreme heat, floods and cyclones, exposes our business to damage in our infrastructure, assets, and operations leading to financial impacts. For example, rail misalignments and track buckling are possible from thermal rail expansion, and extreme cold could result in track freezing leading to greater frequency of broken rails, frozen switches, and high rates of wheel replacements. Further, flash floods can result in landslides and mudslides, and cause overflows damaging the rail bed support structures and tracks. Temperature extremes can also impact our sites and networks in the U.S. Tornado Belt, Midwest and New Orleans area, making us vulnerable to increases in tornado occurrences and intensity. We regularly monitor potential rail misalignments and track buckling from thermal rail expansion, and damage to rail bed support structures and tracks from flash floods, tornadoes, and harsh cold weather conditions.</p> <p><b>Magnitude of the Impact</b> The financial impact of extreme weather events varies from year to year. In 2018, the financial impact of extreme weather events on our business was estimated at C\$77 Million. Specifically, our network was impacted by harsh cold weather conditions adversely affecting network fluidity and productivity, flooding and washouts requiring infrastructure repairs and in some cases relocation of the entire track infrastructure, and one of the busiest wildfire seasons in Ontario in a decade. Through our financial planning process we allocate operational expenditures to respond to physical changes from climate change, including extreme weather readiness plans, emergency response planning, inspection programs and strategies to deploy non-rail modes of transport. In 2018, up to C\$100 Million of our operating expenditures was directed towards proactive inspections, readiness plans, emergency response plans, and network infrastructure upgrades.</p>
<p>Investment in R&amp;D Not yet impacted</p>	<p><b>Potential impact - reduced operating costs through efficiency gains</b> Working in collaboration with the Université de Montréal, CN has invested in a 5 year optimization research project to develop mathematical models that have the potential to improve operational and fuel efficiency (and reduce carbon emissions). These models focus on two key areas for efficiency improvements: optimized locomotive power on trains, and improved aerodynamics of intermodal trains. Preliminary results have been produced and are under review. CN is in year 2 of this research project and thus the business impacts have not yet been realized.</p> <p><b>Potential time scale for the impact</b> Timing for the results of this research to impact our business is estimated to be in the longer term, potentially over the next 3 to 5 years.</p>
<p>Operations Impacted</p>	<p><b>Increased capital availability through supportive policy incentives</b> The implementation of energy efficiency projects at our buildings and yards has been impacted through increasing availability of government and utility company incentives for these types of projects. CN's Sustainability and Facilities Management teams leverage incentives to implement projects in our buildings and yards that increase operational efficiency, reduce energy consumption and contribute to lowering emissions and reducing capital and operating costs. Specifically, in 2018, CN received subsidies from BC Hydro, Manitoba Hydro, Efficiency Nova Scotia, and Commonwealth Edison for energy efficiency projects implemented at rail yards across our network.</p> <p><b>Magnitude of the Impact</b> In 2018 CN benefited from increased capital availability for energy efficiency projects of approximately \$600,000 through the various government and utility company programs.</p>

## 2. Risks and opportunities

### Financial planning assessment

#### 2.6

Where and how the identified risks and opportunities have factored into our financial planning process

Area	Relevance	Description
Revenues	Impacted	As part of our financial planning processes, we assess the potential revenues and growth projections from individual commodity groups, which includes impacts from climate-related risks and opportunities. Specifically, as part of the review of our intermodal business segment, taking into consideration market trends and customer demands for more environmentally friendly and fuel-efficient options for freight transportation through modal shift, we established growth targets and investment strategies. <i>Magnitude:</i> In 2018, our intermodal business segment saw an increase of approximately C\$265 Million in revenues vs 2017 (8%), of which a portion is attributable to truck to rail conversion. Over time, revenues from this business segment could continue to increase as we grow our market share from truck to rail freight.
Operating costs	Impacted	As part of our financial planning process, we track the potential impact of climate-related events on our operating costs. Specifically, in 2018, we took into consideration the financial impact associated with compliance costs related to carbon pricing regulatory regimes (including fuel distributor flow through costs, carbon taxes, and Cap and Trade allowance purchases associated with the import of fuel), operational costs from extreme weather events on our network, and operating costs to position the environmental benefits of rail with our customers. As part of the financial planning process, we allocate the necessary funds through departmental operating budgets. <i>Magnitude:</i> In 2018, the magnitude of the operating costs (taking into consideration both the financial impact and management costs of climate-related risks) were estimated to be approximately C\$170,000 to ensure our compliance with carbon regulatory requirements, approximately C\$60 million in carbon pricing costs, C\$77 million for weather events, and approximately C\$500,000 for marketing the environmental benefits of rail.
Capital expenditures / capital allocation	Impacted	On an annual basis, as part of our financial planning process we allocate a significant budget to our capital program. This includes capital expenditures to acquire a new fleet that is compliant with U.S EPA and Canada emission limit standards for locomotives, as well as fleet purchases for growing business segments like intermodal. <i>Magnitude:</i> In 2018, CN allocated C\$500 million for capital equipment expenditures, which included the acquisition of 65 new high-horsepower locomotives. These new locomotives will enable us to meet emission standards and drive even greater fuel and cost saving efficiencies across our business. It also included 100 new refrigerated containers to our CargoCool service fleet, to transport temperature-sensitive goods quickly and cost-competitively and handle growth opportunities in this market.
Acquisitions and divestments	Impacted	As part of our financial planning process, we target acquisitions that support our business growth strategy, including those that could allow us to take advantage of climate-related opportunities like modal shift. Specifically, in 2018, we launched our bid to acquire TransX, one of Canada's most established and largest transportation companies. <i>Magnitude:</i> In 2018, our intermodal business segment saw an increase of approximately C\$265 Million in revenues vs 2017 (8%). Over time, revenues from this business segment could continue to grow as we move forward with our business growth strategy.
Assets	Impacted	As part of our financial planning process, our Network Transportation and System Engineering Function, will assign specific budgets to ensure we plan for potential disruptions to our network and impacts on our assets from extreme weather events. In 2018, the magnitude of the impact, taking into account both financial impact and management costs, was approximately C\$177 million for extreme weather events.
Liabilities	Not impacted	As part of our financial planning process, we have not had to plan for specific liabilities associated with climate-related risks. Carbon pricing regulation costs (specifically with respect to cap and trade costs and carbon taxes) are passed through to our customers through surcharges. As a result, these costs do not present a liability for our business.
Access to capital	Impacted	As part of our financial planning process, we factored access to capital from various state and provincial government efficiency incentive programs into our 2018 budget. CN's Sustainability and Facilities Management teams leverage these subsidies to implement energy efficiency projects in our buildings and yards. <i>Magnitude:</i> In 2018, the magnitude of the impact of these incentives was approximately C\$600,000 through subsidies received from BC Hydro, Manitoba Hydro, Efficiency Nova Scotia, and Commonwealth Edison. The added capital from these programs allowed us to complete several indoor and outdoor lighting upgrades from older technology to energy-efficient LED technology.
Other, please specify	N/A	N/A



**Business strategy**

## 3. Business strategy

### 3.1 - 3.1c

Climate-related issues are integrated into our business strategy and qualitative and quantitative scenario analysis informs our business strategy. Additionally, we have developed a low-carbon transition plan to support our long-term business strategy

#### **i) How the business objectives and strategy have been influenced by climate-related issues**

To inform our business strategy and objectives, we take into consideration a broad range of factors, including relevant climate related issues. For example, we review our carbon and fuel efficiency performance to inform fleet management and conservation strategies, the frequency and severity of extreme weather events on our network to inform our capital program investments, locomotive emission standards to inform our fleet renewal strategy, changing customer demands for environmentally friendly rail services to inform business segment marketing strategies, and carbon pricing implications on our business to inform procurement, financial, and pricing strategies. For example, over the last two years, CN's network fluidity and productivity have been adversely affected by increasingly harsh, cold winter conditions. To minimize these impacts, CN prepared for the 2018-2019 winter by putting in place our largest ever capital expansion program adding new infrastructure needed to boost the railway's capacity and network resiliency.

Also in 2018, as a result of the evolving carbon pricing landscape in some Canadian provinces, we estimated a financial impact on our business of approximately C\$60 million, which further informed our pricing strategy to flow-through the cost to our customers by establishing surcharges within the respective Canadian provinces.

#### **ii) Explanation of whether the business strategy is linked to an emission reduction target**

Our business strategy, anchored on the continuous pursuit of operational and service excellence, is tied to our science-based target to reduce our GHG emission intensity (tCO<sub>2</sub>e/million tonne kilometres) by 29% by 2030 based on 2015 levels. With almost 90% of our

direct GHG emissions generated from rail operations, our focus is to continuously improve our locomotive fuel efficiency and reduce our carbon emissions. Our significant investments in innovative rail technology applications and analytics capabilities are helping us continuously reduce our carbon footprint. By leveraging Trip Optimizer technology, locomotive throttle and dynamic braking we are improving our fuel efficiency. Our Horsepower Tonnage Analyzer (HPTA) also uses data to optimize a locomotive's horsepower-to-tonnage ratio and conserve fuel. These investments in locomotive efficiency, combined with our significant investments in network capacity, fluidity, and resiliency to boost operational efficiency, will help us to achieve our target.

#### **iii) The most substantial business decision in the reporting year influenced by climate change**

Our most substantial business decision in 2018 influenced by climate change was our decision to start investing a larger share (25%) of our revenue in capital expenditures to further grow our operational capabilities. In 2018, we implemented our largest-ever capital expansion program to add new infrastructure needed to boost the railway's capacity, fluidity and resiliency. This included investment in double track and yard capacity to allow CN to better manage through and recover from unplanned network disruptions, as well as the addition of new, more efficient locomotives. Specifically, in 2018, CN invested a record C\$3.5 billion in its capital program, with C\$1.6 billion invested to maintain the safety, integrity and fluidity of the network, C\$1.0 billion on strategic initiatives to increase capacity, enable growth and improve network resiliency, including line capacity upgrades and information technology initiatives, and C\$500 million on equipment capital expenditures including 65 new high-horsepower locomotives.

## 3. Business strategy

### 3.1d Our use of climate-related scenario analysis

Climate-related scenario	Description
2DS	<p>CN collaborated with the Science-Based Targets Initiative (SBTI) on a science based target setting approach within the freight rail sector.</p> <p>In setting our target, we made business growth projections, applied key assumptions on efficiency gains that could be made through the use of existing and yet-to-be developed fuel efficiency technologies, and incorporated growing emissions reductions resulting from increasingly stringent regulations on life-cycle emissions from fuels. These assumptions enabled us to set a 2 degree climate science target to reduce our GHG emission intensity (tCO<sub>2</sub>e/million tonne kilometres) by 29% by 2030 based on 2015 levels. This target anchors our future low carbon transition plan, to continuously improve our efficiency and to use cleaner more sustainable fuels in our rail locomotive operations. Details of the model are presented below.</p> <p><b>Boundaries and Time Horizons</b></p> <p>Our climate scenario analysis is based on our Scope 1 and 2 direct GHG emissions related to all aspects of our business, including rail locomotives, other fleets, and our buildings and yards. The climate scenario analysis was conducted using a 15 year time horizon from 2015 to 2030, inclusive. The time horizon of 2030 is relevant to our business context in North America, which aligns with Canada's GHG 2030 reduction target as well as the time it will take to realistically assess the feasibility and application of cleaner less GHG intensive fuels for our rail locomotives.</p> <p><b>Methodology</b></p> <p>Inputs: The key inputs into the model included a sector target based on the International Energy Agency (IEA) – Energy Technology Perspectives 2016 document; CN company-specific emissions and activity data in tonne kilometres for the selected baseline year of 2015; CN forecast emissions and rail transportation activity in tonne kilometres for the target year of 2030.</p> <p>Assumptions: As part of the model, we assumed business growth in line with forecasts developed by CN's Finance department, taking into consideration CN's business mix, as well as relevant market and economic factors. We also incorporated increasingly ambitious efficiency gains over the 2017-2030 period, along with increasing volumes of renewable fuel blending.</p> <p>Analytical Methods: The method to conduct the analytics was based on the SBTi rail freight sector model, which provided the basis for determining the target pathway. The model applies transportation mode-specific emission and activity forecasts and targets from the IEA – Energy Technology Perspective 2016 document.</p> <p>Changes from the reference scenario: There were no specific changes from the reference scenario of the SBTi rail freight sector model.</p> <p><b>Results and Outcomes</b></p> <p>The scenario analysis model resulted in a reduction target requirement of 29% of our GHG emission intensity (tCO<sub>2</sub>e/million tonne kilometres) by 2030 based on 2015 levels. This target has now been used to set our low carbon transition plan. We obtained formal approval from the SBTi for the target and use of their scenario analysis, and now publicly report the target through our CDP submission along with tracking and monitoring performance annually in our sustainability reporting through our GRI Data Supplement.</p> <p><b>Changes to the Strategy and Case Example of Impact on Corporate Objectives from the Scenario Analysis</b></p> <p>In 2018, working as a member of the Railway Association of Canada (RAC), we developed a Memorandum of Understanding with Transport Canada to establish voluntary reduction targets for emissions produced by locomotives in Canada. The MOU establishes a framework through which the RAC, its members, and Transport Canada will reduce greenhouse gases (GHGs) emitted by locomotives operated by Canadian-owned railways. Class 1 freight railways have committed to an emissions intensity reduction target of 6% by 2022 based on 2017. This industry target will further contribute to achieving our corporate target developed through scenario analysis.</p>

### 3. Business strategy

#### 3.1e Our low-carbon transition plan

Our low carbon-carbon transition plan has been developed to meet our science-based target of 29% GHG emission intensity (tCO<sub>2</sub>e/million tonne kilometres) reduction by 2030 based on 2015 levels. With almost 90% of our direct GHG emissions generated from rail operations, our low carbon transition plan is mainly focused on continuously improving our rail locomotive fuel efficiency and increasing the use of renewable fuel blends. Our low carbon transition plan is specifically focused on:

- a) **Fleet renewal:** Continue to purchase tier-compliant locomotives as part of our strategy to acquire, retire and upgrade our fleet. We ordered 260 new GE Tier 4 locomotives to be delivered over the next 3 years. We received 65 new locomotives in 2018 and will be taking delivery of 140 more in 2019, with the balance to be delivered in 2020. These new locomotives are equipped with GE Transportation's GoLINC Platform, Trip Optimizer system and Distributed Power LOCOTROL eXpanded Architecture to maximize train effectiveness and efficiency. The purchases of these locomotives are part of our annual equipment capital expenditures to which we allocated C\$500 million in 2018 and are allocating a further \$C800 million in 2019. These locomotive acquisitions will allow CN to accommodate future growth opportunities and further drive fuel and operational efficiency.
- b) **Fuel-efficient technologies and data analytics:** Continue to install and optimize the use of fuel-efficient technologies and data analytic capabilities to optimize the efficiency of our fleet. This includes:
  - a. Trip optimizer to regulate the speed of a train by controlling the locomotive throttle and dynamic brake, and compute the most fuel efficient manner to handle the train;
  - b. Locomotive Telemetry System to collect data to drive improved locomotive and train performance, including fuel conservation. Our Horsepower Tonnage Analyzer (HPTA) also uses the data from the system to optimize a locomotive's horsepower-to-tonnage ratio for efficiency.
  - c. Distributed Power (DP) to remotely control the locomotive and improve braking performance, train handling and fuel efficiency.

- c) **Fuel conservation practices:** We are focused on training our train crews and rail traffic controllers on best practices for fuel conservation, including locomotive shutdowns in our yards, streamlined railcar handling, train pacing, coasting and braking strategies. We are also training our locomotive engineers on-the-job on technologies to optimize fuel consumption. Our future focus will be on excess idling reduction and continued horsepower optimization.
- d) **Renewable fuels:** Driven by regulatory requirements, the growth of the renewable fuel market has presented an important opportunity for us to further reduce our emissions by using renewable fuel blends in our locomotive fleet. As part of our plan, we will be focusing our efforts on working with our suppliers to explore the use of renewable fuels as an important part of how we meet our regulatory compliance obligations and efficiency objectives in line with our science based target.

Furthermore, we are also working hard to reduce our non-rail GHG emissions, as well as the GHG emissions from our buildings and yards. We worked with our owner-operated CNTL trucking fleet to develop fuel efficiency standards and continue to provide training on various fuel-efficiency initiatives, including aerodynamic components and trucks, and routing optimization initiatives. In addition, in early 2019, CN signed a Memorandum of Understanding with the Lion Electric Co. for the conception, design and manufacturing of eight tandem axle, Class 8, zero-emission, electric trucks as part of our larger sustainability strategy to reduce emissions through innovations. We also trained our OCS (On Company Service) drivers and ship operators on better fuel handling practices that reduce speed, engine running and idling time. Through our various EcoConnexions programs, we have been engaging our employees, communities and customers to help us make a difference and achieve our environmental goals of reducing emissions, conserving energy and increasing biodiversity. Since our employee program was launched in 2011, we have reduced our energy consumption at key yards and facilities by 17% and saved over 111,000 tonnes of CO<sub>2</sub>e.



# Targets and performance

## 4. Targets and performance

### Targets

4.1 - 4.1b  
Our target

Target reference number	Scope	% of emissions in Scope	% reduction from base year	Metric	Base year	Start year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	% achieved (emissions)	Target status	Explanation	% change anticipated in absolute Scope 1 & 2 emissions	% change anticipated in absolute Scope 3 emissions
INT1	1 and 2 (location-based)	100%	29%	tCO <sub>2</sub> e per million tonne kilometres	2015	2017	15.98 tCO <sub>2</sub> e/million tonne km	2030	Yes, approved	8%	Underway	CN has completed the third year of our 15 year science-based target approved by the SBTI. In 2018 we achieved an emission intensity reduction of 2.3% from fuel consumption related to locomotives and other fleets and energy consumption at our buildings and yards (tCO <sub>2</sub> e/million tonne km) based on 2015 levels. This was in line with our projected target pathway given the operational challenges encountered in 2018. Specifically, a combination of low network resiliency in some high volume areas and extremely harsh winter conditions impacted our operational efficiency. We have since ramped up our capital expenditures (\$3.5 billion in 2018 and \$3.9 billion in 2019) to grow our operational capabilities and increase the fluid movement of trains on our network. Scope 3 emissions are not included in our target as they represent less than 40% of our total Scope 1, 2 & 3 emissions.	-9%	0%

## 4. Targets and performance

### Emission reduction initiatives

4.3 - 4.3b  
Emission reduction initiatives active within the reporting year

Stage of development	Number of projects	Total estimated annual CO <sub>2</sub> e savings
Under investigation	0	0
To be implemented	0	0
Implementation commenced	0	0
Implemented	5	363,776
Not to be implemented	0	0

Initiative type	Description of initiative	Estimated annual CO <sub>2</sub> e savings (tCO <sub>2</sub> e)	Scope	Voluntary / Mandatory	Annual monetary savings	Investment required	Payback period	Estimated lifetime of the initiative	Comments
Process emission reductions	New equipment	360,286	Scope 1	Voluntary	C\$107 million	C\$500 million	4-10 years	> 30 years	The estimated emissions savings relate to Scope 1 emissions covering our rail locomotives. In 2018 we continued to implement projects related to our rail locomotive emissions and energy efficiency strategy, which represent almost 90% of our direct greenhouse gas emissions. This includes new locomotive acquisitions, fuel efficiency training for our locomotive engineers, installation of new locomotive technologies such as Trip Optimizer and CN's locomotive telemetry system, and installation of anti-idling devices. These projects will help us achieve our science based emissions intensity reduction target of 29% in 2030, based on 2015 levels.
Energy efficiency: building services	Various projects	3,489	Scope 2 (location-based)	Voluntary	C\$931,000	C\$4.6 million	4-10 years	11-15 years	We continue to work to reduce Scope 2 emissions from electricity consumption at our buildings and yards. We invest in energy efficiency projects including HVAC, lighting and air compressor upgrades. This includes a C\$5 million dollar EcoFund to support energy and emission reduction projects.

## 4. Targets and performance

### Emission reduction initiatives (continued)

#### 4.3c Methods used to drive investments in emission reduction activities

Method	Comments
Compliance with regulatory requirements / standards	Through the US EPA and Environment Canada Locomotive Emission Standards, CN continues to follow-through on its commitment to acquire, retire and upgrade locomotives so as to improve air quality, enhance rail fuel efficiency and reduce rail GHG emission intensity. Based on this obligation, we assess our locomotive fleet annually through financial optimization calculations to determine the budget that would be necessary to meet our commitments in the context of our business needs. For example, in 2018 we invested C\$500 million for equipment expenditures, including 65 new high-horsepower locomotives. In 2019, we are targeting approximately C\$800 million for equipment expenditures, including a further 140 new high-horsepower locomotives.
Dedicated budget for energy efficiency	We invest in the efficiency of our locomotive fleet beyond our regulatory compliance obligations. This includes new rail technologies such as Trip Optimizer, Automatic Engine Start / Stop devices, Locomotive Telemetry, which wirelessly communicates operational data from locomotives to a central system, and Horse Power Tonnage Analyzer (HPTA), which uses the data collected by Locomotive Telemetry to optimize a locomotive's horsepower-to-tonnage ratio.
Employee engagement	Our employees are integral to our ability to reduce energy consumption. Our EcoConnexions employee engagement program, launched in 2011, is focused on embedding environmental sustainability into our culture, including targeted initiatives to reduce energy consumption and emissions. Through the EcoConnexions program, our employees are engaged to make a difference. With the help of dedicated EcoChampions across our network we are working collaboratively to share best practices and reduce our environmental impact.
Dedicated budget for energy efficiency	Energy efficiency is part of our science based target to reduce our GHG emission intensity by 29% by 2030, based on 2015 levels. To meet this objective, we identified processes and equipment where the biggest reductions were possible by reviewing our energy management data information. Once identified, we conducted a business analysis to determine the key projects that could support our reduction initiatives.  We then assessed the projects based on saving potentials, investment needs and return on investment calculations. Feasible projects are financed through a dedicated energy management budget, facility specific budgets and through subsidies / grants. We have also established a dedicated EcoFund budget of C\$ 5 million annually for our emission and energy reduction activities as identified through our EcoConnexions employee engagement program.
Internal incentives / recognition programs	Through our Employee Performance Scorecard, a percentage of the bonus structure is allocated to meeting corporate objectives, including our fuel efficiency objectives. These incentive contributions vary according to employee levels within the organization, and the extent to which the employee contributes to meeting objectives.

## 4. Targets and performance

### Low-carbon products

#### 4.5 - 4.5a

How our services directly enable GHG emissions to be avoided by third parties

Level of aggregation	Description of product	Low-carbon products or avoided emissions	Taxonomy, project or methodology used to classify products as low-carbon or to calculate avoided emissions	% revenue from low-carbon products	Comments
Product	The rail freight service we provide, representing 95% of our business, enables our customers to move goods over land in the most efficient and environmentally friendly way. On average, trains are approximately four times more fuel efficient than trucks. They also reduce highway congestion, lower GHG emissions and reduce air pollution.	Low-carbon products	Low-Carbon Investment (LCI) Registry Taxonomy	95%	We continue to invest in greener and cleaner technologies and more efficient practices, to strengthen our low carbon rail freight service, enabling our customers to reduce GHG emissions.
Product	Our intermodal freight shipping service combines the resources of different transportation modes, such as trucking and rail. Intermodal helps our customers reduce emissions by leveraging rail for the long haul and trucking over shorter distances.	Avoided emissions	Other – see comment	24%	Moving freight by rail instead of truck lowers GHG emissions by 75%. To leverage these benefits, we work with many of our customers, providing them with a GHG calculator, based on our industry leading modal shift quantification protocol, which allows them to calculate their total transportation supply chain emissions and determine where they can achieve carbon savings by switching heavy long-haul freight from truck to rail.



# **Emissions methodology**

## 5. Emissions methodology

### Base year emissions

5.1  
Base year and base year  
emissions (Scope 1 and 2)

Scope	Base year start	Base year end	Base year emissions (metric tonnes CO <sub>2</sub> e)
Scope 1	Jan. 1, 2015	Dec. 31, 2015	5,339,172
Scope 2 (location-based)	Jan. 1, 2015	Dec. 31, 2015	193,613
Scope 2 (market-based)	N/A	N/A	N/A

### Emissions methodology

5.2  
Protocol used to calculate  
Scope 1 and 2 emissions

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)



**Emissions data**

## 6. Emissions data

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### Scope 1 emissions data

6.1  
Gross global Scope 1  
emissions in 2018

5,776,183 metric tonnes CO<sub>2</sub>e

### Scope 2 emissions reporting

6.2  
Approach to reporting  
Scope 2 emissions

Scope 2, location-based	Scope 2, market-based
We are reporting a Scope 2, location-based figure	We have no operations where we are able to access electricity supplier emissions factors or residual emissions factors and are unable to report a Scope 2, market-based figure

### Scope 2 emissions data

6.3  
Gross global Scope 2  
emissions in 2018

188,992 metric tonnes CO<sub>2</sub>e

6.4  
Sources of Scope 1 and  
Scope 2 emissions not  
included in our disclosure

None.

## 6. Emissions data

### Scope 3 emissions data

#### 6.5 Sources of Scope 3 emissions

Sources of Scope 3 emissions	Evaluation status	Metric tonnes of CO <sub>2</sub> e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	314,304	Emissions for purchased goods were calculated using volumes of key purchased goods by type of material applied against applicable emission factors from the Greet 2018 and ICE 2.0 models. Emissions for purchased services were calculated following an environmental economic input-output methodology using data from the World Input Output database. Emission factors on a tCO <sub>2</sub> e per \$ basis were calculated by economic sector. The sector- appropriate emission factor was then applied against the 2018 expenditures for that sector to calculate total emissions.	100%	Volumes of purchased goods by type of material as well as dollars spent on purchased services were obtained directly from supplier invoice data in our SAP system. Note: Methodology for extracting volumes of rail and other track material was updated to reflect the year the goods were received by CN, vs previous years' data which was extracted based on the year the purchase order was issued. There can be a lag of several months between purchase order date and receipt of goods.
Capital goods	Relevant, calculated	411,523	Emissions for capital goods were calculated using volumes of key capital goods by type of material applied against applicable emission factors from the Greet 2018 and ICE 2.0 models.	100%	Volumes of capital goods by type of material were obtained directly from supplier invoice data in our SAP system. Note: Methodology for extracting volumes of rail and other track material was updated to reflect the year the goods were received by CN, vs previous years' data which was extracted based on the year the purchase order was issued. There can be a lag of several months between purchase order date and receipt of goods.
Fuel- and energy-related activities (not included in Scope 1 and 2)	Relevant, calculated	1,669,529	Upstream emissions from the production of diesel fuel used to operate our locomotives were calculated using the GHGenius version 5.0 calculation tool.	100%	Litres and gallons of fuel purchased by jurisdiction were obtained directly from supplier invoice data in our SAP system.
Upstream transportation and distribution	Relevant, calculated	4,109	Emissions were calculated following an environmental economic input-output methodology using data from the World Input Output database. Emission factors on a tCO <sub>2</sub> e per \$ basis were calculated by economic sector. The sector- appropriate emission factor was then applied against the 2018 expenditures for upstream transportation to calculate total emissions.	100%	Dollars spent on upstream transportation and distribution were obtained directly from supplier invoice data in our SAP system.
Waste generated in operations	Relevant, calculated	41,397	Emissions were estimated using standard emission factors multiplied by activity level formulas. Tons of waste generated by disposal method for 2018 were obtained from internal data sources. Emission factors were obtained from various sources including Canada's National Inventory Report, 1990-2016, 2006 IPCC Guidelines for National Greenhouse Gas Inventories Metal Industry Emissions, and the Ecoinvent database V3.	100%	Tons of waste generated by disposal method were obtained directly from our suppliers.
Business travel	Relevant, calculated	47,796	Compilation from corporate travel service providers	100%	Business travel emissions were obtained directly from suppliers handling CN's business travel needs (airlines, passenger rail, etc.)
Employee commuting	Not relevant	N/A	N/A		Employees travel to and from work using road transport (car or bus) or commuter train or subway. These scope 3 emissions are not considered significant when compared to other sources of scope 3 emissions such as fuel production.

## 6. Emissions data

### Scope 3 emissions data (continued)

Sources of Scope 3 emissions	Evaluation status	Metric tonnes of CO <sub>2</sub> e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Upstream leased assets	Not relevant, explanation provided	N/A	N/A		We lease rail cars and some rail equipment. These Scope 3 emissions are not considered significant when compared to other sources of Scope 3 emissions such as fuel production.
Investments	Not relevant, explanation provided	N/A	N/A		Investments of pensions are conducted through the pension committee. These Scope 3 emissions are not considered significant when compared to other sources of Scope 3 emissions such as fuel production.
Downstream transportation and distribution	Not relevant, explanation provided	N/A	N/A		As a transport and logistics services company, we are part of the transportation supply chain. These Scope 3 emissions are not considered significant when compared to other sources of Scope 3 emissions such as fuel production.
Processing of sold products	Not relevant, explanation provided	N/A	N/A		As a transport and logistics services company, we do not process a sold product.
Use of sold products	Not relevant, explanation provided	N/A	N/A		We do not process a sold product that is then used by third parties. We offer a transportation and logistics service.
End-of-life treatment of sold products	Not relevant, explanation provided	N/A	N/A		We do not process a sold product where the end of life treatment of sold products is relevant.
Downstream leased assets	Not relevant, explanation provided	N/A	N/A		We do not lease assets downstream.
Franchises	Not relevant, explanation provided	N/A	N/A		We do not own any franchises.
Other (upstream)					
Other (downstream)					

## 6. Emissions data

### Carbon dioxide emissions from biologically sequestered carbon

#### 6.7 - 6.7a

Carbon dioxide emissions from the combustion of biologically sequestered carbon

66,683 metric tonnes CO<sub>2</sub>e.

Comment: The biologically sequestered carbon reported here relates to volumes of renewable fuel consumed by our locomotives.

### Emissions intensities

#### 6.10

Gross global combined Scope 1 and 2 emissions per unit total revenue in 2018

Intensity figure	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: unit	Metric denominator: unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.000417	5,965,175	Unit total revenue	14,321,000,000	Location-based	4.2%	Decreased	On a unit total revenue basis, CN's emissions intensity decreased due to a combination of continued emissions reduction activities relating to fuel efficiency for our locomotives and other fleets, as well as energy reduction projects at our key yards, and an overall increase in our annual revenues.

## 6. Emissions data

### Emissions intensities: Transport services

#### 6.15 Intensity metrics by activity

Activity	Scope used for calculation of intensities	Intensity figure	Metric numerator (emissions in metric tonnes CO <sub>2</sub> e)	Metric denominator: unit	Metric denominator: unit total	% change from previous year	Please explain any exclusions in your coverage of transport emissions in selected category, and reasons for change in emissions intensity.
Rail	Scope 1	.00001405	5,095,382	t.km	362,626,000,000	-0.03%	The reported intensity figure covers 100% of our scope 1 rail transport emissions. Overall, in 2018 our rail emissions intensity on a tonne-km basis remained flat due to a combination of low network resiliency in some high volume areas and extremely harsh cold weather conditions impacting our rail operational efficiency vs 2017.
HDV	Scope 1	0.00008169	149,620	t.km	1,832,000,000	-2.2%	The reported intensity figure covers 100% of the scope 1 emissions from our CNTL truck fleet. Overall, our truck emissions intensity in 2018 decreased vs 2017 due to fuel efficiency gains.
Marine	Scope 1	0.00001110	192,860	t.km	17,377,000,000	-1.0%	The reported intensity figure covers 100% of the scope 1 emissions from our Great Lakes Vessel fleet. Overall, our marine emissions intensity in 2018 decreased vs 2017 due to the ongoing engine upgrade program to replace old diesel engines on our vessel fleet with new, more fuel-efficient EPA compliant engines.
ALL	Scope 1	0.00001424	5,437,862	t.km	381,835,000,000	-0.2%	The reported figure covers 100% of the scope 1 emissions from our freight transportation fleet. In 2018 our overall freight transportation fleet emissions intensity decreased slightly vs 2017, mainly due to efficiency gains by our truck and marine fleets.



# Emissions breakdown

## 7. Emissions breakdown

### Scope 1 breakdown: GHGs

#### 7.1 - 7.1a

Total gross global Scope 1 emissions by greenhouse gas type

Greenhouse gas	Scope 1 emissions (metric tonnes of selected GHG, in CO <sub>2</sub> e)	GWP Reference
CO <sub>2</sub>	5,294,356	IPCC Fifth Assessment Report (AR5 – 100 year)
CH <sub>4</sub>	8,331	IPCC Fifth Assessment Report (AR5 – 100 year)
N <sub>2</sub> O	473,496	IPCC Fifth Assessment Report (AR5 – 100 year)

#### 7.2

Total gross global Scope 1 emissions by country

Country / Region	Scope 1 metric tonnes CO <sub>2</sub> e
Canada	4,074,042
U.S.	1,702,141

#### 7.3 - 7.3c

Total gross global Scope 1 emissions by activity

Activity	Scope 1 metric tonnes CO <sub>2</sub> e
Locomotives	5,095,382
Intermodal trucks	149,620
Marine fleet	192,860
On Company Service fleet	95,664
Miscellaneous fuel consumption	180,334
Intermodal equipment	62,323

### Scope 1: sector production activities

#### 7.4

Total gross global Scope 1 emissions by sector production activity

Sector production activity	Gross Scope 1 emissions (metric tonnes CO <sub>2</sub> e)	Comment
Transport services activities	5,680,519	Our Scope 1 emissions that are dependent on being part of the transport services sector include emissions from our locomotive, marine and truck fleets, as well emissions from the combustion of fuels to operate ancillary equipment in our yards. Excluded from this figure are the emissions from the operation of our company vehicles used mainly for work activities along our rail network.

## 7. Emissions breakdown

### Scope 2 breakdown: country

7.5  
Total gross global  
Scope 2 emissions by  
country

Country / Region	Scope 2, location based (metric tonnes CO <sub>2</sub> e)	Scope 2, market-based (metric tonnes CO <sub>2</sub> e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Canada	60,606	N/A	345,585	N/A
U.S.	128,387	N/A	246,189	N/A

### Scope 2: business breakdowns

7.6 - 7.6a  
Total gross global  
Scope 2 emissions by  
business division

Business Division	Scope 2, location-based (metric tonnes CO <sub>2</sub> e)
Western	51,361
Eastern	9,244
Southern	128,387

### Scope 2: sector production activities

7.7  
Total gross global  
Scope 2 emissions by  
sector production activity

Sector production activity	Scope 2, location-based, (metric tonnes CO <sub>2</sub> e)	Scope 2, market based (metric tonnes CO <sub>2</sub> e)	Comment
Transport services activities	0	N/A	CN's Scope 2 emissions are related to the consumption of electricity in our buildings and yards. We do not generate Scope 2 emissions during our transport operational activities. Specifically, we do not currently operate any electric rail locomotives due to technical and economic feasibility challenges in North America.

## 7. Emissions breakdown

### Emission performance

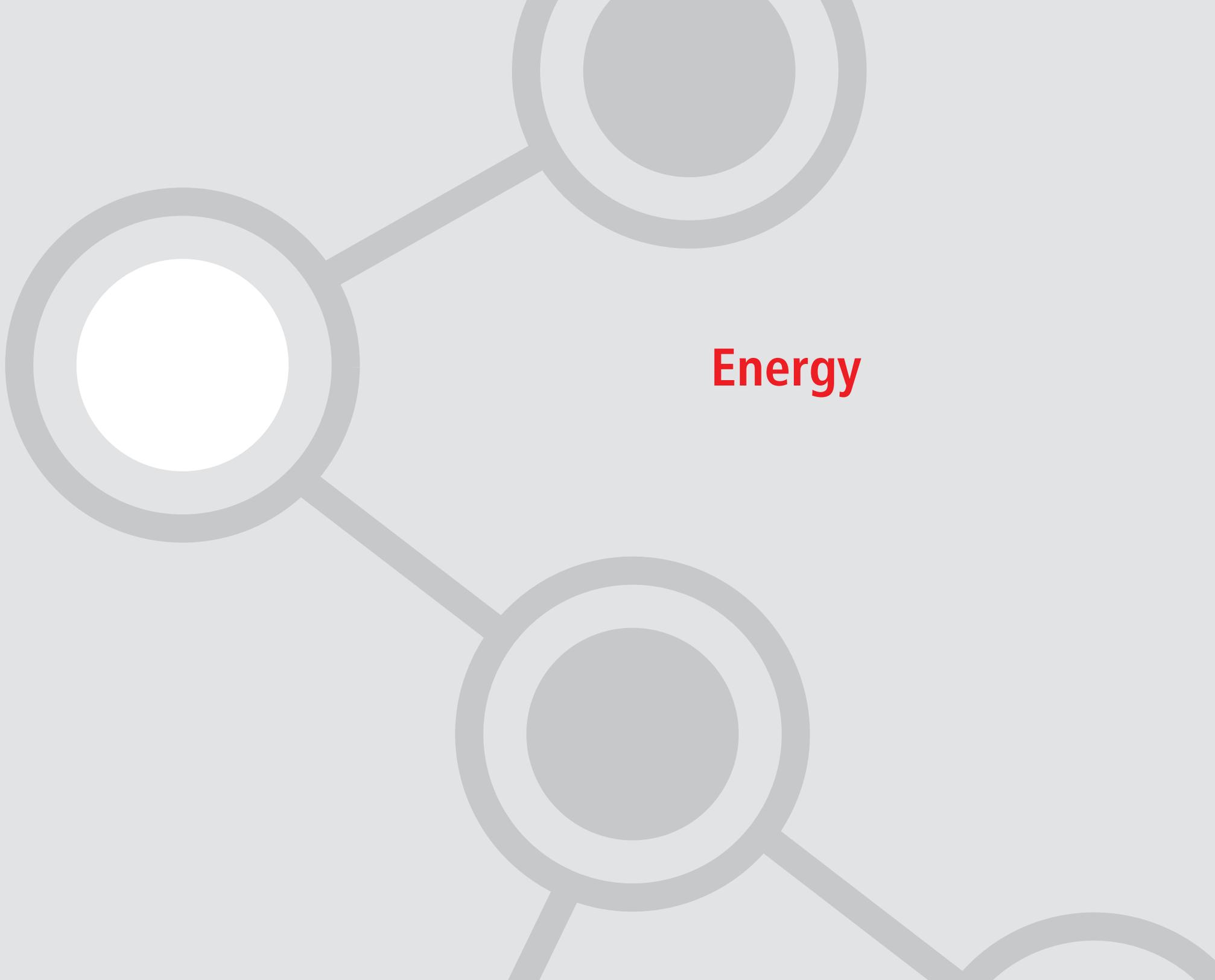
#### 7.9 - 7.9b

Gross global emissions (Scope 1 and 2 combined) compared to the previous year and reasons for any change

Compared to the previous year, our gross global emissions have increased.

Reason	Change in emissions (metric tonnes CO <sub>2</sub> e)	Direction of change	Emissions value (percentage)	Please explain and include calculation
Emission reduction activities	363,776	Decreased	6.4%	The carbon emissions from locomotives decreased due to continued implementation of projects in 2018 related to our rail locomotive emissions and energy efficiency strategy, which represent 85% of our scope 1 & 2 greenhouse gas emissions. This includes new locomotive acquisitions, anti-idling devices and practices, and the installation of new locomotive technologies such as Trip Optimizer and CN's RTBI locomotive telemetry system. In addition, we achieved emissions savings from energy efficiency projects implemented at our key yards. This includes lighting and HVAC upgrades, as well as upgrades to air compressors. We calculated a reduction of approximately 363,776 tCO <sub>2</sub> e from emission reduction activities related to locomotive fuel efficiency and energy efficiency in our buildings and yards. Our total Scope 1 and Scope 2 emissions in 2017 were 5,671,982. Based on the carbon reductions, we calculated a 6.4% reduction in emissions $(363,776 / 5,671,982) * 100 = 6.4\%$ decrease.
Changes in output	256,448	Increased	4.5%	CN experienced increases in emissions due to higher freight volumes. We calculated an increase of approximately 256,448 tCO <sub>2</sub> e from changes in output. Our total Scope 1 and Scope 2 emissions in 2017 were 5,671,982. Based on the changes in output, we calculated a 4.5% increase in emissions $(256,448 / 5,671,982) * 100 = 4.5\%$ increase.
Loss of network fluidity	400,521	Increased	7.1%	CN experienced increases in emissions due to a combination of low network resiliency in some high volume areas and extremely harsh cold weather conditions at the beginning of 2018 which impacted our productivity and network fluidity. We calculated an increase of approximately 400,521 tCO <sub>2</sub> e from loss of network fluidity. Our total Scope 1 and Scope 2 emissions in 2017 were 5,671,982. Based on the estimated productivity impacts, we calculated a 7.1% increase in emissions $(400,521 / 5,671,982) * 100 = 7.1\%$ increase.

Our calculations in C7.9 and C7.9a are based on a location-based Scope 2 emissions figure.



**Energy**

## 8. Energy

**8.1**  
Percentage of total operational spend in 2018 on energy

More than 15%, but less than or equal to 20%.

**8.2**  
Energy-related activities

Activity	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes

**8.2a**  
Energy consumption totals (excluding feedstocks) in MWh

Energy carrier	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total MWh
Consumption of fuel (excluding feedstocks)	HHV	265,043	21,293,053	21,558,096
Consumption of purchased or acquired electricity	HHV	179,617	412,157	591,775
Total energy consumption		444,660	21,705,210	22,149,870

**8.2b**  
Applications of our consumption of fuel

Fuel application	Indicate whether your organization undertakes this energy-related activity
Consumption of fuel for the generation of electricity	No
Consumption of fuel for the generation of heat (includes combustion for engines)	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

## 8. Energy

### 8.2c

Fuel consumed (excluding feedstocks) by fuel type.

Fuels	Heating value	MWh fuel consumed for self-generation of heat (includes fuel combustion in engines)	Total MWh consumed by the organization
Diesel (locomotives)	HHV	18,637,602	18,637,602
Diesel (others)	HHV	1,858,793	1,858,793
Propane liquid	HHV	122,437	122,437
Gasoline (motor)	HHV	229,542	229,542
Furnace oil (fuel oil #2)	HHV	3,860	3,860
Stove oil (fuel oil #1)	HHV	1,856	1,856
Kerosene	HHV	1,225	1,225
Natural gas	HHV	702,780	702,780

### 8.2d

Average emission factors of fuels reported in 8.2c

Fuels	Emission factor	Unit	Emission factor source	Comment
Diesel (locomotives)	2.9502	Kg CO <sub>2</sub> e per liter	Env. Canada National Inventory Report 1990-2016, Part 2, Table A6-12	The emission factor reported here is specific to locomotive diesel fuel.
Diesel (others)	2.7241	Kg CO <sub>2</sub> e per liter	Env. Canada National Inventory Report 1990-2016, Part 2, Table A6-12	The emission factor reported here is for diesel consumed by our CNTL trucks and other yard equipment requiring diesel fuel to operate (excludes locomotives).
Propane liquid	1.5443	Kg CO <sub>2</sub> e per liter	Env. Canada National Inventory Report 1990-2016, Part 2, Table A6-12	
Gasoline (motor)	2.3746	Kg CO <sub>2</sub> e per liter	Env. Canada National Inventory Report 1990-2016, Part 2, Table A6-12	
Furnace oil (fuel oil #2)	3.1763	Kg CO <sub>2</sub> e per liter	Env. Canada National Inventory Report 1990-2016, Part 2, Table A6-12	
Stove oil (fuel oil #1)	2.7614	Kg CO <sub>2</sub> e per liter	Env. Canada National Inventory Report 1990-2016, Part 2, Table A6-12	
Kerosene	2.5684	Kg CO <sub>2</sub> e per liter	Env. Canada National Inventory Report 1990-2016, Part 2, Table A6-12	
Natural gas	1.9030	Kg CO <sub>2</sub> e per m <sup>3</sup>	Env. Canada National Inventory Report 1990-2016, Part 2, Table A6-1 and A6-2	

## 8. Energy

### 8.2f

Electricity, heat, steam, and/or cooling amounts accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low carbon emission factor	Low-carbon technology type	Region of consumption of low-carbon electricity, heat steam or cooling	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO <sub>2</sub> e per MWh)	Comments
No purchases or generation of low-carbon electricity, heat, steam or cooling accounted with a low-carbon emission factor					

### 8.2h

Average emission factor used for transport movements per mode that directly source energy from the grid.

Category	Emissions factor unit	Average emissions factor (gCO <sub>2</sub> e/ kwh)	Comments
N/A			We do not currently have any transport movements that directly source energy from the grid.

## Transport-related energy efficiency metrics

### 8.4

Efficiency metrics for our transport services

Activity	Intensity figure	Metric numerator	Metric denominator	Metric numerator: unit total	Metric denominator: unit total	% change from previous year	Please explain
Rail	1060	Gross ton miles (millions)	Gallons of fuel (millions)	490,414	462.7	-0.3%	CN and other Class 1 railroads in North America often benchmark fuel efficiency using the metric of gross ton miles per gallon of fuel consumed. (A gross ton of freight includes the weight of the rail car + the weight of its contents). Our rail locomotive efficiency in 2018 vs 2017 remained relatively flat due to the offset of locomotive efficiency gains by productivity and network fluidity challenges resulting from a combination of low network resiliency in some high volume areas and extremely harsh cold winter conditions at the beginning of 2018.



**Additional metrics**

## 9. Additional metrics

### Other climate-related metrics

#### 9.1 Additional climate-related metrics relevant to our business

Description	Metric value	Metric numerator	Metric denominator (intensity metric only)	% change from previous year	Direction of change	Explanation
MWh Renewable energy/million tonne km	0.73	Renewable fuel energy consumption in MWh	Tonne km (millions)	13%	Decreased	Renewable fuel regulations in Canada require an average of 2% renewables in all diesel produced or imported to Canada. Compliance with these regulations contributes to the achievement of emission reduction targets across the rail sector. In 2018, renewable fuel energy consumption per million tonne km decreased vs 2017 due to improvements in the quality of the data the company obtained from fuel suppliers. Although regulations require fuel producers and importers to blend an average 2% renewable fuel in locomotive diesel, the actual percent of blended product may vary by location and by month of the year. The revised, more specific data meant a decrease in this metric vs 2017.

### Low-carbon technology implementation

#### 9.2 Tracking metrics for implementation of low-carbon transport technology

Activity	Metric	Technology	Metric figure	Metric unit	Explanation
Rail	Fleet adoption	New fuel-efficient locomotives	65	# of locomotives	We continue to upgrade existing locomotives and acquire new locomotives enabling us to not only meet our compliance objectives but also benefit from even greater fuel efficiencies. For example, in 2018, we added 65 new high-horsepower locomotives to our fleet, and expect to take delivery of an additional 140 high-horsepower locomotives in 2019.
HDV	Fleet adoption	Trucks using diesel blended with renewable fuels	1100	# of trucks	CN's truck fleet uses diesel blended with renewable fuels when operating in Canada, in compliance with Federal and provincial clean fuel regulations. As these regulations increase in stringency, emissions from our trucks will continue to decrease in intensity.
Marine	Fleet adoption	New skewed propeller blades	1	# of marine vessels upgraded	CN owns a fleet of four marine vessels operating on the Great Lakes. In 2018, CN installed new skewed propeller blades on one of these vessels. These new blades will improve the speed and fuel efficiency of the vessel, contributing to reduced carbon emissions from its operation.

#### 9.6 Our investment in the low-carbon transition

Activity	Investment start date	Investment end date	Investment area	Technology area	Investment maturity	Investment figure	Low-carbon investment percentage	Explanation
Rail	01/01/2018	31/12/2018	Equipment	Transportation equipment	Large scale commercial deployment	C\$500 million	81-100%	Freight rail transportation is by definition (Low Carbon Investment Registry Taxonomy) a low carbon product. Compared to other modes of transportation, rail is the most fuel efficient method of moving freight over land – on average, trains are approximately four times more fuel efficient than truck. CN continues to invest in the low carbon transition through the purchase of transportation equipment to operate and grow our freight rail transportation service. Specifically, we purchase tier-compliant locomotives as part of our strategy to acquire, retire and upgrade our fleet. In 2018, CN allocated C\$500 million for capital equipment expenditures, which included the acquisition of 65 new high-horsepower locomotives. These new locomotives will enable us to meet emission standards and drive even greater fuel and cost saving efficiencies across our business.



**Verification**

## 10. Verification

### Verification

**10.1**  
Verification/assurance status for our reported emissions

Scope	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

**10.1a**  
Verification/assurance details for our Scope 1 and Scope 2 emissions

Scope	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Relevant standard	Proportion of reported emissions verified (%)
Scope 1	Annual	Complete	Limited	ISAE 3410	88%
Scope 2 (location based)	Annual	Complete	Limited	ISAE 3410	100%

**10.1b**  
Verification/assurance details for our Scope 3 emissions

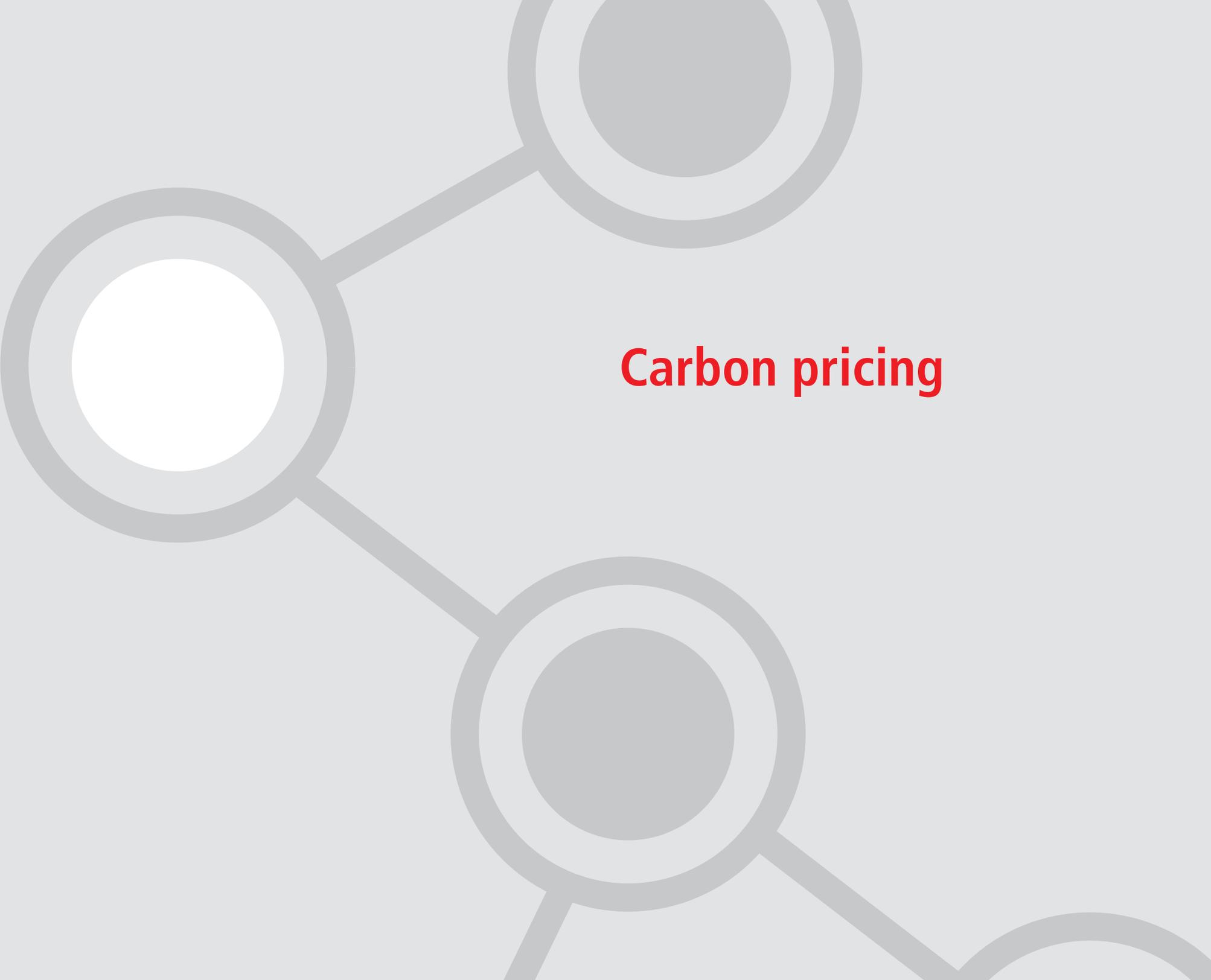
Scope	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Relevant standard
Scope 3 – at least one applicable category	Annual	Complete	Limited	ISAE 3410

## 10. Verification

### Other verified data

10.2 - 10.2a  
Other data points verified  
as part of our third party  
assurance process

Disclosure module verification relates to	Data verified	Verification standard	Explanation
C6. Emissions data	Year on year change in emissions (Scope 1)	Limited assurance in accordance with the ISAE 3410 standard	A third party has verified the change in our Scope 1 emissions from locomotive fuel consumption included in our total Scope 1 emissions figure reported in C6.1 vs the corresponding figure for 2017. Emissions from locomotive fuel consumption account for almost 90% of our total direct emissions. We complete this verification on an annual basis to track our emissions performance.
C6. Emissions data	Year on year change in emissions (Scope 2)	Limited assurance in accordance with the ISAE 3410 standard	A third party has verified the change in our 2018 location-based Scope 2 emissions from consumption of electricity in our buildings and yards in C6.3 vs the corresponding figure for 2017. Data verified accounted for 100% of our Scope 2 emissions. We complete this verification on an annual basis to track our emissions performance.
C6. Emissions data	Year on year change in emissions (Scope 3)	Limited assurance in accordance with the ISAE 3410 standard	A third party has verified the change in our 2018 Scope 3 emissions from diesel fuel production included in our total Scope 3 emissions reported in C6.5 vs the corresponding figure for 2017. Data verified accounted for 67% of our scope 3 emissions. We complete this verification on an annual basis to track our emissions performance.
C8. Energy	Energy consumption for locomotive diesel fuel	Limited assurance in accordance with the ISAE 3410 standard	A third party has verified the 2018 diesel locomotive fuel consumption in MWh reported in C8.2c. Fuel consumption for our locomotives accounts for 86% of our total direct fuel consumption. We complete this verification on an annual basis to track our energy performance.
C8. Energy	Energy consumption for electricity	Limited assurance in accordance with the ISAE 3410 standard	A third party has verified the 2018 energy consumption from purchased electricity C8.2a. The figure reported accounts for 100% of our electricity consumption in our buildings and yards. We complete this verification on an annual basis to track our energy performance.



# Carbon pricing

# 11. Carbon pricing

## Carbon pricing systems

In 2018, the Alberta carbon tax, BC carbon tax, Ontario Cap & Trade and Quebec Cap & Trade carbon pricing regulations impacted our operations.

**11.1 and 11.1a**  
Carbon pricing regulations impacting our operations

**11.1b**  
Emissions trading systems in which we participate

System name	% of Scope 1 emissions covered by the ETS	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tons CO <sub>2</sub> e	Details of ownership	Comments
Ontario Cap & Trade	9%	2018	0	3,172	3,172	Purchases and imports of fossil fuels	In Cap & Trade jurisdictions, all purchases of fossil fuels within the jurisdiction include a carbon price component that is flowed through to CN by our fuel suppliers. In addition, CN must purchase emission allowances for any imports of fossil fuels from outside the Cap & Trade jurisdiction to be consumed within the jurisdiction. Allowance purchases reported here reflect fossil fuel imports ONLY as per the regulation. Coverage of scope 1 emissions reflects total locomotive diesel fuel purchases in Ontario subject to the carbon price flow through. Note that Ontario eliminated its Cap & Trade system in October 2018.
Quebec Cap & Trade	4%	2018	0	184	184	Purchases and imports of fossil fuels	In Cap & Trade jurisdictions, all purchases of fossil fuels within the jurisdiction include a carbon price component that is flowed through to CN by our fuel suppliers. In addition, CN must purchase emission allowances for any imports of fossil fuels from outside the Cap & Trade jurisdiction to be consumed within the jurisdiction. Allowance purchases reported here reflect fossil fuel imports ONLY as per the regulation. Coverage of scope 1 emissions reflects total locomotive diesel fuel purchases in Quebec subject to the carbon price flow through.

**11.1c**  
Tax systems in which we participate

Pricing system	Period for which data is supplied	% of emissions covered by tax	Total cost of tax paid	Comments
Alberta carbon tax	2018	10%	N/A	Tax amounts paid are confidential and cannot be disclosed.
BC carbon tax	2018	15%	N/A	Tax amounts paid are confidential and cannot be disclosed.

# 11. Carbon pricing

## Carbon pricing systems (continued)

11.1d  
Strategy for complying with carbon pricing systems

### Description of strategy for complying with the system

Our strategy to comply with the emission trading and tax systems is to ensure we effectively monitor, forecast and plan for the impacts of carbon pricing and regulations on our business. On an annual basis, we report and verify our emissions, track our fuel consumption and import volumes to calculate regulated emissions, and pay our carbon tax and cap and trade liabilities in a timely manner.

### Example of how the strategy has been applied

For example, within each of the jurisdictions, we track our monthly fuel purchase and consumption data to estimate carbon cost impacts to the company, as well as to determine our regulatory compliance obligations under the respective Cap and Trade or tax systems. Cap and Trade compliance obligations are tracked by the Sustainability department, who arrange

to participate in the quarterly WCI (Western Climate Initiative) emissions allowance auctions as required. Specifically, in 2018 we participated in the May 15 auction in order to purchase allowances to cover fossil fuel imports into Ontario in 2017. Carbon tax obligations are tracked and paid monthly by Accounts Payable with support from the Taxation group.

Furthermore, to minimize our compliance risks and carbon price costs, our Fuel Procurement department has continued to follow a strategy to eliminate fuel imports across jurisdictions and source fuel locally as much as possible (except in emergency situations where local fuel is unavailable). For example, in 2018 CN had no diesel fuel imports into the provinces of Quebec or Ontario. Emissions allowance purchase requirements were minimized to cover imports of propane to fuel switch heaters, which could not be sourced locally. In addition, we continue to focus on our fuel efficiency and carbon management strategy, which will further enable us to minimize our exposure to carbon costs.

## Project-based carbon credits

11.2  
Origination of project based carbon credits

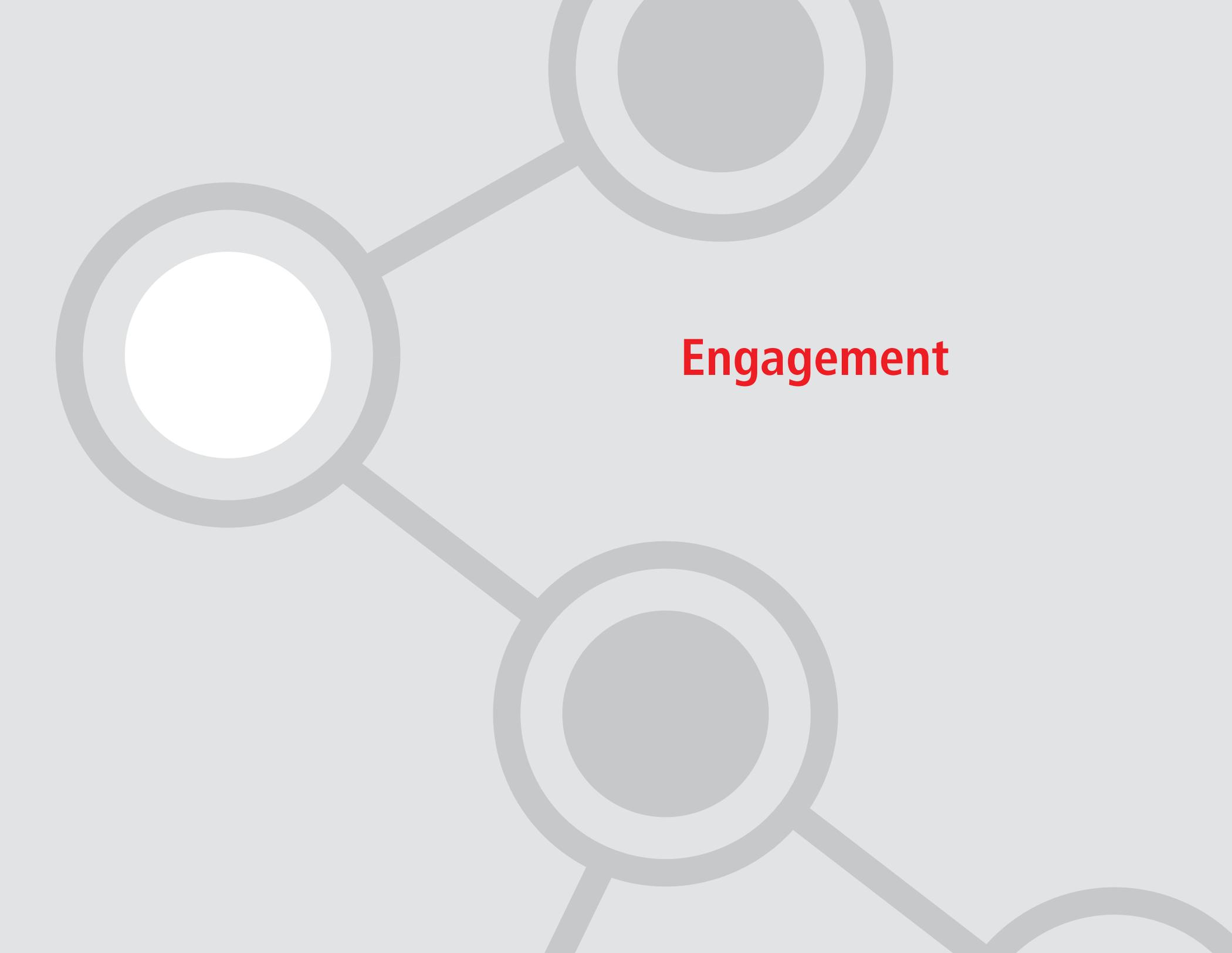
We have not originated or purchased any project-based carbon credits within the reporting period.

## Internal price on carbon

We use an internal price of carbon.

11.3 and 11.3a  
Internal price of carbon

Objective for implementing an internal carbon price	GHG Scope	Application	Actual price(s) used (currency/metric tonne)	Variance of price(s) used	Type of internal carbon price	Impact & implication
<ul style="list-style-type: none"> <li>Navigate GHG regulations</li> <li>Drive energy efficiency</li> <li>Stakeholder expectations</li> <li>Change internal behaviour</li> <li>Drive low carbon investment</li> <li>Identify or seize low carbon opportunities</li> <li>Supplier engagement</li> </ul>	Scope 1	The carbon price is applied by our corporate procurement group to inform business decisions related to the purchase of fuel and our sustainability and tax groups to ensure we meet our compliance obligations under Canadian GHG regulatory requirements.	C\$24	The carbon price we apply ranges from C\$18 to C\$35 per metric tonne CO <sub>2</sub> e. These ranges reflect the respective Canadian provinces and U.S. states that have implemented carbon price mechanisms through carbon taxes and Cap and Trade markets.	Shadow price	We use an internal carbon price based on the carbon price regulatory framework that is evolving in Canada. As a leading transportation logistics provider, CN is subject to various Provincial and Federal jurisdictional carbon pricing mechanisms across Canada. To inform business decisions and ensure we meet our compliance and other corporate objectives, we internalize the cost of carbon based on current and projected carbon tax and carbon Cap and Trade pricing analysis. Based on our analysis up until 2022, our carbon shadow pricing analysis from external carbon tax and market pricing, we have estimated our carbon price to be on average C\$24 per tonne of carbon in 2018, with an increase to C\$50 per tonne of carbon by 2022 for our Canadian operations.



**Engagement**

## 12. Engagement

### Value chain engagement

#### 12.1a Climate-related supplier engagement strategy

Type of engagement	Details of engagement	% of suppliers by number	% of total spend (direct and indirect)	% Scope 3 emissions as reported in C6.5	Rationale for the coverage of your engagement	Impact of engagement including measures of success	Comment
Information collection	Collect climate change and carbon information at least annually from suppliers	5%	37%	67%	<p>We have engaged with our 59 tier 1 critical suppliers, on various environmental issues, including climate related matters.</p> <p>For example, we continue to engage with our major fuel suppliers to collect information and ensure we comply with renewable fuel regulations in Canada, allowing us to estimate volumes of renewable fuels to contribute to our GHG reduction targets, and understand carbon pricing flow through costs. Major fuel suppliers engaged make up approximately 5% of our 59 tier 1 critical suppliers.</p> <p>Fuel is CN's third biggest operating expense and makes up 37% of our operational expenses on raw materials, goods and services procured. Scope 3 emissions from the production of fuel account for 67% of our total scope 3 emissions reported in C6.5.</p>	<p>Engaging with fuel suppliers is enabling us to reduce our GHG emissions based on renewable fuel content, and minimize compliance needs and costs for renewable fuel compliance units as well as Cap &amp; Trade emissions allowances.</p> <p>In particular, in 2018 we were able to continue to meet all of our Quebec diesel fuel requirements through local sourcing, resulting in our direct Cap &amp; Trade costs for diesel fuel imports into Quebec remaining at \$0 for a second consecutive year (Note: We still had some small volumes of propane imports due to lack of availability of local supplies). We also obtained more detailed information on renewable blending volumes which allowed us to more accurately account for biodiesel volumes consumed in 2018.</p>	

## 12. Engagement

### Value chain engagement (continued)

12.1b  
Climate-related customer  
engagement strategy

Engagement category	Details of engagement	% of customers by number	% Scope 3 emissions as reported in C6.5	Rationale for selecting this group of customers and scope of engagement	Impact of engagement including measures of success
Education / information sharing	Run an engagement strategy to educate customers about the climate change impacts of (using) our products, goods, and/or services	4%	100%	<p>We proactively engaged with customers committed to carbon management who were interested to learn more about CN's performance. For example, in 2018, we engaged with some of these customers to provide information through the CDP supply chain questionnaire. In 2018, we directly engaged with customers, representing more than C\$690 billion of our revenues, of which 4 were on our top 100 customer list, representing 4% of customers.</p> <p>We also provide our customers with a web-based carbon calculator to measure the emissions from rail, marine and truck transportation – the first of its kind in the industry. Specifically, in 2018, we had over 3600 requests for carbon emissions calculations through our web calculator, an increase of more than 70% versus the previous year.</p>	<p>Our customer engagements have contributed to the increase in our intermodal business revenues – from customers shifting their freight from truck to a more carbon and fuel efficient rail option. Specifically, in 2018, revenues from our intermodal business segment increased by C\$265 million vs. 2017 of which a portion was market share gains from modal shift.</p> <p>Furthermore, our engagements have helped strengthen our customer relationships and the potential to increase our market share.</p> <p>Please note that as a transportation company that reports its emissions using an operational control approach, 100% of the emissions from our customers' use of our transportation services are reported under our Scope 1 emissions and not under Scope 3 emissions. As such, 100% of our emissions are reported in our CDP submission.</p>
Collaboration & Innovation	EcoConnexions Partnership program	21%	100%	<p>Launched in 2014, CN's EcoConnexions Partnership Program aims to both partner with and recognize customers who are committed to building an efficient and more sustainable future.</p> <p>Each year, customers are invited to partake in the program and submissions are evaluated based on sustainable policies, energy efficiency, reporting to the CDP, and modal shift. In 2018, we planted 100,000 trees to recognize 40 of our customers for their sustainable business practices, of which 21% were from our top 100 customers.</p>	<p>As a result of our engagements through the EcoConnexions Partnership Program, we have influenced performance on energy efficiency and carbon reporting. In addition, we contributed to increasing market share from customers shifting from truck to our more sustainable rail transportation for long haul shipments. We have also worked collaboratively with our customers to protect environmental ecosystems. For example, since the program's inception in 2014, we have planted 410,000 trees with our customers.</p> <p>Please note that as a transportation company that reports its emissions using an operational control approach, 100% of the emissions from our customers' use of our transportation services are reported under our scope 1 emissions and not under scope 3 emissions. As such, 100% of our emissions are reported in our CDP submission.</p>

## 12. Engagement

### Public policy engagement

#### 12.3 and 12.3a

Direct engagement in activities to influence policy makers on climate-related issues

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Cap and trade	Support	We engage with various Canadian federal and provincial governments (Quebec, Ontario, Nova Scotia) on their Cap and Trade systems to position rail freight as a viable low carbon transportation solution.	We support provincial and state carbon markets within Canada and the U.S. We believe that involvement with leading policy makers on carbon markets moves the transportation sector forward in identifying practical solutions that contribute to, and support, future policy developments in a manner that will foster low carbon economic growth, while ensuring significant GHG emission reductions.
Climate finance	Support	We engage with various Canadian federal and provincial governments on funding to support and grow the transportation of freight by rail as a means of decreasing emissions in the transportation sector. Rail is approximately 4 times more fuel efficient than truck, reducing GHG emissions by 75% for an equivalent volume of freight.	We advocate for the allocation funds to support modal shift from truck to rail (including investment in rail infrastructure) as a means of reducing freight transportation emissions. We also support investment in rail fuel efficiency technologies and innovation to further increase the efficiency benefits of shipping by rail.

#### 12.3b and 12.3c

Trade associations CN belongs to which are likely to take a position on climate change legislation

Trade association	Is our position on climate change consistent with theirs?	Please describe the trade association's position	How have you, or are you attempting to influence the position
Railway Association of Canada (RAC)	Consistent	The RAC represents rail businesses within Canada on various issues, including environmental sustainability. The RAC supports and encourages sustainable transportation systems to serve the nation and its regions.	We engage with Environment Canada, through our role as the chair of the Railway Association of Canada. CN believes in working with both Canadian and U.S. governments to identify technically feasible options to meet greater efficiency standards for locomotives.
Association of American Railroads (AAR)	Consistent	The AAR is a standard setting organization for North America's railroads, focused on improving safety and productivity of rail transportation. It supports affordable, efficient and environmentally responsible transportation.	We engage with the AAR as a member of the organization, and support them in promoting a cleaner, greener, efficient, and environmentally-responsible transportation solutions.

#### 12.3d

Public disclosure of research organizations we fund

Yes, we publicly disclose a list of all the research organizations we fund.

## 12. Engagement

### Value chain engagement (continued)

12.3e  
Details of other engagement activities we undertake

#### Description:

We play an active role in the advocacy of rail as part of the climate change solution with federal, provincial and state governments in North America. Rail transportation is approximately four times more fuel efficient than truck, translating into a 75 per cent reduction in greenhouse gas emissions for an equivalent volume of freight. CN firmly believes that solutions to meet Canada's emission reduction targets should include encouraging shippers to use the most carbon-friendly transportation option available.

#### Method of engagement:

We have engaged with the federal, provincial and state governments in North America through individual meetings, as well as through the Railway Association of Canada.

#### Topic of engagement:

The topic of engagement is how railways can help meet jurisdictional emissions reductions targets.

12.3f  
Processes to ensure all direct and indirect activities that influence public policy are consistent with our overall climate change strategy

The direct and indirect activities that could influence public policy are typically reviewed by the Government and Public Affairs department on an annual basis to ensure alignment with the strategic direction of the business, including our climate change strategic focus areas. Public policy decisions that could impact our overall climate strategy are communicated to the sustainability team to be validated for consistency with our climate strategy. Where inconsistencies are noted, recommendations are proposed to ensure alignment.

#### Nature of engagement:

Our engagement relates to educating the federal, provincial and state governments on the environmental benefits of shipping by rail vs truck through discussions as well as through the submission of a written brief outlining these benefits and the proposed actions that can be taken to encourage the shipment of freight by rail.

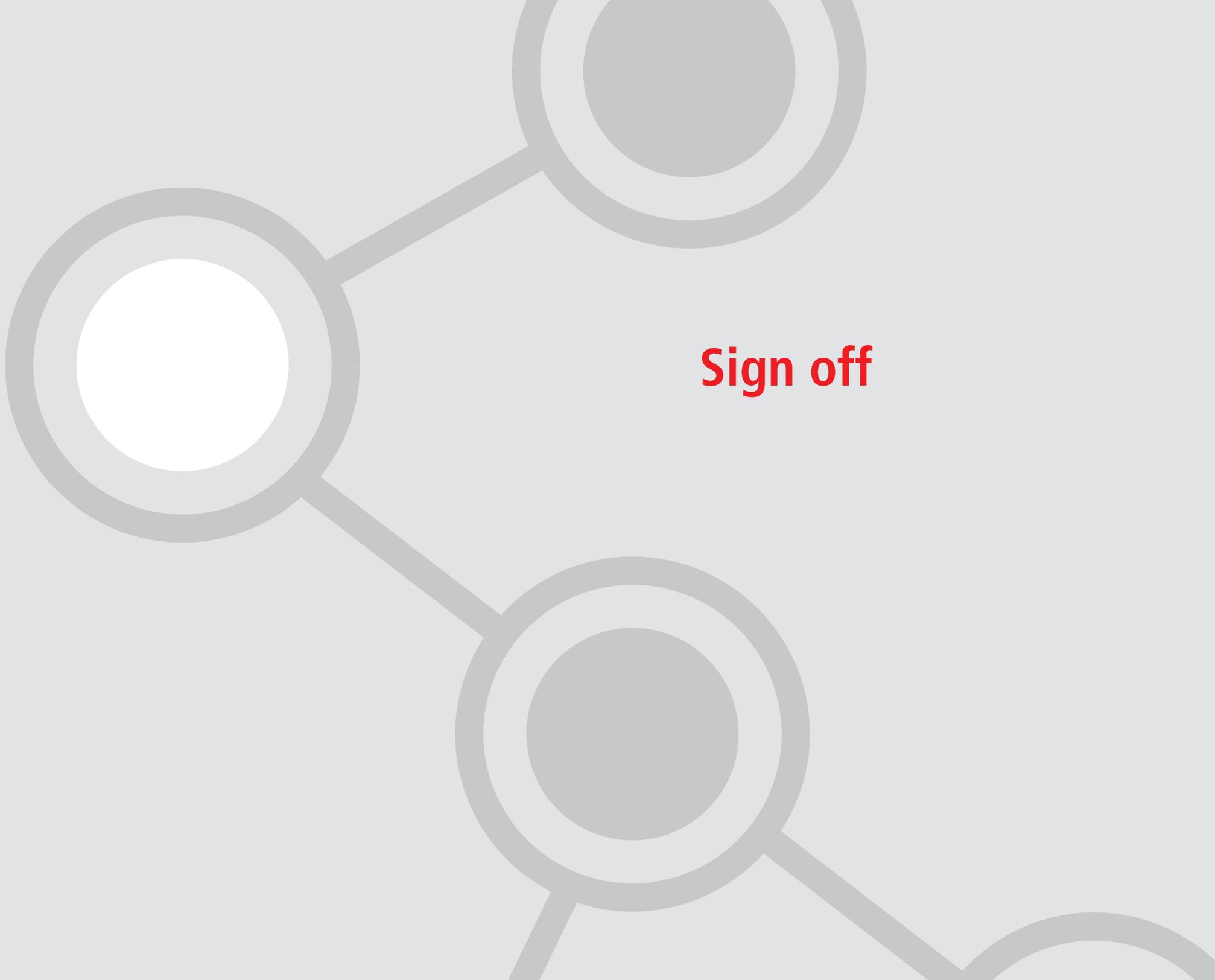
#### Action advocated as part of engagement:

Actions advocated include allocating funds to support modal shift from truck to rail, investment in rail fuel efficiency technologies and innovation, investment in rail infrastructure, harmonizing the regulatory regime for carbon regulations and markets in North America and climate adaptation.

## Communications

12.4  
Information CN has published relating to our response to climate change and GHG emissions performance

Publication	Status	Page/Section reference	Content elements	Comments
In mainstream reports	Complete	p. XVII, p. 1, p. 5, p. 55	Governance Strategy Risks & Opportunities Other metrics Fuel efficiency	We publish information on our sustainability initiatives, our fuel efficiency performance (directly relates to our locomotive emissions), as well as business risks related to climate change in our annual report, available on our website <a href="http://www.cn.ca">www.cn.ca</a> .
In Voluntary Sustainability report	Complete	p. 1, p. 2	Emissions figures Emission targets Other metrics	We publish statistics related to our carbon inventory, emissions intensity, emissions targets and other energy and fuel efficiency metrics in our Delivering Responsibly Data Supplement, available on our website <a href="http://www.cn.ca">www.cn.ca</a> .



**Sign off**

## 14. Sign off

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14.1  
Sign off for our CDP report

Job title	Corresponding job category
Executive Vice-President and Chief Financial Officer	Chief Financial Officer (CFO)

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