



# **Carbon Disclosure Project 2012**



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# Introduction

# Introduction

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**As a leader in the North American rail transportation industry, we recognize that CN's long-term success is connected to a sustainable future, particularly in the provision of rail freight services. Rail is the most energy efficient method of moving freight on land – no ground transportation mode can outperform rail for the hauling of large volumes of high-density freight over long distances. Rail also relieves traffic congestion and stress from our strained public infrastructure. With these environmental and economic advantages, we believe rail can be an integral part of the climate change solution.**

Over the past year, we have continued to execute on our emission and energy efficiency strategy, which includes reducing our carbon footprint; investing in efficient and reliable infrastructure; providing sustainable solutions to customers; growing the business through cleaner energy markets; and, enhancing our stakeholder outreach activities.

We continue to make progress on reducing our carbon footprint. In 2011, we reduced the GHG emission intensity (tCO<sub>2</sub>e/GTM) of our rail locomotives by 9% since 2007. Based on these reductions, we are on track to meet our target of reducing our rail locomotive GHG emission intensity by 10% by 2013, based on 2007 levels. This is important progress given that rail represents more than 80% of our GHG emissions. We have also continued to reduce the emissions from our other fleets, buildings and yard operations.

As part of our approach to climate change adaptation, we have continued to invest \$1 billion annually in track infrastructure upgrades, while executing seasonal readiness plans, natural hazard warning systems, and other weather-related emergency preparedness protocols.

We are also optimizing the opportunities presented by climate change. We offer various solutions to help our customers reduce their carbon emissions, including fuel-efficient services and a GHG carbon calculator that enables our customers to calculate the carbon savings from switching from truck to rail, based on our modal shift quantification protocol. Through the protocol, our customers in British Columbia are eligible to receive offset credits which may be used to meet emission reduction goals, traded to other regulated emitters to help them achieve required reductions, or banked for future use.

We are continuing to grow the business to support clean energy markets through the movement of biodiesel, wood pellets, and equipment related to cleaner technologies, such as wind turbines and solar panel components.

Finally, we are reaching out to our stakeholders to identify and implement carbon solutions. We collaborate with our suppliers to support research into alternative fuels, and have maintained our commitment of \$1 million in research into next-generation locomotives. We also recently launched our EcoConnexions initiative to develop and deliver a holistic employee engagement program that includes building a network of 23,000 sustainability champions to facilitate increased engagement and participation in our emissions and energy efficiency reduction initiatives.

With a clear strategic agenda, driven by a commitment to operational excellence, innovation, and running our trains safely with minimal environmental impact, we are confident that our emissions and energy efficiency strategy will continue to create value for our customers and our shareholders.

*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, BC, 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., with 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: [www.cn.ca](http://www.cn.ca)*

*Except where otherwise indicated, all financial information reflected in this document is expressed in Canadian dollars and determined on the basis of United States generally accepted accounting principles (U.S. GAAP).*



**Management**

# Management

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## 1. Governance

**1.1 - 1.1a**  
Highest level of direct responsibility for climate change and position of individual or name of committee with this responsibility.

At the Board level, the Environment, Safety and Security Committee reviews the Company's progress and status regarding climate change issues at regular quarterly and annual meetings. Through these meetings, the Board assesses performance against strategic programs as well as the relevancy and effectiveness of material climate change information.

At the executive level, the Chief Safety and Sustainability Officer (CSSO) and Assistant Vice President of Environment and Sustainability have direct responsibility for climate change within the Company and communicate with the CEO regularly on strategic climate change initiatives. These individuals are responsible for reviewing our climate change strategic initiatives as defined through the sustainability action plan against set climate change objectives, targets and performance expectations.

Also reporting to the CSSO and the Assistant Vice President for Sustainability is a cross-functional sustainability committee with senior representation from CN's departments. The sustainability committee meets quarterly to define and align CN's sustainability and climate change priorities with the business strategy, and monitor and communicate performance as identified in our sustainable development action plan.

# Management

## 1. Governance

1.2 - 1.2a  
Incentives for management of climate change issues, including attainment of targets.

Who is entitled to benefit from those incentives?	The type of incentives	Incentivized performance indicator
Corporate executive team	Monetary reward	<p>CN's executive team have included sustainability and climate change objectives and targets as part of their Employee Performance Scorecards (EPS). For example:</p> <ul style="list-style-type: none"> <li>• CN's Chief Executive Officer, Mr. Claude Mongeau, has integrated sustainability performance targets into his EPS, which includes the implementation of the emissions and energy efficiency strategy.</li> <li>• CN's Senior Vice President, Engineering, Mechanical and Supply Management, Mr. Samey Fahmy and the Chief Operating Officer, Mr. Keith Creel, have their performance targets tied to CN's annual year-over-year carbon intensity improvement (tCO<sub>2</sub>e/GTM) and fuel efficiency target of 1.5%.</li> <li>• CN's Chief Safety and Sustainability Officer, Mr. John Orr, has his performance tied to the implementation of CN's sustainability initiatives, including the emissions and energy efficiency strategy.</li> </ul> <p>Achievement of the respective performance indicators are tied to the executive annual compensation and bonus reward structure.</p>
Management group	Monetary reward	<p>Various management employees are responsible for executing our emissions and energy efficiency strategy. The performance indicators are included within the EPS system. For example:</p> <ul style="list-style-type: none"> <li>• Our fuel management team performance is tied to our annual year-over-year carbon intensity improvement (tCO<sub>2</sub>e/GTM) and fuel efficiency target of 1.5% annually until 2013;</li> <li>• Our energy management team performance is tied to the reduction of energy consumption of natural gas and electricity by 5% annually until 2013;</li> <li>• Our sales management performance is tied to generating business in clean energy markets; and,</li> <li>• Our sustainability management team's performance is tied to the implementation of our carbon energy strategy and the execution of our climate change communications.</li> </ul> <p>The achievement of performance indicators is linked to employee recognition as well as the individual's annual compensation and bonus reward structures.</p>
All employees	Recognition (non-monetary)	<p>Fuel efficiency and energy reduction initiatives are recognized through CN's President's Awards for Excellence within the sustainability category.</p>

# Management

## 2. Strategy

### Strategic Risks and Opportunities

CN recognizes that long-term success is connected to a sustainable and viable future. In order to ensure our success, we have aligned our business strategy with our climate change strategy, which is further linked to our high rated carbon risks and opportunities. The risks and opportunities that ranked within the high, medium-high, and medium rating (as presented below) were considered strategically important. As such, the Company addressed actions to respond to these risks and opportunities as outlined in the table below. It is important to note that the risk rating of high is not synonymous with the concept of materiality as determined in our financial reports.

<b>Frequency/Probability</b>	High			
	Medium		<div style="display: flex; flex-wrap: wrap; gap: 5px;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">10</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">7</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">1</div> </div> <div style="display: flex; flex-wrap: wrap; gap: 5px; margin-top: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">3</div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">4</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">8</div> </div> <div style="display: flex; flex-wrap: wrap; gap: 5px; margin-top: 5px;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">6</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">9</div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">5</div> <div style="border: 1px solid black; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">2</div> </div>	
	Low			
		Low	Medium	High
	<b>Severity/Degree of Impact</b>			

#### RISKS

1. Air Pollution Limits (locomotive/vessel emission standards) posing financial and compliance risks
2. Renewable fuel content standard and carbon tax
3. Frequent severe weather events impacting network infrastructure/track operating efficiency
4. Changing customer demands for low carbon services impacting CN commodity markets
5. Competition from other carriers

#### OPPORTUNITIES

6. Voluntary agreements and emission limits could result in greater fuel efficiency
7. Cap and trade schemes/taxes means carbon credits from shifting truck to rail as well as from operational efficiencies
8. Customer and supplier requirements e.g., Walmart and CDP to benefit CN low carbon transport and logistics positioning
9. New energy products or services e.g., clean technology markets, biomass, ethanol
10. Enhanced reputation in sustainable rail freight transportation from CN's low carbon service offering

- Opportunities
- Risks

The Company is responding to its climate change risks and opportunities in a way that effectively aligns with our business strategy, enabling us to manage our exposure and position ourselves for growth in a carbon constrained world. Our climate change initiatives have been integrated into our sustainability action plan, which represents a tool for identifying and reporting on progress. In order to effectively integrate the climate change opportunities into the business strategy, we will be working with our sustainability committee to align the Company's sustainability values, and specifically our climate change objectives, with the skills development, performance management, and empowerment of our work force.



# Management

## 2. Strategy

### Risk Management Approach

2.1 - 2.1a  
Risk management  
procedures regarding  
climate change risks and  
opportunities.

#### The Scope of the Process

Climate change risks and opportunities are integrated into CN's multi-disciplinary Enterprise-wide Risk Management (ERM) process, which follows the ERM COSO Framework. In order to understand both the business and financial risks and opportunities associated with climate change, the sustainability department conducts an assessment of CN's strategic objectives, emerging policy, macro-economic trends, peer and industry reviews. Based on this review, risks and opportunities are identified and assessed against the probability and severity of impact. Significant climate change risks are then integrated into CN's ERM process, and further assessed and classified within CN's company-wide risk categories. These risks are then further assessed, alongside the overall business and financial risks, to identify CN's enterprise-wide priority risks.

#### Assessment of Risks and Opportunities From a Company Level Perspective

At the Company level, climate change risks and opportunities are assessed through a detailed assessment that includes information from the various departmental functions within the Company, and in consideration of changing policies, strategic objectives and market trends. Risks and opportunities at the Company level are further categorized through the ERM process into the respective Company level risk and opportunity categories, which include strategic, financial, organizational, operational, external, compliance and reputational categories.

#### Assessment of Risks and Opportunities From an Asset Level Perspective

At the asset level, the climate change risks and opportunities are assessed through departmental assessments that include information from the Network Transportation and System Engineering. The focus of the assessment includes natural disasters and network disruptions due to severe weather conditions.

#### The Frequency of Monitoring

The monitoring process is conducted on a quarterly basis, or as required, through various business unit assessments and more formally, on an annual basis, through the direction of the sustainability committee with oversight from the audit committee.

#### Criteria for Determining Materiality/Priorities

The materiality of climate change risks and opportunities is based on our understanding of the likelihood and severity of the potential impacts on our operations and business. We evaluate the impacts in terms of the economic, environmental and social implications, using qualitative ratings of low, medium and high. Risks and opportunities that result in a medium or higher rating are assigned as significant. The significant ratings are then integrated into the ERM process and re-assessed.

Climate change information that could be material is presented in the MD & A section of our financial annual report. Where a significant rating of high is assigned to a risk and opportunity, the Company conducts a more strategic review at the executive level to assess the costs and benefits associated with proposed strategic climate change programs to ensure alignment with CN's business goals. Once approved, strategic climate change programs are integrated, tracked and monitored through the sustainability committee's action plan.

#### Reporting of Results

Where relevant, the information is communicated through the sustainability committee to the Chief Safety and Sustainability Officer and the Assistant Vice President of Environment and Sustainability. This information is then generally discussed at meetings of the Executive Committee and where relevant, information is also presented to the Board of Directors. On an annual basis, significant climate change risks and opportunities are made publicly available to CN's stakeholders, including investors, through the annual report, CN's sustainability report, and the carbon disclosure project submission which is posted on the CN website annually.

# Management

## 2. Strategy

### Business Strategy

2.2 - 2.2a  
Climate change is integrated into our business strategy.

#### The Process by Which the Strategy is Influenced

The climate strategy is influenced by various factors including policies, fuel efficiency performance, rail yard operations and network fluidity, and market trends relating to customer demands. The information is fed to the sustainability committee from relevant departments, and used to inform our emissions and energy efficiency strategy. Once formulated, the executive team, including the Chief Safety and Sustainability Officer, review the strategy to ensure alignment with strategic business objectives. Through these communications, the executive team develops the company-wide business strategy that effectively integrates top priority business issues, and if relevant, any topics within our energy and emissions strategy. These priorities are formalized and updated annually in our internal Sustainability Action Plan.

#### Change Aspects That Have Influenced the Strategy

The climate change risks that most influenced our business strategy included: locomotive and shipping vessels' emission standards, and weather events impacting network infrastructure and track operating efficiency. From an opportunity perspective, our business strategy was influenced by growth in new energy products or services and changing customer requirements for low carbon service offerings.

#### Most Important Components of the Short-Term Strategy That Have Been Influenced by Climate Change

Our business strategy centres on operational and service excellence, with a focus on five key areas: quality top line growth, precision railroading, innovation capabilities, connecting with our people and smart stakeholder engagement. In the short term, the business strategy relating to precision railroading and connecting with our people was most influenced by climate change. The strategic focus on precision railroading has been influenced by our desire to increase fuel efficiency and reduce energy consumption and GHG emissions. We continue to invest in various initiatives and programs to efficiently operate the railroad and improve our locomotive fuel conservation practices. These initiatives are linked with our target to reduce the GHG emission intensity of our rail locomotives by 10% by 2013, based on 2007 levels – an emission reduction in this area is a top priority since the emissions from our locomotives account for more than three-quarters of the Company's GHGs. In order to attain even greater reductions, we expanded our operational excellence to other aspects of the business including intermodal trucks, shipping vessels, and Company vehicles. We have also set a 15% energy and carbon reduction target relating to the consumption of natural gas and electricity by 2013, based on 2010.

In addition, our short-term strategy relating to connecting with our people has also been influenced by climate change and the need to increase employee awareness of our efficiency and energy reduction objectives. To this end, the Company recently launched the EcoConnexions initiative to develop and deliver a holistic employee engagement program, that includes building a network of 23,000 sustainability champions to facilitate increased engagement and participation in our energy management and carbon reduction initiatives.

#### Most Important Components of the Long-Term Strategy That Have Been Influenced by Climate Change

The long-term strategy relating to innovation, top line growth and smart stakeholder engagement has been influenced by climate change. First, increasing energy costs and changing emission standards influence our demand for a more efficient fleet, which has become an important focus of our innovation strategy. In 2010-2011, we invested \$225 million on fuel-efficient locomotives and improvements to existing fleets and will be investing \$1 million on research into next-generation locomotives over the next three years. We also recognize the potential operational and service disruptions that could result from climate change and global warming impacts and the importance in maintaining an efficient and reliable infrastructure. As such, the Company continues to invest significantly in track infrastructure upgrades (approximately \$1 billion in 2011), we execute and enhance our seasonal readiness plans, and ensure processes and procedures exist to recover from emergency weather situations. Finally, we are working towards creating a more flexible customer-focused operating and service model, which we expect will ultimately enable our customers to gain fuel and carbon efficiencies.

We see increased opportunities in the area of sustainable energy products, including biodiesel and wood pellets, as well as equipment and components related to "cleaner" technologies, such as wind turbines and solar panels.

Finally, increasing customer awareness of government incentives for low carbon rail freight solutions has been influencing our smart stakeholder engagement strategy. For instance, we are increasing stakeholder awareness of government incentive programs for low carbon rail freight solutions, and advancing our modal shift quantification protocol that can be used to gain carbon credits for switching from truck to rail.

# Management

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## 2. Strategy

### Business Strategy (continued)

#### **How This Approach is Gaining a Strategic Advantage Over Competitors**

Through our business strategy integration of climate change aspects, we are gaining a competitive advantage by continuing to offer the most carbon efficient and productive rail service in North America, enabling our customers to reduce carbon from switching freight from truck to rail (the first of its kind in North America), and gaining new market opportunities from an expected increase in products fuelled by a low carbon economy.

Our climate strategy positions us to continue to manage reputational risks, reduce energy costs, grow revenues in emerging cleaner sectors, and increase customer demand and loyalty through products and services that help them to reduce their carbon emissions.

#### **Most Substantial Business Decisions Made During the Reporting Year Influenced by Climate Change**

The most substantial business decisions made during 2011 that have been influenced by climate change aspects include: our investment of \$225 million (covering 2010 and 2011) on fuel-efficient locomotives and improvements to existing fleets, investment of approximately \$1 billion to ensure the safety and reliability of our rail infrastructures, the implementation of the EcoConnexions employee engagement initiative, and continued positioning of CN to take advantage of market opportunities for sustainable energy products and cleaner technologies.

# Management

## 2. Strategy

### Engaging With Policy Makers

2.3  
Engagement with policy makers to encourage further action on mitigation and/or adaptation.

#### i) Engagement Process

**Method of engagement:** CN has been active at various levels throughout North America engaging with policy makers on responses to climate change. Our methods of engagement include direct participation as an individual Company on issues related to carbon trading policy and biofuel specifications. On issues related to emission standards for the locomotive and non-locomotive aspects of our business, we have typically engaged through the respective trade or industry organizations. For example, these can include the Railway Association of Canada, American Association of Railroads, Lake Carriers Association, and various truck associations.

**Topic of engagement:** The general topics of engagement include CN's perspectives on carbon trading regimes, rail industry GHG emission standards and biofuel specifications.

**Nature of engagement:** The nature of engagement can include consultations such as with biofuel specifications, policy research in the case of the Western Climate Initiative, and verbal deliberations, as with the Railway Association of Canada.

#### ii) Actions Advocated

CN has been active at various levels throughout North America engaging with policy makers on responses to climate change, specifically in the area of carbon trading regimes, rail industry GHG emission standards and biofuel specifications. The following provides an overview of our engagements:

##### *Carbon Trading Policy Making Positioning*

**British Columbia Government:** CN actively engages with the province of BC through the Pacific Carbon Trust (PCT), to position and obtain approval for the modal shift protocol. Over the next year, we expect to continue to work with the PCT to establish the first modal shifting project.

**Saskatchewan Government:** Over the past year, CN has continued to engage with the province of Saskatchewan to present the modal shift protocol. It is currently under review.

**Western Climate Change Initiative:** We have been engaged with the WCI in discussions associated with its regional cap and trade system, and the positioning of rail freight as a viable low carbon transportation alternative. CN believes that involvement in such sessions with leading policy makers in the WCI, moves the transportation sector forward in identifying practical solutions that contribute to or support future policy development in a manner that will foster economic growth, while ensuring significant GHG emission reductions.

##### *Emission Standards Policy Making Positioning*

**Railway Association of Canada (RAC):** Through our membership with the RAC, we have been participating in initiatives to provide GHG emission data and support studies into the carbon benefits of rail freight transport.

**Environment Canada:** We engage with Environment Canada, through our role as the chair of the RAC MOU Management Committee, in discussions regarding future emission standards for locomotives.

**US EPA:** We are involved and continue to engage with the US EPA to reduce emissions and develop action plans to demonstrate progress in meeting our SmartWay Agreements.

**Lake Carriers Association and Great Lakes Maritime Task Force:** CN participates in these associations as a major contributing member, playing an active role in shaping policy. In addition, CN has engaged with the US EPA on emission standards and implementation feasibility for shipping vessels as specified under the EPA Rule.

**Truck Associations:** As members of the associations, CN participates in discussions related to climate and fuel efficiency issues. We also receive regular information on fuel conservation in trucking.

##### *Biofuel Specifications*

CN has been engaged with a number of provinces, including Quebec, BC and Manitoba, on issues related to renewable content in diesel fuels. Through our deliberations, we communicated our concern on the potential for fuel cost increases when the supply of renewable content alternatives is low, and we continue to dialogue on the technical difficulties associated with applying biofuels in rail freight transportation during winter periods.

# Management

## 3. Targets and Initiatives

### Targets

**3.1 - 3.1a**  
Our emission reduction target active in the reporting year.

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Base year emissions (tCO <sub>2</sub> e)	Target year	Comments
001	1 and 2	100%	15%	tCO <sub>2</sub> e	2010	226,443	2013	We established an objective to reduce our energy consumption of electricity and natural gas by 15% by 2013, based on 2010 levels. In 2011, we surpassed our target, reducing our energy consumption and carbon emissions by 24%.

**3.1b**  
Our intensity target.

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Base year emissions (tCO <sub>2</sub> e)	Target year	Comments
002	1	84%	10%	tCO <sub>2</sub> e/GTM	2007	12.82	2013	We have set a 10% reduction in our rail locomotive GHG emission intensity (tonnes of CO <sub>2</sub> e/Gross Ton Mile) target by 2013, based on 2007. In 2011, we achieved a 9% reduction of our rail locomotive GHG emission intensity, based on 2007.

**3.1c**  
Change in absolute emissions our target reflects.

ID	Direction of change anticipated in absolute Scope 1 and 2 emissions at target completion	% change anticipated in absolute Scope 1 and 2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion	% change anticipated in absolute Scope 3 emissions	Comments
002	Increase	3.38%	N/A	N/A	The increase in emissions reflects our Scope 1 GHG emissions from our rail locomotives, which we attribute to the increase in volume and traffic growth in 2011.

**3.1d**  
Our progress compared to our target.

ID	% complete (time)	% complete (emissions)	Comments
001	33%	100%	We achieved a 24% reduction in our GHG emissions relating to natural gas and electricity, surpassing our reduction objective. We remain on track to meet our target.
002	65%	100%	In 2011, we achieved a 9% reduction of our rail locomotive GHG emission intensity, based on 2007. We are on track to meet our target.

# Management

## 3. Targets and Initiatives

### Emission Reduction Initiatives

#### 3.2 - 3.2a

How our service directly enables GHG emissions to be avoided by third parties.

#### i) How Emissions are Avoided

We help our customers avoid carbon emissions by offering them a carbon efficient rail service alternative when compared to other modes of transport. Rail is the most energy-efficient method of moving freight on land. No ground transportation mode can outperform rail for the hauling of large volumes of high-density freight over long distances. Over the years, the Company's precision railroading initiatives, greener fleet acquisitions that include distributed power, rail yard efficiencies, and focused fuel conservation practices, have contributed to even more GHG reductions, making us the most efficient and productive railroad in North America. It is through our rail service offering that we provide our customers with an option to avoid GHG emissions.

#### ii) Estimated Amount of Emissions Avoided Over Time

Our estimation of the emissions that have been avoided is based on the amount of truck traffic that has shifted to rail.

#### iii) Methodology, Assumptions, Emission Factors and Global Warming Potentials Used

The methodology for calculating the emissions avoided from shifting baseline truck freight to rail locomotives has been defined in our modal shift quantification protocol. In addition, we also provide a GHG calculator on the CN website to estimate GHG emissions when shipping with CN versus other transportation modes. The calculator is based on the same quantification methodology as set out in our modal shift quantification protocol. However the value applied for truck weight can be adjusted and is a customizable function in the calculator.

The protocol has now been approved under the British Columbia cap and trade system, and is awaiting approval with Saskatchewan. The British Columbia protocol is located at:

<http://www.pacificcarbontrust.com/LinkClick.aspx?fileticket=SyA1NMa6DZw%3D&tabid=81&mid=577>

*Three key assumptions* have been developed to account for the complex array of factors that can influence emissions, as follows:

- a) Average and conservative emission factors and assumptions have been developed when detailed per-shipment project data is not available.
- b) Since emission reductions from a single shipment are usually small, the protocol is intended to be used for the aggregation of emission reductions from all shipments initiated by a particular producer or aggregator of goods.
- c) In order to accurately compare the GHG emissions of rail transport to truck transport, the protocol assumes a common project and baseline function of freight transportation, and a functional unit of Revenue Ton-Kilometres (RTK) shipped, representing the mass and distance of freight shipped.

*The emissions sources and sinks* are identified in the protocols.

*Global warming potentials* are those used by Environment Canada.

#### iv) Considerations on Generating CERs or ERUs Within the CDM or JI

We are currently considering opportunities relating to carbon credits, especially now that Quebec has put in place cap and trade regulations, which is expected to facilitate the process.

## Management

### 3. Targets and Initiatives

#### Emission Reduction Initiatives (continued)

3.3, 3.3a and 3.3b  
Emissions reduction  
initiatives active within the  
reporting year.

Activity type	Description of activity	tCO <sub>2</sub> e savings associated with the action	Annual monetary savings (\$)	Investment required (\$)	Payback period
Transportation: fleet	<p><b>Locomotive Fleet Management:</b> In 2011, emissions from our locomotive diesel engines represented 84% of our GHG emissions, making reduction in this area an ongoing priority.</p> <p>To target fuel and cost saving efficiencies, we continue to focus our initiatives on our asset-lean precision railroading initiatives, fuel-efficient locomotive acquisitions and technology upgrades, efficient operation of the railroad through routing and co-production arrangements, innovative yard efficiencies and fuel conservation practices.</p> <p>In 2010 and 2011, we spent \$225 million on fuel-efficient locomotives and improvements to our existing locomotive fleet. As a result of our rail initiatives, we have been carrying our freight more efficiently.</p> <p>In 2011, we reduced our rail GHG emission intensity, measured at 11.69 kgCO<sub>2</sub>e/GTM by 1.5% based on 2010 levels, which we measured at 11.87 kgCO<sub>2</sub>e/GTM. This reduction resulted in a savings of 61,383 tonnes of CO<sub>2</sub>.</p>	61,383 tonnes	18,000,000	225,000,000	9 years

# Management

## 3. Targets and Initiatives

### Emission Reduction Initiatives (continued)

3.3c  
Methods used to drive investment in emissions reduction activities.

Method	Comment
Compliance with regulatory requirements/standards	With the expiration of our Memorandum of Understanding (MOU) with Environment Canada and pending the Canadian Locomotive Emission Standards, CN continues to follow through on its commitment to acquire, retire and upgrade locomotives so as to improve air quality, enhance fuel efficiency and reduce 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. Between 2010 and 2011, we allocated approximately \$225 million to fuel-efficient locomotives and improvements to existing fleets.
Dedicated budget for energy efficiency	We have established a 15% energy reduction target by 2013, with a baseline of 2010 relating to the consumption of natural gas and electricity at our buildings and yards. 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. Through this analysis we have selected projects and allocated a budget for approval.
Dedicated budget for other emission reduction activities	We have established a dedicated budget for various other emission and energy reduction activities as identified in our sustainability action plan. On an annual basis, various department heads and groups, including intermodal, supply management, Great Lakes shipping, and our facilities team, submit their business case investment needs to meet the corporate fuel efficiency and carbon reduction objectives. Based on these analyses, we allocate our dedicated sustainability budget to projects that bring the biggest efficiency or reduction benefits.
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 differ according to employee level with the organization, and the extent to which the employee contributes to meeting objectives.
Partnering with governments on technology development	The Company remains committed to investing in fuel-efficient locomotives and advancements in new and cleaner technology alternatives. As such, we have allocated a specific budget of \$1 million to research into next-generation locomotives. This budget is allocated based on a dedicated Research and Development budget for a three-year period between 2009 and 2011.



# Management

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## 4. Communications

### Climate Change and GHG Emission Performance

4.1  
Information CN has published relating to our responses to climate change and GHG emissions performance.

Publication	Page/section reference	Identify the attachment
In annual reports (complete)	Delivering Responsibly, p. 11	2011 Annual Report
In voluntary communications (complete)	Pages 16-24, Emissions and Energy Efficiency	2010 Sustainability Report
In voluntary communications (complete)	Pages 94-97, Sustainability	2011 Investor Fact Book
Voluntary communications (complete)	Delivering Responsibly Section	Website at <a href="http://www.cn.ca">www.cn.ca</a>



# **Risks and Opportunities**

# Risks and Opportunities

## 5. Climate Change Risk

### Climate Change – Regulatory Risks

Regulatory risk exposure is identified based on external regulatory assessments, interactions with governments and industry associations. The significant regulatory risks for the Company have been identified and include voluntary agreements, air pollution limits, fuel/energy taxes and regulations, emission reporting obligations, cap and trade schemes, and uncertainty surrounding new regulations. The regulatory risks were then assessed for significance based on the likelihood of the regulatory risk occurring and the severity of the impact on the Company. Once understood, only those risks that could have a substantive impact (receiving a high significance rating or medium to medium-high significance rating) on the business are reported in the following section.

<b>Frequency/Probability</b>	High			
	Medium		1	2
	Low	6	4 3 5 9 10 12	7 8 11 13
		Low	Medium	High
	<b>Severity of Impact</b>			

	High significance - disclosure and alignment with business strategy
	Medium-high significance - disclosure
	Medium-low significance, disclosure depends on risk perception of the Company
	Not significant, disclosure not required

#### Air Pollution Limits

1. Canada proposed standards
2. US EPA locomotive standards
3. US EPA vessel standards
4. Heavy duty vehicle standards (pending)
5. Light duty vehicle standards
6. Canadian rail yard standards

#### Fuel Energy Taxes and Regulations

7. Renewable fuel content standard
8. Fuel carbon tax

#### Voluntary Agreements

9. US SmartWay Agreement

#### Emission Reporting Obligations

10. EU Aviation Directive

#### Cap and Trade Schemes

11. Western Climate Initiative (WCI)

#### Uncertainty Surrounding New Regulations

12. US Climate Bill
13. Canadian federal and provincial regulations

# Risks and Opportunities

## 5. Climate Change Risk

### Climate Change – Regulatory Risks (continued)

5.1 - 5.1a  
Risks driven by changes in regulations.

ID	Risk driver	Description	Potential impact	Time frame	Direct/indirect	Likelihood	Magnitude of impact
01-REG	Air pollution limits	<p><b>Proposed Canadian Federal Locomotive Emission Standards</b></p> <p>Our Memorandum of Understanding on locomotive emissions standards with the RAC expired in 2010. We are now anticipating Canadian locomotive emission standards, similar to those established under the US EPA, expanding the scope of requirements into Canada. In anticipation of these regulations, we remain committed to continuing to acquire, retire and upgrade locomotives, to improve air quality, enhance fuel efficiency and reduce GHG emission intensity.</p>	<p>√ Increased operational cost</p> <p>√ Increased capital cost</p>	0-5 years	Direct	Very likely	Medium
02-REG	Air pollution limits	<p><b>US EPA Emission Regulations for Locomotive Engines</b></p> <p>In the US, CN's locomotive emissions are regulated by the US EPA, which sets emission standards for newly manufactured and remanufactured off-road engines. In 2008, the EPA adopted even more stringent locomotive Tier 4 emission standards with an additional requirement that mandates the application of idle emission controls on newly manufactured and remanufactured engines.</p>	<p>√ Increased capital cost</p>	Current	Direct	Virtually certain	Medium
03-REG	Fuel/energy taxes and regulations	<p><b>Renewable Fuel Content Federal Policy and Provincial Regulations</b></p> <p>Canadian federal regulations require CN to purchase diesel fuel with 2% biodiesel content. The renewable content in diesel fuel could expose the Company to potential fuel price increases when renewable content is in limited supply. Furthermore, where renewable fuel content exceeds a 5% blend our manufacturers have indicated that locomotive engine functioning could be compromised. We are currently working with manufacturers on the threshold for a biodiesel blend.</p>	<p>√ Increased operational cost</p>	Current	Direct	Virtually certain	Low-medium
04-REG	Fuel/energy taxes and regulations	<p><b>Fuel Carbon Tax</b></p> <p>Since July 1, 2008, the province of British Columbia has taken steps toward introducing a carbon tax based on GHG emissions from fossil fuel combustion. This tax is being phased in over four years and is assessed on all carbon-based fuel types, including locomotive diesel fuel consumed in this province. As of July 1, 2011, CN's BC carbon tax surcharge increased to \$16.10/carload and \$8.05/intermodal unit. For more information refer to CN's press release at the following url: <a href="http://www.cn.ca/en/customer-news-bc-carbon-tax-20110524.htm">http://www.cn.ca/en/customer-news-bc-carbon-tax-20110524.htm</a></p>	<p>√ Reduced demand for goods/ services</p>	Current	Indirect	Virtually certain	Low-medium

# Risks and Opportunities

## 5. Climate Change Risk

### Financial Implications

5.1b  
Potential financial implications of risk before taking action, methods used to manage risk, and associated costs.

Financial implications of the risk	Methods to manage the risk	Costs associated with these actions
<b>Air Pollution Limits – Emission Standards on Locomotives (01- and 02-REG)</b>		
Non-compliance with pending future locomotive emissions standards could expose the Company to administrative penalties, such as fines, as well as loss of some business due to locomotive shutdowns.	To meet the US EPA emission standards, we purchase only tier-compliant engines. To meet the more stringent Tier 4 standards, we are working with our manufacturers in the development of new engine technologies that can effectively lower fuel consumption and emissions. Our efforts to meet the US EPA emission standards will enable us to comply with the proposed Canadian emission standards, which we understand will be similar to the US EPA standards.	The Company invested \$225 million between 2010 and 2011 as part of our locomotive acquisitions, retirements and upgrades strategy. Doing so enables us to meet locomotive emission standards.
<b>Fuel/Energy Taxes and Regulations – Renewable Fuel Content Regulations (03-REG)</b>		
Renewable content in diesel fuel could expose the Company to potential fuel price increases when renewable content is in limited supply.	We are working with our engine suppliers to see what type of additives would be needed if renewable fuel blends exceed the 5% threshold. We are also trying to understand the impacts on locomotive engine functioning.	At this time, we have not had to incur costs associated with the R&D activities of our manufacturers. These costs will likely be passed on to us once a solution to address blended fuels has been identified.
<b>Fuel/Energy Taxes and Regulations – Fuel Carbon Tax (04-REG)</b>		
In BC, the Carbon Tax Act - Bill 37, taxes GHGs emitted from the use of virtually all fossil fuels. In 2011, the taxation rate increased to 16.10 per railcar and 8.05 per container. Refer to: <a href="http://www.cn.ca/en/customer-news-bc-carbon-tax-20110524.htm">http://www.cn.ca/en/customer-news-bc-carbon-tax-20110524.htm</a>	Our customers shipping freight within BC are obligated to pay a carbon surcharge to cover the carbon taxation costs for freight shipped within the province. For CN, the introduction of the tax in BC has prompted greater attention to the accuracy of our fuel data management system. Over the next three years, we will be enhancing our fuel management reconciliation system in order to gain a better understanding of fuel inventory variations.	We are investing up to \$20 million in the installation of new meters at fuel reception points, fuel tanks and locomotive delivery areas.

# Risks and Opportunities

## 5. Climate Change Risk

### Climate Change – Physical Risks

At CN, we recognize that climate change, including the impacts of global warming, could increase the frequency of adverse weather events. Severe weather and natural disasters, such as extreme cold and extreme heat, flooding, drought, and hurricanes, can disrupt operations and service for the railroad, affecting the performance of locomotives, rolling stock, and the physical plant, as well as disrupting operations for the Company’s customers. The following diagram and section provides an overview of significant climate change-related physical risks that are impacting, or have the potential to impact CN’s operations, and the actions taken to manage these risks. Once understood, only those risks that could have a substantive impact (receiving a high significance rating or medium to medium-high significance rating) on the business are reported in the following section.

<b>Frequency/Probability</b>	High			
	Medium	5	1 3 4	
	Low	9	6 7 2 8	
		Low	Medium	High
	<b>Severity of Impact</b>			

	High significance - disclosure and alignment with business strategy
	Medium-high significance - disclosure
	Medium-low significance, disclosure depends on risk perception of the Company
	Not significant, disclosure not required

#### Changes in Frequency of Weather Events/Tropical Cyclones

1. Network infrastructure/productivity
2. Asset vulnerability
3. Insurance cost increases

#### Changes in Precipitation Extremes and Drought

4. Track operating efficiency

#### Induced Changes in Supply Chain and/or Customers

5. Risk of energy shortages and cost increases
6. Raw materials/equipment supplies

#### Induced Changes in Natural Resources

7. Commodity market changes
8. Network efficiency risks from high sea levels
9. Declining navigational waters

# Risks and Opportunities

## 5. Climate Change Risk

### Climate Change – Physical Risks (continued)

5.1c  
Risks driven by change in physical climate parameters.

ID	Risk driver	Description	Potential impact	Time frame	Direct/indirect	Likelihood	Magnitude of impact
01-PHY	Changes in temperature extremes	<p>Extreme temperatures can present a significant risk to our network infrastructure. Rail misalignments and track buckling are possible from thermal rail expansions. In addition, extreme cold can result in track freezing, leading to greater frequencies of broken rails, frozen switches, and high rates of wheel replacements. Extreme cold temperatures are particularly frequent in the northern Canada regions, while extreme hot temperatures are particularly common in the southern parts of the US as well as parts of the Canadian prairies. In such instances, there have been cases when CN has had to shut down significant portions of the network for a period of time, exposing the Company to operational and financial risks.</p> <p>As the frequency and severity of extreme weather events increase, and insurers are forced to contend with greater uncertainty, insurance premiums in general could rise, adversely affecting the Company financials. Network disruptions and increasing costs associated with the frequency of weather events could further adversely affect customer deliveries and efficiencies.</p>	<p>√ Increased operational cost</p> <p>√ Increased capital cost</p>	Current	Direct	Virtually certain	Medium
02-PHY	Tropical cyclones	<p>Our sites and networks are located within the US Tornado Belt, making us vulnerable to increases in tornado occurrences and intensity. This is particularly the case throughout the Midwest and the New Orleans area. For instance, during hurricane Katrina, we were subjected to disruptions in our operations. Not only were we unable to access our fuelling stations, but we also experienced damage to infrastructure and property.</p>	<p>√ Increased operational cost</p> <p>√ Increased capital costs</p>	Current	Direct	Virtually certain	Medium
03-PHY	Changes in precipitation extremes and drought	<p>Over the past years, the Company has experienced increases in intense precipitation, leading to more pronounced episodes of flooding, landslides in unstable mountainous regions, and mud slides. Such episodes can be disruptive to our operations. Flooding can be damaging to rail bed support structures and cause overflows onto tracks. Landslides and mud slides can be especially damaging to our rail tracks. In previous years, severe flooding in Eastern Canada, as well as in the Chicago, Illinois area, was particularly disruptive to our infrastructure, resulting in service disruptions. Meanwhile, extensive winter rain with accompanying mud slides led to the closure of some of our networks in Western Canada. Warming temperatures could result in significant declines in navigational waters, particularly along the St. Lawrence–Great Lakes Seaway, Gulf Coast, and the Mississippi River. Navigational interruptions from ice, floods, and droughts could adversely impact CN’s shipping traffic and rates.</p>	<p>√ Increased operational cost</p> <p>√ Increased capital cost</p>	Current	Direct	Virtually certain	Medium
04-PHY	Sea level rise	<p>The Intergovernmental Panel on Climate Change (IPCC) projections suggest that the average global sea level is expected to rise with considerable regional variations. Based on studies by Natural Resources Canada, higher mean sea levels, coupled with high tides and storm surges could severely impact transportation infrastructure, resulting in service disruptions. CN has a number of port locations that could be vulnerable to rising sea levels, including our operations at Halifax, Prince Rupert, Vancouver and New Orleans. Furthermore, rising sea levels could result in more frequent flooding of railroads near estuaries during high tides and storms, which could disrupt operations and service. We do not expect sea level rises to have an immediate impact on our business, as these risks are more likely to occur well into the future.</p>	<p>√ Increased capital cost</p>	6-10 years	Direct	Very likely	Low-medium

# Risks and Opportunities

## 5. Climate Change Risk

### Financial Implications

5.1d  
Potential financial implications of risk before taking action, methods used to manage risk, and associated costs.

Financial implications of the risk	Methods to manage the risk	Costs associated with these actions
<b>Changes in Temperature Extremes (01-PHY)</b>		
The financial implications of extreme temperature conditions could result in network disruptions impacting revenues and operating costs.	CN has put in place a number of programs to respond to such extreme weather events. For instance, summer and winter readiness plans have been established that include procedures for train speed, train length and weight, inspections, rail replacements, de-stressing, and fire prevention and response. Furthermore, our engineering department ensures the productivity and fluidity of the network through continued testing of our tracks, additions of ultrasonic rail flaw detectors, increased sightline and surface inspections, and computerized track inspection logs. We also installed weather stations to monitor outside temperatures and humidity.	Year over year, CN expends considerable costs towards the maintenance of its infrastructure to protect the Company assets from wear and tear that could be attributable to changes in climate. In 2011, CN invested \$1 billion to ensure the safety and reliability of our rail infrastructure.
<b>Tropical Cyclones (02-PHY)</b>		
The financial implications of tropical cyclones could result in network disruptions impacting revenues and operating costs.	On an ongoing basis, our teams review and update our emergency response planning procedures to address extreme weather patterns, including hurricanes. This has included the redesign of fuelling station locations as well as providing the necessary back-up IT systems. Furthermore, our field forces have ready access to a 24-hour weather forecasting and advisory service using the SmartRAD weather warning service.	In 2011, CN invested \$1 billion towards operating a safe railroad, including investments in emergency response programs, IT and weather monitoring programs.
<b>Changes in Precipitation Extremes and Droughts (03-PHY)</b>		
The financial implications of precipitation extremes and droughts could result in network disruptions impacting revenues and operating costs.	Through our winter, summer and spring operating plans, our Engineering department conducts ongoing rail inspections to check for obstructed waterways, water pooling near roadbeds, evidence of roadbed or bank erosion, unusually high and/or turbulent water adjacent to the track, and changes in normal draining patterns. We have also installed natural hazard warning systems to detect and report on slides or track hazards in known sensitive areas, such as in the BC corridors. For example, we constructed slide fences that activate alarms if rock or debris fall on the track, warning approaching trains of a hazard. We also built tip-over posts to detect larger movement of debris such as those from mud slides.  CN is also well-placed to address reduced vessel traffic volumes that may occur as a result of extreme drought conditions, given our ability to provide both locomotive and truck freight transport alternative services.	In 2011, CN invested \$1 billion towards operating a safe railroad, including addressing adverse impacts resulting from changing climatic patterns.
<b>Sea Level Rise (04-PHY)</b>		
The financial implications of sea level rise could result in network disruptions impacting revenues and operating costs.	We continue to monitor sea level rising trends and remain committed to ensuring that network updates take these risks into consideration.	In 2011, CN invested \$1 billion towards operating a safe railroad, including addressing adverse impacts resulting from changing climate patterns.



# Risks and Opportunities

## 5. Climate Change Risk

### Climate Change – Other Risks

In the normal course of business, CN is exposed to various other climate change risks, which are identified through the Company's annual risk management process. Through this process, CN's Corporate Environment department plays an integral role in identifying other climate change risks based on the results of operational and maintenance programs, as well as ongoing environmental audits. The following diagram and section provide an overview of significant other climate change-related risks that are impacting, or have the potential to impact CN's operations. Once understood, only those risks that could have a substantive impact (receiving a high significance rating or medium to medium-high significance rating) on the business are reported in the following section.

<b>Frequency/Probability</b>	High			
	Medium		6 4 1	5
	Low		2 7 3	
			Low	Medium
	<b>Severity of Impact</b>			

	High significance - disclosure and alignment with business strategy
	Medium-high significance - disclosure
	Medium-low significance, disclosure depends on risk perception of the Company
	Not significant, disclosure not required

#### Market Risk

1. Changing customer demands
2. Economic conditions
3. Credit risk
4. Competition from other carriers

#### Changes in the Availability and Costs of Goods and Services

5. Dependence on diesel fuel as an energy source

#### Reputational Risks

6. Reputation associated with the shipment of carbon intensive goods and services

#### Security Risks

7. Loss or damage to assets associated with carbon intensive goods and services

# Risks and Opportunities

## 5. Climate Change Risk

### Climate Change – Other Risks (continued)

5.1e  
Risks driven by changes in other climate-related developments.

ID	Risk driver	Description	Potential impact	Time frame	Direct/indirect	Likelihood	Magnitude of impact
01-OTH	Competition from other carriers	Given the environmental advantages that rail freight provides over other modes of transport, the Company could face competition from rail carriers that effectively market and differentiate themselves as the lowest carbon freight service offering. Competition from other railroad carriers could impact volumes, revenues and profit margins.	<ul style="list-style-type: none"> <li>√ Reduced demand for goods/services</li> <li>√ Reduced stock price (market valuation)</li> </ul>	6-10 years	Direct	About as likely as not	Medium
02-OTH	Changing consumer demands	With growing awareness and concern for climate change, consumer demands for low carbon and more responsible products are growing throughout Europe and North America. With these demands have come increasing pressures on our customers to demonstrate the carbon impacts of their products, including aspects of their distribution networks. In fact, some large multinational retailers and manufacturers are already starting to pre-select their suppliers based on environmental criteria that include carbon criteria within the distribution network. Furthermore, Europe and some US states, including California, have put in place Low Carbon Fuel Standards (LCFS) which could indirectly impact oil and gas companies from a public relations standpoint.	<ul style="list-style-type: none"> <li>√ Reduced demand for goods/services</li> </ul>	Current	Direct	More likely than not	Medium
03-OTH	Reputation	With increasing public concern for the environment, the Company is exposed to reputational risks from stakeholders that hold the Company accountable for carbon intensive products that we may transport. As a rail common carrier, we have a duty to carry all freight, as long as there are no reasonable grounds to refuse to do so. Therefore, railroads cannot generally refuse to transport a commodity based on its specific characteristics. The Company is committed to being a good corporate citizen, and providing carbon efficient transport and logistic services to our customers in a way that ensures safety and respect for the environment.	<ul style="list-style-type: none"> <li>√ Reduced demand for goods/services</li> <li>√ Reduced stock price (market valuation)</li> </ul>	Current	Direct	About as likely as not	Medium
04-OTH	Changes in the availability and costs of goods and services	The Company's operations, and in particular the running of our locomotives, are currently dependent on the availability of diesel. Declining oil reserves, which may impact the available supply of diesel fuel, could pose a risk to the Company's ability to operate. While we do not consider this risk to materialize in the short- to medium-term, we are monitoring developments on alternative fuel sources with interest.	<ul style="list-style-type: none"> <li>√ Increased operational costs</li> <li>√ Increased capital cost</li> </ul>	Unknown	Direct	About as likely as not	Medium to high

# Risks and Opportunities

## 5. Climate Change Risk

### Financial Implications

5.1f  
Potential financial implications of risk before taking action, methods used to manage risk, and associated costs.

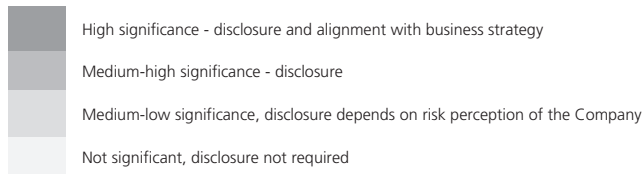
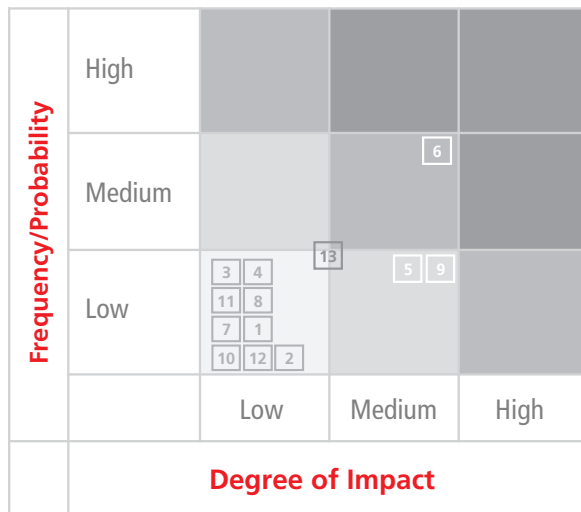
Financial implications of the risk	Methods to manage the risk	Costs associated with these actions
<b>Competition From Other Carriers (01-OTH)</b>		
Competition from other carriers could result in reduced demand for our services impacting revenues.	We work with our customers to not only demonstrate the carbon benefits of rail freight, but to also differentiate ourselves in the marketplace as the most fuel-efficient service provider. To further communicate the carbon benefits of rail, we introduced a GHG calculator to estimate the carbon emissions for shipments using a combination of vessel, rail and truck. Please refer to <a href="http://www.cn.ca/en/corporate-citizenship-environment-greenhouse-gas-calculator.htm">http://www.cn.ca/en/corporate-citizenship-environment-greenhouse-gas-calculator.htm</a> .	CN expends considerable costs to ensure we operate the most fuel-efficient railroad. In 2010 and 2011, CN spent \$225 million on fuel-efficient locomotives and improvements to our existing locomotive fleet. In addition, we also expend costs into marketing the low carbon freight advantages of shipping by rail versus other transportation modes, which is part of our overall operating budget.
<b>Changing Consumer Demands - (02-OTH)</b>		
Changes in consumer demand, including a focus on low carbon solutions, could adversely affect our volumes.	The Company is well-positioned to manage this risk as we benefit from a diversified portfolio of business, both in terms of the commodities that we ship and the customers that we service, as well as our broad geographic scope. Additionally, we continue to demonstrate to customers the carbon benefits of rail freight transportation. We have also increased our participation in sustainable product markets, including: ethanol; recycled and new forest products such as wood pellets; wood pulp; wind turbines; and biodiesel.	The cost associated with communicating to our customers is integrated into the Company's operating costs.
<b>Reputation (03-OTH)</b>		
The financial implications of not shipping goods could impact our reputation and business related to carbon intensive goods.	As a rail common carrier, we have a duty to carry all freight, as long as there are no reasonable grounds to refuse to do so. Railroads cannot generally refuse to transport a commodity based on its specific characteristics. The Company is committed to being a good corporate citizen, and providing carbon efficient transport and logistic services to our customers in a way that ensures safety and respect for the environment.	We have developed a sustainability action plan and assigned costs to various aspects of our business to enhance our sustainability performance that has implications on our customer shipments.
<b>Changes in the Availability and Costs of Goods and Services (04-OTH)</b>		
A reliance on fossil fuel could expose our customers to fuel price volatility and increases, adversely impacting business demand.	We are committed to exploring renewable alternatives by supporting and monitoring research towards cleaner alternative energy sources, including liquid natural gas, fuel cell power natural gas, and biodiesel fuels.	We are investing \$1 million over three (2010-2012) years into next-generation locomotives, which includes renewable fuel alternatives.

# Risks and Opportunities

## 6. Climate Change Opportunities

### Climate Change – Regulatory Opportunities

Regulatory opportunities related to climate change are typically identified through our work with government authorities, various stakeholders, and third-party reviews. The following diagram and section provide an overview of climate change related regulatory opportunities that are impacting, or have the potential to impact CN's operations. Once understood, only those opportunities that could have a substantive impact (receiving a high significance rating or medium to medium-high significance rating) on the business are reported in the following section.



#### Voluntary Agreements

1. US SmartWay Agreement

#### Cap and Trade Schemes

2. Alberta Climate Change and Emissions Act
3. British Columbia GHG Act
4. Quebec Bill 42
5. Western Climate Initiative (WCI)

#### Air Pollution Limits

6. US EPA Emission Standards

#### Fuel Energy Taxes and Regulations

7. BC Carbon Tax Act – Bill 37
8. Renewable Fuel Content

#### Indirect Exposure through Customers and Suppliers

9. Walmart and Ford Sustainability Questionnaire
10. Carbon Disclosure Project
11. Climate Bill
12. Low Carbon Fuel Standard
13. Government policies supporting rail freight

# Risks and Opportunities

## 6. Climate Change Opportunities

### Climate Change – Regulatory Opportunities (continued)

6.1 - 6.1a  
Opportunities driven by changes in regulation.

ID	Opportunity driver	Description	Potential impact	Time frame	Direct/indirect	Likelihood	Magnitude of impact
01-REG	Voluntary agreements	<b>Air Emission Limits</b> As part of our obligations to the US EPA locomotive emission standards, and in anticipation of the Canadian emission standards, opportunities exist to realize long-term carbon efficiencies and significant fuel savings through our locomotive fleet management strategy.	√ Reduced operational cost	Current	Direct	Virtually certain	Medium
02-REG	Cap and trade schemes	<b>Western Climate Initiative (WCI) Regional Cap and Trade Scheme</b> The cap and trade schemes developing in Canada, particularly through the WCI, present an important opportunity for CN in positioning the modal shift quantification protocol for switching long-haul truck freight to rail. Already the provinces of British Columbia, Saskatchewan, Ontario and Quebec have put into effect regulations that align with the setting up of a cap and trade scheme through the WCI. The protocol has been adopted by the province of British Columbia and is currently under consideration with the province of Saskatchewan. By positioning the protocol for approval throughout North America, CN's customers can benefit from the carbon credits associated with shifting truck freight traffic to rail.	√ Increased demand for existing products/services	Current	Direct	Virtually certain	Low-medium
03-REG	Indirect exposure through customer and supplier requirements	<b>Customer and Supplier Requirements</b> There are growing pressures to manage the carbon impacts throughout the supply chain. Leading multinational and manufacturing companies are already setting environmental pre-selection criteria for their suppliers. In fact, both Ford and Walmart are engaging with suppliers to understand their carbon impacts. For example, Walmart has invited its suppliers to report their GHGs and reduction targets as part of its sustainability index for Walmart products. In addition, the CDP recently came out with a supply chain questionnaire, endorsed by Walmart, Ford and other leading multinational organizations, to enable companies to capture supplier emissions. These requirements present an important opportunity for CN to enhance our reputation and gain market share by demonstrating to our customers and other stakeholders CN's low carbon rail freight transportation solution.	√ Increased demand for existing products/services	Current	Direct	Very likely	Low-medium
04-REG	Government policies supporting rail freight	<b>Favourable Government Policies</b> With increasing support for low carbon transportation and logistics services from North American governments, opportunities exist to enhance the positioning of CN's rail freight transportation as the "greener choice." For example, as part of its 2006-2012 action plan on climate change, the Quebec government created an assistance program to support transportation companies and organizations in their efforts to improve energy efficiency and lower GHGs. We are also starting to see similar developments evolving in other North American states and provinces, including Ontario, British Columbia, New Brunswick, Illinois, Minnesota, and Wisconsin.	√ Reduced operational cost	Current	Direct	Virtually certain	Low

# Risks and Opportunities

## 6. Climate Change Opportunities

### Financial Implications

6.1b  
Potential financial implications of opportunity, methods used to manage opportunity, and associated costs.

Financial implications of the opportunities	Methods to manage the opportunities	Costs associated with these actions
<b>Voluntary Agreements (01-REG)</b>		
Our voluntary agreements drivers, which are one of many, play a role in our fuel efficiency reductions. Through various initiatives, we estimate potential savings of approximately 1.5% of our operating costs annually.	To increase our fuel efficiency, we have implemented various initiatives that have resulted in fuel savings. This has included the implementation of fuel efficiency measures, such as improved train handling, the inherent improvements in diesel engine thermal efficiency, reduced “parasitic” losses in the locomotive auxiliaries, high horse power capacities allowing longer/heavier trains, train operation with dynamic brakes, train consolidations facilitated by distributed power and the acquisition of more fuel-efficient locomotives.	The Company invested \$225 million in 2010 and 2011 as part of our locomotive acquisitions, retirements and upgrade strategy. Doing so enables us to meet our compliance objectives, while minimizing GHG emissions and increasing fuel efficiency.
<b>Cap and Trade Schemes - (02-REG)</b>		
The protocol provides an opportunity for CN to grow revenue from customers exposed to various regulatory or other requirements that are driving the need to control their Scope 3 emissions.	Over the past year, CN has been engaging with the province of Saskatchewan as well as the WCI and its member provinces and states to present the freight modal shift protocol for review and adoption. We are also actively engaging with our customers to improve the carbon footprint of our customers’ shipments and increase our revenues from modal shift.	The costs associated with communicating with our customers, and exploring opportunities to benefit from government funding have been included in marketing and sustainability functional budgets.
<b>Customer and Supplier Requirements (03-REG)</b>		
Through an enhanced reputation we expect to increase revenues as well as share price and investor returns.	CN has developed and enhanced its GHG calculator to enable customers to measure the GHGs from rail, marine and truck transportation; the first of its kind in the industry. Further, with the development of a modal shift rail freight protocol, ongoing strategic partnerships and engagement with stakeholders, as well as our own operational efficiency, we have significantly improved our visibility and reputation as a leader in fuel efficiency.	The costs associated with developing the GHG calculator and modal shift protocol was part of our overall operating budget.
<b>Government Policies that Support Rail Freight (04-REG)</b>		
The government subsidies of our low carbon transportation and logistics services are expected to contribute to annual savings of approximately 1.5% of our operating costs.	In order to maximize government support for low carbon transportation and logistics services, we have received government funding to support our initiatives to enhance our locomotive, truck and shipping fleets towards greater fuel efficiency.	The upfront cost associated with our fuel efficiency investments was approximately \$6 million. These costs will be further subsidized by the government.

# Risks and Opportunities

## 6. Climate Change Opportunities

### Climate Change – Physical Opportunities

At CN, we also recognize that while physical changes resulting from climate change could present important opportunities for our business. The Sales and Marketing Department typically identifies opportunities to grow revenues, while various departments throughout the Company typically identify areas for cost savings. Opportunities that could present significant benefits to the Company are included in our planning process and are generally discussed at the regular meetings of the Executive Committee. The following diagram and section provide an overview of the physical opportunities that are impacting, or have the potential to impact CN's operations. Once understood, only those opportunities that could have a substantive impact (receiving a high significance rating or medium to medium-high significance rating) on the business are reported in the following section.

<b>Frequency/Probability</b>	High			
	Medium		4 2	
	Low	3	1	
		Low	Medium	High
	<b>Degree of Impact</b>			

#### Induced Changes in Natural Resources and Amenities

1. Increase in agriculture and feedstock from warming climates
2. Competitive advantage from declining navigational waters
3. Volume growth of lumber in pine beetle-affected areas
4. Energy savings from warmer climates

	High significance - disclosure and alignment with business strategy
	Medium-high significance - disclosure
	Medium-low significance, disclosure depends on risk perception of the Company
	Not significant, disclosure not required

# Risks and Opportunities

## 6. Climate Change Opportunities

### Climate Change – Physical Opportunities (continued)

6.1c  
Opportunities driven by changes in physical climate parameters.

ID	Risk driver	Description	Potential impact	Time frame	Direct/indirect	Likelihood	Magnitude of impact
01-PHY	Changes in mean average temperatures	<p><b>Warming Climate Increases Agricultural and Forest Feedstock in the Prairies and Northern Regions</b></p> <p>A warmer climate could lengthen growing seasons and increase the availability of agricultural and forest feedstock. These opportunities could be especially important within the prairie regions of Canada, lengthening growing seasons and increasing crop production in northern regions where suitable soils exist. We continue to monitor warming trends and the impact on agriculture and forest feedstock revenues.</p>	√ Increased demand for existing products/services	Current	Direct	Virtually certain	Low-medium
02-PHY	Changes in precipitation extremes and droughts	<p><b>Declining Navigational Waters Resulting in Competitive Advantages Against Barge Competition</b></p> <p>Warming temperatures could result in significant declines in navigational waters, particularly along the St. Lawrence–Great Lakes Seaway, Gulf Coast, and the Mississippi River. These declines could impact barge traffic and present a competitive advantage for our rail and intermodal operations, particularly in terms of shipping coal and grain. Barge competition and barge rates can be adversely affected by navigational interruptions from ice, floods, and droughts. As such, warming temperatures and their impact on navigational waters could increase our traffic volumes when shipping alternatives are not possible due to climatic changes.</p>	√ Increased demand for existing products/services	Current	Direct	Virtually certain	Medium
03-PHY	Changes in mean average temperatures	<p><b>Energy Savings From Warmer Temperatures</b></p> <p>Warmer winters could result in decreased fuel consumption needs for rail locomotives and trucks during the winter months. In addition, reduced energy needs within our yards and business operations could also provide reduced heating costs and ultimately fewer GHG emissions. The positive impact of warming trends on fuel and energy consumption is not expected in the immediate short term.</p>	√ Reduced operational costs	Current	Direct	Virtually certain	Medium



# Risks and Opportunities

## 6. Climate Change Opportunities

### Financial Implications

6.1d  
Potential financial implications of opportunity, methods used to manage opportunity, and associated costs.

Financial implications of the opportunity	Methods to manage the opportunity	Costs associated with these actions
<b>Changes in Mean Average Temperature (01-PHY)</b>		
A warmer climate could lengthen growing seasons and increase the availability of agricultural and forest feedstock from our customers, increasing commodity markets for the freight we transport. Given the geographic scope and nature of our operations, it is difficult to quantify the revenue increase potentials.	<p>We continue to monitor warming trends and the impact on commodity groups, such as agriculture and forest feedstock, that could be impacted from changing climates.</p> <p>With a diversified portfolio of business from a variety of commodity groups, CN has been able to offset the impacts of climate change on our business.</p>	The costs associated with our diversification portfolio are integrated into the Company's general operating budget.
<b>Changes in Precipitation Extremes and Droughts - (02-PHY)</b>		
Warming temperatures and their impact on navigational waters could increase our traffic volumes when shipping alternatives are not possible due to climatic changes. Given the geographic scope and nature of our operations, it is difficult to quantify the revenue increase potentials from increased traffic volumes.	We continue to market our rail services within the area of the Great Lakes, and maintain a competitive advantage, as we are one of the only railroads with capabilities to ship by rail in the region.	No specific costs or actions have been associated with this opportunity.
<b>Energy Savings From Warmer Temperatures (03-PHY)</b>		
Warmer winters could result in decreased fuel consumption needs for rail locomotives and trucks during the winter months. In addition, reduced energy needs within our yards and business operations could also provide reduced heating costs and ultimately fewer GHG emissions.	The positive impact of warming trends on fuel and energy consumption has already been experienced during isolated years. We continue to monitor warming impacts on our fuel and energy consumption to determine any historical trends.	There have been no costs associated with this action.

# Risks and Opportunities

## 6. Climate Change Opportunities

### Climate Change – Other Opportunities

Other opportunities related to climate change are typically identified by a variety of internal departments. Business opportunities that are considered significant to the business are itemized and addressed at the regular meetings of the Executive Committee, as well as at the annual board meetings, as considered relevant. The following diagram and section provide an overview of the other opportunities that are impacting, or have the potential to impact CN’s operations. Once understood, only those opportunities that could have a substantive impact (receiving a high significance rating or medium to medium-high significance rating) on the business are reported in the following section.

<b>Frequency/Probability</b>	High			
	Medium		7 5	
	Low		8 1 4 2 3	
		Low	Medium	High
	<b>Degree of Impact</b>			

#### **New Service and/or Product Market Opportunities**

1. Competitive positioning over truck due to fuel cost increases

#### **Increased Efficiency of Goods and Services**

2. Technological developments
3. Economic conditions
4. Acquisitions

#### **New Energy Products or Services**

5. Product innovation and new markets
6. Clean technology markets

#### **Reputation/Attract and Retain Talent**

7. Enhanced reputation in sustainable rail freight transportation
8. Attract, develop and retain talent

	High significance - disclosure and alignment with business strategy
	Medium-high significance - disclosure
	Medium-low significance, disclosure depends on risk perception of the Company
	Not significant, disclosure not required

# Risks and Opportunities

## 6. Climate Change Opportunities

### Climate Change – Other Opportunities (continued)

6.1e  
Opportunities driven by changes in other climate-related developments.

ID	Risk driver	Description	Potential impact	Time frame	Direct/indirect	Likelihood	Magnitude of impact
01-OTH	Reputation	Environmental responsibility is becoming a top issue on corporate agendas as companies grapple with the complexities associated with creating meaningful eco-efficient operations. As a result, there are growing pressures to not only manage the impacts controlled by the Company but also those it influences through the supply chain network. For example, leading multinational and manufacturing companies, such as Walmart and Ford, are already setting environmental pre-selection criteria for their suppliers, which include specific criteria for carbon efficient operations. These pressures could present opportunities to enhance our reputation by demonstrating to our customers and other stakeholders the value of rail as a low carbon rail freight transportation solution.	√ Increased demand for existing products/services	Current	Direct	Virtually certain	Medium
02-OTH	Other	With increasing pressure to reduce our reliance on non-renewable sources of energy, opportunities exist to explore alternative, more sustainable fuels, particularly within rail freight transportation. Doing so will enable us to further reduce our GHG emissions as well as meet regulatory compliance obligations. To this end, CN has been committed to working with manufacturers and research centres to support the development of cleaner rail technologies.	√ Increased demand for existing products/services	10 years or more	Direct	About as likely as not	Medium
03-OTH	Other	As the issue of climate change and the need for renewable energy sources reaches a critical point, CN is well positioned to find growth opportunities in cleaner technology markets. In many jurisdictions across North America, policy and financial incentives are being introduced to encourage the development of clean technology.	√ New products/business services	Current	Direct	About as likely as not	Low-medium

# Risks and Opportunities

## 6. Climate Change Opportunities

### Financial Implications

6.1f  
Potential financial implications of opportunity, methods used to manage opportunity, and associated costs.

Financial implications of the opportunity	Methods to manage the opportunity	Costs associated with these actions
<b>Reputation (01-OTH)</b>		
The reputational benefits associated with a low carbon freight service offering could result in increased market share and revenue for the Company.	<p>With the active participation in the development of a modal shift rail freight protocol, ongoing strategic partnerships and engagement with stakeholders (suppliers, customers, and governments), as well as our own operational efficiency focus, we have significantly improved our visibility and reputation as a leader in fuel efficiency.</p> <p>We continue to be recognized by the Corporate Knights rating scheme, Jantzi Social Index, the FTSE4Good Index, Global Challenges Index and the Dow Jones Sustainability Index.</p>	The costs associated with this opportunity are integrated into the operating budgets of our sustainability team.
<b>Other – Alternative Fuels (02-OTH)</b>		
Reducing our reliance on fossil fuels through technologies that can support alternative fuels could reduce CN's operating costs.	<p>CN has been committed to working with manufacturers and research centres to support the development of cleaner rail technologies. Furthermore, we support research and educational advancements in rail through university sponsorships.</p> <p>We are also currently implementing various pilot programs to test the use of hybrid vehicles in our On Company Service (OCS) and trucking fleet, as well as with our shunt trucks.</p>	We are investing \$1 million, which includes monitoring research and development of the next-generation locomotives using hydrogen injection, GENSET, and alternative fuels.
<b>Other – Alternative Sustainable Cleaner Technology Markets (03-OTH)</b>		
The implications of clean technology market is growing. For instance, revenues for CN's Forest Products group increased by \$29 million, or five per cent, in the first six months of 2011 when compared to the same period in 2010. The increase was partly due to increased shipments of wood pellets.	In order to tap into this opportunity, CN has been working with wind turbine companies like Vestas and GE Energy to provide transportation solutions for wind farm projects throughout North America. Revenue growth from clean technology markets has the potential of presenting a considerable long-term growth initiative for CN, including increased shipments of biofuels, solar panels and wood pellets.	Marketing costs associated with working with our customers, including marketing our services for clean technology markets, is integrated into the overall operating budget.



**Emissions**

# Emissions

## 7. Emissions Methodology

7.1  
Base year and base year emissions (Scopes 1 and 2).

Base year	Scope 1 base year emissions (metric tonnes CO <sub>2</sub> e)	Scope 2 base year emissions (metric tonnes CO <sub>2</sub> e)
01/01/2007	4,458,409	N/A
01/01/2010	N/A	226,443

7.2 - 7.2a  
Methodology used to collect activity data and calculate Scope 1 and Scope 2 emissions.

### Scope 1 GHG Emissions

**Locomotive fuel consumption data:** We rely on a combined approach of consumption data from fuel invoices as well as fuel storage metered measurements. On a monthly basis, the fuel consumption data is compiled and a reconciliation is completed to ensure all fuel purchased is accounted for either in inventory or consumed data. This process is verified as part of the financial audit process.

**Shipping fleet data:** The fuel consumption and cost data from our eight-vessel shipping fleet, comprising diesel and bunker, are submitted regularly to CN's fuel supply management and shipping vessels department through supplier invoices. On an annual basis, the information is reconciled between the two departments to identify and resolve any discrepancies.

**Intermodal trucking data:** CN compiles both intermodal truck mileage data and fuel consumption data. Fuel mileage data is compiled from the odometer readings entered into truck owner operated BlackBerries at the start and finish of trips. CN's dispatch system extracts the information to a data compilation and reporting system. Fuel consumption data is collected from truck owner fuel cards, which are used to purchase fuel. On a monthly basis, the information is uploaded onto the CN payroll system. On an annual basis, audits are undertaken to: validate that fuel card numbers match the respective trucks; identify discrepancies in terms of miles per gallon data; and assess random trucks for a detailed review of fuel purchases in relation to mileage. Annually, our sub-contractors provide a report on intermodal truck fuel consumption and mileage information.

**On Company Service (OCS) fleet data:** Approximately 94% of the total fuel (gasoline and diesel) consumed by OCS vehicles is captured by fuel credit cards and uploaded into the Automotive Management Information System (AMIS). An additional 5% of fuel consumed by OCS vehicles is drawn from CN fuel tanks on CN property. This usage is manually recorded, by vehicle, in AMIS by Fleet Management clerical staff on an ongoing basis. The final 1% of CN's total OCS fuel usage is provided by suppliers outside of the credit card process, representing 285 vehicles (out of our fleet of 4,450 vehicles). On an annual basis, a reconciliation is completed between the numbers entered into the AMIS system and the credit card records, resulting in a 99% reporting accuracy.

**Miscellaneous fuel consumption:** Information from the use of miscellaneous fuel is compiled through our tanks data base, which is comprised of a list of CN's tanks and fuel consumption and cost data entered manually from invoices.

**Natural gas consumption:** The natural gas cost data are extracted into an Excel spreadsheet from a central SAP database system that houses CN's energy consumption invoices. Once extracted, the average natural gas cost per MWh per region is obtained from a Hydro-Québec analysis report. The natural gas cost data is calculated in MWh.

The information is converted into GHG emissions data by the Corporate Environmental Department. GHG emission factors for locomotive emissions apply Environment Canada emission factors and for non-locomotive emissions, we have applied emissions factors (for carbon dioxide, methane, and nitrous oxide) provided by the IPCC 2006, Volume 2 Energy for stationary and mobile sources. For natural gas, GHG emissions are calculated directly into CO<sub>2</sub>e, using provincial/state emission factors from the National Emissions Inventory (for Canada) and from the US EPA (for USA). The traffic data is compiled through mileage readings at our various stations located throughout the railroad infrastructure network.

### Scope 2 GHG Emissions – Emissions From Electricity Consumption

The electricity consumption data are extracted into an Excel spreadsheet from a central SAP database system that stores electricity cost data from utility invoices. Once extracted, the average electricity cost per MWh per region is obtained from a Hydro-Québec analysis report (attached). The electricity cost data is then calculated into MWh and GHG emissions are calculated directly into CO<sub>2</sub>e, using provincial/state emission factors from the Environment Canada National Emissions Inventory and from the US Energy Information Administration.

# Emissions

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## 7. Emissions Methodology

7.3  
Source for global warming potentials used.

Gas	Reference
CO <sub>2</sub>	IPCC 2006 Second Assessment Report
CH <sub>4</sub>	IPCC 2006 Second Assessment Report
N <sub>2</sub> O	IPCC 2006 Second Assessment Report
Electricity Canada	Environment Canada National Inventory Report 2009
Electricity USA	Energy Information Administration State Average CO <sub>2</sub> emission coefficients for Electric Utilities

# Emissions

## 7. Emissions Methodology

7.4  
Emissions factors applied  
and their origin.

Fuel/material/ energy	Emission factor	Unit	Reference
Diesel (locomotive)	2663	Carbon dioxide	Environment Canada
	0.15	Methane	Environment Canada
	1.1	Nitrous oxide	Environment Canada
Diesel other	74100	Carbon dioxide	IPCC 2006, Volume 2 Energy
	3.9	Methane	IPCC 2006, Volume 2 Energy
	3.9	Nitrous oxide	IPCC 2006, Volume 2 Energy
Gasoline	69300	Carbon dioxide	IPCC 2006, Volume 2 Energy
	25	Methane	IPCC 2006, Volume 2 Energy
	8	Nitrous oxide	IPCC 2006, Volume 2 Energy
Propane	63100	Carbon dioxide	IPCC 2006, Volume 2 Energy
	62	Methane	IPCC 2006, Volume 2 Energy
	0.2	Nitrous oxide	IPCC 2006, Volume 2 Energy
Furnace Oil	74100	Carbon dioxide	IPCC 2006, Volume 2 Energy
	10	Methane	IPCC 2006, Volume 2 Energy
	0.6	Nitrous oxide	IPCC 2006, Volume 2 Energy
Stove Oil	74100	Carbon dioxide	IPCC 2006, Volume 2 Energy
	10	Methane	IPCC 2006, Volume 2 Energy
	0.6	Nitrous oxide	IPCC 2006, Volume 2 Energy
Kerosene	71900	Carbon dioxide	IPCC 2006, Volume 2 Energy
	10	Methane	IPCC 2006, Volume 2 Energy
	0.6	Nitrous oxide	IPCC 2006, Volume 2 Energy
Natural Gas	Based on location	CO <sub>2</sub> e	Energy Information Administration State Average CO <sub>2</sub> emission coefficients for Electric Utilities
Electricity Canada	Based on provincial emission factors	CO <sub>2</sub> e	Canada - Environment Canada National Inventory Report 2009
Electricity USA	Based on state emission factors	CO <sub>2</sub> e	Energy Information Administration State Average CO <sub>2</sub> emission coefficients for Electric Utilities



# Emissions

## 8. Emissions Data

**8.1**  
Boundary used for Scope 1 and 2 greenhouse gas inventory.

Financial control

**8.2**  
Gross global Scope 1 emissions.

4,797,401 metric tonnes CO<sub>2</sub>e

**8.3**  
Gross global Scope 2 emissions.

172,005 metric tonnes CO<sub>2</sub>e

**8.4 - 8.4a**  
Sources (e.g., facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions not included in this disclosure.

Source	Scope	Explain why the source is excluded
Emissions from intermodal equipment	Scope 1	We estimate that less than 1% of Scope 1 emissions have not been covered, which includes some of the fuel consumption from our intermodal equipment.

**8.5**  
Level of uncertainty of the total gross global Scope 1 and Scope 2 figures supplied and sources of uncertainty.

Scope	Uncertainty range	Sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	Less than or equal to 2%	Metering/measurement constraints	<p>We currently apply a combination of both generic mass balance and metering measurement methodology in the compilation of our locomotive fuel consumption data. A reconciliation between the fuel consumption data from our invoices and the fuel consumption data from mass balance and metering measurements revealed a 1.5% variance. The 1.5% variance is mostly a result of the fuel evaporation losses at the dispenser fuel tanks.</p> <p>The discrepancies related to fuel consumption measurements from fuel dispenser metering systems are not always being captured. Furthermore, metering systems do not exist throughout our entire fuelling systems, thereby forcing the Company to rely on a combination of certified mass balance and metering measurements. The Company has initiated a precision fuel management program, which will expand our fuel metering system to cover all our fuel tanks.</p>
Scope 2	Less than or equal to 2%	Extrapolations	<p><b>Extrapolations made to estimate MWh:</b> At this time, invoices from utilities that are uploaded onto our SAP system provide costs only. This data includes administrative costs as well as consumption data, which impacts the level of accuracy in our data consumption numbers. Furthermore, in order to calculate the MWh consumption numbers, the Company has applied generic cost per MWh factors, as provided by the Hydro-Québec Analysis. Data uncertainty could exist where utility cost variances occur based on the time of use of electricity as opposed to the quantity of use of electricity.</p> <p><b>Use of generic factors to calculate GHG emissions:</b> Conversions into GHG emissions are based on the generic GHG emission factors as provided through the Canadian GHG National Inventory and not the utility factors. We will be working over the next few years to obtain detailed utility invoicing to effectively capture electricity consumption and emission factors.</p>

# Emissions

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## 8. Emissions Data

**8.6**  
Verification/assurance status for our Scope 1 emissions.

Verification is incomplete. The locomotive fuel consumption data is currently verified through our financial audit. We have not yet verified the corresponding GHG emissions. The fuel consumption from our rail locomotives represents 84% of our total company-wide GHG emissions. Refer to the 2011 Annual Report for more information on our fuel consumption data assurance.

**8.7**  
Verification/assurance status for our Scope 2 emissions.

Not verified.

**8.8**  
Relevance of carbon dioxide emissions from the combustion of biologically sequestered carbon.

The emissions of carbon dioxide from the combustion of biologically sequestered carbon (i.e., carbon dioxide emissions from burning biomass/biofuels) are relevant to our Company.

**8.8a**  
Emissions in metric tonnes CO<sub>2</sub>e.

Our diesel locomotive fuel contains approximately 0.3% biofuel. We will be reviewing the emission factors to account for the carbon emissions related to biofuel in the next year.

# Emissions

## 9. Scope 1 Emissions Breakdown

### 9.1 - 9.1a

We have Scope 1 emission sources in Canada and the US.

Country/region	Scope 1 metric tonnes CO <sub>2</sub> e
Canada	3,486,649
US	1,310,752

### 9.2 - 9.2a

Our total gross global Scope 1 emissions by activity.

Activity	Scope 1 metric tonnes CO <sub>2</sub> e
Locomotives	4,185,733
Intermodal trucks	107,528
Shipping vessel fleet	240,019
On Company Service fleet	98,746
Miscellaneous fuel consumption	147,851
Intermodal equipment	17,524

## Emissions

### 10. Scope 2 Emissions Breakdown

10.1 - 10.1a  
Scope 2 emission sources  
in Canada and the US.

Country/region	Scope 2 metric tonnes CO <sub>2</sub> e
Canada	54,987
US	117,018

### 11. Scope 2 Contractual Emissions

11.1  
Grid average factors.

We consider that the grid average factors used to report Scope 2 emissions in question 8.3 reflect the contractual arrangements we have with electricity suppliers.

11.2  
Retired certificates.

Our organization has not retired any certificates, e.g., Renewable Energy Certificates, associated with zero or low carbon electricity within the reporting year.

# Emissions

## 12. Energy

**12.1**  
Percentage of total operational spend in the reporting year on energy.

23% of our operational spend was on energy during the reporting year.

**12.2**  
Fuel, electricity, heat, steam, and cooling our organization has consumed during the reporting year.

Energy type	MWh
Fuel	16,545,061
Electricity	492,610
Heat	N/A
Steam	N/A
Cooling	N/A

**12.3**  
A breakdown of the total "Fuel" figure (above) by fuel type.

Fuels	MWh
Diesel (locomotives)	14,144,255
Diesel (others)	1,689,804
Gasoline	238,680
Diesel/gas oil	16,072,739 Total (diesel and gasoline)
Propane	69,613
Furnace oil	10,851
Stove oil	2,115
Kerosene	2,319
Natural gas	387,424

# Emissions

## 13. Emission Performance

**13.1 - 13.1a**  
Absolute emissions (Scopes 1 and 2 combined) for the reporting year compared to the previous year.

When compared to the previous year, our absolute emissions (Scope 1 and 2) for the reporting year have increased.

Reason	Emission value (percentage)	Direction of change	Comment
Output change	3.38	Increase	In 2011, we increased the volume and traffic growth from our rail service, thereby increasing our absolute emissions.

**13.2**  
Gross combined Scopes 1 and 2 emissions for the reporting year in metric tonnes CO<sub>2</sub>e per unit currency of total revenue.

Intensity figure	Metric numerator	Metric denominator	% from previous year	Direction of change from previous year	Explanation
0.00055	Metric tonnes of CO <sub>2</sub> e	Unit total revenue	4.43	Decrease	Emission reduction actions as described in question 3.3.

**13.3**  
Gross combined Scopes 1 and 2 emissions for the reporting year in metric tonnes CO<sub>2</sub>e per full time equivalent (FTE) employee.

Intensity figure	Metric numerator	Metric denominator	% from previous year	Direction of change from previous year	Explanation
213.92	Metric tonnes of CO <sub>2</sub> e	FTE employee	0.27	Decrease	The decrease in emissions was a result of various emission reduction activities as described in question 3.3.

**13.4**  
Additional intensity (normalized) metric appropriate to our business operations.

Intensity figure	Metric numerator	Metric denominator	% from previous year	Direction of change from previous year	Explanation
11.69	Metric tonnes of CO <sub>2</sub> e	Gross Ton Miles	1.5	Decrease	The decrease in emissions was a result of various emission reduction activities as described in question 3.3.

# Emissions

## 14. Emission Trading

14.1  
Emission trading.

We do not participate in emission trading schemes and do not currently anticipate doing so in the next two years.

14.2  
Project-based carbon credits.

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

## 15. Scope 3 Emissions

15.1  
Data on sources of Scope 3 emissions relevant to our organization.

Sources of Scope 3 emissions	Metric tonnes of CO <sub>2</sub> e	Methodology	If you cannot provide a figure for emissions, please describe them.
Business travel	32,064	The data was compiled from our various service providers (rail, air, car rentals and taxi services), who apply their own unique data compilation and calculations for the data based on industry standards.	N/A

15.2  
Verification/assurance status regarding our Scope 3 emissions.

Our Scope 3 emissions are not verified or assured.

15.3  
Scope 3 emissions comparison.

Sources of Scope 3 emissions	Reason	Emission value percentage	Direction of change	Comment
Business travel	Other – increased business activity.	16	Increase	The comparison can be made as it relates to air travel. Over the past year, we increased our sales, which was reflected in an increase in corporate air travel.