

**Module: Introduction****Page: Introduction**

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**CC0.1****Introduction**

Please give a general description and introduction to your organization.

Norfolk Southern Corporation ("Norfolk Southern" or "NS"), based in Norfolk, Virginia, U.S.A., controls a major freight railroad, Norfolk Southern Railway Company (collectively with its railroad subsidiaries, "NSR"). NSR is a common carrier by rail engaged in the transportation of raw materials, intermediate products and finished goods. NSR operates primarily in the eastern half of the U.S.A. and, via interchange with other rail carriers, provides service to and from the rest of the U.S.A.

As of December 31, 2014, NSR operated approximately 20,000 route miles of track in 22 states and the District of Columbia. The system's lines reach many individual industries, electric generating facilities, mines, distribution centers, transload facilities, and other businesses located in smaller communities in its service area. NSR also transports overseas freight through several Atlantic and Gulf Coast ports, provides comprehensive logistics services and offers the most extensive intermodal network in the eastern half of the U.S.A. The common stock of Norfolk Southern is listed on the New York Stock Exchange ("NYSE") under the symbol NSC.

Norfolk Southern's operations are subject to federal and state environmental laws and regulations concerning, among other things, emissions to the air; discharges to waterways or ground water supplies; handling, storage, transportation, and disposal of waste and other materials; and the cleanup of hazardous material or petroleum releases. Compliance with such environmental laws is a principal objective of Norfolk Southern.

Norfolk Southern also supports and encourages voluntary efforts to conduct its business in accordance with sustainability practices that will help promote corporate success and the health of the environment. To further reflect on these objectives, Norfolk Southern has established a Sustainability Report that complies with the Global Reporting Initiative's 3.1 Level C reporting standards. The 2014 Sustainability Report includes data from calendar year 2014 and is available to the public at <http://www.nssustainability.com>. The 2015 Sustainability Report will be available online in summer 2015.

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**CC0.2**

**Reporting Year**

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

**Enter Periods that will be disclosed**

Wed 01 Jan 2014 - Wed 31 Dec 2014

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**CC0.3****Country list configuration**

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

**Select country**

United States of America

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**CC0.4****Currency selection**

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

USD(\$)

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**CC0.6****Modules**

As part of the request for information on behalf of investors, electric utilities, companies with electric utility activities or assets, companies in the automobile or auto component manufacture sub-industries, companies in the oil and gas sub-industries, companies in the information technology and telecommunications sectors and companies in the food, beverage and tobacco industry group should complete supplementary questions in addition to the main questionnaire.

If you are in these sector groupings (according to the Global Industry Classification Standard (GICS)), the corresponding sector modules will not appear below but will automatically appear in the navigation bar when you save this page. If you want to query your classification, please email [respond@cdp.net](mailto:respond@cdp.net).

If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below. If you wish to view the questions first, please see <https://www.cdp.net/en-US/Programmes/Pages/More-questionnaires.aspx>.

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**Further Information**

**Module: Management**

**Page: CC1. Governance**

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**CC1.1**

**Where is the highest level of direct responsibility for climate change within your organization?**

Board or individual/sub-set of the Board or other committee appointed by the Board

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**CC1.1a**

**Please identify the position of the individual or name of the committee with this responsibility**

The Norfolk Southern Board of Directors named F. Blair Wimbush as Corporate Sustainability Officer, a Vice President level position. The Corporate Sustainability Officer manages Norfolk Southern's sustainability activities, including its greenhouse gas emission reduction goal. The Corporate Sustainability Officer reports to the chairperson of the Norfolk Southern Environmental Policy Council. The Environmental Policy Council is composed of senior managers and is responsible for ensuring that appropriate policies, procedures, and resources are in place to address environmental issues across the company's rail system. As part of its duties,

the Environmental Policy Council bears overall responsibility for activities deemed related to climate change. The Corporate Sustainability Officer provides status reports to, and engages with, the Environmental Policy Council at its meetings held several times each year, and the Environmental Policy Council reports directly to Norfolk Southern's Chairman and Chief Executive Officer, Wick Moorman.

**CC1.2**

**Do you provide incentives for the management of climate change issues, including the attainment of targets?**

Yes

**CC1.2a**

**Please provide further details on the incentives provided for the management of climate change issues**

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Executive officer	Monetary reward	Emissions reduction target	Our Executive Vice President of Information Technology and Planning is the head of the Environmental Policy Council as well as the direct manager of the Corporate Sustainability Officer. Every year the CSO and our EVP meet to review goals and our emissions reduction target is one of those goals. As all of our employees are evaluated on their ability to reach their annual goals in order to receive a merit bonus, the bonus of our EVP is directly tied to the corporate meeting our emissions reduction targets, among other KPI's.
Chief Operating Officer (COO)	Monetary reward	Emissions reduction project Efficiency project	Our Chief Operating Officer is responsible for our network operations. In this role he focuses on increase our network efficiency and as a part of that he has an incentive to reduce the amount of fuel we purchase in order to promote cost savings and progress towards our corporate carbon reduction goals. The award is based on his ability to achieve this. Among his main initiatives to achieve this is our LEADER fuel efficiency program on our locomotives (which is expanded on in 3.3b). Locomotive diesel emissions are a majority of our emissions.

**Further Information**

CC2.1

Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a

Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	Our entire operating system is considered during discussions of risk. Norfolk Southern Corporation operates in 22 states as well as the District of Columbia. All territory stretches from all along the eastern seaboard, as far west as Kansas City and Eastern Texas.	> 6 years	The Board has been involved with making sure climate change risk was one of our material risks in our 10K financial report. The responsibility for risk management belongs to the CEO who reports directly to the board on such matters.

CC2.1b

Please describe how your risk and opportunity identification processes are applied at both company and asset level

Company level- Norfolk Southern’s Board Disclosure Committee determines the materiality of Norfolk Southern’s business risks. To the extent that climate change represents a risk factor for the company, the Norfolk Southern Board of Directors exercises oversight of it along with all other risk factors. Annually, the Board of Directors appoints a committee (“Disclosure Committee”) tasked with assisting the Board with oversight of Norfolk Southern’s risk assessment and risk management procedures and facilitating communication between the Board and Norfolk Southern’s financial and senior management. Periodically, members of the Disclosure Committee meet with Norfolk Southern management to (1) review and discuss Norfolk Southern’s risk assessment and risk management policies, (2) ensure that management periodically reviews and discusses with the Board any risks faced by Norfolk Southern requiring disclosure in the Corporation’s periodic reports filed

with the SEC pursuant to the Securities Exchange Act of 1934, and (3) ensure that management reports to the Board the steps that management has taken to monitor and control the aforementioned risks.

Asset level- Norfolk Southern's Environmental Policy Council is composed of senior managers and is responsible for ensuring that appropriate policies, procedures, and resources are in place to address environmental issues and oversee management of environmental risk and liability across the company's rail system. As climate change is an environmental policy issue, the Council is tasked with overall responsibility for activities that are deemed related to climate change. The Council includes representation from relevant business functions, facilitating organizational awareness and a cohesive strategic response to environmental risks and opportunities. The Council's departmental oversight role promotes assessment of risks and opportunities at the asset level.

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**CC2.1c****How do you prioritize the risks and opportunities identified?**

According to our Annual Report: Concern over climate change has led to significant federal, state, and international legislative and regulatory efforts to limit greenhouse gas (GHG) emissions. Moreover, even without such legislation or regulation, government incentives and adverse publicity relating to GHGs could affect certain of our customers and the markets for certain of the commodities we carry. Restrictions, caps, taxes, or other controls on GHG emissions, including diesel exhaust, could significantly increase our operating costs, decrease the amount of traffic handled, and decrease the value of coal reserves we own, and thus could have an adverse effect on our financial position, results of operations, or liquidity in a particular year or quarter. Such restrictions could affect our customers that (1) use commodities that we carry to produce energy, including coal, (2) use significant amounts of energy in producing or delivering the commodities we carry, or (3) manufacture or produce goods that consume significant amounts of energy.

Norfolk Southern actively manages and reviews the identified risks to ensure that it focuses on risks that are most probable and material. Norfolk Southern weighs the potential for storm or hurricane impacts on operations along with possibility of legislation or regulation that may affect operations or customers. The Disclosure Committee process specifically weighs probability and materiality and whether resources are available and steps are taken to "monitor and control".

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**CC2.1d**

**Please explain why you do not have a process in place for assessing and managing risks and opportunities from climate change, and whether you plan to introduce such a process in future**

Main reason for not having a process	Do you plan to introduce a process?	Comment

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**CC2.2****Is climate change integrated into your business strategy?**

Yes

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**CC2.2a****Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process**

NS has come to regard our corporate sustainability program as an important element of our business strategy, driving top-line growth.

(1) Influence on business strategy. Environmental stewardship is essential to NS' success and reflects our corporate business standards of ethics and responsibility. Climate change is integrated into our short-term business strategy by focusing on many projects around emission reduction and conservation. NS' current collaborations with stakeholders regarding sustainable transportation and greenhouse gas emissions have influenced Norfolk Southern's strategy. We engage a variety of external stakeholders—including state agencies, federal government agencies, and private organizations—on improving air quality through congestion mitigation, emissions reduction technologies, and other aspects of transportation logistics to maximize and enhance the inherent environmental efficiencies of rail freight transportation. In particular, NS' participation in the U.S. EPA's SmartWay program and our involvement with voluntary reporting initiatives like CDP have shaped our understanding of the scope of our greenhouse gas emissions.

(2) How NS' business strategy is attuned to the risks and opportunities presented by climate change. As detailed in Sections 5 and 6 of this response, Norfolk Southern is prepared to manage several potential developments related to climate change as part of our long-term business strategy, including:

Federal, state, and international legislative and regulatory efforts to limit greenhouse gas emissions (e.g. restrictions, caps, taxes, or other controls on greenhouse gas emissions); Adverse publicity relating to greenhouse gases; Positive reactions to NS' reputation as a fuel- and carbon-efficient mode of freight transportation; Severe weather conditions or other natural phenomena; and emissions reporting obligations. Various aspects of NS' long-term business strategy could serve to address risks and benefits that may arise as a result of the aforementioned developments, including NS' plans to purchase new, more fuel-efficient locomotives; continue deployment of idle-reduction and train handling technologies; refine engine maintenance practices; and make infrastructure improvements to increase capacity and fluidity of our major rail corridors, including the Heartland and Crescent corridors.

(3) Most important short-term business strategy linked to climate change. In the short term, NS' desire to mitigate its potential climate change impacts has led us to adopt a greenhouse mitigation strategy of both emissions reduction and verified emission reduction projects. Our short term goal is to reduce our CO<sub>2</sub>e emissions by 10% per revenue ton mile between 2009 and 2014, exclusive of any offsets. Our journey to meet this target has provided a great incentive around our system-wide carbon reduction efforts. Locomotive efficiency is a key component of this mitigation strategy, both in the short and long term; NS is actively purchasing more fuel-efficient locomotives and recycling/rebuilding existing locomotives in pursuit of this goal.

(4) Most important long-term business strategy components linked to climate change. By evaluating the possibility of various risks and opportunities linked to climate change, NS has prepared a long-term business strategy that takes those issues into account. One opportunity comes from a modal shift by our current and potential customers who desire to reduce their carbon footprint by moving more of their goods on a carbon-efficient mode of transport. NS is preparing to accommodate increased rail freight volumes in the future by developing network improvement projects, such as NS' "Crescent Corridor" route. Norfolk Southern has also considered how the projects would affect our own greenhouse gas emissions. For example, NS reviewed the impacts of the Crescent Corridor over 20- and 30-year analysis periods and determined that, once fully developed, it will eliminate an estimated 1.3 billion highway vehicle miles and 169 million gallons of fuel per year, reduce CO<sub>2</sub>e emissions by 1.9 million tons annually, increase the capacity and fluidity of our major rail corridors, and provide about \$7.7 billion in cumulative congestion reduction benefits between 2011 and 2013 across the 13 states touched by the project.

(5) How this strategy is gaining NS strategic advantage over its competitors. Compared with other modes of ground transportation, NS offers its customers a fuel- and carbon-efficient means of transporting freight. This advantage influences our business strategy because we are very focused on increasing our intermodal line of business as well as investing in network improvements to strengthen our value proposition to our current and potential customers. According to a Federal Railroad Administration study, railroads on average are four times more fuel-efficient than trucks. Moving freight by rail instead of truck reduces greenhouse gas emissions by 75%, on average. A carbon-constrained business environment could lead to increased demand for carbon-efficient transportation and, as Norfolk Southern operates the most extensive rail intermodal network in the East, we are well-positioned to accommodate the freight of shippers who choose to shift their shipments from road to rail. Enhancing capacity on our rails and refining our carbon-efficient operations will further distinguish us from other freight transport providers and enable us to drive top-line growth.

(6) Most substantial business decisions made during reporting year that were influenced by the reliability of future fuel sources and our goals to minimize our carbon impact. The most substantial business decision has been to increase our capital investments in carbon reduction initiatives and projects. For privacy reasons the exact figure cannot be disclosed, but over the last few years, NS' capital spending on such projects has increased dramatically. In 2014, Norfolk Southern continued to install solar-powered gage-face lubricators and top-of-rail friction modification systems in order to reduce our emissions through our rail operations. In addition, Norfolk Southern replaced HVAC systems with higher efficiency models in order to reduce our carbon impacts through energy efficiency measures. In 2014, Norfolk Southern continued its work to enhance the battery management system to address technical challenges that arose during trial field operations. Norfolk Southern began developing a battery-powered locomotive in 2007, part of a larger initiative to explore alternative-powered engines to save on fuel costs, lower emissions, and reduce reliance on foreign oil sources. In 2014 NS rolled out the next generation NS 999, outfitted with a bank of more technologically advanced hybrid lead-carbon batteries developed by industry partner Axion Power International.

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## CC2.2b

Please explain why climate change is not integrated into your business strategy

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## CC2.2c

**Does your company use an internal price of carbon?**

No, and we currently don't anticipate doing so in the next 2 years

**CC2.2d**

Please provide details and examples of how your company uses an internal price of carbon

**CC2.3**

**Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)**

- Direct engagement with policy makers
- Trade associations
- Funding research organizations

**CC2.3a**

**On what issues have you been engaging directly with policy makers?**

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Mandatory carbon reporting	Neutral	Norfolk Southern along with other Class I freight railroads through the American Association of Railroads, have engaged with the Sustainable Accounting Standards Board in regards to proposed legislation to mandate carbon reporting.	Norfolk Southern and the AAR do not feel at this time that SASB's current proposal is something that could be adopted by freight rail since all freight rail already voluntarily reports on these issues and the requirements of the proposed reporting framework do not take into account the complexities of railroad operations.
Other: Truck size and weight	Oppose	Norfolk Southern consistently engages with lawmakers on the issue of increasing the size and weight regulations for on-road freight trucks.	Norfolk Southern is committed to shipping our customers goods in the most fuel efficient way possible. If trucks are allowed to be longer and heavier and therefore transport more material, the nationwide modal shift that is occurring due to multiple factors including carbon reduction goals held by each of our customers may begin to swing in the other direction. Which is something that

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
			would not benefit Norfolk Southern.

**CC2.3b**

**Are you on the Board of any trade associations or provide funding beyond membership?**

Yes

**CC2.3c**

**Please enter the details of those trade associations that are likely to take a position on climate change legislation**

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
American Association of Railroads	Consistent	The AAR's position on climate changes is as follows: As the Congress considers legislation to limit emissions of carbon dioxide and other greenhouse gases, it should take into account the environmental friendliness of freight railroading. Climate change legislation offers an opportunity for policymakers to encourage the movement of more freight by environmentally-friendly rail and to spur the development of carbon capture and storage technology.	Norfolk Southern consulted with the AAR regarding the trade association's position on this issue and concurs with the current position. We are not attempting to influence their current position.
Business Roundtable	Consistent	Because the consequences of global warming for society and ecosystems are potentially serious and far-reaching, Business Roundtable believes that steps to address the risks of such warming are prudent and supports collective actions that will lead to the reduction of greenhouse gas emissions on a global basis.	Norfolk Southern is a signatory to the "Taking Action on Energy" report supporting US initiatives to improve energy efficiency. We are not attempting to influence their current position.

**CC2.3d**

**Do you publicly disclose a list of all the research organizations that you fund?**

Yes

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**CC2.3e**

**Do you fund any research organizations to produce or disseminate public work on climate change?**

Yes

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**CC2.3f**

**Please describe the work and how it aligns with your own strategy on climate change**

Norfolk Southern funds research in the area of carbon sequestration through re-forestation. Norfolk Southern works closely with both the American Chestnut Foundation and The Nature Conservancy which both produce public work on the effect of reforestation projects on carbon sequestration. This aligns closely with our own strategy of reducing our own emissions and then off-setting some of it through reforestation to produce carbon credits.

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**CC2.3g**

**Please provide details of the other engagement activities that you undertake**

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**CC2.3h**

**What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?**

Norfolk Southern's direct activities are managed by in-house professionals in consultation with environmental sustainability officers who work to ensure that all of our direct and indirect activities that influence policy are consistent with our overall climate change strategy. Whenever a situation occurs, our operations professionals meet with our environmental and sustainability officers to review concerns, analyze options and discuss ways to implement the best strategies, this way all parties are aligned in concordance with the strategy.

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**CC2.3i**

Please explain why you do not engage with policy makers

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**CC2.4**

**Would your organization's board of directors support an international agreement between governments on climate change, which seeks to limit global temperature rise to under two degree Celsius from pre-industrial levels in line with IPCC scenarios such as RCP2.6?**

No

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**CC2.4a**

**Please describe your board's position on what an effective agreement would mean for your organization and activities that you are undertaking to help deliver this agreement at the 2015 United Nations Climate Change Conference in Paris (COP 21)**

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**Further Information**

**Page: CC3. Targets and Initiatives**

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**CC3.1**

**Did you have an emissions reduction target that was active (ongoing or reached completion) in the reporting year?**

Intensity target

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**CC3.1a**

Please provide details of your absolute target

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions (metric tonnes CO2e)	Target year	Comment
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**CC3.1b**

Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions	Target year	Comment
Int1	Scope 1+2	100%	10%	Other: grams CO2e per revenue ton mile	2009	30	2014	

**CC3.1c**

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	Decrease	5.54			This estimate assumed that we accomplished intensity from 30 grams CO2e per revenue ton mile to 27 grams of CO2e per revenue ton mile. It also assumed that business volume (as measured by revenue ton mileage) remained consistent

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
					between during the 5 years of the goal time horizon, the target year for our intensity goal.

**CC3.1d**

For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions)	Comment
Int1	100%	86.33%	In 2010, NS set a goal to reduce our emissions from our 2009 baseline of 30 g CO2e/ Revenue Ton Mile to 27 g/RTM. By 2014, the end of our 5 year target reduction phase, we had reduced our emissions to 27.41 g/RTM, which means we got 86% of the way to our proposed goal. By setting an aggressive goal, NS wanted to challenge itself to really pursue change. Though the goal wasn't met, NS will continue to set ambitious goals.

**CC3.1e**

Please explain (i) why you do not have a target; and (ii) forecast how your emissions will change over the next five years

**CC3.2**

**Does the use of your goods and/or services directly enable GHG emissions to be avoided by a third party?**

Yes

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**CC3.2a**

**Please provide details of how the use of your goods and/or services directly enable GHG emissions to be avoided by a third party**

I) By providing our customers with the ability to ship their goods by rail instead of primarily by truck, we can lower their scope 3 emissions dramatically. Rail is much more fuel efficient than trucking according to the Federal Railroad Administration.

II) For one customer in particular, we reduced their scope 3 emissions by 64% in 2014 on one of their routes by providing rail for intermodal transport, as opposed to using trucking alone.

III) To calculate savings, we started with the amount of carbon emitted when the customer used only trucking to get the shipment from the port to their facility. We started with the Truck Ton-Miles (Volume (containers) \* Avg Weight Per Shipment (tons) \* Truck Distance (miles)) which was  $(20,000 * 20 * 212) = 84,800,000$ . We took the Truck Ton-Miles and divided it by the average truck fuel efficiency per the Federal Railroad Administration (96 ton-miles/ gallon), to get the gallons of fuel consumed: 883,333. Then we multiplied the gallons of fuel by the emissions factor for diesel fuel (22.2 pounds CO2 per gallon) to get 19,610,000 pounds of CO2 emitted for each trip the shipment took from the port to the facility.

To determine the carbon emissions reduction we enabled by switching part of the journey from the port to the facility to rail and only using minimal drayage trucking, we began by calculating the truck ton-miles for the drayage miles (volume \* avg weight per shipment \* drayage distance) =  $(20,000 * 20 * 15) = 6,000,000$ . Then we calculated the rail ton-miles for the rail portion of the trip (volume \* avg weight per shipment \* rail distance) =  $(20,000 * 20 * 235) = 94,000,000$ . Then we calculated the total gallons of diesel consumed by calculating it for each transportation mode (truck =  $6,000,000 / 96$ ) and (rail =  $94,000,000 / 369$  ton-miles/ gallon which is the average double-stack container rail fuel efficiency per the FRA). We added those two fuel consumption numbers to get a total of 317,243 gallons of diesel consumed when both modes of transportation are used, but primarily rail, per trip to get the shipment from the port to the facility. Multiplying the gallons consumed by the diesel emissions factor gave us 7,042,785 pounds of CO2 emitted when using primarily rail for this shipment.

That represents a total reduction of 64% per shipment for this particular customer for this facility.

Assumptions: Assumptions made include using the average truck fuel efficiency per the Federal Railroad Administration (96 ton-miles/ gallon) and the average double-stack container rail fuel efficiency per the FRA; it is possible that in reality the emissions saved in this particular situation are slightly higher or lower. No GWP data was used for this calculation.

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**CC3.3**

Did you have emissions reduction initiatives that were active within the reporting year (this can include those in the planning and/or implementation phases)

Yes

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**CC3.3a**

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	
To be implemented*	0	
Implementation commenced*	0	
Implemented*	4	172298
Not to be implemented	0	

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**CC3.3b**

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Building services	Replacement of HVAC systems that are at least 15 years old and/or are improperly sized for the space they are heating and/or cooling with more energy-efficient models. In 2014, Norfolk Southern replaced 35 HVAC systems with higher efficiency models that use less energy which contributes towards our carbon reduction goals.. The annual monetary savings column at right reflects the additional incremental cost/savings from replacing these units with energy-efficient technology instead of the prior technology. The information at right covers data for the 2014 program.	1174	Scope 1 Scope 2	Voluntary	194281	766903	4-10 years	Ongoing	The HVAC program is ongoing and no end date is set for the initiative.
Energy efficiency: Building services	As part of a long-term program to outfit 600 offices, shops, rail yards, and facilities in 300 locations with longer-lasting, more energy-efficient lighting, NS upgraded 8,627 lighting fixtures at rail yard facilities in multiple states in 2014.	22	Scope 2	Voluntary	1582883	3528800	1-3 years	Ongoing	The lighting upgrade program is ongoing with no set end date.

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	Over the lifetime of the program, we have installed over 96,000 of the more technologically advanced light bulbs and fixtures. This initiative is one of the many ways NS is trying to reduce energy usage and therefore reduce the associated carbon emissions. The information at right covers data for the 2014 program.								
Transportation: fleet	Locomotive Engineer Assist Display Event Recorder ("LEADER"), a computer-based algorithm that seeks to preserve kinetic energy as a means of enhancing fuel economy. The LEADER display provides train handling guidance to the engineer, which the engineer can use to improve fuel economy and thereby reduce greenhouse gas emissions. Currently over 1,700 units are installed on Norfolk Southern Locomotives.	165465	Scope 1	Voluntary					Since the LEADER technology is part of our competitive advantage over other rails, NS does not feel comfortable releasing specific numbers for monetary aspect of this project. In addition the carbon savings is a crude calculation based on an overall savings increase of 5% for LEADER equipped locomotives.
Transportation: fleet	Reduction in locomotive idling. Initiatives such as implementation of automatic	5637	Scope 1	Voluntary				Ongoing	AESS systems installed on overhauled locomotives must

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	engine start-stop ("AESS") systems on our locomotives and enforcement of our company-wide idling policy reduce emissions. AESS systems reduce greenhouse gas emissions by shutting down and/or starting the engine without operator action based on parameters monitored by the AESS system. Currently over 2000 systems are installed on NS locomotives.								remain in place for the lifetime of the locomotive. Norfolk Southern is not willing to release the investment or monetary savings of this project at this time.

**CC3.3c**

**What methods do you use to drive investment in emissions reduction activities?**

Method	Comment
Compliance with regulatory requirements/standards	
Partnering with governments on technology development	
Internal finance mechanisms	Capital expenditures process requires proof of claimed fuel savings from projects.

Method	Comment
Internal incentives/recognition programs	

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CC3.3d

If you do not have any emissions reduction initiatives, please explain why not

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**Further Information**

**Page: CC4. Communication**

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CC4.1

Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s)

Publication	Status	Page/Section reference	Attach the document
In voluntary communications	Underway - previous year attached	15-26	<a href="https://www.cdp.net/sites/2015/25/13425/Climate%20Change%202015/Shared%20Documents/Attachments/CC4.1/2013%20NS%20Sustainability%20Report.pdf">https://www.cdp.net/sites/2015/25/13425/Climate Change 2015/Shared Documents/Attachments/CC4.1/2013 NS Sustainability Report.pdf</a>

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**Further Information**

**Module: Risks and Opportunities**

CC5.1

Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Risks driven by changes in regulation
- Risks driven by changes in physical climate parameters
- Risks driven by changes in other climate-related developments

CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Air pollution limits	Restrictions or caps on greenhouse gas emissions, including diesel exhaust, often are at odds with fuel efficiency. Rail is marketed as a much more fuel efficient way to move goods, however if restrictions on air emissions were to	Increased operational cost	Unknown	Direct	More likely than not	High	Diesel fuel is Norfolk Southern's number one expense. If a restriction on exhaust caused a 1% rise in fuel cost, that would result in a \$15 million a year increase in fuel cost. If the restriction caused a 5% increase in	Norfolk Southern is actively managing this risk by leveraging the expertise of our government relations program . Norfolk Southern's Board of Directors believes it is in the best interests of Norfolk Southern and its stockholders for the company to participate in the	The costs to manage this risk include costs to making our network more efficient, purchasing fuel efficient equipment to improve efficiency and reduce emissions by demand reductions. In addition, Norfolk Southern makes company

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>occur, that claim is at risk of not being as true. This could potentially cost Norfolk Southern business.</p>						<p>fuel cost, it would result in a \$75 million a year increase in fuel costs.</p>	<p>political process since it significantly impacts Norfolk Southern through government policies, legislation, and regulatory decisions. The government relations program seeks to educate and inform public officials about issues important to Norfolk Southern's business, and it supports public officials and candidates whose views match those of Norfolk Southern. By doing so, Norfolk Southern furthers public policy goals consistent with the sustainability of our business and values. For example, in 2014 NS met with policy makers to discuss the impact of legislation around increased truck-weight capacity. Remaining engaged with policymakers ensures that Norfolk Southern will be</p>	<p>contributions to state and local candidates, political committees, and tax-exempt political organizations in compliance with all applicable laws.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								consistently aware of any air pollution regulation imposing emission limits on organizations. This knowledge positions NS to remain resilient and flexible in our fuel sourcing and fuel reduction strategies.	

**CC5.1b**

Please describe your inherent risks that are driven by change in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	Severe weather conditions, including hurricanes, fires, and floods, may cause significant business interruptions. In 2005, Norfolk Southern operations were	Increased operational cost	>6 years	Direct	Unknown	Medium	Though it is difficult to predict the magnitude or the timing of a storm event, Norfolk Southern knows from past experience the financial implications can be costly. For	In 2014 Norfolk Southern spent \$2.1 billion investing in its infrastructure to maintain the railway in good operating condition and to minimize damage from severe	There is a cost associated with each of the aforementioned greenhouse gas emissions reduction initiatives, as well as with infrastructure maintenance and insurance

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>adversely affected by the damage caused by Hurricane Katrina. Though severe weather may occur at any time, the likelihood of such a given severe weather event is not capable of accurate prediction; therefore, NS has characterized the likelihood of this risk as "unknown."</p>						<p>example in the last few years Norfolk Southern has had to spend over \$40 million more on fuel due to the operation inefficiencies garnered through the severe winter weather even after offsetting for the lower price. In 2014 NS was able to return back to its previous, more usual fuel spend. However if similar disruptions occurred moving forward, we expect that the financial implications per year could exceed \$40 million spent in the past.</p>	<p>weather events. Approximately \$200 million was spent on the Crescent Corridor in 2014, one of our principal infrastructure improvement projects. Norfolk Southern has proven adept at responding to operational disruptions from severe weather in the past for instance during events like Hurricane Katrina. In 2014, our network planning operators worked cohesively to re-route many of our shipments, proving our resiliency in the face of changing weather conditions. Additionally, Norfolk Southern is actively mitigating against the effects of further changes in</p>	<p>expenses. Norfolk Southern has invested millions of dollars in its HVAC/lighting efficiency improvement, LEADER implementation, AESS implementation, and top-of-rail friction improvement projects alone.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								physical climate parameters by investing in fuel-efficient locomotive technologies and reducing our carbon footprint. Norfolk Southern is pursuing a variety of actions to manage its greenhouse gas emissions.	

CC5.1c

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other drivers	A need to reduce carbon emissions nation-wide has seen one of our market areas decrease and another one increase. As the price of natural	Reduced demand for goods/services	Unknown	Direct	Virtually certain	Medium	In the last 2 years alone, from 2012 to 2014, our coal revenues have dropped 17%, representing \$500 million. Coal shipments have dropped by 8	Norfolk Southern has demonstrated its agility by continuing to support our coal customers while looking to increase market share in our intermodal	The cost of managing this risk would include the infrastructure improvements we've made in our system to greater leverage our intermodal

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	gas of natural gas decreases and there is a desire for fuels that have lower carbon emissions, consumers and companies are preferring to generate electricity through the combustion of natural gas as opposed to coal. Since coal shipping is one of NS' major business lines, the decrease in the national appetite for coal, in favor of lower carbon emitting natural gas, is a risk factor for our business that is directly linked to climate change.						million tons in the same time frame. In the future we expect revenue from coal shipments to continue to decrease. If this trend continues in the future, this could cause up to 21% in profits for NS since that was the portion of NS business represented by coal in 2014.	business (truck to rail conversions). By observing the market desiring a shift to operational energy efficiency, Norfolk Southern has poised itself to more than make up for the loss in coal revenues by bolstering the bottom line through an increase in our intermodal business. In 2014 our intermodal market managers continued to pursue new intermodal business for NS which in the last two years has increased by \$320 million. .	capacity. On just one of our intermodal network improvement projects, the Crescent Corridor, we expect to invest \$2.5 billion.

CC5.1d

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC5.1e

Please explain why you do not consider your company to be exposed to inherent risks driven by physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC5.1f

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

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**Further Information**

**Page: CC6. Climate Change Opportunities**

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CC6.1

**Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply**

Opportunities driven by changes in regulation

Opportunities driven by changes in physical climate parameters

Opportunities driven by changes in other climate-related developments

CC6.1a

Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Fuel/energy taxes and regulations	Possible fuel or energy tax regulations will cause companies to be held accountable for the amount of carbon emitted as part of its operational processes. In order to avoid paying any extra taxes or fines related to non-compliance companies will look into ways to reduce their footprint and rail is well poised to benefit from that modal shift from long haul trucking	Increased demand for existing products/services	Unknown	Indirect (Supply chain)	Unknown	Unknown	In 2014 Norfolk Southern's intermodal revenue contributed to 22% of our revenue and improved by \$178 million, the result of continued highway-to-rail conversions and additional business associated with the opening of new intermodal terminals. In the future if 50% of this increase is due to customers wishing to decrease their emissions to meet reporting	By observing the market desiring a shift to operational energy efficiency, Norfolk Southern's bottom line has already benefitted from the increase in our intermodal business which in the last two years has increased by \$320 million. Norfolk Southern continues to make strategic, long-term investments in its rail system in order to handle increased volumes of traffic. Norfolk Southern's investments in network infrastructure	The cost of managing this opportunity would include the infrastructure improvements we've made in our system to greater leverage our intermodal capacity. On just one of our intermodal network improvement projects, the Crescent Corridor, we expect to invest \$2.5 billion.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	which is 4 times less fuel efficient than rail.						obligations, the financial opportunity could exceed \$89 million based on the events of 2014.	and train handling technologies have improved the company's freight capacity. The Heartland Corridor, Crescent Corridor, and CREATE projects are all groundbreaking public-private partnerships that have positioned Norfolk Southern to accommodate increased traffic by raising tunnel clearances to allow the use of efficient double-stack containers and refining other aspects of the routes. Also, Norfolk Southern is leveraging its RailEdge software system to optimize the flow of train traffic in the Norfolk Southern track system, thus enhancing	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>capacity. RailEdge is the result of collaboration between Norfolk Southern and GE Transportation to design a standardized dispatching system that will analyze dozens of variables to determine the best train plan for the network. At full deployment, RailEdge could increase the average network speed of trains by increasing the fluidity of the network and eliminating bottlenecks, thus enabling trains to make faster connections and complete their trips earlier.</p>	

Please describe the inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation extremes and droughts	Changes in physical climate parameters could result in severe weather conditions such as hurricanes, floods, and fires. Such weather phenomena could cause significant business interruptions with respect to other modes of on-road freight transportation, and any such interruptions could result in the affected freight traffic being diverted to the Norfolk Southern rail system. Though severe weather may occur at any time, the likelihood of such a given severe weather event is not capable of	Increased demand for existing products/services	Unknown	Indirect (Client)	Unknown	Unknown	In 2014 Norfolk Southern's intermodal revenues improved by \$178 million, the result of continued highway-to-rail conversions and additional business associated with the opening of new intermodal terminals. If in the future current conditions persisted, 20% of the increase would be due to a diversion of freight traffic to NS because of severe weather affecting other transportation, the potential financial opportunity could exceed \$35.6 million.	Norfolk Southern continues to make strategic, long-term investments in its rail system in order to handle increased volumes of traffic. Norfolk Southern's investments in network infrastructure and train handling technologies have improved the company's freight capacity. The Heartland Corridor, Crescent Corridor, and CREATE projects are all groundbreaking public-private partnerships that have positioned Norfolk Southern to accommodate increased traffic by raising tunnel clearances to allow the use of	The costs to manage this opportunity would include any and all upgrades that need to be made to the infrastructure that will make it possible for NS to handle more capacity.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>accurate prediction; therefore, NS has characterized the likelihood of this opportunity as "unknown." Similarly, we cannot state the magnitude of the impact of this potential opportunity without knowing the scale of the precipitating event.</p>							<p>efficient double-stack containers and refining other aspects of the routes. Also, Norfolk Southern is leveraging its RailEdge software system to optimize the flow of train traffic in the Norfolk Southern track system, thus enhancing capacity. RailEdge is the result of collaboration between Norfolk Southern and GE Transportation to design a standardized dispatching system that will analyze dozens of variables to determine the best train plan for the network. At full deployment, RailEdge could increase the average network speed of trains by increasing the</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								fluidity of the network and eliminating bottlenecks, thus enabling trains to make faster connections and complete their trips earlier.	

**CC6.1c**

Please describe the inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	Freight rail is widely regarded as a fuel- and carbon-efficient mode of freight transportation. According to a recent independent study produced for the Federal Railroad Administration, railroads on	Increased demand for existing products/services	Unknown	Direct	Unknown	Unknown	Norfolk Southern's reputation as a fuel- and carbon-efficient freight transporter could moderately increase demand for NS' services, which hypothetically could have a	Norfolk Southern works with internal and external stakeholders to communicate how our dedication to fuel-efficient freight transportation will benefit our supply chain partners.	There are zero dollars allocated for external costs associated with membership in the SmartWay Transport partnership or Business Roundtable's SEE Change.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>average are four times more fuel-efficient than trucks. Moving freight by rail instead of truck reduces gas emissions by 75 percent, on average. If just 10 percent of long-distance freight that currently moves by highway switched to rail companies like Norfolk Southern, national fuel savings would exceed one billion gallons a year and annual greenhouse gas emissions would fall by some 12 million tons. Norfolk Southern is well poised to reap the benefits from this shift.</p>						<p>positive effect on NS' operating results, financial position, and liquidity. On January 2nd, 2014 our stock price was \$91.31, if it were to increase by 10% because of positive perception, that would be \$9.13 a share.</p>	<p>Norfolk Southern participates in the United States Environmental Protection Agency's voluntary SmartWay Transport Program. As part of the partnership, Norfolk Southern and other freight transporters have committed to develop and implement plans to improve fuel efficiency and reduce carbon emissions. The SmartWay Transport Program underscores our continued commitment to optimize the efficiency of our operations, reduce our emissions, and be a responsible corporate citizen. The SmartWay Transport</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>Program has recognized the important role freight rail could play in a global approach to greenhouse gas emissions reduction. Encouraging intermodal transportation, as opposed to all-highway transportation, is an approved emissions control strategy of the USEPA's SmartWay Transport Program. Norfolk Southern's continued involvement with the Business Roundtable's SEE Change initiative carried over into 2014 and has further demonstrated Norfolk Southern's commitment to sustainable</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								business development.	

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CC6.1d

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC6.1e

Please explain why you do not consider your company to be exposed to inherent opportunities driven by physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

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CC6.1f

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

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**Further Information**

**Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading**

**Page: CC7. Emissions Methodology**

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**CC7.1**

**Please provide your base year and base year emissions (Scopes 1 and 2)**

<b>Scope</b>	<b>Base year</b>	<b>Base year emissions (metric tonnes CO2e)</b>
Scope 1	Thu 01 Jan 2009 - Thu 31 Dec 2009	4505719
Scope 2	Thu 01 Jan 2009 - Thu 31 Dec 2009	243357

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**CC7.2**

**Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions**

**Please select the published methodologies that you use**

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

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**CC7.2a**

If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

### CC7.3

Please give the source for the global warming potentials you have used

Gas	Reference
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: N20	IPCC Fourth Assessment Report (AR4 - 100 year)

### CC7.4

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Sub bituminous coal	3656.14	lb CO2 per short ton	US EPA
Natural gas	120	lb CO2 per 1000 ft3	US EPA
Distillate fuel oil No 2	930.15	lb CO2 per barrel	US EPA
Liquefied petroleum gas (LPG)	535.79	lb CO2 per barrel	US EPA
Diesel/Gas oil	22.23	lb CO2 per gallon	US EPA

Fuel/Material/Energy	Emission Factor	Unit	Reference
Motor gasoline	19.37	lb CO2 per gallon	US EPA
Aviation gasoline	18.15	lb CO2 per gallon	US EPA
Jet kerosene	20.89	lb CO2 per gallon	US EPA
Propane	63.07	Other: kg CO2/mmBtu	US EPA

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#### Further Information

**Page: CC8. Emissions Data - (1 Jan 2014 - 31 Dec 2014)**

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#### CC8.1

**Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory**

Financial control

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#### CC8.2

**Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e**

5358750

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#### CC8.3

**Please provide your gross global Scope 2 emissions figures in metric tonnes CO2e**

266815

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**CC8.4**

**Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?**

Yes

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**CC8.4a**

**Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure**

<b>Source</b>	<b>Relevance of Scope 1 emissions from this source</b>	<b>Relevance of Scope 2 emissions excluded from this source</b>	<b>Explain why the source is excluded</b>
Fugitive emissions and refrigerants	Emissions are not relevant	No emissions from this source	Norfolk Southern did not calculate so-called "fugitive emissions" (including hydrofluorocarbons and sulfur hexafluoride). Any potential release of these gases is negligible and would have no material or statistical relevance to our emissions figures

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**CC8.5**

**Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations**

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	Less than or equal to 2%	Assumptions Extrapolation Metering/ Measurement Constraints	Consumption of certain fuels and electricity was calculated using invoices and company records for purchases of those fuels and electricity, so errors in those invoices/records and/or assumptions regarding precise use could create an error in the greenhouse gas inventory.
Scope 2	Less than or equal to 2%	Assumptions Metering/ Measurement Constraints	Consumption of certain fuels and electricity was calculated using invoices and company records for purchases of those fuels and electricity, so errors in those invoices/records and/or assumptions regarding precise use could create an error in the greenhouse gas inventory.

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**CC8.6**

**Please indicate the verification/assurance status that applies to your reported Scope 1 emissions**

Third party verification or assurance complete

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**CC8.6a**

**Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements**

Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Limited assurance	<a href="https://www.cdp.net/sites/2015/25/13425/Climate Change 2015/Shared Documents/Attachments/CC8.6a/KPMG Assurance_NS Greenhouse Gas Emissions opinion Review Report.pdf">https://www.cdp.net/sites/2015/25/13425/Climate Change 2015/Shared Documents/Attachments/CC8.6a/KPMG Assurance_NS Greenhouse Gas Emissions opinion Review Report.pdf</a>	1-2	Attestation standards established by AICPA (AT101)	100

**CC8.6b**

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emissions Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission

**CC8.7**

Please indicate the verification/assurance status that applies to your reported Scope 2 emissions

Third party verification or assurance complete

**CC8.7a**

Please provide further details of the verification/assurance undertaken for your Scope 2 emissions, and attach the relevant statements

Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Limited assurance	<a href="https://www.cdp.net/sites/2015/25/13425/Climate_Change_2015/Shared_Documents/Attachments/CC8.7a/KPMG_Assurance_NS_Greenhouse_Gas_Emissions_opinion_Review_Report.pdf">https://www.cdp.net/sites/2015/25/13425/Climate_Change_2015/Shared Documents/Attachments/CC8.7a/KPMG Assurance_NS Greenhouse Gas Emissions opinion Review Report.pdf</a>	1-2	Attestation standards established by AICPA (AT101)	100

**CC8.8**

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Year on year change in emissions (Scope 1 and 2)	

**CC8.9**

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

Yes

**CC8.9a**

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

44553

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**Further Information**

**Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2014 - 31 Dec 2014)**

---

**CC9.1**

**Do you have Scope 1 emissions sources in more than one country?**

No

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**CC9.1a**

Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e

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**CC9.2**

**Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)**

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**CC9.2a**

Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)
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**CC9.2b**

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
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**CC9.2c**

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
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**CC9.2d**

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)
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**CC9.2e**

Please break down your total gross global Scope 1 emissions by legal structure

Legal structure	Scope 1 emissions (metric tonnes CO2e)
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**Further Information**

**Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2014 - 31 Dec 2014)**

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**CC10.1**

**Do you have Scope 2 emissions sources in more than one country?**

No

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**CC10.1a**

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2 metric tonnes CO2e	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted for in CC8.3 (MWh)
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**CC10.2**

**Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)**

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**CC10.2a**

**Please break down your total gross global Scope 2 emissions by business division**

Business division	Scope 2 emissions (metric tonnes CO2e)

---

**CC10.2b**

**Please break down your total gross global Scope 2 emissions by facility**

Facility	Scope 2 emissions (metric tonnes CO2e)

---

**CC10.2c**

**Please break down your total gross global Scope 2 emissions by activity**

Activity	Scope 2 emissions (metric tonnes CO2e)

---

CC10.2d

Please break down your total gross global Scope 2 emissions by legal structure

Legal structure	Scope 2 emissions (metric tonnes CO2e)

---

**Further Information**

**Page: CC11. Energy**

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CC11.1

**What percentage of your total operational spend in the reporting year was on energy?**

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

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CC11.2

**Please state how much fuel, electricity, heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year**

Energy type	MWh
Fuel	15896282

Energy type	MWh
Electricity	452871
Heat	0
Steam	0
Cooling	0

---

**CC11.3**

Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Bituminous coal	89800
Diesel/Gas oil	15269678
Residual fuel oil	327918
Kerosene	15942
Jet kerosene	14034
Natural gas	1133
Propane	105039
Biodiesels	72738

---

**CC11.4**

Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the Scope 2 figure reported in CC8.3

Basis for applying a low carbon emission factor	MWh associated with low carbon electricity, heat, steam or cooling	Comment
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Basis for applying a low carbon emission factor	MWh associated with low carbon electricity, heat, steam or cooling	Comment
No purchases or generation of low carbon electricity, heat, steam or cooling accounted with a low carbon emissions factor		

#### Further Information

#### Page: CC12. Emissions Performance

#### CC12.1

How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Increased

#### CC12.1a

Please identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year

Reason	Emissions value (percentage)	Direction of change	Comment
Emissions reduction activities	3.39	Decrease	In 2014, 172,298 metric tons of CO <sub>2</sub> e were reduced by our emissions reduction activities. Our total scope 1 and 2 emissions in the previous year were 5,088,314 metric tons of CO <sub>2</sub> e, therefore we arrived at a 3.39% decrease: $(172,298/5,088,314)*100 = 3.39\%$ .
Divestment			
Acquisitions			
Mergers			
Change in output	5.68	Increase	In 2014, shipping volumes (revenue ton-miles) were 205 billion and in 2013 it was 193.5 billion representing an increase of output of 11 billion revenue ton-miles. This resulted in an increase of emissions by 5.91% $(11,000,000,000/193,500,000,000)*100 = 5.68\%$
Change in			

Reason	Emissions value (percentage)	Direction of change	Comment
methodology			
Change in boundary			
Change in physical operating conditions			
Unidentified			
Other			

#### CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change
0.0004839612	metric tonnes CO2e	unit total revenue	7.38	Increase	In 2014, many areas of our network suffered delays due to weather which hurt the ratio of carbon emissions to revenue since we were not as efficient.

#### CC12.3

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per full time equivalent (FTE) employee

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change
190.81	metric tonnes CO2e	FTE employee	5.32	Increase	In 2014 we reduced our workforce from 30,103 in 2013 to 29,482 in 2014. The decline in employees did not correspond with our fuel emissions therefore, even though there was an intensity reduction based on revenue ton miles, the emissions per employee increased.

#### CC12.4

Please provide an additional intensity (normalized) metric that is appropriate to your business operations

Intensity figure	Metric numerator	Metric denominator	% change from previous year	Direction of change from previous year	Reason for change
0.0000274418	metric tonnes CO2e	Other: revenue ton mile	2.61	Decrease	With a 5% increase in our revenue and a 3.39% decrease in emissions due to our emissions reduction activities, we were able to achieve an intensity decrease in our emissions.

#### Further Information

Page: **CC13. Emissions Trading**

#### CC13.1

Do you participate in any emissions trading schemes?

Yes

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**CC13.1a**

Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership
Other: Voluntary market	Tue 01 Jan 2013 - Tue 31 Dec 2013	10000	0	10000	Other: Operated in partnership with GreenTrees

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**CC13.1b**

**What is your strategy for complying with the schemes in which you participate or anticipate participating?**

Norfolk Southern has partnered with GreenTrees to plant over 6 million trees in the Mississippi Delta. The planting finished in 2014. Between 2016 and 2030, the trees planted in the Mississippi Delta through our Trees and Trains program are expected to generate 1.12 million carbon credits that can be sold to individuals or businesses wishing to offset their carbon emissions.

These credits are verified and registered by the American Carbon Registry, a nonprofit enterprise that handles over-the-counter transactions in the voluntary U.S. carbon-offset market. In late 2013, the ACR transferred the first 10,000 tons of carbon credits into Norfolk Southern's account.

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**CC13.2**

**Has your organization originated any project-based carbon credits or purchased any within the reporting period?**

Yes

CC13.2a

Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes of CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits cancelled	Purpose, e.g. compliance
Credit Origination	Agriculture	Trees and Trains	Other: American Carbon Registry	10000	10000	No	Voluntary Offsetting

Further Information

Page: **CC14. Scope 3 Emissions**

CC14.1

Please account for your organization’s Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, not yet calculated				

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Capital goods	Relevant, not yet calculated				
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, not yet calculated				
Upstream transportation and distribution	Relevant, not yet calculated				
Waste generated in operations	Relevant, not yet calculated				
Business travel	Relevant, calculated	6090	This business travel figure represents emissions from air travel and personal vehicle travel and is based on passenger mileage and mileage, respectively. We entered this data into the Greenhouse Gas Protocol Initiative Mobile Combustion Tool.	100.00%	
Employee commuting	Relevant, calculated	2.5	In June 2014, Norfolk Southern conducted their first employee commuting survey as a part of a clean commute strategy encouraging employees to try alternative transportation. While the participation rate in the survey was relatively small, we hope to expand the program in coming years.	1%	
Upstream leased assets	Relevant, calculated	867	This figure represents emissions from facilities that Norfolk Southern leases from third parties. We used EPA eGRID industry average data to calculate estimated energy consumption for each facility based on the square footage of each lease. Using the Greenhouse Gas Protocol Initiative's calculation tool for purchased electricity, we derived the CO2e emissions from each.	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Downstream transportation and distribution	Not relevant, explanation provided				As a provider of freight transportation services, Norfolk Southern is not a significant user of downstream transportation. Furthermore, as a service provider, Norfolk Southern is not a significant user of goods distribution services.
Processing of sold products	Not relevant, explanation provided				Norfolk Southern is primarily a provider of freight transportation services, not a manufacturer or vendor of products for sale. As such, the emissions generated by processing of sold products are not relevant to Norfolk Southern.
Use of sold products	Not relevant, explanation provided				Norfolk Southern is primarily a provider of freight transportation services, not a manufacturer or vendor of products for sale. As such, the emissions generated by use of sold products are not relevant to Norfolk Southern.
End of life treatment of sold products	Not relevant, explanation provided				Norfolk Southern is primarily a provider of freight transportation services, not a manufacturer or vendor of products for sale. As such, the emissions generated by end of life treatment of sold products are not relevant to Norfolk Southern.
Downstream leased assets	Not relevant, explanation provided				Norfolk Southern is primarily a provider of freight transportation services, not a manufacturer or vendor of products for sale. As such, the emissions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
					generated by downstream leased assets are not relevant to Norfolk Southern.
Franchises	Not relevant, explanation provided				Norfolk Southern is primarily a provider of freight transportation services, not a manufacturer or vendor of products for sale. As such, the emissions generated by franchises are not relevant to Norfolk Southern.
Investments	Relevant, not yet calculated				
Other (upstream)					
Other (downstream)					

**CC14.2**

**Please indicate the verification/assurance status that applies to your reported Scope 3 emissions**

Third party verification or assurance complete

**CC14.2a**

**Please provide further details of the verification/assurance undertaken, and attach the relevant statements**

Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of Scope 3 emissions verified (%)
Limited assurance	<a href="https://www.cdp.net/sites/2015/25/13425/Climate%20Change%202015/Shared%20Documents/Attachments/CC14.2a/KPMG%20Assurance_NS%20Greenhouse%20Gas%20Emissions%20opinion%20Review%20Report.pdf">https://www.cdp.net/sites/2015/25/13425/Climate Change 2015/Shared Documents/Attachments/CC14.2a/KPMG Assurance_NS Greenhouse Gas Emissions opinion Review Report.pdf</a>	1,2	Attestation standards established by AICPA (AT101)	100

### CC14.3

Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

### CC14.3a

Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Business travel	Emissions reduction activities	4.00	Decrease	Norfolk Southern has been encouraging employees to participate in virtual meetings like telepresence and conference calls in stead of flying and driving to meetings in order to reduce our carbon emissions.
Upstream leased assets	Divestment	7.77	Decrease	Norfolk Southern did not renew some of our leases which contributed to the decrease in emissions.

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**CC14.4**

**Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)**

Yes, our suppliers  
Yes, our customers

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**CC14.4a**

**Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success**

- i) Methods of engagement: Norfolk Southern engages with customers and suppliers on multiple levels. For our customers, we routinely respond to customer inquiries regarding our sustainability practices and carbon efficiency, and information about our greenhouse gas emissions impact is included in customer proposals where appropriate. As to our suppliers, we engage with strategic partners to enhance the energy- and carbon-efficiency of our locomotives and our buildings. We also have worked with GE--one of our major suppliers--to co-sponsor the Annual Railroad Sustainability Symposium and advance the dialogue about sustainability in the railroad industry.
- ii) Prioritization strategy: Norfolk Southern prioritizes sustainability value chain engagement according to our corporate goals and values. Naturally, customer engagements are of primary importance to us, particularly those in which the customer has requested information or assistance.
- iii) Measures of success: We measure success by our ability to provide the information or assistance the customer seeks while adding value to their business model.

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**CC14.4b**

**To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent**

Number of suppliers	% of total spend	Comment
2	12%	Norfolk Southern actively engages with our locomotive suppliers to ensure that the locomotives we purchase will aid us in reaching our fuel efficiency goals. Norfolk Southern has informed our suppliers of our sustainability program and we inquire about what our suppliers are doing within their own companies around sustainability issues.

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**CC14.4c**

If you have data on your suppliers' GHG emissions and climate change strategies, please explain how you make use of that data

How you make use of the data	Please give details
We do not have any data	Norfolk Southern is in the beginning stages of incorporating sustainability into our supplier scorecards.

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CC14.4d

Please explain why you do not engage with any elements of your value chain on GHG emissions and climate change strategies, and any plans you have to develop an engagement strategy in the future

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Further Information

**Module: Sign Off**

**Page: CC15. Sign Off**

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CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Esi Waters	Manager Corporate Sustainability	Environment/Sustainability manager

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Further Information

**CDP**