

2024

CLIMATE TRANSITION PLAN

FULL REPORT

DECEMBER 28, 2023



STATEMENT FROM THE CHIEF SUSTAINABILITY OFFICER



To our fellow stakeholders,

I am pleased to introduce Norfolk Southern's inaugural Climate Transition Plan (CTP), another milestone in our longstanding commitment to environmental stewardship and sustainability. Rail is the most sustainable way to move freight over land. As one of the nation's leading freight railroads, we understand the critical role we play in reducing supply chain emissions and fostering a transition to a low-carbon economy. We remain focused on building a better planet, a brighter future for our employees and our communities, and partnering with our customers to achieve their sustainability goals.

Acknowledging climate-related risks and opportunities, our CTP identifies three key performance indicators (KPIs) as decarbonization levers, essential to achieving our current science-based target of reducing GHG emissions intensity 42% by 2034. These include a 13% improvement in locomotive fuel efficiency by 2027, a commitment to increasing renewable energy usage to 30% by 2030, and 20% consumption of low carbon fuels by 2034.

This report outlines our journey toward a more sustainable future and underscores our commitment to making a positive impact on our communities. Thank you for your continued partnership as we work together toward a low-carbon, resilient world for future generations.

A handwritten signature in black ink, appearing to read 'Josh', written in a cursive style.

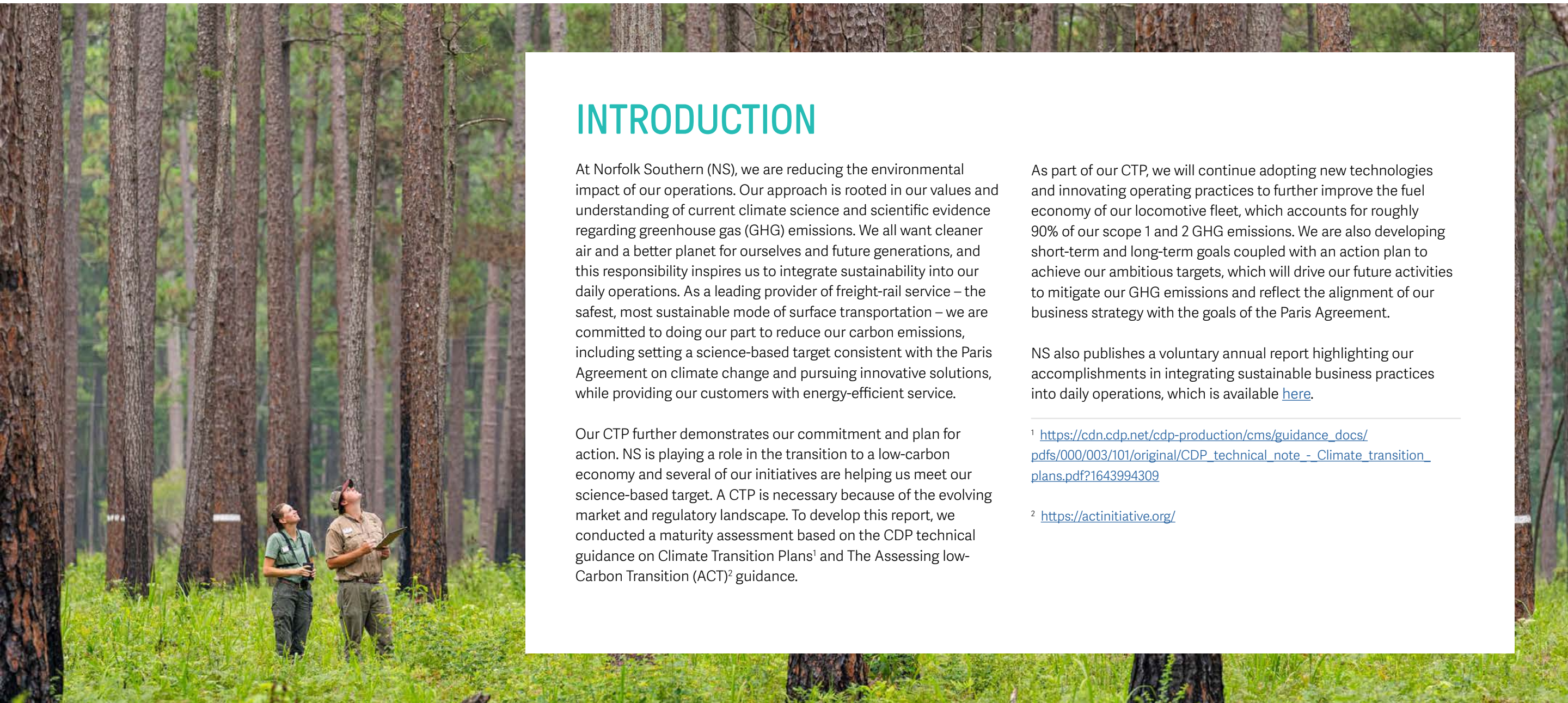
Josh Raglin
Chief Sustainability Officer

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INTRODUCTION



INTRODUCTION

At Norfolk Southern (NS), we are reducing the environmental impact of our operations. Our approach is rooted in our values and understanding of current climate science and scientific evidence regarding greenhouse gas (GHG) emissions. We all want cleaner air and a better planet for ourselves and future generations, and this responsibility inspires us to integrate sustainability into our daily operations. As a leading provider of freight-rail service – the safest, most sustainable mode of surface transportation – we are committed to doing our part to reduce our carbon emissions, including setting a science-based target consistent with the Paris Agreement on climate change and pursuing innovative solutions, while providing our customers with energy-efficient service.

Our CTP further demonstrates our commitment and plan for action. NS is playing a role in the transition to a low-carbon economy and several of our initiatives are helping us meet our science-based target. A CTP is necessary because of the evolving market and regulatory landscape. To develop this report, we conducted a maturity assessment based on the CDP technical guidance on Climate Transition Plans¹ and The Assessing low-Carbon Transition (ACT)² guidance.

As part of our CTP, we will continue adopting new technologies and innovating operating practices to further improve the fuel economy of our locomotive fleet, which accounts for roughly 90% of our scope 1 and 2 GHG emissions. We are also developing short-term and long-term goals coupled with an action plan to achieve our ambitious targets, which will drive our future activities to mitigate our GHG emissions and reflect the alignment of our business strategy with the goals of the Paris Agreement.

NS also publishes a voluntary annual report highlighting our accomplishments in integrating sustainable business practices into daily operations, which is available [here](#).

¹ https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/003/101/original/CDP_technical_note_-_Climate_transition_plans.pdf?1643994309

² <https://actinitiative.org/>

Categories	Addressed by NS	Credible Transition Plan Elements	ISSB	U.S. SEC	EFRAG (ESRS)/ CSRD	UKTPT	TCFD	ACT	GFANZ	CBI	TPI
Governance	<input checked="" type="checkbox"/>	Board-level oversight (1)									
	<input checked="" type="checkbox"/>	Board expertise on climate-related issues (2)									
	<input checked="" type="checkbox"/>	Executive management accountability and feedback mechanisms (3)									
	<input checked="" type="checkbox"/>	Executive incentives linked to climate performance indicators (4)									
Scenario Analysis	<input checked="" type="checkbox"/>	Details of scenario analysis (5)									
Risks & Opportunities	<input checked="" type="checkbox"/>	Process for identifying climate-related risks and opportunities (6)									
	<input checked="" type="checkbox"/>	Climate-related risks – risk potential financial impact and response strategy (7)									
	<input checked="" type="checkbox"/>	Climate-related opportunities – opportunities, potential financial impact and response strategy (8)									
			Existence of a 1.5C world aligned transition plan with business strategy and shareholder feedback (9)								

Strategy to achieve net zero	☑	Link between identified (and potential) climate-related risks, opportunities and company strategy (10)									
Financial Planning		Financial planning details associated with a 1.5C world (11)									
	☑	Low-carbon products or services (12)									
Targets	☑	Emission reduction targets – absolute and intensity (13)									
		Net-zero targets (14)									
	☑	Other climate-related targets (15)									
Scope 1-3 accounting with verification	☑	Comprehensive and third-party verified emission accounting (16)									
Policy Engagement	☑	Alignment of public policy engagement with climate ambition and strategy (17)									
Value chain engagement	☑	Low-carbon initiatives – direct operations (18)									
	☑	Value chain engagement (19)									

*Please note that NS is pursuing completion of each of the credible transition plan elements above and this CTP will be updated every 2-5 years to reflect progress.

■ Covered by Framework ■ Partially covered by Framework



GOVERNANCE

We are actively developing governance processes for our transition plan, including approval, oversight, and accountability, drawing on the existing framework for oversight of sustainability and climate change risk and issues set forth below. These processes will capture our climate-related capabilities, technologies, transition pathways, scenarios, and financial strategies and address our transition risks directly. Climate-related risks and opportunities impact our governance and business decisions, and this transition plan is an important piece of our overall strategy. As described in our Executive Summary, our current transition planning effort consists of a “well-below 2°C” temperature and current policy scenarios.



Independent Board Chair Amy Miles and President and CEO Alan Shaw

BOARD-LEVEL OVERSIGHT AND EXPERTISE (ELEMENTS 1 AND 2)

Our board of directors is ultimately responsible for monitoring the primary operational, compliance, financial and strategic risks facing the company, including oversight of the company’s corresponding Enterprise Risk Management (ERM) program to proactively identify, assess, monitor, and mitigate the primary risks that may impact our business objectives. The company’s management has in turn created an Enterprise Risk Council, composed of executive leadership, to implement the ERM program. This council coordinates with business leaders across the company to assess and mitigate enterprise risks, which we evaluate through a thorough process that considers the magnitude of potential risks and the likelihood of occurrence. This risk-evaluation process informs our risk management policies and enables us to identify and capture material climate-related issues (along with discussions and feedback from our shareholders, customers and community stakeholders, as well as by reviewing the strategic plan developed by the Chief Executive Officer and our board of directors).

Subject to the board’s ultimate oversight and accountability, and notwithstanding its periodic receipt of reports and recommendations regarding ERM-related matters, the board has delegated specific risk management oversight responsibilities to its various committees, as set forth below. The board and its committees are authorized to engage outside advisors to assist in performing such risk management oversight duties, with the board and the Finance and Risk Management Committee being further authorized to conduct related risk assessments at any time.

The board has delegated oversight of the ERM program to the Finance and Risk Management Committee, including to request and receive periodic reports from management on the company’s overall risk monitoring and mitigation activities.

The board has further delegated oversight of the company’s sustainability and climate change risks and issues to the Governance and Nominating Committee. Our management and employees otherwise collaborate to identify and mitigate any sustainability and climate change risks, with periodic reports also provided to the board and the Finance and Risk Management Committee.

As a result, the Governance and Nominating Committee’s charter includes the following elements:

- Oversight of the company’s sustainability and climate change risks and initiatives, including related policies, emerging sustainability issues, and annual and long-term sustainability goals; and
- Overseeing the ESG Report

The Governance and Nominating Committee periodically reviews, along with company management and our Chief Sustainability Officer, the company’s climate risk and sustainability initiatives, including with respect to shareholder expectations and market practices, as well as our ESG Report, which we draft and publish annually on our website, to ensure an appropriate level of detail and clarity. The chair of the Governance and Nominating Committee in turn provides reports to our board of directors at each of its meetings on the issues addressed and decisions made by the committee. As a result, our board of directors is able to provide climate-related oversight, including reviewing and guiding risk-management policies, reviewing and guiding strategy, and monitoring progress towards corporate targets related to climate change, energy, and environmental policy.

In terms of overall expertise, our board, which is comprised of our President and Chief Executive Officer, an independent board chair, and

13 additional independent directors, includes nine total members (60% overall) who possess experience in environmental or safety matters, including two new directors who were appointed in July 2023. One of our new directors, Francesca DeBiase, has held sustainability and supply chain leadership roles for nearly 15 years, including having previously served as the Chief Sustainability Officer for McDonald's Corporation. We further encourage and support board members that enhance their expertise on climate-related issues.

MANAGEMENT-LEVEL OVERSIGHT (ELEMENTS 1 AND 2)

The board has further empowered two company-level officers with responsibilities for climate-related issues: an Executive Vice President and Chief Transformation Officer, who oversees NS sustainability issues and initiatives to reduce impacts to the environment; and an Executive Vice President and Chief Legal Officer, who oversees government relations, corporate governance, and legal matters, including environmental and climate change issues.

The company has also designated a Chief Sustainability Officer with over 15 years of experience to lead and oversee the company's overall sustainability initiatives and disclosures, being the first Class I railroad to do so back in 2007. Our Chief

Sustainability Officer reports to our Executive Vice President and Chief Transformation Officer, who in turn reports to our President and Chief Executive Officer and ultimately, our board of directors.

Our Chief Sustainability Officer is responsible for advancing the company's strategy to integrate sustainability practices into daily operations to achieve efficiencies, control costs, generate revenue, and reduce impacts. The Chief Sustainability Officer position is critical to NS' commitment to environmental, social, and governance practices that positively impact the environment while supporting the company's growth and evolution. This position has oversight and responsibility within their role and reports to the full board of directors on issues, including climate issues related to their purview. This position has the authority, influence, and resources to act on climate-related risks and opportunities in alignment with our corporate strategy.

The company also recently established an ESG Council, comprised of leaders from across the organization who meet on a periodic basis to review and direct our ESG-related activities, issues, and disclosures in conjunction with the company's Chief Sustainability Officer.



EXECUTIVE MANAGEMENT ACCOUNTABILITY & FEEDBACK MECHANISMS (ELEMENT 3)

Executive management accountability and feedback mechanisms are crucial components of effective corporate governance and organizational performance. Our approach ensures that executive management is held responsible for their actions, decisions, and the overall success of the company. Our executive management teams have been an essential stakeholder in our climate risk assessment process and key to driving actionable outcomes that reduce our vulnerability to climate change. Executive management accountability is governed by:

1. Clear roles and responsibilities with each member of the team assigned specific duties and their performance is measured against these responsibilities.
2. Key Performance Indicators (KPIs), which are established to track the effectiveness of executive management. KPIs include financial metrics such as revenue growth and profitability, operational metrics such as efficiency, service and safety performance, and strategic metrics like market share and customer satisfaction.
3. Strategic Planning execution which involves setting long-term goals, defining strategies, allocating resources, and ensuring the company's actions align with our vision and mission.
4. Risk Management by identifying, assessing, and mitigating risks that could affect the organization's financial stability, operational execution, reputation, or legal and regulatory compliance.

Feedback mechanisms are the Board of Directors, performance reviews, the ESG Council, stakeholder engagement, compliance checks, and continuous improvement to adapt strategies and refine process that enhance the leadership of our organization.

EXECUTIVE INCENTIVES & CLIMATE PERFORMANCE INDICATORS & LONG-TERM SENIOR EXECUTIVE COMPENSATION PLANNING (ELEMENT 4)

NS' 2023 annual monetary incentive is designed to compensate executives based on achievement of corporate yearly performance metrics: operating income, weighted at 40%; annual revenues, weighted at 30%; service metrics (specifically merchandise on-time delivery and intermodal composite performance), weighted at 20% (10% each); and safety metrics (FRA-reportable train accident and injury rates), weighted at 10% (5% each). Operating income is calculated using operational expenses. As a result, our management team receives monetary incentives based on their achievement of climate-related performance metrics. As fuel expenses are the third-largest expense, fuel efficiency improvements can significantly improve our operating income. Since locomotive fuel drives over 90% of our Scope 1 and Scope 2 emissions, the annual cash incentive encourages our executives to focus on fuel and operating efficiencies that ultimately result in emissions reduction per ton-mile.

We recognize that having a corporate governance structure in place for managing climate-related risks and opportunities is critical to the development of climate strategy, financial planning, target-setting, and value chain engagement as well as to the overall success of a CTP. Elements such as board oversight and expertise, executive management accountability, feedback, and incentives all play a key role in the development of a well-defined and strong governance structure. At NS, we aim to ensure that climate-related risks and opportunities are addressed with the proper expertise and oversight and that impactful incentive structures exist to drive real change.





GHG ACCOUNTING & VERIFICATION

GHG ACCOUNTING & VERIFICATION

We have calculated and publicly disclosed our GHG emissions since 2010 and will continue maintaining the inventory’s completeness, accuracy, transparency, consistency, and relevance. Our GHG inventory was completed in alignment with the Greenhouse Gas Protocol’s³ control approach, which defines the boundaries of an inventory. Each of our subsidiaries is a wholly owned operating company of Norfolk Southern Corporation and has operational control of all aspects of its operation.

Please see the table below for our Organizational & Operational Boundaries:

TABLE 1 | GHG EMISSIONS ORGANIZATIONAL & OPERATIONAL BOUNDARIES

Boundaries	Definitions
Geographic	United States
Greenhouse gas types Geographic	carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), and hydrofluorocarbons (HFCs)

COMPREHENSIVE AND THIRD-PARTY VERIFIED EMISSIONS ACCOUNTING (ELEMENT 16)

Our combined Scope 1, 2 and 3 emissions primarily come from mobile off-road combustions—accounting for 54% of our total emissions.

Our **scope 1** direct emission sources primarily result from our operational activities and include emissions from locomotives, on-road vehicle fleet, off-road equipment, and aircraft. Direct sources also include the use of natural gas, propane, and used oil, which are

used for heating. Other stationary combustion sources use diesel fuel, gasoline, and kerosene which are used for on-site generators and boiler heating. Scope 1 also includes total purchasing card fuel purchases, oil/water separator methane emissions, as well as fugitive refrigerant emissions from buildings and locomotives.

Our **scope 2** indirect emission sources are coming from our energy demands, primarily for buildings such as locomotive shops, classification yards, operations offices, service, and support centers, and transload facilities. GHG emissions from energy demands are associated with purchased electricity. We quantified our scope 2 emissions using two methods: a location-based method and a market-based method. The location-based method considers average emission factors for the electricity grids that provide electricity. The market-based method considers emission rates from purchased energy certificates or contractual arrangements under which power is procured from specific sources, such as renewable energy.

Lastly, our **scope 3** indirect emission sources result from our employee commuting and employee business travel via commercial airlines and vehicles not owned by NS (e.g., taxi/shuttle, rental, and personal vehicles), upstream leased assets, waste generated in operations, upstream transportation and distribution, purchased goods and services, and capital goods. We continue to evaluate which Scope 3 emission sources to include in the inventory and how to improve Scope 3 calculation methodologies, with selection and assessment based on the highest relevant available data/resources that contribute to the company’s GHG risk and/or ability to achieve or influence emission reductions.

³ <https://ghgprotocol.org/corporate-standard>



Our GHG Inventory for the year 2022 (ending December 31st, 2022), can be seen as below:

TABLE 2 | 2022 GHG INVENTORY FINDINGS

Source of GHG Emissions	Scope	CO ₂ Emissions	N ₂ O Emissions	CH ₄ Emissions	Total Emissions	Total GHG Emissions
		<i>metric tons CO₂-eq</i>	<i>metric tons CO₂-eq</i>	<i>metric tons CO₂-eq</i>	<i>metric tons CO₂-eq</i>	<i>Scopes 1, 2, and 3</i>
Mobile Off-Road Combustion Sources (Locomotives and Aircrafts)	1	3,826,074	29,054	7,489	3,862,617	54.4%
Locomotive Biodiesel	1	31,467	10	11.65	31,488	0.5%
Mobile On-Road Vehicle Fleet	1	83,147	404	28	83,579	1.2%
Stationary Combustion Sources	1	180,169	394	174	180,736	2.5%
Refrigerant Losses	1				35	0.0%
Oil/Water Separators (OWS) – Methane Emissions	1				691	0.0%
Purchased Electricity (Market-Based)	2				150,491	2.1%
Purchased Goods and Services	3				400,830	5.6%
Capital Goods	3				1,289,401	18.2%
Fuel-and-Energy-Related Activities (WTT)	3				956,554	13.5%
Upstream Transportation and Distribution	3	175	1.4	0.04	177	0.0%
Waste generated in operations	3				55,125	0.8%
Business Travel	3	13,910	107.3	9.1	14,027	0.2%

Employee commuting	3	76,202	508	49	76,758	1.1%
Upstream leased assets	3	653.9	1.9	1.1	657	0.0%
		Total Scope 1*	4,127,658 metric tons CO_{2-eq}			
			Total Scope 2			
			150,491 metric tons CO_{2-eq}			
			Total Scope 3			
			2,793,527 metric tons CO_{2-eq}			
			Total Scope 1+2+3			
			7,103,165 metric tons CO_{2-eq}			
			Total Scope 1+2			
			4,278,149 metric tons CO_{2-eq}			
			Emissions Intensity (Scope 1+2) / MGMTM			
			12.61 metric tons CO_{2-eq} per million gross ton miles			

*Scope 1 emissions exclude 31,488 metric tons of direct CO_{2e} emissions from the use of biofuels (biodiesel). | Notes: CH₄ = methane; CO₂ = carbon dioxide; CO_{2-eq} = carbon dioxide equivalent; N₂O = nitrous oxide

We have our GHG inventory verified under limited assurance from an independent registered public accounting firm and will continue to do so in the future to maintain transparency and credibility. For more details, please see our [verification statement](#).



SCENARIO ANALYSIS

In early 2023, we assessed risks and opportunities related to transitioning to a low-carbon economy per the Task Force on Climate-Related Financial Disclosure (TCFD) framework. These risks include current and emerging regulations, legal exposure, transition to low-emission technology, market changes, and reputational risks. Additionally, we identified opportunities from the transition, which include, but are not limited to, benefits from shifts in customer demand for low-carbon transportation, the transition to low-carbon emissions operations and services, and participation in carbon markets. NS pursued a top-down transition risk and opportunity analysis that engaged a cross-section of internal stakeholders that understand the impact a transition risk or opportunity would have on our organization and our vulnerability or readiness to each risk or opportunity, respectively, given our business continuity plans and existing management methods. This process has supported and led to the development of this CTP.

TRANSITION SCENARIO ANALYSIS APPROACH

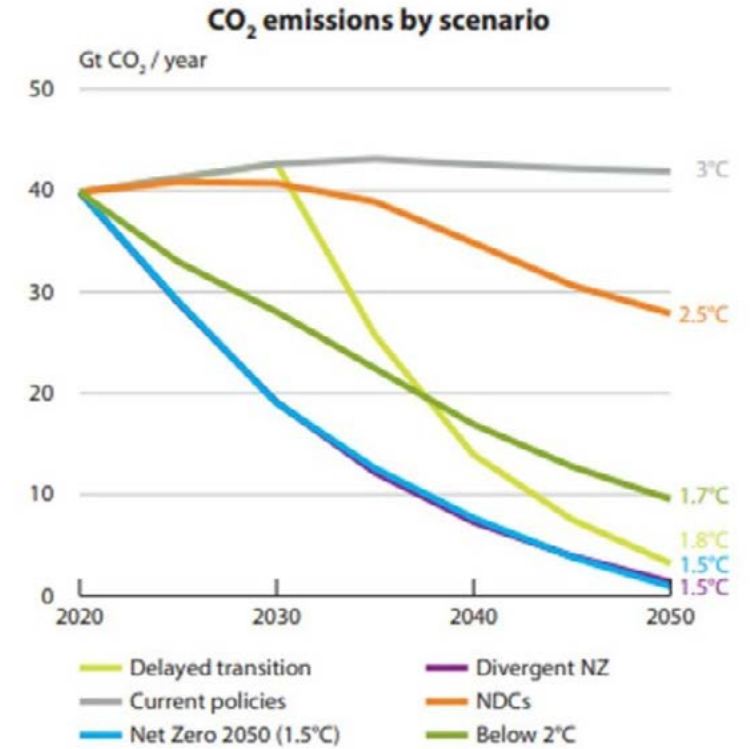
We conducted a company-wide, qualitative transition scenario analysis using the Network for Greening the Financial System (NGFS) Disorderly: Delayed Transition and Hot House World: Nationally Determined Contributions (NDCs)⁴ to evaluate the impacts of emerging regulations and inform our climate-related strategy. The Delayed Transition scenario assumes annual emissions do not decrease until 2030, and strong policies are needed to limit warming to below 2°C – CO₂ removal is limited. The Nationally Determined Contributions (NDCs) scenario includes all pledged policies but not yet implemented policy measures.

Regarding the boundary of the assessment, the climate sensitivity workshop evaluated climate-related risks for our value chain, however, our substantive risks focused on our operations due to our ability to

reduce vulnerability through business continuity planning. The estimated physical risks would be slightly lower than in the Current Policies case but still well above the Paris target, with a median temperature rise of over 2°C by 2050 and over 3°C by 2100. The estimated transition risks would still be limited.⁵ The scenario analysis assessed the potential impacts on NS from five climate-related transition risks and opportunities under two climate scenarios and three-time horizons. We engaged a cross-section of stakeholders in a climate sensitivity workshop to identify our highest exposure transition risks. This engagement resulted in three transition risks: policy, legal, and market and technology risks, while the two opportunities include an energy source and customer market opportunities. The temperature alignment of the scenario analysis was 1.6°C – 2°C.

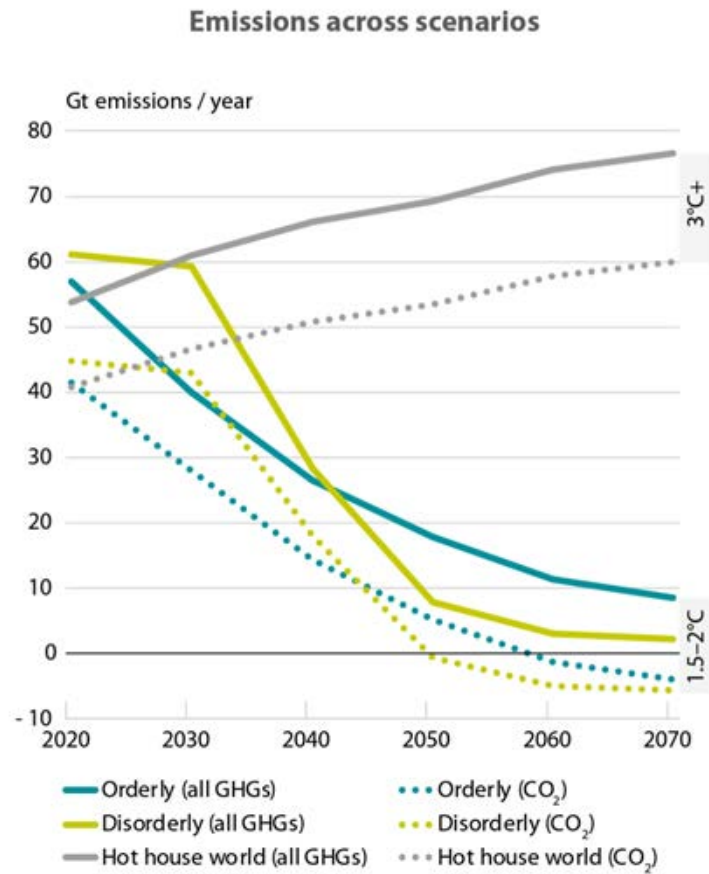
The Delayed Transition scenario assumes high variation in regional and delayed policy start. Delayed Transition assumes policy uncertainty leads to higher investment premiums lasting two years, 2030-2031. The assumption is that suppliers provide zero-emission locomotives, and low-carbon fuel demand will significantly increase. Slow to fast changes in demand for low-emission technology are a higher risk in a delayed transition. NDCs scenario focuses on decarbonizing the energy sector and passenger transportation. Existing mandates stay within a steady state with a push for decarbonization where possible. Considering these two scenarios, we evaluated existing management methods to mitigate emerging regulation risks. We concluded that our company is moderately prepared to manage the risks of mandates and regulations on locomotive transportation and locomotive technology availability. Our KPIs are noted in Table 10. Action Plan – Emissions Reduction Initiatives demonstrate our commitment to meeting science-based target emission reductions and incorporating collaboration and innovation engagements. The Figure 1 & 2 graphs illustrate the different

FIGURE 1 | EMISSIONS BY NGFS CLIMATE SCENARIO



Source: IIASA NGFS Climate Scenarios Database, REMIND model. End of century warming outcomes shown.

FIGURE 2 | EMISSIONS BY NGFS CLIMATE SCENARIO



NGFS climate scenarios pathways between 2020 and 2050 or 2070 and aligns with NS' asset lifetime.

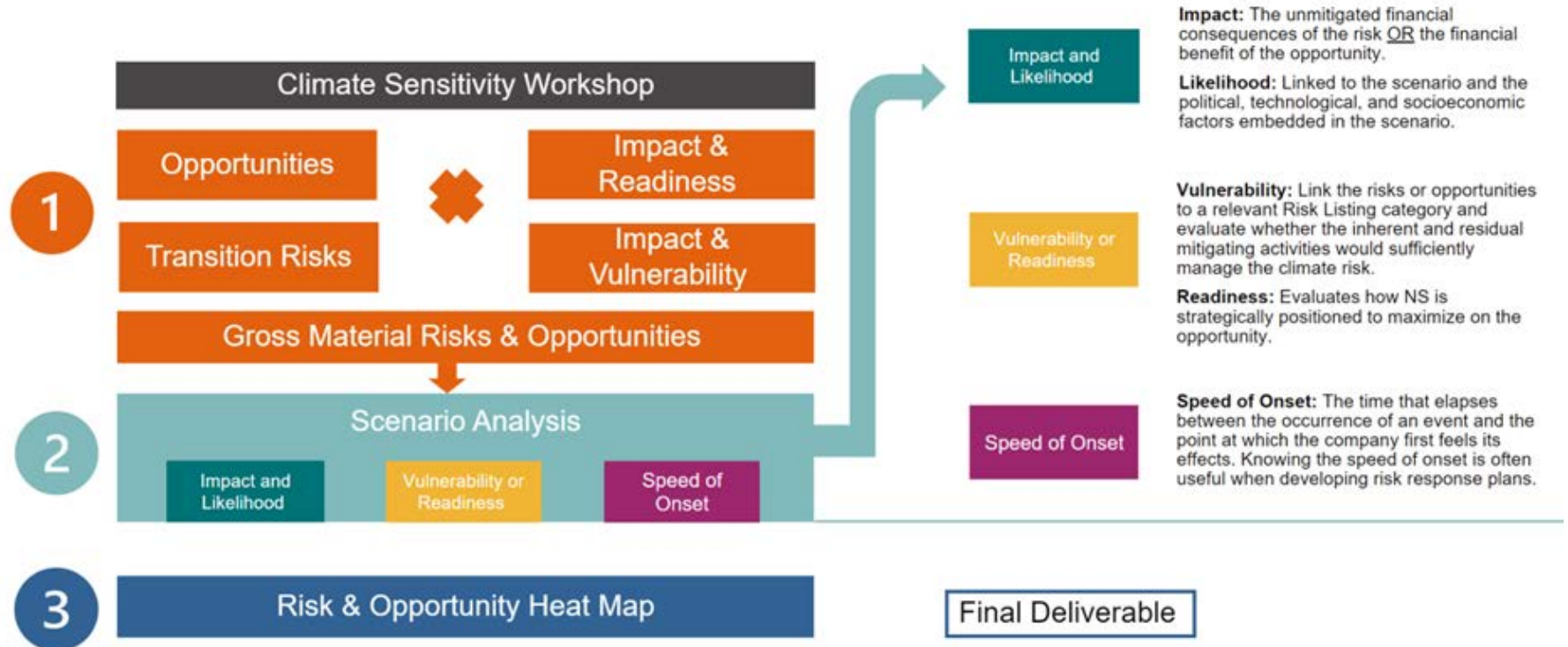
Figure 3 below illustrates the approach and evaluation process used to conduct the transition scenario analysis. The process started with hosting a climate sensitivity workshop to prioritize impactful risks and opportunities and assess impact alongside readiness and vulnerability.

We developed a risk inventory by mapping the prioritized risks to our existing risk listing. We then conducted the scenario analysis where we assessed risk and opportunity impact and likelihood, vulnerability or readiness, and the speed of onset.

⁴ <https://www.ngfs.net/ngfs-scenarios-portal/>

⁵ https://www.ngfs.net/sites/default/files/medias/documents/ngfs_guide_scenario_analysis_final.pdf

FIGURE 3. TRANSITION SCENARIO ANALYSIS APPROACH & EVALUATION LOGIC



SCENARIO ANALYSIS DETAILS (ELEMENT 5)

Criteria and Boundaries

Defining substantive risks

The NS Enterprise Risk Council utilizes the ERM function to identify and define risks which may have a substantive effect on our operations. Risks are evaluated based on quantitative and qualitative factors of impact, likelihood, and management effectiveness. The impact is a measure of potential effect(s) a risk will have on the organization and considers financial, operational, reputational, legal and/or technological implications of a risk event. Likelihood evaluates the frequency or probability of a risk event occurring. Risks that NS determines to carry high exposures to our strategic objectives are designated as “enterprise risks” and may require additional management actions and monitoring to prepare for, prevent or respond to a risk event.

Scope of scenario testing

The company-wide transition scenario analysis covers policy, legal, market, and technology (reputation) risks as well as resource efficiency energy source, products, and services customer market opportunities.

Time horizons

NS is a capital-intensive company. Our planning horizons are primarily determined by our critical assets' acquisition and disposition cycles. Most operational assets have a lifecycle that ranges from six years (electronic components) to 50 years (statutory limit of railcars in interline service). We aligned the time horizons of the scenario analysis with our asset lifecycles noted in Table 4.

TABLE 3 | CLIMATE-RELATED TRANSITION RISKS & OPPORTUNITIES

Transition Risk / Opportunity		Definition	TCFD Risk / Opportunity Category
1	Policy risk	Legal risks associated with mandates and regulations for raw/synthetic materials and/or products	Policy and legal risk
2	Legal risk	Increase in climate-related legal disputes and/or violations	Policy and legal risk
3	Market and Technology risk	Reduced availability of key raw/synthetic materials	Market and reputation risks
4	Energy Source opportunities	Carbon market participation and cost avoidance from transition to low carbon emission operations, services, and meeting our climate targets	Resource efficiency and energy sources opportunities
5	Customer Market opportunities	Strategic advantage over competitors to access new markets & anticipated use/prioritization of public-sector incentives	Products and services and market opportunities

TABLE 4 | SCENARIO ANALYSIS TIME HORIZONS

Time Horizon	Definitions
Short-term	2025-2030
Medium-term	2031-2040
Long-term	2041-2050

Our short-term time horizon is when tactical and operational decisions are made based on the assets already in place. Our medium-term planning horizon encompasses those years in which most of our operating assets, including locomotives, rail, railcars, radios, and operational electronics will be retired and replaced. While most NS assets are procured and retired within a 7 to 50-year, medium-term horizon, many decisions span a significantly longer period. For instance, in 2016, we completed the retirement and replacement of a railroad bridge in Letchworth State Park in Portageville, New York. The original bridge was 147 years old and was replaced by a bridge that NS hopes will provide productive service for another 150 years. Numerous other operating properties have been in service for our company and its predecessors for 100 years or more.

Key assumptions and parameters from scenarios chosen

To evaluate the impact of climate-related risks in more detail, NS performed a scenario analysis using the NGFS Disorderly: Delayed Transition and Hot House World: Nationally Determined Contributions. The Disorderly: Delayed Transition scenario assumes a high variation in regional policy and delayed policy start. Delayed Transition assumes that policy uncertainty leads to a higher investment premium that lasts for two years, 2030-2031. The assumption is that suppliers could provide zero-emission locomotives, and there will be a significant increase in demand for low-carbon fuels. Slow to fast changes in demand for low-emission technology are a higher risk in a delayed transition. Hot House World: NDCs scenario focuses on decarbonizing the energy sector and passenger transportation. As a result, existing mandates stay within a steady state with a push for decarbonization where possible.

Considering these two scenarios, we evaluated the rigor of our existing management methods to mitigate the risk of emerging regulations and concluded that we are prepared to manage the risk of mandates and regulations on locomotive transportation and the availability of locomotive technology. Table 10. Action Plan – Emissions Reduction Initiatives demonstrate NS' commitment to meeting the emission reductions of the SBT and incorporating collaboration and innovation engagements. However, there is an opportunity to enhance management activities that would result in mitigating the risks in their entirety. This exercise helped further define NS' appetite for risk and the proportionality of climate related risks to enterprise-wide risks. In addition, this exercise highlighted NS' need to develop a strategic technology and decarbonization analysis tracked in existing risk listing, complete strategic assessment of locomotives by age and emission tier for future incorporation of financial planning in risk mitigating activities, supply chain resilience, and capital expenditure considerations.

Disorderly: Delayed Transition and Hot House World: Nationally Determined Contributions. The Delayed Transition scenario assumes a high variation in regional policy and delayed policy start. Delayed Transition assumes that policy uncertainty leads to a higher investment premium that lasts for two years, 2030-2031.

Delayed Transition scenario assumptions anticipated a shift from low to high carbon price implications between 2030 and 2050, with aggressive policy implementation starting in 2030 reflecting the need to decarbonize. This will result in an increase in demand for biofuel or biofuel blends, increasing NS' operational costs. NDCs scenario assumptions had low carbon price implications with moderate regional policy variation. NDCs focus on passenger transportation and thus do not have a direct impact on NS' operations; however, the increase in demand for alternative fuels, low-emission fuels, or zero-emission transportation may result in a surge price in alternative fuels and battery propulsion locomotives, resulting in higher capital costs.

Evaluation

Materiality of the climate related risks and opportunities

NS determined the materiality of climate-related risks and opportunities following the ISO 14090 "vulnerability assessment" methodology. This methodology evaluates all gross climate-related risks and opportunities through a materiality exercise scoring the impact (e.g., impact - the unmitigated financial or non-financial consequence if the risk were to materialize) to NS and NS' vulnerability to the risk (e.g., vulnerability - evaluate whether the inherent and residual mitigating activities would sufficiently manage the climate risk) as well as impact and readiness (e.g., evaluates how NS is strategically positioned to maximize on the opportunity) to identify net material risks and opportunities.

Description of how the scenario analysis informed the plan

The insights gained from our climate scenario analysis have been instrumental in shaping our CTP in the following ways:

- **Risk Mitigation Strategies:** We identified transition risks that could impact our business and developed strategies to mitigate them. These strategies include diversifying our service offerings, investing in sustainable technologies, and closely monitoring regulatory developments.
- **Opportunity Assessment:** Beyond risk mitigation, the analysis highlighted potential opportunities in the transition to a low carbon economy. These opportunities include expanding into low carbon fuel markets, improving energy efficiency, and developing innovative sustainable products and services.
- **Scenario-Based Decision-Making:** Our CTP now incorporates scenario-based decision making. We have outlined specific actions driven by the outcomes of the climate scenarios, including Key Performance Indicators (KPIs) development mapped to our Risk Register and aligned with ERM governance.
- **Reporting and Disclosure:** We commit to transparently disclosing our climate transition efforts to stakeholders, aligning with global reporting standards such as the TCFD. This commitment enhances our accountability and builds trust among investors and customers.

Incorporating climate scenario analysis focused on transition risk into our CTP has been transformative. It has enabled us to proactively address climate-related challenges, seize emerging opportunities, and position ourselves with our industry leaders in sustainability. We anticipate that

our commitment to an adaptive and resilient strategy will drive long-term value and contribute to a more sustainable and climate-resilient future for all.

Scenario Analysis Findings

Our company must be adequately prepared for the operational shock of a potential national transportation decarbonization rule. However, our climate risk assessment highlighted several existing factors that may mitigate the severity of such an event. We are integrating climate risks and their associated mitigating activities into relevant ERM risk categories, which embed climate risk into our strategic risks and enable monitoring of risk mitigating activities. As we expand the scope of these analyses, we will continue to evaluate the costs and benefits of more aggressive decarbonization goals and the capital investments necessary to stand by our commitment to reduce our impact on the climate.



TABLE 5 | TRANSITION RISK & OPPORTUNITY ANALYSIS FINDINGS

Delayed Transition				
Risk / Opportunity	Impact	Likelihood	Speed of Onset / Time Horizon	Vulnerability / Readiness
Policy	Major	Likely	Medium-term (2031-2040)	Moderate – High
Legal	Moderate	Likely	Medium-term (2031-2040)	Moderate
Market & Technology	Major	Likely	Medium-term (2031-2040)	Moderate – High
Energy Source	Prosperous	Likely	Medium-term (2031-2040)	Moderate – High
Customer Market	Moderate	Possible	Medium-term (2031-2040)	Moderate
NDCs				
Risk / Opportunity	Impact	Likelihood	Speed of Onset / Time Horizon	Vulnerability
Policy	Minor	Unlikely	Short-term (up to 2030)	Low
Legal	Minor	Unlikely	Short-term (up to 2030)	Low
Market & Technology	Minor	Unlikely	Short-term (up to 2030)	Low – Moderate
Energy Source	Major	Almost Certain	Short-term (up to 2030)	High
Customer Market	Major	Likely	Short-term (up to 2030)	Moderate – High

FIGURE 5 | OPPORTUNITY HEAT MAP SUMMARY

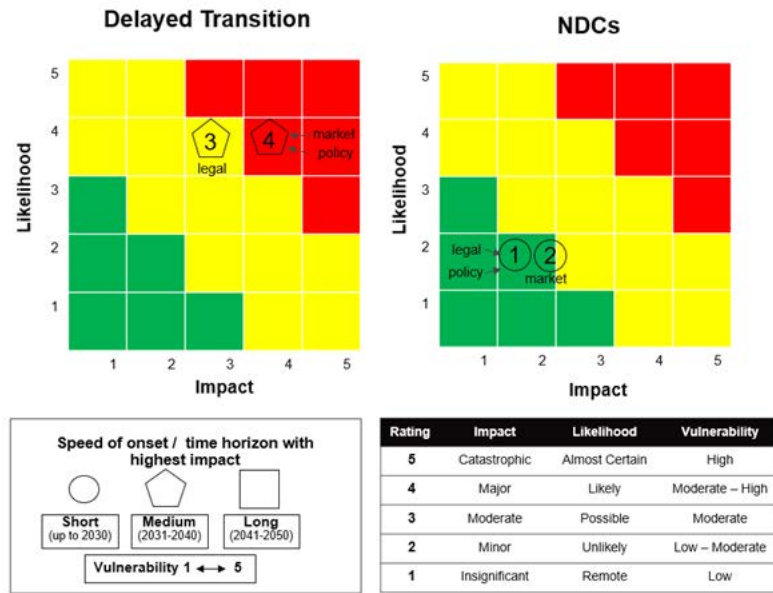
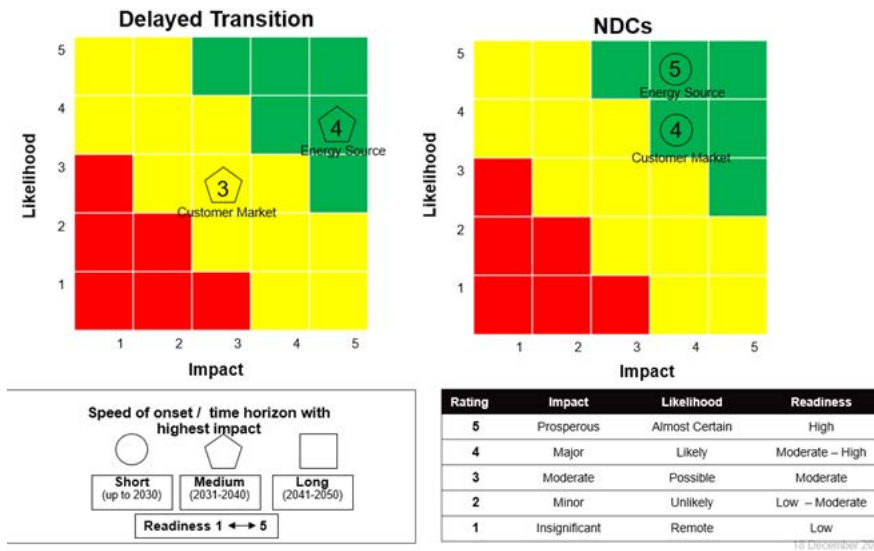
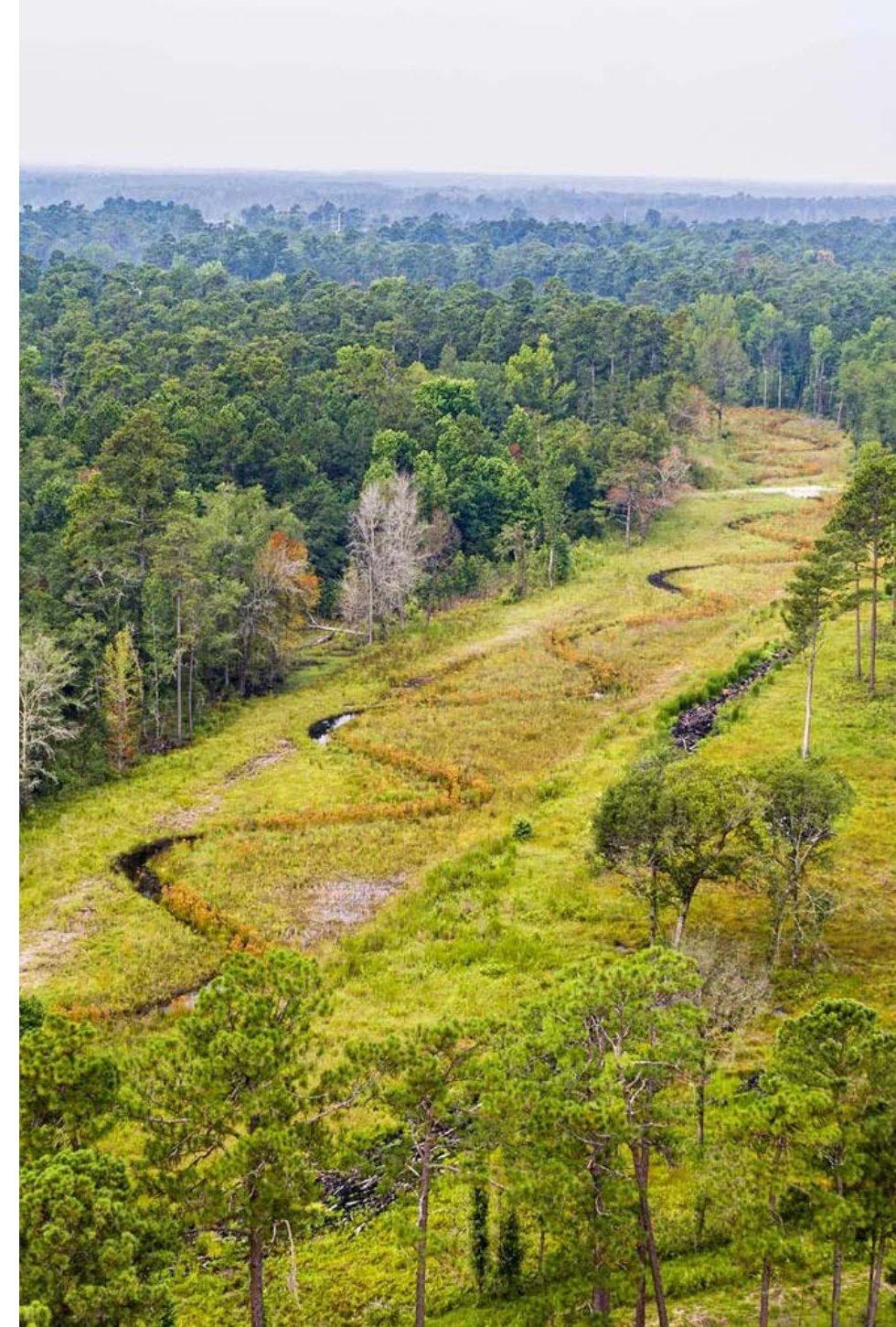


FIGURE 4 | RISK HEAT MAP SUMMARY



When comparing the Delayed Transition and NDCs scenario, the NDCs scenario lives within the Hot House world dimension while Delayed Transition lives within the Disorderly dimension. In a Hot House world, “scenarios assume that some climate policies are implemented in some jurisdictions, but global efforts are insufficient to halt significant global warming. The scenarios result in severe physical risk, including irreversible impacts like sea-level rise. In a Disorderly world, scenarios explore higher transition risk due to delayed or divergent policies across countries and sectors. For example, carbon prices would have to increase abruptly after a delay.”⁶ Within the Hot House dimension and NDCs scenario, the company will not experience significant transition risk effects but instead may face substantial physical risks and climate-change impact associated with global warming of 3°C or more. This explains why the NDC’s risk matrices show lower transition risk and opportunity impacts and likelihoods when compared to the Disorderly Transition risk matrices.

⁶ <https://www.ngfs.net/ngfs-scenarios-portal/>





RISKS & OPPORTUNITIES

We conducted a transition scenario analysis to identify and assess climate-related risk and opportunities that have a substantive financial and/or strategic impact on our business. This section aims to provide additional insight into the prioritized transition risks and opportunities we identified and outline our process for addressing climate-related risks and maximizing climate-related opportunities.

In the context of climate risk, risk preparedness, risk management, and risk mitigation represent distinct but interconnected approaches to address the challenges posed by climate change. Risk preparedness involves understanding the potential impacts of climate-related events and developing strategies and contingency plans to respond effectively when such events occur, with emphasis on readiness and resilience. On the other hand, risk management encompasses a broader and ongoing process that identifies, assesses, and prioritizes climate risks, followed by implementing measures to reduce these risks. It includes risk preparedness and mitigation but extends to continuously monitoring and adapting strategies as climate risks evolve. Lastly, risk mitigation focuses explicitly on actions taken to plan for climate-related events and minimize the severity of their adverse effects. It involves initiatives such as reducing GHG emissions, fortifying infrastructure against extreme weather, or diversifying supply chains to mitigate climate-related vulnerabilities. While risk preparedness enables readiness, risk management encompasses a comprehensive strategy and risk mitigation focuses on direct actions to address climate risks.

Our company needs to be prepared for the risks a country-wide transportation decarbonization rule would have on operations; however, our climate risk assessment highlighted many existing mitigating factors that will reduce the severity of the risk impacts. As a result, we are integrating these climate risks and their associated mitigating activities

into relevant ERM risk categories, which embeds climate risk into our strategy (preparedness) holistically, our risk management function, and our risk mitigating actions. As we expand the breadth of these analyses, we will continue to evaluate the financial feasibility of more aggressive decarbonization goals and the capital investments necessary to stand by our commitment to reduce our impact on the climate.

PROCESS FOR IDENTIFYING CLIMATE-RELATED RISKS AND OPPORTUNITIES (ELEMENT 6)

We initiated a robust engagement process involving diverse organizational stakeholders, ensuring representation from various business units. The collaborative effort aimed to comprehensively assess the potential impact of climate-related risks, evaluate the organization's vulnerability to these risks, and establish the organization's appetite for climate-related risks. This collective effort identified a list of transition risks with both high impact and high vulnerability, laying the foundation for a rigorous scenario analysis to assess their potential implications and develop strategic responses.

Each risk and opportunity type were analyzed by identifying specific category risks and opportunities and assessing the potential impacts on the company (e.g., reviewing relevant policies and fuel technologies). The vulnerability was determined by NS' existing mitigation strategies and appetite for risks, resulting in enhanced management opportunities.

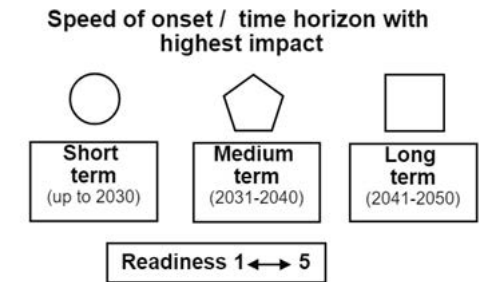
The Risk & Opportunity Rating Assessment Chart in Table 6 contains the risk assessment criteria and different rating levels that can be assigned to individual risk types. Each risk and opportunity receive a rating based on the magnitude of impact for the company, the likelihood that the risk impact will occur with the assumptions of the climate scenario, and the

company's vulnerability or readiness to address a risk or opportunity. The speed of onset and time horizon key in Figure 6 is used to explain the expected speed of onset or time horizon; it is assumed that the risk will occur given the assumptions of the climate scenarios.

TABLE 6 | RISK & OPPORTUNITY RATING ASSESSMENT CHART

Rating	Impact	Likelihood	Vulnerability/Readiness
5	Catastrophic	Almost Certain	High
4	Major	Likely	Moderate – High
3	Moderate	Possible	Moderate
2	Minor	Unlikely	Low – Moderate
1	Insignificant	Remote	Low

FIGURE 6 | SPEED OF ONSET / TIME HORIZON KEY



CLIMATE-RELATED RISKS (ELEMENT 7)

Policy Risk

Description of Risk

Policy risks are mandates and regulations for raw/synthetic materials and/or products. More specifically, for our company, this involves the impact of mandates and regulations on locomotive transportation and the availability of locomotive technology.

Key policies such as fuel standards, emissions restriction standards, and climate disclosure rules could significantly impact our company's operations and compliance. These policies are being developed by different levels of government and government agencies, and the potential impact of these policies on NS spans multiple time horizons and US regions.

Approach & Evaluation

We identified our priority policy risks and analyzed the potential impacts on NS, which involved analyzing proposed climate policies by scenario and reviewing key U.S. state climate policies relevant to the transport sector (e.g., CARB in-use locomotive regulation). Our existing risk mitigation strategies were assessed by examining internal and external resources dedicated to policy research and government affairs to determine where we could enhance our risk management. The policy risk was then rated by scenario based on impact, likelihood, vulnerability, and speed of onset. Six key policies were used to evaluate this risk type:

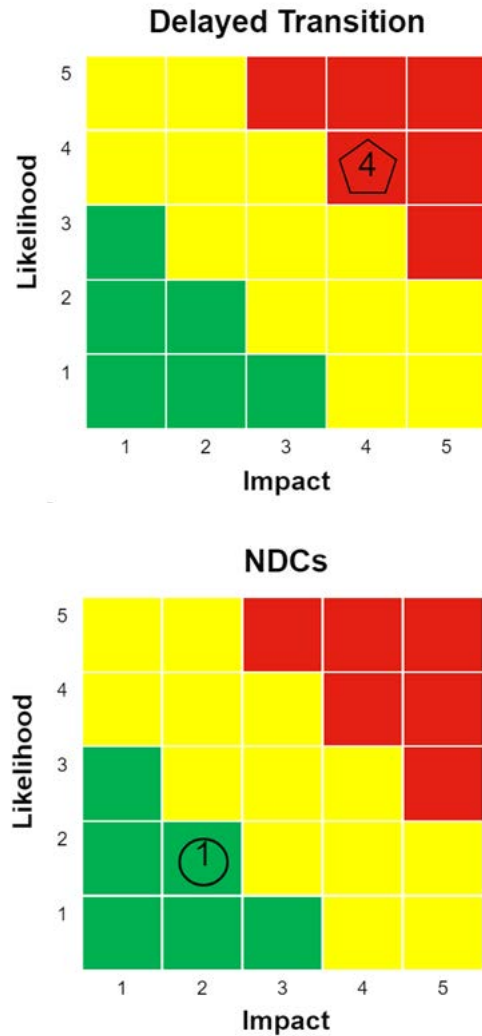
TABLE 7 | KEY CLIMATE POLICIES

Key Policy Type	Policy	Policy Summary	Time Horizon & Geographies
Fuel standards	<u>EPA Renewable Fuel Standard (RFS)</u>	The rule will establish required RFS volumes and % standards for 2023, 2024, and 2025. It also would allow parties to register with the EPA and generate eRINs* produced from qualifying renewable biomass used as transportation fuel.	Short and Mid-term: Federal
Emissions restriction standards	<u>2023 CARB In-Use Locomotive Regulation**</u>	The rule will ban locomotive engines > 23 years old by 2030 and increase the use of zero-emissions technology to transport freight from ports and throughout railyards. It would also ban CA locomotives from idling longer than 30 minutes if equipped with an automatic shutoff.	Short-term: West Coast Mid-term: Northeast Long-term: Federal
Emissions restriction standards	<u>EPA GHG Emissions Standards for Heavy-Duty Vehicles</u>	EPA is proposing to revise regulations addressing preemption of state regulation of locomotives. If approved, the EPA will likely have more control over locomotive emissions with an increase in renewable fuel demand by transportation sector at large.	Short and Mid-term: Federal
Emissions restriction standards	<u>California Low Carbon Fuel Standard (LCFS)</u>	The Low Carbon Fuel Standard (LCFS) Program requires a reduction in the carbon intensity of transportation fuels that are sold, supplied, or offered for sale in the state of California through 2030.	Short and Mid-term: West Coast (CA, OR, WA)
Climate disclosure rules	<u>SEC Climate Change Disclosure Proposed Rules</u>	The SEC's proposed climate change disclosure rules are intended to enhance and standardize climate-related disclosures to address related investor needs at the federal level.	Short, Mid, and Long-term: Federal
Climate disclosure rules	<u>Federal Supplier Climate Proposed Rule</u>	The Federal Supplier Climate Risks and Resilience Proposed Rule would require major Federal contractors to publicly disclose their greenhouse gas emissions and climate-related financial risks and set science-based emissions reduction targets.	Short, Mid, and Long-term: Federal

* One RIN is equivalent to one ethanol-equivalent gallon of renewable fuel.
 ** While not directly applicable to NS since NS doesn't operate in CA, the CARB rule could be used as a model in other US geographies.

Policy Risks – Explanation of Results & Potential Impacts by Scenario					
Delayed Transition					
Context	Impact	Likelihood	Timescale	Vulnerability	ERM Mapping
<p>This scenario assumes a high variation in regional policy and delayed policy start. Disorderly Delayed Transition assumes that policy uncertainty leads to a higher investment premium that lasts for two years, 2030-2031.</p>	<p>Major – a sudden increase in demand for low-emission high efficiency transportation in 2030 could result in an increased investment premium for compliant locomotives. Due to the nature of fleet replacement lifecycle and limited production capacity, NS could accrue substantial fines to continue operations and considerable losses associated with ROI-C for locomotives replaced before 25-year lifecycle. This would be likened to high annual penalties to railroads associated with CARB-like policies for additional operational territories.</p>	Likely	Medium term (2031-2040)	<p>Moderate-High – the risk is adequately managed through current mitigating factors; however, potential impacts that consider existing mitigating factors would still be major.</p> <p>Existing Mitigating Activities –</p> <ul style="list-style-type: none"> Fuel Efficiencies/Emissions project Emissions reduction intensity target Fleet modernizations 	<p>Operations –</p> <ul style="list-style-type: none"> Equipment functionality Asset availability Service planning Purchasing <p>Compliance –</p> <ul style="list-style-type: none"> Regulatory Change Regulatory Compliance Regulatory Reporting
Nationally Determined Contributions (NDCs)					
Context	Impact & Likelihood	Likelihood	Timescale	Vulnerability	ERM Mapping
<p>This scenario focuses on decarbonization of the energy sector and passenger transportation. As a result, existing mandates stay within a steady state with a push for decarbonization where possible.</p>	<p>Minor – the current state scenario could result in minor impacts to NS operations and cashflow statements. NDC push for decarbonization in the transportation sector could provide NS access to new markets.</p>	Unlikely	Short term (up to 2030)	<p>Low – the risk is adequately managed and financial consequences associated with regulatory compliance would be negligible.</p> <p>Existing Mitigating Activities –</p> <ul style="list-style-type: none"> Fuel Efficiencies/Emissions project Emissions reduction intensity target Fleet modernizations 	<p>Operations –</p> <ul style="list-style-type: none"> Infrastructure functionality Asset availability Railway inoperability Demand resource planning <p>Compliance –</p> <ul style="list-style-type: none"> Regulatory Change Regulatory Compliance Regulatory Reporting

FIGURE 7 | POLICY RISK MATRIX - ILLUSTRATES THE LIKELIHOOD AND IMPACT ASSOCIATED WITH POLICY RISKS IN BOTH A DELAYED TRANSITION AND NDCS SCENARIO



Conclusion

Multiple climate-related policies could impact NS operations and compliance, and the magnitude of impact and likelihood varies based on the scenario applied. The potential financial impacts associated with policy risks may include,

- Write-offs or early retirement of existing assets – Decreased asset value or asset useful life leading to write-offs, asset impairment, or early retirement of existing assets
- Compliance costs
- Increased capital expenditures
- Increased indirect (operating) costs
- Passing fuel costs to customers and carbon price fluctuations could affect market competitiveness

In a Delayed Transition world, the company could face increased investment premiums, substantial fines, and losses associated with the return on investment for locomotives. In contrast, in an NDC world, we could experience a current state scenario resulting in minor operations and cashflow statement impacts, and the push for transportation sector decarbonization could provide access to new markets.



Legal Risk

Description of Risk

Legal risks are associated with increased climate-related legal disputes and/or violations and ESG disclosure requirements that an entity may face. Federal climate disclosure rules such as the SEC’s proposed rule on the Enhancement and Standardization of Climate-Related Disclosures for Investors⁷ and the Federal Supplier Climate Risks and Resilience Proposed Rule⁸ may significantly impact our company’s regulatory compliance and strategy and progress toward ESG targets.

Approach & Evaluation

We identified our priority legal risks and analyzed the potential impacts on NS, which involved analyzing the existing climate-related regulatory landscape, identifying the implications of current and emerging climate disclosure rules to NS, and assessing NS’ ESG ratings, rankings, and any legal disputes. This led to evaluating our preparedness to respond to the proposed SEC climate disclosure rule and assessing the high-level qualitative financial impacts on us and our vulnerability. We considered our existing risk mitigation strategies by examining internal and external resources to determine where to enhance our risk management. The legal risk was then rated by scenario based on impact, likelihood, vulnerability, and speed of onset.

⁷ <https://www.sec.gov/files/rules/proposed/2022/33-11042.pdf>

⁸ <https://www.sustainability.gov/federalsustainabilityplan/fed-supplier-rule.html>

Climate Disclosure Rule	Description	Time Horizons & Geographies	Applicability
SEC Proposed Rule – The Enhancement and Standardization of Climate-Related Disclosures for Investors	Intended to enhance and standardize climate-related disclosures to address related investor needs at the federal level. Includes financial expenditure and impact metrics, and non-financial disclosure requirements in alignment with TCFD pillars (Governance, Risks & Opportunities, Risk Management, and Metrics & Targets).	Short, Medium, and Long-term Federal	Reporting of climate-related financial impact and expenditure metrics, subject to external audit and required as footnotes to financial statements. Reporting of scope 1 and 2 along with material scope 3 emissions; climate-related risks; risk management processes; targets & goals; and governance & oversight of climate-related risks. Required for inclusion in a new 10K section.
Council on Environmental Quality – The Federal Supplier Climate Risks and Resilience Proposed Rule	Mobilize the US government’s procurement towards climate action. It would require major Federal contractors to publicly disclose their GHG emissions and climate-related financial risks and set science-based emissions reduction targets.	Short, Medium, and Long-term Federal	Major Contractors, >\$50M <ul style="list-style-type: none"> • Scope 1, Scope 2, and material Scope 3 emissions reporting aligned with the GHG Protocol • Climate Risks assessment aligned with TCFD emissions reduction target validated by SBTi Significant Contractors, >\$7.5M-\$50M – Scope 1 and 2 reporting aligned with the GHG Protocol Other Contractors, <\$7.5M – Not applicable

CLIMATE-RELATED DISCLOSURE – SEC PROPOSED RULE

TABLE 8 | SEC READINESS ANALYSIS

Category	Financial Metrics	GHG Emissions	Risk and Opportunities	Risk Management	Goals and Target	Governance
Details of the proposed SEC rule	Climate-related financial impact* metrics if amount exceeds 1% of the related line item	Scope 1 and 2 by each GHG and intensity emissions	How climate-related risks have or are likely to have a material impact on the business and its financial statement	Processes for detecting and managing climate-related risks	Scope, time horizon, interim targets	Board member(s) or board committee(s) responsibility
	Climate-related expenditure metrics if amount exceeds 1% of the related line item	Scope 3 (if material or if registrant has established a reduction target or goal that includes Scope 3)	How climate-related risks have affected or are likely to affect strategy, business model, and outlook		Plans to achieve targets	Board member expertise
	Discussion of the impact on financial estimates and assumptions in the financial statements	Scope 1 and Scope 2 subject to assurance	Disclosure of scenario analysis if performed	Integration into broader risk management program	Yearly update of progress	Processes undertaken by the board or committee(s) to discuss climate-related risks
	Impact and expenditure metrics subject to assurance	Disclosure of boundary, methodology, and estimation approach	Disclosure on opportunities is permitted but not required		Offsets or RECs if used	
				Internal price on carbon if used		

■ Reasonably prepared
 ■ Moderately prepared
 ■ In progress

TABLE 9 | SEC READINESS EVALUATION

Financial Metrics	GHG Emissions	Risk and Opportunities	Risk Management	Goals and Target	Governance
<ul style="list-style-type: none"> • NS has partially identified climate-related financial impacts and expenditures through physical risk planning and documentation. • To satisfy the SEC’s proposed financial metric disclosures, NS needs to incorporate a full accounting of material climate-related impacts and expenditures (>1% of a line item). • NS will also need to include a discussion on any climate-related financial impacts in annual filings. 	Complete	<ul style="list-style-type: none"> • To be completed once the CTP is finalized. • NS needs financial analyses of physical and material transition risks. • Strategy and business model modifications due to these analyses will come from the transition plan. 	<ul style="list-style-type: none"> • To be completed once the CTP is finalized. • While NS has completed the process of detecting climate-related risks, NS needs to implement management methods for material climate-related risks. • Additionally, NS will need to map material risks to ERM categories. 	Complete	<ul style="list-style-type: none"> • A dedicated board member or board committee has been identified as responsible for climate risk. • 3 of 14 board members have relevant climate related experience and expertise. Future goal to improve board member expertise in climate-related issues. • Board responsibility for climate related risks & opportunities will continue to evolve.

■ Reasonably prepared
 ■ Moderately prepared
 ■ In progress

NS ESG Ratings & Rankings

ESG-related assessment platforms (raters and rankers) are expected to increase their scrutiny of corporate data and will demand for publicly reported companies to increase their levels of data transparency. A review of these rater and ranker evaluations finds,

- MSCI evaluations indicate average management of ESG issues that could impact NS financially.
- MSCI notes that NS’ emission goals are misaligned, contributing to a 2-3.2°C warming.
- Sustainalytics notes NS is at medium risk for ESG risks.

LEGAL RISKS

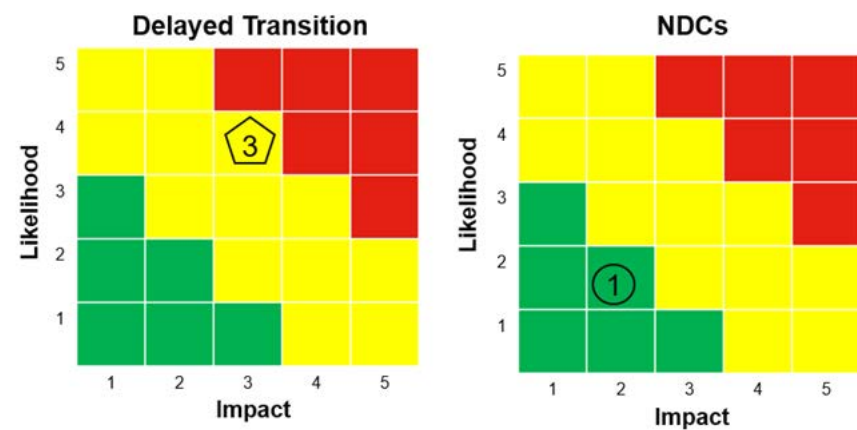
As the negative effects of climate change become more apparent globally, stakeholders may view these effects as material to their financial and non-financial interests. Climate-related legal disputes are anticipated to continue to rise in response to material impacts on these interests, whether they are

deliberate or not. To monitor, enforce, and settle climate-related disputes, expect a more pronounced shift from disclosure to activism and regulation as key time horizons for the energy transition approach.

Legal Risks – Explanation of Results & Potential Impacts by Scenario					
Delayed Transition					
Context	Impact	Likelihood	Timescale	Vulnerability	ERM Mapping
Disorderly Delayed Transition assumes that policy uncertainty leads to a higher investment premium that lasts for two years, 2030-2031. Current regulations such as the proposed SEC climate disclosure rule may increase in rigor and transparency, resulting in higher disclosure risks. In parallel with Federal ESG Disclosure requirements, raters and rankers may require leaders to increase transparency and demonstrate leadership in annual reports. Likewise, insurance premiums may rise for carbon intensive sectors, including transportation.	Moderate – NS currently ranks in the leadership category in various raters and rankers. However, increased disclosure requirements associated with a regulatory and market demand for ESG data may result in NS ranking lower due to emission intensity and sustainability goals.	Likely	Medium term (2031-2040)	<p>Moderate – current readiness for the proposed SEC climate disclosure rule is moderate due to maturity of climate-related governance at NS. Raters and rankers may increase leadership criteria, which may push NS out of leadership. Additionally, an increase in shareholder expectations may result in more dispute momentum that NS will have to react to unless proactive measures are implemented.</p> <p>Existing Mitigating Activities –</p> <ul style="list-style-type: none"> Proactively scrutinizing ESG reporting and regulatory developments – involving the legal team and the ESG Council in reviews of ESG disclosure. Incorporating external assurance and internal audit throughout the GHG inventory processes to improve transparency and efficacy. Actively monitoring ESG-related financial impacts associated with brand reputation risk and potentially negative shareholder reactions. 	<p>Compliance –</p> <ul style="list-style-type: none"> Regulatory Change Regulatory Compliance Regulatory Reporting <p>Strategic –</p> <ul style="list-style-type: none"> ESG Target and Progress ESG Disclosure Requirements <p>Financial –</p> <ul style="list-style-type: none"> Insurance

Nationally Determined Contributions (NDCs)					
Context	Impact	Likelihood	Timescale	Vulnerability	ERM Mapping
<p>This scenario focuses on decarbonization of the energy sector and passenger transportation. As a result, existing mandates stay within a steady state with a push for decarbonization where possible. Nevertheless, the SEC Rule will be in effect with less rigor than a Delayed Transition Scenario.</p>	<p>Minor – the current state scenario could result in minor impacts to NS operations and cashflow statements. US NDC push for decarbonization in the transportation sector could apply more pressure to the rigor associated with NS’ decarbonization targets.</p>	<p>Unlikely</p>	<p>Short term (up to 2030)</p>	<p>Low – current management methods adequately address the requirements in the proposed SEC climate disclosure rule, resulting in a reduced vulnerability. It is important to note, NDC scenario could result in an opportunity for NS to have an increase in demand for services and access to new markets.</p> <p>Existing Mitigating Activities –</p> <ul style="list-style-type: none"> Proactively scrutinizing ESG reporting and regulatory developments – involving the legal team and the ESG Council in reviews of ESG disclosure. Incorporating external assurance and internal audit throughout the GHG inventory processes to improve transparency and efficacy. Actively monitoring ESG-related financial impacts associated with brand reputation risk and potentially negative shareholder reactions. 	<p>Compliance – Regulatory Compliance</p> <p>Strategic – ESG Target and Progress</p>

FIGURE 8 | LEGAL RISK MATRIX - ILLUSTRATES THE LIKELIHOOD AND IMPACT ASSOCIATED WITH POLICY RISKS IN BOTH A DELAYED TRANSITION AND NDCS SCENARIO



Conclusion

Multiple legal and regulatory climate-related disclosures could impact NS compliance, operations and strategy, and the magnitude of impact and likelihood varies based on the scenario applied. In a Delayed Transition world, the company could face higher investment premiums, higher disclosure risks, higher insurance premiums for carbon-intensive sectors, including transportation, and increased transparency and leadership expectations from raters and rankers. In contrast, in an NDC world, we could experience a current state scenario resulting in minor operations and cashflow statement impacts, and the U.S. NDC push for decarbonization in the transportation sector could apply more pressure

to the rigor associated with NS’ decarbonization targets. Potential financial impacts may include increased costs due to fines or fees associated with noncompliance and access to capital issues.

Market and Technology Risk

Description of Risk

Market and technology risks focus on the availability and viability of zero-emission locomotives and low-carbon fuels. Numerous emerging

solutions are in the development phase, and original equipment manufacturers (OEMs) are pursuing initiatives in clean locomotives or low-emission fuel technology. Emerging emission reduction fuel solutions in rail include battery electric (BEV), hydrogen fuel cell (FCEV),

biomass-based diesel (BBD), and renewable diesel (RD). BEV and FCEV technologies are zero-emission locomotives (ZEV), while BBD and RD are low-carbon fuels.

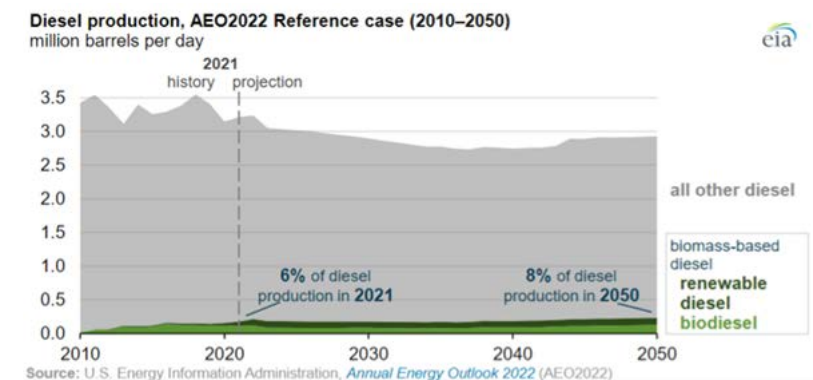
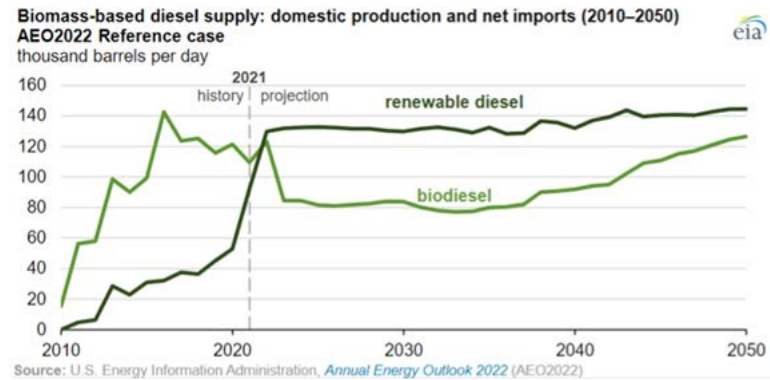
Solution	Description	Current and Projected Future Costs ⁹	Maturity & Availability	Operations Challenges
Battery Electric	A ZEV solution leveraging rechargeable batteries. Emission reductions up to 100%, depending on source of electricity (renewable or grid). Most energy efficient solution.	<p>CAPEX – Limited viable models available, comparative diesel costs unknown given only pilot retrofits underway; Anticipated to be greater CAPEX than comparable ICE locomotive .</p> <p>OPEX – Limited regional haul data available, but BEV switcher trials point to a reduction in maintenance costs and local/noise pollution compared to diesel, especially when idling.</p>	<p>Immature</p> <p>Limited supply available from OEMs with ~3 models arriving in the next 3-5 years; Charging infrastructures and grid capacity are unavailable with build-out taking >24 months</p>	<p>Inadequate range for duty cycles >350 miles</p> <p>Significant work is yet to be done in testing various terrains, temperatures, conditions, and safety before commercial volumes are available.</p>
Hydrogen Fuel Cell	Hydrogen FCEVs convert hydrogen into electricity. Various hydrogen fuel cell technologies are being considered for transportation. Least energy efficient solution on a life cycle basis from generation to consumption.	<p>CAPEX – Limited viable models available, comparative diesel costs unknown given only pilot retrofits underway; Anticipated to be greater capex than comparable ICE locomotive .</p> <p>OPEX – Limited real-world data to pinpoint impact on maintenance costs compared to diesel or BEV.</p>	<p>Immature</p> <p>No commercial deliveries available before 2030. Several retrofit models in demonstration phase.</p> <p>Refueling infrastructure and tender cars are currently unavailable with no viable deployment at scale before 2030.</p>	<p>Promises faster refueling times and longer range in line with current operations.</p> <p>Additional training on safety and maintenance procedures and fuel procurement is needed.</p>

⁹ <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/locomotive22/15dayappc.pdf>

<p>Biomass-Based Diesel</p>	<p>Engines combust a product nearly chemically identical to diesel, produced from vegetable oils, fats, and greases.</p> <p>Established technology with substantially more refueling infrastructure and maintenance history. Heavy near-term increase as fleets increasingly focused to decarbonize.</p>	<p>CAPEX – Drop-in replacement fuel, no incremental capex costs.</p> <p>OPEX – Slight price premium in some markets, but price competitive in states with tax incentives.</p>	<p>Fairly Mature</p> <p>20% blends currently the highest available use without engine modification</p> <p>Sufficient tankage distribution could increase throughput by repurposing tanks or installing onsite blending operations.</p>	<p>Reported minimal efficiency loss compared to diesel.</p> <p>Increased preventative maintenance checks required to ensure uptime, especially during idle.</p> <p>Fuel procurement must be upskilled to properly purchase and account for environmental attributes.</p>
<p>Renewable Diesel</p>	<p>Engines combust a product nearly chemically identical to diesel, produced from used cooking oils, fats, and greases.</p> <p>Drop-in solution that works with existing engines, tanks, and refueling infrastructure.</p>	<p>CAPEX – Drop-in replacement fuel, no incremental capex costs.</p> <p>OPEX – Moderate price premium relative to diesel fuel in most national markets, with more favorable economics in markets with low-carbon fuel regulations (west coast).</p>	<p>Mature</p> <p>Limited supply available with production & distribution supply chain continuing to expand.</p> <p>Sufficient tankage distribution, could increase throughput by repurposing tanks or installing onsite blending operations</p>	<p>Virtually no change in existing operations</p> <p>Best practices require improving tracking and transparency of renewable fuel volumes consumed, if running a blend of fossil/ renewable diesel</p>

SUPPLY AND DEMAND FORECASTS OF LOW-CARBON LIQUID FUELS THROUGH 2050

Per the U.S. Energy Administration graphs below, U.S. renewable diesel production capacity is forecast to almost triple in the next few years, exceeding 7 billion gallons of annual production, though remaining still a tiny overall percentage of the distillate production. This increase in volume is primarily policy-driven, with the federal Renewable Fuel Standard (RFS2) and state Low-Carbon Fuel Standard (LCFS) programs incentivizing growth. Low-carbon, liquid fuels are the most viable near-term decarbonization solution for U.S. freight rail. State and federal policy mandates constrain available supply. Given this information, we should prioritize management methods around fuel procurement and policy advocacy and engagement.



Approach & Evaluation

We identified our priority market and technology risks. We analyzed the potential impacts on NS, which involved studying the market risk associated with the availability and viability of low-carbon fuels and zero-emission propulsion. We reviewed the landscape of viable

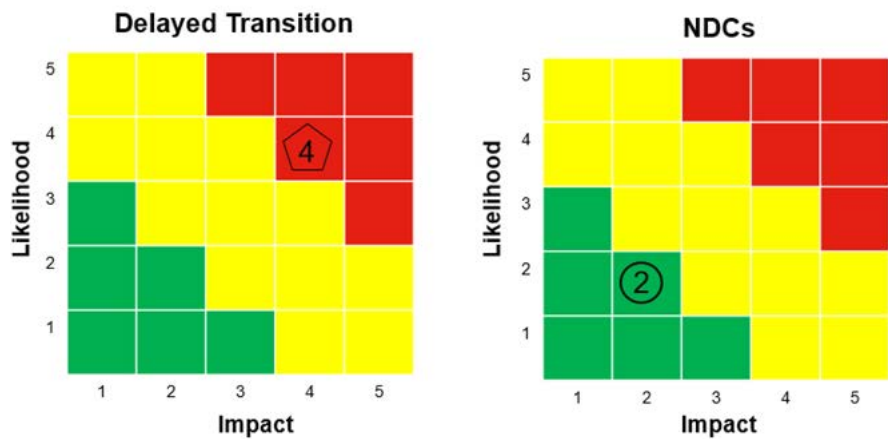
emission-reduction fuel technologies and our decarbonization strategy and alignment with available technologies. We assessed our existing risk mitigation strategies by examining internal and external resources to determine where to enhance our risk management. Market and

technology risks were rated by scenario based on impact, likelihood, vulnerability, and speed onset.

Market & Technology Risks – Explanation of Results & Potential Impacts by Scenario					
Delayed Transition					
Context	Impact	Likelihood	Timescale	Vulnerability	ERM Mapping
<p>This scenario assumes a high variation in regional policy and delayed policy start. Disorderly Delayed Transition assumes that policy uncertainty leads to a higher investment premium that lasts for two years, 2030-2031. Assumption is that suppliers could be able to provide zero-emission locomotives and there may be a significant increase in demand for low-carbon fuels. Slow to fast changes in demand for low emission technology are a higher risk in a delayed transition.</p>	<p>Major – given our current decarbonization efforts, customer and stakeholder expectations for decarbonization may be moderate to major depending on if transportation emissions are included in the customer’s decarbonization efforts. High likelihood of imbalanced supply and demand for low/zero carbon alternatives and traditional fossil fuels as well as price volatility given rapid increase in demand and underinvestment in production.</p>	<p>Likely</p>	<p>Medium term (2031-2040)</p>	<p>Moderate-High – current management methods may not adequately address the readiness required to comply with a sudden shift in decarbonization policy. Additional risk management and monitoring needed relating to supplier integration within supply chain, particularly relating to energy and fuel.</p> <p>Existing Mitigating Activities –</p> <ul style="list-style-type: none"> • Modernizing more than 100 locomotives each year since 2016 • Outfitting over 90% of road locomotives with energy-management technologies • Adding distributed power systems to more locomotives • Conserving more than 2.6 million gallons of fuel annually • Expanding use of low-carbon fuel blends to lower NS carbon intensity 	<p>Operational –</p> <ul style="list-style-type: none"> • Asset Availability • Inventory Management • Purchasing <p>Strategic –</p> <ul style="list-style-type: none"> • ESG Target and Progress • Disruption <p>Compliance –</p> <ul style="list-style-type: none"> • Regulatory Change • Regulatory Compliance

Nationally Determined Contributions (NDCs)					
Context	Impact & Likelihood	Likelihood	Timescale	Vulnerability	ERM Mapping
<p>This scenario focuses on decarbonization of the energy sector and passenger transportation. As a result, existing mandates stay within a steady state with a push for decarbonization where possible.</p> <p><i>On 12/8/2023 the U.S. and Canada announce a joint effort to coordinate strategies to accelerate the rail sector's transition from diesel-powered locomotives to zero-emission technologies to ensure a net-zero rail sector by no later than 2050. Note this announcement was not included in our analyses due to timeline, however, NS mitigating activities are relevant to the management of this emerging risk.</i></p>	<p>Minor – in this scenario both supply and demand of zero-emission locomotives and low carbon fuels are driven higher by existing policies. Supply expansions and price of biofuels in NS network are dependent on subnational LCFS expansion. Zero-emission alternatives may not reach commercial scale until after 2030.</p>	<p>Unlikely (due to the current focus on passenger rail)</p>	<p>Short term (up to 2030)</p>	<p>Low-Moderate – current management methods adequately address the requirements in the NDCs with rail benefitting as a lower-carbon alternative to truck. Implementation of low carbon and zero-emissions alternatives continue based on supply availability, technology readiness and customer willingness to pay rather than policy mandates.</p> <p>Existing Mitigating Activities –</p> <ul style="list-style-type: none"> • Modernizing more than 100 locomotives each year since 2016 • Outfitting road locomotives with energy-management technologies • Adding distributed power systems to more locomotives • Conserving more than 2.6 million gallons of fuel annually • Continuing use of biofuel blends to lower NS carbon intensity 	<p>Operational –</p> <ul style="list-style-type: none"> • Physical Assets <p>Strategic –</p> <ul style="list-style-type: none"> • ESG Target and Progress • Disruptive technology

FIGURE 9 | MARKET & TECHNOLOGY RISK MATRIX



Conclusion

In a Delayed Transition world, the company could face higher investment premiums and could experience higher risk due to a slow to fast change in demand for low-emission technology. In an NDC world, the company may experience steady-state existing mandates with decarbonization where possible. This scenario could impact low-carbon fuel availability and price associated with transportation investment in decarbonization, and low demand for low-emission technology could be expected. Potential financial impacts may include,

- Capital investment for zero-emission locomotives and charging infrastructure

- Operational costs of energy, insurance, maintenance
- Increased passthrough costs to customers from increase in operational expenditures

Due to existing NS mitigating factors, this risk is partially managed but may not be mitigated. NS may need to invest in additional procurement resources, supplier collaboration/innovation, and risk monitoring to demonstrate proactive measures to secure zero-emission and low-carbon fuel suppliers.

CLIMATE RELATED OPPORTUNITIES IDENTIFIED TO HAVE A SUBSTANTIVE FINANCIAL OR STRATEGIC IMPACT ON BUSINESS- OPPORTUNITIES, POTENTIAL FINANCIAL IMPACT AND RESPONSE STRATEGY (ELEMENT 8)

Energy Source Opportunities

Description of Opportunity

Energy source opportunities include carbon market participation and cost avoidance from transitioning to low-carbon emission operations services and meeting our company’s climate targets. According to the International Energy Agency (IEA), “to meet global emission-reduction goals, countries will need to transition a major percentage of their energy generation to low emission alternatives such as wind, solar, wave, tidal, hydro, geothermal, nuclear, biofuels, and carbon capture and storage. For the fifth year, investments in renewable energy capacity have exceeded investments in fossil fuel generation. The trend toward decentralized clean energy sources, rapidly declining costs, improved storage capabilities, and subsequent global adoption of these technologies are significant. Organizations shifting their energy usage toward low emission energy sources could save on annual energy costs.”¹⁰

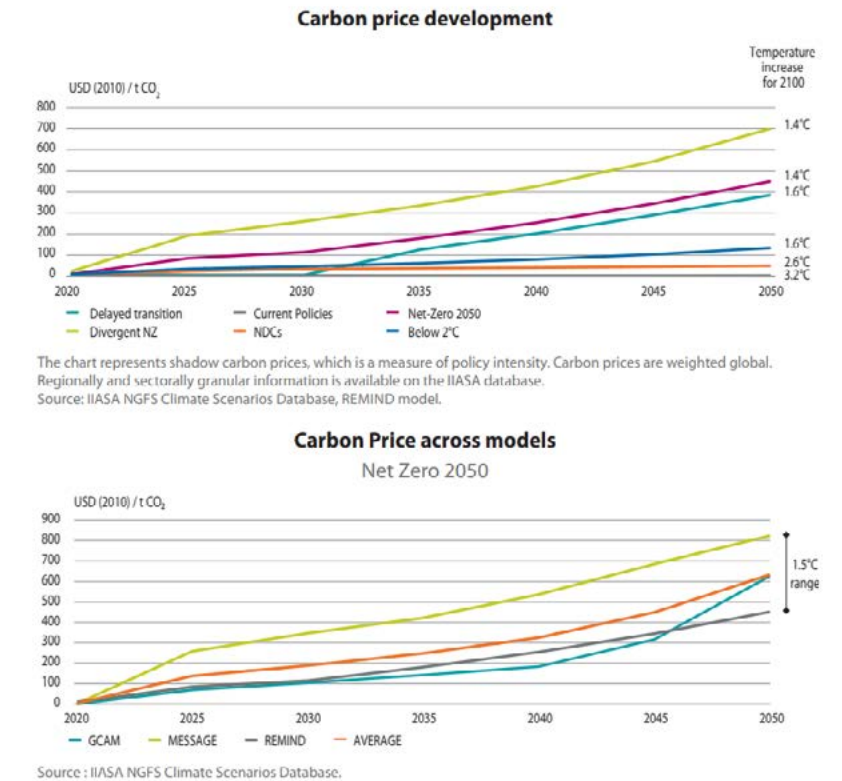
Approach & Evaluation

To better understand energy source opportunity’s impact on our business, we analyzed sector carbon prices and cost avoidance associated with our science-based target. The evaluation included analyzing NGFS data for transportation sector energy price and U.S. carbon price by scenario, identifying cost avoidance associated with our climate target and potentially implementing a carbon price—noting a shift in energy prices and avoidance of fossil fuel prices—and lastly, evaluating the unique opportunity of Carbon Dioxide Removal (CDR) projects. Our existing opportunity execution mitigation strategies were assessed by reviewing existing readiness. The energy source opportunity was then rated by scenario based on impact, likelihood, readiness, and speed of onset.

Each NGFS scenario assumes a different price on carbon informed by various socioeconomic factors occurring in each. For example, in the Carbon Price Development graph below, Divergent Net Zero demonstrates a dramatic increase in the price of carbon to reach 1.4°C. The divergent and ununiform approach to decarbonization results in high carbon prices. Delayed Transition assumes annual emissions do not decrease until 2030. Past 2030, this scenario’s carbon price development pathway parallels Divergent Net Zero, supporting a rapid acceleration of global decarbonization efforts. However, Net-Zero 2050 is an orderly scenario that results in lower carbon price points due to the uniform implementation of decarbonization targets globally to reach 1.4°C. Current Policies and NDCs and Hot House World scenarios have low carbon price implications due to the lack of decarbonization policies. While these scenarios have low transition risks, the 2.6°C and 3.2°C worlds expose high physical risk.

¹⁰ <https://assets.bbhub.io/company/sites/60/2021/10/FINAL-2017-TCFD-Report.pdf>

FIGURE 10 | NGFS SCENARIOS – SHADOW CARBON PRICES¹¹



¹¹ https://tntcat.iiasa.ac.at/SspWorkDb/download/iam_scenario_doc/SSP_Model_Documentation.pdf

☰ RISKS & OPPORTUNITIES

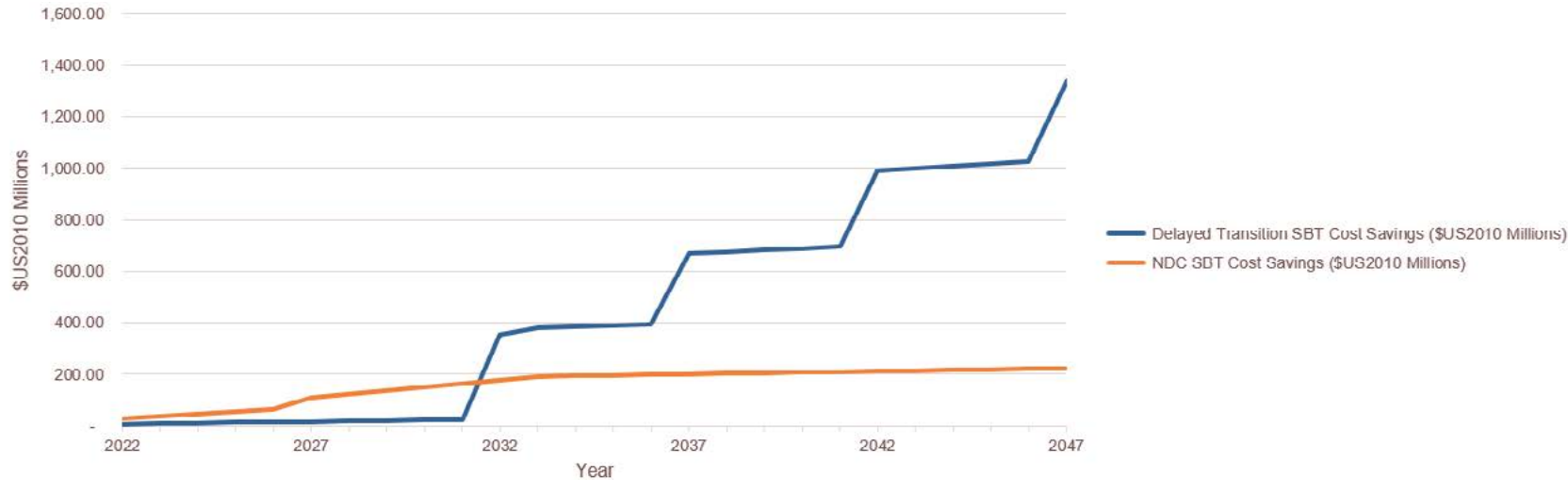
We analyzed the cost avoidance from a transition to low carbon emissions by meeting NS' GHG emission reduction targets. The assumptions applied during this analysis include,

- Achieve Scope 1-2 Emission reduction target
- To apply SBT, assumed gross ton-miles remain constant, resulting in a 2.4% decrease in YOY emissions until 2034 to reach NS' target of 42% reduction in Scope 1 and 2 GHG emission intensity by 2034

- 1% organic growth rate applied
- No grid decarbonization

The Carbon price projections are from REMIND MAgPIE Model Prices for the US for Delayed Transition and NDC scenarios and leveraged from the publicly accessible NGFS data portal. One limitation of this analysis is that it is a high-level estimation. Our science-based target is intensity-based, and so further evaluation of cost avoidance and emission reduction measures would be needed to evaluate this in more detail.

FIGURE 11 | AVOIDED PRICE OF CARBON COSTS DUE TO SCIENCE-BASED TARGET



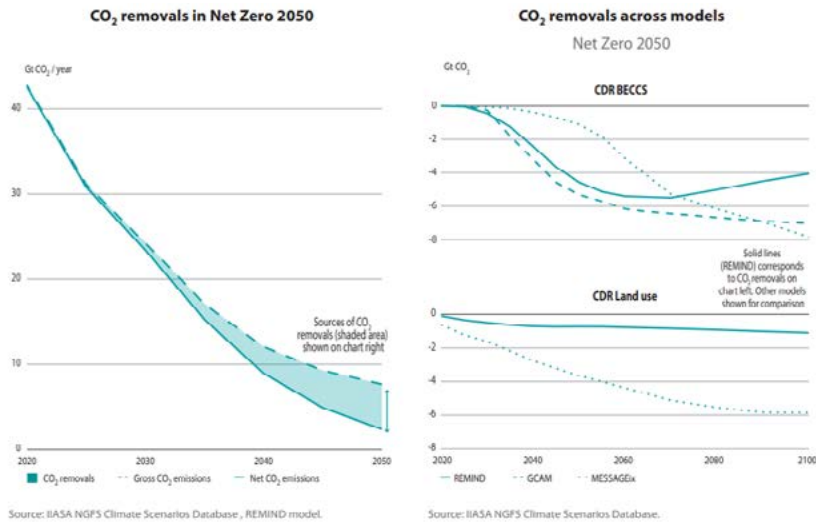
Scenario	2025		2030		2040		2050	
	Total Avoided Cost (US\$M 2010)	Carbon Price (\$/tCO2e)	Total Avoided Cost (US\$M 2010)	Carbon Price (\$/tCO2e)	Total Avoided Cost (US\$M 2010)	Carbon Price (\$/tCO2e)	Total Avoided Cost (US\$M 2010)	Carbon Price (\$/tCO2e)
Delayed Transition	8.58	19	20.15	17	675.23	407	1,338	738
NDC	36.86	80	123.31	120	205.12	122	222	122



CARBON DIOXIDE REMOVAL OPPORTUNITIES

Carbon dioxide removal (CDR) involves removing carbon from the atmosphere through increasing forest cover and soil sequestration (land use) or growing crops for bioenergy (bioenergy with carbon capture and storage, BECCs). CDR presents an opportunity for us given our Trees and Trains reforestation and carbon capture program and if the demand for carbon sequestration from such initiatives increases to enable decarbonization. This opportunity could have reputational market benefits, reduce costs to offset, and increase revenues if we decide to establish a CDR program and sell associated credits. CDR assumptions play an important role in the NGFS scenarios and models. While the NGFS scenarios assume low to medium availability of these technologies, there is a strong variance across the models shown in the CO₂ removals across models as shown in Figure 12.

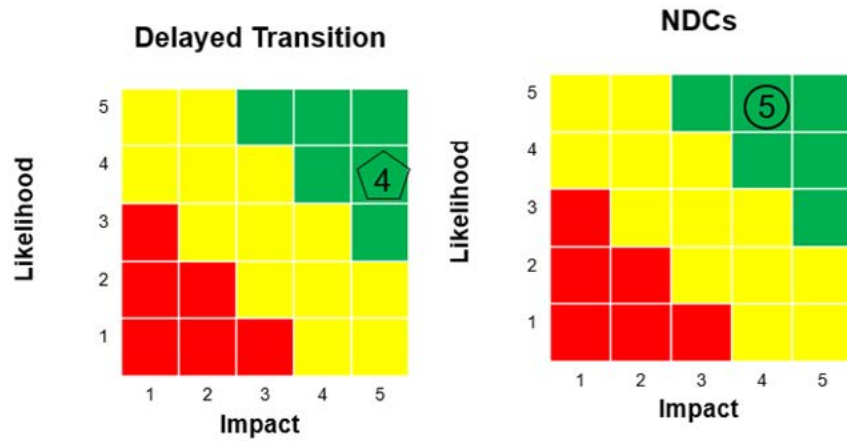
FIGURE 12 | NGFS CO₂ REMOVALS ACROSS MODELS



Energy Source Opportunity – Explanation of Results & Potential Impacts by Scenario					
Delayed Transition					
Context	Impact	Likelihood	Timescale	Readiness	ERM Mapping
<p>This scenario assumes a high variation in regional policy and delayed policy start. Disorderly Delayed Transition assumes that policy uncertainty leads to a higher investment premium that lasts for two years, 2030-2031. Low to medium use of carbon dioxide removal (CDR) technologies. Delayed carbon price with a rapid increase in 2031 as a policy response.</p>	<p>Prosperous – significant potential cost avoidance if NS meets its emission reduction targets due to potential high carbon price projections under this scenario estimated at \$20.15 million peaking at \$1,338 million in 2050.</p>	<p>Likely</p>	<p>Medium term (2031-2040)</p>	<p>Moderate-High – the cost avoidance is a high-level estimation assuming a 1% YOY organic growth rate. NS target is intensity-based, so further evaluation of cost avoidance and emission reduction measures could be needed to evaluate this in more detail. Regardless, NS is strategically positioned to increase market-share due to the nature of locomotive based transportation in a decarbonizing economy and its decarbonization target with assumed 2.4% YOY reduction until 2034 .</p> <p>Existing Mitigating Activities:</p> <ul style="list-style-type: none"> Investing in CDR with the Trees to Trains program, which could be a market differentiator in both scenarios SBT of a 42% reduction in Scope 1-2 GHG intensity by 2034 Modernizing >100 locomotives each year since 2016 Outfitting locomotives with energy-management technologies Adding distributed power systems to locomotives Identifying and eliminating hours of idling and conserving fuel Using biofuel and renewable blends Incentivizing companies to relocate along their lines with a site selection group and external stakeholder education 	<p>Strategic –</p> <ul style="list-style-type: none"> ESG Target and Progress Innovation Strategic Initiatives External Industry <p>Operational –</p> <ul style="list-style-type: none"> Service Planning Inventory Management

Nationally Determined Contributions (NDCs)					
Context	Impact & Likelihood	Likelihood	Timescale	Readiness	ERM Mapping
<p>This scenario focuses on decarbonization of the energy sector and passenger transportation. As a result, existing mandates stay within a steady state with a push for decarbonization where possible. Low to medium use of carbon dioxide removal (CDR) technologies. Moderate carbon pricing due to low to moderate policy changes.</p>	<p>Major – the avoided losses associated with a price on carbon is major. Significant potential cost avoidance if NS meets its emission reduction targets due to potential high carbon price projections under this scenario - estimated at \$123.31 million in 2030 and \$222.4 million in 2050.</p>	<p>Almost Certain</p>	<p>Short term (up to 2030)</p>	<p>High – the cost avoidance is a high-level estimation assuming a 1% YOY organic growth rate. NS target is intensity based, so further evaluation of cost avoidance and emission reduction measures would be needed to evaluate this in more detail. NS is strategically positioned to increase market-share due to the nature of locomotive based transportation in a decarbonizing economy and its decarbonization target.</p> <p>Existing Mitigating Activities:</p> <ul style="list-style-type: none"> Investing in CDR with the Trees to Trains program, which would be a market differentiator in both scenarios. SBT of a 42% reduction in Scope 1-2 GHG intensity by 2034 Modernizing >100 locomotives each year since 2016 Outfitting locomotives with energy-management technologies Adding distributed power systems to locomotives Identifying and eliminating hours of idling and conserving fuel Using biofuel blends Incentivizing companies to relocate along their lines with a site selection group and external stakeholder education 	<p>Strategic –</p> <ul style="list-style-type: none"> ESG Target and Progress

FIGURE 13 | ENERGY SOURCE OPPORTUNITY RISK MATRIX



Conclusion

Energy source opportunities exist for our company, and the benefits we may experience from these opportunities are contingent upon the presence and strength of decarbonization policies, carbon pricing, and carbon removal initiatives. This opportunity may impact our strategic approach toward progress on ESG targets. Potential financial impacts include,

- Reduced operating costs
- Reduced exposure to fossil fuel price fluctuations
- Reduced exposure to GHG emissions; therefore, less sensitivity to changes in the cost of carbon
- Increased access to capital from investors favoring low-emission producers

In a Delayed Transition world, the company could face higher investment premiums and experience delayed carbon prices with a rapid increase in 2031 as a policy response. In an NDC world, the company could avoid losses associated with carbon and may experience significant cost avoidance if it meets its emission

reduction targets due to potential high carbon price projections under this scenario.

While NS will benefit from existing emission reduction activities, the potential financial implications from a possible carbon price under the different climate scenarios could lead to operational costs (offsetting total footprint each year). In addition, future energy price scenarios indicate higher costs for fossil/liquid fuels than for low-emission alternatives.

Customer Market Opportunities

Description of Opportunity

Customer market opportunities are the strategic advantage over competitors to access new markets and the anticipated use/prioritization of public-sector incentives. This opportunity aims to understand our current and future intentions for intermodal and low-carbon transportation services. It should be noted that “organizations that pro-actively seek opportunities in new markets or types of assets may be able to diversify their activities and better position themselves for the transition to a lower-carbon economy.”¹²

Approach & Evaluation

We analyzed our existing opportunity execution strategy by reviewing our public-private partnership (P3) leadership team projects and our carbon calculator for shippers. We assessed our current opportunity execution strategies by examining existing readiness. The energy source opportunity was then rated by scenario based on impact, likelihood, readiness, and speed of onset.

Our company has a unique opportunity to incentivize modal shifts in customers using our Carbon Abatement Program. The methodology is based on modal shift and carbon emissions avoidance, and the tool

presents an incentive to accelerate customer transitions to the low carbon economy. As the opportunity is entirely free to the shipper, we embrace customer behavior change in a way that lasts. We serve as carbon developers, which de-risks the engagement with the shipper. NS and the shipper share the sale of credits, which provides a financial incentive.

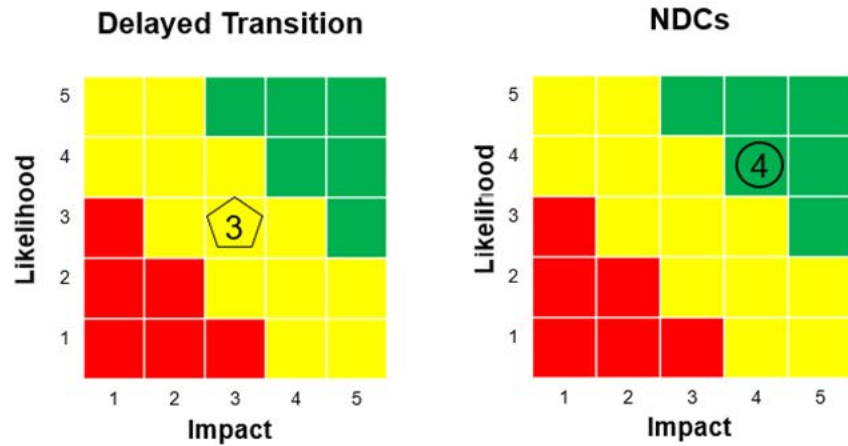
NS is a leader in P3 with a committed team ensuring project and financial success for all parties involved. The P3 leadership team’s commitment to management and the engagement of a cross-section of stakeholders.

¹² <https://assets.bbhub.io/company/sites/60/2021/10/FINAL-2017-TCFD-Report.pdf>



Customer Market Opportunities – Explanation of Results & Potential Impacts by Scenario					
Delayed Transition					
Context	Impact	Likelihood	Timescale	Readiness	ERM Mapping
<p>This scenario assumes a high variation in regional policy and delayed policy start. Disorderly Delayed Transition assumes that policy uncertainty leads to a higher investment premium that lasts for two years, 2030-2031.</p>	<p>Moderate – the sudden increase in decarbonization needs in 2030-2031 may result in demand increases for NS services as well as an increase in availability for P3 projects. Rail transport is three to seven times more efficient than trucking, potentially resulting in a dramatic shift in transportation needs to the rail sector. However, investment in zero-emission technology up to 2030 may be essential to replace oil and gas dependency in the current fleet and avoid surge pricing of zero-emission technology.</p>	<p>Possible</p>	<p>Medium term (2031-2040)</p>	<p>Moderate – NS is a leader in P3 with a committed team ensuring project and financial success for all parties involved. NS is well positioned due to its strong P3 project management team and stakeholder engagement. However, a delayed transition could require NS to invest in zero-emission technology before 2030.</p> <p>Existing Mitigating Activities:</p> <ul style="list-style-type: none"> • NS has a history of P3 success • NS carbon calculator • Carbon credits 	<p>Operational –</p> <ul style="list-style-type: none"> • Service Planning • Inventory Management <p>Strategic –</p> <ul style="list-style-type: none"> • Disruption • External Competitor

FIGURE 14 | CUSTOMER MARKET OPPORTUNITY RISK MATRIX



Conclusion

Customer market opportunities exist for our company, which may impact our operational service resiliency and strategic disruptive technology. Potential financial impacts may include increased revenue through demand for lower emissions products and services, competitive position to reflect shifting consumer preferences, and increased diversification of financial assets (e.g., expanded infrastructure).

In a Delayed Transition world, the company could experience demand increases for company services and an increase in availability for P3 projects due to a sudden rise in decarbonization needs in 2030-2031. Because there may be a dramatic shift toward lower carbon modes of transportation and rail transport is three to seven times more efficient than trucks, there may be more demand for company services. However, investment in zero-emission technology up to 2030 may be essential to replace oil and gas dependency in the current fleet and avoid surge pricing of zero-emission technology. In an NDC world,

a steady demand for decarbonization may increase demand for NS services due to the 50-52% reductions required by NDC commitment that could motivate customer modal shift to rail; however, the NDC’s decarbonization efforts currently focus on passenger transportation and not commercial transportation. Additionally, any commercial transportation decarbonization funding may be focused on aviation, resulting in business as usual in the availability of P3 but an increase in investment in the rail sector.

A delayed transition could require NS to invest in zero-emission technology before 2030 and reduce dependence on fossil fuels to prepare for a rapid energy transition and demand increases anticipated in 2030. While rail could be deemed the most appropriate mode of transportation in an urgent need to decarbonize, rail is still a significant customer for and dependent on fossil fuels for propulsion.





FINANCIAL PLANNING (Element 11)

Integrating climate-related risks and opportunities into our financial planning is a crucial part of our climate commitment, and it may be beneficial in a 1.5°C world. We have started to identify and analyze how climate-related risks and opportunities could directly impact the financial performance of our business as our customers' preferences shift to low-carbon services. We anticipate further aligning our financial planning with our climate transition plan, more specifically how it could impact our CAPEX and/or OPEX as we realize our ambitions.

MAJOR FINANCIAL CHANGES TO THE BUSINESS

Our rail transport emits, on average, 75% less GHG emissions per ton-mile than trucks. Our network of interconnected rail lines and intermodal facilities allows shippers to easily access our transportation services for an efficient and environmentally friendly way to haul their freight. We communicate to our customers the climate change and transportation efficiency benefits of moving goods via train versus truck.

As customers pursue less carbon-intensive modes of transporting freight, our rail services provide an opportunity for customers to reduce their supply chain emissions. A recent survey indicates that 15% of shippers may convert some business from truck to rail because of the increased stakeholder focus on ESG. Over 25% of our largest customers are committed to SBTi, and this number continues to increase.

Overall, railroads have a vital role in the transition to a low-carbon economy, and we could experience positive financial impacts for our business as the market shifts to lower-emitting and more efficient modes of transportation – resulting in increased revenue.

OUR BUSINESS MODEL IN A LOW-CARBON ECONOMY

We recognize the need to address climate-related risks and opportunities as customers seek low-carbon transportation services and improvements to supply and/or value chains. We have seen many opportunities to shift our business model to offer low-carbon solutions and, thus, shifted our short- and long-term actions to align with our low-carbon ambition.

In the short term, we aim to offer our customers more low-carbon solutions and services while continuously implementing innovative technologies to improve efficiency. We launched a new operating plan that overhauls the way the railroad runs trains across the network, which results in fewer, heavier trains, reducing circuitry and train miles, reducing car handlings, and increasing network velocity – all contributing to lower carbon emissions per ton-mile. Because railroad transport service is three to seven times more fuel efficient and emits on average 75% less GHG emissions than highway transport, we have made a substantial strategic decision to underscore intermodal freight haul in future planning and partner with trucking customers to use train service for long haul and truck service for local delivery. A typical intermodal freight train can carry the freight of hundreds of trucks and, in turn, take congestion off roads and reduce carbon emissions. Any carbon restrictive regulation could cause potential customers to shift business to rail — creating advantages for us. Recognizing the potential of these efficiencies, we have received an approved science-based target (SBT) for reducing GHG emissions into the future.

Our long-term vision involves our commitment to investing in research and development to prosper further safety, innovation, operating efficiency, and the opportunity to reduce the industry's carbon contributions by developing innovative technologies that can mitigate GHG emissions from locomotive operations.



LOW CARBON PRODUCTS OR SERVICES (ELEMENT 12)

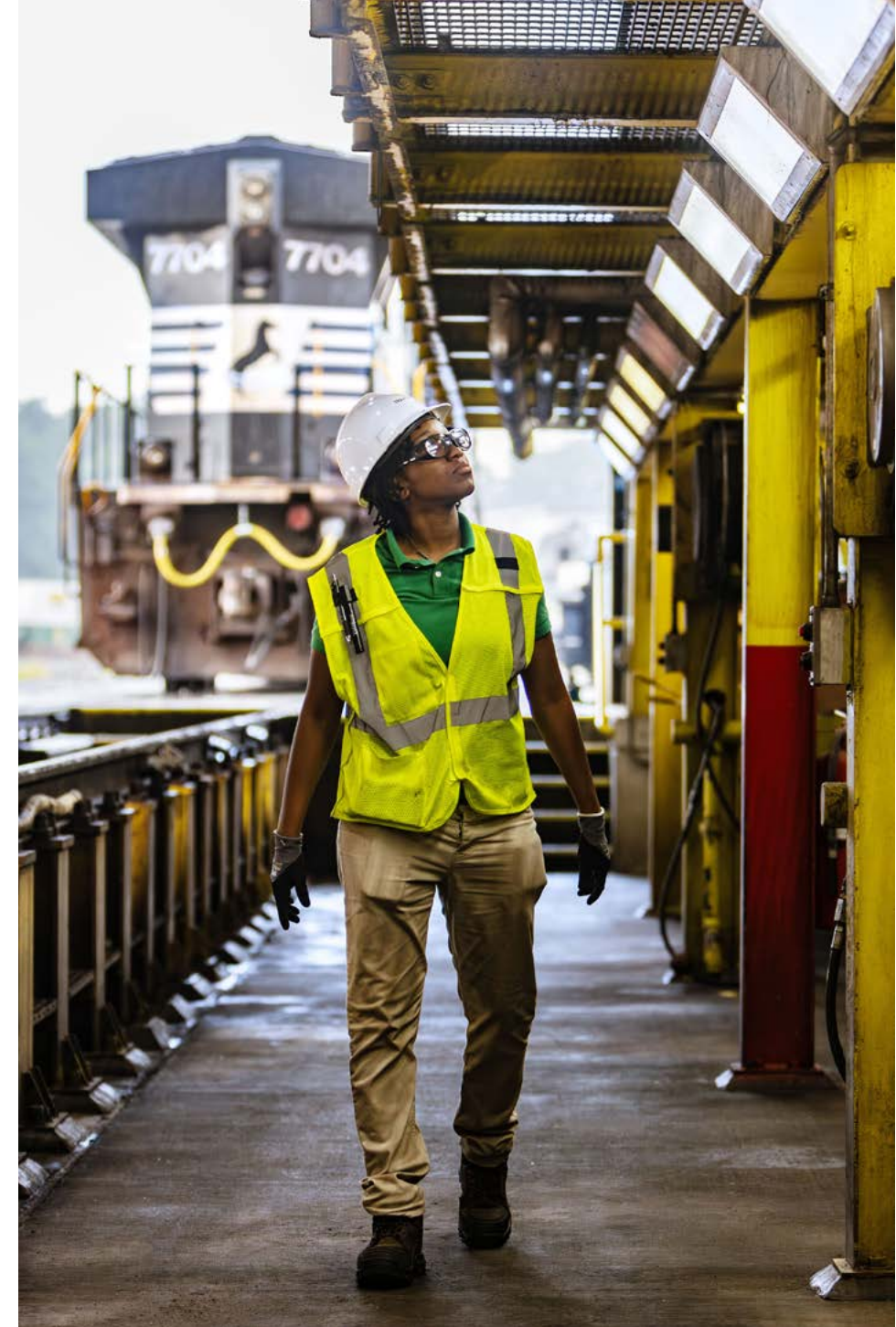
We have been developing and implementing new ways of delivering our business to respond to our customers' growing need for low-carbon services. A strategic decision we have made in operations is the continuation, contribution, and continual monitoring of our locomotive idle-reduction policies. To further reduce the carbon footprint from railroad operations through reductions in fuel consumption, we developed idle-reduction policies and programs to eliminate unnecessary engine idling. Our fuel conservation rules reduced locomotive idling in 2022 by almost 3,000 hours per day from 2021, which reduces fuel usage by approximately 311,000 gallons per month, resulting in 3,200 metric tons of avoided emissions.

We also implemented a Precision Scheduled Railroading (PSR) operating model to improve rail transportation services for our customers. The PSR model improves efficiencies in asset utilization and train performance and helped us to achieve significant reductions in fuel consumption and associated GHG emissions. The PSR strategies create year-over-year improvements in operating efficiencies, resulting in annual reductions in GHG emissions.

Our enhanced network planning and optimization team uses modeling and simulation tools to run scenarios, analyze operating data, and train flows. Before we launched the plan, we met with hundreds of customers to communicate expectations for the transition and explain the program's supply chain and environmental benefits. The initiatives to improve locomotive fuel efficiency have resulted in an 8% improvement since 2019, conserving more than 80 million gallons of diesel and avoiding more than 825,000 metric tons of CO₂ emissions. We have improved emissions intensity per gross ton-miles (GTM) by 5.8% in 2022 compared to our 2019 baseline.

As part of our long-term vision, we have invested strategically in installing Energy Management (EM) System technologies. We have been investing in the research and development of energy management/fuel conservation systems since 2005. Since then, we have continued driving technology development in this area. In 2016, we began installing the latest EM technologies implementing throttle control on road locomotives. The throttle control installations continue to drive fuel conservation on our road fleet, with 172 new installations in 2020 and 120 new installations in 2021. At the end of 2022, over 99% of the road fleet was equipped with EM. Another R&D project involved the assembly of a Tier 4 switcher locomotive to be tested in conjunction with Progress Rail. This test will check the feasibility of exhaust after treatment utilizing a diesel exhaust fluid (DEF) solution to reduce exhaust emissions in the rail industry.

Climate transition risks and opportunities may have significant implications for our financial planning process and decision making. Recognizing the major financial changes and understanding how our business model may need to evolve in a low-carbon economy as well as implementing low-carbon services for customers is critical to ensuring our company can mitigate risks and maximize opportunities.





TARGETS

TARGETS

EMISSIONS INTENSITY REDUCTION TARGET (ELEMENT 13)

As a leading transportation provider, we are actively reducing our environmental impact and helping our customers reduce their carbon footprint. In recent years, our customers have avoided 15 million metric tons of carbon emissions annually by shipping their goods and materials with Norfolk Southern.

To demonstrate our commitment, we established a science-based target in 2021 to reduce our scope 1 and 2 GHG emissions intensity 42% by 2034 from a 2019 base year. As locomotive fuel accounts for over 90% of our scope 1 and 2 GHG emissions, engaging with suppliers and investing in our locomotive fleet have been a primary focus. Our implementation of innovative technologies, sustainable operating practices, and locomotive modernizations are key to our efforts to achieve our sustainability goals. As part of our 2015 strategic plan, we set a fuel-efficiency goal targeting an 8.6% improvement by 2020. We exceeded that goal, achieving a 9.4% improvement over such period, resulting in savings of more than 130 million gallons of diesel fuel and avoiding approximately 1.3 million metric tons of emissions. We achieved an additional efficiency of 4.3% by 2022 and recently set an aggressive target to improve 13% by 2027.

We plan to achieve our SBTi-approved target in the short term by increasing our procurement of biodiesel and renewable diesel fuel. In the medium- and long-term time horizons, we continue to research and invest in alternative propulsion methods and technologies that will not only accelerate our transition to the low-carbon economy but also help alleviate our climate-related risks and advance our climate-related opportunities.

OTHER CLIMATE RELATED TARGETS (ELEMENT 14)

We have also committed to 30% renewable energy by 2030. Purchased electricity is currently around 3.5% of our annual scope 1 and 2 emissions so increasing our use of renewable energy can assist with meeting our 2034 target. To achieve this target, we are exploring opportunities on solar and energy purchase agreements. Currently, we have a clean energy purchase agreement in the state of Pennsylvania. For 2022, we added two community solar agreements in the state of New York which helped increase our renewable energy consumption from 3.7% to 4.2%.

NET ZERO TARGETS (ELEMENT 15)

At NS, we prioritize integrity and honor our commitments while championing sustainability in our operations. We acknowledge the significance of net-zero targets in pursuing a sustainable future. However, our current decision not to commit to a net-zero target is rooted in a conscientious feasibility evaluation.

The road to achieving net-zero emissions demands significant technological advancements and industry-wide innovation. We are dedicated to embracing advances that reduce emissions and actively participating in sustainability efforts. However, our stance remains that a concrete commitment to a net-zero target must align with the availability of mature tools and technologies to ensure a realistic path toward a net-zero future without overpromising or compromising feasibility.

NS has committed to a well-below 2°C Science-Based Target initiative (SBTi)-approved target, and we are actively assessing how to advance and align our Key Performance Indicators (KPIs) with a 1.5°C SBTi target.

Our commitment to sustainability has a considerable influence on our strategy in operations, products, services, supply chain, value chain, and investments in research and development.

Climate-related risks and opportunities significantly influence our strategy. We are committed to proactively addressing these factors and leveraging opportunities to transition towards more sustainable and environmentally friendly practices. We understand the importance of transparency and responsibility in addressing climate change and are committed to continuous improvement and evaluating feasible advancements that align with tangible technological innovations and industry advancements.

We value ongoing dialogues with stakeholders and remain dedicated to continual progress. Our commitment to sustainability is a continuous journey, and we remain open to further discussions regarding our sustainability goals and the steps we are taking to achieve them.



STRATEGY

STRATEGY

We are committed to reaching our targets and plan to continuously track and assess our progress. At NS, our strategy has been influenced by climate-related risks and opportunities. More specifically, climate-related risks and opportunities have influenced our strategy in operations, products and services, the supply chain and value chain, and our investment in R&D. The NS Transition Scenario Analysis established three significant KPIs as decarbonization levers to inform our transition strategy. These KPIs are essential for us to achieve our science-based target of reducing Scope 1 and 2 GHG emissions intensity 42% by 2034

For over 15 years, Norfolk Southern has been a corporate leader in sustainability. In 2007, we named the industry's first Chief Sustainability Officer and published our inaugural sustainability report a year later. In 2021, we established a science-based target to reduce Scope 1 and 2 GHG emissions intensity by 42% by 2034 to further our environmental commitment. At Norfolk Southern, we are committed to bold action and innovative approaches that move our company forward on its sustainability journey and invite our customers and partners to work with us to build a better planet. This is why, over the past year, we developed this CTP to help us meet our science-based target.

EXISTENCE OF A "1.5°C WORLD" ALIGNED TRANSITION PLAN WITHIN BUSINESS STRATEGY & SHAREHOLDER FEEDBACK (ELEMENT 9)

At Norfolk Southern, we prioritize integrity and honor our commitments while championing sustainability in our operations. We acknowledge the significance of net-zero targets in pursuing a sustainable future. However, our current decision not to commit to a net-zero target is rooted in a conscientious feasibility evaluation.

The road to achieving net-zero emissions demands significant technological advancements and industry-wide innovation. We are wholeheartedly dedicated to embracing advances that reduce emissions and actively participating in sustainability efforts. However, our stance remains that a concrete commitment to a net-zero target must align with the availability of mature tools and technologies to ensure a realistic path toward a net-zero future without overpromising or compromising feasibility.

NS has committed to a well-below 2°C Science-Based Target initiative (SBTi)-approved target, and we are actively assessing how to advance and align our Key Performance Indicators (KPIs) with a 1.5°C SBT target. Our commitment to sustainability has a considerable influence on our strategy in operations, products, services, supply chain, value chain, and research and development investments.

Climate-related risks and opportunities significantly influence our strategy. We are committed to proactively addressing these factors and leveraging opportunities to transition towards more sustainable and environmentally friendly practices. We understand the importance of transparency and responsibility in addressing climate change and are committed to continuous improvement and evaluating feasible advancements that align with tangible technological innovations and industry advancements.

We value ongoing dialogues with stakeholders and remain dedicated to continual progress. Our commitment to sustainability is an ongoing journey, and we remain open to further discussions regarding our sustainability goals and the steps we are taking to achieve them.

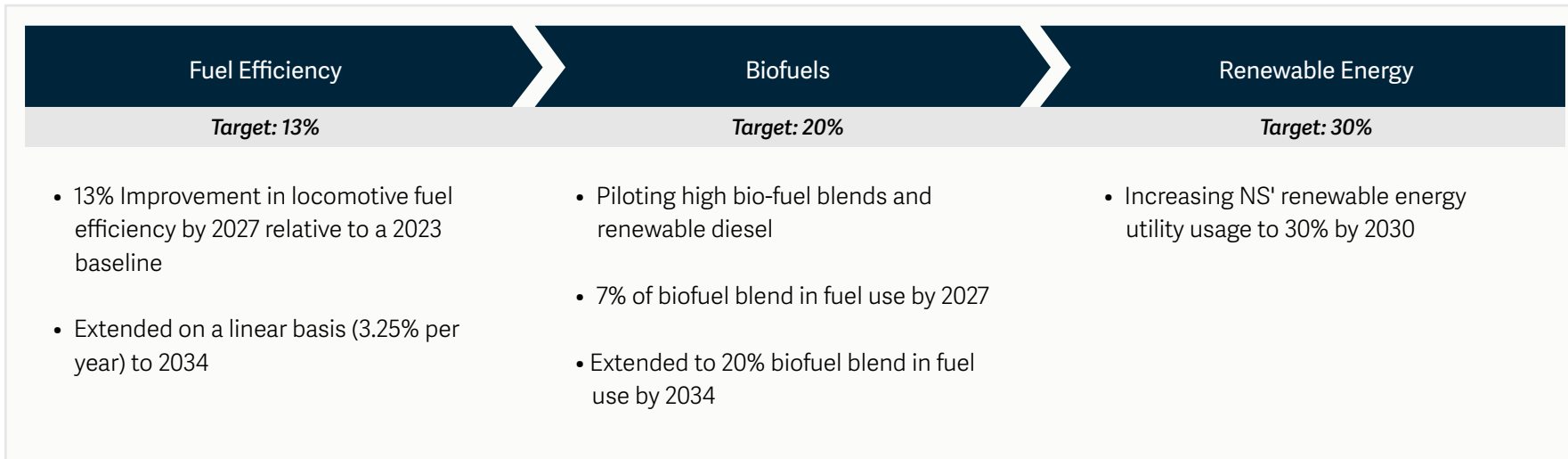
COMPANY STRATEGY – CLIMATE-RELATED RISKS AND OPPORTUNITIES (ELEMENT 10)

We are committed to reaching our targets and plan to continuously track and assess our progress. At NS, our strategy has been influenced by climate-related risks and opportunities. More specifically, climate-related risks and opportunities have influenced our strategy in operations, products and services, the supply chain and value chain, and our investment in R&D.

The NS Transition Scenario Analysis established three significant KPIs as decarbonization levers to inform our transition strategy. These KPIs are essential for us to achieve our science-based target of reducing Scope 1 and 2 GHG emissions intensity 42% by 2034.



FIGURE 15 | EMISSIONS REDUCTION LEVERS



We modeled our three significant emissions reduction levers out to year 2034 (Figure 16). These levers are predicted to get us very close to our 2034 target but with a slight gap. We feel that the other reduction levers listed in Tables 10 and 11 should close this gap.

TAKING ACTION – CLIMATE TRANSITION RISKS

Reducing carbon emissions is a strategic component of our environmental strategy. In 2021, we announced our science-based target to achieve a 42% reduction in scope 1 and 2 GHG emissions intensity by 2034 from a 2019 base year. We have made a 6% reduction thus far and continue to make steady progress toward that goal through several decarbonization initiatives.

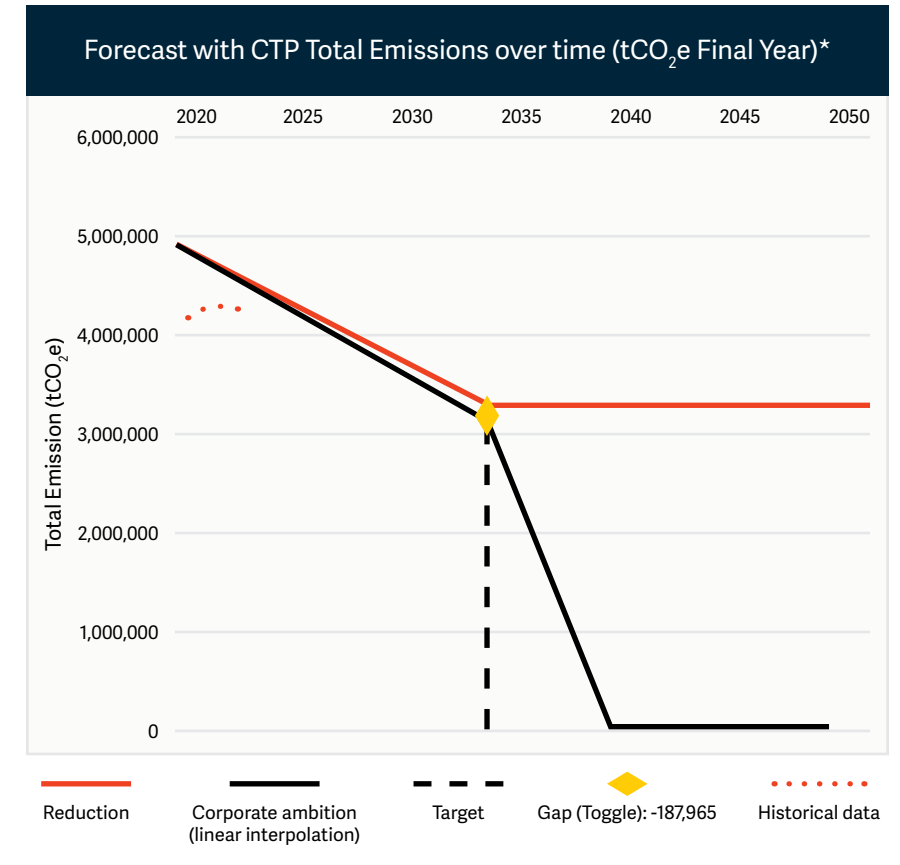
We are taking action to decarbonize and address climate risks associated with transitioning to a low-carbon economy by implementing a diverse set of initiatives targeting locomotive fuel efficiency and low-carbon fuels as well as the emissions from purchased electricity in the built environment. In 2023, we held a visioning workshop to capture ongoing

projects and programs that reduce our climate impact. Key internal stakeholders from across the company participated in this workshop and developed key performance indicators (KPIs) associated with these programs. The participating stakeholders were placed into the following groups to specifically address scope 1 and 2 emissions:

- Locomotives and Fuel Efficiency
- Low-carbon Fuels
- Equipment
- Solar and Renewables
- Built Environment

The emission reduction initiatives and KPIs detailed below in Table 10 have assigned SMART goals—demonstrating our commitment to align our actions with our targets and reduce risk exposure. These KPIs highlight how we have progressed operational and value chain efficiencies while driving targeted decarbonization levers. In identifying responsible stakeholders and formalizing interdepartmental collaboration on these KPIs, we have taken the crucial step of embedding climate-related metrics into our management and operational structures.

FIGURE 16 | MODELING THE THREE PRIMARY LEVERS



Emissions Reduction initiatives

TABLE 10 | ACTION PLAN – EMISSIONS REDUCTION INITIATIVES

Project Name	Emissions Impact	Time Frame	Responsible Business Unit	KPIs/SMART Goal
Scope 1 – Direct Emissions from Combustion				
Locomotive Fuel Efficiency				
DC2AC Locomotive Modernizations	High impact	Short-term (< 5 years)	Network Operations	80% of road fleet converted from DC to AC traction by 2027; continue modernizing over 100 locomotives per year with over 1,000 units expected by the end of 2025; these recent overhauls can improve fuel efficiency up to 25% per unit
Fuel Efficiency	High impact	Short-term (< 5 years)	Network Operations & Accounting	13% improvement in locomotive fuel efficiency by 2027 relative to a 2023 baseline
Low Carbon Fuels				
Increase Blend of Low-Carbon Fuels	High impact	Short-term (< 5 years)	Purchasing	7% of low-carbon fuels consumed by 2027 and to 20% by 2034
Other Equipment				
Intermodal Crane Replacements	Low impact	Short-term (< 5 years)	Assets & Optimization	Existing overhead diesel cranes replaced with hybrid and/or fully electric units by 2034
Vehicle Fleet Telematics	Low impact	Short-term (< 5 years)	Engineering & Vehicle Fleet	Increase average vehicle MPGs 10% by 2027 relative to a 2023 baseline
Scope 2 – Purchased Electricity Emissions				
Solar & Renewables				
30 X 30 Renewable Energy Goal	Low impact	Short-term (< 5 years)	Facility Services	Increase and/or offset renewable energy utility usage to 30% by 2030

We are making progress on locomotive fuel efficiency through locomotive modernizations, upgrades to Tier 3 and 4 yard and local locomotives through P3, network optimization, rail and wheel wear reduction, distributed power, increasing rail cargo capacity, rail equipment aerodynamic improvements, ATO development, locomotive idling monitoring, and energy management initiatives.

In addition to fuel efficiency, we are pursuing initiatives in low carbon fuels through fuel supplier engagement, OEM/local supplier engagement, collaboration with AAR and other railroads, sector partnerships/engagement, government legislation and advocacy policy, and tracking biofuel/low-carbon fuel consumption.

Operational equipment contributes to our scope 1 emissions, and we are also making progress on reducing scope 2 emissions by working on initiatives to address emission sources from the built environment. Additional scope 1 and 2 initiatives include:

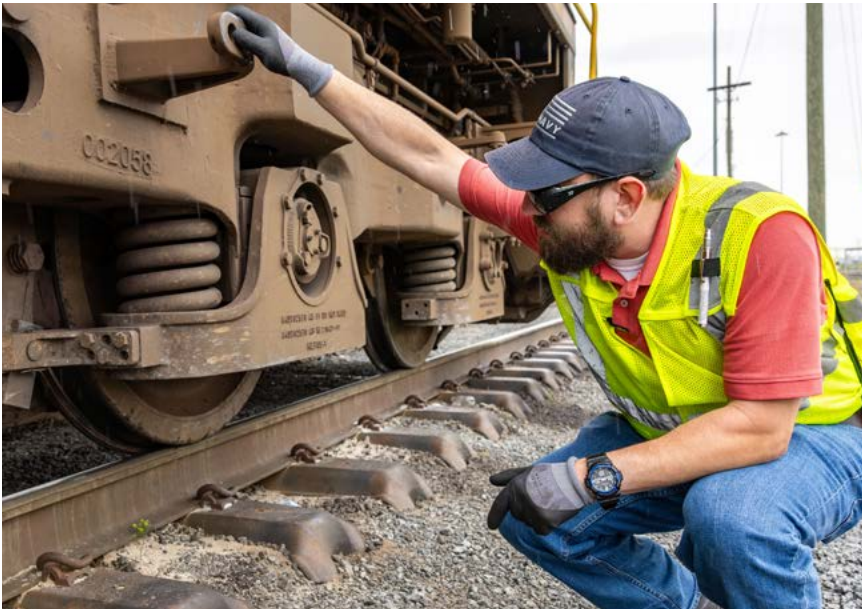


TABLE 11 | EMISSION REDUCITON LEVERS

Scope 1 Emissions Reduction Initiatives	Scope 2 Emissions Reduction Initiatives
Intermodal yard of the future: increase capacity and efficiencies	Submetering
Opportunities to replace other intermodal lift equipment	Third-party energy audits
Stop gate elimination	Measure efficiency of current buildings
Appointment system	HVAC system upgrades
Telematics to reduce idling and monitor efficiency of vehicles	Lighting system upgrades – LED lighting
Stack optimization	Dedicated AFE funding
OPCT – work order management	Dedicated regional managers for building maintenance
Low emission lift trucks	Remedy software upgrades
Electric hostlers	Shadow carbon price for energy projects
EV trucks for first mile/last mile	Incorporate solar in new buildings or when roof systems are upgraded
Status on vehicle fuel efficiency projects	Design standards for new buildings
Deployment of electric vehicles	Consolidate buildings; retire older structures
Expanded EV charging stations for employees	Potential external – electricity consumption in facilities
Driving behavior scores	Purchase Renewable Energy Credits
Digital reporting (ELD, compliance)	Power purchase agreements & VPPA agreements
Reuse/re-harvest vehicle fleet components	Solar projects
Fleet replacement to reduce vehicle age	Green-e certificates

PROJECTED ABATEMENT PATHWAY FOR DECARBONIZATION

We have adopted a clear and forward-looking strategy to reduce GHG emissions. During collaborative workshops conducted in 2023, we collectively determined key emissions reduction initiatives and KPIs that will serve as measures for our decarbonization journey. A thorough multi-criteria analysis that includes technological readiness, operational disruption, and safety concerns. Measures such as biofuel implementation and locomotive fuel efficiency were evaluated—taking into consideration the execution rate of the stored measures alongside the potential target achievement percentage and the expected annual progress pace.

Through our pathway abatement assessment, we are analyzing our performance and progress on our existing well-below-2°C target, and we are currently assessing the feasibility of a 1.5°C-aligned target. This abatement assessment will allow us to gain critical insight into the expected emission reduction per measure per year, our cost per annual avoided emissions, and total abatement costs. These abatement statistics provide insight into the financial commitment needed to achieve our climate ambition. Moreover, the assessment outputs will highlight potential challenges, feasibility, and opportunities of our existing measures' emission reduction trajectory that aligns with our corporate purpose. The pathway assessment process is not only a mirror reflecting our current progress but also a compass guiding us on how to adjust and evolve in our decarbonization journey.





*VALUE CHAIN ENGAGEMENT &
LOW-CARBON INITIATIVES*

VALUE CHAIN ENGAGEMENT & LOW-CARBON INITIATIVES

We recognize the need and opportunity to further decarbonize our business operations along our value chain for both upstream and downstream operations. Primarily, we focus on supplier and customer engagement and implementing low-carbon initiatives. We strive to partner with companies that hold the same ideals through their demonstration of sustainable projects and policies, including their efforts to reduce GHG emissions.

VALUE CHAIN ENGAGEMENT (ELEMENT 19)

Suppliers

We are committed to purchasing from companies that have demonstrated sustainability in their products, processes, and operations. This is one element of the company's long-term strategy to effectively meet present business needs without compromising the ability of future generations to meet their own needs through our sourcing commitment. By adopting our Sourcing Sustainability Policy¹³, we hope to encourage the producers and suppliers of products and services purchased and used by Norfolk Southern to adopt and pursue business practices that also reduce their environmental, economic, and social impacts through the adoption of GHG reduction targets and other sustainability initiatives that are appropriate for the service, industry, or company.

In 2022, we launched the Thoroughbred Sustainability Partner Awards¹⁴, a new annual opportunity to recognize our customers and suppliers who are leaders in sustainability. All customers and suppliers were welcome to apply to be recognized. Our internal team, which consists of cross-departmental leaders, reviewed applications for their measurable progress during 2021. Fifteen winners were selected based on their program's novelty, relevance, and impact. The award recipients collectively demonstrated outstanding energy efficiency, innovation,

and environmental stewardship achievements. Achievements by the honorees included:

- Diverting 17 million pounds of waste from landfills
- Avoiding more than 500,000 metric tons of carbon emissions
- Eliminating 5.2 million miles of diesel fuel burned annually
- Removing millions of pounds of plastic from the ocean and converting it into auto parts
- Achieving a 30% reduction in fuel consumption, saving 225,000 gallons annually

As part of our commitment to being a responsible steward of the environment and helping protect the communities where we operate and source materials, we seek suppliers demonstrating a commitment to sustainable business practices. To that end, we have a sourcing sustainability statement that lists six ways that companies can establish sustainable projects and policies, including:

- Documented corporate sustainability strategy
- Plans and processes to reduce GHG emissions
- Commitment to increase post-consumer recycled content
- Documented reduction in landfill-bound waste
- Documented minimization in packaging materials
- Demonstrated commitment to consolidate shipments

Consideration will be given to suppliers who demonstrate a sustainability focus, including the above initiatives, who work to exceed their sustainability performance expectations, and who demonstrate transparency of their supply chain impacts through documentation, including country of origin. The target suppliers are those with potential impact, including wood tie treaters, rail mills, taxi crew-haul carriers, diesel fuel providers, intermodal facility operators, used crosstie



dispositions, ballast quarries, locomotives, and others. Beginning with a 2015 pilot, we continue to survey key suppliers in our major supply chains on their sustainability efforts.

¹³ <https://www.norfolksouthern.com/content/dam/nscorp/pdf/Sourcing-Sustainability-Policy.pdf>

¹⁴ <https://www.norfolksouthern.com/en/commitments/sustainability/thoroughbred-sustainability-partner-awards#:~:text=Norfolk%20Southern's%20Thoroughbred%20Sustainability%20Partner,who%20are%20leaders%20in%20sustainability.>

Customers

In a multi-year effort, we are improving how we engage and communicate with customers. We partner with customers to help them achieve their sustainability goals, and like us, much of their recent focus is on reducing emissions.

We support our customers in this critical objective by encouraging them to use our next-generation carbon calculator. The NS carbon calculator¹⁵ makes it easier for them to do business with us by incorporating carbon into their freight decision framework with quantifiable benefits from modal shift. When our customers use our carbon calculator, they also demonstrate that they are committing to the transition to a low-carbon economy and are serious about their own sustainability goals. We value that commitment to sustainability, mainly through choosing NS and the freight industry. Customers will utilize a new NS carbon calculator web tool to estimate emissions savings as they run “what-if” freight mode conversion scenarios. As customers use the tool, they will be linked with marketing and sales representatives who can assist them in establishing freight service.

The NS carbon calculator provides a user-friendly system for estimating emissions savings as customers convert their mode of freight transport from truck to rail. The new system assists our customers in meeting sustainability goals related to reducing their carbon footprint. By providing estimates for carbon savings when choosing rail, we can increase the volume of freight shipped on our lines by those customers. With the advancement of recent technology, we have implemented the ability to capture near real-time fuel data from our fleet of locomotives, correlate the fuel data to train consists, and therefore calculate a fuel burn metric at the train, railcar, customer, and commodity level. This fuel burn information and mileage from historical traffic patterns establishes a repeatable, verifiable process for calculating truck and rail emissions for fuel

consumed in freight transportation services. In essence we are calculating emissions for every shipment that moves across our network and have developed the ability to roll this up to a single annual rail emissions report for our customers. This report can further educate our customers on how they can engage with us utilizing rail transport to achieve their own sustainability goals, related to reducing supply chain emissions from transportation.

An additional measure of success for this engagement is the change in the number of our customers year-to-year who have committed to SBTi, which validates carbon reduction targets. For our customers that have an established SBTi target, they will look to their suppliers for additional ways to help them achieve their targets. Over 25% of our top 200 customers by revenue have committed to the SBTi and this number is continuing to increase.

In May 2023, we formally launched our customer-focused Rail Emissions Report tool that provides customers with comprehensive data on the positive environmental impact of shipping by rail, including total carbon dioxide emissions, fuel consumption, and train miles traveled. Additionally, the tool gives customers visibility into the entire lifecycle and carbon footprint of moving a shipment across our 22-state rail network. With these insights, customers can make better-informed decisions about transporting their goods, develop strategies to reduce emissions, and meet decarbonization goals.

LOW-CARBON INITIATIVES - DIRECT OPERATIONS (ELEMENT 18)

We are reducing our GHG emissions through various low-carbon initiatives within our direct operations. We installed two vendors' train energy management hardware and software versions on our locomotives. Energy Management is a core component of our emissions intensity reduction target as the systems have been EPA-certified for fuel savings of at least 10%. Using the estimated annual CO₂e savings and converting

this to 37.8M gallons of diesel conserved at approximately \$4.23 per gallon (U.S. Energy Information Administration – average 2023 wholesale diesel price) represents \$159.9 million in savings for 2023.

Additionally, we are improving techniques and training associated with locomotive assignment and handling. It is a core component of our emissions intensity reduction target, currently set to reduce consumption/emissions intensity by 42% from 2019 through 2034. This equates to 2.5% absolute emissions reductions annually. Using the estimated annual CO₂e savings and converting this to gallons of diesel (9.45M gallons), conserved at approximately \$4.23 per gallon (U.S. Energy Information Administration – average 2023 wholesale diesel price). Assuming that half of our reduction comes through this training and technique, this would represent \$19.99 million in yearly savings.

¹⁵ <https://carbon-calculator.nscorp.com/#/>





POLICY ENGAGEMENT

POLICY ENGAGEMENT

Our government relations program and process seek to educate public officials about important business issues. We engage with policymakers as they shape legislation, regulation, and other policies that could impact our business. By doing so, NS further supports public policy goals consistent with our company and values, as demonstrated by our safety and economic regulations as well as investments in technology.

- **Safety:** At Norfolk Southern, we define operational excellence as safely delivering reliable and resilient service to our customers. Everything we do starts with safety, and it goes hand-in-hand with service. Railroad operations are subject to strict safety oversight by the Federal Railroad Administration and other federal agencies. NS and our Class I peers are dedicated to adopting leading-edge technologies for safety and service, and they advocate for a modern, performance-based regulatory framework that encourages innovation and sets operational goals based on data.
- **Economic:** Freight railroads support a continuation of existing balanced regulatory policies that flowed from the 1980 Staggers Act, which partially deregulated the rail industry. Today's economic regulatory framework, overseen by the Surface Transportation Board (STB), is based on sound economics and market-based competition. It allows railroads to make the investments needed to remain the world's safest and most efficient freight rail system and meet customer demand. STB policies should encourage this reinvestment, not deter it.
- **Investment in technology:** Norfolk Southern and other Class I railroads are investing millions of dollars in advanced technologies to enhance safety and better serve customers. NS led the industry in developing and deploying the first automated track inspection system mounted on a locomotive, enabling us to monitor track geometry conditions

at track speed under full load. We also are deploying train inspection corridors across our network that use machine vision, deep-learning algorithms, and other technologies to spot potential railcar defects. We believe the FRA should adopt forward-looking policies that encourage more investment in rail safety innovations and the development of technologies that promote safety and operating efficiencies in the U.S. freight rail transportation network.

To advocate our position, NS relies on government relations professionals, assisted as needed by subject matter experts. Our adopted corporate procedure states that only authorized employees and contract lobbyists may engage in lobbying activities, as defined by the appropriate jurisdiction, on behalf of NS. In addition, the procedure requires an employee involved in lobbying on behalf of NS to report the time spent on such lobbying and any associated expenses immediately following the close of the calendar quarter in which such lobbying occurred. The procedure further requires that persons who engage in lobbying on behalf of NS to comply with all applicable legal requirements.

We continue to have an ongoing dialogue with regulators and policymakers. As part of its oversight role, the Governance and Nominating Committee of our board of directors reviews, at least annually, NS' political contributions, including spending related to trade associations and other tax-exempt organizations. More information can be found on our [Government Relations Policy Priorities website](#).

ALIGNMENT OF PUBLIC POLICY ENGAGEMENT WITH CLIMATE AMBITION & STRATEGY (ELEMENT 17)

In May 2021, our shareholders passed a resolution at our annual shareholder's meeting asking that we evaluate and publish a report describing if and how our lobbying activities (direct and through trade associations and other organizations) align with the goals of the Paris Agreement and risks presented by any misalignment. Our shareholders generally communicated that they were looking for an understanding of our efforts in the climate area, transparency as to our activities concerning climate lobbying, and the oversight of such activities. We considered these shareholders' concerns as we published our [Climate Lobbying Report](#). This report is aligned with our climate change strategy.

We fully support and are looking for ways to further engage toward government understanding of railroads' improved fuel efficiency metrics and cautiously impose new requirements that may help the increased efficiency. Freight railroads voluntarily invest millions of dollars annually into technologies supporting improved fuel efficiency metrics. Freight railroads remain significantly more fuel efficient than over-the-road trucking options. Our energy efficiency advocacy is coordinated through the Association of American Railroads (AAR).

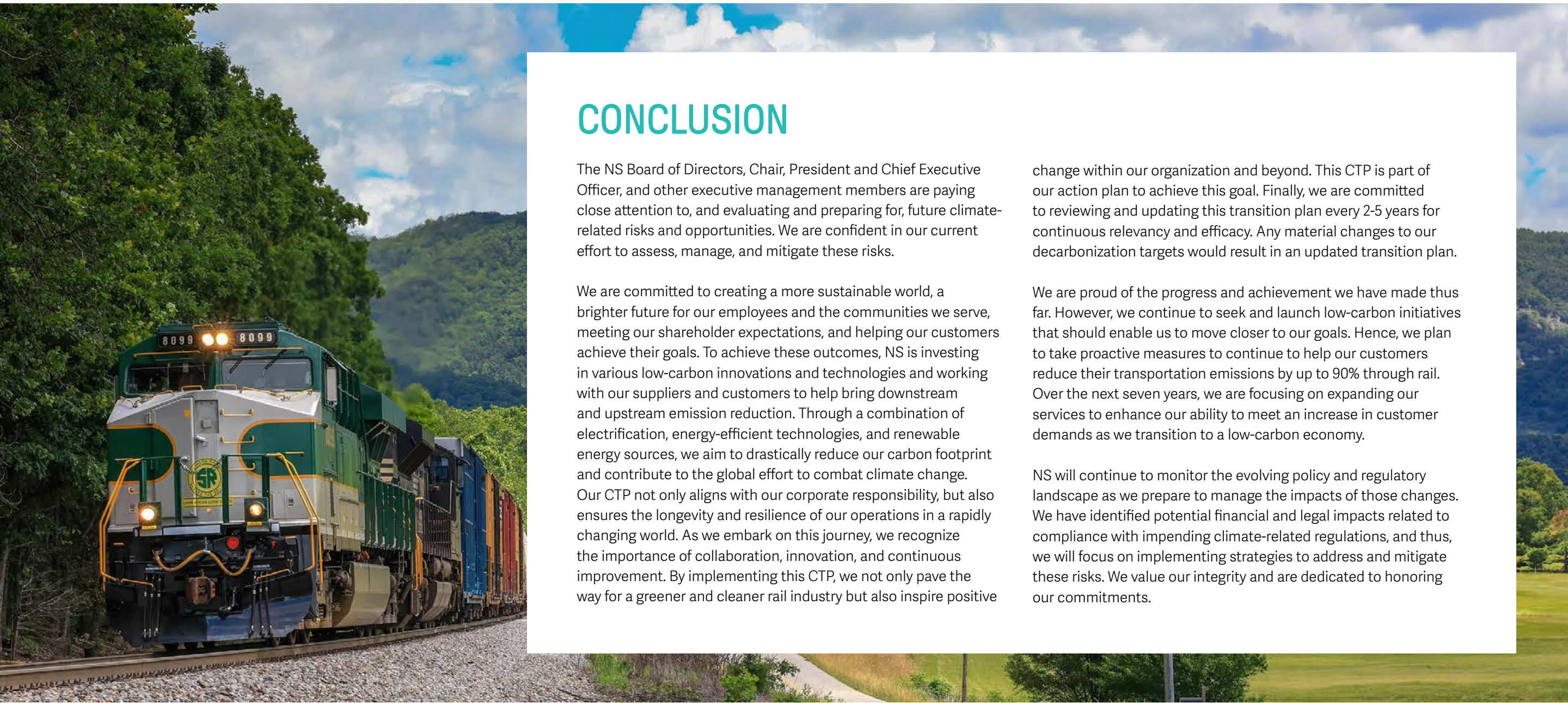
The overwhelming majority of our nondeductible contributions to trade associations or chambers of commerce in 2022 went to the Association of American Railroads (AAR), representing 88% of such contributions. AAR's mission is to promote a safe and efficient North American rail system, with principal activities in standards, operations, safety, security, public affairs, and public policy. AAR's climate policy recognizes the impact of climate change. It highlights that as the most fuel-efficient way to move freight over land, freight rail is ahead of other surface transportation modes in limiting its carbon

footprint. AAR notes that one train can carry the freight of hundreds of trucks, which reduces highway congestion; moving freight by train instead of by truck reduces GHG emissions by 75% on average; and railroads account for 40% of US freight, but only 1.9% of US transport-related GHGs. As such, AAR notes that the potential reduction in transportation related GHG emissions associated with moving more freight by rail is substantial. AAR's policy goals in this arena are to encourage policymakers to remove impediments to transporting freight by rail, promote policies that enable the rail industry to move more goods more efficiently, and foster modal equity in incorporating new and emerging technologies. AAR notes that all six Class I freight railroads that are members of AAR are participating in the STBi to reduce their GHG emissions. Thus, all the major freight railroads in North America, which are all AAR members, have voluntarily committed to GHG emission reductions consistent with what climate science deems necessary to meet the goals of the Paris Agreement. Considering AAR's stated recognition of climate change impacts, the stated policy goal of increasing rail transportation, and the concurrent reduction in GHG emissions, we have concluded that there is no misalignment between AAR and the emission-reduction goal of the Paris Agreement.





CONCLUSION



CONCLUSION

The NS Board of Directors, Chair, President and Chief Executive Officer, and other executive management members are paying close attention to, and evaluating and preparing for, future climate-related risks and opportunities. We are confident in our current effort to assess, manage, and mitigate these risks.

We are committed to creating a more sustainable world, a brighter future for our employees and the communities we serve, meeting our shareholder expectations, and helping our customers achieve their goals. To achieve these outcomes, NS is investing in various low-carbon innovations and technologies and working with our suppliers and customers to help bring downstream and upstream emission reduction. Through a combination of electrification, energy-efficient technologies, and renewable energy sources, we aim to drastically reduce our carbon footprint and contribute to the global effort to combat climate change. Our CTP not only aligns with our corporate responsibility, but also ensures the longevity and resilience of our operations in a rapidly changing world. As we embark on this journey, we recognize the importance of collaboration, innovation, and continuous improvement. By implementing this CTP, we not only pave the way for a greener and cleaner rail industry but also inspire positive

change within our organization and beyond. This CTP is part of our action plan to achieve this goal. Finally, we are committed to reviewing and updating this transition plan every 2-5 years for continuous relevancy and efficacy. Any material changes to our decarbonization targets would result in an updated transition plan.

We are proud of the progress and achievement we have made thus far. However, we continue to seek and launch low-carbon initiatives that should enable us to move closer to our goals. Hence, we plan to take proactive measures to continue to help our customers reduce their transportation emissions by up to 90% through rail. Over the next seven years, we are focusing on expanding our services to enhance our ability to meet an increase in customer demands as we transition to a low-carbon economy.

NS will continue to monitor the evolving policy and regulatory landscape as we prepare to manage the impacts of those changes. We have identified potential financial and legal impacts related to compliance with impending climate-related regulations, and thus, we will focus on implementing strategies to address and mitigate these risks. We value our integrity and are dedicated to honoring our commitments.



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