C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Union Pacific Railroad Company (Union Pacific, UP, or the Company) is the principal operating company of Union Pacific Corporation (NYSE: UNP), with headquarters in Omaha, Nebraska. One of America's most recognized companies, Union Pacific owns and operates over 32,000 track miles that link 23 states in the western two-thirds of the country by rail, providing a critical link in the global supply chain. Over the past 10 years, from 2013 to 2022, Union Pacific invested approximately $36 billion dollars into its network and operations to support America's transportation infrastructure. Union Pacific serves many of the fastest-growing U.S. population centers, operates from all major West Coast and Gulf Coast ports to eastern gateways, connects with Canada's rail systems, and is the only railroad serving all six major gateways into and out of Mexico.

The company's diversified business mix includes the following three business groups: Bulk (e.g., grain and grain products, fertilizer, food and refrigerated, coal and renewables); Industrial (e.g., construction, industrial chemicals, plastics, forest products, specialized industrial products, metals and ores, petroleum, liquid petroleum gases (LPG), soda ash, and sand); and Premium (e.g., finished automobiles, automotive parts, merchandise in intermodal containers, both domestic and international).

The company provides value to thousands of customers by delivering products in a safe, reliable, fuel-efficient, and environmentally responsible manner. In doing so, the company works to preserve the ecosystems it touches by finding ways to manage or reduce environmental impacts. In 2020, UP announced it would commit to establishing science-based targets to help us understand how much and how quickly greenhouse gas (GHG) emissions must be reduced to support global climate change goals. In early 2021, the Science Based Targets Initiative (SBTi) approved the company's targets, i.e., to reduce absolute scope 1 and scope 2 GHG emissions from our operations by 26% (against a 2018 baseline) by 2030. In 2022, we formally committed with SBTi to revise our near-term emissions reduction target to support a 1.5ºC climate ambition, as well as set and validate a net-zero emissions target. We are continuing to develop our decarbonization and residual emissions strategies in conjunction with this commitment.

Most of our focus in reducing our carbon footprint is on our locomotive operations. In 2022, locomotive emissions made up 96.5% of our Scope 1 emissions. We are approaching this target by continuing to make our operations more efficient through a better service plan and implementation of fuel-saving technology. In addition, we are pursuing efforts to decarbonize our operations through greater use of low-carbon fuels and the adoption of alternative-propulsion technology.

Union Pacific's services can also help freight customers reduce their own GHG footprint. In 2021, the U.S. EPA concluded that as an industry, freight railroads contribute only 0.5% of nationwide GHG emissions and just 1.7% of the emissions from all transportation-related sources. In fact, railroads are one of the most environmentally efficient means of transportation available to freight customers. On average, trains are up to four times more fuel efficient than trucks, which means moving freight by train instead of truck reduces greenhouse gas emissions from fuel consumption by up to 75%. Union Pacific can move a ton of freight 454 miles on a single gallon of diesel fuel. If 25% of truck traffic moving at least 750 miles went by rail instead, annual greenhouse gas emissions would fall by more than 13.1 million tons. This is equivalent to removing 2.6 million automobiles from highways for one year or diverting more than 4 million tons of recyclable waste from landfills. In 2022, Union Pacific customers eliminated an estimated 23.4 million metric tons of GHG emissions by choosing the company's rail services over long haul truck.

Union Pacific by the Numbers (2022):

Route Miles: 32,534;

Employees: 33,179;

Car Loads: 8.2 million;

Locomotives: 7,338;

Investment in Capital Expenditures: $3,620 million

C0.2

(C0.2) State the start and end date of the year for which you are reporting data and indicate whether you will be providing emissions data for past reporting years.

Reporting year

Start date
January 1 2022

End date
December 31 2022

Indicate if you are providing emissions data for past reporting years
No

Select the number of past reporting years you will be providing Scope 1 emissions data for
<Not Applicable>

Select the number of past reporting years you will be providing Scope 2 emissions data for
<Not Applicable>

Select the number of past reporting years you will be providing Scope 3 emissions data for
<Not Applicable>

C0.3

(C0.3) Select the countries/areas in which you operate.
United States of America

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.
USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.
Operational control

C-TO0.7/C-TS0.7

(C-TO0.7/C-TS0.7) For which transport modes will you be providing data?
Rail

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	US9078181081

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?
Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual or committee	Responsibilities for climate-related issues
Board Chair	Union Pacific is proud of the impact it has on reducing greenhouse gas emissions. Knowledge of that impact reaches the highest levels of authority within the company. The positions of Chairman of the Board and, Chief Executive Officer, and President are currently occupied by one individual (per our proxy statement (pg 33). The Board has decided that upon the retirement of our CEO, which currently is expected to occur in 2023, the positions of Chairman and CEO should be separated, with the position of Chairman being filled by an independent director. The Chairman, CEO and President holds the highest level of direct responsibility for the company's environmental performance, management, compliance, and the pursuit of initiatives related to managing the negative impacts associated with climate change. He oversees all UP departments, including those with significant oversight of climate-related matters, and leads the Board, which regularly considers climate-related issues as part of departmental reporting and committee meetings. In 2021, with the full approval and support of the Chairman, CEO and President, the company adopted a science-based target to support the global climate change objectives outlined by the Paris Agreement. In the past two years, company leadership approved research and analysis that resulted in our agreement to reduce absolute scope 1 and 2 GHG emissions from our operations by 26% (against a 2018 baseline) by 2030. Final approval by the SBTi approving body took place in Q1 2021. We are currently in the process of revalidating our SBT to align with a 1.5 degree scenario, setting us up to be on the path to net zero by 2050.
Chief Executive Officer (CEO)	Union Pacific is proud of the impact it has on reducing greenhouse gas emissions. Knowledge of that impact reaches the highest levels of authority within the company. The positions of Chairman of the Board and, Chief Executive Officer, and President are currently occupied by one individual (per our proxy statement (pg 33). The Board has decided that upon the retirement of our CEO, which currently is expected to occur in 2023, the positions of Chairman and CEO should be separated, with the position of Chairman being filled by an independent director. The Chairman, CEO and President holds the highest level of direct responsibility for the company's environmental performance, management, compliance, and the pursuit of initiatives related to managing the negative impacts associated with climate change. He oversees all UP departments, including those with significant oversight of climate-related matters, and leads the Board, which regularly considers climate-related issues as part of departmental reporting and committee meetings. In 2021, with the full approval and support of the Chairman, CEO and President, the company adopted a science-based target to support the global climate change objectives outlined by the Paris Agreement. In the past two years, company leadership approved research and analysis that resulted in our agreement to reduce absolute scope 1 and 2 GHG emissions from our operations by 26% (against a 2018 baseline) by 2030. Final approval by the SBTi approving body took place in Q1 2021. We are currently in the process of revalidating our SBT to align with a 1.5 degree scenario, setting us up to be on the path to net zero by 2050.
President	Union Pacific is proud of the impact it has on reducing greenhouse gas emissions. Knowledge of that impact reaches the highest levels of authority within the company. The positions of Chairman of the Board and, Chief Executive Officer, and President are currently occupied by one individual (per our proxy statement (pg 33). The Board has decided that upon the retirement of our CEO, which currently is expected to occur in 2023, the positions of Chairman and CEO should be separated, with the position of Chairman being filled by an independent director. The Chairman, CEO and President holds the highest level of direct responsibility for the company's environmental performance, management, compliance, and the pursuit of initiatives related to managing the negative impacts associated with climate change. He oversees all UP departments, including those with significant oversight of climate-related matters, and leads the Board, which regularly considers climate-related issues as part of departmental reporting and committee meetings. In 2021, with the full approval and support of the Chairman, CEO and President, the company adopted a science-based target to support the global climate change objectives outlined by the Paris Agreement. In the past two years, company leadership approved research and analysis that resulted in our agreement to reduce absolute scope 1 and 2 GHG emissions from our operations by 26% (against a 2018 baseline) by 2030. Final approval by the SBTi approving body took place in Q1 2021. We are currently in the process of revalidating our SBT to align with a 1.5 degree scenario, setting us up to be on the path to net zero by 2050.
Board-level committee	The Board of Directors provides oversight of our sustainability strategy. The Corporate Governance, Nominating and Sustainability Committee is responsible for reviewing current developments in sustainability and recommends adoption of new, or modifications to existing practices, policies, and procedures.
Board-level committee	The Board of Directors is responsible for overseeing the assessment and management of the critical enterprise risks affecting the Company, including sustainability risks. Management identifies and prioritizes enterprise risks and reviews them with the Board at least once a year to answer any questions and obtain input related to mitigation strategies and categories of risk. The Board has delegated to the Audit Committee primary responsibility for oversight of risks related to financial and operational controls of the Company, as well as compliance, regulatory, safety, sustainability, climate, and cyber risks.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – all meetings	Reviewing and guiding annual budgets Overseeing major capital expenditures Overseeing and guiding employee incentives Reviewing and guiding strategy Monitoring the implementation of a transition plan Monitoring progress towards corporate targets Reviewing and guiding the risk management process	<Not Applicable>	The Board of Directors performs oversight of critical enterprise risks that affect railroad operations, including risks associated with climate change. This oversight helps to align the company's organizational strategy, major emergency response plans, the development and integration of risk management policies, and capital expenditure outlays to respond to and/or avoid potential impacts, such as those associated with major flood events. The company identifies and prioritizes its enterprise risks, and has identified climate change-related risks as an enterprise risk, in its 10-K. The Board has provided oversight and direction related to the following: 1) introducing the Building a Sustainable Future 2030 strategy to improve our environmental performance through investing in technology, maintaining equipment, and training employees in environmentally responsible behaviors; 2) committing to development of a science-based target to reduce absolute scope 1 and scope 2 GHG emissions from operations 26% (against a 2018 baseline) by 2030; 3) committing to revalidating that target for a 1.5 degree scenario and setting a 2050 net-zero target; and 4) adoption of ten of the United Nations' Sustainable Development Goals (SDGs), including SDG #12, which is relevant to "Responsible Consumption and Production," and SDG #13, "Climate Action." The Board delegates primary responsibility for oversight of climate-related and other environmental risks to the Audit Committee. The Audit Committee is composed of directors who meet the independence criteria outlined by the NYSE listing standards. The Chief Accounting, Risk and Compliance Officer, who reports to the Chief Financial Officer and is responsible for the Company's enterprise risk management program, meets with the Audit Committee at each of its scheduled meetings. The Audit Committee regularly receives reports throughout the year from the Chief Accounting, Risk and Compliance Officer and the senior executives responsible for financial reporting processes, safety and compliance, cybersecurity, and environmental and litigation matters. Additionally, the senior executives responsible for implementation of appropriate mitigation strategies for the Company's top enterprise risks provide reports and updates directly to the Audit Committee and/or the Board throughout the year. Climate risk, including transition risks, is also defined as part of our enterprise risk management program. To address climate risk, our enterprise risk management program provides for the review, monitoring and mitigation of climate change risks and how these risks may affect the Company's ability to participate in emerging commodity or financial markets or impact rail's environmental advantage over other modes of transportation. The Audit Committee and our Board receive updates on Company activities and mitigation strategies related to climate risk. In 2022, the board met six times.

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues	Primary reason for no board-level competence on climate-related issues	Explain why your organization does not have at least one board member with competence on climate-related issues and any plans to address board-level competence in the future
Row 1	Yes	Union Pacific has reviewed each of its directors' climate-related experience considering their professional experience, education, board-level accountabilities, and professional education (including substantive training provided by internal and external subject matter experts). Based on this review, Union Pacific determined that five out of ten Board members, or 50%, possess relevant experience to address UP's climate-related risks and opportunities.	<Not Applicable>	<Not Applicable>

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Position or committee
Chief Executive Officer (CEO)

Climate-related responsibilities of this position
Managing major capital and/or operational expenditures related to low-carbon products or services (including R&D)
Implementing a climate transition plan
Integrating climate-related issues into the strategy

Coverage of responsibilities
<Not Applicable>

Reporting line
Reports to the board directly

Frequency of reporting to the board on climate-related issues via this reporting line
Quarterly

Please explain
The positions of Chairman of the Board and, Chief Executive Officer, and President are currently occupied by one individual (per our proxy statement (pg 33). The Board has decided that upon the retirement of our CEO, which currently is expected to occur in 2023, the positions of Chairman and CEO should be separated, with the position of Chairman being filled by an independent director. This individual holds the highest level of direct responsibility for the company's environmental performance, management, compliance, and the pursuit of initiatives related to managing the negative impacts associated with climate change.

Position or committee
President

Climate-related responsibilities of this position
Managing major capital and/or operational expenditures related to low-carbon products or services (including R&D)
Implementing a climate transition plan
Integrating climate-related issues into the strategy

Coverage of responsibilities
<Not Applicable>

Reporting line
Reports to the board directly

Frequency of reporting to the board on climate-related issues via this reporting line
Quarterly

Please explain
The positions of Chairman of the Board and, Chief Executive Officer, and President are currently occupied by one individual (per our proxy statement (pg 33). The Board has decided that upon the retirement of our CEO, which currently is expected to occur in 2023, the positions of Chairman and CEO should be separated, with the position of Chairman being filled by an independent director. This individual holds the highest level of direct responsibility for the company's environmental performance, management, compliance, and the pursuit of initiatives related to managing the negative impacts associated with climate change.

Position or committee
Sustainability committee

Climate-related responsibilities of this position
Developing a climate transition plan
Implementing a climate transition plan
Integrating climate-related issues into the strategy
Monitoring progress against climate-related corporate targets
Managing public policy engagement that may impact the climate
Managing value chain engagement on climate-related issues

Coverage of responsibilities
<Not Applicable>

Reporting line
Corporate Sustainability/CSR reporting line

Frequency of reporting to the board on climate-related issues via this reporting line
Quarterly

Please explain
Sustainability Steering Committee - Senior leaders from Law, Finance, Marketing and Sales, Operations (Mechanical & Engineering), Supply Chain, Environmental

Management, Corporate Relations, Investor Relations, and Workforce Resources meet quarterly to drive decision-making, accountability and ownership of specific initiatives.

Position or committee
Other C-Suite Officer, please specify (Executive Vice President-Sustainability and Strategy)

Climate-related responsibilities of this position
Developing a climate transition plan
Integrating climate-related issues into the strategy
Setting climate-related corporate targets
Monitoring progress against climate-related corporate targets

Coverage of responsibilities
<Not Applicable>

Reporting line
CEO reporting line

Frequency of reporting to the board on climate-related issues via this reporting line
More frequently than quarterly

Please explain
The Executive Vice President-Sustainability and Strategy helps lead the development and implementation of Union Pacific's strategic vision as it strives to become the nation's No. 1 supply chain logistics provider and oversees its sustainability initiatives, guiding the railroad's efforts to reach net zero by 2050.

Position or committee
Other C-Suite Officer, please specify (AVP Strategy & Sustainability)

Climate-related responsibilities of this position
Integrating climate-related issues into the strategy
Conducting climate-related scenario analysis
Monitoring progress against climate-related corporate targets

Coverage of responsibilities
<Not Applicable>

Reporting line
Corporate Sustainability/CSR reporting line

Frequency of reporting to the board on climate-related issues via this reporting line
As important matters arise

Please explain
The AVP Strategy & Sustainability role is to oversee the day-to-day implementation of Union Pacific's sustainability strategy and moving the company forward on its sustainability disclosure journey.

Position or committee
Risk committee

Climate-related responsibilities of this position
Assessing climate-related risks and opportunities
Managing climate-related risks and opportunities

Coverage of responsibilities
<Not Applicable>

Reporting line
Reports to the board directly

Frequency of reporting to the board on climate-related issues via this reporting line
Annually

Please explain
The Board has delegated to the Audit Committee primary responsibility for oversight of risks related to financial and operational controls of the Company, as well as compliance, regulatory, safety, sustainability, climate, and cyber risks. The Chief Accounting, Risk and Compliance Officer, who reports to the Chief Financial Officer and is responsible for the Company's enterprise risk management program, meets with the Audit Committee at each of its scheduled meetings. The Audit Committee regularly receives reports throughout the year from the Chief Accounting, Risk and Compliance Officer and the senior executives responsible for financial reporting processes, safety and compliance, cybersecurity, and environmental and litigation matters. Additionally, the senior executives responsible for implementation of appropriate mitigation strategies for the Company's top enterprise risks provide reports and updates directly to the Audit Committee and/or the Board throughout the year.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive
Chief Executive Officer (CEO)

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Progress towards a climate-related target

Incentive plan(s) this incentive is linked to
Long-Term Incentive Plan

Further details of incentive(s)
Seventy percent (70%) of the target annual incentive cash bonuses paid to executives, including the NEOs, is based on the attainment of pre-established objective Company financial performance goals, twenty percent (20%) is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend and ten percent (10%) is based on individual performance.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
To advance our sustainability governance efforts, we are continuing to evolve sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all of which directly impact emissions, are tied to executive compensation.

Entitled to incentive
Business unit manager

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Energy efficiency improvement

Incentive plan(s) this incentive is linked to
Short-Term Incentive Plan

Further details of incentive(s)
Annual bonus

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
Business unit managers were directed to support and implement strategies designed to achieve a company-wide goal to reduce the company's locomotive fuel consumption rate. This initiative would, in effect, help to reduce GHG emissions. In 2022, the company achieved year over year improvement, with the fuel consumption rate (measured in gallons of fuel per thousand gross ton miles) improving by 1% from 2021 levels.

These positive results are credited to the efforts of business unit managers in their implementation of various operational and technology driven fuel efficiency initiatives. This achievement is also a factor considered in the annual performance appraisals of business unit managers, which in turn affects their incentive/bonus compensation. The company intends to continue its evaluation and adjustment of fuel consumption goals, consistent with the recently adopted science-based targets, and expects its future efforts will help to further reduce GHG emissions from its operations.

Entitled to incentive
Other C-Suite Officer

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Progress towards a climate-related target
Implementation of an emissions reduction initiative

Incentive plan(s) this incentive is linked to
Short-Term Incentive Plan

Further details of incentive(s)
Annual bonus

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
Union Pacific has established performance goals that incentivize the AVP Strategy & Sustainability to address climate change and sustainability issues as part of their performance rating and compensation.

Entitled to incentive
Chief Financial Officer (CFO)

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)

Progress towards a climate-related target

Incentive plan(s) this incentive is linked to
Long-Term Incentive Plan

Further details of incentive(s)
Seventy percent (70%) of the target annual incentive cash bonuses paid to executives, including the NEOs, is based on the attainment of pre-established objective Company financial performance goals, twenty percent (20%) is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend and ten percent (10%) is based on individual performance.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
To advance our sustainability governance efforts, we are continuing to evolve sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all of which directly impact emissions, are tied to executive compensation.

Entitled to incentive
Chief Operating Officer (COO)

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Progress towards a climate-related target

Incentive plan(s) this incentive is linked to
Long-Term Incentive Plan

Further details of incentive(s)
Seventy percent (70%) of the target annual incentive cash bonuses paid to executives, including the NEOs, is based on the attainment of pre-established objective Company financial performance goals, twenty percent (20%) is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend and ten percent (10%) is based on individual performance.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
To advance our sustainability governance efforts, we are continuing to evolve sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all of which directly impact emissions, are tied to executive compensation.

Entitled to incentive
Chief Procurement Officer (CPO)

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Progress towards a climate-related target

Incentive plan(s) this incentive is linked to
Long-Term Incentive Plan

Further details of incentive(s)
Seventy percent (70%) of the target annual incentive cash bonuses paid to executives, including the NEOs, is based on the attainment of pre-established objective Company financial performance goals, twenty percent (20%) is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend and ten percent (10%) is based on individual performance.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
To advance our sustainability governance efforts, we are continuing to evolve sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all of which directly impact emissions, are tied to executive compensation.

Entitled to incentive
Chief Risk Officer (CRO)

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Progress towards a climate-related target

Incentive plan(s) this incentive is linked to
Long-Term Incentive Plan

Further details of incentive(s)
Seventy percent (70%) of the target annual incentive cash bonuses paid to executives, including the NEOs, is based on the attainment of pre-established objective Company financial performance goals, twenty percent (20%) is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend and ten percent (10%) is based on individual performance.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
To advance our sustainability governance efforts, we are continuing to evolve sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all of which directly impact emissions, are tied to

executive compensation.

Entitled to incentive
Chief Sustainability Officer (CSO)

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Progress towards a climate-related target

Incentive plan(s) this incentive is linked to
Long-Term Incentive Plan

Further details of incentive(s)
Seventy percent (70%) of the target annual incentive cash bonuses paid to executives, including the NEOs, is based on the attainment of pre-established objective Company financial performance goals, twenty percent (20%) is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend and ten percent (10%) is based on individual performance.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
To advance our sustainability governance efforts, we are continuing to evolve sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all of which directly impact emissions, are tied to executive compensation.

Entitled to incentive
Chief Government Relations Officer (CGRO)

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Progress towards a climate-related target

Incentive plan(s) this incentive is linked to
Long-Term Incentive Plan

Further details of incentive(s)
Seventy percent (70%) of the target annual incentive cash bonuses paid to executives, including the NEOs, is based on the attainment of pre-established objective Company financial performance goals, twenty percent (20%) is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend and ten percent (10%) is based on individual performance.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
To advance our sustainability governance efforts, we are continuing to evolve sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all of which directly impact emissions, are tied to executive compensation.

Entitled to incentive
Chief Technology Officer (CTO)

Type of incentive
Monetary reward

Incentive(s)
Bonus – set figure

Performance indicator(s)
Progress towards a climate-related target

Incentive plan(s) this incentive is linked to
Long-Term Incentive Plan

Further details of incentive(s)
Seventy percent (70%) of the target annual incentive cash bonuses paid to executives, including the NEOs, is based on the attainment of pre-established objective Company financial performance goals, twenty percent (20%) is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend and ten percent (10%) is based on individual performance.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
To advance our sustainability governance efforts, we are continuing to evolve sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all of which directly impact emissions, are tied to executive compensation.

Entitled to incentive
All employees

Type of incentive
Non-monetary reward

Incentive(s)
Internal company award
Public recognition

Performance indicator(s)
Other (please specify) (Outstanding stewardship of the environment)

Incentive plan(s) this incentive is linked to
This position does not have an incentive plan

Further details of incentive(s)
Environmental Award

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan
(1) Union Pacific provides annual training to its employees on company policies relevant to environmental compliance and protection; (2) employees with employment roles affecting environmental compliance and/or protection are provided with more comprehensive training; and (3) On Earth Day 1994, Union Pacific presented the first annual "Chairman's Environmental Award." The award was established to recognize a Union Pacific Railroad employee demonstrating outstanding environmental awareness, leadership and responsibility. The Chairman's Environmental Award winner represents Union Pacific as its nominee for the Association of American Railroads' (AAR) John H. Chafee Environmental Excellence Award. One nominee is selected from among all participating railroads for the prestigious award. The Chafee Award is given to those who exhibit outstanding stewardship of the environment. The award is named for John H. Chafee, a four-term U.S. Senator from Rhode Island, and a noted environmentalist. Sen. Lincoln Chafee, son of the man for whom the award was named, has presented the award to recent recipients.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?
Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	3	The short-term planning horizon encompasses the period in which climate-related decisions are made based on the assets already in place.
Medium-term	3	10	The medium-term horizon aligns with our 2030 near-term SBTi GHG emissions target.
Long-term	10	30	The long-term horizon aligns with our 2050 net-zero emissions ambition, and our climate scenario analysis. When identifying, assessing and responding to long-term climate-related impacts, UP defines long-term as up to 30 years in the future.

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

Union Pacific defines a substantive financial or strategic impact to be a significant impact on the company's Annual Plan achievement, defined as a material adverse effect on the Union Pacific's financial condition, results of operations or liquidity, and which could cause those results to differ materially from those expressed or implied in the Company's forward-looking statements, resulting in the potential for customer or shareholder concern. In the case of costs that exceed the Union Pacific's regular forecasts, our company may provide its shareholders with an estimate of the impact the event may have had on the company's financial results. For example, in 2021, the Company notified investors via an 8-K filing that the financial impact-including revenue, operating expenses and capital investment, of Winter Storm Uri, California wildfires, and heavy rains experienced during 2021 in the South and Southeast part of the Company's network exceeded $100 million through September 17, 2021.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered
Direct operations
Upstream
Downstream

Risk management process
Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment
More than once a year

Time horizon(s) covered
Short-term
Medium-term
Long-term

Description of process
Union Pacific has identified “climate-related risk” as an enterprise risk in its Annual Report Form 10K, and integrates it into its multi-disciplinary company-wide risk management process that occurs more frequently than annually, as described below:

Overarching Risk/Opportunity Identification Process:
The company collects and assesses information regarding climate-related risks and opportunities at the operational performance level (short-term 0-3 years), infrastructure health level (medium-term 3-10 years), and long-term business strategy level (long-term 10-30 years) more than once a year. This risk and opportunity process incorporates bottom-up input from multiple departments, including Finance, Strategic Planning, Sustainability, Operations, Engineering, Law, Marketing & Sales, Corporate Relations, Finance, and the Fuel & Environmental Management Team. Risks and opportunities identified as high probability and/or high cost events are addressed as priority items within our overall risk/opportunity management process by the Enterprise Risk Management (ERM) Committee, which manages our multi-disciplinary company-wide risk management process. The ERM Committee meets monthly to monitor enterprise risk indicators, and coordinate risk assessment and mitigation initiatives.

Overarching Risk/Opportunity Assessment and Response Process:
Union Pacific assesses these impacts in terms of likelihood and magnitude of the impact, then determines a response strategy (to mitigate, transfer, accept or avoid) the identified climate-related risks and to capitalize on opportunities, and monitors progress. Management (including the Enterprise Risk Management Committee) identifies and prioritizes enterprise risks, including climate-related risks, and regularly presents them to the Board for its review and consideration. The senior executives responsible for implementation of appropriate mitigation strategies for the company’s top enterprise risks, along with the Chief Accounting, Risk and Compliance officer, provide reports directly to the Audit Committee and/or the Board during the year.

The process includes an assessment of cost, materiality and probability, with higher or more severe assessments along any off those three dimensions receiving higher prioritization and attention. In each case, the criteria for materiality and priorities are dictated first and foremost by an analysis of impacts to health and safety. Evaluation of impacts to customer service, and the environment also dictate materiality and priority. These criteria are not mutually exclusive and can overlap.

Case studies demonstrating our risk assessment identification, assessment and response:

1) Direct Operations: Short-term, physical risk: the annual evaluation of the health of our track, bridge and signal infrastructure network and their ability to withstand acute weather events, which informs our capital investment decisions. Managing climate-related risks includes operating and adapting through acute weather events, such as heavy precipitation, flooding, and wildfires, and the associated impacts on the company's 32,000 miles of infrastructure. Union Pacific manages these types of climate-related risks by investing in those areas deemed susceptible to impact. We conduct a rigorous program of inspections, prioritizations, lifecycle modeling and acute weather impact modeling to identify facilities that are most in need of strengthening or replacement due, in part, to climate-related physical risks. Example of investments related solely to climate-related event mitigation include raising the height of the track profile to prevent water over the top of the rails, strengthening bridges to combat future flooding issues, and the addition or expansion of culverts to prevent flood waters from washing out the track. Capital expenditures related solely to climate-related event mitigation averaged approximately $17 million over the past five years.

2) Direct Operations and Downstream Value Chain: Long term, physical and transition risks: In 2022, we completed our first climate scenario analysis, a rigorous assessment of the climate-related risks and opportunities the company may face in the future under a range of potential climate scenarios that encompassed the 2022-2050 time period. We identified and assessed the potential impacts of four priority risk/opportunity drivers on Union Pacific’s business under both high-carbon and low-carbon scenarios, using a combination of climate and business data. Those areas included carbon pricing exposure and acute weather increases (impact on our own direct operations) and electricity generation customer mix and changing agriculture yields impacting downstream customers. We are working to identify potential strategic responses to mitigate the risks and capitalize on opportunities identified in the climate scenario analysis.

3) Upstream: Medium- and long-term: With 96.5% of our Scope 1 GHG emissions coming from locomotives, our major focus in reducing our carbon footprint is on our locomotive operations. Union Pacific has identified the issue of there currently being no zero-emission locomotive available on the commercial market. After assessing this situation, Union Pacific determined to explore technical partnerships with the two major locomotive manufacturers to speed the R&D of new locomotive technologies that would reduce or eliminate locomotive GHG emissions, and in 2022 announced our plans to purchase battery-electric locomotives for testing in yard operations. As announced, the combined purchases and required upgrades to yard infrastructure to support battery-electric locomotive operations are expected to exceed $100 million, which would represent the largest investment in battery-electric technology by a U.S. Class I railroad. The purchases will not only help locomotive manufacturers develop and assess the locomotives’ potential deployment in long-haul service, but they will also help our company meet a goal of reducing Scope 1 and 2 GHG emissions by 26% by 2030 and achieve net-zero GHG emissions by 2050, thus progressing mitigation of our medium- and long-term climate transition risk in this area.

4) Downstream: Short- and medium-term opportunity: In 2022 Union Pacific implemented of a sustainability flag in our customer relationship management (CRM) system, which allows sales representatives who regularly engage our customers to flag companies with expressed interest in climate-related issues. Within the CRM system, our sales representatives can describe climate-related revenue opportunities for further tracking and development by our sales and marketing team. Using the new CRM flag, UP Sales closed over $100 million in sustainability-related revenue opportunities during the first quarter of 2023, with $76 million of that amount being new business or new shipping lanes for our company.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Our enterprise risk management (ERM) process is designed to identify and consider a variety of risks to achieving the Union Pacific's strategic objectives, including climate-related risks. Specifically, we monitor the potential impact of current federal and state regulations as they may affect our revenues, costs, and operational requirements, and evaluate how to mitigate those potential impacts. For example, the use of coal and other fossil fuel commodities to generate electricity has been hampered by complex regulatory frameworks, other legal requirements, and market conditions. According to the Energy Information Administration (EIA) Energy Outlook, the percentage of U.S. electricity generated by coal has declined from approximately 57% in 1988 to 18% in 2022, while the percentage of electricity generated from renewable energy rose from 12% in 1990 to about 22% in 2022. The EIA further projects that coal's share of U.S. electricity production will fall to about 10% in 2050. This secular shift will impact Union Pacific revenues due to decreased demand for coal. The company has responded by increasing support for customers that generate power from renewables, including renewable fuels feedstocks and wind and solar energy equipment components.
Emerging regulation	Relevant, always included	Our enterprise risk management (ERM) process is designed to identify and consider a variety of emerging regulation risks, including climate-related risks, that may impact Union Pacific's strategic objectives, revenues, costs, and operational requirements. We evaluate potential impact mitigation strategies through subject matter experts, and through our active engagement with elected officials. For example, during 2022 UP monitored the California Air Resources Board's proposed In-Use Locomotive Regulation, which includes state-mandated directives for railroads to set aside funds for the future purchase of zero-emission locomotives. Zero-emission technology, however, is still under development, has not yet been tested across the full range of railroad operations, and does not yet exist at the commercial level. UP recognizes the potential impacts that this and other emerging climate-related regulations can impose upon UP and our value chain and works with its trade association (Association of American Railroads) and other railroads to educate regulatory officials and local communities on the potential implications associated with such initiatives. Union Pacific is also committed to decarbonization, as evidenced by our announced plans to purchase battery electric locomotives for testing in yard operations, execution of a three-year deal to modernize 600 additional locomotives starting in 2023, and adoption of science based targets for a 26% reduction of absolute Scope 1 and 2 GHG emissions and Scope 3 locomotive well-to-wheel emissions by 2030.
Technology	Relevant, always included	Technology is monitored as a transition risk driver in our enterprise and operational risk management processes. For example, locomotive emissions comprise 96.5% of our total Scope 1 emissions. Over time, new propulsion technologies like battery-electric, renewable fuels and fuel cell technology may become increasingly viable for use in heavy-haul, long-distance freight locomotives. Our pathway to net zero will depend on the introduction of zero-emissions locomotives into our operations, the locomotives' operational reliability, the availability of support infrastructure, the economics of production and procurement, and public policy and marketplace support. Union Pacific must rely on the critical technology developments of upstream locomotive suppliers to achieve the technological developments required to achieve low- and zero-emissions locomotives. UP considers the loss of one or more of the domestic locomotive suppliers, or any interruption in the development of locomotive emission reduction technology, to be an enterprise risk. As part of UP's enterprise risk management process, UP collaborates with others in our industry, such as locomotive equipment manufacturers, to advance low- and zero-emissions locomotive technology. During 2022 we announced plans to purchase battery electric locomotives for testing in yard operations. For every 10 battery-electric locomotives used, approximately 4,000 tons of carbon will be eliminated annually. The purchases will help locomotive manufacturers develop and assess the locomotives' potential deployment in long-haul service. We also committed to spending more than $1 billion on modernizing 600 locomotives from 2023-2025 with technology improvements. These modernizations should provide approximately 350 tons of carbon reduction per locomotive per year, totaling approximately 210,000 tons in annual emission reductions when fully implemented.
Legal	Relevant, always included	Union Pacific identifies climate-related risk, including litigation and regulatory responses to climate change, to be an enterprise risk. In addition to absorbing increased capital asset and operational costs, the company may be forced to absorb increased costs associated with defending and resolving legal claims related to climate change, including claims that allege a significant impact to climate change from railroad operations. These factors can have a material adverse impact on our results of operations, financial condition, and liquidity. While UP was not sued for climate related risk in 2022, it does monitor such litigation. According to the Sabin-AP U.S. Climate Change Litigation Database, various filed climate cases alleged, for example, that: (1) companies can cause harm if they downplay the threat of climate change; (2) the impacts of resource extraction are linked to climate change and resilience; and (3) particular emissions are the proximate cause of particular adverse climate change impacts. These cases also attempt to establish liability for companies that fail to adapt to or adequately prepare for climate change. In the last example, several cases were filed by investors against companies they believed had not taken enough steps to address climate change risks, specifically related to wildfires. UP's senior management and the Board of Directors evaluate climate-related litigation risks and potential mitigation strategies with the assistance of the company's law department, the Enterprise Risk Committee and outside counsel.
Market	Relevant, always included	Climate-related transition in the marketplace is an enterprise risk for Union Pacific. For example, restrictions on emissions could also affect our customers that (a) use commodities that we carry to produce energy, (b) use significant amounts of energy in producing or delivering the commodities we carry, or (c) manufacture or produce goods that consume significant amounts of energy or burn fossil fuels, including chemical producers, farmers and food producers, and automakers and other manufacturers. Significant cost increases, government regulation, climate-driven shifts in supply or demand, or changes of consumer preferences for goods or services relating to alternative sources of energy, emissions reductions, and GHG emissions could materially affect the markets for the commodities we carry and demand for our services, which in turn could have a material adverse effect on our results of operations, financial condition, and liquidity. In 2022 we completed a climate scenario analysis, which included an analysis focused on potential impacts to UP's bulk agricultural commodity revenues via climate change-driven impacts to ag yields. Net annual revenue impacts to agricultural commodities originated in the U.S. is projected to be approximately $11 million USD in 2030 that shrinks to less than $0.5 million USD by 2050. Projected yield decreases in certain crops were offset by increases in other crop types, or increased yields for the same crop type in other states. Qualitative analysis of the dynamics of agricultural commodities markets revealed that international markets and crop yields are also an important driver in the amount of crop shipment revenue enjoyed by Union Pacific. Further analysis of international climate change-driven crop yields is a necessary next step in understanding this type of climate risk.
Reputation	Relevant, always included	Climate change-related expectations by our stakeholders (shareholders, customers, communities and employees) have grown significantly, with concomitant demands for climate-related performance commitments, transparent disclosure, and climate-benefiting investment. We recognize that with increasing public and investor concerns over climate change, a lack of disclosure on how we identify and manage climate change risks could expose us to potential reputational risk. In 2022, we increased our climate-related disclosures and commitments by formalizing our commitment with the Science Based Target Initiative (SBTi) to revise our near-term emissions reduction target to support a 1.5ºC climate ambition, as well as set and validate a net-zero emissions target. We are also continuing to strengthen the transparency and credibility of the information we publish publicly on climate-related issues, including concerning governance, risks, opportunities and performance. In 2022-2023, climate-related disclosures were included in our 10-K Annual Report, Proxy, Climate Action Plan, Sustainability Data and Metrics webpage, TCFD disclosure, Climate Lobbying Alignment Assessment, and our sustainability website.
Acute physical	Relevant, always included	As a railroad with a vast network of over 32,000 track miles across 23 U.S. states, the company is exposed to severe weather conditions and other natural phenomena that may be triggered or exacerbated by climate change, including hurricanes, wildfires, floods, mudslides, and landslides. Track closures in one region of the company's service area and other related interruptions can adversely affect Union Pacific's entire rail network, which in turn can adversely affect revenue, costs and liabilities. Acute precipitation and flooding also impacts the company by increasing infrastructure maintenance costs and decreasing the velocity of operations. For example, in September 2021, the Company notified investors via an 8-K filing that the financial impact-including revenue, operating expenses and capital investment, of Winter Storm Uri, California wildfires, and heavy rains in the South and Southeast part of the Company's network exceeded $100 million during fiscal year 2021. Our action planning to address increased acute precipitation and flooding is location-specific. Plans prioritize locations with repeated high water events as identified by our historical data and forward-looking climate trend analysis. Additional qualitative and quantitative analysis of candidate projects prioritizes potential flood/washout locations that have 1) additional infrastructure at-risk factors that make them more susceptible to failure, 2) a critical role in our operational fluidity, such as being a major classification yard, 3) have higher train traffic, and 4) adjacent external stakeholders, such as customers or communities. Prioritized projects undergo additional engineering analysis to identify the type of resiliency capital improvement will be most effective, such as reestablishing the drainage system of culverts and ditches, embankment stabilization, working with adjacent landowners to reroute drainage, or nature-based solutions, such as plantings for erosion control.
Chronic physical	Relevant, always included	In 2022, our climate scenario analysis considered the impact of chronic physical transition risks to our company. As our operations span 23 states and are conducted largely outdoors, long-term changes in weather patterns, such as secular shifts in annual temperature and precipitation levels, represent a risk to our infrastructure and our work patterns. For example, chronic shifts in climate patterns, such as increased temperatures could cause rail to expand and buckle, resulting in more track repairs or speed restrictions to avoid derailments. We have engaged our infrastructure maintenance teams to understand the impact of rising temperatures on our track structure and are evaluating ways to refine our inspection and maintenance practices to improve our operational resiliency in the face of higher temperatures. In addition, shifts in climate patterns can also impact the markets and commodities we move. In 2022, we completed an analysis focused on potential impacts to UP's bulk agricultural commodity revenues via climate change-driven impacts to agriculture yields. Projected yield decreases in certain crops were offset by increases in other crop types, or increased yields for the same crop type in other states. Qualitative analysis of the dynamics of agricultural commodities markets revealed that international markets and crop yields are also an important driver in the amount of crop shipment revenue enjoyed by Union Pacific. Further analysis of international climate change-driven crop yields is a necessary next step in understanding this type of climate risk.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?
Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier
Risk 1

Where in the value chain does the risk driver occur?
Downstream

Risk type & Primary climate-related risk driver

Market	Changing customer behavior

Primary potential financial impact
Decreased revenues due to reduced demand for products and services

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Our company's railroad network supports the transportation of coal shipments to independent and regulated power companies and industrial facilities throughout the U.S. Coal shipments contributed nearly 10% of our company's revenue in 2022, and about 10% of our revenue carloads.

According to the U.S. Energy Information Administration (EIA), the percentage of U.S. electricity generated from coal has declined from approximately 39% in 2014 to 20% in 2022. Over a similar period (2014-2022), UP revenue from coal dropped over 50%. Significant cost increases, government regulation, or changes of consumer preferences for goods or services relating to alternative sources of energy, emissions reductions, and GHG emissions could materially affect the markets for the commodities we carry and demand for our services, which in turn could have a material adverse effect on our operations, financial condition, and liquidity. Decreasing cost for renewable energy, including solar, combined with various federal and state regulatory initiatives aimed at reducing the use of fossil fuels and promoting the adoption of renewable energy sources, continues to reduce the demand for coal over the long term, and this will have a continued anticipated impact on UP's shipment of fossil fuel commodities.

Time horizon
Long-term

Likelihood
Very likely

Magnitude of impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
1155972014

Potential financial impact figure – maximum (currency)
1320940919

Explanation of financial impact figure
Union Pacific assessed the potential revenue impacts of a changing electricity generation mix to our bulk business segment during our climate scenario analysis. In this analysis, we evaluated how current revenues from coal transportation to US utilities ($1,321,866,226 in 2021) could change by 2050 in a business-as-usual and low-carbon scenario based on energy demand forecasts through EnerData. We determined that in a business-as-usual scenario, demand for coal could decline 87.45% by 2050 ($1,321,866,226 * 87.45% = $1,155,972,014) and in a low-carbon scenario, demand for coal could decline by 99.93% by 2050 ($1,321,866,226 * 99.93% = $1,320,940,919). The financial figures represent the total potential exposure, before any risk mitigation action. UP also evaluated the potential revenue impacts from other demand indicators (coal consumption in industry, coal consumption in exports, etc.), though the results from these analyses are less material overall compared to power generation in the U.S.

Cost of response to risk
1

Description of response and explanation of cost calculation
Company Specific Situation/Task:
Decreasing cost for renewable energy, including solar, combined with various federal and state regulatory initiatives aimed at reducing the use of fossil fuels and promoting the adoption of renewable energy sources, continues to reduce the demand for coal over the long term, and this will have a continued anticipated impact on UP's shipment of fossil fuel commodities.

Company Specific Actions:
To mitigate the aforementioned market risk, the company is working to increase market share in the transportation of renewable energy infrastructure and alternative fuels. We are actively engaging with existing and potential customers to position the logistics and environmental benefits that rail offers, quickly realizing new production of biodiesel from new production coming online. Efforts include customer education and outreach through our sales and marketing department, including educating current and potential customers on how to ship renewable fuel and feedstocks by rail.

Results:
As an example, between 2018-2022, UP had segment revenue of over $327 million from the shipment of renewable biomass and wind power infrastructure. Union Pacific

expects to be able to continue to support most customers that choose to ship renewable energy, including renewable energy feedstock and wind power generation infrastructure via our current rail infrastructure, and cannot further quantify the cost of responding to the risk due to restrictions governing public disclosure of sensitive forward-looking financial information. Therefore, Union Pacific is estimating the cost to realize the opportunity to be more than $1.00.

Comment

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Flood (coastal, fluvial, pluvial, groundwater)

Primary potential financial impact
Increased capital expenditures

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
As a railroad with a vast network, UP is exposed to severe weather conditions and other natural phenomena, including precipitation extremes such as flooding and droughts, and secondary consequences like wildfires, which can impact business operations, decrease train velocity, cause delays, and disrupt customer service. Extreme weather events also impact the company by increasing track repair, roadbed restoration and maintenance costs. Moreover, line outages or other disruptions in one region of the network have adversely affected operations, with subsequent loss of revenue, in other regions, or the entire rail network. Precipitation extremes and droughts can also create harsh work environments for employees, many of whom work outside while restoring the rail lines impacted by weather extremes, further increasing rail restoration, repair, and maintenance costs.

These events can happen throughout our network but are primarily a concern on floodplains or in mountainous regions. Two areas at significant risk of acute physical risk events are segments of track through Oregon and California, the upper Mississippi (Nebraska, Iowa, and Missouri) and Texas. Approximately 46% of our total network track miles are located in those states, and many of our key operating terminals are located there. From 2018-2022, our network experienced an average of six major acute weather-related events (defined as having at least $1 million in infrastructure recovery costs per event), and the total recovery costs for those major events averaged $29 million per year.

Time horizon
Short-term

Likelihood
More likely than not

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
29000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact figure
Acute flooding-related operation disruptions can affect UP financially. However, the financial impact of an acute weather event is highly dependent on many factors, including but not limited to the type of event, the length of time required to address and restore our infrastructure, the amount of revenue traffic demand potentially at risk due to the event, the event's location on our network, and whether nearby track routes are available to reroute trains. The financial impact figure of $29 million provided in this disclosure represents the 2018-2022 average annual total infrastructure recovery costs of major acute weather-related events (defined as having at least $1 million in infrastructure recovery costs per event. This figure is not representative of total annual costs but instead provides an estimate of the potential infrastructure impact of future similar localized acute weather events.

Cost of response to risk
17000000

Description of response and explanation of cost calculation
Situation/Task:
As climate change is expected to amplify acute physical impacts from severe flooding events on our network, UP continues to focus on improving planning and mitigating measures to harden infrastructure in areas with historical flooding risks. The 2018-2022 average annual total infrastructure recovery costs of major acute weather-related events, especially flooding, where the event required at least $1 million in infrastructure recovery costs per event, was $29 million.

Action:
In 2022, UP explored exposure to extreme weather events during our climate scenario analysis and used customized downscaled climate modeling to further identify future high-risk areas. Once identified, the company addresses high-priority locations by adding or improving drainage or raising track embankments to manage water flow and harden those portions of the network to better protect fluidity of the rail system before damage occurs. Union Pacific manages these types of climate-related risks by investing in those areas deemed susceptible to impact. Example of investments related solely to climate-related event mitigation include raising the height of the track profile to prevent water over the top of the rails, strengthening bridges to combat future flooding issues, and the addition or expansion of culverts to prevent flood waters from washing out the track. Timescale: Analysis of flood modeling project prioritization is ongoing, and projects are initiated and completed annually to address the higher-risk locations.

Result:
Capital expenditures related solely to climate-related event mitigation averaged approximately $17 million annually during 2018-2022. These capital improvements harden

our track infrastructure and reduce the likelihood of acute flooding events damaging or temporarily incapacitating our operations.

Explanation of cost calculation:
Due to the variability and uncertainty of the scope, scale, and location of an acute physical impact weather event on our network, Union Pacific cannot exactly quantify the amount of service recovery response costs for future years; therefore, Union Pacific is estimating the cost to respond to the risk to be $17 million, which is an average of the prior five year history provided above for annual investments made for flood mitigation improvement measures.

Comment

Identifier
Risk 4

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation	Carbon pricing mechanisms

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
<Not Applicable>

Company-specific description
Union Pacific is currently exposed to current and potential future carbon pricing mechanisms because of our corporate GHG emissions, especially Scope 1 emissions, which result from the combustion of fuel in our fleet and facilities. For example, our operations in California are currently exposed to the California Cap and Trade System, and in this region, we have seen fuel prices increase. Union Pacific's Scope 2 and Scope 3 emissions are also exposed indirectly, as supplier could pass on carbon costs to our organization. We monitor carbon price developments using the World Bank Carbon Pricing Dashboard.

Time horizon
Medium-term

Likelihood
Virtually certain

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
310959375

Potential financial impact figure – maximum (currency)
2404519782

Explanation of financial impact figure
The potential financial impact range was calculated by multiplying our corporate GHG emissions by an assumed carbon price for the years 2021-2050, based on the carbon pricing assumptions from our Climate Scenario Analysis. Specifically, UP evaluated a low-carbon scenario where carbon pricing is $130/tCO2e in 2030, $205/tCO2e in 2040, and $250/tCO2e in 2050. The minimum and maximum financial exposure was estimated based on 2 UP emissions scenarios – a business as usual scenario (maximum) where UP emissions remained flat throughout the 2021-2050 forecast period and a science-based target scenario (minimum) where UP meets its current science-based target and sets and achieves and net-zero science-based target by 2050. UP also made assumptions about cost passthrough rates for each emissions scope. Scope 1 passthrough rate = 100%, Scope 2 passthrough rate = 65%, Scope 3 passthrough rate = 42%. The maximum financial impact figure in 2050 was calculated as [(9,236,742 Scope 1 * 100%) + (208,904 Scope 2 * 65%) + (584,642 Scope 3 * 42%)] * $250/tCO2e = $2,404,519,782. The minimum financial impact figure in 2050 was calculated as [(1,127,968 Scope 1 * 100%) + (46,045 Scope 2 * 65%) + (204,620 Scope 3 * 42%)] * $250/tCO2e = $310,959,375.

Cost of response to risk
432582750

Description of response and explanation of cost calculation
The difference between the minimum and maximum financial exposure is based on UP achieving a net-zero target by 2050 which translates to an absolute reduction of 8,651,655 tons CO2e emissions from a 2021 base line. Assuming an abatement cost of $50/tCO2e, this would translate to a total cost of response to risk of $432,582,750. (8,651,655 tCO2e emissions reduction * $50/tCO2e abatement = $432,582,750). The cost of response to risk could be higher or lower if our abatement costs turn out to be different than $50/tCO2e.

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?
Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier
Opp1

Where in the value chain does the opportunity occur?
Direct operations

Opportunity type
Products and services

Primary climate-related opportunity driver
Development and/or expansion of low emission goods and services

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
Railroads are currently the most fuel-efficient way to move freight over land. As more of our customers set science-based targets and begin focusing on reducing their own environmental footprints, we are uniquely positioned to provide lower carbon transportation solutions that can help them reach their targets. Converting traffic to rail from truck offers our customers an immediate reduction in Scope 3 GHG emissions, which we believe will enable us to become a bigger part of our customers' value chains, especially in our intermodal business segment, which competes directly with long-haul trucking. In 2022, we estimate that our customers avoided approximately 23.4 million metric tons of GHG emissions by choosing rail over truck transportation. We communicate the lower emissions benefits of rail versus truck directly to customers via annual emissions savings estimates, marketing communications and sales outreach. More broadly, we communicate to our customers and the public through our published Climate Action Plan, Sustainability Metrics and Framework, CDP and other disclosures.

Locomotive operations are the primary source of our Scope 1 emissions. We have been executing near-term strategies to reduce our emissions annually via improvements in
our operating efficiencies, locomotive fuel efficiency and locomotive modernizations. These strategies have yielded the bulk of our cumulative 18% reduction in Scope 1 GHG emissions compared to our 2018 baseline, and continue to position us to customers as an attractive alternative to trucks.

For example, revenues from our domestic and international intermodal shipments accounted for 22% of our 2022 revenue. Over time, these revenues could continue to increase as we grow our market share of intermodal business by better positioning the environmental benefits with our customers, in conjunction with improved shipment reliability and lowered costs.

Time horizon
Medium-term

Likelihood
More likely than not

Magnitude of impact
Medium

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
1

Potential financial impact figure – maximum (currency)
1040000000

Explanation of financial impact figure
Rail intermodal is the long-haul movement of shipping containers and truck trailers by rail, combined with a truck or water movement at one or both ends. Intermodal combines the best attributes of different transportation modes to yield an efficient, cost-effective total movement. Intermodal freight transport is utilized by a broad cross-section of shippers and represents a continuing, excellent opportunity for our business to convert shippers from truck to rail transportation. In 2022, intermodal accounted for $5.2 billion Union Pacific revenue.

Union Pacific expects to be able to support most intermodal customers that convert their shipping operations from truck to rail, either directly or via the services of a third party logistics provider. Union Pacific cannot specifically quantify the amount of that opportunity due to restrictions governing public disclosure of sensitive forward-looking financial information; therefore, we estimate the opportunity could be more than $1.00 and up to $1.04 billion which represents 20% growth over 2022 total intermodal revenue (total intermodal revenue in 2022=$5,200,000,000 billion * 20% = $1,040,000,000).

Cost to realize opportunity
3620000000

Strategy to realize opportunity and explanation of cost calculation
Company Specific Example:
To realize the opportunity, we are actively engaging with existing and potential customers to position the environmental benefits that rail offers for long-haul shipments of freight over truck. Efforts include customer education and outreach through our sales and marketing department, issuance of carbon emissions statements to customers alerting them to the GHG emissions they avoided in 2022 by utilizing our transportation services vs shipping via truck, and market research to determine which customer segments most value the environmental benefits of using our transport services.

We see many opportunities to grow our intermodal business, whether by providing more services for our customers or by expanding our reach through new transload facilities or pop-up intermodal terminals. We continue to make significant investments in our infrastructure to support our service product, which include both intermodal-specific infrastructure investments as well as investments in our network to improve operational reliability and efficiency.

Results of Our Actions:
We became the primary rail transport provider in the western U.S. for an intermodal carrier, who has one of the largest intermodal fleets in North America, including more than 28,000 company-owned containers and over 45 intermodal ramp locations. Partnering with UP is a pivotal step in their plans to double their intermodal size by 2030. In addition to offering consistent service and greater access to customer markets, the transition to Union Pacific is a crucial piece in furthering their sustainability goals.

Cost to Realize Opportunity / Partially Attributable:

In 2022, our capital programs included spending aligned, but not solely attributable, to capturing this financial opportunity:
- $276 million for line capacity projects, including 24 siding projects to improve operational efficiency
- $308 million for commercial facilities expansions, including finishing the Twin Cities, MN, intermodal terminal to expand customer access to this market and further expanding the West Colton, CA, intermodal terminal
- $800 million for locomotives and freight cars including modernizations of locomotives to improve fuel efficiency and reliability
- $1,890 million to harden our infrastructure by upgrading and maintaining key track infrastructure for improved overall safety, fluidity and efficiency

Comment

Identifier
Opp4

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Markets

Primary climate-related opportunity driver
Access to new markets

Primary potential financial impact
Other, please specify (Increased revenue through demand for lower emissions products and services)

Company-specific description
UP has an opportunity to offset declines in fossil fuel shipments by diversifying its commodity portfolio to include renewable energy, including biofuels. Our trains are ideal for shipping large volumes of freight, including renewable fuels and feedstocks. One train can carry up to three hundred trucks' worth of product. Our transit times for rail can be comparable to over-the-road trucking, and rail is less susceptible to traffic congestion and road construction delays and has the ability to move shipments over long distances quickly and efficiently. We further reduce the shipping cost structure vs trucks when we can introduce a circular shipment in both delivering feedstocks to a biofuels refinery, and distributing the plant's renewable fuels product to transload points. Lastly, shipping by rail is the most environmentally responsible way to ship freight by land: on average, railroads move one ton of freight 454 miles per gallon of fuel, and trains are four times more fuel efficient than trucks. This makes rail a fitting transportation solution for renewable fuels.

Renewable fuels utilization is expected to grow sharply over the short-term: some traditional fuel producers are retooling petroleum refineries to switch to renewable diesel. It's estimated U.S. renewable diesel production capacity will total 5.1 billion gallons per year by the end of 2024, compared to nearly 2.6 billion gallons of production capacity in 2022.

States with high demand for biofuels are located on our network: Historically, California has been the largest consumer of renewable diesel, thanks to the economic benefits offered by the state's Low Carbon Fuel Standard. Texas, the state with the most diesel consumption of any state, and the second most vehicle miles traveled, after California, is the nation's leading consumer of biodiesel.

In 2022, our revenue from renewable diesel fuel shipments was approximately $200 million. Union Pacific cannot specifically forecast the amount of that opportunity due to restrictions governing public disclosure of sensitive forward-looking financial information; however, if we are able to capture incremental revenue from shipping renewable energy in line with the EIA's growth forecasts, the total opportunity would be more than $1.00 and up to $360 million which represents a doubling of the 2022 revenue, not including the potential revenue gain from increased feedstock shipments.

Time horizon
Short-term

Likelihood
More likely than not

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, an estimated range

Potential financial impact figure (currency)
<Not Applicable>

Potential financial impact figure – minimum (currency)
1

Potential financial impact figure – maximum (currency)
360000000

Explanation of financial impact figure
Union Pacific cannot specifically quantify the amount of that opportunity due to restrictions governing public disclosure of sensitive forward-looking financial information; therefore, we estimate the opportunity to be more than $1.00 and up to $360 million which assumes growth in line with overall production growth as forecast by EIA, and represents a 200% increase from the 2022 renewable diesel shipment revenue.

Cost to realize opportunity
500000

Strategy to realize opportunity and explanation of cost calculation
Company Specific Example:
To realize the opportunity, we are actively engaging with existing and potential customers to position the logistics and environmental benefits that rail offers, quickly realizing new production of biodiesel from new production coming online. Efforts include customer education and outreach through our sales and marketing department, including educating current and potential customers on how to ship renewable fuel and feedstocks by rail.

Cost to Realize Opportunity:
Union Pacific expects to be able to support most customers that choose to ship renewable fuels and feedstocks. The costs of communicating with our customers and exploring opportunities to position our service is included in the Marketing and Sales functional budgets. The total costs associated with internal resource time, advertising, and consultants are estimated to be approximately $500,000 annually.

Comment

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a climate transition plan that aligns with a 1.5°C world?

Row 1

Climate transition plan

Yes, we have a climate transition plan which aligns with a 1.5°C world

Publicly available climate transition plan

Yes

Mechanism by which feedback is collected from shareholders on your climate transition plan

We have a different feedback mechanism in place

Description of feedback mechanism

Union Pacific regularly engages with investors, customers, suppliers, industry trade groups, and policymakers to receive feedback on our climate transition plan.

• Company representatives meet regularly with shareholders and analysts in discussion of UP's climate transition plan.
• In 2022, Union Pacific assembled an internal, ongoing Marketing & Sales Sustainability Insights Team to better understand what sustainability-related issues and initiatives are most important to our customers. The team provided customer perspectives on our sustainability tools, climate strategies and low-carbon offerings, and identified sustainability-related opportunities with customers. We also directly engage customers regarding their requests for climate-related data about our company, and provided over 1,150 customers with specific annual emissions savings statements estimating what their actual shipments with Union Pacific had saved in reduced GHG emissions versus utilizing trucks.
• We collaborate with our supply chain to activate portions of our climate transition plan and receive feedback. Our strategic partnerships with locomotive manufacturers, for example, include testing of prototype battery-electric locomotives. We are working hand-in-hand with our locomotive and fuel suppliers to increase our use of renewable diesel and biofuels. We are also engaging with our upstream suppliers to better understand their emissions reduction activities so that we can better measure reductions in our Scope 3 emissions.
• Union Pacific is an active member of the Association of American Railroads' Decarbonization Working Group, where freight railroads collaborate on climate transition initiatives and approaches.
• We frequently engage government policymakers, such as the Federal Railroad Administration, the EPA, and state regulatory agencies to discuss and receive feedback on our climate transition plans.

Frequency of feedback collection

More frequently than annually

Attach any relevant documents which detail your climate transition plan (optional)

Our Climate Action Plan is our climate transition plan and is updated annually. Our Proxy contains details of our climate transition plan for investors, see pp 5, 9-11, 33-34.
pdf_unp_proxy_040523 (3).pdf
pdf_up_2022_climate_action_pln (1).pdf

Explain why your organization does not have a climate transition plan that aligns with a 1.5°C world and any plans to develop one in the future

<Not Applicable>

Explain why climate-related risks and opportunities have not influenced your strategy

<Not Applicable>

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy	Primary reason why your organization does not use climate-related scenario analysis to inform its strategy	Explain why your organization does not use climate-related scenario analysis to inform its strategy and any plans to use it in the future
Row 1	Yes, qualitative and quantitative	<Not Applicable>	<Not Applicable>

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios: Customized publicly available transition scenario	Company-wide	1.5ºC	To assess our company's transition risks, Union Pacific developed a 1.5ºC aligned, low-carbon climate scenario using a variety of publicly available transition scenarios including the IEA NZE 2050, EIA Low Renewables Cost Case, and EnerFuture's EnerGreen scenario. Union Pacific used multiple public transition scenarios to source the data and context suitable to our company's business activities, including operations, suppliers, and customers. Based on the scenarios, one area we conducted quantitative analysis on was to assess the potential impacts of carbon pricing exposure to our business. We also conducted qualitative analysis of potential climate transition impacts to our operations, business mix, and stakeholder relations. Parameters: Our use of NZE 2050, EIA Low Renewables Cost, and EnerFuture's Energreen scenarios reflect an economy that reaches net-zero by 2050, with rapid decarbonization in the power generation and transportation sectors through renewables and electrification. However, even in this scenario, global emissions drive up U.S. mean air temperatures 1.4°C above pre-industrial levels by 2050. Assumptions: This scenario assumes that climate policy is a significant driver of transition costs, and carbon pricing reaches notable highs - $250/tonne by 2050. We made assumptions regarding the overall level of exposure Union Pacific could have to carbon pricing mechanisms in the future, and the ability of our suppliers to pass carbon pricing on to us, and our ability to pass carbon pricing on to our customers. Analytical methods and choices: To conduct the carbon price financial exposure analysis, we multiplied our assumed overall level of exposure to carbon pricing mechanisms in the future by the scenarios' forecasted carbon cost, and discounted it by the assumed cost pass-through percentages for our suppliers and our company. Scenario inputs included UP GHG emissions for our 2018 baseline year, emissions trending up to 2050, and Scope 3 emissions from purchased goods, services, and capital purchases. We determined that a long-term time horizon until 2050 for the analysis was relevant for our business as it aligns with our net-zero emissions ambition.
Physical climate scenarios: RCP 8.5	Company-wide	<Not Applicable>	To assess our company's physical risks, Union Pacific used climate data projections, including temperature and precipitation, from the IPCC's RCP 8.5 scenario. Analysis focused on potential impacts to bulk agricultural commodity revenues via climate change-driven impacts to agriculture yields. Parameters: The RCP 8.5 scenario is a high-emissions scenario that combines assumptions about high population with modest rates of technological change and energy intensity improvements, leading in the long term to high energy demand and greenhouse gas emissions in absence of climate change policies. The RCP 8.5 pathway delivers a temperature increase of about 4.3˚C by 2100. The crop yield projections derived from RCP 8.5 were used to forecast potential impact to our agricultural commodity customers. Assumptions: We used 2021 bulk revenues from agricultural commodities as a baseline, assuming no change in market share or pricing for the agricultural impact study. Analytical methods and choices: To conduct the carbon price financial exposure analysis, we used the RCP 8.5 forecasts of changes to agricultural yields against our current agriculture commodity revenues by state, noting the changing yields for each major commodity over time up to 2050. We determined that a long-term time horizon until 2050 for the analysis was relevant for our business as it aligns with our net-zero emissions ambition.
Physical climate scenarios: Customized publicly available physical scenario	Company-wide	4.1ºC and above	To assist with assessing our company's physical risks from flooding and high-water events, Union Pacific used climate data projections for temperature and precipitation in conjunction with a consultant modeling tool to project impacts to company infrastructure due to high-precipitation and 100-year flood events. Impact assessment results are based on projections from the RCP 8.5 scenario. Parameters: The RCP 8.5 scenario is a high-emissions scenario that assumes high future emissions leading to a temperature increase of about 4.3˚C by 2100. Our analysis used the 99th percentile daily precipitation indicator to assess UP's future flood risk for the top 50 subdivisions (railroad freight routes). Assumptions: We assumed that high-water events are typically the result of high amounts of precipitation. The 99th percentile daily precipitation was considered representative of a precipitation amount conducive to a flooding event. Sites with the highest number of events were considered the most important for assessing future flood risk. Analytical choices: To conduct the flood risk analysis, we organized UP's subdivisions by the frequency of high-water events that occurred from May 2010 – May 2022. The sites covering the top ~50% of events were selected for the impact assessment. The long-term horizon (2022-2050) was selected to better understand exposure and plan network resilience measures.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

Carbon Pricing

1. Under a 1.5ºC aligned, low-carbon climate transition scenario (IEA NZE 2050, EIA Low Renewables Cost Case, and EnerFuture's EnerGreen scenarios), what could be the range of financial impact of the increase in carbon pricing on our operations?
2. Which GHG emissions category (Scope 1, 2, or 3) should we focus our decarbonization efforts on? What percentage of the scenario's financial impact is attributable to our Scope 1 (primarily locomotive GHG) emissions, Scope 2 emissions, and Scope 3 emissions?
3. How would the financial impact of this risk vary, depending on how quickly we achieve our net-zero emissions goal?

Agricultural Yields

1. Under an RCP 8.5 scenario, what would be the financial impact of changing agricultural yields by state for each commodity, assuming no other changes (such as market share)?
2. Under the RCP 8.5 scenario, which agricultural commodities are most likely to be impacted for our service area?
3. (Qualitative): What is Union Pacific's ability to adjust to decreasing or increasing agricultural yields? To what extent does changes in worldwide agricultural yields for those same commodities make a difference to Union Pacific?

Flooding

1. Which track network subdivisions are projected to be at greater risk than today due to climate change-driven increases in acute precipitation/flooding? What is the order of magnitude of change in risk?
2. What types of actions could we take to address these risk increases?

Results of the climate-related scenario analysis with respect to the focal questions

Carbon Pricing:

The analysis indicated that under a 1.5ºC aligned, low-carbon climate scenario with national carbon pricing implemented and Union Pacific emitting under a business-as-usual scenario, the company could be exposed to financial impact in excess of ~$1.25 billion USD annually by 2030 and $2.4 billion USD annually by 2050. Most of UP's Scope 1-derived carbon price exposure (96.5%) comes from Scope 1 emissions (combustion of fuel), primarily from locomotives.

In a SBT emissions scenario with carbon pricing aligned to a 1.5°C future and where UP reaches net-zero by 2050, UP could be exposed to a carbon pricing financial impact in excess of ~$1.15 billion USD annually by 2030 and $0.3 billion USD annually by 2050. Potential risk mitigation measures include earlier or more aggressive GHG emissions reductions, the partial pass-through of costs to customers, and the purchase of lower-carbon products from suppliers.

These results have reinforced our commitment to achieving our climate target and decarbonization strategy, which will reduce carbon pricing exposure. One immediate opportunity to mitigate potential carbon pricing exposure is increased utilization of renewable fuels in locomotives. We have a public target to increase low-carbon fuels consumption to 10% of our total diesel consumption by 2025 and 20% by 2030. To facilitate this, we are adding more locomotive fueling locations using low-carbon fuels and have begun infrastructure design work for additional storage and blending infrastructure for implementation by 2030.

Agricultural Yields:

Net revenue impacts to agricultural commodities originated in the U.S. is projected to be approximately $11 million USD in 2030 that shrinks to under $0.5 million USD by 2050. Projected yield decreases in certain crops were offset by increases in other crop types, or increased yields for the same crop type in other states. Qualitative analysis of the dynamics of agricultural commodities markets revealed that international markets and crop yields are also an important driver in the amount of crop shipment revenue enjoyed by Union Pacific. Further analysis of international climate change-driven crop yields is a necessary next step in understanding this type of climate risk.

Flooding:

The climate scenario for increased flooding projected that eight subdivisions could, by 2050, incur 99th percentile one-day historical precipitation annually. Our action planning to address this increased risk includes budgeting approximately $20 million USD annually for prioritized locations with 1) repeated high water events 2) additional infrastructure at-risk factors that make them more susceptible to failure, and 3) a critical role in our operational fluidity. Improvements include reestablishing the drainage system of culverts and ditches, embankment stabilization, working with adjacent landowners to reroute drainage, or nature-based solutions, such as plantings for erosion control.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Situation: Recognizing the need to address climate-related risks and opportunities as customers seek low-carbon transportation services, we recognize that locomotive operations are our greatest source of GHG emissions. In 2022, locomotive emissions comprised 96.5% of our total calculated emissions. Task: Accordingly, most of our focus in reducing our carbon footprint is on our locomotive operations in order to meet our 2030 SBTi validated GHG emissions reduction goal and improve our value proposition to our customers who seek lower Scope 3 emissions from their logistics partners. Through these efforts, the company intends to encourage or otherwise facilitate a sustained shift of freight transport from long haul truck to rail. Our Actions We are adopting technology that reduces fuel consumption, improves locomotive productivity, and reduces GHG emissions per locomotive. Examples include: 1) Locomotive Energy Management System (EMS) locomotives, which works like cruise control, automatically controlling a locomotive's throttle and dynamic brake to reduce fuel usage and minimize GHG emissions. EMS has been implemented in approximately two thirds of our active road fleet with a target of full implementation by 2025. 2) In 2022, we announced an agreement worth more than $1 billion for 600 locomotive modernizations. Compared to existing technology, the modernizations will yield a fuel-efficiency improvement of up to 18%, and increased reliability and capacity, resulting in fewer locomotives required to haul our freight. 3) Increasing the use of renewable diesel and biodiesel fuels currently represents the most promising avenue to help Union Pacific meet its science-based target. We are working to increase the percentage of low-carbon fuels consumed to 10% of our total diesel consumption by 2025 and push that number to 20% by 2030. Results - We estimate that EMS will reduce our absolute GHG emissions by 4% annually by 2025. - In 2022, we completed a portion of the locomotive modernizations, with full completion of all 600 units expected by the end of 2025. When completed, the total order will enable Union Pacific to realize approximately 210,000 tons in annual emission reductions. - In 2022, we increased our biofuels utilization to 4.5% of total diesel consumed.
Supply chain and/or value chain	Yes	Situation: Climate change is anticipated to impact the volatility of specific industrial sectors and markets, including agriculture. Approximately 23% of UP's 2022 revenues were derived from shipments of grain and grain products, fertilizer, and food products. Task/Action: In 2022, we conducted an extensive climate scenario analysis under both high-carbon and low-carbon future scenarios. Part of the analysis included modeling the impact of chronic temperature increases on agriculture yields in our service area, particularly the Midwest. Result: Net revenue impacts to agricultural commodities originated in the U.S. is projected to be small, with a projected annual decrease of approximately $11 million USD in 2030 that shrinks to less than $0.5 million USD by 2050. Projected yield decreases in certain crops were offset by increases in other crop types, or increased yields for the same crop type in other states. Qualitative analysis of the dynamics of agricultural commodities markets revealed that international markets and crop yields are also an important driver in the amount of crop shipment revenue enjoyed by Union Pacific. Further analysis of international climate change-driven crop yields is a necessary next step in understanding this type of climate risk. The findings of scenario analysis have helped inform our customer engagement strategy and enhanced our understanding of how market-specific demand for freight rail transportation could evolve over time.
Investment in R&D	Yes	Situation: Current advances in low- or zero-emission passenger vehicles are encouraging, but we believe additional research and development is required before our industry can adopt zero emissions locomotives at scale. Task: By working with locomotive manufacturers who are developing new, low- and zero-emissions propulsion technologies for locomotives, Union Pacific hopes to advance technology development and evaluate its potential deployment in long-haul service. Our Actions: 1) In January 2022, we announced plans to work with locomotive OEMs to develop battery-electric locomotives for testing in yard operations. The combined purchases and required upgrades to yard infrastructure to support battery-electric locomotive operations are expected to be up to $100 million, which would represent the largest investment in battery-electric technology by a U.S. Class I railroad. The locomotives will be tested for performance in cold and warm weather, helping identify the locomotives' capabilities and challenges for broader deployment. 2) In 2022, we announced a partnership with ZTR, a leader in locomotive control systems, to build hybrid-electric locomotives. The locomotives will work much like a plug-in hybrid car, capable of operating in multiple modes. We plan to use the lessons learned from this project to inform our thinking about our long-term transition of our existing fleet to low- and zero-emissions technology. 3) To reach our goals related to the consumption of low-carbon fuels, more of our locomotive model types must be certified as compatible with higher blends of low-carbon fuels. We continue to collaborate with domestic locomotive manufacturers on testing and approving use of blends of biofuel and renewable diesel for use in nearly every major locomotive model we operate. Results 1) For every 10 battery-electric locomotives used, approximately 4,000 tons of carbon will be eliminated annually. Due to supply chain challenges and the complexity associated with design, we now expect delivery of our first units no earlier than late 2024. 2) Preliminary design for the ZTR hybrid switch locomotive estimate a savings of approximately 450 tCO2e per unit annually. 3) We expect to implement results from the low-carbon fuel testing into our fueling plans during 2024. This will enable UP to progress its goal of 20% biofuels utilization by 2030.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Operations	Yes	Situation: Our strategy is to move cars faster and reduce the number of times each car is touched, resulting in terminal consolidation opportunities, improved asset utilization, and fewer car classifications, which in turn leads to products getting to the market quicker and more reliably. The result is a better customer experience, which enables us to grow our market share. Climate-related opportunities, such as increasing customer expectations for reliable, efficient, low-carbon transportation services that reduce their Scope 3 emissions, have influenced our operations strategy by reinforcing the importance of operating and fuel efficiencies as a key lever for achieving both our business growth and climate-related goals. Task: Locomotive operations are the primary source of our Scope 1 emissions. Our near-term strategies to reduce our emissions depend in part on annual improvements in our operating efficiencies, locomotive fuel efficiency, and locomotive productivity. Our Actions and Results: Operating efficiency strategies have yielded the bulk of our cumulative 18% reduction in locomotive GHG emissions compared to our 2018 baseline, with fuel efficiencies as a key driver. For the fourth consecutive year, we achieved a best-ever fuel consumption rate, improving 1% versus 2021. Examples include: 1) Since 2018, Union Pacific has implemented changes to its transportation plan to eliminate unnecessary work, increasing freight car velocity across our network. Faster movement and decreased dwell time for trains in terminals reduces fuel consumption, which reduces GHG emissions. 2) A focus on network efficiency, longer train lengths, and improved locomotive reliability through modernizations has improved locomotive productivity from 106 gross ton-miles per horsepower-day in 2018 (our baseline year) to 125 GTMs/HP-Day, an 18% increase. Average max train length has increased over the same period by 33%. Higher productivity typically reduces the required number of locomotives in our fleet, allowing us to retire or store our least-efficient units, improving our average fuel efficiency. 3) We use automatic shutdown technology on many of our locomotives to prevent unnecessary engine idling. Additional operating practices have allowed us to further reduce overall locomotive energy consumption by about 6% from 2018 to 2022

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Capital expenditures Capital allocation Access to capital Assets	Revenue As part of our financial planning processes, we assess the potential revenues and growth projections from individual commodity groups, which include impacts of climate-related risks and opportunities. Examples of how climate risks and opportunities influence this process include: - Analyzing intermodal market trends and opportunities to create modal shift from trucks to rail, as customers demand more environmentally friendly and fuel-efficient options for freight transportation - Projecting the demand for coal and other fossil fuel transportation in light of policymaker regulatory initiatives to boost green energy sources - Creating support and initiatives to capture additional revenue from growing commodity markets in renewable power, such as biofuels, biomass feedstocks, and wind and solar infrastructure. The time horizon for our financial planning related to revenues covers three years and is coordinated with resource and financial planning in other areas (procurement, capital investment, etc.). Direct Costs Climate-related opportunities, such as increasing customer expectations for reliable, efficient, low-carbon transportation services that reduce their Scope 3 emissions have influenced our operations strategy by reinforcing the importance of operating and fuel efficiencies as a key lever for achieving both our business growth and climate-related goals. Our company-specific targets to increase the percentage of low-carbon fuels consumed to 10% of our total diesel consumption by 2025 and 20% by 2030 will influence our direct cost financial planning as we manage the (currently) higher cost of biofuels vs fossil fuel-based petroleum. Our utilization of biofuels has grown from 3.0% of total diesel used in 2021 to 4.5% in 2022. Capital Expenditures In 2022, our capital programs totaled approximately $3.6 billion, and included spending in part aligned to climate-related issues and opportunities: - $276 million for line capacity projects, including 24 siding projects to improve operational efficiency - $308 million for commercial facilities expansions, including finishing the Twin Cities, MN, intermodal terminal to expand customer access to this market and further expanding the West Colton, CA, intermodal terminal to support modal shift from trucks to rail. - $800 million for locomotives and freight cars including modernizations of locomotives to improve fuel efficiency and reliability - $1,890 million to harden our infrastructure by upgrading and maintaining key track infrastructure for improved overall safety, fluidity and efficiency Capital Allocation Union Pacific also annually allocates capital expenditures towards infrastructure investments in those areas deemed susceptible to impact from acute physical risks. Examples of investments related solely to climate-related event mitigation include raising the height of the track profile to prevent water over the top of the rails, strengthening bridges to combat future flooding issues, and the addition or expansion of culverts to prevent flood waters from washing out the track. Capital expenditures related solely to climate-related event mitigation have average $17 million over the past five years. Assets As part of our financial planning process, our Transportation and Engineering functions allocate specific budgets to that support operational and asset plans to prevent and mitigate potential disruptions to our network from extreme weather events, such as acute precipitation/flooding/snow, wildfire, and acute temperature swings. Access to Capital In 2022, Union Pacific issued $600 million in green bonds to support investments that will reduce the railroad's carbon footprint. Proceeds from the bond will be exclusively applied to climate-related or environmentally friendly projects, such as but not limited to, the purchase of battery electric locomotives, locomotive modernizations, expansion of intermodal terminals, new and extended passing sidings, and the development of onsite and offsite solar and wind farms for the generation and distribution of renewable energy. Infrastructure and rolling stock for routes dedicated to the transportation of fossil fuels do not qualify for proceeds from the green bonds. This bond issue demonstrates UP's commitment to our SBTi near-term target and net-zero ambition. After the issuance of any green financing, Union Pacific intends to report via its website on the allocation of an amount equal to the net proceeds to eligible projects, and the positive environmental impacts related to those projects. Updates will continue at least annually until full allocation and as necessary thereafter in the event of material developments.

C3.5

(C3.5) In your organization's financial accounting, do you identify spending/revenue that is aligned with your organization's climate transition?

	Identification of spending/revenue that is aligned with your organization's climate transition	Indicate the level at which you identify the alignment of your spending/revenue with a sustainable finance taxonomy
Row 1	Yes, we identify alignment with our climate transition plan	<Not Applicable>

C3.5a

(C3.5a) Quantify the percentage share of your spending/revenue that is aligned with your organization's climate transition.

Financial Metric
Revenue/Turnover

Type of alignment being reported for this financial metric
Alignment with our climate transition plan

Taxonomy under which information is being reported
<Not Applicable>

Objective under which alignment is being reported
<Not Applicable>

Amount of selected financial metric that is aligned in the reporting year (unit currency as selected in C0.4)
20092000000

Percentage share of selected financial metric aligned in the reporting year (%)
87

Percentage share of selected financial metric planned to align in 2025 (%)

Percentage share of selected financial metric planned to align in 2030 (%)

Describe the methodology used to identify spending/revenue that is aligned
Union Pacific is committed to reaching net-zero GHG emissions. In 2022 we joined the Business Ambition for 1.5°C, an alliance of more than 3,000 companies pledged to taking bold action to limit global warming to 1.5°C. As part of that pledge, we committed to the Science Based Targets Initiative (SBTi) to revalidate our short-term target in line with the 1.5°C global warming scenario and develop a long-term, science-based target to reach net-zero value chain GHG emissions by 2050.

As part of our commitment, we see important opportunities to work with our customers to help them reduce their transportation supply chain emissions and meet their decarbonization targets, by leveraging rail for the long haul and trucking over shorter distances. Shipping via rail cars instead of trucks enables customers to utilize a lower-carbon transportation product for the majority of their shipment miles, as a typical UP freight train is on average three to four times more fuel efficient per freight ton-mile than truck transportation, equating to up to a 75% reduction in transportation related CO2e emissions. As a result of this efficiency, our low-carbon transportation services help customers avoid and/or reduce GHG emissions that would otherwise be generated from more carbon-intensive modes of transportation. In 2022 UP's GHG emissions intensity was below the 25 gCO2e/tkm emissions threshold criteria for the low-carbon transport sector, per the Climate Bonds Taxonomy and the low-carbon transport universal freight threshold for all types of freight transport on the IEA's 2 Degrees Scenario Freight Activity Mode.

The 87% of total revenue related to providing low carbon freight transportation goods and services includes our freight revenue for intermodal, industrial and bulk shipments, excluding coal, petcoke, petroleum, and liquid petroleum gas.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?
Absolute target

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number
Abs 1

Is this a science-based target?
Yes, and this target has been approved by the Science Based Targets initiative

Target ambition
Well-below 2°C aligned

Year target was set
2021

Target coverage
Company-wide

Scope(s)
Scope 1
Scope 2
Scope 3

Scope 2 accounting method
Location-based

Scope 3 category(ies)
Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2)

Base year
2018

Base year Scope 1 emissions covered by target (metric tons CO2e)
11313933

Base year Scope 2 emissions covered by target (metric tons CO2e)
277200

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 2: Capital goods emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target (metric tons CO2e)
3624596

Base year Scope 3, Category 4: Upstream transportation and distribution emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 5: Waste generated in operations emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 6: Business travel emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 7: Employee commuting emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 8: Upstream leased assets emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 10: Processing of sold products emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 11: Use of sold products emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 13: Downstream leased assets emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 14: Franchises emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 15: Investments emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Other (upstream) emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Other (downstream) emissions covered by target (metric tons CO2e)
<Not Applicable>

Base year total Scope 3 emissions covered by target (metric tons CO2e)
3624596

Total base year emissions covered by target in all selected Scopes (metric tons CO2e)
15215729

Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1
100

Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2
100

Base year Scope 3, Category 1: Purchased goods and services emissions covered by target as % of total base year emissions in Scope 3, Category 1: Purchased goods and services (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 2: Capital goods emissions covered by target as % of total base year emissions in Scope 3, Category 2: Capital goods (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions covered by target as % of total base year emissions in Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)
95

Base year Scope 3, Category 4: Upstream transportation and distribution covered by target as % of total base year emissions in Scope 3, Category 4: Upstream transportation and distribution (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 5: Waste generated in operations emissions covered by target as % of total base year emissions in Scope 3, Category 5: Waste generated in operations (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 6: Business travel emissions covered by target as % of total base year emissions in Scope 3, Category 6: Business travel (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 7: Employee commuting covered by target as % of total base year emissions in Scope 3, Category 7: Employee commuting (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 8: Upstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 8: Upstream leased assets (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 9: Downstream transportation and distribution emissions covered by target as % of total base year emissions in Scope 3, Category 9: Downstream transportation and distribution (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 10: Processing of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 10: Processing of sold products (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 11: Use of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 11: Use of sold products (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 12: End-of-life treatment of sold products emissions covered by target as % of total base year emissions in Scope 3, Category 12: End-of-life treatment of sold products (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 13: Downstream leased assets emissions covered by target as % of total base year emissions in Scope 3, Category 13: Downstream leased assets (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 14: Franchises emissions covered by target as % of total base year emissions in Scope 3, Category 14: Franchises (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Category 15: Investments emissions covered by target as % of total base year emissions in Scope 3, Category 15: Investments (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Other (upstream) emissions covered by target as % of total base year emissions in Scope 3, Other (upstream) (metric tons CO2e)
<Not Applicable>

Base year Scope 3, Other (downstream) emissions covered by target as % of total base year emissions in Scope 3, Other (downstream) (metric tons CO2e)
<Not Applicable>

Base year total Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)
58

Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes
85

Target year
2030

Targeted reduction from base year (%)
26

Total emissions in target year covered by target in all selected Scopes (metric tons CO2e) [auto-calculated]
11259639.46

Scope 1 emissions in reporting year covered by target (metric tons CO2e)
9266469

Scope 2 emissions in reporting year covered by target (metric tons CO2e)
237327

Scope 3, Category 1: Purchased goods and services emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 2: Capital goods emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 3: Fuel-and-energy-related activities (not included in Scopes 1 or 2) emissions in reporting year covered by target (metric tons CO2e)
2917165

Scope 3, Category 4: Upstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 5: Waste generated in operations emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 6: Business travel emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 7: Employee commuting emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 8: Upstream leased assets emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 9: Downstream transportation and distribution emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 10: Processing of sold products emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 11: Use of sold products emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 12: End-of-life treatment of sold products emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 13: Downstream leased assets emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 14: Franchises emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Category 15: Investments emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Other (upstream) emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Scope 3, Other (downstream) emissions in reporting year covered by target (metric tons CO2e)
<Not Applicable>

Total Scope 3 emissions in reporting year covered by target (metric tons CO2e)
2917165

Total emissions in reporting year covered by target in all selected scopes (metric tons CO2e)
12420961

Does this target cover any land-related emissions?
No, it does not cover any land-related emissions (e.g. non-FLAG SBT)

% of target achieved relative to base year [auto-calculated]
70.6447104329191

Target status in reporting year
Underway

Please explain target coverage and identify any exclusions
Union Pacific announced its target to reduce absolute Scope 1 and 2 GHG emissions and GHG emissions on a well-to-wheel basis from locomotive operations 26% by 2030 from a 2018 baseline. Well-to-wheel emissions include well-to-tank emissions, which are Scope 3 emissions generated upstream in the value chain during fuel production and transport, and tank-to-wheel emissions, which are Scope 1 emissions related to the consumption of the fuel. All other Scope 3 emissions (capital goods, purchased goods and services, etc.) are excluded from this target.

Plan for achieving target, and progress made to the end of the reporting year
Over the short term, continued progress on fuel efficiency initiatives and operational productivity, coupled with increased utilization of low-carbon fuels, are key to achieving our short-term 2030 science-based target. We have also announced investments in battery-electric and hybrid propulsion technology and are developing partnerships that will help us develop solutions to achieve our long-term net-zero target. Union Pacific already has made significant progress toward its science-based target with its efficiency gains achieved through the implementation of operational efficiencies and fuel-saving initiatives. As the Scope 3 component of our 2030 target covers emissions from fuel and energy-related activities, these initiatives taken to reduce Scope 1 emissions from running locomotives more efficiently will result in reducing the volume of fuel purchased.

List the emissions reduction initiatives which contributed most to achieving this target
<Not Applicable>

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?
Target(s) to increase low-carbon energy consumption or production
Net-zero target(s)

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number
Low 1

Year target was set
2021

Target coverage
Company-wide

Target type: energy carrier
Other, please specify (renewable diesel and biodiesel fuels)

Target type: activity
Consumption

Target type: energy source
Renewable energy source(s) only

Base year
2018

Consumption or production of selected energy carrier in base year (MWh)
334317

% share of low-carbon or renewable energy in base year
1.2

Target year
2030

% share of low-carbon or renewable energy in target year
20

% share of low-carbon or renewable energy in reporting year
4.55

% of target achieved relative to base year [auto-calculated]
17.8191489361702

Target status in reporting year
Underway

Is this target part of an emissions target?
No.

Is this target part of an overarching initiative?
Science Based Targets initiative

Please explain target coverage and identify any exclusions
We are working to increase the percentage of renewable fuels consumed to 10% of our total diesel consumption by 2025 and push that number to 20% by 2030. Along with reductions resulting from more efficient operations and reduced fuel consumption, the achievement of these alternative fuel goals would enable us to meet our science-based target. In February 2021, Union Pacific announced its target to reduce absolute Scope 1 and 2 GHG emissions and GHG emissions on a well-to-wheel basis from locomotive operations 26% by 2030 from a 2018 baseline. Well-to-wheel emissions include well-to-tank emissions, which are Scope 3 emissions generated upstream in the value chain during fuel production and transport, and tank-to-wheel emissions, which are Scope 1 emissions related to the consumption of the fuel. The target boundary includes biogenic emissions and removals from bioenergy feedstocks and has been validated by the Science Based Target initiative (SBTi).

Plan for achieving target, and progress made to the end of the reporting year
To facilitate our increased use of low-carbon fuels, we added more locomotive fueling locations using low-carbon fuels, including Los Angeles, Houston, Roseville, Des Moines and Baton Rouge. Additionally, we have analyzed our network fueling locations and begun infrastructure design work for new and retrofitted storage and blending infrastructure to further increase our usage of low-carbon fuels each year. For the 2022 reporting year, the percentage of renewable fuels consumed grew from 3.0% to over 4.5%.

To reach our goals related to the consumption of low-carbon fuels, more of our locomotive model types must be certified as compatible with higher blends of low-carbon fuels. We continue to collaborate with other North American freight railroads and with domestic locomotive manufacturers on testing and approving use of blends of biofuel and renewable diesel for use in nearly every major locomotive model we operate and expect to implement results from the testing into our fueling plans during 2024. We are also working with our fuel supply-chain partners to secure supplies of low-carbon fuels to meet both our current and projected future needs. Additionally, we believe governmental and regulatory action is necessary to encourage the supply of biodiesel and renewable diesel in the 23 states where we operate. Federal and state government policies should harness market principles to encourage the development and deployment of low-carbon fuels. We are working to develop policy strategies through the Decarbonization Working Group of the Association of American Railroads (AAR) to support this effort.

List the actions which contributed most to achieving this target
<Not Applicable>

C4.2c

(C4.2c) Provide details of your net-zero target(s).

Target reference number
NZ1

Target coverage
Company-wide

Absolute/intensity emission target(s) linked to this net-zero target
Abs1

Target year for achieving net zero
2050

Is this a science-based target?
Yes, we consider this a science-based target, and we have committed to seek validation of this target by the Science Based Targets initiative in the next two years

Please explain target coverage and identify any exclusions
Union Pacific is committed to reaching net-zero GHG emissions. In 2022 we joined the Business Ambition for 1.5°C, an alliance of more than 3,000 companies pledged to taking bold action to limit global warming to 1.5°C. As part of that pledge, we committed to the Science Based Targets Initiative (SBTi) to revalidate our short-term target in line with the 1.5°C global warming scenario and develop a long-term, science-based target to reach net-zero value chain GHG emissions by 2050. This net-zero target will be aligned with our Science Based Target which covers our total (100%) Scope 1 and 2 emissions, and a subset of Scope 3 emissions, per SBTi's guidance. We will publish both targets after they are validated by SBTi.

Do you intend to neutralize any unabated emissions with permanent carbon removals at the target year?
Unsure

Planned milestones and/or near-term investments for neutralization at target year
<Not Applicable>

Planned actions to mitigate emissions beyond your value chain (optional)

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.
Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	9	623736
Implementation commenced*	9	564545
Implemented*	13	354083
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in buildings	Other, please specify (LED lighting at facilities)

Estimated annual CO2e savings (metric tonnes CO2e)
735

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 2 (location-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period
4-10 years

Estimated lifetime of the initiative
11-15 years

Comment

We are continuing to reduce our Scope 2 emissions by reducing our electricity consumption at our buildings and yards via LED lighting infrastructure conversions, HVAC efficiency improvements, and air compressor upgrade projects. Additional similar projects have commenced implementation and will be completed in future reporting periods.

Initiative category & Initiative type

Energy efficiency in production processes	Other, please specify (equipment modernization)

Estimated annual CO2e savings (metric tonnes CO2e)
47348

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

Investment required (unit currency – as specified in C0.4)

Payback period
Please select

Estimated lifetime of the initiative
16-20 years

Comment
In 2022, we announced the largest-ever investment in modernized locomotives in rail industry history: an agreement for 600 locomotive modernizations, worth more than $1 billion. Compared to existing technology, the modernizations will include next-generation controls and a fuel-efficiency improvement of up to 18%. Increased reliability and capacity result in fewer locomotives required to haul our freight. The modernizations also support the circular economy, with components comprising more than half the locomotive's weight being reused. Expected to be fully completed for all 600 units by the end of 2025, the total order will enable Union Pacific to realize approximately 210,000 tons in annual emission reductions, equivalent to removing emissions from nearly 45,000 passenger cars per year.

Initiative category & Initiative type

Low-carbon energy consumption	Liquid biofuels

Estimated annual CO2e savings (metric tonnes CO2e)
306000

Scope(s) or Scope 3 category(ies) where emissions savings occur
Scope 1

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
0

Investment required (unit currency – as specified in C0.4)
410000

Payback period
No payback

Estimated lifetime of the initiative
21-30 years

Comment
Increasing the use of renewable diesel and biodiesel fuels currently represents the most promising avenue to help Union Pacific meet its science-based target. We are working to increase the percentage of low-carbon fuels consumed to 10% of our total diesel consumption by 2025 and to 20% by 2030. To facilitate this, we are investing in fuel storage and blending infrastructure at various locations to enable greater delivery, storage and utilization of low-carbon biofuels derived from sustainable biomass in locomotives. Our utilization of biofuels has grown from 3.0% of total diesel used in 2021 to 4.5% in 2022. Estimated annual CO2e savings provided are only for the infrastructure improvement completed during the reporting year.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Investment is directed towards emissions reduction activities that are mandated by federal, state and/or local laws, regulations and standards. Union Pacific's locomotive emissions, are governed by EPA regulations that limit greenhouse gas, particulate, and other emissions based on locomotive manufacture date. Based on this obligation, we assess our locomotive fleet annually through financial optimization calculations to determine the budget that would be necessary to meet our regulatory commitments in the context of our business needs. In 2022, UP spent approximately $3.6 billion in its capital program, which included investment in locomotive and freight car capital expenditures, such as the modernization of high horsepower locomotives.
Employee engagement	Operating expenses and other resources are provided to support training and implementation of other employee engagement strategies designed to help achieve the company's goal of improved environmental performance and reduce our environmental footprint. Employees play a role in fuel conservation and other efforts that help reduce GHG emissions. Additionally, Union Pacific is the first railroad to organize an employee-led business resource group focused on environmental sustainability, Planet Tracks. The organization's mission is to improve business performance while fostering workforce engagement and personal awareness driven by initiatives that inspire sustainable focus and innovation throughout the organization. Its objectives include identifying and educating Union Pacific's workforce on environmental issues; championing environmental stewardship across the company and fostering employee engagement through training, networking and targeted activities.
Partnering with governments on technology development	We are working with a locomotive OEM, to develop and purchase 10 battery-electric locomotives for testing in yard operations. Battery-electric locomotives do not use fuel and emit zero emissions. For every 10 battery-electric locomotives used, approximately 4,000 tons of carbon will be eliminated annually, the equivalent of removing 800 cars from the highway. By working with the locomotive manufacturers in this test phase, Union Pacific hopes to advance battery-electric technology development and evaluate its potential deployment in long-haul service. Union Pacific partnered with the Port of Los Angeles to partially fund the cost of one of the battery-electric locomotives for use at the port via a Diesel Emission Reduction Act (DERA) grant from the U.S. Environmental Protection Agency. Via this partnership, Union Pacific and the locomotive OEM will gain valuable experience testing battery-electric locomotives in warm weather service, and the Port will see reduced emissions from our operations.
Other (Partnering with suppliers on technology development)	Union Pacific cooperates with its suppliers on capital-intensive product development to reduce investment risk and speed progress to market of products that will assist in its emissions reduction journey. Case study: There are currently only two domestic suppliers of high horsepower locomotive technology. These suppliers manufacture U.S. EPA Tier 4 locomotives to meet the most stringent air emission standards. Tier 4 locomotives offer an improvement in the quality of air emissions, but they are not zero or near-zero emission, and there is currently no zero-emission locomotive available on the commercial market. If one or both domestic locomotive suppliers are not able to meet more restrictive emission requirements in the future, UP's access to state-of-the-art locomotive technology at a reasonable cost is likely to be hampered. After assessing this situation, Union Pacific determined to explore technical partnerships with the two major locomotive manufacturers to speed the research and development of new locomotive technologies that would reduce or eliminate locomotive GHG emissions. In January 2022 Union Pacific announced plans to expend up to $100 million for battery-electric locomotives and associated infrastructure. For every 10 battery-electric locomotives used, approximately 4,000 tons of carbon will be eliminated annually. The purchases will not only help locomotive manufacturers develop and assess the locomotives' potential deployment in long-haul service, but they will also help our company meet a goal of reducing Scope 1 and 2 GHG emissions by 26% by 2030 and achieve net-zero GHG emissions by 2050.
Internal incentives/recognition programs	To further align and accelerate the Company's sustainability initiatives, we have incorporated sustainability-related key performance indicators in our executive compensation scorecard. Continuous improvement in achieving the Company's fuel efficiency goals, trip plan compliance and use of biofuels, all which directly impact emissions, are tied to executive compensation. For 2022, we note the improvement in the fuel consumption rate and the increase in biofuel blend to over 4.5%. Pages 60-62 of our 2023 Proxy details how 20% of target annual incentive cash bonuses paid to executives is based on a shared set of Company goals in key areas such as safety, customer service, trip plan compliance, market share, employee engagement and renewable fuel blend. Attainment of trip plan compliance and renewable fuel blend utilization goals positively impact our GHG reduction goals.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation
Product or service

Taxonomy used to classify product(s) or service(s) as low-carbon
Climate Bonds Taxonomy

Type of product(s) or service(s)

Rail	Other, please specify (Low-carbon transportation service)

Description of product(s) or service(s)
The main competitor to rail transportation is transportation via trucks, and Union Pacific is engaged in attempting to win market share from truck transportation. Shipping via intermodal or general merchandise rail cars instead of trucks enables customers to utilize a lower-carbon transportation product for the majority of their shipment miles, as a typical UP freight train is on average three to four times more fuel efficient per freight ton-mile than truck transportation, equating to up to a 75% reduction in transportation related CO2e emissions. As a result of this efficiency, UP helps customers avoid and/or reduce GHG emissions that would otherwise be generated from more carbon-intensive modes of transportation.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)
Yes

Methodology used to calculate avoided emissions
Other, please specify (Internal Union Pacific methodology)

Life cycle stage(s) covered for the low-carbon product(s) or services(s)
Use stage

Functional unit used
Revenue Ton-Miles (RTM) and Revenue Ton-Mile per gallon of diesel (RTM/gal) are used as freight haul efficiency metrics in the railroad sector. RTM/gal measures a freight train's efficiency in transporting one short ton of freight a distance (miles) per gallon of diesel fuel. For this metric, the higher the more efficient. For the inversion of this ratio "gallons of fuel per RTM", less is better and represents fuel consumed to move one freight ton one mile.

Reference product/service or baseline scenario used
The references used were the RTM and RTM/gal metrics for freight hauling if the transport mode was a heavy-duty diesel semi-truck, which is the primary surface transport mode for freight hauling, and our average actual freight shipments occurring during 2022 for our customers. The types of shipments generally belong to our merchandise, agricultural and intermodal shipment types (e.g. excludes coal, due to regulatory restrictions relating to its hauling).

Life cycle stage(s) covered for the reference product/service or baseline scenario
Use stage

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario
23415437

Explain your calculation of avoided emissions, including any assumptions
Our internal methodology compares actual customer shipments in 2022 (system avg revenue miles, waybilled shipment and freight car weight, and average 2022 fuel consumption rate per mile) to a theoretical shipping movement for the same origin-destination pairs utilizing the truck transportation mode. This methodology aligns with Association of American Railroads analysis concluding that Rail transport is three to four times more fuel and GHG efficient than trucks.

Assumptions: Estimates apply to one-way loaded shipments only. Emissions calculations for the truck emissions comparison are based on heavy-duty diesel semi-truck emissions factors from EPA/NHTSA's Draft Regulatory Impact Analysis: Proposed Rulemaking to Establish Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium and Heavy-Duty Engines and Vehicles. Railroad routes and mileages are applied to the comparative truck shipments. Actual emissions and savings may vary based on routing and other variable factors. Union Pacific's fuel consumption rate is applied to other carriers' miles for interline moves.

Using this methodology, in 2023 we provided over 1,700 contacts with over 1,150 customers, with annual emissions savings statements for reporting year 2022. The statements estimated what the customers' actual shipments with Union Pacific had saved in reduced GHG emissions versus utilizing trucks. The total estimated avoided emissions for these customers was over 23,400,000 mtons CO2e.

Converting traffic to rail from truck offers an immediate reduction in Scope 3 GHG emissions. UP's focus on improvements in locomotive fuel efficiency has allowed us to provide a low-carbon transportation option to our customers. In 2022 UP's GHG emissions intensity was below the 25 gCO2e/tkm emissions threshold criteria for the low-carbon transport sector, per the Climate Bonds Taxonomy and the low-carbon transport universal freight threshold for all types of freight transport on the IEA's 2 Degrees Scenario Freight Activity Mode [for more information on our intensities, see section 6 of CDP].

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year
86

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?
No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?
No

Name of organization(s) acquired, divested from, or merged with
<Not Applicable>

Details of structural change(s), including completion dates
<Not Applicable>

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?	Details of methodology, boundary, and/or reporting year definition change(s)
Row 1	Yes, a change in methodology Yes, a change in boundary	Union Pacific completed a full assessment of Scope 3 categories for relevancy and determined additional categories had applicability and well as some methodology changes within the already reported categories. In addition, Union Pacific changed from using eGRID factors made available in The Climate Registry to EPA Emission Factors Hub for Greenhouse Gas Inventories (Table 6). This is in line with what our industry peers are using.

C5.1c

(C5.1c) Have your organization's base year emissions and past years' emissions been recalculated as a result of any changes or errors reported in C5.1a and/or C5.1b?

	Base year recalculation	Scope(s) recalculated	Base year emissions recalculation policy, including significance threshold	Past years' recalculation
Row 1	Yes	Scope 3	[Base year emissions were recalculated for Scope 3. Scope 2 changes as a result of moving to EPA Emission Factors Hub did not meet significance threshold for restatement.] UPRR's approach to GHG data recalculation is aligned with GHG best practice guidance. UPRR has adopted a +/- 5% materiality threshold for GHG data which is consistent with the 2004 WBCSD/WRI GHG Protocol guidance that "an error is considered to be materially misleading if its value exceeds 5% of the total inventory". Emissions will be recalculated for all years back to the fixed target base year. Base year recalculation may be triggered by: Ø Structural changes to operational boundaries Ø Changes in calculation methodology, data availability, or improvement in the accuracy of emissions factors Ø Discovery of errors or a number of smaller errors that, when accumulated, meet the materiality threshold Ø Adjustment of operational boundaries Base year recalculation based on the circumstances described above will be performed whenever the cumulative change in emissions would represent 5% or greater of the current base year emissions estimate. Recalculation may be performed where changes represent less than 5% of base year emissions at Union Pacific's discretion. Base year recalculation will be done so that the comparison to base year emissions from one year to the next will be comparable and true.	No

C5.2

(C5.2) Provide your base year and base year emissions.

Scope 1

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
11313933

Comment

Scope 2 (location-based)

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
277200

Comment

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 1: Purchased goods and services

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
659281

Comment

Scope 3 category 2: Capital goods

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
559287

Comment

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
3824960

Comment

Scope 3 category 4: Upstream transportation and distribution

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
697657

Comment

Scope 3 category 5: Waste generated in operations

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
21212

Comment

Scope 3 category 6: Business travel

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
18246

Comment

Scope 3 category 7: Employee commuting

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
141618

Comment

Scope 3 category 8: Upstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 10: Processing of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 11: Use of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 12: End of life treatment of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 13: Downstream leased assets

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
8470

Comment

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 15: Investments

Base year start
January 1 2018

Base year end
December 31 2018

Base year emissions (metric tons CO2e)
312479

Comment

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)
9266469

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based
We are reporting a Scope 2, market-based figure

Comment
In 2023 Union Pacific changed from using eGRID factors made available in The Climate Registry to EPA Emission Factors Hub for Greenhouse Gas Inventories (Table 6). This is in line with what our industry peers are using.

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based
237327

Scope 2, market-based (if applicable)
245798

Start date
<Not Applicable>

End date
<Not Applicable>

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1, Scope 2 or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure?
No

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
868106

Emissions calculation methodology
Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Union Pacific calculated our Scope 3 category 1 emissions using spend based conversions to calculate estimated emissions. UPRR categorized company wide spend into appropriate EEIO categories and converted spend into emissions using appropriate emission factors for each category.

Capital goods

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
682196

Emissions calculation methodology
Spend-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Union Pacific calculated our Scope 3 category 2 emissions using spend based conversions to calculate estimated emissions. UPRR categorized company wide spend into appropriate EEIO categories and converted spend into emissions using appropriate emission factors for each category.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
3025471

Emissions calculation methodology
Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
The WRI Greenhouse Gas Protocol was the methodology used to calculate the emissions associated with transmission and distribution losses associated with electricity purchases. We divided electricity purchased by 100% minus the transmission and distribution losses per eGRID2021 region for the United States from the Energy Information Administration United States Electricity Profile, and then subtracted electricity purchased to determine the upstream losses. We then used emissions factors from the 2021 EPA eGRID database to convert electricity losses into GHG emissions. In order to be consistent with Union Pacific's Scope 1 and 2 inventory, Union Pacific used the global warming potentials provided by the IPCC. Emissions resulting from extraction, production, and transportation of fuel consumed by Union Pacific is also included here. UP assumes that the extraction, production, and transportation of kerosene, jet fuel, and gasoline result in similar GHG emissions as diesel, and, therefore, the GHG emission factors for upstream diesel activities have been applied for upstream kerosene, jet fuel, and gasoline activities as well.

Upstream transportation and distribution

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
556190

Emissions calculation methodology
Spend-based method
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
32

Please explain
Union Pacific calculated Scope 3 Category 4 emissions using spend based conversions to calculate estimated emissions, and gross-ton-mile data provided by wholly owned subsidiary LOUP. UPRR extracted company wide spend on Truck & Vans and Air Transportation, and converted spend into emissions using appropriate emission factors for each spend category. LOUP gross-ton-mile data for Rail and Truck & Van transportation was collected and emissions were calculated using the appropriate emission factors for each category.

Waste generated in operations

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
148375

Emissions calculation methodology
Supplier-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Emissions were calculated using data directly collected by Union Pacific from waste suppliers for total tonnage sent to landfills, total tonnage of Municipal Solid Waste Recycling, and total tonnage of waste incinerated. No calculations were made using secondary data (i.e. industry averages). Emissions were calculated by applying the emissions factors from the EPA Emissions Factor Hub.

Business travel

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
38905

Emissions calculation methodology
Fuel-based method
Distance-based method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain
Evaluation completed in 2023 determined UPRR was able to add Hotel Stays, reported in number of nights, directly from suppliers. As of 2023, UPRR now reports the following supplier provided data: Rental car miles, Airline miles, Hotel Stays, Crew Shuttle miles. Emissions factors used were based on fuel type (gasoline, diesel fuel and jet fuel) from the EPA Emissions Factor Hub.

Employee commuting

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
174299

Emissions calculation methodology
Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
Emissions were calculated using data directly collected by Union Pacific, and reported externally in our 10-K filing for number of agreement/non-agreement employees, and assumptions made about use of UPRRs 50% allowable work from home policy for non-agreement employees. Average number of commute miles per person taken from Numbeo, using "Average when primary using Car" value, and emission factors used were EPA.

https://www.numbeo.com/traffic/country_result.jsp?country=United+States

Upstream leased assets

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Based upon the Guidance for Calculating Scope 3 Emissions, Union Pacific has concluded that this category is not relevant. This category is based on square footage of buildings where UPRR is the lessee and have not been accounted for in scope 1 and 2. UPRR captures all relevant instances in our reported Scope 1 & 2 data.

Downstream transportation and distribution

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Based upon the Guidance for Calculating Scope 3 Emissions, Union Pacific has concluded that this category is not relevant. Union Pacific reached this conclusion based upon the definition of “downstream transportation and distribution.” This category includes emissions from transportation and distribution of products sold by Union Pacific in the reporting year. Union Pacific does not sell or distribute a product. Union Pacific is a common carrier and transports freight.

Processing of sold products

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Based upon the Guidance for Calculating Scope 3 Emissions, Union Pacific has concluded that this category is not relevant. Union Pacific reached this conclusion based upon the definition of “processing of sold products.” The category includes emissions from the processing of intermediate products by third parties. Union Pacific does not sell intermediate products for processing. Union Pacific is a common carrier and transports freight.

Use of sold products

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Based upon the Guidance for Calculating Scope 3 Emissions, Union Pacific has concluded that this category is not relevant. Union Pacific reached this conclusion based upon the definition of “use of sold products.” This category includes emissions from the use of goods and services sold by Union Pacific in the reporting year to end users. Union Pacific does not sell products for use. Union Pacific is a common carrier and transports freight.

End of life treatment of sold products

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Based upon the Guidance for Calculating Scope 3 Emissions, Union Pacific has concluded that this category is not relevant. Union Pacific reached this conclusion based upon the definition of “end of life treatment of sold products.” This category includes emissions from the waste disposal and treatment of products sold by Union Pacific in the reporting year at the end of their life. Union Pacific is a common carrier and transports freight. There is no end of life treatment of sold products because UP provides a service and therefore does not have sold products with end of life treatment.

Downstream leased assets

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
4530

Emissions calculation methodology
Average data method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
0

Please explain
This category includes emissions from the operation of assets that are owned by Union Pacific and leased to other entities in the reporting year that are not already included in its Scope 1 or Scope 2 emission calculations. For GHG reporting Union Pacific is including real estate assets it owns and leases to other entities that are not captured in its Scope 1 or 2 emissions calculations. Emissions were calculated using square footage measurements and average emission factors provided by the EPA Emissions Factor Hub.

Franchises

Evaluation status
Not relevant, explanation provided

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain
Based upon the Guidance for Calculating Scope 3 Emissions, Union Pacific has concluded that this category is not relevant. Union Pacific reached this conclusion based upon the definition of “franchise.” A franchise is a business operating under a license to sell or distribute another Company’s goods or services within a certain location. Union Pacific has no franchises.

Investments

Evaluation status
Relevant, calculated

Emissions in reporting year (metric tons CO2e)
314515

Emissions calculation methodology
Average data method
Investment-specific method

Percentage of emissions calculated using data obtained from suppliers or value chain partners
92

Please explain
Emissions were calculated using data directly collected by Union Pacific, provided by UPRRs investment & joint venture partners. Included in UPRRs emissions are Scope 1 & 2 emissions directly provided by partners or calculated emissions from locomotives, and office & shop space. UPRRs locomotive emission estimation calculations were completed assuming each locomotive burns 75,000 gallons of diesel fuel per year. Office & shop emissions were calculated using square footage measurements and average emission factors provided by EPA.

Other (upstream)

Evaluation status
Not evaluated

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain

Other (downstream)

Evaluation status
Not evaluated

Emissions in reporting year (metric tons CO2e)
<Not Applicable>

Emissions calculation methodology
<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners
<Not Applicable>

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?
Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment
Row 1	404876	Represents the CO2 portion of biogenic source emissions from biodiesel and renewable diesel used to power locomotives. Any methane (CH4) and nitrous oxide (N2O) from biogenic emissions are accounted for in our Scope 1 reporting.

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure
0.0003820621

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
9503795

Metric denominator
unit total revenue

Metric denominator: Unit total
24875000000

Scope 2 figure used
Location-based

% change from previous year
12

Direction of change
Decreased

Reason(s) for change
Other emissions reduction activities
Change in revenue

Please explain
From 2021 to 2022, Union Pacific's emissions increase by 0.4%. From 2021 to 2022, Union Pacific's revenue increased by 14%. The slight increase in emissions compared to the larger increase in revenue led to an overall decrease in intensity for 2022 compared to 2021.

C-TS6.15

(C-TS6.15) What are your primary intensity (activity-based) metrics that are appropriate to your emissions from transport activities in Scope 1, 2, and 3?

Rail

Scopes used for calculation of intensities
Report just Scope 1

Intensity figure
0.0000106077

Metric numerator: emissions in metric tons CO2e
8947032

Metric denominator: unit
t.mile

Metric denominator: unit total
843443000000

% change from previous year
-2

Please explain any exclusions in your coverage of transport emissions in selected category, and reasons for change in emissions intensity.
YoY increase GTMs was up 3% while Scope 1 Rail Activity (Loco Fuel - Biogenic CO2 + Railcar Refrigerant) emission change YoY was only 0.7%.

ALL

Scopes used for calculation of intensities
Report Scope 1 + 2

Intensity figure
0.0112678574

Metric numerator: emissions in metric tons CO2e
9503795

Metric denominator: unit
t.mile

Metric denominator: unit total
843443000

% change from previous year
-3

Please explain any exclusions in your coverage of transport emissions in selected category, and reasons for change in emissions intensity.
2022's intensity has decreased 3%. A decrease in intensity is a result of higher rate of decrease in Scope 1+2 emissions relative to the increase in ton miles in 2022 resulting from increased freight transportation activity.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	9164742	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	22317	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	71232	IPCC Fifth Assessment Report (AR5 – 100 year)
HFCs	8177	IPCC Fifth Assessment Report (AR5 – 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/area/region.

Country/area/region	Scope 1 emissions (metric tons CO2e)
United States of America	9266469

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By activity

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Locomotives	8942510
Corporate Jets	3986
Vehicles and Other Mobile Sources	242477
Stationary Combustion Sources	69319
Railcar Refrigerant	4522
Vehicle/Mobile AC	3575
Misc. Refrigerant Loss	80

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	8942510	<Not Applicable>	This amount accounts for locomotive fuel. Union Pacific uses biodiesel and renewable diesel for its locomotives. However, based on the "Technical Note on Special Conditions for Reporting Scope 1 Emissions," the emissions associated with these fuel sources are reported separately under C6.7a.

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/area/region.

Country/area/region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
United States of America	237327	245798

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By activity

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Electricity	237247	245718
Steam	50	50
Chilled Water	30	30

C7.7

(C7.7) Is your organization able to break down your emissions data for any of the subsidiaries included in your CDP response?

No

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (midstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	0	0	Transport services activities (i.e., freight haul) are diesel-powered locomotives which do not contribute to Scope 2 emissions. No freight haul activities are powered by electricity at this time.

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Increased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change in emissions	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	202	Decreased	0.002	Union Pacific had 2 yard offices generating and using solar power in 2021 vs only 1 location in 2022 and we calculated a reduction of 202 MT CO2e emissions from renewable energy consumption. [(Change in Scope1+2 emissions)/(Prior Year Scope 1+2 emissions)]*100% = [(202/9,465,831)]*100% = 0.002%.
Other emissions reduction activities	86506	Decreased	0.914	Total Scope 1 & Scope 2 emissions increased by from 9,465,831 MT CO2e in 2021 to 9,503,795 MT CO2e in 2022. Union Pacific continues to pursue a variety of emission reduction initiatives including increased usage of biodiesel and renewable diesel for locomotive fuel by 54% going from 3.1% of total locomotive fuel use from biogenic sources in 2021 to 4.5% in 2022. In addition, Union Pacific saw a 1% YoY improvement in the fuel consumption rate realized from productivity initiatives. We calculated a reduction of 87,939 MT CO2e related to these emission reduction activities. [(Change in Scope1+2 emissions)/(Prior Year Scope 1+2 emissions)]*100% = [(87939/9,465,831)]*100% = 0.914%.
Divestment	0	No change	0	
Acquisitions	0	No change	0	
Mergers	0	No change	0	
Change in output	218168	Increased	2.305	GHG emissions from combustion of diesel, used to power locomotives, represents the largest source of the Scope 1 & Scope 2 emissions categories (94%). In 2022 Union Pacific saw a increase in revenue ton-miles (RTMs) of 2%. If no emission reduction measures had been taken, increased RTMs leading to increased output would have generated an 2.3% more of emissions.
Change in methodology	93496	Decreased	0.988	In 2023 Union Pacific changed from using eGRID factors made available in The Climate Registry to EPA Emission Factors Hub for Greenhouse Gas Inventories (Table 6). This is in line with what our industry peers are using. The methodology change accounts for decreasing emissions by 93,496 MT CO2e. [(Change in Scope1+2 emissions)/(Prior Year Scope 1+2 emissions)]*100% = [(93496/9,465,831)]*100% = 1.0%.
Change in boundary	0	No change	0	
Change in physical operating conditions	0	No change	0	
Unidentified	0	No change	0	
Other	0	No change	0	

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 20% but less than or equal to 25%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	Yes
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	1057588	37969901	39027489
Consumption of purchased or acquired electricity	<Not Applicable>	0	578241	578241
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	0	222	222
Consumption of purchased or acquired cooling	<Not Applicable>	0	65	65
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	159	<Not Applicable>	159
Total energy consumption	<Not Applicable>	1057747	38548429	39606176

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	No
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Sustainable biomass

Heating value
Unable to confirm heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

Other biomass

Heating value
HHV

Total fuel MWh consumed by the organization
583024

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Heat value from fuel combustion used to power locomotives.

Other renewable fuels (e.g. renewable hydrogen)

Heating value
HHV

Total fuel MWh consumed by the organization
474564

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Heat value from fuel combustion used to power locomotives.

Coal

Heating value
Unable to confirm heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

Oil

Heating value
Unable to confirm heating value

Total fuel MWh consumed by the organization
0

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

Gas

Heating value
HHV

Total fuel MWh consumed by the organization
250478

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Natural gas as a heating source in buildings and powering heat generating equipment.

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value
HHV

Total fuel MWh consumed by the organization
36661835

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment
Heat value from combustion used to power locomotives, vehicles, work equipment, heaters, and other equipment used to support operations.

Total fuel

Heating value
HHV

Total fuel MWh consumed by the organization
37969901

MWh fuel consumed for self-generation of electricity
0

MWh fuel consumed for self-generation of heat
0

MWh fuel consumed for self-generation of steam
<Not Applicable>

MWh fuel consumed for self-generation of cooling
<Not Applicable>

MWh fuel consumed for self- cogeneration or self-trigeneration
<Not Applicable>

Comment

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	33279	33279	159	159
Heat	0	0	0	0
Steam	0	0	0	0
Cooling	0	0	0	0

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.

Country/area of low-carbon energy consumption
United States of America

Sourcing method
Other, please specify (Onsite renewable energy generation)

Energy carrier
Electricity

Low-carbon technology type
Solar

Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)
159

Tracking instrument used
Other, please specify (Solar power generation tracked using an onsite system for measuring MWh)

Country/area of origin (generation) of the low-carbon energy or energy attribute
United States of America

Are you able to report the commissioning or re-powering year of the energy generation facility?
Yes

Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)
2010

Comment
Electricity generation from onsite solar PV arrays at the Santa Teresa facility.

C-TS8.2f

(C-TS8.2f) Provide details on the average emission factor used for all transport movements per mode that directly source energy from the grid.

Category	Emission factor unit	Average emission factor: unit value	Comment
Rail	gCO2e/kWh	0	UPRR does not currently have any rail transport movements that directly source energy from the grid.

C8.2g

(C8.2g) Provide a breakdown by country/area of your non-fuel energy consumption in the reporting year.

Country/area
United States of America

Consumption of purchased electricity (MWh)
578241

Consumption of self-generated electricity (MWh)
159

Is this electricity consumption excluded from your RE100 commitment?
<Not Applicable>

Consumption of purchased heat, steam, and cooling (MWh)
287

Consumption of self-generated heat, steam, and cooling (MWh)
0

Total non-fuel energy consumption (MWh) [Auto-calculated]
578687

C-TS8.5

(C-TS8.5) Provide any efficiency metrics that are appropriate for your organization's transport products and/or services.

Activity
Rail

Metric figure
0.0040800476

Metric numerator
Other, please specify (Liters of Fuel)

Metric denominator
Other, please specify (ton-miles (GTMs))

Metric numerator: Unit total
3441287587

Metric denominator: Unit total
843443000000

% change from last year
-1

Please explain
YoY increase GTMs was 3% while Scope 1+2 emission change YoY was only 0.4%.

Locomotive operations comprised 96.5% of Union Pacific's 2022 Scope 1 emissions. Improved locomotive fuel economy via engine efficiency, locomotive handling, and network efficiency reduces fuel consumption, which also reduces GHG emissions.

For the fourth consecutive year, we achieved a best-ever fuel consumption rate, improving 1% versus 2021. We continue to explore and invest to improve our fuel consumption efficiency, including equipping locomotives with energy management systems, utilizing automatic shutdown technology to reduce unnecessary idling, and improving operating practices.

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C-TO9.3/C-TS9.3

(C-TO9.3/C-TS9.3) Provide tracking metrics for the implementation of low-carbon transport technology over the reporting year.

Activity
Rail

Metric
Fleet adoption

Technology
Other, please specify (Battery Electric Locomotives Adoption)

Metric figure
0

Metric unit
Other, please specify (Battery-electric locomotives placed in service in our locomotive fleet)

Explanation
Battery-Electric, Zero-Emissions Locomotives
In January 2022, we announced plans to purchase battery-electric locomotives (BELs) for testing in yard operations. The combined purchases and required upgrades to yard
infrastructure to support BEL operations are expected to exceed $100 million, which would represent the largest investment in battery-electric technology by a U.S. Class I railroad. Once the units are in service, it will be North America's largest carrier-owned battery-electric locomotive fleet in freight service. By working with locomotive manufacturers in this test phase, Union Pacific hopes to advance battery-electric technology development and evaluate its potential deployment in long-haul service. The locomotives will be tested for performance in cold and warm weather, helping identify the locomotives' capabilities and challenges for broader deployment.

This metric tracks the number of BELs placed in service in our network for field testing. Due to supply chain challenges and the complexity associated with design specifications, we now expect delivery of our first units to begin in late 2024 or early 2025.

Activity
Rail

Metric
Other, please specify (Biofuels utilization as a percentage of total annual diesel consumption)

Technology
Other, please specify (Vehicle using Biofuel)

Metric figure
4.5

Metric unit
Other, please specify (Biofuels utilization as a percentage of total annual diesel consumption)

Explanation
In 2021, we announced a company-specific target to increase the percentage of low-carbon fuels consumed to 10% of our total diesel consumption by 2025 and 20% by 2030. Our 2021 low-carbon fuels consumption was 3.0% of total diesel used, up from 2.2% in 2020, and was 4.5% in 2022.

Activity
Rail

Metric
Other, please specify (Number of high-horsepower locomotives modernized)

Technology
Other, please specify (Refurbished/upgraded (modernized) locomotives)

Metric figure

Metric unit
Other, please specify (Count of modernized locomotives)

Explanation
In 2022 we announced an agreement worth more than $1 billion for 600 locomotive modernizations, beginning in 2023. Compared to existing technology, the modernizations will yield a fuel-efficiency improvement of up to 18%, and increased reliability and capacity, resulting in fewer locomotives required to haul our freight. The modernizations should provide incremental fuel efficiency resulting in approximately 350 tons of carbon reduction per locomotive per year, and the total order for 600 locomotives will realize approximately 210,000 tons in annual emission reductions.

2022 Results
- In 2022, we completed a portion of the locomotive modernizations, with full completion of all 600 units expected by the end of 2025.

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	To position UP as a leader in the transition to a low-carbon economy and fully execute our Climate Action Plan, we recognize that new approaches will be required to deploy capital, operating budgets and people in the most efficient and effective ways possible. This will include systematic ways to: 1) Identify potential carbon reduction mechanisms 2) Assess new mechanisms in terms of carbon reduction potential and feasibility for the Union Pacific's business model and rail operations. 3) Successfully deploy promising alternative fuels and propulsion methods. 4) Engage and collaborate with OEMs and our customers to progress this work. In 2021, UP began establishing separate sustainability budgets for low-carbon R&D project and their implementation. Because of the lack of budget history, UP is reporting % of total R&D budget for 2022 only (not average three years).

C-TO9.6a/C-TS9.6a

(C-TO9.6a/C-TS9.6a) Provide details of your organization's investments in low-carbon R&D for transport-related activities over the last three years.

Activity
Rail

Technology area
Alternative fuels

Stage of development in the reporting year
Pilot demonstration

Average % of total R&D investment over the last 3 years
6

R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)
354000

Average % of total R&D investment planned over the next 5 years

Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan
Current advances in low- or zero-emission passenger vehicles are encouraging, but we believe additional research and development is required before our industry can adopt zero emissions locomotives at scale. Efforts to develop next-generation battery electric and other fuel cell technologies will take time, and locomotives typically have a useful operational life of 40 or more years. As a transitional strategy, we are focused on utilizing low-carbon fuels in our locomotives to further reduce our emissions across
our entire fleet while proactively supporting research and testing for a new generation of low- and zero-emissions locomotives.

Last year, we announced a company-specific target to increase the percentage of low-carbon fuels consumed to 10% of our total diesel consumption by 2025 and 20% by 2030. Our 2022 low-carbon fuels consumption was 4.5% of total diesel used, up from 3.0% in 2020. To reach our goals related to the consumption of low-carbon fuels, more of our locomotive model types must be certified as compatible with higher blends of low-carbon fuels. We continue to collaborate with other Class I railroads and with domestic locomotive manufacturers on testing and approving use of blends of biofuel and renewable diesel for use in nearly every major locomotive model we operate and expect to implement results from the testing into our fueling plans during 2024.

Activity
Rail

Technology area
Electrification

Stage of development in the reporting year
Pilot demonstration

Average % of total R&D investment over the last 3 years
2

R&D investment figure in the reporting year (unit currency as selected in C0.4) (optional)
152000

Average % of total R&D investment planned over the next 5 years

Explain how your R&D investment in this technology area is aligned with your climate commitments and/or climate transition plan
In January 2022, we announced plans to work with locomotive OEMs to develop battery-electric locomotives for testing in yard operations. The combined purchases and required upgrades to yard infrastructure to support battery-electric locomotive operations are expected to be up to $100 million, which would represent the largest investment in battery-electric technology by a U.S. Class I railroad. The locomotives will be tested for performance in cold and warm weather, helping identify the locomotives' capabilities and challenges for broader deployment. We expect delivery of the first units in late 2024 or early 2025, which is when the bulk of the R&D funding activity will commence.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

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

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Reasonable assurance

Attach the statement
11228514-RPT-3-2022 Verification Report.pdf

Page/ section reference
Pages 5-6

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Reasonable assurance

Attach the statement
11228514-RPT-3-2022 Verification Report.pdf

Page/ section reference
Page 6

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 2 approach
Scope 2 market-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Reasonable assurance

Attach the statement
11228514-RPT-3-2022 Verification Report.pdf

Page/ section reference
Page 7

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category
Scope 3: Purchased goods and services
Scope 3: Capital goods
Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)
Scope 3: Upstream transportation and distribution
Scope 3: Waste generated in operations
Scope 3: Business travel
Scope 3: Employee commuting
Scope 3: Investments
Scope 3: Downstream leased assets

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Reasonable assurance

Attach the statement
11228514-RPT-3-2022 Verification Report.pdf

Page/section reference
Pages 7-9

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?
Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C7. Emissions breakdown	Year on year change in emissions (Scope 1 and 2)	ISO 14064-3	Union Pacific elects to verify emissions to demonstrate confirmation of the self-reported emissions values. This verification helps Union Pacific track proportions of emissions from varying business activities to understand how the emission profile is changing on an activity-by-activity basis each year and track progress in emissions reduction. UP completes this verification on an annual basis for all operations.

11228514-RPT-3-2022 Verification Report.pdf

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?
Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.
California CaT - ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

California CaT - ETS

% of Scope 1 emissions covered by the ETS
11.1

% of Scope 2 emissions covered by the ETS
0

Period start date
January 1 2022

Period end date
December 31 2022

Allowances allocated
0

Allowances purchased
0

Verified Scope 1 emissions in metric tons CO2e
9266469

Verified Scope 2 emissions in metric tons CO2e
237327

Details of ownership
Facilities we own and operate

Comment
Union Pacific will surrender 183,477 carbon allowances/offsets before Nov 1.

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

Union Pacific's strategy to comply with California's Global Warming Solutions Act is to: 1) report our greenhouse gas emissions as required by the California Air Resources Board's (CARB) Mandatory Reporting Rule, and 2) purchase compliance instruments prior to the deadline for surrender as required by CARB's Cap and Trade Rule. Union Pacific is required to participate in CARB's cap-and-trade program under the California Global Warming Solutions Act and implementing regulations due to fuel delivered to tanks at four California railroad facilities (yards) via pipeline, meeting the definition of a fuel supplier. Union Pacific must acquire, and later surrender, compliance instruments equal to the GHG emissions reported to CARB during the second compliance period beginning in 2015. The fourth compliance period is from 2021 to 2023. Compliance instruments are either allowances or offsets. An allowance is a tradable and bankable permit to emit one metric ton of CO2e in a specified year. An offset is a credit approved by CARB that is equivalent to reducing 1 MTCO2e. UP surrendered 178,700 compliance instruments in 2022 against the program's third compliance period. UP's 2022 cap-and-trade regulated emissions were 611,591 tonnes of CO2e for which UP will surrender 183,477 compliance instruments before November 1, 2023 and the balance before November 1, 2024 per program guidelines. Compliance instruments to be surrendered in 2023 will come from inventory acquired in previous years. Union Pacific did not purchase allowances or offsets during 2022.

C11.2

(C11.2) Has your organization canceled any project-based carbon credits within the reporting year?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

No, and we do not currently anticipate doing so in the next two years

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers
Yes, our customers/clients
Yes, other partners in the value chain

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement
Information collection (understanding supplier behavior)

Details of engagement
Collect climate transition plan information at least annually from suppliers
Collect other climate related information at least annually from suppliers
Other, please specify (In 2022, we surveyed our top critical and strategic suppliers on sustainability topics, including climate action.)

% of suppliers by number
0.6

% total procurement spend (direct and indirect)
26

% of supplier-related Scope 3 emissions as reported in C6.5

Rationale for the coverage of your engagement
Our “Critical Suppliers” provide materials or services that are difficult to obtain from other suppliers and whose failure would impact UP operations. Our “Strategic Suppliers” provide critical materials or services that are difficult to obtain from other suppliers, whose failure would impact UP operations, and have a high capacity to add value through product innovation or Total Cost of Ownership improvement. We chose a portion of these suppliers because of their importance to our business. Going forward, we anticipate increasing the number of suppliers who receive this request so that we have a better line of sight into our supply chain. The suppliers chosen for this survey make up 0.6% of all supplier by number but 26% of total procurement spend.

Impact of engagement, including measures of success
In 2022, we took supplier engagement a step further by requesting our top Critical and Strategic suppliers to submit responses to a sustainability questionnaire. 100% of requested suppliers responded to the survey. We received responses from all requested suppliers and placed each supplier into a tier based on their responses. Subsequently, suppliers received notification of their tier placement, as well as action items outlining how they might improve their sustainability practices going forward. Our strategic supplier reviews now include a review and discussion of their responses to the questionnaire. Important action items necessary to improve sustainability in the supplier’s operations are explained, resources are provided, and an open dialogue with Q&A is encouraged. Through this process, we have had suppliers commit to filling certain sustainability-related gaps.

Comment

Type of engagement
Innovation & collaboration (changing markets)

Details of engagement
Collaborate with suppliers on innovative business models to source renewable energy
Other, please specify (Collaborate with suppliers on innovative business models to source renewable fuel)

% of suppliers by number
0.6

% total procurement spend (direct and indirect)
36

% of supplier-related Scope 3 emissions as reported in C6.5
52

Rationale for the coverage of your engagement
As a transitional strategy, we are focused on utilizing low-carbon fuels in our locomotives to further reduce our emissions across our entire fleet while proactively supporting research and testing for a new generation of low- and zero-emissions locomotives. With 80% of our GHG emissions (Scope 1 and Scope 3 category 3) generated from the use of fuel in our rail operations, engagement of our fuel suppliers is key to our adoption of low-carbon fuels for locomotives. As such, we engage our major fuel suppliers on ways to increase our procurement and delivery of biofuels. “Major fuel suppliers”, for this example, comprise 28 of the 133 fuel suppliers managed by the Procurement group and 92% of our total managed fuel procurement spend. Our major fuel suppliers make up 0.6% of all suppliers.

Impact of engagement, including measures of success
Nature of Engagement:
We're working with our fuel supply-chain partners to secure supplies of low-carbon fuels to meet our current and projected future needs. These efforts include creating logistics solutions to enable the refueling of locomotives with biofuel blends at new locations on our network, establishing longer-term commercial contracts for biodiesel with our suppliers, and making cooperative efforts to encourage efficient, circular shipping of biofuels and biofuel feedstocks by rail. We're also working with a fuel supplier and 2 locomotive OEMs to test a 100% renewable fuel blend (testing ranges from B20 to B20R80 to R99) in commercial field application. Four Union Pacific locomotives providing service to a San Bernardino sand and gravel mine are running 100% biomass-based fuel. Data gathered during tests is expected to demonstrate that the performance and reliability of their engines are comparable whether operated with biofuel or traditional diesel fuel. Every 6 months, each locomotive will be evaluated based on emissions data and wear-and-tear on engine, which will help us understand the fuel efficiency impact of a switch to biofuels and validate our estimates for the GHG emissions reductions to be gained from switching to biofuels.

Measure of Success/Threshold:
In 2021, we announced a company-specific target to increase the percentage of low-carbon fuels consumed to 10% of our total diesel consumption by 2025 and 20% by 2030. We also measure success by participation of at least one major fuel supplier in our testing pilots with locomotive manufacturers on the use of sustainable renewable fuel blends in our locomotives to help achieve our targets.

Impact of Engagement:
In 2022, the impact of our engagement with suppliers was successful. We achieved an overall 4.5% percentage of biodiesel fuel in our locomotives, up from 3.0% in 2021. The continued collaboration with our fuel suppliers and locomotive OEMs enabled our Procurement, Fuel Management and Operations teams to increase our emissions savings from the use of renewable fuels to 244,892 mtons CO2e, while simultaneously improving our fuel efficiency by 1%. Our testing of 100% biomass-based fuel is continuing to progress with no serious issues. Data and experience obtained during the course of the pilot, expected to last until the end of 2025, if positive, will help us to meet our goals.

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement & Details of engagement

Education/information sharing	Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services

% of customers by number

35

% of customer - related Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

Union Pacific's Carbon Emission Estimator allows customers seeking to reduce carbon emissions to calculate their potential carbon emissions savings from shipping on our railroad compared to moving goods by truck. This calculator is public and gives customers and potential customers the ability to make the best environmental choice of transportation option for their needs. They can calculate the carbon emissions savings of specific rail shipments, providing comparative data among their choices. We also provide interested customers with annual emissions savings estimates. Customers sign up to receive the savings estimates. In 2022, 1,164 of our 3,324 customers [# of unique send freight parent names] received carbon savings estimates from UP [roughly 35% as mentioned above]. Over 1,700 letters were sent to 1,164 customers in total. We estimate that our customers eliminated approximately 23.4 million metric tons of GHG emissions by choosing rail over truck transportation, in 2022. The figures above relate to this campaign.

Impact of engagement, including measures of success

35% of our customers opted to receive the carbon emissions statement email with 2022 allocations. We hope to increase the % of customer who choose to receive an annual emissions savings estimate YOY.

C12.1d

(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

Union Pacific uses various tools to engage with other partners in the value chain (i.e., employees, shareholders, government agencies, and the public) about GHG emissions and climate change strategies. The company does this through varied communication modes: e.g., its financial reporting to the SEC, the company's sustainability and citizenship report known as the Building America Report, the news media, and social media platforms. We also engage our workforce on sustainability initiatives. In 2021, Union Pacific was the first railroad to organize an employee-led business resource group focused on environmental sustainability, Planet Tracks. Currently, Planet Tracks has nearly 3,000 employee members, including the CEO and several executives. The organization's mission is to improve business performance while fostering workforce engagement and personal awareness driven by initiatives that inspire sustainable focus and innovation throughout the organization. Its objectives include identifying and educating Union Pacific's workforce on environmental issues; championing environmental stewardship across the company and fostering employee engagement through training, networking and targeted activities. Planet Tracks, among other events, has held educational presentations for employees on the company's climate goals and initiatives, including our biodiesel usage goals and battery-electric locomotive investments. Planet Tracks also hosts local park clean ups and other volunteering events.

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?

No, but we plan to introduce climate-related requirements within the next two years

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

External engagement activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
Yes, our membership of/engagement with trade associations could influence policy, law, or regulation that may impact the climate

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?
Yes

Attach commitment or position statement(s)
The Paris Agreement is a legally-binding international treaty that sets a foundation for climate policy by aiming to address the intricacies of climate change – which is a heavy lift. We know that in addition to doing our part, we must engage all members of our value chain – our employees, suppliers, customers, communities and policy influencers. To this end, we support the goals of the Paris Agreement. Union Pacific is proud to be a part of the climate solution. Railroads are uniquely positioned to aid North America and the rest of the world in mitigating the effects of climate change and transitioning into a low-carbon economy. Freight rail leads other forms of surface transportation when it comes to minimizing greenhouse gas (GHG) emissions. Research shows that on average, trains are three to four times more fuel-efficient, and produce 75% fewer greenhouse gas emissions than trucks. Therefore, shifting shipments from truck to rail actively supports meeting the goals of the Paris Agreement.
Climate Lobbying Alignment Assessment.pdf

Describe the process(es) your organization has in place to ensure that your external engagement activities are consistent with your climate commitments and/or climate transition plan
It is important we ensure our direct and indirect climate-related lobbying activities are aligned with the goals of the Paris Agreement as well as our own climate-related targets and ambitions. Thus, Union Pacific published its first Climate Lobbying Alignment Assessment. The purpose of this assessment was to facilitate responsive and open stakeholder communication regarding our position on climate change and how that position aligns with the organizations where we are members. We reviewed publicly available information for each of the trade associations detailed in the assessment to determine whether its respective position on climate change and related lobbying efforts align with the Paris Agreement and Union Pacific's position on climate change. This assessment includes trade associations where we made non-deductible 2022 payments attributable to lobbying activities in excess of $25,000. We exclude state railroad membership associations, even if our non-deductible payments exceeded $25,000, because these organizations' lobbying activities are limited to the positions endorsed by Union Pacific and the Association of American Railroads.

Union Pacific executives review our trade association memberships annually for alignment with our position on climate. We are also engaged in the appropriate committees and working groups of trade associations to best exercise leadership and influence climate- and business-related policy positions. Union Pacific is committed to open and transparent discussions regarding our involvement in state and federal lobbying and policymaking.

Primary reason for not engaging in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
<Not Applicable>

Explain why your organization does not engage in activities that could directly or indirectly influence policy, law, or regulation that may impact the climate
<Not Applicable>

C12.3b

(C12.3b) Provide details of the trade associations your organization is a member of, or engages with, which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association
Other, please specify (Association of American Railroads)

Is your organization's position on climate change policy consistent with theirs?
Consistent

Has your organization attempted to influence their position in the reporting year?
Yes, we publicly promoted their current position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position
The AAR is the world's leading railroad policy, research, standard-setting, and technology organization that focuses on the safety and productivity of the U.S. freight rail industry. The AAR supports policies to increase the competitiveness of freight railroads, which are the most fuel-efficient way to move freight over land. Because railroads account for only 2.1% of U.S. transportation-related greenhouse gas emissions, supporting policies to take trucks off the road and move more freight by rail supports the goals of the Paris Agreement.
Given the AAR's statement of recognition of climate change impacts, and their aim to increase the amount of freight moved by rail, thus reducing emissions, we conclude that the AAR's lobbying activities are aligned with the goals of the Paris Agreement.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)
10327416

Describe the aim of your organization's funding
Union Pacific participates in a number of trade associations, industry groups and nonprofits across North America. There is a wide array of benefits to being involved with these organizations, including the development of policy recommendations and rail safety protocol, infrastructure investment, and shared knowledge and research.

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Trade association
National Association of Manufacturers

Is your organization's position on climate change policy consistent with theirs?
Consistent

Has your organization attempted to influence their position in the reporting year?
No, we did not attempt to influence their position

Describe how your organization's position is consistent with or differs from the trade association's position, and any actions taken to influence their position
The NAM represents 14,000 member companies—from small businesses to global leaders—in every industrial sector and works as a resource and advocate for manufacturers in the United States. The National Association of Manufacturers calls on policymakers to negotiate and ratify a fair and binding international climate treaty to improve on the Paris Agreement, with the purpose "to keep post-industrial warming of the planet to well below 2 degrees and approaching 1.5 degrees." In addition, the

NAM released specific recommendations to Congress to enact a “single, unified policy to manage GHG emissions.” Thus, we conclude the NAM’s stated policy positions are aligned with the goals of the Paris Climate Agreement.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)
176023

Describe the aim of your organization’s funding
Union Pacific participates in a number of trade associations, industry groups and nonprofits across North America. There is a wide array of benefits to being involved with these organizations, including the development of policy recommendations and rail safety protocol, infrastructure investment, and shared knowledge and research.

Have you evaluated whether your organization’s engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Trade association
Business Roundtable

Is your organization’s position on climate change policy consistent with theirs?
Consistent

Has your organization attempted to influence their position in the reporting year?
No, we did not attempt to influence their position

Describe how your organization’s position is consistent with or differs from the trade association’s position, and any actions taken to influence their position
Business Roundtable is an association of chief executive officers (CEOs) of America’s leading companies who are working to promote a thriving U.S. economy and expanded opportunity for all Americans through sound public policy. Business Roundtable was among the first national business organizations to publish a comprehensive set of principles and policies “to limit global temperature rise this century to well below 2 degrees Celsius above preindustrial levels, consistent with the Paris Agreement.” Therefore, we conclude Business Roundtable’s policy positions are aligned with the goals of the Paris Agreement.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)
300000

Describe the aim of your organization’s funding
Union Pacific participates in a number of trade associations, industry groups and nonprofits across North America. There is a wide array of benefits to being involved with these organizations, including the development of policy recommendations and rail safety protocol, infrastructure investment, and shared knowledge and research.

Have you evaluated whether your organization’s engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

Trade association
US Chamber of Commerce

Is your organization’s position on climate change policy consistent with theirs?
Consistent

Has your organization attempted to influence their position in the reporting year?
No, we did not attempt to influence their position

Describe how your organization’s position is consistent with or differs from the trade association’s position, and any actions taken to influence their position
The Chamber of Commerce of the United States is the world’s largest business organization. Members range from small businesses and chambers of commerce across the country to leading industry associations and global corporations.
The U.S. Chamber of Commerce released detailed principles for climate policy and welcomed the Biden Administration’s decision to rejoin the Paris Agreement. The Chamber supports U.S. participation in the Paris Agreement and is clear that inaction is not an option. Of note, the Chamber vigorously supported the Infrastructure Investment and Jobs Act (IIJA) that included significant resources to advance climate and energy technology innovation, electric grid infrastructure and resilience, and EV (Electric Vehicle) infrastructure and supply chains. Therefore, we conclude the US Chamber of Commerce’s policy positions are aligned with the goals of the Paris Agreement.

Funding figure your organization provided to this trade association in the reporting year (currency as selected in C0.4)
250000

Describe the aim of your organization’s funding
Union Pacific participates in a number of trade associations, industry groups and nonprofits across North America. There is a wide array of benefits to being involved with these organizations, including the development of policy recommendations and rail safety protocol, infrastructure investment, and shared knowledge and research.

Have you evaluated whether your organization’s engagement with this trade association is aligned with the goals of the Paris Agreement?
Yes, we have evaluated, and it is aligned

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication
In voluntary sustainability report

Status
Underway – previous year attached

Attach the document
Union Pacific 2022 Climate Action Plan.pdf

Page/Section reference
Governance: 25; Strategy: 11-24; Risks & Opportunities: 26; Emissions Figures: 28 ; Emissions Targets: 6-7; Other Metrics: 28

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment
Union Pacific publishes a Climate Action Plan annually.

Publication
In mainstream reports

Status
Complete

Attach the document
Union Pacific 2023 Proxy Statement.pdf

Page/Section reference
Governance: 8-9; Strategy: 3; Risks & Opportunities: 34; Emissions Figures: 5; Emissions Targets: 5; Other Metrics: 5

Content elements
Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment
Union Pacific publishes a Proxy Statement annually.

Publication
In voluntary sustainability report

Status
Complete

Attach the document
Sustainability Metrics Table.xlsx.pdf

Page/Section reference
Emissions figures, other metrics - Pg. 1

Content elements
Emissions figures
Other metrics

Comment
Union Pacific updates the sustainability data on this webpage at least annually.

C12.5

(C12.5) Indicate the collaborative frameworks, initiatives and/or commitments related to environmental issues for which you are a signatory/member.

	Environmental collaborative framework, initiative and/or commitment	Describe your organization's role within each framework, initiative and/or commitment
Row 1	Business Ambition for 1.5C Task Force on Climate-related Financial Disclosures (TCFD)	We publish a comprehensive view into how Union Pacific understands and manages the risks and opportunities associated with climate change in our TCFD disclosure. It is available here: https://www.up.com/aboutup/esg/sustainability-metrics-frameworks/index.htm In 2022, we joined the Business Ambition for 1.5°C, an alliance of more than 3,000 companies pledged to taking bold action to limit global warming to 1.5°C. As part of that pledge, we committed to the Science Based Targets Initiative (SBTi) to revalidate our short-term target in line with the 1.5°C global warming scenario and develop a long-term, science-based target to reach net-zero value chain GHG emissions by 2050. Our SBTi-approved target is displayed on their webpage here: https://sciencebasedtargets.org/companies-taking-action?ambitionToggle=1#table

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity	Scope of board-level oversight
Row 1	Yes, executive management-level responsibility	Union Pacific's Executive Vice President - Sustainability & Strategy has overall responsibility for the company's sustainability initiatives, including biodiversity, under the direction of our CEO. Union Pacific's executive leadership in our Engineering Department have management-level responsibility for implementing a mitigation hierarchy approach in regards to biodiversity issues. These activities largely are conducted as Engineering evaluates construction capital projects to determine whether there would be impacts to threatened or endangered species, and designs those identified projects to avoid or minimize negative impacts. For example, in 2021 we scheduled site prep work outside of the northern long-eared bat's roosting period and complied with in-water work restrictions during construction in order to avoid impacts to the pallid sturgeon.	<Not Applicable>

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments only	Adoption of the mitigation hierarchy approach Commitment to respect legally designated protected areas Commitment to avoidance of negative impacts on threatened and protected species	<Not Applicable>

C15.3

(C15.3) Does your organization assess the impacts and dependencies of its value chain on biodiversity?

Impacts on biodiversity

Indicate whether your organization undertakes this type of assessment
No and we don't plan to within the next two years

Value chain stage(s) covered
<Not Applicable>

Portfolio activity
<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity
<Not Applicable>

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)
<Not Applicable>

Dependencies on biodiversity

Indicate whether your organization undertakes this type of assessment
No and we don't plan to within the next two years

Value chain stage(s) covered
<Not Applicable>

Portfolio activity
<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity
<Not Applicable>

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)
<Not Applicable>

C15.4

(C15.4) Does your organization have activities located in or near to biodiversity- sensitive areas in the reporting year?
Yes

C15.4a

(C15.4a) Provide details of your organization's activities in the reporting year located in or near to biodiversity -sensitive areas.

Classification of biodiversity -sensitive area
Other biodiversity sensitive area, please specify (Various operational or construction sites owned and operated by Union Pacific)

Country/area
United States of America

Name of the biodiversity-sensitive area
Various: We define our operational sites to include bridge replacement and facility construction sites, commercial facilities construction projects, and new railroad capacity (mainline track and yard) construction projects where our experience and evaluation protocols determine that a likelihood of waterways/wetlands/species impact potential exists.

Proximity
Adjacent

Briefly describe your organization's activities in the reporting year located in or near to the selected area
Union Pacific reviews and manages sensitive resources (endangered species, migratory birds, etc) as required by Federal and State law. Our reviews follow the federal level Clean Water Act (Section 404) and all resources included in this guidance. This includes jurisdictional waterways & wetlands, threatened and endangered species, and cultural/historical/tribal resources.

Scope: We define our operational sites to include bridge replacement and facility construction sites, commercial facilities construction projects, and new railroad capacity (mainline track and yard) construction projects where our experience and evaluation protocols determine that a likelihood of waterways/wetlands/species impact potential exists.

Impact: During 2022 we had 247 operational sites as defined above which involved utilization of biodiversity management plans in consideration of waterways, wetlands, and threatened & endangered species and migratory birds.

Mitigation: For most of these locations, Union Pacific followed the regulatory bodies' prescribed guidance for how to manage issues and impacts associated with these resources.

Indicate whether any of your organization's activities located in or near to the selected area could negatively affect biodiversity
Yes, but mitigation measures have been implemented

Mitigation measures implemented within the selected area
Scheduling
Physical controls
Operational controls
Abatement controls
Restoration

Explain how your organization's activities located in or near to the selected area could negatively affect biodiversity, how this was assessed, and describe any mitigation measures implemented
Union Pacific reviews and manages sensitive resources (endangered species, migratory birds, etc) as required by Federal and State law. Our reviews follow the federal level Clean Water Act (Section 404) and all resources included in this guidance. This includes jurisdictional waterways & wetlands, threatened and endangered species, and cultural/historical/tribal resources.

C15.5

(C15.5) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity- related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water protection Land/water management Education & awareness

C15.6

(C15.6) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	No	Please select

C15.7

(C15.7) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Biodiversity strategy	1) Union Pacific 2022 Climate Action Plan pg 21. 2) News release: "Union Pacific Adds Environmental Sustainability as Philanthropic Priority" - all pages. PR Newswire Union Pacific and TNC Biodiversity 10Nov2022.pdf pdf_up_2022_climate_action_pln (1).pdf
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments	Union Pacific Biodiversity Statement: All Pages. Attached, also located on web at https://www.up.com/aboutup/esg/biodiversity-statement/. Union Pacific Biodiversity Statement.pdf

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Executive Vice-President, Sustainability & Strategy Union Pacific	Chief Sustainability Officer (CSO)