

C0. Introduction

C0.1

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

Northrop Grumman Corporation (herein referred to as “Northrop Grumman,” the “company,” “we,” “us,” or “our”) is a publicly traded company whose common stock is listed on the New York Stock Exchange (NYSE: NOC). Northrop Grumman is a leading global aerospace and defense (A&D) technology company. We deliver a broad range of products, services and solutions to United States (U.S.) and international customers, and principally to the U.S. Department of Defense (DoD) and intelligence community. Our broad portfolio is aligned to support national security priorities and our solutions equip our customers with capabilities they need to connect, protect and advance humanity. The company is a leading provider of space systems, advanced aircraft, missile defense, advanced weapons and long-range fires capabilities, mission systems, networking and communications, strategic deterrence systems, and breakthrough technologies, such as artificial intelligence, advanced computing and cyber. We are focused on competing and winning programs that enable continued growth, performing on our commitments and affordably delivering capability our customers need. With the investments we’ve made in advanced technologies, combined with our talented workforce and digital transformation capabilities, Northrop Grumman is well positioned to meet our customers’ needs today and in the future. Northrop Grumman established an environmental sustainability program in 2008 to reduce the company’s environmental footprint by improving operational efficiency and integrating environmental sustainability practices across our operations. Our Environmental Sustainability Program supports a vision for a more sustainable future by expanding environmental sustainability awareness throughout our organization, supporting our corporate values and meeting the expectations of our diverse set of stakeholders. Northrop Grumman announced our next generation sustainability goals in April 2022, which expand the company’s focus on sustainability beyond our operational footprint. Our next generation sustainability initiatives focus on activity around three mission areas: (1) Footprint: Minimizing the footprint of our operations; (2) Handprint: Enhance sustainability within the aerospace and defense industry by supporting customer needs and supply chain objectives; and (3) Blueprint: Affirm Sustainability leadership by collaborating to protect ecosystems and define environmental opportunities in our communities.

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

October 1 2021

End date

September 30 2022

Indicate if you are providing emissions data for past reporting years

Yes

Select the number of past reporting years you will be providing Scope 1 emissions data for

2 years

Select the number of past reporting years you will be providing Scope 2 emissions data for

2 years

Select the number of past reporting years you will be providing Scope 3 emissions data for

2 years

C0.3

(C0.3) Select the countries/areas in which you operate.

- Australia
- Belgium
- Canada
- Denmark
- France
- Germany
- Italy
- Japan
- Netherlands
- Norway
- Poland
- Republic of Korea
- Saudi Arabia
- Switzerland
- United Arab Emirates
- United Kingdom of Great Britain and Northern Ireland
- 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

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, a Ticker symbol	NOC

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-level committee	<p>Our Board provides leadership and oversight with respect to ESG practices and our enterprise risk management activities, including those related to climate, among other duties. Each of our independent Board committees assists in this role, providing its expertise. The full Board has ultimate responsibility for the oversight of risk and receives updates from each of the committees as well as periodic reports from senior management, including the Chief Sustainability Officer (CSO), addressing specific issues and risks, including those related to climate.</p> <p>The Policy Committee oversees the company's environmental programs, including climate change, Net Zero operations, water and waste reduction, and other initiatives and matters. The Policy Committee reviews with the CSO at least annually the status of such programs and reviews. The committee also provides oversight and recommendations regarding the company's ESG report (formerly known as the Sustainability Report) and the TCFD report. In 2022, the committee reviewed the 2021 Sustainability Report and 2022 TCFD Report. This included review of the company's commitment to achieving Net Zero GHG emissions in our operations by 2035.</p>
Board-level committee	<p>Our Board provides leadership and oversight with respect to ESG practices and our enterprise risk management activities, including those related to climate, among other duties. Each of our independent Board committees assists in this role, providing its expertise. The full Board has ultimate responsibility for the oversight of risk and receives updates from each of the committees as well as periodic reports from senior management, including the Chief Sustainability Officer (CSO), addressing specific issues and risks, including those related to climate.</p> <p>The Audit and Risk Committee assists the Board in its overall financial and enterprise risk management responsibility, including a review of the company's risks related to environmental (including climate change) matters. The committee also provides oversight of internal controls over publicly reported data in the ESG and TCFD reports and provides oversight of audit and assurance processes for ESG reporting.</p>
Board-level committee	<p>Our Board provides leadership and oversight with respect to ESG practices and our enterprise risk management activities, including those related to climate, among other duties. Each of our independent Board committees assists in this role, providing its expertise. The full Board has ultimate responsibility for the oversight of risk, and receives updates from each of the committees as well as periodic reports from senior management, including the Chief Sustainability Officer (CSO), addressing specific issues and risks, including those related to climate.</p> <p>The Compensation and Human Capital Committee approves the annual and long-term performance goals for our compensation program, including financial and non-financial metrics for our compensation program, among other responsibilities. The non-financial metrics include certain environmental and diversity, equity and inclusion goals. In February 2022, the Compensation and Human Capital Committee approved changes to the nonfinancial metrics in the Annual Incentive Plan design. The company revised the metric from a negative-only modifier by embedding it in our core metrics to reflect our continued focus on ESG and to bring greater alignment for employees, shareholders and other stakeholders. The non-financial metrics account for 10% of the overall 2022 annual incentive plan score and include a specific environmental metric - reduction in absolute GHG emissions.</p>
Board-level committee	<p>Our Board provides leadership and oversight with respect to ESG practices and our enterprise risk management activities, including those related to climate, among other duties. Each of our independent Board committees assists in this role, providing its expertise. The full Board has ultimate responsibility for the oversight of risk and receives updates from each of the committees as well as periodic reports from senior management, including the Chief Sustainability Officer (CSO), addressing specific issues and risks, including those related to climate.</p> <p>The Governance Committee Nominating and Corporate Governance Committee assists the Board in ensuring a comprehensive and effective framework for Board oversight, including of ESG matters. The committee also looks broadly at governance-related risks, including the role of each committee with respect to oversight of ESG and corporate culture, among other responsibilities.</p>

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 – some meetings	Overseeing major capital expenditures Overseeing and guiding employee incentives Reviewing and guiding strategy Overseeing the setting of corporate targets Monitoring progress towards corporate targets Reviewing and guiding the risk management process	<Not Applicable>	<p>The Policy Committee oversees the company's environmental programs, including climate change, Net Zero operations, water and waste reduction, and other initiatives and matters. The Policy Committee reviews with the CSO at least annually the status of such programs and reviews. The committee also provides oversight and recommendations regarding the company's ESG report (formerly known as the Sustainability Report) and the TCFD report. In 2022, the committee reviewed the 2021 Sustainability Report and 2022 TCFD Report. This included review of the company's commitment to achieving Net Zero GHG emissions in our operations by 2035.</p> <p>The Compensation and Human Capital Committee approves the annual and long-term performance goals for our compensation program, including financial and non-financial metrics for our compensation program, among other responsibilities. The non-financial metrics include certain environmental and diversity, equity and inclusion goals. In February 2022, the Compensation and Human Capital Committee approved changes to the nonfinancial metrics in the Annual Incentive Plan design. The company revised the metric from a negative-only modifier by embedding it in our core metrics to reflect our continued focus on ESG and to bring greater alignment for employees, shareholders and other stakeholders. The non-financial metrics account for 10% of the overall 2022 annual incentive plan score and include a specific environmental metric - reduction in absolute GHG emissions. Non-financial metrics also influence bonus payments to all eligible employees.</p> <p>The Audit and Risk Committee assists the Board in its overall financial and enterprise risk management responsibility, including a review of the company's risks related to environmental (including climate change) matters. The committee also provides oversight of internal controls over publicly reported data in the ESG and TCFD reports and provides oversight of audit and assurance processes for ESG reporting.</p> <p>The Governance Committee looks broadly at governance-related risks, including the role of each committee with respect to oversight of ESG and corporate culture, among other responsibilities.</p>

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	In considering Board nominees, the Nominating and Corporate Governance Committee considers each individual's background and personal and professional experiences in addition to general qualifications. Nominees are evaluated in the context of the Board as a whole, with a focus on achieving an appropriate mix of skills needed to provide effective governance and oversight, advancing the long-term interests of our shareholders. The Nominating and Corporate Governance Committee regularly assesses and communicates with the Board about current and future skills and backgrounds to ensure the Board maintains an appropriate mix. Certain of the skills and qualifications nominees are assessed against are listed in the 2023 Proxy statement on p.17 and includes the topic of Environmental Sustainability/Corporate Responsibility, which is inclusive of the topic of climate-related issues. Currently, nine of 13 board members have been assessed and evaluated as possessing skills in this area.	<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 Sustainability Officer (CSO)

Climate-related responsibilities of this position

- Setting climate-related corporate targets
- Monitoring progress against climate-related corporate targets
- Assessing climate-related risks and opportunities
- Managing climate-related risks and opportunities

Coverage of responsibilities

<Not Applicable>

Reporting line

CEO reporting line

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

Annually

Please explain

The CSO, who reports to the CEO, leads a team focused on a variety of sustainability initiatives such as designing and implementing enterprise-wide business practices for carbon reduction, resource efficiency and material management, including the development, management, tracking and reporting of climate-related targets and goals. The CSO is responsible for helping to reduce the company’s environmental impact and advance sustainability throughout the business. The CSO is also responsible for the monitoring of climate-related issues and risks and, as a member of the Enterprise Risk Management Committee (ERMC). The CSO provides periodic updates to the Board and the Policy Committee reviews with the CSO at least annually the status of the company’s environmental programs, including climate change and Net Zero operations.

Position or committee

Chief Executive Officer (CEO)

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 CEO has oversight over the role of the CSO. As noted above, the CEO leads a team focused on a variety of sustainability and climate initiatives.

The Board of Directors, which is chaired by our CEO, and its Committees provide oversight of the Company’s risk management processes, including the Enterprise Risk Management Committee (ERMC). Management is directly involved in sustainability risk assessment and monitoring, including risks related to climate change and natural disasters that may affect operations, through, among other things, the ERMC. The ERMC is comprised of the CEO, all members of the Executive Leadership Team (i.e., the sector presidents, the Chief Human Resources Officer, the Vice President of Global Operations, General Counsel, Chief Strategy and Development Officer, Chief Financial Officer, Chief Global Business Officer and Chief Communications Officer) as well as leaders across key functional areas, including the Chief Accounting Officer, Chief Compliance Officer, Chief Technology Officer, CSO, Corporate Secretary, Vice President of Global Supply Chain, Vice President of Internal Audit and Treasurer.

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

Corporate executive team

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Performance indicator(s)

Reduction in absolute emissions

Incentive plan(s) this incentive is linked to

Short-Term Incentive Plan

Further details of incentive(s)

As noted in the 2023 Proxy Statement, under our 2022 Annual Incentive Plan (AIP), we used a mix of financial and non-financial metrics to measure our performance for purposes of determining award payout to our Named Executive Officers (including the CEO, CFO and others) annually. Environmental Sustainability is one of five non-financial metrics. Performance against this metric is measured in terms of reductions in absolute greenhouse gas emissions. The AIP was modified in February 2022 to include the non-financial metrics, including Environmental Sustainability, as core metrics as opposed to negative-only modifiers, as in prior years, as a reflection of our continued focus on ESG and alignment for employees, shareholders and other stakeholders. The non-financial metrics accounted for 10% of the overall 2022 annual incentive plan score.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Reductions in absolute emissions directly aligns with our Net Zero by 2035 goal and overall emissions reduction strategy.

Entitled to incentive

All employees

Type of incentive

Monetary reward

Incentive(s)

Bonus - % of salary

Performance indicator(s)

Reduction in absolute emissions

Incentive plan(s) this incentive is linked to

Short-Term Incentive Plan

Further details of incentive(s)

Non-financial metrics also influence bonus payments to all eligible employees. Environmental Sustainability is one of five non-financial metrics that is measured in terms of reductions in absolute greenhouse gas emissions.

Explain how this incentive contributes to the implementation of your organization's climate commitments and/or climate transition plan

Reductions in absolute emissions directly aligns with our Net Zero by 2035 goal and overall emissions reduction strategy.

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	5	Time horizons defined within this response are for the purpose of our climate-related risk and opportunity assessments.
Medium-term	5	15	Time horizons defined within this response are for the purpose of our climate-related risk and opportunity assessments.
Long-term	15		Time horizons defined within this response are for the purpose of our climate-related risk and opportunity assessments.

C2.1b

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

Our 2022 Annual Report, Item 1A: Risk Factors (page 10), lists factors that may have material adverse effect on our financial position, results of operations and/or cash flows. Specific to the Business Impact Analysis process at the site/asset level, the impact is determined on a scale of low, medium, or high. The analysis assesses the effect on the company by determining the financial, reputational and known legal impact if recovery is not achieved. Using a tiered ranking system, we evaluate risks to help determine prioritization based on probability, business impact (including a focus on top-tier suppliers), recovery time and if the exposure will be addressed at the site, sector or company level. Medium and high impacts represent a substantive financial impact. We use the word “substantive” throughout this questionnaire, as is consistent with CDP, and substantive impacts represent notable business impacts. We do not consider “substantive” to be analogous with materiality as defined by, or in the context of, the U.S. Securities and Exchange Commission (SEC) laws, including those related to SEC reporting and disclosure obligations (or any other securities laws) or as the term is used in the context of financial statements and financial reporting.

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

Annually

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

Our Board provides leadership and oversight with respect to ESG practices and our enterprise risk management activities, including those related to climate, among other duties. Each of our independent Board committees assists in this role, providing its expertise. The full Board has ultimate responsibility for the oversight of risk and receives updates from each of the committees as well as periodic reports from senior management, including the Chief Sustainability Officer (CSO), addressing specific issues and risks, including those related to climate.

The Enterprise Risk Management Committee (ERMC) evaluates risks and mitigation strategies across the company, including new, emerging or evolving risks. The ERMC is comprised of the CEO, all members of the Executive Leadership Team (i.e., the sector presidents, the Chief Human Resources Officer, the Vice President of Global Operations, General Counsel, Chief Strategy and Development Officer, Chief Financial Officer, Chief Global Business Officer and Chief Communications Officer) as well as leaders across key functional areas, including the Chief Accounting Officer, Chief Compliance Officer, Chief Technology Officer, CSO, Corporate Secretary, Vice President of Global Supply Chain, Vice President of Internal Audit and Treasurer. The ERMC seeks to ensure that the company has identified and understands the more significant risks facing our business and that we have effective mitigation measures in place to address each of them. These risks are described in the company’s Annual Report on Form 10-K. Included within these risks are natural disasters, environmental, health and safety, compliance with laws, hazardous and high-risk operations, and climate-related risks, such as increased wildfire risks, rising mean temperature and sea levels, and long-term changes in precipitation patterns, like increased drought, desertification and/or poor water quality. Certain members of the ERMC have responsibility for specific risks, including the CSO’s responsibility for climate-related risks, and are responsible for assessing risks, developing and executing risk mitigation plans, and monitoring status and trends.

The ERMC meets at least twice a year and the supporting working group and steering committee meet at least four times a year. At the ERMC meetings, members review each of the significant risks to the business, current trends related to those risks and the status and effectiveness of mitigation measures. For example, the ERMC reviews how climate change may continue to impact facilities, operations, employees and communities in certain regions potentially exposed to climate change-related natural disasters. Similarly, the ERMC evaluates how climate change-related disruptions could impact the availability and cost of materials needed for manufacturing, and how new or more stringent regulations adopted in response to climate change could require substantial capital investment and enhanced reporting. Importantly, the ERMC also identifies, discusses and considers new potential or emerging risks that could become significant to the company, including emerging climate-related risks, and integrates climate-related risks into the overall risk management process at Northrop Grumman. Members of the ERMC discuss the status of each risk, whether the risk is increasing or decreasing and areas of concern. The company has developed risk mitigation efforts for each of our significant risks, which members of the ERMC manage. The ERMC members work with management on risk mitigation and provide updates at least annually to the Board. These risk analyses cover our operations, as well as our customers and suppliers.

Our Business Resiliency team operates through centralized control and oversight. The Business Resiliency team conducts physical security surveys to evaluate risks and opportunities and their potential impacts to the company, personnel and/or operations. Business impact analyses are performed annually, originating at the site level and rolling up to the sector level, and the impact is determined on a scale of low, medium or high. The team facilitates these business impact analyses in coordination with the sectors to assess the potential risk and identify the recovery prioritization of sites and business processes, as well as gaps in recoverability. The analysis assesses the effect on the company by determining the financial, reputational and known legal impact if recovery of the process is not achieved. Using a tiered ranking system, we evaluate risks to help determine prioritization based on probability, business impact (including a focus on top-tier suppliers), recovery time and if the exposure will be addressed at the site, sector or company level. When possible, we establish contingency plans in case our personnel or buildings are unavailable due to risks, such as natural disasters exacerbated by the effects of climate change. Certain risks and issues are elevated to sector and company leadership where mitigation options are developed and funded.

Our Annual Report, Item 1A: Risk Factors, lists factors that may have material adverse effect on our financial position, results of operations and/or cash flows. Specific to the Business Impact Analysis process at the site/asset level, the impact is determined on a scale of low, medium, or high, with medium and high impacts representing a substantive financial impact.

Efforts to manage climate-related risks also create opportunities for the company. To capitalize on these opportunities, our environmental sustainability program collaborates internally to analyze, address, and pursue potential opportunities from resource efficiency to stakeholder engagement. By working towards our next-generation environmental sustainability goals, including our Net Zero by 2035 in our operations emissions goal, we are actively reviewing and implementing initiatives that not only reduce our environmental footprint, but also may positively influence the company through cost savings, resiliency, and/or company reputation.

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	The Company considers current regulations as part of its risk evaluation and mitigation strategies. Increased worldwide focus on climate change has led to legislative and regulatory efforts to combat both potential causes and adverse impacts of climate change, including regulation of greenhouse gas emissions. New or more stringent laws and regulations related to greenhouse gas emissions and other climate change related concerns have affected and will likely continue to affect us, our suppliers and our customers. Internationally, for example, where we have major operations such as in the United Kingdom and European Union, we must comply with greenhouse gas and energy reporting requirements, like the climate-related financial disclosure regulations or the Corporate Sustainability Reporting Directive, to ensure our in-country locations are meeting climate-related reporting requirements, as applicable.
Emerging regulation	Relevant, always included	The Company considers emerging regulations as part of its risk assessment and management programs. Increased worldwide focus on climate change has led to legislative and regulatory efforts to combat both potential causes and adverse impacts of climate change, including regulation of greenhouse gas emissions. New or more stringent laws and regulations related to greenhouse gas emissions and other climate change related concerns have affected and will likely continue to affect us, our suppliers and our customers. For example, in 2022, the U.S. Securities and Exchange Commission (SEC) and Federal Acquisition Regulation (FAR) council issued proposed rule-makings on climate change.
Technology	Relevant, always included	The Company considers technology as part of its risk assessment for climate change. Considering the pace of sustainability-focused technological advancements across the globe and the emissions and/or climate impacts associated with the defense industrial base, both for Northrop Grumman and our suppliers, it is reasonably likely that the industry will experience changes in technology over the next 20 to 30 years.
Legal	Relevant, always included	The Company considers legal and regulatory risks as part of its risk assessment. New or more stringent laws and regulations related to greenhouse gas emissions and other climate change related concerns may adversely affect us, our suppliers and our customers. Some of our facilities are, for example, engaged in manufacturing processes that produce greenhouse gas emissions, including carbon dioxide, or rely on products from others that do so. However, new and evolving laws and regulations could mandate different or more restrictive standards, could require capital investments to transition to low carbon technologies, could adversely impact our ongoing operations, and could require changes on a more accelerated time frame. Our suppliers may face similar challenges and incur additional compliance costs that are passed on to us.
Market	Relevant, always included	The Company considers market risks as part of its risk assessment and management programs, and we assess global security trends and how these trends may impact our customer's needs. Many of the markets in which we operate are characterized by rapidly-changing technologies and are highly competitive. Changing conditions impacting the frequency of extreme weather, the movement of glaciers and soil moisture conditions require increased monitoring and measurement. From observations to decision support, Northrop Grumman develops and operates systems and services to deliver environmental intelligence through science, sensors and enterprise services. Examples include the Global Hawk air vehicle that is being used by NASA earth science missions as sustainment services for the Air Force Weather program or the ICESat-2 satellite that measures the changing height of Earth's glaciers, ice sheets and sea ice.
Reputation	Relevant, always included	The Company considers reputational risks as part of its risk assessment and management programs. Northrop Grumman remains committed to sustainable performance through effective environmental stewardship, strong corporate citizenship, devotion to diversity and inclusion and maintenance of high standards of ethics, business conduct and corporate governance. Our ability to acquire and retain talent within the company also depends, in part, on our ability to maintain our reputation in our community and industry. As stated in our 2022 ESG Report, talent management is key to our near- and long-term growth. Without a best culture workplace, which includes strong environmental management, we may not be able to attract and retain the most diverse talent from top colleges and the labor market. Having an environmental sustainability program and time-bound enterprise-wide goals to address climate-related issues demonstrates a commitment to environmental, social, and governance topics that are important to potential new hires, and thus reinforces Northrop Grumman's reputation as a preferred employer.
Acute physical	Relevant, always included	The Company considers acute physical risk such as natural disasters as part of its risk assessment and management programs. The increase in frequency and/or severity of extreme weather events may have a significant impact on many parts of our business, including: manufacturing, corporate locations (including facilities that have been and may in the future be exposed to extreme weather events), distribution facilities, logistics and transportation, supply chain and even demand for product. We have significant operations, including centers of excellence, located in regions that have been and may in the future be exposed to hurricanes and other damaging storms, changing water levels, wildfires and other natural disasters. Our subcontractors and suppliers similarly are subject to natural disasters that could affect their ability to deliver or perform under a contract, including possible disruptions to their workforce or the critical industrial infrastructure needed for normal business operation. One example is our St. Augustine, Florida Aircraft Integration Center of Excellence where the E-2D Hawkeye aircraft is manufactured. This facility is located in North Florida, near coastal waterways, and subject to hurricanes and tropical storms.
Chronic physical	Relevant, always included	The Company considers chronic physical risks as part of its risk assessment and management programs. We leverage insurance modelling systems to determine the maximum windstorm and earthquake exposure when designing new buildings and use this as a basis for annual insurance coverage. We also review the infrastructure supporting critical sites and assess and rank priority risk level based on function and facility two times a year to determine the best way to support the highest priority facilities. An example of considering chronic risks is represented in the design of the new Building 100 at our St. Augustine, Florida site. The design requirements included the capability to withstand an ultimate wind speed of 130 mph into the building structure design and the roof-mounted, integrated solar panels.

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?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Cyclone, hurricane, typhoon
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Primary potential financial impact

Decreased revenues due to reduced production capacity

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Our business is subject to disruption caused by natural and/or environmental disasters that could adversely affect our revenues, profitability and our overall financial

position. We have significant operations located in regions that may be exposed to damaging storms and other natural disasters. Our St. Augustine, Florida Aircraft Integration Center of Excellence where the E-2D Hawkeye aircraft is manufactured and our Melbourne, Florida Manned Aircraft Design Center of Excellence. These facilities are located in coastal Florida, near coastal waterways, and are subject to hurricanes and tropical storms. Natural and environmental disasters could also disrupt the critical infrastructure needed for normal business operations. As a result of the increased risk and expected recovery cost after catastrophic climate events, there is a risk of insurance coverage becoming less available or a larger financial burden.

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, a single figure estimate

Potential financial impact figure (currency)

750000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The financial impact represents the impact to our Melbourne, FL operations during Hurricane Irma. The \$750,000 equals the sum of lost production hours, employee time off and overtime, post-event cleanup, travel costs and diesel fuel for generators.

Cost of response to risk

0

Description of response and explanation of cost calculation

The Business Continuity Program is designed to enable the company to respond effectively to unanticipated events (e.g. natural disasters) with an emphasis on the protection of people, information and assets as well as continuity of mission. At the facility (asset) level, the Business Continuity Program leverages annual physical security surveys known as a Business Impact Analysis, to evaluate risks and opportunities and their potential impacts to the company, personnel, and/or operations. The Business Impact Analysis helps prioritize the recovery order of business assets and sites, identify gaps in recoverability, and help determine potential financial, reputational, and known legal impacts if recovery is not achieved.

Case Study: During Hurricane Irma, the company executed this process at the Melbourne, FL facility, which helped ensure important safeguards were in place to protect employees and assets during and after the hurricane. Safeguards included proactive communication to employees five days before the hurricane; the transport of vital supplies to employees and delivering fuel trucks to operate generators for mission critical systems two days before landfall; and sending first responder teams and RVs after the hurricane to help resume business operations. The cost of response to risk is \$0 because there is no additional cost in managing risks of extreme weather events as our Business Continuity Program is part of our regular course of business.

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Chronic physical	Precipitation and/or hydrological variability
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Primary potential financial impact

Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

The effects of climate change have the potential to impact the cost of utilities at our sites as cities cope with and plan for the cycles of drought, extreme heat, and flash floods which are putting a strain on natural resources and critical infrastructure. Our California sites in El Segundo, Manhattan Beach, Redondo Beach, Palmdale, and Sunnyvale, among others, account for approximately one third of both our natural gas and electricity usage and could see higher operating costs as a result of increased utility fees associated with new regulations that have recently been passed to combat these environmental changes. Furthermore, in California, water utilities are assessing drought fees on customers and adding a surcharge for users that exceed their established allocations as a way to better manage drought risks. Additionally, AB 1054 was passed in California in July of 2019. The program established by this law is designed as an insurance fund to help electric utilities cover the cost of asset damage resulting from the increasing frequency of wildfires in California. Utilities are now allowed to impose additional fees and rate increases on rate payers like our sites mentioned above and we are continuing to assess how these additional rates have impacted the operating costs at our sites.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

2600000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Estimated financial impact is based on the company's 2019 base year water usage and projecting an average rate increase of 3.0% per year for water over 10 years (per the DOE FEMP Annual Price Escalation Rate report from March 2023) Financial Impact= [(\$6.00/kgal*.030)*(1,438,000,000/1000gals)*10years]

Cost of response to risk

1750000

Description of response and explanation of cost calculation

Northrop Grumman's next-generation environmental sustainability goals for greenhouse gas emissions reduction and potable water use reduction assist in managing the climate-related risks associated with increasing costs of utilities. Through these goals, we are driving operational efficiency and cost savings throughout our company, reducing energy consumption and conserving water; we are also reducing the future impacts of rising utility costs as a result of issues such as the California drought. Case Study: In California, we are reducing the future impacts of rising utility costs as a result of chronic drought risk. Each year we implement potable water conservation projects to drive performance to our potable water use reduction goal. Across our business, through our environmental and efficiency allocated capital (E&E) we allocated \$2.7 million in 2022 to drive environmental sustainability projects, including water conservation projects. At sites in southern California, we completed projects such as replacing landscaping with hardscaping, converting irrigation to recycled water, and converting a cooling tower to reclaim water, totaling approximately \$1,750,000 in capital costs, reducing over 5 million gallons of water and saving \$7,000 annually in operational costs. We use this figure as our cost of management response to risk.

Comment**Identifier**

Risk 3

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 direct costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Companies across the board may face new climate change-related policy and legal requirements, such as carbon taxes or cap-and-trade programs in the states and/or countries in which they primarily operate. The financial impact of a carbon tax could be significant, based on Northrop Grumman's historical Scope 1 and 2 emission levels and the International Energy Agency's (IEA's) estimated carbon price of \$140/tCO2 by 2040. The primary source of potential cost from the implementation of carbon pricing is from purchased electricity costs, as utility companies pass the carbon price on their emissions through the cost of electricity.

Time horizon

Long-term

Likelihood

Likely

Magnitude of impact

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)

11038720

Potential financial impact figure – maximum (currency)

110387200

Explanation of financial impact figure

The estimated calculation represents an estimated annual carbon tax Northrop Grumman would have to pay annually in 2040 if the company maintains emissions at 2021 levels. Our analysis, as described in our TCFD report, is based on an estimated carbon price of \$140/tCO2 that IEA estimates will occur by 2040. Financial impact: By multiplying our 2019 base year annual emissions (788,480 tCO2) by the estimated 2040 carbon price (\$140/tCO2), we identify one scenario of how our business could be impacted by a carbon price. This high-end estimate assumes that our carbon emissions would continue at 2019 levels until 2040. At the low end of the range, we assume that we achieve our Net Zero by 2035 emissions goal, with a remaining 10% emissions at the end of the goal period to offset. The lower estimate is based on 10% of our 2019 base year emissions (which is 78,480 tCO2) multiplied by the same carbon price (\$140/tCO2). Based on this scenario analysis, we do not anticipate the impact of carbon pricing to be significant relative to overall costs, and we believe we are currently resilient to this risk.

Cost of response to risk

3000000

Description of response and explanation of cost calculation

By proactively and voluntarily reducing our emissions, we are reducing exposure to future carbon taxes from the federal government, states and/or countries where we do business, while also making a contributing to the fight against climate change. We have set a Net Zero emissions by 2035 goal for our operations (Scopes 1 and 2), with a 50% reduction by 2030. Achieving this goal can decrease the risk of carbon pricing to our business.

Case Study: In order to achieve our Net Zero emissions goal and minimize our exposure to future carbon taxes, each year we invest in our infrastructure through energy efficiency and GHG emissions reduction projects. The \$3 million cost figure represents our annual investment in greenhouse gas emissions-reduction projects in 2022. In 2022, our execution of 47 GHG emissions reduction projects across the company will reduce annual emissions by an estimated 2,445 MTCO₂e; these projects have an average payback of 5 years. Project examples include HVAC and lighting upgrades, energy management systems, installations of VFDs, and conversion to electric fleet vehicles. This year, one LED lighting upgrade project at our Troy Hill facility reduced an estimated 337 MTCO₂e and annual operational costs by \$78,000, with a simple payback of 2.4 years.

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

Resource efficiency

Primary climate-related opportunity driver

Use of more efficient production and distribution processes

Primary potential financial impact

Reduced indirect (operating) costs

Company-specific description

Resource efficiency, driven by Northrop Grumman's environmental sustainability program and next-generation goals, creates an opportunity for reduced operating costs at our sites. Each year we invest in our infrastructure through energy efficiency and greenhouse gas emissions reductions projects, reducing the cost of our operations and minimizing our environmental footprint across all of our global operations. For example, we have 17 "green" buildings in our portfolio, certified to Energy Star and LEED standards, and totaling approximately 2.2 million square feet of floor space. Investments in projects such as these drove performance towards our 2020 greenhouse gas reduction goal of 30% from a 2010 base year and reduce operation costs. These investments will continue to drive our strategy to achieve our Net Zero by 2035 goal.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

4725000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The estimated financial impact represents the annual positive financial implications of our 2022 investments in resource efficiency projects. Lifetime cost savings of the 2022 investment in greenhouse gas emissions-reduction projects which is calculated over an estimated 7.5-year minimum lifespan of the projects. The average payback period for these projects is 5 years. Financial impact 4,725,000 = (630,000 annual cost savings * 7.5 years).

Cost to realize opportunity

3000000

Strategy to realize opportunity and explanation of cost calculation

Northrop Grumman manages this opportunity through the company's Environmental, Health & Safety (EHS) and Environmental Sustainability organizations. The EHS team heads the company's efforts to provide a safe and healthy workplace for our employees and to ensure that we conduct our operations in an environmentally responsible manner and that we conduct our business activities in accordance with applicable legal requirements. To manage potential greenhouse gas emissions reporting obligations the environmental sustainability program was established in 2008. Our second greenhouse gas emissions-reduction goal was to reduce emissions by 30% from 2010 to 2020. Our next-generation goal is to achieve Net Zero emissions in our operations (Scopes 1 and 2) by 2035, with a 50% reduction by 2030. The cost to realize the opportunity represents the sum of the 2022 investments in emissions reductions activities that enable the company to minimize its greenhouse gas emissions and make progress towards its net zero goal.

Case Study: By proactively and voluntarily reducing our emissions, we are reducing exposure to future environmental regulations from the federal government and states where we do business and capitalizing on efficiency opportunities. In 2022, our execution of 47 GHG emissions reduction projects across the company will reduce annual emissions by an estimated 2,445 MTCO₂e; these projects have an average payback of 5 years. Project examples include HVAC and lighting upgrades, energy management systems, installations of VFDs, and conversion to electric fleet vehicles. This year, one LED lighting upgrade project at our Troy Hill facility reduced an estimated 337 MTCO₂e and annual operational costs by \$78,000, with a simple payback of 2.4 years.

Comment**Identifier**

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Reduced water usage and consumption

Primary potential financial impact

Reduced indirect (operating) costs

Company-specific description

Resource efficiency, driven by Northrop Grumman's environmental sustainability program and next-generation goals, creates an opportunity for reduced operating costs at our sites. Each year we invest in our infrastructure through reduced water usage and consumption projects, reducing the cost of our operations and minimizing our environmental footprint across all of our global operations. For example, the 11 water conservation projects completed in 2022 are estimated to conserve over 15 million gallons annually across the business. Investments in these projects drive performance toward our next-generation water goal.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

900000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The estimated financial impact represents the cost savings resulting from our 2022 annual water reductions over a 10 year period. Estimated reduction of 15 million gallons annually and an average cost of water of \$6/kgal. Financial impacts: $900,000 = (15\text{MG}/1000\text{gal} * \$6\text{price/kgal}) * 10 \text{ years}$

Cost to realize opportunity

3200000

Strategy to realize opportunity and explanation of cost calculation

Northrop Grumman's next-generation environmental sustainability goals for water use reduction assist in managing the climate-related risks associated with increasing costs of utilities. Through these goals, we drive operational efficiency and cost savings throughout our company, reducing energy consumption and conserving water. Through these reductions, we are also reducing the future impacts of rising utility costs as a result of issues such as the Arizona and California droughts. Each year we implement potable water conservation projects to drive performance to our next-generation water goal. In 2022, we implemented targeted conservation projects estimated to save 15 million gallons of water by investing approximately \$3.2 million across the business. This cost to realize the opportunities represents the sum of the costs of these projects. We use this figure as our cost of management.

Case Study: We invest in water reduction projects across our business; however, in areas like Arizona and southern California, our facilities face potential future impacts of rising utility costs related to drought. In response to this risk, we focus investments on driving water conservation in water-stressed regions. At sites in Arizona and southern California, for example, we completed projects such as replacing landscaping with hardscaping, converting irrigation to recycled water, and converting a cooling tower to reclaim water, reducing over 6 million gallons of water and saving \$10,000 annually in operational costs in a region where water risk and rising utility costs could impact our business in the future.

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Climate-related issues may increase demand for technologies and capabilities provided by Northrop Grumman that support environmental and weather research. From observations to decision support, Northrop Grumman develops and operates systems and services to deliver environmental intelligence through science, sensors and enterprise services. Examples include the Global Hawk air vehicle that is being used by NASA earth science missions, sustainment services for the Air Force Weather program, and the AstroMesh-Lite® reflector being developed for NASA JPL's Soil Moisture Active Passive spacecraft.

Time horizon

Medium-term

Likelihood

About as likely as not

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

9000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

The financial impact of \$9,000,000 represents the lowest contract value from the examples provided below. Financial impacts vary based on individual contract value. Example programs include the \$300 million Air Force contract for the Systems Engineering, Management and Sustainment III, the \$121 million Advanced Technology Microwave Sounder for NOAA's Joint Polar Satellite System, and the \$9 million Scalable Space Inertial Reference Units for the Korea Aerospace Research Institute GEO-KOMPSAT-2 space satellite program.

Cost to realize opportunity

0

Strategy to realize opportunity and explanation of cost calculation

The methods used to manage these opportunities include Northrop Grumman's business development/customer relationship management practices. Northrop Grumman has supported NASA environmental data missions since the 1980s and our support has matured and evolved. We showcase our expanded suite of technical capabilities and supporting IT platforms, including those designed for environmental and climate monitoring via press releases and our public website. Our environmental and weather information solutions have a dedicated page on our capabilities website which describes our initiatives that support weather and environmental science.

Case Study: Northrop Grumman extended the NASA Space Act Agreement into 2018 to continue joint use and shared cost of the Northrop Grumman-produced Global Hawk unmanned aircraft for science missions, hurricane surveillance, atmospheric research and exploration of new mission capabilities. There is no additional cost to realize the opportunity as engaging with customers to demonstrate our capabilities is part of our regular course of business.

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

No, but our strategy has been influenced by climate-related risks and opportunities, and we are developing a climate transition plan within two years

Publicly available climate transition plan

<Not Applicable>

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

<Not Applicable>

Description of feedback mechanism

<Not Applicable>

Frequency of feedback collection

<Not Applicable>

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

<Not Applicable>

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

Northrop Grumman recognizes that climate-related risks and opportunities have the potential to impact our business in the short, medium and long term. In 2022, Northrop Grumman conducted a climate scenario analysis on certain physical and transition risks to gain a deeper understanding of our resilience in different climate scenarios. The results of this analysis were published in our first TCFD report. In 2022, we further enhanced our Net Zero operations transition plan. Our strategy includes multiple facets – (1) sourcing renewable electricity, (2) identifying and implementing energy efficiency solutions across our sites and (3) engraining resource conservation and efficiency into operations decisions. Northrop Grumman is also pursuing other emissions reduction solutions including electrification, alternative fuels and energy monitoring. We expect that in order to reach Net Zero operations, approximately 10 percent of the overall emissions reduction from the 2019 baseline year will likely be addressed through carbon removals as the emissions will be from hard-to-abate sources. Within the next two years, we plan to develop a comprehensive transition plan and roadmap to achieving our Net Zero target.

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

<Not Applicable>

(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 IEA SDS	Company-wide	<Not Applicable>	To understand the potential impacts of carbon pricing, we chose two scenarios for our analysis based upon the IEA Stated Policies Scenario (STEPS, 2.6°C) and Sustainable Development Scenario (SDS, 1.5-to-2°C), across a time horizon spanning from a base year of 2021 to 2050. For the purpose of modelling the impact of carbon pricing, SDS represents IEA's view on the policy necessary for an orderly transition to a low-carbon economy in support of global temperature increases well below 2°C. SDS assumes a near-term surge in clean energy policies and investments to achieve sustainable energy objectives in line with the Paris Agreement, including universal access to modern energy and air quality goals. Although some assumptions made by the IEA may seem aggressive relative to current trends, they are modelled as presented for standardization purposes and best practices to allow us to understand the impact to our business under a 1.5-to-2°C warming scenario. We believe these two scenarios provide a useful comparison between existing policy (STEPS) and what would be necessary to avoid the worst physical impacts of climate change (SDS).
Transition scenarios IEA STEPS (previously IEA NPS)	Company-wide	<Not Applicable>	To understand the potential impacts of carbon pricing, we chose two scenarios for our analysis based upon the IEA Stated Policies Scenario (STEPS, 2.6°C) and Sustainable Development Scenario (SDS, 1.5-to-2°C), across a time horizon spanning from a base year of 2021 to 2050. For the purpose of modelling the impact of carbon pricing, STEPS considers only currently enacted carbon policy (which aligns with a 2.6°C increase in temperature by 2100 relative to pre-industrial levels. STEPS is based on policies in place as of mid-2021. It includes long-term energy and climate targets only to the extent that they are backed up by specific governmental or regulatory policies. Under STEPS, the share of renewable energy is gradually increasing, and accounts for over 40% of electricity generation by 2040. Renewables are even more prevalent than in STEPS, with all advanced economies reaching net zero emissions by 2050. Although some assumptions made by the IEA may seem aggressive relative to current trends, they are modelled as presented for standardization purposes and best practices to allow us to understand the impact to our business under a 1.5-to-2°C warming scenario. We believe these two scenarios provide a useful comparison between existing policy (STEPS) and what would be necessary to avoid the worst physical impacts of climate change (SDS).
Physical climate scenarios RCP 2.6	Company-wide	<Not Applicable>	Representative Concentration Pathways (RCP) 2.6 and RCP 8.5 are two generally-accepted scenarios used for the purposes of discussing physical risk scenario testing, and we believe that they provide a useful contrast of best- and worst-case physical risk exposure. RCP 2.6 is characterized by substantial net negative GHG emissions by the year 2100. It assumes carbon transition policies are put in place and is largely aligned with the well-below 2°C warming scenario described in the Paris Agreement.
Physical climate scenarios RCP 8.5	Company-wide	<Not Applicable>	Representative Concentration Pathways (RCP) 2.6 and RCP 8.5 are two generally-accepted scenarios used for the purposes of discussing physical risk scenario testing, and we believe that they provide a useful contrast of best- and worst-case physical risk exposure. RCP 8.5 is characterized by very high emissions throughout the 21st century. Though considered relatively unlikely, this scenario would result in approximately 4.3°C of warming as minimal additional effort is made to constrain GHG emissions. This is generally considered a “worst-case” climate change scenario.

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

Focal Question 1: What is the impact of increased pricing of GHG emissions due to the implementation of a carbon price?

Focal Question 2: What are the potential changes to the risk of flood, tornados, tropical cyclone and wildfires at all of our site locations, including manufacturing, facilities, offices and warehouses?

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

Focal Question 1: The potential carbon price impact to Northrop Grumman varies considerably across climate change scenarios, as the lower warming scenario (SDS) requires a more stringent policy implementation. In either scenario, the estimated direct impact of carbon pricing on our Scope 1 emissions, as produced by our model, is negligible due to our low Scope 1 emission levels. The primary source of potential cost from the implementation of carbon pricing is from purchased electricity costs (Scope 2 emissions) as utility companies pass the carbon price on their emissions through the cost of electricity. Our risk of carbon pricing can be decreased by achieving our commitment to net zero GHG emissions in our operations. We also separately project carbon prices for the operating regions in which Northrop Grumman observes significant GHG emissions (e.g., US, UK, EU, and Australia) for the purposes of scenario planning. By creating distinct projections for specific geographies, we are able to better assess the impact a carbon price would have on sites in a particular operational region. Currently, we believe we are resilient in a carbon policy environment that is aligned to 1.5-to-2°C. One action we take in relation to this focal question is to continue to revisit this analysis in the future as carbon policy in our significant operating areas evolves.

Focal Question 2: Overall, Northrop Grumman’s business is diversified geographically in both high and low warming scenarios, and no single peril presents a heavily-concentrated risk across all locations. As expected, physical risk is estimated to be more impactful under RCP 8.5 conditions because of higher global GHG emissions. However, we still observe changes to physical risk levels under RCP 2.6 conditions. We split our analysis by peril, highlighting the regions that face the biggest risk or experience the biggest increase in projected risk in each area. For example, one action we take in relation to this focal question is to closely monitor wildfire activity in California due to our large operational presence in the state.

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
Products and services	Yes	Climate-related issues may increase demand by our customers for technologies and capabilities provided by Northrop Grumman that support environmental and weather research. From observations to decision support, Northrop Grumman has made the strategic business decision to develop and operate systems and services to deliver environmental intelligence through science, sensors and enterprise services. The time horizon for these activities is ongoing (short-, medium-, and long-term as specified in C2.1a). Northrop Grumman provides an array of products that support climate and earth monitoring activities being completed by our customers. The data acquired from the systems we develop provide important information that is required to better understand the Earth's changing climate. The continued need for these systems provides further opportunity to leverage Northrop Grumman capabilities (Opportunity #3 in question 2.4a). For example, the JPSS-1 satellite was launched carrying two Northrop Grumman-developed sensors that monitor atmospheric data. The NASA Global Hawk developed by Northrop Grumman is used for various climate monitoring missions and has recently been used to closely monitor hurricanes and aid in disaster relief efforts.
Supply chain and/or value chain	Yes	Climate/natural disaster issues are one of many characteristics integrated into our Global Supply Chain Risk Management strategy. We have a committee that meets monthly to identify, assess and monitor medium-term (5 to 10 years) supply chain risks across the enterprise in order to manage issues on an ongoing basis. Our strategy is influenced by the fact that our suppliers and subcontractors are subject to natural and environmental disasters that could affect their performance to our contracts and ultimately impact our operations. As an example, when a Climate/natural disaster supply chain risk has been identified (i.e. hurricanes, wildfires), our committee assesses for probability of supply chain disruption as well as severity of impact to our business operations and programs. Detailed mitigation plans are established at the local or enterprise level, in collaboration with our internal stakeholders and suppliers as appropriate. Case study: During Hurricane Irma, our facilities in Melbourne and St. Augustine experienced availability and delivery issues for diesel fuel required to power emergency generators as a result of limited supply, high-demand and damaged infrastructure caused by the storm. A decision based on our risk mitigation strategy included leveraging our geographically diverse supply base in order to coordinate alternative sources of supply from outside of the impacted area in order to continue operational continuity of our facilities.
Investment in R&D	Yes	Climate-related risks and opportunities can have a direct impact on our investment in R&D due to the nature of our business. Our products and services are designed to meet contractual requirements of our customers, primarily the U.S. Government and principally the Department of Defense and intelligence community. Company-sponsored R&D investment strategy includes significant investment to support future technologies and mission solutions primarily related to government programs. One example of a low-carbon future technology is the development of a space-based solar power system. Northrop Grumman has provided a significant investment in a partnership with the California Institute of Technology (Caltech) for the development of the Space Solar Power Initiative. This program brings together our top engineers with researchers from Caltech to develop scientific and technological innovations to enable a space-based solar power system capable of generating electric power at cost parity with grid-connected fossil fuel power plants. In 2015, Northrop Grumman provided \$17.5 million to support this project and continues to collaborate with the Caltech team to develop solutions, build prototypes and obtain experimental and numerical validation concepts that could allow for the development and eventual implementation of new deep space solar technology.
Operations	Yes	Our strategy is influenced by the fact that our business is subject to disruption caused by natural and/or environmental disasters that could adversely affect our profitability and our overall financial position. We have significant operations located in regions that may be exposed to hurricanes and other damaging storms and natural disasters. For example, Hurricanes Irma and Maria impacted our St. Augustine, Florida and Melbourne, Florida operations and resulted in employee evacuations, lost work-hours, and limited infrastructure damage. During annual planning for these events, our robust Business Continuity Program deploys an array of preventative and active measures that help to mitigate and adapt to impacts from natural and/or environmental disasters on our employees, operations, and physical infrastructure. Furthermore, we consider these risks in our new building design and construction. Mitigation efforts during the construction of the new Building 100 at our St. Augustine, Florida site required additional investment to incorporate the capability to withstand an ultimate wind speed of 130 mph into the building structure design and the roof-mounted, integrated solar panels. We have implemented a net zero by 2035 greenhouse gas goal to anticipate these risks, and we are also implementing additional strategies in parallel. For example, a substantial business decision made as a result of integration of climate-related issues, specifically related to greenhouse gas emissions reductions, was the decision to look beyond just our goals and minimize our impact to the environment as our operations expand. This is being accomplished through investing in clean energy, building our portfolio of both onsite and offsite solar projects to support decarbonization. Ten percent of the electricity we used in 2022 came from renewable sources. To reach our renewable energy goal of 50%, we plan to incorporate a mix of both on and offsite renewable energy. We have developed and approved solar power purchase and site license agreement. We have approved onsite solar designs for 10 different sites across four states.

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 Indirect costs Capital expenditures Assets	Our business is subject to disruption caused by natural and/or environmental disasters that could impact our business. We have significant operations located in regions that may be exposed to hurricanes and other damaging storms and natural disasters such as our St. Augustine, Florida and Melbourne, Florida sites. Our subcontractors and suppliers are also subject to natural and environmental disasters that could affect their ability to deliver or perform under a contract. Although preventative measures may help to mitigate damage, the damage and disruption resulting from natural and environmental disasters may be significant. Insurance or other risk-transfer mechanisms may be unavailable or insufficient to recover all costs or we may experience a significant disruption to our business due to a natural or environmental disaster. On an annual basis, our Business Continuity program analyzes acute physical climate-related issues and uses weather trends to perform quantitative analyses that include financial implications of business disruption from natural disasters. This analysis drives various risk management programs to be implemented across the company. As described in C2.3a Risk #1, proactive assessments and planning for Hurricane Irma resulted in a low impact on our Melbourne, Florida operations. As outlined in C2.4a Opportunities #1 and #2, Northrop Grumman drives resource efficiency through capital expenditures required to achieve environmental sustainability program goals and objectives as well as to reduce operating costs. This includes expenditures for energy efficiency, LEED certified buildings, onsite renewable energy systems, water conservation, and solid waste diversion. In 2022, our execution of 64 greenhouse gas emissions-reductions projects across the company will reduce annual emissions by approximately 3,250 MTCO ₂ e; these projects have an average payback of 6 years. Project examples include HVAC replacements, lighting upgrades, building controls systems, and installations of variable frequency drives (VFDs). In addition, seventeen of our buildings, representing 2.2 million sq. ft. of the company's footprint, is has achieved a LEED or Energy Star rating.

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	No, and we do not plan to in the next two years	<Not Applicable>

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?

No, and we do not anticipate setting one in the next two years

Target ambition

<Not Applicable>

Year target was set

2021

Target coverage

Company-wide

Scope(s)

Scope 1

Scope 2

Scope 2 accounting method

Market-based

Scope 3 category(ies)

<Not Applicable>

Base year

2019

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

275530

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

523940

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)

<Not Applicable>

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)

<Not Applicable>

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

799470

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)

<Not Applicable>

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)

<Not Applicable>

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

100

Target year

2030

Targeted reduction from base year (%)

50

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

399735

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

100

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

100

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)

<Not Applicable>

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)

<Not Applicable>

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

705240

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]

Target status in reporting year

Underway

Please explain target coverage and identify any exclusions

Our target is company-wide and covers 100% of our Scope 1 and 2 emissions

Plan for achieving target, and progress made to the end of the reporting year

We have set a target to reduce 50% of Scope 1 and Scope 2 emissions by 2030. This interim target will support progress towards our Net Zero Operations (Scope 1 and 2) by 2035 goal. Our strategy to achieve this target includes multiple facets - (1) sourcing renewable electricity, (2) identifying and implementing energy efficiency solutions across our sites and (3) engraining resource conservation and efficiency into operations decisions. Northrop Grumman is also pursuing other emissions reduction solutions including electrification, alternative fuels and energy monitoring. In 2022, we achieved a 10.6% reduction in emissions, compared to our 2019 base year and sourced 10.0% of electricity from renewable sources, which contributed to our progress.

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

Electricity

Target type: activity

Consumption

Target type: energy source

Renewable energy source(s) only

Base year

2019

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

1512450

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

1.4

Target year

2030

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

50

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

10

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

17.6954732510288

Target status in reporting year

Underway

Is this target part of an emissions target?

Yes, this target is associated with our Absolute ghg emissions reduction target (Abs1) and both are aligned with our Net Zero 2035 target (NZ1)

Is this target part of an overarching initiative?

Other, please specify (NGC Next Generation Sustainability Goals)

Please explain target coverage and identify any exclusions

This target includes all electricity usage (MWh) across the company

Plan for achieving target, and progress made to the end of the reporting year

Sourcing renewable electricity is an important component of our mission to achieve Net Zero operations by 2035. In 2022, we sourced 10.0% of electricity from renewable sources. To achieve our 50% renewable energy goal, we will work to integrate a mix of onsite and offsite renewable energy across our portfolio.

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

2035

Is this a science-based target?

No, and we do not anticipate setting one in the next two years

Please explain target coverage and identify any exclusions

This goal covers Scope 1 and Scope 2 emissions for all buildings and facilities within which we have operational control.

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

Yes

Planned milestones and/or near-term investments for neutralization at target year

We currently anticipate that approximately 10% of emissions that have not been otherwise eliminated will required additional neutralization action in the target year.

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*	0	0
Implementation commenced*	0	0
Implemented*	47	2440
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 (Building Services)
--------------------------------	--

Estimated annual CO2e savings (metric tonnes CO2e)

2290

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

- Scope 1
- Scope 2 (location-based)
- Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

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

611000

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

2460000

Payback period

4-10 years

Estimated lifetime of the initiative

11-15 years

Comment

Building efficiency projects include HVAC, lighting, and compressed air systems. The approximate avoided electricity by implementing these building services projects is 6,190 MWh, and the approximate avoided natural gas usage is 4,200 therms. Additional GHG savings of 810 MT CO2e are achieved through maintenance and other activities that have higher investments and extended ROIs. The additional cost for energy efficiency gains beyond standard replacement is difficult to isolate and is not included in this line item. As outlined in our 2022 ESG Report, we realized total emissions reductions of 3,250 MT CO2e from energy efficiency (building services and production processes), maintenance and other activities in 2022.

Initiative category & Initiative type

Non-energy industrial process emissions reductions	Other, please specify (Process Optimization)
--	---

Estimated annual CO2e savings (metric tonnes CO2e)

20

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)

0

Payback period

No payback

Estimated lifetime of the initiative

11-15 years

Comment

Industrial process efficiency efforts include manufacturing changes. As outlined in our 2022 ESG Report, we realized total emissions reductions of 3,250 MT CO2e from energy efficiency (building services and production processes), maintenance and other activities in 2022.

Initiative category & Initiative type

Low-carbon energy generation	Solar PV
------------------------------	----------

Estimated annual CO2e savings (metric tonnes CO2e)

40

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

Scope 2 (location-based)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

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

10000

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

170000

Payback period

16-20 years

Estimated lifetime of the initiative

11-15 years

Comment

Low-carbon energy generation includes onsite solar optimization. The approximate avoided electricity is 110 MWh. As outlined in our 2022 ESG Report, we realized total emissions reductions of 3,250 MT CO2e from energy efficiency (building services and production processes), maintenance and other activities in 2022.

Initiative category & Initiative type

Transportation	Company fleet vehicle efficiency
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Estimated annual CO2e savings (metric tonnes CO2e)

90

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)

9000

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

510000

Payback period

>25 years

Estimated lifetime of the initiative

11-15 years

Comment

Transportation includes fleet decarbonization efforts. The approximate avoided fuel use by implementing these projects is 7,850 gallons of gasoline and 250 gallons of diesel. As outlined in our 2022 ESG Report, we realized total emissions reductions of 3,250 MT CO₂e from energy efficiency (building services and production processes), maintenance and other activities in 2022.

C4.3c

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

Method	Comment
Dedicated budget for energy efficiency	We make annual financial investments in energy efficiency projects in our buildings and operations to support progress towards our goals to reduce greenhouse gas emissions, water withdrawals, and solid waste sent to landfill and incineration.
Dedicated budget for other emissions reduction activities	We make annual financial investments in projects that increase efficiency and directly or indirectly result in GHG emissions reductions to support progress towards our goals to reduce greenhouse gas emissions, water withdrawals, and solid waste sent to landfill and incineration.
Internal incentives/recognition programs	Environmental sustainability (measured in terms of reductions in absolute greenhouse gas emissions, potable water use consumption and improvement in solid waste diversion) is one of the Company's five non-financial metrics that influences the annual incentive compensation program and holds ourselves accountable.
Employee engagement	Employee awareness and behavior is an important element of efficiency and emissions-reductions activities. We engage with employees through our environmentally focused Employee Resource Group, signage in our facilities, webinars, and voluntary training.
Internal finance mechanisms	We employ a centralized investment mechanism to allocate targeted environmental and efficiency (E&E) capital, which allows us to solicit project ideas from across the company and fund impactful projects that drive efficiency and performance against our 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

No taxonomy used to classify product(s) or service(s) as low carbon

Type of product(s) or service(s)

Other	Other, please specify (Uncrewed Aerial Vehicle)
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Description of product(s) or service(s)

Northrop Grumman's uncrewed aerial vehicle, used for surveillance and reconnaissance, is designed to have a smaller fuselage on a bigger wingspan, creating better flying efficiency and lower emissions compared to traditional manned flights. Autonomous flight capabilities also help the system fly with greater efficiency than a human pilot and cruise at higher altitudes. Compared to the equivalent manned system, this UAS not only uses less fuel but also emits 34 times less carbon dioxide. One standard flight uses the equivalent of a 55,922-mile (nearly 90,000 km) car journey, while fuel consumption for its manned counterparts rockets to the equivalent of almost 2 million miles for a similar flight. This helps our customers reduce emissions significantly over the lifespan of the product.

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 (Comparative emissions between two products)

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

Use stage

Functional unit used

One surveillance mission

Reference product/service or baseline scenario used

Equivalent manned system

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

0

Explain your calculation of avoided emissions, including any assumptions

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

0

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?

Yes, other structural change, please specify (Integration of Orbital ATK data into Scope 3)

Name of organization(s) acquired, divested from, or merged with

N/A

Details of structural change(s), including completion dates

Scope 3 emissions categories reported have been recalculated to be inclusive of Orbital ATK data (acquired by Northrop Grumman in 2018) where data was not previously included.

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 reporting year definition	Yes, a change in reporting year definition In 2022, we shifted our environmental data reporting year from calendar year (January-December) to the government fiscal year (October-September). This shift accommodates our earlier report publication date and enables our data to include actual results for all months where data is available, improving our data quality and eliminating duplicative reporting efforts. Yes, a change in methodology As of 2022, RY2019-2021 data has been readjusted to include more relevant actual data. The materiality of refrigerant emissions has been re-assessed, and are now included as in-scope. Data has been adjusted back to the RY2019 base year.

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 1 Scope 2, location-based Scope 2, market-based Scope 3	Scope 1 + Scope 2 [L] and [M] The 2019-2021 environmental data for GHG, energy, water and solid waste for Northrop Grumman global facilities has been re-stated to reflect our adjusted reporting year. This restatement also includes the addition of refrigerant emissions as in-scope to Northrop Grumman reporting and other data adjustments to report more relevant actual data. Scope 3 Our reported Scope 3 emissions categories have been recalculated to be inclusive of Orbital ATK data where data was not previously included.	Yes

C5.2

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

Scope 1

Base year start

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

275530

Comment

Scope 2 (location-based)

Base year start

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

534190

Comment

Scope 2 (market-based)

Base year start

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

523940

Comment

Scope 3 category 1: Purchased goods and services

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 2: Capital goods

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

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

Base year start

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

31640

Comment

RY2019 data has been recalculated to be inclusive of Orbital ATK data, which was acquired by Northrop Grumman in 2018.

Scope 3 category 4: Upstream transportation and distribution

Base year start

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

1108840

Comment

Does not include data from legacy Orbital ATK

Scope 3 category 5: Waste generated in operations

Base year start

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

14570

Comment

RY2019 data has been recalculated to be inclusive of Orbital ATK data, which was acquired by Northrop Grumman in 2018. Also, the emission calculation methodology was updated from the previous U.S. EPA WARM model to instead use the U.S. EPA Center for Corporate Climate Leadership GHG EF Hub, which aligns with EPA guidance.

Scope 3 category 6: Business travel

Base year start

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

202660

Comment

RY2019 data has been recalculated to be inclusive of Orbital ATK data, which was acquired by Northrop Grumman in 2018.

Scope 3 category 7: Employee commuting

Base year start

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

223090

Comment

RY2019 data has been recalculated to be inclusive of Orbital ATK data, which was acquired by Northrop Grumman in 2018.

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

October 1 2018

Base year end

September 30 2019

Base year emissions (metric tons CO2e)

3110

Comment

RY2019 data has been recalculated to be inclusive of Orbital ATK data, which was acquired by Northrop Grumman in 2018, and emissions from estimated natural gas usage (as per WRI guidance).

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

Base year end

Base year emissions (metric tons CO2e)

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)

Other, please specify (IAEG Aerospace GHG Reporting Guidance)

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)

282240

Start date

October 1 2021

End date

September 30 2022

Comment

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)

265650

Start date

October 1 2020

End date

September 30 2021

Comment

Past year 2

Gross global Scope 1 emissions (metric tons CO2e)

268700

Start date

October 1 2019

End date

September 30 2020

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

C6.3

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

Reporting year

Scope 2, location-based

476930

Scope 2, market-based (if applicable)

423000

Start date

October 1 2021

End date

September 30 2022

Comment

Past year 1

Scope 2, location-based

488310

Scope 2, market-based (if applicable)

479100

Start date

October 1 2020

End date

September 30 2021

Comment

Past year 2

Scope 2, location-based

503410

Scope 2, market-based (if applicable)

493680

Start date

October 1 2019

End date

September 30 2020

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?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1, Scope 2, or Scope 3 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source of excluded emissions

Mobile emissions for small fleets (<10 vehicles)

Scope(s) or Scope 3 category(ies)

Scope 1

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

0.6

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

Fuel consumption (diesel, gasoline and propane) for all reporting sites comprises 1.2% of the baseline total inventory. Therefore, it was concluded that emissions associated with sites that have fewer than 10 vehicles are immaterial to the GHG inventory. This category is continuously monitored and was reflected in the NGC GHG inventory that received limited assurance through third party verification.

Explain how you estimated the percentage of emissions this excluded source represents

Mobile diesel, gasoline, and propane usage accounted for 10,270 MT CO₂e emissions in 2022. Using an intensity metric of emissions per SF, we estimate that our emissions from mobile emissions for small fleets would be 4,190 MT CO₂e. Our total gross S1 + S2 emissions in 2022 was 705,240, therefore $(4,190/705,240)*100 = 0.59\%$.

Source of excluded emissions

Non-utility fuel data for sites less than 100,000 square feet

Scope(s) or Scope 3 category(ies)

Scope 1

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

0.4

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

For sites less than 100,000 square feet, fuel deliveries that are not utility based (e.g., natural gas and propane) are excluded because they are not common at Northrop Grumman and are immaterial to the baseline inventory. This category is continuously monitored and was reflected in the NGC GHG inventory that received limited assurance through third party verification.

Explain how you estimated the percentage of emissions this excluded source represents

Total stationary generator reporting (sites >100K or voluntary under the threshold) accounted for 7,680 MT CO₂e emissions in 2022. Using an intensity metric of emissions per total square feet, we estimate that our emissions from non-utility fuel data for sites <100k SF would be 3,130 MT CO₂e. Our total gross S1 + S2 emissions in 2022 was 705,240, therefore $(3,130/705,240)*100 = 0.44\%$

Source of excluded emissions

Refrigerant emissions excluded for buildings less than 100,000 square feet

Scope(s) or Scope 3 category(ies)

Scope 1

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

1.2

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

A majority of manufacturing and testing is performed at the Northrop Grumman sites and campuses that are greater than 100,000 sq.ft. The majority of buildings in the Northrop Grumman real estate portfolio that are less than 100,000 sq. ft are used primarily as office space and not for manufacturing operations. Thus, refrigerant emissions related to operations in these sites are associated with HVAC systems and considered immaterial. This category is continuously monitored and was reflected in the NGC GHG inventory that received limited assurance through third party verification.

Explain how you estimated the percentage of emissions this excluded source represents

Total refrigerant emissions (sites >100K or voluntary under the threshold), accounted for 20,160 MT CO₂e emissions in 2022 -- this includes both process and HVAC refrigerants. Using an intensity metric of emissions per total square feet, we estimate that our emissions from refrigerants for sites <100k SF would be 8,220 MT CO₂e. Buildings <100k SF are used primarily as office space and do not typically have manufacturing that utilize process gases, so this value is likely over-estimated. Our total gross S1 + S2 emissions in 2022 was 705,240, therefore $(8,220/705,240)*100 = 1.17\%$.

Source of excluded emissions

Process emissions excluded for buildings less than 100,000 square feet

Scope(s) or Scope 3 category(ies)

Scope 1

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

0.9

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

A majority of manufacturing and testing is performed at the Northrop Grumman sites and campuses that are greater than 100,000 sq.ft. The majority of buildings in the Northrop Grumman real estate portfolio that are less than 100,000 sq. ft are used primarily as office space and not for manufacturing operations. Thus, any process emissions related to operations in these sites are considered immaterial. This category is continuously monitored and was reflected in the NGC GHG inventory that received limited assurance through third party verification.

Explain how you estimated the percentage of emissions this excluded source represents

Total process emissions (sites >100K or voluntary under the threshold) accounted for 14,960 MT CO₂e emissions in 2022. Using an intensity metric of emissions per total square feet, we estimate that our emissions from process emissions for sites <100k SF would be 6,100 MT CO₂e. Our total gross S1 + S2 emissions in 2022 was 705,240, therefore $(6,100/705,240)*100 = 0.86\%$.

Source of excluded emissions

Emissions of PFCs from fire suppression systems

Scope(s) or Scope 3 category(ies)

Scope 1

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

<Not Applicable>

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

0.2

Estimated percentage of total Scope 3 emissions this excluded source represents

<Not Applicable>

Explain why this source is excluded

Northrop Grumman tracks fire suppression system leaks and releases. In our base year, releases accounted for 0.13 percent of the GHG inventory and were deemed immaterial to the inventory. This category is continuously monitored and was reflected in the NGC GHG inventory that received limited assurance through third party verification.

Explain how you estimated the percentage of emissions this excluded source represents

Fire suppression system releases accounted for 1,075 MT CO₂e emissions in 2019 (current base year). Our total gross S1 + S2 emissions in 2022 was 705,240, therefore $(1,075/705,240)*100 = 0.15\%$.

Source of excluded emissions

Purchased goods and Services.

Scope(s) or Scope 3 category(ies)

Scope 3: Purchased goods and services

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are relevant but not yet calculated

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents

Explain why this source is excluded

Northrop Grumman spent nearly \$11 billion domestically on subcontractors during government fiscal year 2022. Over \$3.9 billion was awarded to small business suppliers, representing 36% of our total domestic spend. We have a large supply chain that may be multiple levels deep and are exploring ways to calculate/estimate Scope 3 emissions for purchased goods and services.

Explain how you estimated the percentage of emissions this excluded source represents

Source of excluded emissions

Capital Goods

Scope(s) or Scope 3 category(ies)

Scope 3: Capital goods

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are relevant but not yet calculated

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents

Explain why this source is excluded

Northrop Grumman spent nearly \$11 billion domestically on subcontractors during government fiscal year 2022. Over \$3.9 billion was awarded to small business suppliers, representing 36% of our total domestic spend. We have a large supply chain that may be multiple levels deep and are exploring ways to calculate/estimate Scope 3 emissions for capital goods.

Explain how you estimated the percentage of emissions this excluded source represents

Source of excluded emissions

Scope 3 category 8: Upstream leased assets

Scope(s) or Scope 3 category(ies)

Scope 3: Upstream leased assets

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are not relevant

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents

0

Explain why this source is excluded

Northrop Grumman reports emissions from leased spaces as part of Scope 1 and Scope 2 inventories since we consider leased space within our operational control. Therefore, we do not have additional emissions to report as part of this Scope 3 category.

Explain how you estimated the percentage of emissions this excluded source represents

Source of excluded emissions

Scope 3 category 9: Downstream transportation and distribution

Scope(s) or Scope 3 category(ies)

Scope 3: Downstream transportation and distribution

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are not relevant

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents**Explain why this source is excluded**

According to the Voluntary GHG Reporting Guidance for the Aerospace Industry (IAEG, 2016), downstream transportation and distribution emissions are most often captured in a customer's Scope 1 emissions or are more appropriately quantified in Scope 3 Category 4. Therefore, Category 9 is irrelevant to the aerospace industry. The International Aerospace Environmental Group (IAEG) is a non-profit organization of global aerospace companies created to collaborate on and share environmental solutions for the industry.

Explain how you estimated the percentage of emissions this excluded source represents**Source of excluded emissions**

Scope 3 category 10: Processing of sold products

Scope(s) or Scope 3 category(ies)

Scope 3: Processing of sold products

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are not relevant

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents**Explain why this source is excluded**

Products and services provided by Northrop Grumman do not require further processing, transformation or inclusion in another product before use by the end consumer. This status is a function of Northrop Grumman's role as a prime contractor to the U.S. and allied governments. Where Northrop Grumman is a supplier to another prime contractor, post-processing is minimal and considered immaterial.

Explain how you estimated the percentage of emissions this excluded source represents**Source of excluded emissions**

Scope 3 category 11: Use of sold products

Scope(s) or Scope 3 category(ies)

Scope 3: Use of sold products

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are relevant but not yet calculated

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents**Explain why this source is excluded**

Northrop Grumman's customer base is primarily the U.S. Government, principally the Department of Defense and intelligence community. We also conduct business with foreign, state and local governments, as well as commercial customers. Our products and services are designed to meet contractual requirements of our customers.

Products are sold to government customers who take formal possession of the product and, as such, detail around the use of those products by our military customers is not disclosed to manufacturers, such as Northrop Grumman. Currently, the lack of available information in this category for defense companies makes calculating emissions unworkable at this time.

Explain how you estimated the percentage of emissions this excluded source represents

Source of excluded emissions

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

Scope(s) or Scope 3 category(ies)

Scope 3: End-of-life treatment of sold products

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are not relevant

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents

0

Explain why this source is excluded

Northrop Grumman's customer base is primarily the U.S. Government, principally the Department of Defense and intelligence community. We also conduct business with foreign, state and local governments, as well as commercial customers. Our products and services are designed to meet contractual requirements of our customers. Products are sold to government customers who take formal possession of the product. Customers have their own property disposition process for owned-property, especially products used for military and defense operations. Due to the nature of our business and customer requirements, Northrop Grumman believes that "not relevant, explanation provided" is the most appropriate available response.

Explain how you estimated the percentage of emissions this excluded source represents

Source of excluded emissions

Scope 3 category 14: Franchises

Scope(s) or Scope 3 category(ies)

Scope 3: Franchises

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are not relevant

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents

0

Explain why this source is excluded

Northrop Grumman does not own or operate franchises.

Explain how you estimated the percentage of emissions this excluded source represents

Source of excluded emissions

Scope 3 category 15: Investments

Scope(s) or Scope 3 category(ies)

Scope 3: Investments

Relevance of Scope 1 emissions from this source

<Not Applicable>

Relevance of location-based Scope 2 emissions from this source

<Not Applicable>

Relevance of market-based Scope 2 emissions from this source

<Not Applicable>

Relevance of Scope 3 emissions from this source

Emissions are not relevant

Date of completion of acquisition or merger

<Not Applicable>

Estimated percentage of total Scope 1+2 emissions this excluded source represents

<Not Applicable>

Estimated percentage of total Scope 3 emissions this excluded source represents

0

Explain why this source is excluded

Northrop Grumman is not a financial institution or financial services organization. Therefore, in accordance with the WRI Scope 3 Protocol, this category of emissions is not relevant to Northrop Grumman.

Explain how you estimated the percentage of emissions this excluded source represents

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, not yet calculated

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

Northrop Grumman spent nearly \$11 billion domestically on subcontractors during government fiscal year 2022. Over \$3.9 billion was awarded to small business suppliers, representing 36% of our total domestic spend. We have a large supply chain that may be multiple levels deep and are exploring ways to calculate/estimate Scope 3 emissions for purchased goods and services.

Capital goods

Evaluation status

Relevant, not yet calculated

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

Northrop Grumman spent nearly \$11 billion domestically on subcontractors during government fiscal year 2022. Over \$3.9 billion was awarded to small business suppliers, representing 36% of our total domestic spend. We have a large supply chain that may be multiple levels deep and are exploring ways to calculate/estimate Scope 3 emissions for capital goods.

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

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

32030

Emissions calculation methodology

Average data method

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

0

Please explain

Northrop Grumman calculated metric tonnes of CO2e due to transmission and distribution loss using the average U.S. nation-wide loss provided by the EPA (<https://www.eia.gov/tools/faqs/faq.php?id=105&t=3>). The 2020 nation-wide loss published by the EPA was approximately 5.3%. Based on Northrop Grumman's purchased electricity for RY2022 (1,533,654,293 kWh), we calculated the amount of electricity that would have been needed to deliver those kWh taking into consideration a 5.3% loss. We then calculated the kWh that were lost during transmission and distribution and applied the eGRID2020 U.S. average emission factor of 822.61 lb CO2e/kWh, which resulted in 32,027 metric tonnes of CO2e due to transmission and distribution loss. The primary kWh data used by Northrop Grumman comes from bill pay IT system. However, a 5.10% assumed distribution loss comes from EPA. Therefore, stating 0% of data comes from suppliers or value chain partner.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

891090

Emissions calculation methodology

Supplier-specific method

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

100

Please explain

Northrop Grumman is an EPA SmartWay partner and utilizes ground shipment data collected, managed and provided by our partner logistics organization. The primary domestic shipment and mileage data is tracked through our partner's Freight Bill Audit & Payment (FBAP) System. The GWPs are consistent with our Scope 1 and Scope 2 emissions inventory and come from the IPCC Fourth Assessment Report (AR4). Our logistics partner applies the SmartWay program's emission factors based on classification of each carrier and mode type to the primary mileage data per shipment. The majority of the emissions reported in this category are covered by SmartWay carrier partners. Data estimated based on three-year average because actual data not yet available. Northrop Grumman's domestic shipments are all tracked and managed through our logistics partner's FBAP. Shipments and mileage data from Smartway & non-Smartway carriers is consolidated into the FBAP system, and EPA Smartway standard emission factors (g/mile) are applied to generate a total inventory.

Waste generated in operations

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

15390

Emissions calculation methodology

Waste-type-specific method

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

72

Please explain

Northrop Grumman sites within our operational control boundary track their annual waste by category (commodity, product, unit, etc.) and by management method. As of RY2022, the emission calculation methodology was updated from the previous U.S. EPA WARM model to instead use the U.S. EPA Center for Corporate Climate Leadership GHG EF Hub, which aligns with EPA guidance (https://www.epa.gov/sites/default/files/2020-04/documents/guidanceefwastefactors_vs_warm.pdf). Updated Scope 3 emissions from waste generated in operations were recalculated for RY2019-RY2022 and now include emissions generated from actual waste data landfilled, recycled, composted, and combusted, whereas previous data only included emissions from waste sent to landfill. Where waste types could not be readily mapped to the available material EFs, those wastes were conservatively assumed to be landfilled "Mixed MSW." The primary data collected comes from waste hauler-provided receipts demonstrating actual tonnage and the remainder is estimated based on applying a standard factor to facility headcount.

Business travel

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO₂e)

110100

Emissions calculation methodology

Hybrid method

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

97

Please explain

Data related to business travel is provided by Northrop Grumman's travel management system. Activity data includes number of hotel nights booked, rental car miles travelled and emissions, and the number of air and train miles travelled. Train travel is estimated based on previous years' actual data, as this data is no longer available in our travel management system. The emissions from air and train travel are calculated using emission factors (EFs) from the U.S. EPA Center for Corporate Climate Leadership GHG EF Hub. Emissions from hotel stays are calculated using the respective EFs from Carbon Fund. Emissions from car rentals are provided by the car rental suppliers. The GWPs are consistent with our Scope 1 and 2 emissions inventory and come from the IPCC Fourth Assessment Report. The GHG inventory for business travel achieved Limited Assurance via Third Party Verification from LRQA America's Sustainability, Inc. A portion of emissions from car rentals are extrapolated based on spend data.

Employee commuting

Evaluation status

Relevant, calculated

Emissions in reporting year (metric tons CO2e)

330000

Emissions calculation methodology

Average data method

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

5

Please explain

Employee commuting accounts for the emissions associated with employee travel to/from work. The GWPs are consistent with our Scope 1 and Scope 2 emissions inventory and come from the IPCC Fourth Assessment Report. The emissions are calculated using emission factors from the U.S. EPA Center for Corporate Climate Leadership GHG Emission Factors Hub. Employee headcount is primary data from the Annual Report (10K) filing which includes all active NG employees. Estimating factors and averages used are from reputable public sources (e.g., EPA). Each business sector provides an average vehicle ridership (AVR) value; if not available, an average is used. The AVR value is multiplied by the number of employees per sector and an average fuel economy. That value is then multiplied by the emission factor to determine the total commuting emissions. Although employee commuting patterns may have been impacted by COVID, we have maintained the same methodologies and assumptions. Approximately 5% of our data is considered actual data from value chain because it is reported through compliance mechanisms.

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

Northrop Grumman reports emissions from leased spaces as part of Scope 1 and Scope 2 inventories since we consider leased space within our operational control. Therefore, we do not have additional emissions to report as part of this Scope 3 category.

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

According to the Voluntary GHG Reporting Guidance for the Aerospace Industry (IAEG, 2016), downstream transportation and distribution emissions are most often captured in a customer's Scope 1 emissions or are more appropriately quantified in Scope 3 Category 4. Therefore, Category 9 is irrelevant to the aerospace industry. The International Aerospace Environmental Group (IAEG) is a non-profit organization of global aerospace companies created to collaborate on and share environmental solutions for the industry.

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

Products and services provided by Northrop Grumman do not require further processing, transformation or inclusion in another product before use by the end consumer. This status is a function of Northrop Grumman's role as a prime contractor to the U.S. and allied governments. Where Northrop Grumman is a supplier to another prime contractor, post-processing is minimal and considered immaterial.

Use of sold products

Evaluation status

Relevant, not yet calculated

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

Northrop Grumman's customer base is primarily the U.S. Government, principally the Department of Defense and intelligence community. We also conduct business with foreign, state and local governments, as well as commercial customers. Our products and services are designed to meet contractual requirements of our customers. Products are sold to government customers who take formal possession of the product. Customers have their own property disposition process for owned-property, especially products used for military and defense operations. Due to the nature of our business and customer requirements, Northrop Grumman believes that "not relevant, explanation provided" is the most appropriate available response.

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

Northrop Grumman's customer base is primarily the U.S. Government, principally the Department of Defense and intelligence community. We also conduct business with foreign, state and local governments, as well as commercial customers. Our products and services are designed to meet contractual requirements of our customers. Products are sold to government customers who take formal possession of the product. Customers have their own property disposition process for owned-property, especially products used for military and defense operations. Due to the nature of our business and customer requirements, Northrop Grumman believes that "not relevant, explanation provided" is the most appropriate available response.

Downstream leased assets

Evaluation status

Not relevant, calculated

Emissions in reporting year (metric tons CO2e)

2250

Emissions calculation methodology

Average data method

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

0

Please explain

As of December 2022, Northrop Grumman had approximately 52 million square feet of floor space of which approximately 255,000 square feet were leased to third parties (Source: Northrop Grumman 2022 Annual Report, pg. 26). By multiplying the average MWh/sq ft and therms/sqft, we derived electricity & natural gas usage for the facilities Northrop Grumman leases to third parties. Using the U.S. national average electricity emission factor from eGRID2020 and natural gas emission factor from EPA eHUB2021, we calculated GHG emissions from downstream leased assets.

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

Northrop Grumman does not own or operate franchises.

Investments

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

Northrop Grumman is not a financial institution or financial services organization. Therefore, in accordance with the WRI Scope 3 Protocol, this category of emissions is not relevant to Northrop Grumman.

Other (upstream)

Evaluation status

Please select

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

Please select

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

C6.5a

(C6.5a) Disclose or restate your Scope 3 emissions data for previous years.

Past year 1

Start date

October 1 2020

End date

September 30 2021

Scope 3: Purchased goods and services (metric tons CO2e)

Scope 3: Capital goods (metric tons CO2e)

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)
32560

Scope 3: Upstream transportation and distribution (metric tons CO2e)
796020

Scope 3: Waste generated in operations (metric tons CO2e)
15470

Scope 3: Business travel (metric tons CO2e)
85410

Scope 3: Employee commuting (metric tons CO2e)
288270

Scope 3: Upstream leased assets (metric tons CO2e)

Scope 3: Downstream transportation and distribution (metric tons CO2e)

Scope 3: Processing of sold products (metric tons CO2e)

Scope 3: Use of sold products (metric tons CO2e)

Scope 3: End of life treatment of sold products (metric tons CO2e)

Scope 3: Downstream leased assets (metric tons CO2e)
2170

Scope 3: Franchises (metric tons CO2e)

Scope 3: Investments (metric tons CO2e)

Scope 3: Other (upstream) (metric tons CO2e)

Scope 3: Other (downstream) (metric tons CO2e)

Comment

Past year 2

Start date

October 1 2019

End date

September 30 2020

Scope 3: Purchased goods and services (metric tons CO2e)

Scope 3: Capital goods (metric tons CO2e)

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)
32790

Scope 3: Upstream transportation and distribution (metric tons CO2e)
768410

Scope 3: Waste generated in operations (metric tons CO2e)
14850

Scope 3: Business travel (metric tons CO2e)
63400

Scope 3: Employee commuting (metric tons CO2e)
278650

Scope 3: Upstream leased assets (metric tons CO2e)

Scope 3: Downstream transportation and distribution (metric tons CO2e)

Scope 3: Processing of sold products (metric tons CO2e)

Scope 3: Use of sold products (metric tons CO2e)

Scope 3: End of life treatment of sold products (metric tons CO2e)

Scope 3: Downstream leased assets (metric tons CO2e)
1860

Scope 3: Franchises (metric tons CO2e)

Scope 3: Investments (metric tons CO2e)

Scope 3: Other (upstream) (metric tons CO2e)

Scope 3: Other (downstream) (metric tons CO2e)

Comment

C6.7

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

No

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

0.00001927

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

705240

Metric denominator

unit total revenue

Metric denominator: Unit total

3660200000

Scope 2 figure used

Market-based

% change from previous year

5.31

Direction of change

Decreased

Reason(s) for change

Change in renewable energy consumption

Other emissions reduction activities

Other, please specify

Please explain

Although we saw fluctuations in operations since 2019, in part due to the COVID-19 pandemic, we are seeing consistent year-over-year benefits from our emissions-reduction projects and process improvements to mitigate inefficiencies. The 2021 net combined Scope 1 and 2 emissions have been adjusted since RY2021 to align with a government fiscal year, and that value is 744,750 MTCO2e. Company sales also increased by approximately 3% from the previous year.

Intensity figure

0.013691854

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

705240

Metric denominator

square foot

Metric denominator: Unit total

51508000

Scope 2 figure used

Market-based

% change from previous year

0.79

Direction of change

Increased

Reason(s) for change

Change in physical operating conditions

Other, please specify

Please explain

Although we saw fluctuations in operations since 2019, in part due to the COVID-19 pandemic, we are seeing consistent year-over-year benefits from our emissions-reduction projects and process improvements to mitigate inefficiencies. The 2021 net combined Scope 1 and 2 emissions have been adjusted since RY2021 to align with a government fiscal year, and that value is 744,750 MTCO2e. Square footage represents owned and leased square footage and excludes subleased space as reported in the Annual Report. Company floor space increased by approximately 1% from the previous year.

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	250380	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	120	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	360	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	20860	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	0	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	6610	IPCC Fourth Assessment Report (AR4 - 100 year)
NF3	170	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (Methylene Chloride)	10	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (Chloroform)	0	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (CF4)	120	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (C2F6)	3560	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (C4F8)	50	IPCC Fourth Assessment Report (AR4 - 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	281030
United Arab Emirates	0
Japan	0
Republic of Korea	20
Saudi Arabia	0
Belgium	150
Germany	340
Denmark	0
France	120
United Kingdom of Great Britain and Northern Ireland	160
Italy	280
Netherlands	40
Australia	0
Norway	0
Canada	100
Poland	0
Switzerland	0

C7.3

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

By business division

C7.3a

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

Business division	Scope 1 emissions (metric ton CO2e)
Aeronautics Systems	51530
Mission Systems	83680
Enterprise Services	6210
Defense Systems	33870
Space Systems	106950

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)
Canada	10	10
United States of America	469180	415250
United Arab Emirates	50	50
Japan	80	80
Republic of Korea	130	130
Saudi Arabia	40	40
Belgium	10	10
Switzerland	0	0
Germany	4300	4300
Denmark	30	30
France	100	100
United Kingdom of Great Britain and Northern Ireland	640	640
Italy	1100	1100
Netherlands	240	240
Norway	0	0
Australia	860	860
Poland	160	160
Switzerland	0	0

C7.6

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

By business division

C7.6a

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

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Aeronautics Systems	100960	95670
Defense Systems	83970	65570
Enterprise Services	6940	2210
Mission Systems	129380	111290
Space Systems	155680	148260

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

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?

Decreased

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	44740	Decreased	6.16	In 2022, we sourced 10% of our electricity from renewable sources. 100% of our electricity usage in Virginia and a portion of usage in West Virginia was offset with 102,047 MWh of Renewable Energy Certificates, as a part of our 15-year virtual power purchase agreement with Dominion Energy signed in 2020. We account for the associated emissions reductions using the eGRID2020 emission factors. We continue to operate four other small on-site solar power systems at our sites. Emissions reductions associated with minor fluctuations in annual solar output and eGRID emission factor variance are negligible. The total gross S1 + S2 market based emissions reported to CDP in RY2021 was 725,835 MT CO2e, therefore $(44,738/725,835) * 100 = 6.16\%$ total reduction in emissions due to additional renewable energy consumption.
Other emissions reduction activities	3250	Decreased	0.45	In 2022, we implemented innovative solutions through the execution of 64 projects which are expected to save a total of 3,250 MT of carbon dioxide-equivalent (CO2e) annually. This includes 1,020 MT in boiler and HVAC replacements and 2,000 MT in LED lighting upgrades. The total gross S1 + S2 market based emissions reported to CDP in RY2021 was 725,835 MT CO2e, therefore $(3,250/725,835) * 100 = 0.45\%$ total reduction in emissions due to emissions-reduction activities.
Divestment		<Not Applicable >		Not applicable
Acquisitions		<Not Applicable >		Not applicable
Mergers		<Not Applicable >		Not applicable
Change in output	8480	Increased	1.17	Although we saw fluctuations in operations since 2019, in part due to the COVID-19 pandemic, we are seeing consistent year-over-year benefits from our emissions-reduction projects and process improvements to mitigate inefficiencies.
Change in methodology	18920	Increased	2.61	In 2022, we shifted our environmental data reporting year from calendar year (January-December) to the government fiscal year (October-September). RY2019-2021 environmental data for Northrop Grumman global facilities has been re-stated to reflect our adjusted reporting year. This restatement also includes the addition of refrigerant emissions as in-scope to Northrop Grumman reporting and other data adjustments to report more accurate actual data. The total gross S1 + S2 market based emissions reported to CDP in RY2021 was 725,835 MT CO2e, therefore $(18,915/725,835) * 100 = 2.61\%$ total increase in emissions due to change in methodology.
Change in boundary		<Not Applicable >		Not applicable
Change in physical operating conditions		<Not Applicable >		Not applicable
Unidentified		<Not Applicable >		Not applicable
Other		<Not Applicable >		Not applicable

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?

Market-based

C8. Energy

C8.1

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

More than 0% but less than or equal to 5%

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	No
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)	Unable to confirm heating value	0	1315270	1315270
Consumption of purchased or acquired electricity	<Not Applicable>	156180	1566940	1723120
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	0	1580	1580
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	660	<Not Applicable>	660
Total energy consumption	<Not Applicable>	156840	2883790	3040630

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	No
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

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

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

Unable to confirm heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

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 renewable fuels (e.g. renewable hydrogen)

Heating value

Unable to confirm heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

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

Coal

Heating value

Unable to confirm heating value

Total fuel MWh consumed by the organization

0

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

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

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

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**

Unable to confirm heating value

Total fuel MWh consumed by the organization

1183120

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

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

This is inclusive of our stationary natural gas usage.

Other non-renewable fuels (e.g. non-renewable hydrogen)**Heating value**

Unable to confirm heating value

Total fuel MWh consumed by the organization

132150

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

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

This is inclusive of all other combustion of fuels, not including stationary natural gas.

Total fuel

Heating value

Unable to confirm heating value

Total fuel MWh consumed by the organization

1315270

MWh fuel consumed for self-generation of electricity

<Not Applicable>

MWh fuel consumed for self-generation of heat

<Not Applicable>

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	660	660	660	660
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

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Solar

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

102047

Tracking instrument used

US-REC

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?

No

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

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

United States of America

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Wind

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

2155

Tracking instrument used

US-REC

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)

2008

Comment

Country/area of low-carbon energy consumption

United States of America

Sourcing method

Retail supply contract with an electricity supplier (retail green electricity)

Energy carrier

Electricity

Low-carbon technology type

Renewable energy mix, please specify (Mixture of wind and solar)

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

40480

Tracking instrument used

US-REC

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?

No

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

<Not Applicable>

Comment

Country/area of low-carbon energy consumption

United States of America

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Wind

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

10000

Tracking instrument used

US-REC

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)

2017

Comment

Country/area of low-carbon energy consumption

United States of America

Sourcing method

Unbundled procurement of energy attribute certificates (EACs)

Energy carrier

Electricity

Low-carbon technology type

Wind

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

1500

Tracking instrument used

US-REC

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)

2017

Comment

C8.2g

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

Canada

Consumption of purchased electricity (MWh)

320

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

320

Country/area

United States of America

Consumption of purchased electricity (MWh)

1547830

Consumption of self-generated electricity (MWh)

660

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

1580

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

0

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

1550070

Country/area

United Arab Emirates

Consumption of purchased electricity (MWh)

90

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

90

Country/area

Japan

Consumption of purchased electricity (MWh)

160

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

160

Country/area

Republic of Korea

Consumption of purchased electricity (MWh)

230

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

230

Country/area

Saudi Arabia

Consumption of purchased electricity (MWh)

50

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

50

Country/area

Hong Kong SAR, China

Consumption of purchased electricity (MWh)

0

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

0

Country/area

Belgium

Consumption of purchased electricity (MWh)

30

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

30

Country/area

Switzerland

Consumption of purchased electricity (MWh)

30

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

30

Country/area

Germany

Consumption of purchased electricity (MWh)

9020

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

9020

Country/area

France

Consumption of purchased electricity (MWh)

1580

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

1580

Country/area

United Kingdom of Great Britain and Northern Ireland

Consumption of purchased electricity (MWh)

3030

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

Total non-fuel energy consumption (MWh) [Auto-calculated]
3030

Country/area

Italy

Consumption of purchased electricity (MWh)
2740

Consumption of self-generated electricity (MWh)
0

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

Consumption of purchased heat, steam, and cooling (MWh)
0

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

Total non-fuel energy consumption (MWh) [Auto-calculated]
2740

Country/area

Netherlands

Consumption of purchased electricity (MWh)
580

Consumption of self-generated electricity (MWh)
0

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

Consumption of purchased heat, steam, and cooling (MWh)
0

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

Total non-fuel energy consumption (MWh) [Auto-calculated]
580

Country/area

Norway

Consumption of purchased electricity (MWh)
0

Consumption of self-generated electricity (MWh)
0

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

Consumption of purchased heat, steam, and cooling (MWh)
0

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

Total non-fuel energy consumption (MWh) [Auto-calculated]
0

Country/area

Poland

Consumption of purchased electricity (MWh)
210

Consumption of self-generated electricity (MWh)
0

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

Consumption of purchased heat, steam, and cooling (MWh)
0

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

Total non-fuel energy consumption (MWh) [Auto-calculated]
210

Country/area

Australia

Consumption of purchased electricity (MWh)

1040

Consumption of self-generated electricity (MWh)

0

Is this electricity consumption excluded from your RE100 commitment?

<Not Applicable>

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

0

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

0

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

1040

C9. Additional metrics

C9.1

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

Description

Waste

Metric value

21940

Metric numerator

Tons of solid waste diverted from landfill.

Metric denominator (intensity metric only)

Total tons of solid waste generated (div + disp)

% change from previous year

2.09

Direction of change

Increased

Please explain

In 2022, Northrop Grumman was in the process of developing next-generation goals to follow our prior 2020 goal period. While we continued our focus on reducing our environmental footprint, we did not operate under a specific target in 2022. In 2023, we set a goal to reduce solid waste sent to landfill and incineration by 10% from a 2019 base year by 2030. We will track our progress to this new goal going forward.

In RY2022, our solid waste sent to landfill/incineration increased 9.7% from our RY2019 baseline.

Description

Other, please specify (Water)

Metric value

1459828000

Metric numerator

Total Water Withdrawals (in gallons)

Metric denominator (intensity metric only)

% change from previous year

6.2

Direction of change

Increased

Please explain

In 2022, Northrop Grumman was in the process of developing next-generation goals to follow our prior 2020 goal period. While we continued our focus on reducing our environmental footprint, we did not operate under a public water goal. In 2023, we set a goal to reduce absolute water withdrawals by 10% from a 2019 base year by 2030. This goal focuses on freshwater withdrawals. We will track our progress to this new goal going forward.

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

Limited assurance

Attach the statement

LRQA Independent Assurance Statement.pdf

Page/ section reference

2

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

Limited assurance

Attach the statement

LRQA Independent Assurance Statement.pdf

Page/ section reference

2

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

Limited assurance

Attach the statement

LRQA Independent Assurance Statement.pdf

Page/ section reference

2

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: Business travel

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

LRQA Independent Assurance Statement.pdf

Page/section reference

2

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?

No, we do not verify any other climate-related information reported in our CDP disclosure

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)?

No, and we do not anticipate being regulated in the next three years

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

Engagement & incentivization (changing supplier behavior)

Details of engagement

Offer financial incentives for suppliers who reduce your operational emissions (Scopes 1 & 2)

% of suppliers by number

3.8

% total procurement spend (direct and indirect)

0.35

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

100

Rationale for the coverage of your engagement

This engagement focuses on our domestic shipping and logistics suppliers. Northrop Grumman is an EPA SmartWay Transport Partner and strives to leverage SmartWay certified carriers for US domestic ground shipments as these partners have committed to demonstrating improvements in efficiency and reporting emissions metrics. The SmartWay program also provides supplier emissions data that supports internal benchmarking and informs our supplier selection process.

Impact of engagement, including measures of success

Northrop Grumman leverages the EPA SmartWay program to select shipping and logistics suppliers who have committed to the carrier partner program. SmartWay carrier partners commit to providing documented emissions metrics, demonstrating efficiency improvements and optimizing fuel economy. Northrop Grumman prioritizes selection of SmartWay carrier partners, and we have seen measured success with this engagement as a majority of our U.S. domestic ground shipments are completed by SmartWay carrier companies. By incentivizing SmartWay partners, Northrop Grumman is prioritizing suppliers committed to lowering emissions as a best practice. The impact of the engagement with SmartWay shipping carriers can be quantified by the average CO₂/mile versus that of non-SmartWay carriers, based on supplier emission factors provided by the EPA. In 2021 (2022 data was not yet available at the time of publication), the SmartWay carriers averaged lower in metric tons CO₂/mile than non-Smartway carriers, resulting in a greenhouse gas emissions reduction of 35% per mile by proactively selecting SmartWay carrier partners. We consider the impact to be successful if there is a reduction in emissions from these efforts, which was achieved, as noted above. This metric provides us a solid foundation off which we are able to expand engagement with our transportation suppliers to identify other efficiencies including consolidating efficiencies and integrating sustainability requirements into our contracts.

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 education customers about your climate change performance and strategy
-------------------------------	--

% of customers by number

86

% 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

As stated in our annual report, 86% of our sales are to the U.S. government, and as such, we engage significantly with them on a variety of environment-related topics including climate. Recent climate-related engagement activities with the U.S. Government include responding to the General Services Administration, Boeing, and Airbus requests to disclose climate-related activity via the CDP Supply Chain Program and communicating our climate priorities directly to our Government customers to better understand how our climate priorities align and to identify opportunities to support our mutual ambitions around climate. We also engage directly with climate-focused offices within federal agencies.

Impact of engagement, including measures of success

Engaging in these climate-related requests and discussions has been impactful because it has enabled us to engage with 86% (based on sales) of our customer base, particularly those directly focused on sustainability-related policies. We can measure the success of these engagement by our achievement of an A- on the CDP Supplier Engagement Rating Report in 2022.

C12.1d

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

Our methods for engagement with partners include membership-based involvement with non-profit organizations. For example, Northrop Grumman is a founding member of the International Aerospace Environmental Group (IAEG), which was formed to develop collaborative approaches for global aerospace companies in the realm of environmental compliance and sustainability. Our strategy to engage with partners is to leverage groups or organizations that provide added value. Through the GHG Management and Reporting Workgroup #3, IAEG has developed GHG Reporting Guidance for the Aerospace Industry, a supplement to the GHG Protocol. The measure of success for this partner engagement is collaboration in development and adoption of the Guidance as well as the improvement in consistency in GHG emissions reporting within the aerospace industry.

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
Yes, we fund organizations or individuals whose activities 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?

No, and we do not plan to have one in the next two years

Attach commitment or position statement(s)

<Not Applicable>

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

Northrop Grumman seeks engagements that are consistent with the company's overall climate strategy through collaboration and regular updates with leadership and stakeholder engagement groups within our organization, with our external stakeholders, and through our larger public and private partnerships. Internally, we engage with the board committees described in question 2 of this questionnaire, the Chief Sustainability Officer, the Vice Presidents of Operations/Quality (Environmental Sustainability Executive Sponsors), Environmental, Health and Safety Leadership Committee (ELC), the Facilities Working Group (FWG), Government Relations, and Communications, among others. These organizations collaboratively monitor state and local regulations and proposals related to environmental policy, including providing guidance through facility operations management team meetings on these policies. Close coordination across the company provides the environmental sustainability program with further insights into local and state policy activities and also provide the Government Relations team a go-to resource for environmental sustainability topics. Environmental technical experts also maintain regular communication with Northrop Grumman representatives serving within industry groups to ensure the activities of relevant associations are consistent with the company's climate strategy.

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

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?

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 Business Roundtable believes, as stated on its website that steps to address the risks of global warming are prudent and supports collective actions that will lead to the reduction of greenhouse gas emissions on a global basis. It also believes that harnessing America's abundant renewable energy resources in a cost-effective manner diversifies U.S. energy supplies, enhances U.S. energy security and advances environmental stewardship. Business Roundtable CEOs are committed to sustainability and making life better in the communities in which their companies operate, while also creating greater prosperity by driving economic growth and job creation. As a member, Northrop Grumman engages in conversations around the subject of climate change and other environmental priorities and the development of comments and position statements. For example, in 2021, the Business Roundtable released a Call to Action from global businesses in support of climate action that enhances competitiveness. This statement outlined seven actions that BRT recommends governments take to support delivery on their commitments under the Paris Agreement on climate change. These actions included prioritizing international cooperation on GHG reductions; promoting effective carbon pricing across regions; investing in innovation; and aligning frameworks for climate risk disclosures, among other things.

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

Northrop Grumman is a member of the Business Roundtable and funding is membership dues. The Business Roundtable is an association of more than 200 CEOs of America's leading companies. Business Roundtable develops and communicates policies to promote a thriving U.S. economy and expanded opportunity for all Americans. As a member of Business Roundtable, Northrop Grumman participates in a number of different topic areas including those related to climate and environment.

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

C12.3c

(C12.3c) Provide details of the funding you provided to other organizations or individuals in the reporting year whose activities could influence policy, law, or regulation that may impact the climate.

Type of organization or individual

Non-Governmental Organization (NGO) or charitable organization

State the organization or individual to which you provided funding

Aerospace Industries Association

Funding figure your organization provided to this organization or individual in the reporting year (currency as selected in C0.4)

497551.49

Describe the aim of this funding and how it could influence policy, law or regulation that may impact the climate

Northrop Grumman is a member of Aerospace Industries Association (AIA) and retains a position on the Executive Committee of this organization. As a member of AIA, Northrop Grumman participates in a number of different areas including those related to climate and environment related to the aerospace industry. Within the Environmental Committee of AIA, Northrop Grumman provides input on global environmental and climate policy related to the aerospace industry, as well as related policy areas and proposed rules.

Have you evaluated whether this funding is aligned with the goals of the Paris Agreement?

No, we have not evaluated

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

Other, please specify (TCFD Report)

Status

Complete

Attach the document

2023-TCFD-Report_Final-for-Upload.pdf

Page/Section reference

1-37

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Publication

In mainstream reports

Status

Complete

Attach the document

Northrop-Grumman-2022-Annual-Report-bookmarked-and-web-ready-FINAL.pdf

Page/Section reference

19-20

Content elements

Risks & opportunities
Emission targets
Other metrics

Comment

Publication

In other regulatory filings

Status

Complete

Attach the document

Northrop-Grumman-2023-Proxy-Statement-FINAL-Bookmarked-Web-Ready-v2.pdf

Page/Section reference

1, 39, 40, 61, 63

Content elements

Governance
Emission targets
Other metrics

Comment

Publication

In voluntary sustainability report

Status

Complete

Attach the document

2022-ESG-Report.pdf

Page/Section reference

5, 6, 10-12, 53-64

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

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	Other, please specify (International Aerospace Environmental Group (IAEG); Corporate Eco Forum)	<p>Northrop Grumman was a founding member of IAEG, a non-profit organization of global aerospace companies created to collaborate on and share innovative environmental solutions for the industry. Northrop Grumman participates in IAEG workgroups that enhance collaboration and frameworks related to environmental issues. For example, Work Group 3 (GHG Management and Reporting) of IAEG was established to address the issue of GHG accounting and reporting by aerospace companies specifically to promote industry wide GHG emissions accounting and reporting and to drive consistent practices within the industry. The group has developed the GHG Reporting Guidance for the Aerospace industry as a supplement to the greenhouse gas protocol, has published a guidance document for the industry in support of Scope 3 reporting on Capital Goods and Services. In addition, we support the efforts of Work Group 11, Aerospace Industry ESG Engagement, which has been chartered to establish a voluntary sectoral framework for ESG engagement.</p> <p>Northrop Grumman is a member of the Corporate Eco Forum (CEF). The CEF is a membership organization comprised of Fortune and Global 500 companies that demonstrate a serious commitment to sustainability as a business strategy issue. CEF drives year-round senior executive dialogue, supports peer-to-peer learning, and spurs collaborations to advance solutions on the topics our members prioritize. CEF was founded in 2008 after extensive interviews with over 70 global business leaders revealed the need for a neutral forum for senior executives to speak candidly with their peers on sustainability challenges, best practices and innovation. We participate in events, trainings and meetings throughout the year, as well as in research and special initiatives developed by CEF.</p>

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	No, and we do not plan to have both within the next two years	<Not Applicable>	<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	Other, please specify (Expand Technology for Conservation (T4C) initiatives in proximity to Northrop Grumman's U.S. locations by 2030, in collaboration with external partners.)	<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

Yes

Value chain stage(s) covered

Direct operations

Portfolio activity

<Not Applicable>

Tools and methods to assess impacts and/or dependencies on biodiversity

IBAT – Integrated Biodiversity Assessment Tool

Please explain how the tools and methods are implemented and provide an indication of the associated outcome(s)

Using a list of our sites, we leveraged the IBAT methodology to assess the biodiversity impact of our direct operations. Our assessment found that none of our sites is located within a biodiversity site.

Dependencies on biodiversity

Indicate whether your organization undertakes this type of assessment

Please select

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?

No

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	Other, please specify (In 2022, we expanded our Technology for Conservation (T4C) initiatives to 54 additional sites (up from 17 sites in 2021) and launched two new T4C projects, HOP Queue and Project Glacier Watch.)

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	Yes, we use indicators	Other, please specify (Number of Northrop Grumman sites with Technology for Conservation projects)

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	Content of biodiversity-related policies or commitments Risks and opportunities Biodiversity strategy	2022 ESG Report, p. 6, 64

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	Chief Sustainability Officer	Chief Sustainability Officer (CSO)

SC. Supply chain module

SC0.0

(SC0.0) If you would like to do so, please provide a separate introduction to this module.

Northrop Grumman Corporation (herein referred to as "Northrop Grumman," the "company," "we," "us," or "our") is a publicly traded company whose common stock is listed on the New York Stock Exchange (NYSE: NOC). Northrop Grumman is a leading global aerospace and defense (A&D) technology company. We deliver a broad range of products, services and solutions to United States (U.S.) and international customers, and principally to the U.S. Department of Defense (DoD) and intelligence community. Our broad portfolio is aligned to support national security priorities and our solutions equip our customers with capabilities they need to connect, protect and advance humanity. The company is a leading provider of space systems, advanced aircraft, missile defense, advanced weapons and long-range fires capabilities, mission systems, networking and communications, strategic deterrence systems, and breakthrough technologies, such as artificial intelligence, advanced computing and cyber. We are focused on competing and winning programs that enable continued growth, performing on our commitments and affordably delivering capability our customers need. With the investments we've made in advanced technologies, combined with our talented workforce and digital transformation capabilities, Northrop Grumman is well positioned to meet our customers' needs today and in the future. Northrop Grumman established an environmental sustainability program in 2008 to reduce the company's environmental footprint by improving operational efficiency and integrating environmental sustainability practices across our operations. Our Environmental Sustainability Program supports a vision for a more sustainable future by expanding environmental sustainability awareness throughout our organization, supporting our corporate values and meeting the expectations of our diverse set of stakeholders. Northrop Grumman announced our next generation sustainability goals in April 2022, which expand the company's focus on sustainability beyond our operational footprint. Our next generation sustainability initiatives focus on activity around three mission areas: (1) Footprint: Minimizing the footprint of our operations; (2) Handprint: Enhance sustainability within the aerospace and defense industry by supporting customer needs and supply chain objectives; and (3) Blueprint: Affirm Sustainability leadership by collaborating to protect ecosystems and define environmental opportunities in our communities.

SC0.1

(SC0.1) What is your company's annual revenue for the stated reporting period?

	Annual Revenue
Row 1	36800000000

SC1.1

(SC1.1) Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.

SC1.2

(SC1.2) Where published information has been used in completing SC1.1, please provide a reference(s).

SC1.3

(SC1.3) What are the challenges in allocating emissions to different customers, and what would help you to overcome these challenges?

Allocation challenges	Please explain what would help you overcome these challenges
Diversity of product lines makes accurately accounting for each product/product line cost ineffective	Northrop Grumman's customer base is primarily the U.S. Government, principally the Department of Defense and intelligence community. We also conduct business with foreign, state and local governments, as well as commercial customers. Our portfolio of products and solutions include autonomous systems, cyber, C4ISR, strike, and logistics and modernization. Due to the nature of our business, broad product portfolio, and customer requirements the allocation of emissions to an individual product or customer is difficult. Consequently, we provide our full GHG inventory so that customers may allocate in accordance with their methodology.

SC1.4

(SC1.4) Do you plan to develop your capabilities to allocate emissions to your customers in the future?

No

SC1.4b

(SC1.4b) Explain why you do not plan to develop capabilities to allocate emissions to your customers.

Northrop Grumman's customer base is primarily the U.S. Government, principally the Department of Defense and intelligence community. We also conduct business with foreign, state and local governments, as well as commercial customers. Our broad portfolio of capabilities and technologies deliver innovative platforms, systems and solutions in space; manned and autonomous airborne systems; including strike; strategic deterrence systems; hypersonic; missile defense; weapons systems; cyber; command, control, communications and computers, intelligence, surveillance and reconnaissance (C4ISR); and logistics and modernization. Due to the nature of our business, broad product portfolio, and customer requirements ,the allocation of emissions to an individual product is difficult.

SC2.1

(SC2.1) Please propose any mutually beneficial climate-related projects you could collaborate on with specific CDP Supply Chain members.

SC2.2

(SC2.2) Have requests or initiatives by CDP Supply Chain members prompted your organization to take organizational-level emissions reduction initiatives?

No

SC4.1

(SC4.1) Are you providing product level data for your organization's goods or services?

No, I am not providing data

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below

I have read and accept the applicable Terms