2022 CLIMATE REPORT

National Fuel

CONTENTS

Letter to Stakeholders

Dear Stakeholder,

I am pleased to provide you with National Fuel's first Climate Report ("Climate Report"), furthering the Company's ongoing efforts to enhance its environmental, social, and governance ("ESG") disclosures. In line with identified stakeholder priorities, our Climate Report further aligns the Company's climate-risk disclosures with the Task Force on Climate-Related Financial Disclosures ("TCFD") framework, focusing on governance surrounding climate-based risks and opportunities, strategies for addressing such factors, related risk management considerations, and metrics and targets which can be used to assess those factors.

Throughout our organization, we continue to take important steps to position our business to play a meaningful role in a lower carbon economy. This Climate Report describes many of those efforts, highlighting the resilience of our operations to potential risks associated with climate change, and identifying opportunities to further participate in the ongoing transition.

As we look to the future, it's clear that natural gas and its delivery system will play an important role in meeting the world's energy needs and should remain a critical part of the energy solution. Within our utility operating footprint in Western New York and northwest Pennsylvania, natural gas' resilience, reliability, and affordability compared with other alternatives make it the energy of choice for both space heating needs and commercial and industrial processes. And, I firmly believe new natural gas infrastructure will be needed if the United States is serious about achieving its aggressive emission reduction goals.

Core Elements of the Task Force on Climate-Related Financial Disclosures

Governance

The organization's governance around climate-related risks and opportunities

Strategy

The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning

Risk Management

The processes used by the organization to identify, assess, and manage climate-related risks

Metrics and Targets

The metrics and targets used to assess and manage relevant climate-related risks and opportunities

In the meantime, we are focused on reducing the emissions of our operations and working with our customers to do the same. In this regard, we believe our three-pronged approach to reducing our carbon footprint – focused on operational emissions reductions, energy conservation, and embracing new and emerging technology, as well as low-carbon fuels – provides a strong foundation for National Fuel's long-term role in the energy complex.

1 Our Commitment to Reducing our Carbon Footprint

National Fuel is committed to lowering our emissions profile. To that end, in September of 2021, coincident with the publication of our 2020 Corporate Responsibility Report, we announced aggressive emissions reduction targets. In particular, we committed to reduce methane intensity at our major operating segments by 30% to 50% from 2020 levels, by 2030. In addition, we pledged to reduce absolute greenhouse gas emissions by 25%, again by 2030. Importantly, unlike the aspirational goals that have become commonplace, these targets, while challenging, are based on tangible projects that use today's technology. This is an important step for the Company – one that demonstrates our commitment to sustainably operating our assets for the long-term by taking concrete action over the short and medium terms.

2 Maintaining our Focus on Energy Conservation

Simply put, we have to encourage our customers to use less. With the support of our regulators, we have already made great strides in this regard, with our Conservation Incentive Program in New York driving end use emissions reduction of over 1.4 million metric tons of CO_2e since its implementation in 2007.

3 Embracing Technology and Low Carbon Fuels

Technology is advancing rapidly, and we must evaluate how it can be used in our operations and by our customers to lower emissions. Additionally, through our Energy Transition Steering Committee, we are studying the feasibility and potential development of projects focused on renewable natural gas (RNG), hydrogen, and carbon capture utilization and storage (CCUS). Likewise, we are proud to be an anchor sponsor of the Low-Carbon Resource Initiative, which is researching new technologies that lower the carbon footprint of pipelines, local distribution companies and their customers.

In furtherance of our evaluation of operational climate-related risk, this inaugural Climate Report, which was developed with the assistance of a third-party consultant, ERM, analyzes the resilience of National Fuel's business using two discrete scenarios published by the International Energy Agency (IEA) in its 2021 World Energy Outlook: The Stated Policies Scenario (STEPS) and the Sustainable Development Scenario (SDS). The STEPS scenario assumes implementation of current policy based on a sector-by-sector assessment, as well as the implementation of policies that have been announced by governments around the world. The SDS scenario assumes achievement of key energy-related United Nations Sustainable Development Goals concerning universal energy access and major improvements in air quality and reaches global net zero emissions by 2070 (with many countries and regions reaching net zero much earlier). Additionally, in connection with our Climate Report, National Fuel completed a physical risk assessment of Company-owned assets, evaluating potential climate-related impacts to our assets using site-specific climate modeling.

A comprehensive review of future physical risks from climate-driven hazards across critical assets within our Upstream, Midstream and Downstream businesses indicated that there is relatively low financial risk from climate hazards in 2030 and 2050 to our facilities and operations. This is largely due to the location of our assets, coupled with the fact that the vast majority of our infrastructure is designed to withstand severe weather. Additionally, under the SDS, our analysis showed that National Fuel can continue to operate profitably and generate free cash flow through 2050 even using the IEA's remarkably pessimistic long-term natural gas price of $2.00 per dekatherm and dramatically reduced demand. Furthermore, due to the national focus of the SDS, our analysis did not take into

account significant potential regional benefits or other key positive differentiators for National Fuel's operations, including the proximity of our pipelines to large winter-focused energy demand markets, our significant depth of prospective natural gas drilling locations within Appalachia, and our large fee-acreage position in the Marcellus and Utica shales, which provides a cost advantage versus peers. These key differentiators, along with our analysis under the respective scenarios, provide the Company with further confidence in our portfolio's resilience.

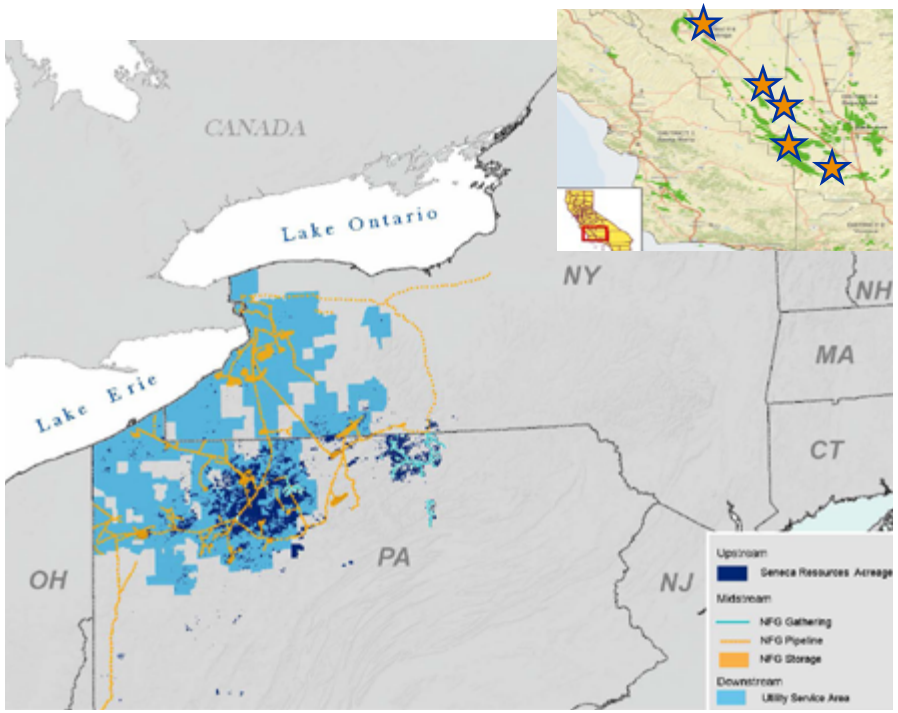
Looking ahead, I firmly believe that the reliability and resilience of our existing infrastructure, the affordability and abundance of natural gas to consumers, and the responsible development of our reserves, which are situated within one of the lowest carbon-intensity basins in the United States, position National Fuel to remain a key participant in the local, regional, and national energy eco-system. Moreover, our significant pipeline assets provide the Company with potential long-term opportunities to transport and store low- and zero-carbon fuels in order to drive further emissions reduction, in line with regional and national climate objectives. Underpinned by our 2,100 dedicated and hardworking employees, our unwavering commitment to environmental stewardship, and our focus on continuous improvement in all aspects of our operations, National Fuel is poised to play a significant role in the energy transition - producing, transporting, and delivering critical energy supplies to homes and businesses across our operating footprint.

David P. Bauer
President and Chief Executive Officer

CORPORATE OVERVIEW

National Fuel Gas Company (National Fuel or the Company) is a holding company organized under the laws of the State of New Jersey and headquartered in Western New York. The Company is a diversified energy company engaged principally in the onshore production, gathering, transportation, storage, and distribution of natural gas in the United States.

Diversified Assets Across the Energy Value Chain



Integrated Natural Gas Operations Focused in New York and Pennsylvania

The Company operates an integrated business, with assets centered in Western New York and Pennsylvania, being used for, and benefiting from, the production and transportation of natural gas from the Appalachian basin. Current natural gas production development activities are focused in the Marcellus and Utica shales, geological formations that are present nearly a mile or more below the surface in the Appalachian region of the United States.

Pipeline development activities are designed to gather, store and transport natural gas production to new and growing markets. Utility activities deliver natural gas to residential, commercial, and industrial end users within the Company's service territories.

The common geographic footprint of the Company's subsidiaries enables them to share certain management, labor, facilities and support services across various businesses and pursue coordinated projects designed to produce, gather, and transport natural gas from the Appalachian basin to markets in the eastern United States and Canada. The Company also develops and produces oil reserves, primarily in California. National Fuel owns directly or indirectly all of the outstanding securities of its subsidiaries, which are represented in the Upstream, Midstream, and Downstream operating segments.

Upstream

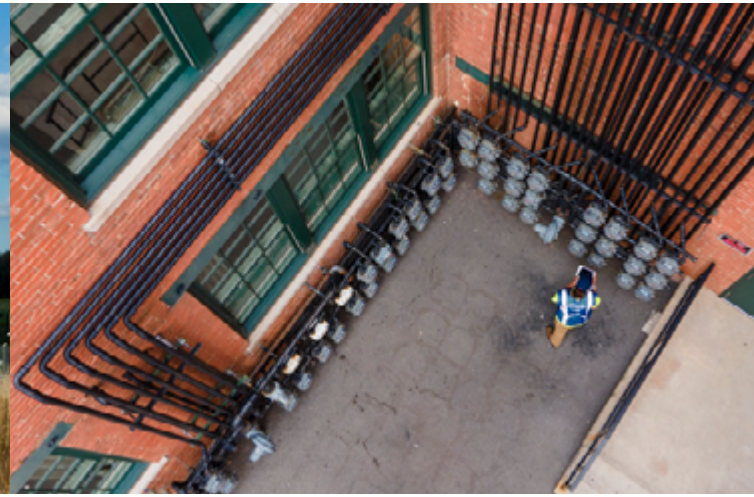
Our exploration and production operations are carried out by Seneca Resources Company, LLC ("Seneca" or "Upstream Segment"), a Pennsylvania limited liability company. Seneca is engaged in the exploration for, and the development and production of, natural gas and oil reserves in the Appalachian region of the United States and in California.

Midstream

The Company's midstream operations are carried out by the Company's Pipeline & Storage and Gathering subsidiaries (collectively the "Midstream Segment"). Our Pipeline & Storage operations are carried out by National Fuel Gas Supply Corporation ("Supply Corporation"), a Pennsylvania corporation, and Empire Pipeline Inc. ("Empire"), a New York corporation. Supply Corporation and Empire provide interstate natural gas transportation and storage services through integrated gas pipeline systems in Pennsylvania and New York. Our Gathering operations are carried out by wholly-owned subsidiaries of National Fuel Gas Midstream Company, LLC ("Midstream Company"), a Pennsylvania limited liability company. Through these subsidiaries, Midstream Company builds, owns and operates natural gas gathering and compression facilities in the Appalachian region.

Downstream

The Company's utility operations are carried out by National Fuel Gas Distribution Corporation ("Distribution Corporation" or "Downstream Segment"), a New York corporation. Our Downstream Segment provides natural gas utility services to over 2 million residents in Western New York and northwestern Pennsylvania through a local distribution system. The principal metropolitan areas served by Distribution Corporation include Buffalo, Niagara Falls and Jamestown, New York and Erie and Sharon, Pennsylvania.



REPORT OVERVIEW

Our Climate Report (Report) provides key information on National Fuel's ongoing commitment to the disclosure and analysis of climate-related information relevant to our business and our stakeholders. Specifically, the Report focuses on the risks and opportunities associated with climate change, and builds on our prior environmental, social, and governance (ESG) reporting, as further described in the Company's 2020 Corporate Responsibility Report.

Reporting Framework

This Report implements the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). The Company has aligned its climate-related risk reporting with the four central pillars of the TCFD recommendations: (1) Governance, (2) Strategy, (3) Risk Management, and (4) Metrics and Targets.

Building upon the Company's existing climate-related disclosures, in line with the TCFD framework, this Report (1) identifies climate-related risks and opportunities for National Fuel, (2) describes how these climate related risks and opportunities may impact the Company's strategy and financial planning, (3) describes how these climate-related risks are identified, assessed and managed through our enterprise risk management process, and (4) discloses metrics and targets for each of our business segments.

Climate risk reporting is an evolving practice and we are committed to continuous improvement of our analytical methods, public reporting, and stakeholder engagement.

TCFD | TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

The Task Force on Climate-related Financial Disclosures (TCFD) was established to improve and increase reporting of climate-related financial information. In 2017, the TCFD released climate-related financial disclosure recommendations designed to help companies provide better information to support informed capital allocation.

More information: www.fsb-tcfd.org

Reporting Boundaries

This Report addresses all segments of our business: Upstream, Midstream, and Downstream operations. These business operations include natural gas and oil production, natural gas transmission pipelines, gathering and boosting operations, natural gas storage, and natural gas delivery to end-use customers.

Forward-looking Information

This climate report contains forward-looking information. Please see "Cautionary Note on Climate Reporting and Forward-Looking Statements" on page 45 of this report.

Our Approach to Climate Change

Reducing our Operational Emissions

National Fuel has established greenhouse reduction targets for all of its business units. We continue to invest in our infrastructure and operations to reduce emissions.

Embracing Technology and Development of Low- and Zero-Carbon Fuels

National Fuel is studying the feasibility and potential development of projects focused on renewable natural gas (RNG), hydrogen, and carbon capture utilization and storage (CCUS).

Advancing Energy Conservation

National Fuel is focused on helping its customers improve the energy efficiency of their homes and businesses. By using less, our consumers can play a pivotal role in lowering emissions.

Transparency and Stakeholder Engagement

National Fuel is committed to improving and enhancing its ESG initiatives, including its climate-related disclosures. We will continue to focus our efforts on these important disclosures and related stakeholder engagement efforts.

GOVERNANCE

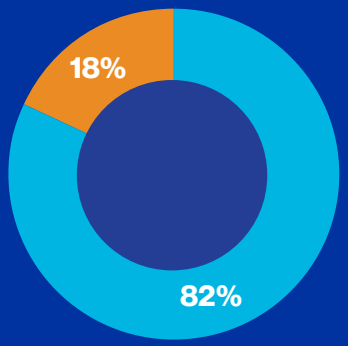
National Fuel employees, managers and officers conduct the Company's business under the oversight of the Board of Directors to serve the long-term interests of the Company's shareholders and meet the needs of its customers. The Board has a fiduciary duty to oversee the management of the Company's operations and uphold those shareholder interests, and the Board and Company management recognize that the long-term interests of stockholders are served by considering the interests of customers, employees and the communities in which we operate. The Company's Board of Directors consists of eleven individuals (nine of which are independent) with extensive and diverse leadership experience and backgrounds. The board has also designated a lead independent director and separated the roles of Chairman of the Board and Chief Executive Officer.

Our Board of Directors[1]

The Company's Board of Directors consists of individuals with extensive and diverse leadership experience within the energy industry, as well as complementary industries, including manufacturing and consulting. The Company believes that it is important for the make-up of the Board to reflect a diversity of experience related to the Company's business segments in which it operates, as well as a diversity of perspectives brought to the Board by the individual members.

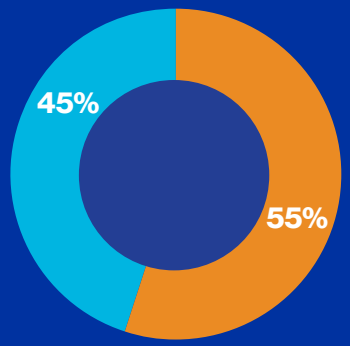
Diverse and Independent Board of Directors

Board Independence



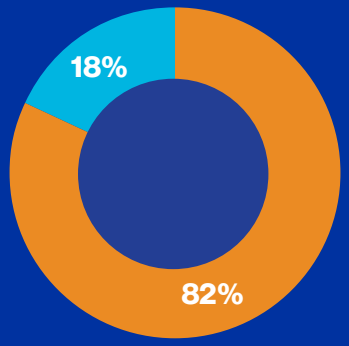
Independent
Other

Board Tenure



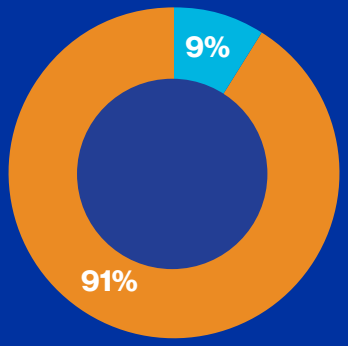
Less than 5 years
Greater than 5 years

Board Gender Diversity



Diverse
Other

Board Racial/ Ethnic Diversity



Diverse
Other

1 The graphs reflect the current makeup of the Company's Board of Directors as of the initial publication date of the 2020 Corporate Responsibility Report in September 2021. In accordance with the NYSE Listed Company Manual, the Company does not consider a director independent if he or she is, or has been within the last three years, employed as an executive officer of the Company.

Our eleven Board members have experience in the following areas, among others:

- CEO/Senior Leadership Position (11)
- Energy Industry Experience (10)
- Operational/Safety (9)
- Other Public Board of Directors Experience (8)
- Federal & State Regulatory/Government Relations (7)
- Legal/Compliance/Enterprise Risk Management (7)
- Consumer/Customer Relations (7)
- Financial/Accounting (5)
- Environmental/Sustainability/Energy Transition (4)

Risk Oversight

The Board retains oversight of safety, environmental, social, operational and corporate governance risks, among other areas central to corporate responsibility, including strategic, financial and regulatory risks and opportunities. An important aspect of the Board's oversight role is the enterprise risk management process, under which enterprise-wide risks have been identified, including climate-related risk, along with mitigative measures to address and manage such risks. Through its enterprise risk management process, the Company has identified specific foundational risks, critical risks and potentially emerging risks and reviews the assessment of these risks, along with any newly identified risks, on a quarterly basis with the Board. Management also reports quarterly to the Board on significant matters within these risk categories. In addition, management provides a detailed presentation on a topic related to one or more risk categories at each Board meeting. Additional review or reporting on enterprise risks is conducted as needed or as requested by the Board. The Board and management consider enterprise risks and opportunities in their strategic and capital spending decision process, and the Board directs management to integrate corporate responsibility concerns into decision-making throughout the organization.

Governance of Corporate Responsibility/ Sustainability and Climate Risk

The Board's structure and responsibilities are outlined in the Company's Corporate Governance Guidelines. Individual committees offer expertise and oversight on specific environmental, social and governance factors. The Nominating/Corporate Governance, Audit, and Compensation committees all have responsibilities that touch on climate change and climate risk. Each is discussed in turn.

Committee	ESG Factor Overview
Nominating/Corporate Governance	• Corporate Governance and Performance • Oversight of Corporate Responsibility and Sustainability • Board Composition and Diversity
Audit	• Financial Statement Integrity • Internal Control Systems • Audit Processes • Enterprise Risk Management Process
Compensation	• Compensation Philosophy and Practices • Executive Compensation tied to ESG metrics

Nominating/Corporate Governance Committee

The Nominating/Corporate Governance Committee specifically has oversight for corporate responsibility matters that are significant to the Company and its stakeholders. The Company conducts business consistent with our six guiding principles of safety, environmental stewardship, community, innovation, satisfaction, and transparency. To that end, corporate responsibility and ESG matters are a standing agenda item at Nominating/Corporate Governance Committee meetings, which are typically attended by the full Board.

Organizational responsibility for corporate responsibility and sustainability flows from the Nominating/Corporate Governance Committee of the Board to our Chief Executive Officer and President, and throughout the Company via our Corporate Responsibility Executive Committee, which is made up of the Company's senior executive team and our Vice President of Corporate Responsibility.

<table>
<tr><td colspan="5">Nominating/Corporate Governance Committee
Oversees and provides guidance of Corporate Responsibility and Sustainability initiatives, strategies and decision-making.</td></tr>
<tr><td colspan="5">Corporate Responsibility Executive Committee
Accountable to the Board for implementation and development of corporate responsibility and sustainability strategies.
Participates in the enterprise risk management process.</td></tr>
<tr><td colspan="5">Vice President of Corporate Responsibility
Executive responsible for corporate responsibility disclosure and advancing the Company's sustainability agenda.</td></tr>
<tr><td rowspan="2">Director of Corporate Responsibility
Responsible for identifying improvement opportunities and enhancing Company disclosure.</td><td colspan="4">Corporate Responsibility Management Committee
Responsibility for prioritizing progression of corporate responsibility and sustainability agenda in specific SME areas, as well as updating Company disclosures.</td></tr>
<tr><td>Governance and Risk Management SMEs</td><td>Human Capital Development SMEs</td><td>Health and Safety SMEs</td><td>Emissions and Air Quality SMEs</td></tr>
<tr><td colspan="5">All Leaders
Responsible for leading team efforts on corporate responsibility and sustainability initiatives.</td></tr>
</table>

Audit Committee

The Audit Committee discusses guidelines and policies governing management's process for assessing and managing the Company's exposure to risk, and on a quarterly basis, at meetings which are attended by the entire Board, reviews the enterprise risk management process described above. The Audit Committee also oversees the scope of work of the Company's Audit Services Department, which includes review of the internal audit function's annual risk-based audit plan. The Audit Services Department considers significant risk categories identified through the enterprise risk management process when creating its internal audit plan. Additionally, in conjunction with its review of the integrity of the Company's financial statements, the Audit Committee discusses with management major financial risk exposures and the steps taken to monitor and control those exposures. The Audit Committee also provides assistance to the Board in fulfilling its oversight responsibility relating to the integrity of the Company's financial statements, and the Company's compliance with legal and regulatory requirements.

Compensation Committee

The Compensation Committee is responsible for various aspects of executive compensation including approval of the base salaries and incentive compensation of the Company's executive officers. The Committee is authorized to evaluate director compensation and make recommendations to the full Board regarding director compensation. Additionally, the Committee may form subcommittees and delegate to those subcommittees such authority as the Compensation Committee deems appropriate, other than authority required to be exercised by the Compensation Committee as a whole. The Compensation Committee also assesses and approves short and long-term executive compensation measures, including greenhouse gas-related performance measures, which affect management compensation.

STRATEGY

Climate Risk Assessment

The Company recognizes the ongoing developments and risks surrounding climate change, as well as the corresponding opportunities associated with the transition to a low-carbon economy. The Board and management consider these risks and opportunities and their corresponding impacts on the organization's businesses and strategy through the Company's enterprise risk management process, strategic planning process and capital spending decision process.

When evaluating the impact of climate-related risks, the Company considers short-, medium- and long-term time horizons and whether the identified risks could have a potential financial impact on the Company within those time horizons.

The short-term time horizon is one year, during which we consider near-term risks to project planning and completion, low commodity prices and continuing shifts in stakeholder and government policy the most impactful risks. The following sections describe the climate related risks for medium-term and long-term time horizons that have the potential to be the most impactful for the Company.

Medium-Term Risks

- **Policy and Regulatory Changes:** Regulatory changes at the federal, state, and/or local levels could require facility modifications, including potential new requirements aimed at reducing emissions for new and existing facilities, increasing capital needs or operating costs, or restricting existing operations.
- **Project Opposition:** Opposition during the project/ facilities planning phase, or during or after construction, could limit growth opportunities if projects become difficult to construct due to prolonged timelines and increased construction costs.
- **Decreased Demand for Natural Gas and Oil:** Demand for fossil fuels could decrease through renewable energy adoptions and subsidization, which could lead to decreased revenues, or the inability to recover the Company's financial investment in plant.

Long-Term Risks

- **Policy and Regulatory Changes:** Evolving federal, state, and local statutory and/or regulatory approaches could negatively impact the Company's ability to grow or maintain its operations and assets. Potential developments could include regional or statewide moratorium(s) on natural gas; increased restrictions on certain operating practices; and cap-and-trade, severance tax and/or carbon tax implementation.
- **Financial Counterparty Restrictions for Carbon-Intensive Industries:** Access to and cost of capital could be negatively impacted due to limitations and restrictions on sources of funding, or insurer divestment from carbon-intensive industries could lead to increased insurance premiums.
- **Project Opposition** (see Medium Term Risks)
- **Decreased Demand** (see Medium Term Risks)

Climate-Related Risks and Potential Impacts

The Company considers climate-related risks as part of its enterprise risk management process, which ultimately informs corporate strategy and the capital spending decision process. The TCFD identifies two categories of climate-related risks – physical risks and transitional risks.

TCFD Physical Risks

Physical risks include acute event-driven physical risks (e.g., severe weather events) and chronic longer-term physical risks (e.g., shifts in climate patterns and sustained higher temperatures).

Climate-Related Physical Risks	Risk	Potential Impact
Acute	• More frequent and severe weather events	• Business interruption or system shutdown leads to reduced revenues • Increased costs for operational damage that are unrecoverable • Increased insurance premiums
Chronic	• Long-term shift in climate patterns resulting in new storm patterns or chronic increased temperatures	• Decreased revenues as a result of warmer weather/fewer degree days • Supply chain disruption

TCFD Transitional Risks

As indicated above, transitional risks are those risks that arise from a transition to a lower-carbon economy. Transitional risks include:

- Policy and legal risks from regulation, legislation and litigation.
- Technology risks from improvements or innovations that support decarbonization.
- Market risks from shifts in supply and demand for fossil fuels.
- Reputational risks from changes in customer and community perceptions and behaviors.

Climate-Related Transitional Risks	Risk	Potential Impacts
Policy and Legal	**Regulatory and Legislative Initiatives** • Carbon taxes, and cap-and-trade programs • Lack of support for system modernization • More stringent emissions regulations or regulatory changes require major system remediation or changes in operating practices • Revisions to federal statutes, laws, or policies related to the drilling or completion of oil or natural gas wells **Political Risks Associated with Climate Pledges** • Regional or statewide moratoriums • Limited geographic footprint • Ban on hydraulic fracturing or increased permitting/operating requirements • Increased permitting requirements surrounding water usage and management for production operations **Increased Government Subsidies for Alternative Energy Sources**	• Increased costs and reduced revenue from reduction in consumer demand based on incremental costs for usage • Negative rate case results • Increased costs for system changes without rate recovery • Lower throughput/demand for natural gas and oil • Production curtailment and related revenue impacts • Decreased revenues • Inability to recover financial investment in plant • Limits pool of potential investors to finance growth • Access to and cost of capital negatively impacted • Increased insurance premiums • Increased shareholder activism leads to increased costs • Prolonged project timelines and increased construction costs • Limits growth opportunities • Impact on stock price
Technology	• Decreased natural gas and oil demand due to renewable energy adoption / technology developments	
Markets	• Shifts in supply and demand for fossil fuels	
Reputation	• Investors shift away from carbon-intensive industries • Financial counterparty restrictions for carbon-intensive companies • Increased opposition to new projects/facilities • Employee attraction and retention • Litigation and lobbying aimed against carbon-intensive companies	

Emissions Mitigation and Reduction Strategies

National Fuel is focused on reducing its carbon footprint to mitigate the potential risks associated with climate change. Our ongoing efforts to reduce emissions are detailed below.

Upstream

Our Upstream Segment is committed to reducing methane emissions and limiting its environmental footprint. As part of these efforts, over the past several years, Seneca has committed to the following voluntary emission reduction programs: EPA Natural Gas STAR (2015), EPA Methane Challenge (2018), and The Environmental Partnership (2018). Seneca has documented cumulative methane reduction strategies totaling over 3,300,000 Mcf (approximately 1,586,000 metric tons of CO_2e) under the Natural Gas STAR program.

Ongoing Emissions Reductions Initiatives

Emissions Reduction Program	Commitments/Initiatives
EPA Natural Gas Star	• Installing flash tank separators on glycol dehydrators • Eliminating unnecessary equipment and/or systems • Improving system design • Identification and replacement of pneumatic devices with zero-bleed devices • Replacement of orifice meters with ultra-sonic meters • Replacements of natural gas pneumatic pumps with electric pumps • Leak detection and repair (LDAR) surveys • Testing and repair of pressure safety valves • Implementation of artificial lift • Utilization of EPA-approved reporting on well pad equipment design to bulk/test versus single well separators
EPA Methane Challenge	Committed to various EPA-approved best management practices: • Pneumatic controllers • Fixed roof, atmospheric hydrocarbon tanks • Replacing rod packing vents for reciprocating compressors
Other Seneca Emissions Controls	Control measures in place for combustion and non-combustion equipment to abate and/or to mitigate methane emissions: • Use of bi-fuel drilling rigs, completion equipment and fleet vehicles • State-of-the-art catalytic converters for engines • Ultra-low-emissions burners for heater treaters and steam generators • Installation of compressed air systems • Utilization of no/low bleed pneumatics controls/actuators • Use of capture and recovery systems for glycol dehydrators and tanks

Responsibly Sourced Gas Initiatives

EQUITABLE ORIGIN

Equitable Origin

In January 2022, Seneca announced it had achieved certification of 100% of its Appalachian natural gas production, over 1 billion cubic feet of daily gross production, under Equitable Origin's EO100™ Standard for Responsible Energy Development, a series of rigorous (ESG) performance targets.

PROJECT CANARY

Project Canary

In September 2021, Seneca announced that it has executed an agreement with Project Canary to seek an independent responsibly sourced gas (RSG) certification for approximately 300 million cubic feet per day of the Company's Appalachian production. In connection with this certification process, Seneca also intends to install continuous monitoring devices at three well pad locations, which will provide real-time, site-level emissions data.

Upstream Emissions Reduction Strategies

Reduced Emissions Completions

Seneca employs "green completion" techniques on nearly all Marcellus and Utica Shale development wells. Green completions avoid venting or flaring during a well's initial production whenever possible to minimize methane emissions. Since 2019, Seneca's development wells have employed green completions.

Pneumatics

Seneca is committed to the use of compressed air or electric powered pneumatics on new development pads, and the Company is retrofitting existing natural gas pneumatics on return trip pads to also run on compressed air. This is expected to continue to reduce our already low methane emissions intensity as we strive to meet our long-term emissions reduction goals.

Ultrasonic Leak Detection Technology

Seneca pioneered the industry's onshore use of ultrasonic leak detection technology on Marcellus well pads. Now, with more than 110 units in place, Seneca is able to remotely detect the presence of any leaks on well pads and immediately shut down production for repair, if necessary.

Emissions Controls

Control measures are in place for combustion and non-combustion equipment to abate and/or mitigate methane and VOC emissions. Seneca uses infrared cameras to perform optical gas imaging for leak detection surveys on its well pads and permitted compressor facilities in Pennsylvania, including wells that are otherwise exempt from these inspections. In California, Seneca goes beyond the required quarterly regulatory inspection frequency of the California Air Pollution Control rules by performing monthly inspections on approximately 2,950 wells and associated facilities using EPA-approved instruments.

Drilling Rig, Completions Equipment, Field Engines and Vehicle Fuel Conversion

In October 2011, Seneca began utilizing EPA-certified natural gas engines to provide all electrical power needed to support drilling rig operations, the first natural gas fueled drilling rigs in Pennsylvania's Marcellus Shale region. Currently, both of Seneca's drilling rigs are dual fuel, allowing the replacement of diesel with clean-burning natural gas. Overall, our focus is on increasing the use of natural gas to fuel our drilling and completion operations. National Fuel is uniquely positioned to do this more efficiently than many of our peers, given our coordinated Upstream and Gathering development. These teams have worked in lockstep to accelerate the development of key infrastructure to ensure we can utilize field gas in nearly all of our operations.

Integrating Renewable Energy into Our Operations

In July 2016, Seneca Resources completed installation of a 3.1-megawatt photovoltaic solar power generation facility at our North Midway Sunset field in Kern County, California, the first California producer to take advantage of the Low-Carbon Fuel Standard "Innovative Method" credit program. This state-of-the-art complex was California's largest solar power generation system in the oil and gas industry at time of construction. Since this installation, Seneca has developed additional solar facilities in California, completing a 1.8-megawatt facility at its South Midway Sunset production field in early 2022, as well as commencing construction of a new 1.0-megawatt facility at its South Lost Hills production field. These investments in solar facilities will be utilized to offset Seneca's operational power needs, reducing our carbon footprint.

Midstream

National Fuel's Midstream Segment is committed to reducing greenhouse gas emissions from its operations. We have numerous initiatives underway to accomplish this commitment, including our participation in the EPA's Methane Challenge Program, through which we are analyzing new and innovative approaches for further methane reductions, including technology enhancements and work practice improvements.

In line with our commitment to continuous improvement, Supply Corporation developed a Best Management Practice (BMP) for fugitive emissions at compressor stations, which focuses on addressing specific leak sources to maximize methane emissions reductions, targeting compressor unit isolation and gas venting valve leakage. EPA approved this BMP in July 2020, and both Supply Corporation and Empire adopted the BMP in September 2020.

To further our goals and objectives under the Methane Challenge Program, National Fuel appointed a Methane Challenge Implementation Manager for each Midstream Segment subsidiary, who is responsible for overseeing the implementation of the various BMP commitments, tracking of emissions reductions, and annual reporting of progress.

As part of its efforts to reduce Midstream Segment emissions, National Fuel is focused on upgrading and modernizing equipment at its existing facilities, including repair and replacement programs for isolation and vent valves, the replacement of compressor venting equipment, the installation of vented natural gas capture systems, and the replacement of natural gas actuating devices.

ONE Future

In August 2021, National Fuel joined Our Nation's Energy Future ("ONE Future"). The ONE Future Coalition is a group of over 50 natural gas companies working together to voluntarily reduce methane emissions across the natural gas value chain to 1% (or less) by 2025 and is comprised of some of the largest natural gas production, gathering & boosting, processing, transmission & storage and distribution companies in the U.S. and represents more than 15% of the U.S. natural gas value chain.

Downstream

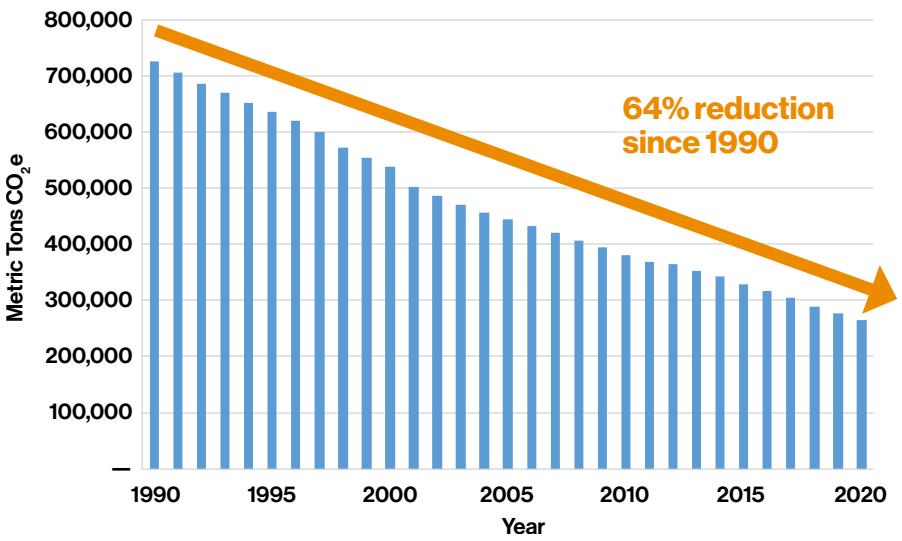
For over 118 years, National Fuel and its employees have been committed to operating safely and responsibly as important members of our local, national, and world communities. One of our six guiding principles is "Environmental Stewardship" which reflects our understanding of the vital role that we play in upholding standards of environmental protection. In furtherance of this principle, in 2021 Distribution Corporation announced greenhouse gas emissions reduction targets of 75% by 2030, and 90% by 2050, from 1990 levels for its utility distribution system, driven by its ongoing system modernization efforts, including continued replacement of older vintage mains and services

National Fuel has accelerated its efforts to replace or retire its leak-prone pipes with the adoption of a comprehensive system modernization program. The program is designed to ensure the safety and reliability of the gas distribution system, and, in turn, reduces leakage rates and greenhouse gas emissions. In 2020, the Company reduced its inventory of unprotected steel mains by 6.1% and cast/wrought iron mains by 7.0%. National Fuel has also been replacing or retiring unprotected steel service lines when leaks are detected or the associated main is replaced. The Company reduced its unprotected steel service lines by 4.8% in 2020.

Since 1990, the baseline year for EPA GHG Inventory (GHGI) reporting, Distribution Corporation's System Modernization Program has reduced annual GHG Emissions by 64%.[1]

Utility EPA Subpart W Emissions

Estimated Emissions as CO_2e [AR5]
1990-2020: Mains & Services Only



In addition, our Utility business has a comprehensive leak management program, including:

- Accelerated leak surveys exceeding regulatory requirements that target facilities with a higher potential to leak or that have potentially higher consequences should a leak occur;
- Annual leak backlog goals to drive year over year improvement, which are also tied to annual executive compensation goals; and
- Annual system modernization targets to replace pipelines that have a higher potential to leak.

1 CO_2e values for Utility Scope 1 Subpart W Emissions for pipeline mains and services have been calculated in accordance with the published 100-year time horizon global warming potential values from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5, 2014).

Climate-Related Opportunities

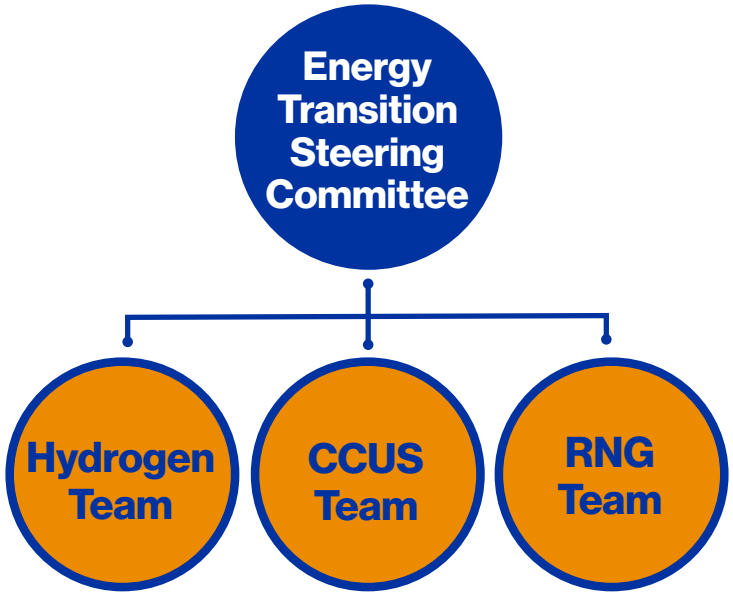
Natural gas has played a pivotal role to date in decarbonizing our economy, driving significant reductions in regional and national greenhouse gas emissions over the past decade. The Company believes that natural gas will continue to remain an important part of the future energy solution as the economy moves toward decarbonization, with continued coal plant retirements and conversions from fuel oil to natural gas. Climate-related opportunities arise through the Company's pursuit of mitigating climate-related risks, as well as the Company's consideration of business development opportunities presented as part of the transition to a low-carbon economy.

The Company's Energy Transition Steering Committee guides Company investment opportunities as the economy moves toward decarbonization. The Committee's goal is to reduce the Company's emission profile and find new business development opportunities. The following executives make up the Steering Committee:

- President and Chief Executive Officer
- Chief Operating Officer
- Presidents of the Company's primary subsidiaries
- General Counsel
- Treasurer of the Downstream and Midstream Segments

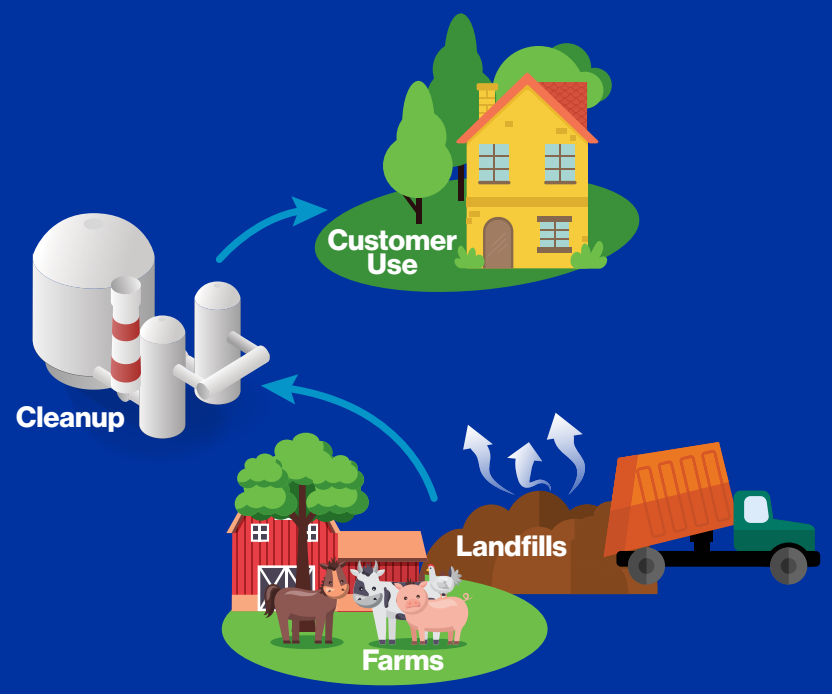
The Company has also developed specific teams made up of technical, regulatory and business development subject matter experts focused on hydrogen, CCUS, RNG. Each team reports to the Energy Transition Steering Committee, which is tasked with reviewing the team's progress, establishing next steps, and providing direction on time and resource allocation that will best position the Company for the future.

Currently, the Company is pursuing ways to improve resource efficiency and lower emissions, as well as exploring alternative low- and zero carbon fuel sources. The potential impact of these climate-related opportunities could include operational efficiencies resulting in increased revenue and lower costs, greater access to capital at a potentially lower cost due to the Company's reduced carbon footprint, and increased revenues, earnings, and cash flows driven by execution of business development opportunities.



Climate-Related Opportunities

TCFD Category	Climate-Related Opportunities
Resource Efficiency	• Modernize existing equipment to minimize emissions • Install low-emissions technology on new facilities • Minimize freshwater consumption and usage • Promote customer efficiency • Use more efficient distribution and production processes
Energy Source	• Leverage alternative energy sources and efficiency initiatives to reduce the Company's energy usage
Products and Services	• Leverage our existing infrastructure to transport renewable natural gas • Explore alternative low-carbon fuel sources, such as blue and green hydrogen • Explore carbon capture utilization and storage opportunities
Markets	• Access to capital for best-in-class ESG performers • Access to markets seeking responsibly sourced natural gas production
Resilience	• Improved efficiencies for natural gas development and gathering operations within contiguous acreage position



Renewable natural gas

Renewable natural gas (RNG) is pipeline-quality natural gas produced from a variety of existing waste streams and biomass sources, including animal waste, food waste, landfill gas, organic waste from wastewater treatment plants, and organic waste from landfill-diversion facilities. It presents an exciting opportunity for the pipeline industry to be part of the solution to climate change.

RNG can also:

- Capture methane from landfills and agricultural sources that would otherwise be emitted to the atmosphere.
- Be used to power equipment and vehicles, generate electricity or be injected back into the natural gas pipeline system.

Significant Technical Potential for RNG within New York State

- Distribution received approval from NY and PA utility commissions to accept RNG into its distribution system.
- In July 2021, Distribution accepted its first RNG deliveries into our New York system from a local anaerobic digester project.

New York RNG Potential (Bcf/Year)[1]

	Low Resource Scenario	High Resource Scenario	Technical Potential
Landfill	20	33	50
Animal/Food Waste	7	13	37
Wastewater	2	3	7
Other	24	56	177
All Sources	**53**	**105**	**271**

1 American Gas Foundation – Renewable Sources of Natural Gas: Supply and Emissions Reduction Assessment (December 2019).

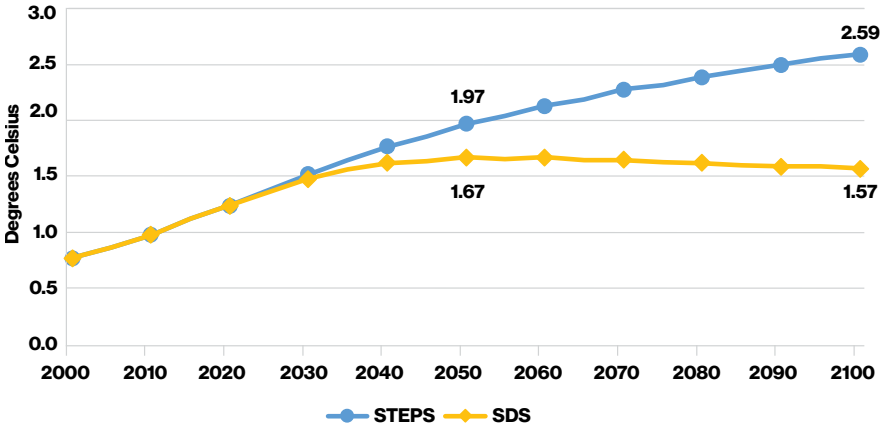
Ensuring the Resilience of Our Business

In March 2021, National Fuel commissioned a study, which was published by Guidehouse Inc., assessing the New York Climate Leadership and Community Protection Act's ("CLCPA" or Climate Act") impacts on New York's energy system and communities, including our New York utility service territory. The Guidehouse study—Meeting the Challenge: Scenarios for Decarbonizing New York's Economy—evaluated scenarios for meeting the state's 2050 GHG emission reduction goal, focusing on the interplay of energy efficiency, electrification, hybrid heating solutions and low-carbon fuels to leverage existing utility infrastructure and provide cost-efficient solutions. In short, the Guidehouse study concluded that multiple pathways could achieve the state's decarbonization targets, but a pathway that deploys a wide range of technologies can provide crucial resilience and reliability benefits. Specifically, the study illustrates how increasing the supply of renewable natural gas and hydrogen in the existing gas system can help in decarbonizing sectors that would be difficult to convert to electricity (e.g., the industrial sector).

Additionally, in 2021, National Fuel retained ERM, an independent-third party consultant, to conduct a climate scenario analysis across all segments of its business. The TCFD Guidance directs companies to: "[d]escribe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario."

For the purposes of this analysis, National Fuel utilized future energy market scenarios developed by the International Energy Agency (IEA): the Stated Policies Scenario (STEPS), and the Sustainable Development Scenario (SDS) to test the resiliency of the Company's assets and operations against potential future climate-related transitional risks. Each scenario assumes a different set of policy changes, as well as market trends (demand), energy efficiencies and technology advancements. Subject matter experts from National Fuel worked with ERM to evaluate the implications of decarbonization pathways consistent with the carbon constrained SDS from the World Energy Outlook 2021.

IEA Estimated Global Median Surface Temperature Rise (World Energy Outlook 2021)



IEA Scenario Assumptions (World Energy Outlook 2021)

Stated Policies (STEPS)						
	2020	2030	2035	2040	2045	2050
IEA crude oil ($/barrel)	44	77	82	85	87	88
US Natural gas ($/MMBtu)	2.0	3.6	3.7	3.8	3.9	4.3
North America natural gas production (Tcf)	41.1	46.1	45.6	44.7	43.0	41.9
Sustainable Development (SDS)						
IEA crude oil ($/barrel)	44	56	54	53	51	50.0
US Natural gas ($/MMBtu)	2.0	1.9	2.0	2.0	2.0	2.0
North America natural gas production (Tcf)	41.1	35.5	25.9	20.7	17.0	15.3

The SDS is a low-carbon scenario, consistent with limiting the average global temperature increase well below 2°C from pre-industrial levels. Many companies rely on the SDS scenario for climate risk assessment because it charts an ambitious transition to a low-carbon energy system, consistent with the goals of the Paris Climate Agreement. In the IEA SDS demand-constrained scenario, steep declines in oil and natural gas demand combined with a large increase in renewable energy production put downward pressure on oil and natural gas prices. The trajectory for emissions in the SDS scenario is consistent with reaching global net zero CO2 emissions in 2070. Under the SDS scenario, natural gas prices in the U.S. are projected to be around $2/MMBtu from 2030 to 2050.

Importantly, the assumptions above are those of the IEA, and are not depictions of the Company's expectations and forecasts as to natural gas demand and pricing over the respective time periods considered, nor the expected profitability or cash flow generation potential of our business over the long-term. For example, it is difficult to reconcile the IEA's use of a $2.00 MMBtu long-term natural gas price assumption (well below current pricing levels and the longer-term natural gas strip) under the SDS, particularly when considering the critical function that pricing serves in incentivizing producers, including those in key production basins such as Appalachia, to continue to deploy capital to meet demand. The Company expects that there will be a long-term need for natural gas, particularly in cold weather regions such as the Northeastern United States, due to its reliability and affordability, and that Appalachian natural gas production, which has a much lower carbon intensity than other basins within North America, will remain a fuel of choice for consumers. We also expect that natural gas will play a long-term, critical role complementing the expansion of renewable energy – providing a readily dispatchable and reliable fuel source during periods where renewables are unable to meet increased energy demand or are otherwise unavailable.

Exploration & Production and Gathering Analysis

To test the resiliency of the Company's upstream and gathering business, our analysis relied on IEA's STEPS as a base case scenario and the IEA SDS as an alternative carbon-constrained future scenario. The analysis applied key outputs from the 2021 IEA scenarios, including natural gas prices and production trends. The SDS is an aggressive demand-constrained scenario. In the SDS, natural gas prices in the U.S. are consistently projected at approximately $2/MMBtu through 2050, while natural gas production in North America declines by more than 60 percent by 2050 from 2020 levels.

As part of this analysis, National Fuel assumed that its production and gathering volumes would increase (or in the case of the SDS scenario, decrease) at the rate in the respective IEA scenarios. National Fuel then assumed ongoing activity levels that generate production of natural gas and crude oil that match the production levels in both scenarios. These levels of activity were also used to estimate capital and operating expenditures, and the pricing assumptions for each of the scenarios were applied to estimate future revenue and cash flows. Given our significant historical investment in building out extensive gathering infrastructure, our relatively low-decline natural gas wells currently producing, along with our large prospective inventory of economic drilling inventory, the Company's upstream and gathering businesses were meaningfully cash flow positive in both the reference case and demand-constrained scenario through 2050.

Exploration & Production and Gathering: Key Conclusions

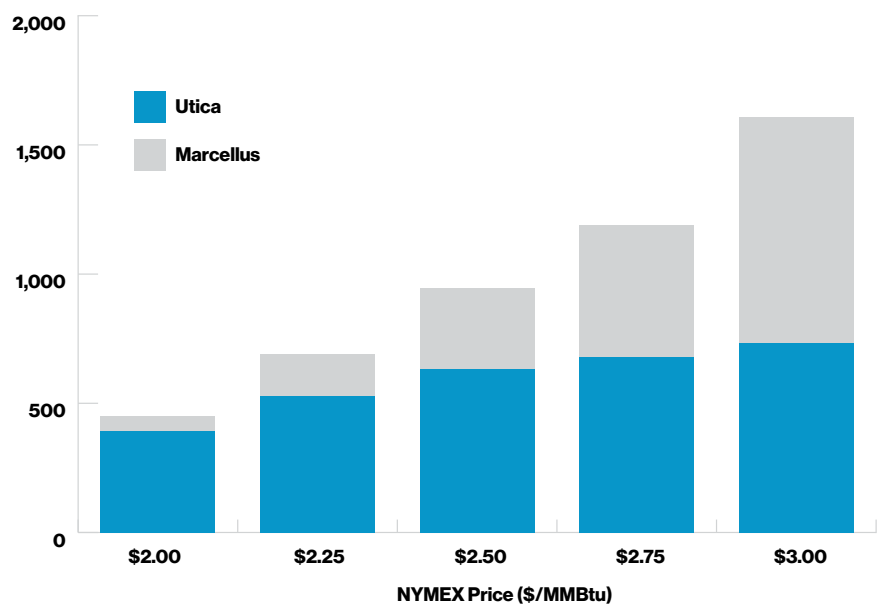
Our scenario analysis gives us confidence in our portfolio's resilience, with our Exploration & Production and Gathering businesses projected to generate meaningful free cash flow through 2050 under both the SDS and STEPS scenarios. With respect to SDS, the underlying assumptions of decreased natural gas production and long-term decreased pricing are expected to drive reduced revenues; however, these reductions are projected to be largely offset by lower capital expenditures and operating expenditures, resulting in our Exploration & Production and Gathering businesses remaining in a free cash flow position. With respect to lower capital, this is largely a function of natural gas wells having a declining production profile over time, which requires limited future investment to follow the demand curve assumed under the SDS.

Our carbon-constrained analysis, aligned with the IEA's SDS scenario, assumed a proportional decline in natural gas production across the entire North American region. Stated differently, we did not assume any differences between natural gas demand and related production within different regions of the United States, as this data is not available from the IEA. This simplifying assumption is likely to overstate the production decline (and potential financial impacts) for a region like Appalachia, which has a relatively low carbon intensity rate (GHG emissions per unit of gas production) and relatively low operating and finding and development costs. Also, due to its close proximity to significant natural gas markets such as the Northeast U.S., Midwest, and Eastern Canada, the Appalachian production basin is well-positioned to serve a large cold weather climate that may be harder to electrify in the long-term. Collectively, these factors are expected to mitigate the potential national-level production impacts assumed in the SDS scenario.

National Fuel has significant drilling inventory that is economic even at the $2.00/MMBtu long-term price assumed in the SDS scenario, with approximately 450 development locations with expected combined Exploration & Production and Gathering returns in excess of 20% at this NYMEX price.[1] In reviewing the SDS scenario and the underlying production necessary to match the assumed production curve in the scenario, we estimated that we would need to drill between 300 and 400 new wells through 2050. As such, we expect our existing asset base will provide the Company with more than sufficient economic inventory under the SDS.

Economic Drilling Locations

Development Locations at 20% IRR

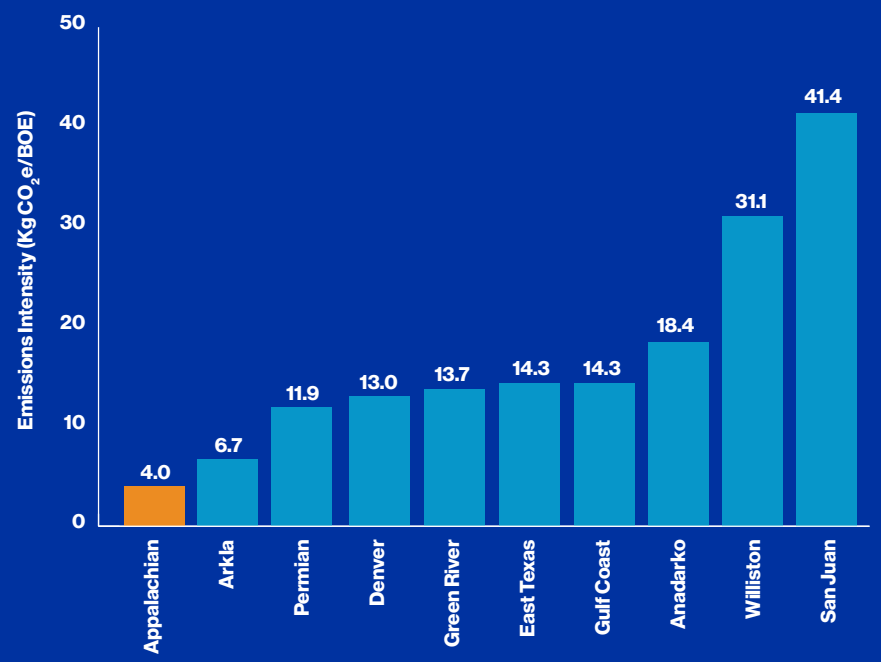


1 Combined Exploration & Production and Gathering segment expected internal rate of return is pre-tax and includes expected gathering capital expenditures, well costs under current cost structure, and non-gathering Lease Operating Expense.

Emissions Intensity of Appalachia vs. Other Basins

The Appalachia Basin has a low greenhouse gas emissions intensity when compared to other United States production basins. Based on publicly reported data, the Appalachian Basin had an average greenhouse gas emissions intensity of 4.04 kilograms of CO_2e per barrel of oil equivalent (BOE) in 2019, making it the lowest among the top 10 largest production basins in the U.S.

Emissions Intensity of Top 10 U.S. Production Basins[2]



2 Benchmarking Methane and Other GHG Emissions of Oil and Natural Gas Production in the United States, June 2021. Available at: https://www.sustainability.com/thinking/benchmarking-methane-ghg-emissions-oil-natural-gas-us

With respect to STEPS, our reference case scenario, which in 2050 assumes natural gas prices in excess of $3.00 per MMBtu and natural gas production in line with current levels, we would expect our Exploration & Production and Gathering businesses to remain highly profitable, continuing to focus on the integrated development of our large inventory of highly economic Appalachian natural gas drilling locations.

Moreover, under either scenario, relative to the vast majority of our natural gas-producing peers, we believe National Fuel is positioned to succeed over the long-term, based on its inventory depth of highly economic drilling locations, ability to develop low-cost and low-emissions intensity natural gas reserves, and its proximity and access to significant demand centers.

Pipeline & Storage Analysis

Similar to our Exploration & Production and Gathering segments, our analysis of the Company's Pipeline & Storage segment utilized the underlying SDS and STEPS assumptions for natural gas production, applying the corresponding increase (or in the case of the SDS, decrease) in expected determinants (total volumes transported) for our transmission and storage assets. The Company also used these assumptions to project capital spending profiles and operating costs for each scenario. In line with the current federal regulatory framework, revenues were projected to equal the cost of service for the Company to continue to safely and reliably operate its assets, assuming our continued ability to fully recover these costs in future rate proceedings. Similar to the approach outlined for our Exploration & Production and Gathering segments, our analysis did not account for potential regional differences in overall transmission and storage asset utilization as the energy transition progresses, which could provide a significant advantage to the Company's assets based on their proximity to low-cost, low-emissions intensity natural gas production, and interconnections with local distribution companies and other interstate pipelines that serve cold-weather areas within the northeast U.S and Canada.

Pipeline & Storage: Key Conclusions

Assuming the federal regulatory ratemaking framework does not materially change, allowing the Company to recover its cost of service, our Pipeline & Storage business is projected to be substantially free cash flow positive in both the production-constrained (SDS) and business-as-usual (STEPS) scenarios. Given the nature of these assets, while there are no significant differences in terms of the projected net cash flows between the two scenarios, there is inherently more risk to these cash flows under the SDS scenario due to a significant assumed reduction in determinants, increasing the burden on remaining customers that will likely be required to maintain base load capacity to meet reliability requirements. To the extent that discounting of rates became necessary to maintain customers on our system due to rate pressures created by this reduced throughput, we still project our Pipeline & Storage business to generate free cash flow. Moreover, our analysis did not assume any potential incremental revenue related to the transportation or storage of low-carbon fuels, including RNG and hydrogen, or the potential conversion of our significant storage assets to CO2 reservoirs, which may provide additional opportunity sets for the Company to leverage its significant existing facilities as utilization and production of these lower emissions intensity fuels expand over time.

Utility Analysis

Our Downstream analysis focused on the financial implications of the SDS scenario on our natural gas utility operations and customers in New York and Pennsylvania. Since the IEA scenarios do not provide detailed regional breakdowns of key outputs, including natural gas demand, our analysis focused on aligning 2050 emissions in our operating jurisdictions with the U.S. emissions reduction in the SDS scenario (i.e., approximately 90 percent from current levels by 2050). We focused on three decarbonization pathways that would achieve these emission reduction goals. Both the risks and the opportunities of these decarbonization paths centered around reducing end-use customer emissions. Each of the three scenarios relied on a different mix of interventions (technologies and fuels) to achieve the prescribed emissions outcomes. These scenarios were: (1) high electrification, (2) mix of electrification and alternative fuels, and (3) high alternative fuels.

Scenario	Description
High Electrification	All residential and commercial customers convert heating and other natural gas usage to electric appliances by 2050.
Fuels & Electrification	Electrification of natural gas usage for residential and commercial customers takes a hybrid (dual-fuel) path in which gas-fired heating serves the coldest temperatures and electric heating serves the balance of the heating season. Lower rates of full customer migration, with higher levels of zero-carbon fuels and greater gas demand.
High Fuels	No electrification but very high levels of fuels, including hydrogen or methanated hydrogen.

Utility Analysis: Key Conclusions

As the IEA World Energy Outlook highlights, there is a "robust long-term case for gases in the energy system." There are services that would be both difficult and costly to provide using other sources of energy, including high temperature heat for industry, winter heat for buildings (critical for our service territory) and flexibility for power systems. Existing gas infrastructure is also a valuable asset that could be repurposed over time to deliver renewable natural gas or green hydrogen. Maintaining gas infrastructure alongside an electricity system also adds an important layer of resilience to the energy delivery system, and likely avoids the buildout of significant electric infrastructure, the costs of which are expected to be borne by customers. The path taken will depend significantly on the decisions of policymakers and utility regulators, as well as future technology advances.

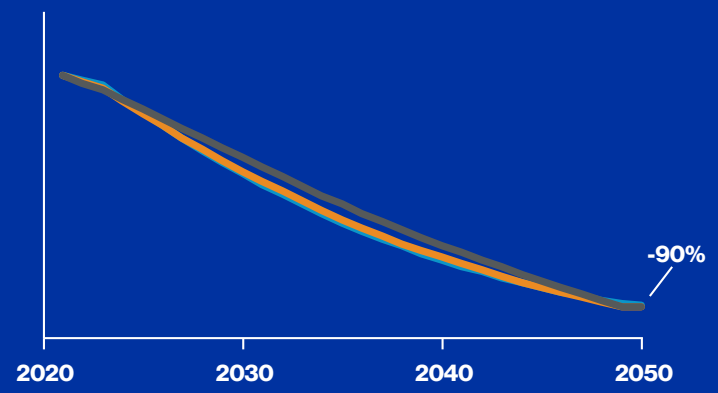
The scenarios chart a wide range of outcomes while still achieving a path currently understood as well-below 2°C. Fossil gas-related emissions decline in each scenario by nearly 90% from 2020 levels. Throughput also declines in each of the scenarios, with the High Electrification scenario experiencing the most significant decrease, as demand migrates to electrified uses.

The High Fuels scenario experiences the least amount of throughput decline as low- and zero-carbon fuels constitute the primary decarbonization strategy. The Fuels and Electrification scenario has a throughput trajectory that lies between that of the two more extreme scenarios. With regard to customers, both the High Fuels and the Fuels and Electrification scenarios chart a path that substantially retains the customer base—and even allows that customer base to increase at current rates of growth—while still achieving emissions reductions consistent with the IEA SDS scenario.

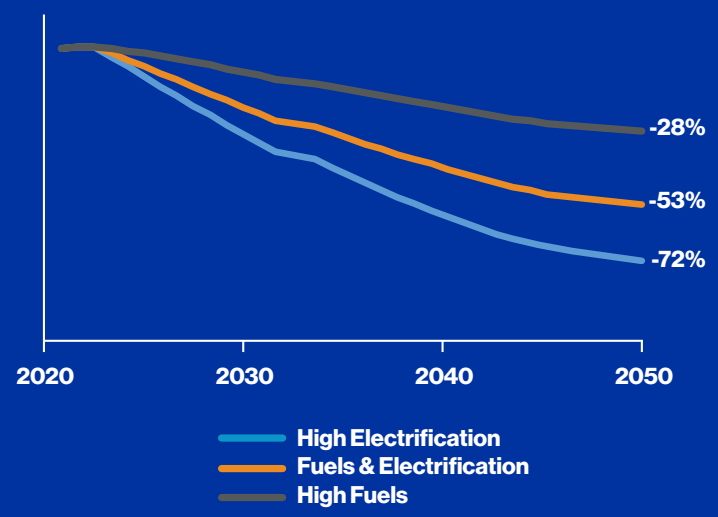
In the Fuels and Electrification scenario, despite the retention of residential and many commercial customers, annual demand per customer is reduced relative to the base case; however, that demand serves a critical role in the coldest of heating season temperatures. In the High Electrification scenario, the decline in gas customers is significant, as only hard-to-electrify customers would be retained by 2050.

The mix of gases in each scenario also ranges widely across the scenarios. In the High Fuels scenario, well over 80% of the delivered fuels are low- and zero-carbon fuels (renewable natural gas and hydrogen). By comparison, in the High Electrification scenario, in which throughput overall is assumed to be significantly decreased, just over 50% of delivered fuels are low- or zero-carbon. In the Fuels and Electrification scenario the share of low- and zero-carbon fuels lies roughly between the other two scenarios.

Representative Downstream Emissions by Scenario



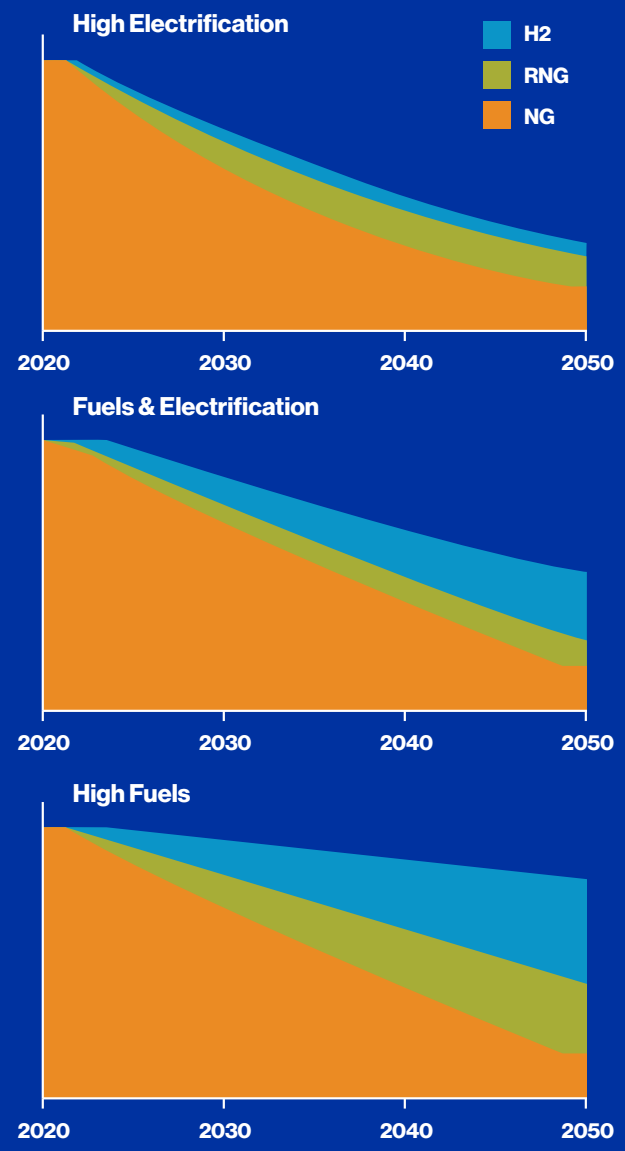
Representative Downstream Throughput by Scenario



While the various SDS scenarios result in a range of customer and throughput outcomes, any path from the present to 2050 will require a safe and reliable distribution system for the customers it serves, even as customers and their demand may be changing. For this reason, and consistent with current regulatory policy, each scenario assumed an ongoing ability to recover, and earn a reasonable return on, existing and future capital investments in the utility system and operating expenses necessary to continue to provide safe and reliable service to customers within our operating jurisdictions. Depending on how the future unfolds, the mechanisms for recovering those costs and the structure of rates may change, particularly in a path that might proceed in a manner similar to that of the High Electrification scenario. For example, due to regulatory or policy-driven pressure, gas utilities may consider increasing their depreciation rates to recover investments in plant over a shorter period of time, leading to customer bill increases and an accelerated reduction in rate base.

The Downstream analysis highlights the challenges of the High Electrification scenario. A transition to full electrification could leave progressively fewer customers to bear the costs of running a safe and reliable system. The significant impact of such a path would likely fall to customers who are least able to afford the range of costs associated with electrification. A different set of cost and feasibility issues are associated with the High Fuels scenario, which could require significant investment in new infrastructure to support the production and transport of substantial volumes of low and zero-carbon fuels. Moreover, the High Fuels scenario assumes the feasibility of including very high percentages of RNG and hydrogen in the energy delivery system. Such high percentages of alternative fuels may present technical or resource availability concerns as well as presenting regulatory challenges, as policy makers may prohibit the use of low-carbon gases. Between those two more extreme paths is the hybrid Fuels and Electrification scenario, which is substantially aligned with the Selective Electrification scenario detailed in the Guidehouse Study noted above. This hybrid approach moderates the most significant of the potential cost and feasibility impacts associated with

Representative Fuel Mix by Scenario



the more extreme scenarios while importantly preserving the energy resiliency provided by the natural gas delivery system.

Overall, analysis of these three SDS-aligned decarbonization paths, affirms the Company's strategy, which focuses on the development of an "all-of-the-above" carbon-reduction approach that preserves essential energy delivery reliability and resilience for consumers. This includes a continuing focus on energy efficiency, embracing a broad range of energy-agnostic technologies and solutions, and the inclusion of low-carbon options like RNG, hydrogen, and hybrid-heating systems. Moreover, the analysis demonstrates the importance of adopting an emission reduction pathway that provides both environmental and economic sustainability, while providing delivery system resiliency, integrity and reliability, and offering options for more affordable carbon reduction measures.

Climate Physical Risk Analysis

The Company has also undertaken a review of future physical risks from climate driven hazards across Upstream, Midstream, and Downstream assets in its portfolio.

Specifically, these risks were evaluated using climate change projections assuming various global warming scenarios. Climate change projections generated from global climate models (GCMs) were used to estimate how climate hazards and climate extremes may fluctuate in the future and pose risk to assets and operations. GCMs are global datasets that model climate conditions of the entire earth out into the future. Specifically, they are multi-dimensional gridded future projections of the world that estimate daily information about temperature, precipitation, and other climate indices for various levels of the atmosphere. For this physical risk climate assessment, the Company used the most recent GCM, the Coupled Model Intercomparison Project Version 6 (CMIP6), which consists of 100 distinct climate models produced by 49 different modeling groups. For the purposes of this analysis, the Company used the ensemble average of the top 5 representative climate models.

The severity and frequency of climate driven hazards may vary in the future depending on how society reacts to those potential changing conditions. GCMs, like CMIP6, include "scenarios" which represent different climate projections based on the ways society could react to climate change. These scenarios take into account both the societal drivers of human interface with climate change, known as the Shared Social Pathways (SSPs), as well as the potential amount of greenhouse gas concentrations, known as Representative Concentration Pathways (RCPs). The TCFD recommends using multiple scenarios when conducting physical risk assessments to evaluate the range of possible risks that a company could experience. The Company conducted a physical risk assessment with two climate scenarios from CMIP6, in alignment with TCFD recommendations:

1. **SSP3-RCP7.0: Business-as-usual scenario.** Society follows a regional rivalry trend with competition among regions, low technological advancement, and high challenges to both adaptations and mitigations. Global temperatures are held below 4 ˚C by 2100.

2. **SSP1-RCP2.6: Optimistic and attainable scenario.** The world follows a sustainable path with low challenges to mitigations or adaptations. Global temperatures are held below 2 ˚C by 2100.

The Company stress tested a representative sample of its critical assets to evaluate its exposure to climate physical risk by analyzing the 4-degree Celsius scenario. In addition, the 2-degree Celsius scenario is used to evaluate the range of possible climate exposures.

Climate Hazards

Acute	Chronic
• Flooding • Landslides • Hurricanes • Wildfires	• Extreme Heat • Extreme Cold • Water Stress & Drought

To further understand the mid- and long-term physical risks, the Company reviewed the 30-year average risks under both scenarios at two-time horizons: 2030 and 2050. Both acute hazards (hurricanes, riverine flooding, coastal flooding, wildfires, landslides, extreme rainfall) and chronic hazards (water stress, extreme heat, and extreme cold) were evaluated under each scenario and at each time horizon. The analysis drew on the most recent climate projections available for each climate hazard to create modeled outcomes based on publicly available datasets.

Asset vulnerability to each type of hazard was also a critical metric considered during the physical risk assessment. Climate hazards derived from the projections were combined with vulnerabilities associated with each of the Company's asset classes to generate a normalized climate physical risk score for 2030 and 2050 under each scenario. These physical risks were compared against each assets criticality to business operations to understand potential impact on the Company.

In accordance with TCFD recommendations, the analysis calculated the indicative financial risks due to direct damage or business interruptions from future climate driven hazards. These financial risks were derived based on the physical risk calculated from asset exposure and hazard intensity/frequency. Limitations of this analysis include variability, accuracy, and uncertainties inherent in the climate projections and relating those projections to potential impacts on the Company's assets and operations.

Physical Risk Approach

	Phase 1: Hazard Screening →	Phase 2: Asset Exposure →	Phase 3: Financial Risk
Objective	Calculate future change in climate hazards across representative assets	Determine climate-related risk for each asset	Calculate future financial risk from climate events for selected assets
Main Activities & Outcomes	• Screen hazard changes from baseline conditions to 2030 & 2050 under two scenarios • Account for both acute and chronic climate hazards	• Determine asset class vulnerability to each hazard • Climate hazards are adjusted by exposure scores to calculate climate risk	• Indicative financial impact from climate hazards due to impact on facilities or operational interruption • Provide estimates of potential damages, losses, and business interruption from climate hazards

Summary of Climate Physical Financial Risks

Chronic and acute hazards projected under the 4-degree Celsius warming scenario (SSP3-RCP7.0) to 2030 and 2050 across the Company's region of operation are not expected to have significant financial impact from physical damage to assets or disruptions to operations. Overall, the magnitude of direct financial damages to assets represents significantly less than one percent of the average facility value annually and only 1 day or less of annual business interruption per facility in 2050 under the 4-degree warming scenario (SSP3-RCP7.0).

Acute hazards such as landslides and wildfires represent the greatest financial risk to the Company's facilities and operations as they may worsen in the wooded, mountainous areas of the East Coast. However, these impacts are not expected to be significant. While wildfires are not frequently observed in the East Coast region where the Company operates, fire weather conditions may modestly worsen to become a more relevant risk in 2030 and 2050 under either the 4-degree or 2-degree warming scenarios. While wildfires and landslides may not directly damage the Company's facilities, they may still result in damages to surrounding infrastructure resulting in temporary business interruptions. Other acute hazards such as hurricanes and flooding are not expected to have a significant financial impact on the Company's assets or operations. The Company has a relatively low financial risk from acute climate hazards, primarily driven by its region of operations and its protection from acute hazards (such as hurricanes and flooding) which typically pose significant risk to oil and gas operations.

Extreme heat is a chronic hazard that may result in financial risk to the Company. Again, however, these impacts are not expected to be significant. Projected average and extreme temperatures are expected to increase across both the Company's East and West Coast asset locations in 2030 and 2050, which may temporarily exceed operational limits, resulting in business interruptions. These interruptions are projected to be very modest (1 day or less per asset per year). Alternatively, extreme cold, particularly across the East Coast, is anticipated to decrease and may result in fewer business interruptions. The Company's assets are designed to withstand extreme cold and therefore have relatively low financial risk from the remaining extreme cold conditions in the future. While water stress is currently high for the Company's West Coast assets and is projected to worsen under the 4-degree warming scenario, it is not likely to result in significant financial risk to the Company's operations due to low water requirements for operations.

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Overall, the Company has limited exposure to climate financial risk from chronic and acute hazards in 2030 or 2050 under either the 4-degree or 2-degree warming scenarios. In addition, this analysis only covered representative above ground assets that were determined to be the most critical or vulnerable to climate driven hazards. The Company's below ground assets (pipeline facilities) are likely less vulnerable than the assets included within this assessment.

Key Physical Risk Conclusions

Our climate physical risk scenario analysis under both the 4-degree (SSP3-RCP7.0) and 2-degree (SSP1-RCP2.6) warming scenarios indicate that there is relatively low financial risk from both chronic and acute hazards in 2030 and 2050 to facilities or operations. Despite potential changes in hazards such as wildfires, landslides, and extreme heat, current projections indicate that the Company is likely to experience minimal disruptions or damages as a result of climate related hazards. Overall, the geographic location of the Company's assets and the design of its facilities to withstand severe weather are key factors in this conclusion. As we look ahead, we expect that our weather-hardened infrastructure will serve an essential role in addressing reliability and energy delivery certainty challenges, particularly during severe climate events.

RISK MANAGEMENT

National Fuel Gas Company has a long-standing risk management process to manage potential risks to our business, including potential risks related to climate change. The Company's Board of Directors retains oversight of Enterprise Risk Management (ERM), including areas central to corporate responsibility and climate-related risks. An important aspect of the Board's oversight role is the ERM process, which is managed internally by an ERM Team, led by the Company's General Counsel. The ERM Team works with senior management to facilitate the identification and monitoring of foundational risks, and the assessment, management and monitoring of critical risks and potentially emerging risks within the major categories of strategic, financial, operational, safety and regulatory risks. Foundational risks are the key risks that the Company constantly monitors and mitigates. As a result, these risks are not assessed as either critical or potentially emerging. Within these major risk categories, the Company also identifies physical and transitional risks and their potential financial impact under the TCFD sub-categories. For this purpose, the Senior Management Team consists of the following:

- President and Chief Executive Officer
- Chief Operating Officer
- Presidents of the Company's primary subsidiaries
- Principal Financial Officer
- Principal Accounting Officer
- Chief Information Officer
- General Counsel

To identify foundational, critical and potentially emerging risks, each member of the senior management team meets with business unit leaders, business segment officers and department heads in their individual subsidiaries or functional areas of responsibility, to identify and provide an initial assessment for segment specific and functional area specific risks. The senior management team then discusses the identified risks and develops a list of the most material risks, both on a consolidated basis and by segment. Critical and potentially emerging risks are rated within an ERM matrix according to the following criteria:

- **Likelihood:** Measures how likely a risk will occur within the risk assessment period with current controls and mitigation measures in place.
- **Severity:** Measures how significant the risk impact is to the Company (primarily considers financial impact, impact to stock price, and reputational risk).

Based on this analysis, the senior management team assesses the significance of the identified risks to the Company. Risks are categorized as either critical or potentially emerging based on their position within the ERM matrix (based on likelihood of occurrence and severity of impact). Each identified risk is assessed on a 1-year, 5-year and 20-year basis.

- **Critical Risks:** Any identified risks assessed with a high severity in the 1-year or 5-year assessment regardless of likelihood, or any risks that have a sustained high likelihood of occurrence in the 1-year and 5-year assessments regardless of severity.
- **Potentially Emerging Risks:** Any risks with a low severity and likelihood in the 1-year and five-year assessments, or any risks that have a sustained low severity in the 1-year and 5-year assessments, but a high likelihood of occurrence in the five-year assessment.

In addition, the Board of Directors identifies foundational risks that are overarching risks that the Company regularly monitors and works to mitigate. Each identified critical risk feeds into one of these foundational risks. For those identified as critical risks, a more detailed narrative of the risk, outstanding items of interest taken into consideration when assessing that risk, and the current mitigation measures for that risk are provided.

On a periodic basis, the senior management team reviews the foundational, critical and potentially emerging risks and decides, based on individual discussions with the segment or functional area business leaders, whether any revisions or additions are warranted and whether there are any changes to the individual risk assessments. A member of the ERM team presents this reviewed document to the Board of Directors during Audit Committee meetings, and Directors provide input on risk identification and assessment. Additionally, management provides a detailed presentation on a topic related to one or more risks at each regularly scheduled Board meeting. Additional review or reporting on these enterprise risks is conducted as needed or as the Board requests.

METRICS & TARGETS

Our Emissions Reduction Targets

Exploration & Production

40% reduction in methane intensity by 2030

Pipeline & Storage

50% reduction in methane intensity by 2030

Gathering

30% reduction in methane intensity by 2030

Utility

30% reduction in methane intensity by 2030

75% reduction in delivery system GHG emissions by 2030 (1990 baseline)

90% reduction in delivery system GHG emissions by 2050 (1990 baseline)

Consolidated Company

25% reduction in total GHG emissions by 2030

National Fuel is committed to transparency by reporting on its key metrics and targets. In the sections that follow, we summarize our (1) emission reduction targets, (2) Scope 1 and Scope 2 greenhouse gas emissions, and (3) other key metrics.

Targets

National Fuel has established a corporate-level greenhouse gas reduction target as well as segment-level methane intensity targets. At the corporate level, the Company's goal is to reduce greenhouse gas emissions 25% by 2030 (from a 2020 baseline). These emission reduction targets are designed to mitigate the climate-related risks described in the Strategy section of this report, in particular the risk of future regulation. Reducing methane emissions across the Company's energy value chain reduces the capital and operating costs associated with potential new regulatory requirements aimed at reducing methane emissions for new and existing facilities.

National Fuel's Utility segment has reduced its EPA subpart W emissions by more than 60% to date. Our other targets are based on a calendar year 2020 baseline. We will report on our progress in future sustainability reports, as more time elapses

Greenhouse Gas Emissions

National Fuel's Scope 1 GHG emissions represent the direct emissions from our operations. They include, for example, emissions from fuel combustion in compressor engines along our pipelines, emissions from our natural gas production, gathering, transportation, storage, and distribution facilities.

Scope 2 GHG emissions are the indirect emissions from the off-site generation of electricity, which the Company consumes to run its equipment.

Scope 3 GHG emissions are the upstream and downstream emissions from our business operations that are not covered by Scope 1 and Scope 2. For example, Scope 3 emissions include the GHG emissions from employee travel and customer natural gas use. National Fuel is currently evaluating Scope 3 emissions disclosure; however, the Company does not currently disclose these emissions.

Greenhouse Gas Emissions Summary

Scope 1 Greenhouse Gas Emissions (Metrics Tons CO_2e)[1,2]	2019	2020
Utility	374,843	365,766
Pipeline and Storage	522,229	519,595
Gathering	468,438	495,994
Exploration & Production	601,419	587,491
Total	**1,966,929**	**1,968,846**
Scope 2 Greenhouse Gas Emissions (Metrics Tons CO_2e)[2]	[3]	**2020**
Utility		2,299
Pipeline and Storage		4,867
Gathering		618
Exploration & Production		11,907
Total		**19,691**
Scope 1 Methane Emissions (Metrics Tons CH_4 as CO_2e)[1,2]	**2019**	**2020**
Utility	364,728	355,633
Pipeline and Storage	295,146	259,609
Gathering	165,806	140,298
Exploration & Production	161,953	163,955
Total	**987,633**	**919,495**

Additional detail on the Company's GHG emissions are provided in our 2020 Corporate Responsibility Report.

Metrics

In addition to tracking its emissions performance and trends, National Fuel also tracks other key metrics, which are directly aligned with the risks and opportunities discussed in the Strategy section above.

1 For sources defined by the US EPA's GHGRP (40 CFR Part 98), Scope 1 emissions were estimated using GHGRP methods and/or emission factors. For sources not included in the GHGRP, estimates align with the NGSI methodology. Fleet and building emissions estimates are from other established methods
2 Metric Tons CO_2e Values and Metric Tons CH_4 as CO_2e Values have been calculated based on those values in accordance with the published 100-year time horizon global warming potential (GWP) values from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5)
3 Scope 2 emissions were reported starting in calendar 2020.

As detailed above, National Fuel's Utility segment has been implementing an ambitious program to accelerate the modernization of its pipeline system. With more than 14,500 miles of pipeline, this is a complex undertaking, requiring substantial investment. Over the past 5 years, our Utility business has replaced approximately 750 miles of older vintage pipeline mains, as well as accompanying service lines, across its distribution system. In Pennsylvania, the Company has eliminated and replaced all cast iron pipelines. As a result of these efforts, the Company has seen a significant reduction in the number of leaks reported annually.

National Fuel's Midstream businesses have also been investing in modern technology to reduce emissions and improve safety, including replacement of aging transmission pipelines and modernization of compression facilities to employ best available technologies. Examples of these technologies include upgrading and modernizing equipment at its existing facilities, including repair and replacement programs for isolation and vent valves, the replacement of compressor venting equipment, the installation of vented natural gas capture systems, and the replacement of natural gas actuating devices.

National Fuel is also evaluating options that can improve combustion efficiency at our existing facilities. In addition, we are assessing the feasibility of various low-carbon project initiatives. Additionally, federal and state pipeline safety codes require that pipeline operators comply with extensive requirements for material quality, design, construction, testing, inspection, and operations and maintenance for all facilities. National Fuel meets or exceeds the requirements of all state and federal laws and regulations applicable to the construction and operation of our natural gas infrastructure.

For additional information on the significant emissions reduction efforts underway for our Exploration & Production business, please see *Emissions Mitigation and Reduction Strategies*.

Correlation to TCFD Recommendations

National Fuel recognizes that climate change is a growing area of interest for the investment community, among other stakeholders. The table below maps the climate disclosure recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures to the locations where the relevant information can be found in this report. Further information on these topics can be found in National Fuel's Corporate Responsibility report.

TCFD recommendation	Disclosure	Page(s)
Governance		
Disclose the organization's governance around potential climate-related risks and opportunities.	(a) Describe the organization's governance around potential climate-related risks and opportunities.	14
	(b) Describe management's role in assessing and managing potential climate-related risks and opportunities.	15
Strategy		
Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's business, strategy, and financial planning where such information is material .	(a) Describe the potential climate-related risks and opportunities the organization has identified over the short, medium,and long terms.	17
	(b) Describe the impact of potential climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	18-25
	(c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2° C or lower scenario.	26-36
Risk management		
Disclose how the organization identifies, assesses, and manages potential climate-related risks.	(a) Describe the organization's processes for identifying and assessing potential climate-related risks.	38
	(b) Describe the organization's processes for managing potential climate-related risks.	38
	(c) Describe how processes for identifying, assessing, and managing potential climate-related risks are integrated into the organization's overall risk management.	39
Metrics and targets		
Disclose the metrics and targets used to assess and manage potential climate-related risks and opportunities where such information is material.	(a) Disclose the metrics used by the organization to assess potential climate-related risks and opportunities in line with its strategy and risk management process.	41-43
	(b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 GHG emissions estimates and the potential related risks.	43
	(c) Describe the targets used by the organization to manage potential climate-related risks and opportunities and performance against targets.	41-42

Cautionary Note on Climate Reporting and Forward-Looking Statements

All information included in this report is being provided on a voluntary basis, and as such, the Company has included and excluded certain topics to customize the sustainability template to our specific circumstances. The decision to include data for historical and future years is at the discretion of the Company and its subsidiaries, and the specific years used as a historical baseline were chosen as appropriate for each reporting segment. The ESG and climate data included in this report does not constitute financial data calculated in accordance with generally accepted accounting principles ("GAAP"). This report also contains "forward-looking statements" as defined by the Private Securities Litigation Reform Act of 1995. Forward-looking statements are all statements other than statements of historical fact, as well as statements that are identified by the use of the words "anticipates," "estimates," "expects," "forecasts," "intends," "plans," "predicts," "projects," "believes," "seeks," "will," "may" and similar expressions. This report and the statements contained herein are submitted for the general information of Company stakeholders and are not intended to induce any sale or purchase of securities or to be used in connection therewith. While the Company's expectations, beliefs and projections are expressed in good faith and are believed to have a reasonable basis, actual results may differ materially from those projected in forward-looking statements. Furthermore, each forward-looking statement speaks only as of the date on which it is made. In addition to other factors, the following are important factors that could cause actual results to differ materially from those discussed in the forward-looking statements: (1) the Company's ability to estimate accurately the time and resources necessary to meet the reporting and testing standards applicable to the additional measures we expect to include in future reports; (2) the Company's ability to estimate accurately the time and resources necessary to meet emissions targets, (3) disallowance by applicable regulatory bodies of appropriate rate recovery for system modernization, (4) governmental/regulatory actions and/or market pressures to reduce or eliminate reliance on natural gas, and (5) the other risks and uncertainties described in (i) the Company's most recent Annual Report on Form 10-K at Item 7, MD&A, and Quarterly Reports on Form 10-Q at Item 2, MD&A, under the heading "Safe Harbor for Forward-Looking Statements," and (ii) the "Risk Factors" included in the Company's most recent Annual Report on Form 10-K at Item 1A, as updated by the Company's Forms 10-Q for subsequent quarters at Item 1A. The Company disclaims any obligation to update any forward-looking statements to reflect events or circumstances after the date hereof. Because of these risks and uncertainties, readers should not place undue reliance on these forward-looking statements or use them for anything other than their intended purpose. This report contains references to National Fuel's website and other reporting documents. National Fuel is not incorporating this report by reference into any other document and is not incorporating any other document posted on the website into this report. Except where specified, this report and the data presented have not been externally audited, assured, attested or verified. The Company makes no warranty, express or implied, regarding the accuracy, adequacy, completeness, legality, reliability or usefulness of this report.

National Fuel

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