

Answering the Call for Affordable, Reliable, Lower Carbon Energy

2021 CLIMATE-RELATED ANALYSIS

CHESAPEAKE
ENERGY

Affordable, Reliable, Lower Carbon Energy

Energy is one of the most fundamental drivers of modern society. Yet in 2021, 770 million people worldwide had no access to electricity, according to the International Energy Agency.

To adequately power our planet in the years ahead, we'll need to significantly increase energy supply, while also responding to the growing risks of climate change. Concerns about GHG emissions and abiding by the framework of the Paris Agreement — which seeks to keep the increase in global temperatures below 2 degrees Celsius above pre-industrial levels — will continue to encourage global energy change.

Chesapeake supports the ambitions of the Paris Agreement, recognizing that we have an important role to play in addressing climate change risks, while providing affordable, reliable energy to all.

Natural gas' readiness to meet global energy needs and its record as the cleanest-burning fossil fuel make it a key part of the solution for projected energy growth in a lower carbon future. Also, the U.S. natural gas industry's environmental performance continues to improve — primarily due to voluntary emissions reductions programs, a strict regulatory environment and active stakeholder involvement — further promoting the global adoption of this fuel.

In the last 30 years in the U.S.⁽¹⁾

96%

Increase in natural gas
production

17%

Decrease in U.S.
methane emissions

Replacing coal with natural gas for power generation has been a significant driver in this success, leading to a 30% decrease of GHG emissions since 2005.⁽²⁾ And, shift from coal to natural gas resulted in the U.S. reaching its 2025 emissions reduction target eight years faster than projected.⁽³⁾

Demand for domestic natural gas is expected to increase, particularly following the Biden administration's commitment to support an additional 15 billion cubic tons of liquefied natural gas (LNG) to Europe in 2022 with plans to increase this number through 2030. The U.S. natural gas market is poised to meet the majority of this demand (in both Europe and Asia) due to its lower cash costs and emissions profile, availability and transportation infrastructure.⁽⁴⁾

With a production mix weighted toward natural gas, Chesapeake is answering the call for affordable, reliable, lower carbon energy. We're proud to be a leader in meeting global demand and addressing energy poverty, while helping to reduce global GHG emissions.

“We firmly embrace a lower carbon future and believe our portfolio is uniquely positioned to help responsibly supply the energy that is needed across the globe today.” – CEO Nick Dell’Osso

(1) Jacobs, Nicole. “EPA: Oil and Natural Gas Methane Emissions Fall Despite Record Production.” *Energy In Depth*, April 19, 2021.

(2) “U.S. Power Sector Sees Impressive Carbon Emission Reductions Amid Natural Gas Growth.” *Energy In Depth*, accessed September 23, 2021.

(3) “Power Sector Carbon Index.” *Carnegie Mellon University*, accessed September 23, 2021.

(4) “Global Energy Review 2021: Natural Gas.” *IEA*, accessed September 23, 2021. Fact Sheet: “United States and European Commission Announce Task Force to Reduce Europe's Dependence on Russian Fossil Fuels.” *The White House*, March 25, 2022.



Dedicated Leadership, Strong Governance

Our climate governance includes accountability and ownership at every level, from our Board of Directors to the employees that impact our operations every day.

Board of Directors Oversight

Chesapeake's Board of Directors has ultimate oversight of our strategy, planning and engagement around climate change and its related impacts.

Our Board's Environmental and Social Governance (ESG) Committee takes active ownership in engaging with our executive team and organizational leaders to manage and mitigate climate risks. This committee meets at least quarterly to discuss climate risks and opportunities, among other ESG topics. Relevant findings, progress and issues are raised to the Board-at-large or shared with other Board committees as needed.

Board-level Climate Discussions

- Climate-risk management and mitigation
- Emissions reduction practices
- Business continuity
- Climate change regulatory positions and trade association alignment
- Goal setting and progress made
- Executive and employee compensation tied to climate-related goals
- Market sensitivity analysis

Although the Board's ESG Committee takes the lead on climate oversight, each of our Board committees has climate performance as part of its responsibilities.

Audit Committee

Reviews climate-related risk as part of the enterprise risk management (ERM) process

Nominating and Corporate Governance Committee

Reviews climate and other ESG-related experience when considering new Board directors

Compensation Committee

Incorporates climate-related goals as part of our executive and employee compensation programs

ESG Committee

Has complete oversight of our climate performance, from managing and mitigating climate risk to confirming progress toward our ESG goals

In 2021, our Board-at-large approved ambitious ESG goals, ultimately directing our company to reach net zero direct (Scope 1) GHG emissions by 2035.

Executive Management and Employee Leadership

Our CEO and executive leadership team (ELT) lead our climate performance, providing strategic direction and accountability to our business units. They also direct our climate-related planning process to address climate risks and opportunities.

Although our CEO and ELT work together to champion our climate-related efforts, their individual responsibilities help to ensure comprehensive coverage and planning related to this important issue.

CEO	ELT
Reviews forecasting and market sensitivity analysis	Oversees the ERM process assessing climate-related risk and mitigation plans and manages the Environmental team
Directs long-term, strategic planning and ensures climate is factored when considering acquisition and divestiture opportunities	Confirms progress related to emissions reduction efforts, reporting and data assurance
Confirms progress toward ESG goals	Advises on public policy engagement and trade association membership/advocacy
Participates in Board-level trade association conversations for climate and emissions reduction information sharing	Manages Internal Controls and Internal Audit teams, as well as the Director of Government & Regulatory Affairs
Reviews and approves our annual sustainability report, including our TCFD disclosures	Reviews and approves our annual sustainability report, including our TCFD disclosures

Pay-for-Performance

Emissions reduction goals and other ESG targets are central to our executive compensation program. In fact, we limit payout if critical ESG metrics, including GHG and methane intensity reductions, are not met.

We include climate-related targets as part of our employee incentive plan as well. The company must meet certain ESG metrics before employees are eligible for “above” target bonus payouts, regardless of performance in other areas of the business.

Chesapeake employees care deeply about improving our climate performance. At our business unit level, we have several departments with dedicated climate-related job responsibilities, including our Environmental, Government & Regulatory Affairs, and Compliance teams.

Core to our culture of collaboration, we also have two internal committees focused on ESG strategy and improving our climate performance.

ESG Advisory Board

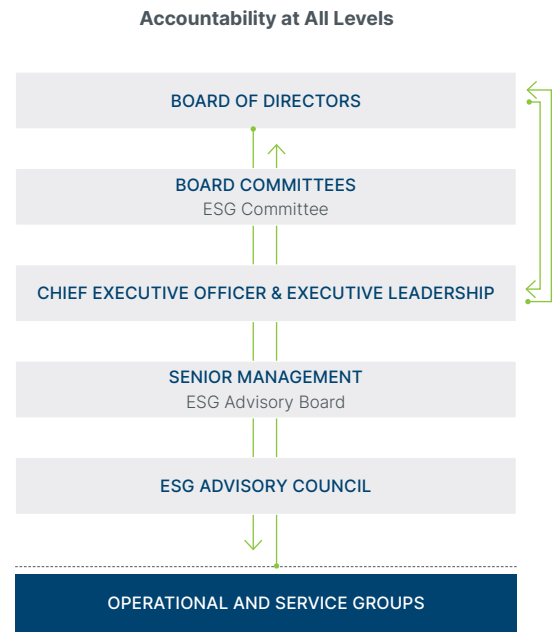
Made up of cross-disciplinary senior leaders and chaired by our Vice President of HSER, the ESG Advisory Board provides management-level leadership and oversight of the company's ESG performance.

Specific to climate, this board establishes and implements climate policy strategy, aids in decision-making regarding emissions management and adopting energy efficiency solutions, approves emissions reduction projects and helps to communicate with stakeholders.

The group meets regularly to ensure ongoing attention to monitoring, managing and reporting major ESG issues and validates the company's ESG disclosures.

ESG Advisory Council

Subject matter experts from multiple disciplines make up our ESG Council. Many of these experts are on the front lines of our ESG efforts, putting into practice the company's strategy and championing ESG initiatives and programs, including our emissions reduction efforts. The council meets regularly for consistent accountability and company integration.





Managing Climate-Related Risk

Guided by our long-standing ERM program, Chesapeake takes a methodical approach to identifying, assessing and managing ESG risks, including climate-related risks. Risk identification is the responsibility of all Chesapeake team members according to our Three Lines of Defense model, with several teams specifically tasked with recognizing and managing risks related to climate change.

Three Lines of Defense Model		
1st Line of Defense <i>Operational and service groups</i>	2nd Line of Defense <i>Internal Controls team</i>	3rd Line of Defense <i>Internal Audit team</i>
Identify and control risk at the front lines of the organization	Provides impartial enterprise risk and compliance analyses	Uses a standardized, objective process to identify risk-based audits of department and business unit controls and processes; reports directly to the Board's Audit Committee

Understanding ERM

Through ERM, internal risk owners identify, review and assess the company's risks. These risks are then linked to core ESG categories and regularly reviewed at the executive level to ensure strategy alignment and responsive risk mitigation.

The Board's Audit Committee also reviews pertinent risks and mitigation plans at least quarterly through our ERM process. This reporting allows the Board to analyze the company's material risks and direct business strategies accordingly.

Assessing Emerging Risks

On an annual basis, all leaders within the organization participate in risk surveys to review current risk drivers and identify any emerging risks. The ERM team also performs subject matter expert interviews across the organization to assure a comprehensive process for risk identification.

When identifying enterprise-wide risks, we measure severity based on four characteristics. This process helps to ensure company alignment on risk priority.

If a risk requires mitigation, we develop and execute plans to reduce the risk to an acceptable level. While risk identification and management is the focus for this process, we also consider opportunities for the organization to take advantage of as we transition to a lower carbon energy future.

Risk Measurement Characteristics

Impact	Likelihood	Velocity	Response Maturity
Expected effects	Potential for risk to occur	Speed of impact	Evaluation of controls and response plan in place to mitigate risk

Identifying Climate Risks

Through our ERM process, we have identified climate-related risks that could impact our business. TCFD separates these risks into two primary categories: transition (risks associated with transitioning to a lower carbon economy) and physical (risks specific to the physical impacts of climate change).

For the purposes of this report, we categorize climate-related risks according to the below timelines.

Defining Risk Horizons



Risk	Impact	Potential Timing	Mitigation Strategies
Policy and Legal	Increased operating costs due to stricter controls, taxes or carbon pricing	Short- to Medium-term	<u>Policy engagement</u> , <u>emissions reduction practices</u> , new technology adoption
Technology	Reduced demand for our product due to renewable energy sources	Medium- to Long-term	New Energy Ventures team, research and capital deployment for alternative energy solutions, <u>emissions reduction practices</u> and operational efficiencies
Market	Depressed prices affecting our financial performance	Medium- to Long-term	Market sensitivity analysis, diversified portfolio, <u>RSG</u> as market differentiator, hedging activity
Reputation	Negative corporate reputation perception, loss of access to capital and increased stakeholder activism	Short- to Medium-term	<u>Emissions reduction practices</u> , <u>stakeholder engagement</u> and reporting transparency, new technology adoption
Physical (Extreme Weather)	Damage to facilities, disruption of operations and/or safety incidents	Short-term and ongoing	<u>Business continuity</u> and disaster recovery planning, facility design, <u>emergency preparedness</u>

Policy and Legal Risk

As the global economy shifts to a lower carbon future, legislative and regulatory proposals could restrict or tax GHG emissions and increase our operating costs relative to obtaining permits, operating our equipment and facilities, and adopting new technology.

At the federal level, the EPA has issued regulations that require us to establish and report a prescribed inventory of GHG emissions. These regulations, including any new potential controls on methane or carbon dioxide emissions, could expand because of goals set forth in the Paris Agreement. States may also pursue the issue directly or indirectly, enacting localized regulations governing or restricting GHG emissions.

Mitigation: We manage our policy and legal risk by collaborating with policy makers, complying with regulatory requirements, supporting science-based research and adopting innovative technologies to reduce our footprint.

Policy Engagement

Through our policy engagement, we collaborate with stakeholders to develop policies that meet mutually beneficial environmental goals. We define sound policy as regulations that are based on scientific research and remain effective and equitable across regulated industries. Regulations should also recognize the expected growth and need for modern, affordable energy, as well as the continued technological and innovative advancements of our industry.

Our focus is collaborative, which is why we work with trade associations and other organizations to partner with governmental agencies in developing regulations. We endorse both API and AXPC's Climate Policy and Principles as a guide for our climate advocacy efforts, and support policy that facilitates meaningful GHG emissions reductions; balances economic, environmental and energy security needs; and promotes innovation.

Research

We continue to partner with universities and other institutions to support scientific research that enhances our understanding of GHG emissions and climate change. Our most recent partnerships have focused on the study of methane detection and reduction.

Innovation

To meet regulatory requirements and voluntarily reduce emissions, we've adopted a number of innovative technologies to better detect emissions and prevent leaks or loss. Some of these technologies include continuous methane emission sensors, pneumatic retrofits, aerial methane detection, a comprehensive leak detection and repair (LDAR) program with OGI cameras and our [WellTender mobile app](#).

Technology Risk

As our economy shifts to lower carbon resources, emerging technologies could displace or affect the competitiveness of more traditional energy and reduce consumer demand.

Mitigation: We continue to study and adopt emerging technologies and commercial solutions to increase our operational efficiencies and reduce our GHG emissions to be most competitive in a lower carbon future.

New Energy Ventures Team and Business Development

Led by our Geoscience head, our New Energy Ventures team (in collaboration with Business Development) explores emerging technologies and commercial solutions to support our emissions reduction efforts and help us capitalize on a lower carbon future. We're targeting investment opportunities that are adjacent to our core business and offer new ways for Chesapeake to enhance our strategies and diversify our portfolio. These opportunities include, but are not limited to: geothermal, carbon capture, utilization and storage (CCUS), carbon capture and storage (CCS) and additional energy sources derived from natural gas including blue hydrogen and blue ammonia.

Operational and Cost Efficiencies

We are mitigating emissions while reducing our cash costs and decreasing cycle times. Our well productivity continues to increase as a result of enhanced operational efficiencies allowing us greater flexibility in the changing energy landscape.

We are also adopting facility design improvements to reduce emissions at various points across our sites. For example, we are removing venting from our pneumatic devices and capturing flash gas from oil plays by adopting different technologies. We are also trialing a new facility design that includes condensate stabilizers to reduce tank flaring.

Reputation Risk

Market and social pressures related to the transition to lower carbon energy may result in increased reputational risks for our industry and decreased access to capital. In particular, poor ESG performance may lead to subpar ratings from organizations that track ESG-related performance, impacting investment recommendations and actions by key investors, analysts and stakeholders. Negative ESG publicity may also affect public sentiment and, in turn, a company's social license to operate.

Mitigation: We're committed to transparent stakeholder engagement and forward-looking programs that promote ESG excellence.

Stakeholder Engagement

Through regular engagement, complemented by active listening, we respond to stakeholder concerns and continue to improve our operations.

Reporting Transparency

Each year we evolve and enhance our sustainability reporting to drive greater transparency. We consult with an independent, third-party organization to review and verify our GHG intensity, methane intensity, TRIR and spills metrics. This added layer of accountability provides assurance for our highest-profile ESG performance metrics.

We're also participating in industry efforts to standardize ESG reporting, particularly related to emissions, and increasing our communications to key stakeholders about our reporting. We commit to reporting our ESG performance at least annually, providing progress on our climate-related pledges to reach net zero GHG emissions (Scope 1 and 2) by 2035.

Proactive ESG-focused Programs

To meet our climate-related pledges, we continue to build upon our emissions reduction practices and adopt new ESG programs. One example is our commitment to pursue RSG certification in our two natural gas basins. This independent certification verifies that our gas was produced to the highest ESG standards, meeting strict emissions requirements, among a number of additional factors. RSG also provides additional data assurance as part of the certification process.

Market Risk

The demand for oil and natural gas could be negatively impacted by regulatory or market incentives to conserve energy or use alternative energy sources in combating climate change. Lower demand for our products could temporarily or permanently reduce pricing should a significant share of energy reliance shift to other sources.

Mitigation: Long-range planning and strategic financial analysis, coupled with our diverse portfolio, allow us to reduce market volatility risk.

Market Analysis	Hedging	Diversified Portfolio
<p>At least quarterly we conduct market sensitivity analysis during which we evaluate our operational strategy and business portfolio against a number of market factors that could impact company performance based on product demand and pricing effects. Should a scenario show an enhanced risk, we develop a targeted mitigation plan.</p>	<p>We strategically protect our capital program by using hedging to offset downside risk. By locking in future market prices, we protect our capital program and affiliated revenue should there be a dip in demand or a significant negative shift in oil and natural gas pricing.</p>	<p>Our diverse portfolio allows us to shift to the most profitable asset based on changes in market demand. By having both oil and natural gas assets in basins across the U.S., we can better react to market volatility.</p>

Physical Risk

Climate change may produce global physical effects, such as higher sea levels, increased frequency and severity of storms, droughts, floods and other extreme weather events. If any of these effects occur in our operating areas, we could experience incidents at our sites, including safety or environmental concerns, downtime or damaged equipment. Our operational resources could also become limited or disrupted, affecting our production and financial performance.

Mitigation: Through the adoption of advanced technology, stringent processes to promote operational resilience and emergency preparedness, we protect our sites against physical risks.

Facility Design	Emergency Response Planning	Business Continuity
<p>Our facility design standards require several elements to protect our operational equipment from extreme weather-related events. Some of these elements include the installation of catenary protection systems to reduce the risks of lightning strikes; cables anchoring tanks to concrete bases for protection during flooding; operational weatherization measures to protect against freezing temperatures; elevated berms for secondary containment if a spill occurs; and solar panels to power remote monitoring and shutdown capabilities if other power is lost.</p>	<p>Should extreme weather cause an emergency at one of our sites, our Emergency Response Plan (ERP) provides employees with the framework and action steps critical for responding to incidents in a safe, effective and efficient manner.</p>	<p>While it's our goal to continue operations during an emergency, sometimes we must temporarily shut down a site or facility. If an emergency requires a prolonged closure, we utilize our business continuity and disaster recovery process to maintain critical operations. Our recovery team assesses the business impacts of certain risks, including extreme weather, and develops enterprise response and recovery plans to reduce potential associated impacts. These plans can include arranging alternate workspace, providing a secondary power source, or engaging with employees outside of our standard communication channels.</p>

Climate-Related Opportunities

Embracing a lower carbon future, while adapting to climate change, can produce opportunities for organizations. Through our nimble operating structure, emissions reduction efforts and commitment to ESG performance improvement, we are well-positioned to capitalize on climate-related opportunities and create value for both the planet and our bottom line.

Opportunity	Impact	Ongoing Activities
Resource Efficiency	Reducing operating costs due to operational efficiencies and emissions reduction programs	<p>Through various operational programs, we continue to yield efficiencies in our production. These programs build upon our technical innovations that reduce our cycle times.</p> <p>We have also adopted a number of emissions reduction programs, most notably our continuous methane emissions monitoring system. This system includes more than 2,000 methane sensors, sending monitoring data to our SCADA platform and WellTender app. Should a leak be identified, the system alerts our lease operators for callout and remedy within 24 hours. Having continuous monitoring data also allows for predictive repair and maintenance.</p>
Energy Source	Shifting to lower carbon energy sources for power generation to reduce costs and emissions	<p>Across our operating areas, we have a number of alternative fuel capabilities to power our drilling, completions and production activities rather than diesel. This includes using natural gas and electricity for drilling, natural gas for completions and electricity for production. We continue to expand these capabilities, which offer both cost savings and environmental benefits.</p> <p>We also established our New Energy Ventures team to explore other potential energy sources and adopt emerging technologies for our company, including geothermal, CCUS/CCS and additional energy sources derived from natural gas including blue hydrogen and blue ammonia.</p> <p>Also, our Operation teams are exploring innovative solutions to further reduce our emissions footprint, including: adopting exhaust capture operations, using waste heat from operations to power devices, utilizing small scale solar, providing power back to the grid by capturing fugitive emissions, and creating compressed natural gas (CNG) demand both by selling gas on pad to CNG providers and piloting CNG trucks in our hauling operations.</p>
Product and Services	Focusing our portfolio on lower emissions products to maintain competitiveness	<p>Our recent A&D activity reflects our strategy of focusing on a lower emissions portfolio. In 2021 and 2022, we purchased additional natural gas assets to expand our Haynesville and Marcellus positions (acquisition of Vine and Chief, respectively).</p> <p>We are also committed to expanding RSG within our portfolio and taking advantage of our production's strategic positioning near LNG terminals to meet the growing global interest in responsibly produced fuel.</p>
Markets	Proactively leading the RSG market to better position Chesapeake for the lower carbon future	<p>We are the first company to pursue RSG certification across two major shale basins, with a goal of completion by the end of 2022.</p> <p>Not only will we have significant volumes (more than 6 bcf/d gross) of certified RSG in our portfolio, but this production is strategically positioned near LNG terminals to meet the growing global interest in responsibly produced fuel.</p> <p>We also plan to apply the innovative technology used to fulfill our RSG certification to our mixed (oil and natural gas) assets to further improve our overall environmental performance.</p>
Resilience	Developing a nimble operating structure and enhanced facility design to best respond to climate change (managing risks and seizing opportunities)	<p>With a geographically diverse portfolio and nimble operating structure, we can efficiently shift resources should a weather or climate-related emergency significantly impact one of our basins.</p> <p>We also have business continuity and emergency response resources in place to react efficiently to an acute climate change event.</p>

Portfolio Resilience: Using Scenarios to Understand Risks, Opportunities

Climate change presents significant risks and opportunities for the global economy.

At Chesapeake, we recognize the need to prepare for the social, economic and environmental uncertainties inherent in how climate change will affect our planet in the future. We study and plan for potential climate change impacts, including conducting a robust scenario analysis to assist in quantifying climate-related risks and opportunities. This analysis also provides additional perspective on how a lower carbon future may affect the company's long-range business plans and portfolio optimization.

For our long-term planning, Chesapeake considers a variety of energy and policy forecasts and analyses from public and private institutions. However, for purposes of this climate-related report, we used scenarios from the International Energy Agency (IEA)'s 2021 World Energy Outlook (WEO) to test our portfolio resilience. Recommended by the Task Force on Climate-related Financial Disclosures (TCFD) and widely used across our industry, this outlook includes climate change policies that align with the goals of the Paris Agreement (defined as a 1.5°C pathway within the WEO).

It's important to note that the 2021 WEO is the most recent version of the outlook, however it was published prior to Russia's invasion of Ukraine in 2022. This conflict is significantly impacting the global energy landscape — and subsequent policy actions — and reiterating the importance of national energy security. As a result, the supply and demand analysis conducted in the WEO may not fully represent today's current energy environment and priorities.

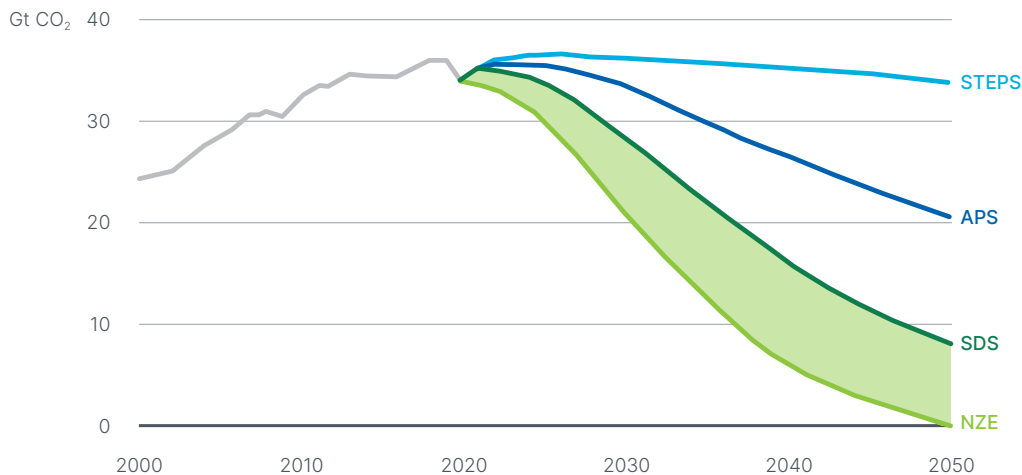
Introducing the Scenarios

While the 2021 WEO presents three primary scenario assessments, we based our analysis on the two exploratory scenarios we believe offer the most achievable outcomes. The two referenced WEO scenarios include predicted fluctuations of product price and energy demand through 2050. Emissions impact is also analyzed, including measuring each scenario's ability to meet Paris Agreement objectives.

- The **Announced Pledges Scenario (APS)** assumes all climate commitments made by governments around the world will be met in full and on time. Appearing for the first time in the 2021 WEO, this scenario shows the cumulative expanse of global climate change goals as of mid-2021 and does not try to reach a particular outcome.
- The **Stated Policies Scenario (STEPS)** reflects current policy intentions and targets on a sector-by-sector basis without additional influence from policy makers. This scenario acts as a barometer as to the strength, impact and expected outcome of these policy settings and does not assume that governments will reach all of their announced goals.

We also reference the Sustainable Development Scenario (SDS), introduced in the 2020 WEO and noted in the 2021 report. The SDS achieves key energy-related United Nations Sustainable Development Goals including universal energy access and greatly improved air quality. This scenario also reaches global net zero emissions by 2070, with many countries achieving net zero prior to that year, and is a “well below 2°C” pathway (projecting to keep global warming to 1.7°C around 2050) to achieve Paris Agreement outcomes.

CO₂ Emissions in the WEO-2021 Scenarios Over Time⁽¹⁾



The APS pushes emissions down, but not until after 2030; the SDS goes further and faster to be aligned with the Paris Agreement; the NZE delivers net zero emissions by 2050.

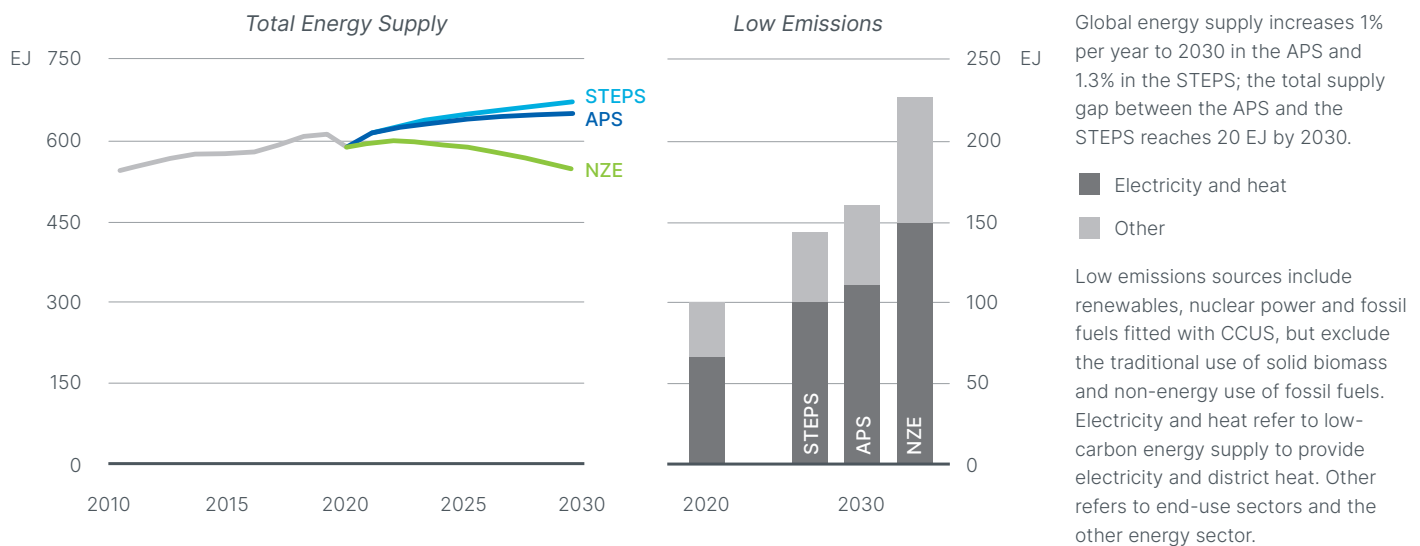
Lastly, the 2021 WEO’s third scenario, the Net Zero Emissions by 2050 (NZE), is Paris-aligned and projects to limit global warming to 1.5°C. The IEA argues that this scenario offers the greatest opportunity to reach global climate goals and projects a decline in oil and gas demand by 2030.

We have tested against this scenario — which forecasts a difficult future for many oil and gas firms — however, we believe its analysis does not realistically balance achieving environmental goals with meeting future energy demand. As noted in the WEO, “secure transitions” require careful planning to help ensure that a reduction in one energy resource is complemented by an increase in another.⁽²⁾

Should the U.S. decrease its oil and gas investments, we would need to dramatically increase spending on low emissions fuels and technologies. To replace more carbon intensive resources, lower carbon sources need to already be in place to meet today’s demands with affordability and reliability.

Discussing energy supply and demand is critical to any conversation about climate change. As we phase out more carbon intensive resources, we must be able to sustain our current energy supply to meet growing demand both now and as it increases in the future. For this reason, we must rely on affordable and reliable forms of energy that are widely available now.

Global Total Energy Supply by Scenario and Low Emissions Energy Supply Sources by Sector, 2010 – 2030⁽¹⁾



It's also important to note that all of the defined scenarios provide studied constructs of the future, but they're not forecasts. They represent potential futures, identifying possible trends or factors that could influence business models should a scenario's key assumptions occur. Many of the scenarios also assume the adoption of technologies that are either unproven or are in various stages of development.

Highlighting Key Outlook Findings

According to the 2021 WEO, today's climate change pledges cover less than 20% of the emissions reduction gap needed to be closed by 2030 if we are to keep global temperature ambitions (a pathway to 1.5°C) within reach.

The 2021 WEO also presents specific solutions to close this gap, including:

- Continuing the advancement of electrification
- Relentlessly focusing on energy efficiency
- Boosting clean energy innovation
- Cutting methane emissions from fossil fuel operations

Without action, the 2021 WEO warns of the unchecked risks of climate change, particularly to the energy sector. Most notably, the physical risks to infrastructure and the resilience needed to react to extreme weather and subsequent demand.

Chesapeake is closely monitoring the risks highlighted in this outlook and taking a leadership role in many of the solutions presented, particularly related to reducing methane emissions and increasing energy efficiency.

According to the 2021 WEO, methane emissions are the second-largest cause of global warming today. While China and Russia are the two largest emitters globally, we recognize the role the U.S. energy industry must play in continuing to reduce domestic emissions.

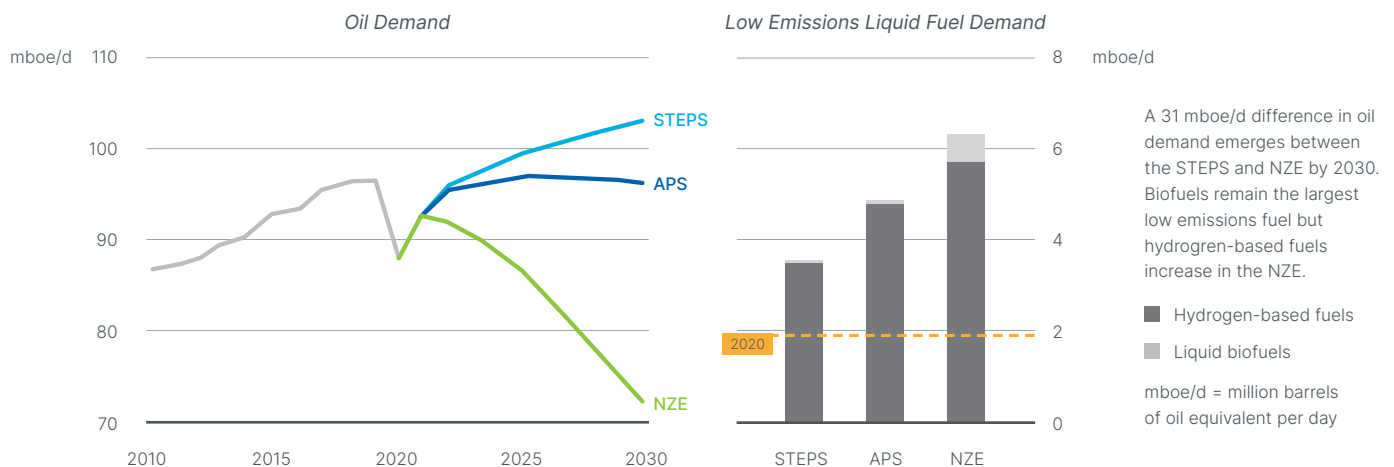
Chesapeake is an industry leader in methane emissions reduction, having pledged — and achieved — a methane intensity of near zero (0.09% was our goal and we achieved 0.07% at year-end 2021).

Oil Demand and Pricing

According to the 2021 WEO, oil demand — for the first time — shows an eventual decline in all scenarios, although timing varies widely. Most of the scenarios indicate that demand may level off in the 2030s but will continue to be bolstered by the aviation, shipping and petrochemical industries according to STEPS.

Also, those countries with net zero pledges are most likely to experience decreased oil demand, however the rest of the world will offset this change in demand. The electrification of passenger vehicles is expected to play a significant role in the reduced demand for oil, as the 2021 WEO predicts that by 2030, 60% of passenger cars sold globally will be electric.

Oil Demand Over Time and Low Emissions Fuel Demand in 2030⁽¹⁾



Even with oil demand peaking and declining under the most stringent scenario, analysis suggests that companies developing high-value projects at streamlined costs will continue to remain competitive.

Oil Price by Scenario⁽¹⁾ as compared to Chesapeake's 2022 breakeven price range: \$33 – \$42 (bbl)

	STEPS	APS	SDS	NZE
2030	\$77	\$67	\$56	\$36
2050	\$88	\$64	\$50	\$24

The reported 2022 breakeven price range is based on internal company estimates for our position in the Eagle Ford Shale, recognizing that pricing is likely to decrease due to industry efficiencies and innovation. Also, in August 2022, we announced that the company is taking actions to solidify our strategic focus on our core Marcellus and Haynesville positions, which offer our best rock, best operations and lowest emissions footprint.

Natural Gas Demand and Pricing

Natural gas demand increases in all scenarios during the next five years, however demand decreases at varying levels afterwards. As the global economy shifts to clean energy, natural gas' prominence in the energy mix is not uniform across different geographies of the world. In STEPS, natural gas demand continues to grow into 2050 as natural gas remains the default option for space heating and fueling the industry and power sectors.

Similar to oil, in APS, natural gas demand is dependent on if countries have made net zero pledges. For those that have, it is expected that they will move away from the use of gas in buildings, reducing consumption by the power sector as early as 2030.

Near-term, higher natural gas demand and the rise in oil prices will put pressure on natural gas prices. This price increase will also be supported by demand growth in China, India and other areas of Southeast Asia. Those regions will likely continue to boost natural gas demand, increasing export opportunities. Natural gas will also continue its relevance in part due to its ability to produce low-carbon hydrogen and participate in carbon capture, utilization and storage (CCUS) for significant emissions reduction.

Through our New Ventures team, Chesapeake is actively exploring enhanced resource solutions and emerging technologies, such as geothermal, CCUS and hydrogen energy development.

Natural Gas Price by Scenario ⁽¹⁾ as compared to Chesapeake's 2022 breakeven price range: \$1.95 – \$2.10 (mbtu)				
	STEPS	APS	SDS	NZE
2030	\$3.6	\$3.1	\$1.9	\$1.9
2050	\$4.3	\$2.0	\$2.0	\$2.0

The reported 2022 breakeven price range is based on internal company estimates for its positions in the Haynesville and Marcellus shales. If we continue to follow long-term market trends, we expect our breakeven prices to decrease due to industry efficiencies and innovation.

Chesapeake's current breakeven prices reinforce the strength of our operational strategy and capital allocation flexibility, in addition to our formidable hedging strategy that helps ensure consistent future revenue. It is important to note that our current scenario analysis only tests against domestic U.S. prices.

Similar to our oil price outlook, Chesapeake's cash-cost efficiency, including faster cycle times and consistent innovation, suggests a strong future for our natural gas projects. Also, we anticipate increased participation in the growing global LNG markets allowing us to diversify revenues by accessing global pricing indices.

Identifying Successful Producers

Throughout the 2021 WEO, the most successful producers will be those that operate at scale but are nimble enough to:

- Recognize cost efficiencies
- Enhance production
- Reduce expenditures and
- Take advantage of export opportunities

Chesapeake is poised to respond to future market conditions, using our agile culture and flexible operating structure to be a market winner. Based on our 2021 scenario planning analysis, we're confident that our portfolio of assets will continue to deliver strong returns well into the future.

(1) Based on IEA data from World Energy Outlook 2020 © OECD/IEA 2020, www.iea.org/statistics, all rights reserved, as modified by Chesapeake Energy Corporation

(2) International Energy Agency (IEA). World Energy Outlook 2021. Revised version December 2021, p 71.

Climate Metrics: Measuring Our Impact

We use performance metrics to measure our progress, recognize trends and identify opportunities for improvement. Our climate-related metrics help to inform the action steps needed for us to achieve our net zero GHG emissions (Scope 1 and 2) goal by 2035.

Defining Our Metrics

- **Scope 1 emissions:** Direct GHG emissions that occur from Chesapeake's operations; most often these sources are from flared hydrocarbons, other combustion, process emissions, fugitive emissions and other vented emissions
- **Scope 2 emissions:** Indirect GHG emissions associated with the purchase of electricity to support our operations
- **Scope 3 emissions:** Indirect GHG emissions from the combustion and use of the oil and natural gas we produce
- **Methane intensity:** The ratio of direct methane emissions to gross natural gas produced
- **GHG intensity:** The ratio of direct GHG emissions released to gross annual production
- **Routine flaring volume:** The amount of natural gas flared from the primary separator; flaring is the regulated and controlled combustion of natural gas
- **Routine flaring intensity:** The percentage of natural gas flared from the primary separator

Our Performance

All data is for calendar year 2021 unless otherwise stated and includes Powder River Basin due to our ownership in 2021 and our Vine assets per our acquisition completion date of Nov. 1, 2021.

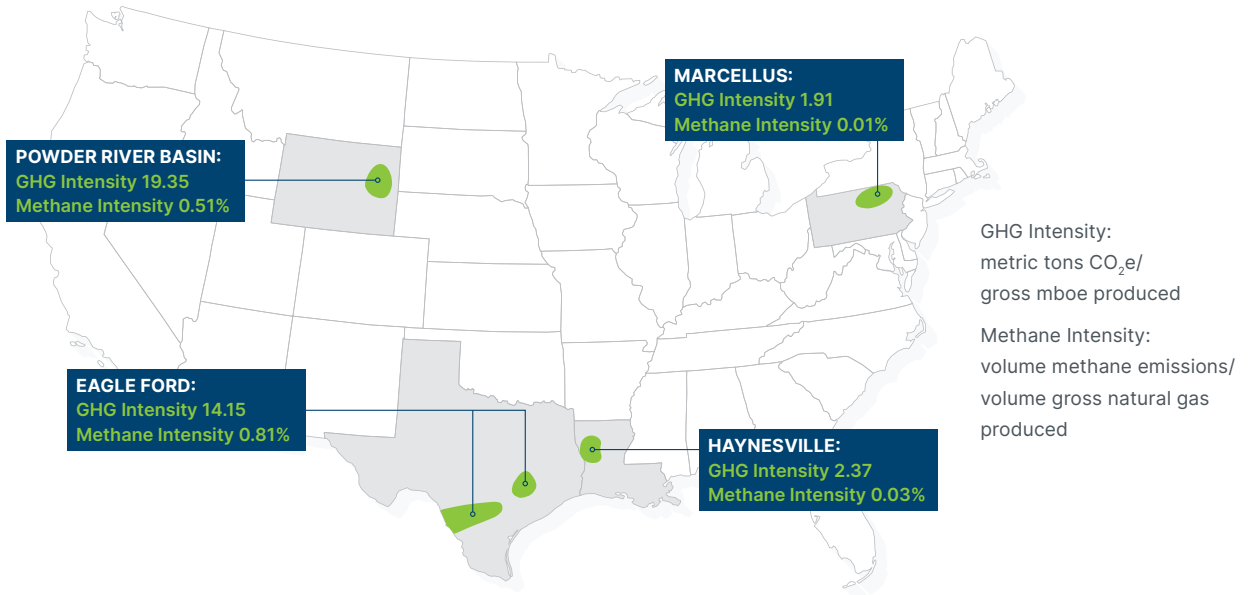
The EPA regulates all of our operations, including emissions, and we report Scope 1 emissions to the EPA's GHG Reporting Program as required by law. The reporting of certain other emissions, such as Scope 2 and Scope 3 emissions, is not required, but we voluntarily report them in this analysis. We consult with a third-party organization to review and verify our GHG emissions, GHG intensity and methane intensity to help ensure reporting accuracy.

Scope 1 GHG Emissions

As reported under the EPA's GHG Reporting Program

	2021	2020	2019	2018	2017
Scope 1 GHG emissions (gross) (million metric tons CO ₂ e)	1.83	1.86	2.81	2.55	3.22
GHG intensity (metric tons CO ₂ e/gross mboe produced)	4.5	6.0	8.2	7.2	9.1
Methane intensity (volume methane emissions/volume gross natural gas produced)	0.07%	0.13%	0.17%	0.16%	0.19%

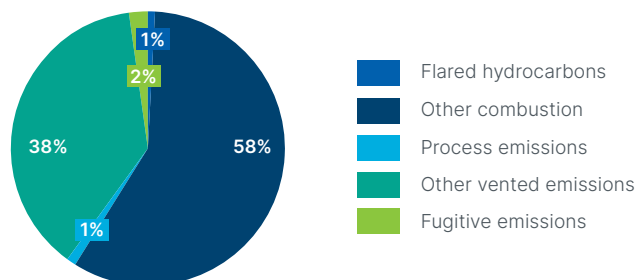
2021 Scope 1 GHG and Methane Intensity by Operating Area



Given the dynamic and complex nature of our business, it's understood that GHG emissions occur from several different sources. The Sustainability Accounting Standards Board, in its standard disclosures for our industry, identified five distinct pathways to the atmosphere that are incorporated into Chesapeake's corporate sustainability performance data.

In addition to providing added transparency to our stakeholders, disclosing source types helps us to identify the technologies and design solutions that best mitigate these.

2021 Scope 1 GHG Emissions Sources



Routine Flaring

Metric	2021
Gross annual volume of flared gas (mcf)	293,595
Flaring intensity – gross annual volume of flared gas (mcf)/gross annual production (mcf)	0.01%
Flaring intensity – gross annual volume of flared gas (mcf)/gross annual production (boe)	0.001

Scope 2 GHG Emissions

Metric	2021	2020
Scope 2 emissions (gross) (million metric tons CO ₂ e)	0.057	0.063

Scope 3 GHG Emissions

As an independent, upstream company, Chesapeake has limited control over the final use and consumption of our oil and natural gas production. For enhanced transparency, we've reported our estimated indirect Scope 3 emissions on an equity basis using Category 11 of the *Estimating petroleum industry value chain (Scope 3) greenhouse gas emissions* reporting guidance by IPIECA/API (2016). The calculation methodology applies the EPA's emission factors for listed fuel types. The estimated emissions reported represent the indirect end use GHG emissions of the products created from our crude oil and natural gas, Chesapeake's most material Scope 3 emissions category.

Chesapeake recognizes that stakeholder demand for reporting Scope 3 indirect emissions is rapidly evolving; however, it's important to note that emissions-estimation methodologies are uncertain and subject to double counting along our value chain. Double counting may occur if entities report certain emissions as Scope 1 or Scope 2 for their organizations and then we include them in our Scope 3 total.

Metric	2021	2020
Scope 3 emissions (million metric tons CO ₂ e)	59	57

Targets: Driving Progress, Improving Performance

In 2021, we committed to achieve net zero GHG emissions (Scope 1 and 2) by 2035 to make meaningful change in support of global climate goals.



Setting high standards for our climate performance is just one of the ways we are answering the call for affordable, reliable lower carbon energy.

Pathway to Net Direct GHG Emissions (Scope 1 & 2 Emissions)

0

Eliminate routine flaring on wells completed from 2021 forward

(enterprise-wide by 2025)

0.09%

Reduce Scope 1 methane intensity by 2025 — **achieved in 2021**

(volume methane emissions/volume gross gas produced)

5.5

Reduce Scope 1 GHG intensity by 2025 — **achieved in 2021**

(tCO₂e/gross mboe produced)

Achieving Our Emissions Reduction Goals

Through a layered toolkit of technologies and best-management practices, we'll better detect and mitigate emissions in support of our short-term GHG reduction goals. Our emissions-reduction approach is holistic, recognizing the opportunities for improvement across our operations and operational lifecycle.

Mitigation Category	Action Step	Impact
Research Analysis	Conduct a basin-by-basin analysis of both proven and emerging technologies	Identification and implementation of a targeted blend of technologies specific to each asset for greatest efficacy
Operational Emissions Reductions	Improve facility design for efficiency	Reduced venting and flaring
	Reduce or capture pneumatic device emissions and emissions from pressure regulators	Reduced venting
	Capture associated gas	Reduced venting and flaring
	Minimize compression emissions	Greater efficiency and reduced combustion emissions
	Reduce well venting from liquids unloading using enhanced work practices and technologies	Reduced venting and flaring
	Utilize electricity to power drilling and completions fleets	Reduced diesel fuel use and associated emissions
	Evaluate the use of geothermal or renewable microgrid technology powered by solar/wind to provide baseload power	Reduced Scope 2 emissions through carbon-neutral power sources (increased efficiency)
	Incorporating site flyovers (aerial methane detection), at least biannually for all sites	Enhanced leak detection
RSG	Track and integrate data from continuous methane emissions monitoring technology	Enhanced leak detection and repair; reduced venting
	Partner with a third-party to verify emissions data	Greater accuracy for trend analysis and operational study
Sequestration	Explore sequestration opportunities including enhanced oil recovery (EOR), carbon capture, utilization and storage (CCUS) and storage (CCS)	Reduced emissions with increased production
Collaborative Partnerships	Engage in partnerships with peers, nonprofits and academic institutions working to enhance methane detection technologies	Improved reporting and data quality through collective efforts; opportunity to develop, test and optimize emerging technologies through a shared capital risk

Chesapeake committed to spend more than \$30 million on ESG-related initiatives by year end 2022. Most of this investment is dedicated to retrofitting more than 19,000 pneumatic devices, which are expected to reduce our reported GHG emissions by approximately 40% and methane emissions by approximately 80%.

Reducing Emissions in South Texas

After acquiring our Brazos Valley asset, we identified that a significant portion of the facilities were not designed and equipped to Chesapeake's rigorous standards.

We embarked on a two-year effort to bring these sites into compliance with support from the Texas Commission of Environmental Quality's audit program. The joint-audit program included calculating emissions for more than 600 facilities and developing a targeted emissions reduction program for the asset.

Efforts in our Brazos Valley acreage included:

- Updating tank control equipment such as flares, combustors and tank hatches to assure proper emissions controls
- Conducting engineering analysis of the closed vent systems of more than 270 facilities
- Testing more than 120 engines for compliance with federal and state requirements
- Enhancing leak detection and repair programs, including AVO inspections
- Retrofitting pneumatic devices and/or installing vent capture to eliminate emissions
- Upgrading flare monitoring systems to remotely evaluate efficient combustion
- Mitigating venting or flaring on certain wells by adding pipeline connections and/or using on-site gas for generator fuel

As a result of Chesapeake's acquisition and subsequent emissions reduction efforts, our Brazos Valley asset's environmental footprint was significantly improved. In 2020 and 2021, we reduced GHG emissions by almost 400,000 metric tons CO₂e.

Exploring Emerging Technologies, Partnering for Progress

We recognize that supporting these programs requires significant research and development capital, which involves a certain degree of risk. We're committed to spending capital to deliver improved performance in this area, and we're also exploring pooling resources with other companies for more efficient technology analysis and development. Part of our partnership strategy is centered on looking beyond Chesapeake's core upstream business and exploring opportunities with our midstream and downstream providers and the end users of our fuel.

In support of this commitment, we established our New Energy Ventures team. This dedicated, cross-functional group explores emerging technologies and commercial solutions to support our net zero goal, helping us capitalize on a lower carbon future. These possible investments including geothermal, CCUS, CCS and additional energy sources derived from natural gas (including blue hydrogen and blue ammonia), offer new ways for Chesapeake to enhance our strategies and diversify our portfolio.

Additionally, we're exploring opportunities to engage partners outside the traditional oil and natural gas value chain, including agricultural solutions for carbon renewal or sequestration. Our analyses focus on the effectiveness of each prospective technology from a technical, operational and economic standpoint.

TCFD Context Index

Our climate reporting follows the Task Force on Climate-related Financial Disclosures (TCFD) framework. By disclosing through this framework, we offer high-quality information that enhances our transparency on the impacts of climate change to our business. We respond to each of the four TCFD disclosure categories noting our climate-related risks and opportunities.

Disclosure Category	Description	Disclosure Location
Governance	<p>a) Describe the Board's oversight of climate-related risks and opportunities.</p> <p>b) Describe management's role in assessing and managing climate-related risks and opportunities.</p>	Climate Governance
<p>Strategy</p> <p>Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning where such information is material.</p>	<p>a) Describe the climate-related risks and opportunities the organization has identified over the short, medium and long term.</p> <p>b) Describe the impact of climate-related risks and opportunities on the organization's business, strategy and financial planning.</p> <p>c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</p>	Climate Strategy & Risk Management , Portfolio Resilience
<p>Risk Management</p> <p>Disclose how the organization identifies, assesses and manages climate-related risks.</p>	<p>a) Describe the organization's processes for identifying and assessing climate-related risks.</p> <p>b) Describe the organization's processes for managing climate-related risks.</p> <p>c) Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management.</p>	Climate Strategy & Risk Management , Air Quality , Managing Risk
<p>Metrics and Targets</p> <p>Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.</p>	<p>a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk-management process.</p> <p>b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</p> <p>c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.</p>	Climate Metrics , Targets , Performance Metrics