



# CORPORATE SUSTAINABILITY REPORT

*SUPPORTING THE ENERGY TRANSITION*

# 2019







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## FOUNDERS' MESSAGE TO OUR STAKEHOLDERS

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Since we embarked on this incredible journey as shale gas pioneers in 2003, we have remained true to our values of creating a sustainable business model and a resilient company. Our company culture is based on core business principles of safety for our employees, contractors and the community, integrity, performance, stewardship of the land and environment, and relentless innovation. These values and principles are ingrained in our corporate DNA.

Our core sustainability programs strengthen our business and inspire confidence in our employees, investors, creditors and contractors, as well as with regulatory agencies and within the communities in which we operate. We take a highly proactive approach to develop and implement work practices and technologies to deliver natural gas, natural gas liquids and oil in the most ethical, environmentally and socially responsible way possible.

Natural gas is key to the energy transition and to our ability to address the risks associated with climate change. If produced and transported properly, natural gas development should be supported by the investment and regulatory communities. As the lightest and least greenhouse gas (GHG) intensive hydrocarbon, natural gas is expected to play a fundamental role as both the U.S. and global economies transition to a lower carbon future. Natural gas is part of the solution and can be produced and transported with almost zero leakage and loss.



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## ENVIRONMENT

We recognize the growing concern over climate change and are committed to proactively managing our business to reduce GHG emissions and limit the environmental impact of our operations.

For instance, while the flaring of natural gas globally hit a 10-year peak in 2019<sup>1</sup>, Antero did not flare any produced gas in 2019 and has not flared produced natural gas since the infancy of the Marcellus and Utica shale projects in West Virginia and Ohio. Further, Antero has utilized green completions in all of its well completions, and implemented a rigorous leak detection and repair (LDAR) program on all of its permitted facilities and pipelines for many years. These best practices have resulted in our industry-leading GHG intensity and leak loss rate numbers. Antero actively participates in a number of voluntary programs that focus on reducing emissions. In 2018, Antero became a member of ONE Future, an industry collective focused on voluntarily reducing methane emissions across the natural gas supply chain. Antero's GHG performance metrics demonstrate that natural gas can live up to its promise as a transition fuel and reduce GHG emissions by more than half, as compared to coal.

Our GHG intensity decreased by 39% from 3.7 metric tons of CO<sub>2</sub>e per 1,000 barrels of oil equivalent (MBOE) of production in 2016 to 2.3 metric tons CO<sub>2</sub>e/MBOE in 2019. Our methane leak loss rate, calculated per the ONE Future protocol, dropped to 0.046% in 2019, well below ONE Future industry and sector targets of 1.00% and 0.280%, respectively. Going forward, we aim to improve our emissions metrics further, with a goal to reduce our methane leak loss rate by 50% to under 0.025%, and reduce our GHG





88% OF PRODUCED  
AND FLOWBACK WATER  
IS RECYCLED—2020 YTD

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intensity by 10% by 2025. We also endeavor to achieve net zero carbon emissions by 2025 through operational improvements and the purchase of carbon offsets.

Water is a critical resource that is utilized in shale completion operations. Antero Midstream has the most extensive fresh water pipeline network in the industry, which is used to deliver water to well pads for completion operations. Each year our fresh water pipeline system eliminates the need for hundreds of thousands of water truckloads traversing local roads in and around the communities where we operate. Our fresh water pipeline system has a tremendously positive impact on emissions reduction and safety.

Further, due to a major shift away from centralized produced water treatment to field level blending and treatment, over 13 million barrels of water has been recycled and reused in 2020. This amounts to about 88% of our total produced water, which includes produced and flowback water, generated year to date in 2020. This shift has materially reduced fresh water use.

## SAFETY

Safety performance starts with culture, and we have built a strong safety culture and dedicated environmental stewardship that starts at the top of the organization. We are laser-focused on health, safety, security, and preservation of the environment (HSSE). Importantly, we empower everyone on the job site, employee or contractor, with Stop Work Authority. We believe that our HSSE success is partly due to continuous incident and risk evaluation and improvements to our safety leadership, management and



systems. We have earned a reputation as an industry leading safe and environmentally responsible operator through continuous emphasis on our HSSE performance. This reputation also makes Antero an employer of choice in Appalachia.

In 2019, we continued to focus on the health and safety of our employees and the public, managing greenhouse gas emissions and recycling produced water from Antero Resources' operations to reduce fresh water use. We focused on enhancing our safety and environmental management systems and continued open, honest, and transparent dialogues with our shareholders, communities, industry peers, and regulators. Our plan for 2020 includes continued improvement of our management systems, developing a disclosure strategy to align with both the Task Force for Climate-related Financial Disclosures (TCFD) guidelines and the Sustainability Accounting Standards Board (SASB).

Every day, the safety of our employees and contractors is our top priority. In 2019, Antero Resources work locations experienced zero employee or contractor fatalities and an employee and contractor Lost Time Incident Rate (LTIR) of 0.026, an 83% reduction since 2016. Similarly, the Antero employee and contractor Total Recordable Incident Rate (TRIR) of 0.285, represents a 53% improvement since 2016. In comparison, the 2019 ISNetworld onshore oil and gas benchmark averages for our industry are 0.32 LTIR and 0.95 TRIR. These results significantly outperformed the 2018 U.S. Bureau of Labor Statistics benchmark averages for our industry. Antero's highly successful HSSE team guides us toward our stated goal of "Zero Incidents, Zero Harm and Zero Compromise."





## GOVERNANCE

We have worked aggressively to ensure appropriate alignment among all our constituents. As part of the 2019 combination of two of our publicly-traded midstream entities, Antero Midstream eliminated its Incentive Distribution Rights (IDRs), converted into a C-Corp and redesigned its board to include a majority of independent directors; together these actions represented the most comprehensive governance changes among such “Simplification” transactions. Subsequently, we have added a number of new directors to both the Antero Resources and the Antero Midstream boards. We are excited about the many years of industry technical and leadership experience which our directors bring to the board. We are also focused on gender diversity, as two of our nine directors at both companies are women. In addition, we are proud to note that the head of our operations, geology, accounting, legal and land administration departments are all women. We also recently formed Environmental, Sustainability, and Social Governance (ESG) committees of the board for both Antero Resources and Antero Midstream which further reinforces our emphasis on the importance of accelerating the agenda on environmental sustainability, safety, and governance topics.



## THE ENERGY TRANSITION

There is growing momentum to identify and implement solutions to reduce GHG emissions without sacrificing economic and humanitarian imperatives such as a rising standard of living for much of the underdeveloped world. Stable and affordable energy supplies will make it possible for more people to access healthcare, transportation and education that contribute to improved living standards and a higher quality of life. Embrace of the energy transition to a lower carbon environment is ubiquitous across government, industry, investor, creditor and the public sectors. We believe that it is critical for Antero to be a leader in the global energy transition and to be part of the solution.

For context, the world consumes almost 600 exajoules (EJ) of primary energy per year, the vast majority of which is derived from hydrocarbons (Figure 1 World Consumption). Natural gas consumption has been increasing for the last 25 years, while renewables began to increase at a rapid rate about 15 years ago (Figure 2 Shares of Global Primary Energy). Natural gas and renewables are slowly displacing oil and coal in the energy mix. Much of that displacement is a result of the electrification that has occurred over the past 20 years.

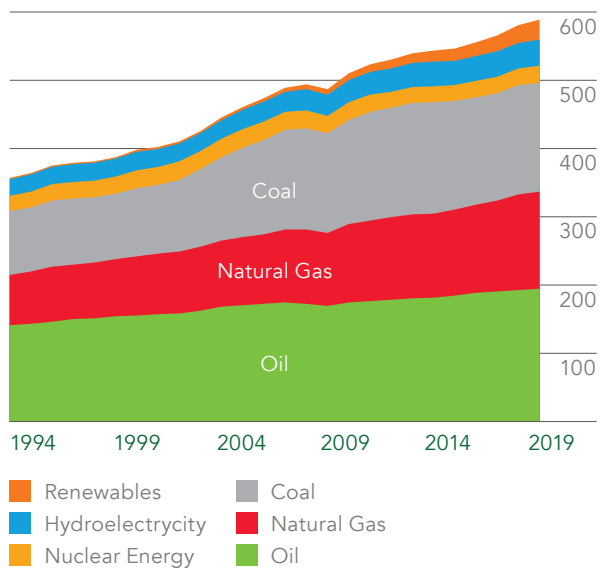




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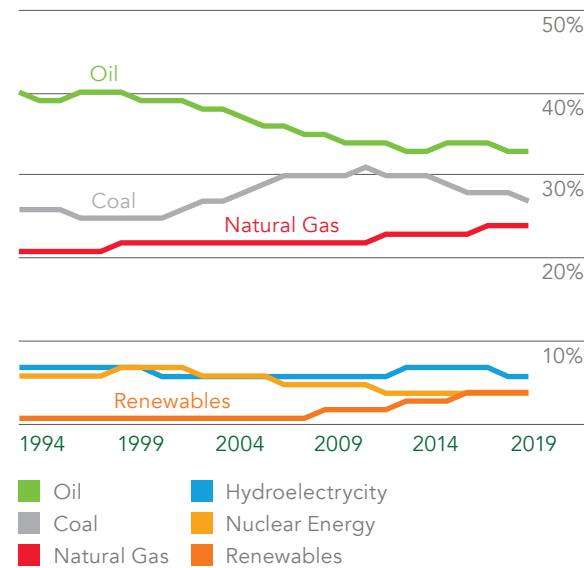


**Figure 1: World Consumption (Exajoules)**



Source: BP Statistical Review of World Energy 2020

**Figure 2: Shares of Global Primary Energy (%)**

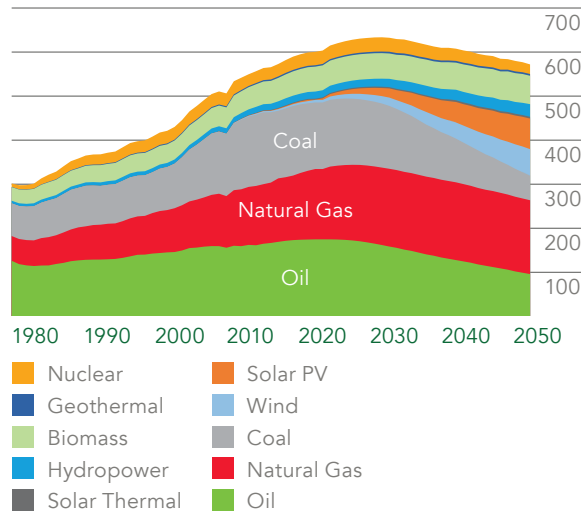


Source: BP Statistical Review of World Energy 2020

Figure 3, entitled World Energy Demand by Source, forecasts energy consumption through 2050, where hydrocarbons still comprise about 55% of energy demand. Figure 4, entitled World Final Energy Demand by Carrier, converts some of the global energy consumption to electricity. The reduction in scale and change in composition between Figure 3 and 4 reflects the impact of conversion losses and the fact that a significant amount of primary energy is used to generate electricity. The displacement trend is forecast to continue over the next 30 years as the consumption of oil and coal eventually decline and global natural gas consumption grows slowly. Overall energy consumption is forecast to continue to grow due to an expanding global economy and population until efficiency gains slow growth around 2030.

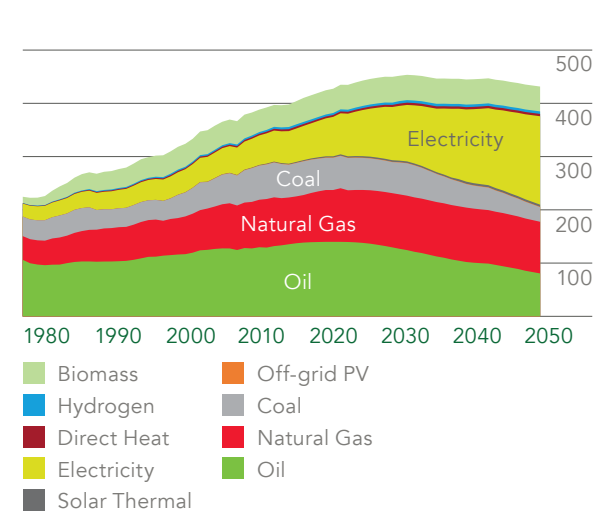


**Figure 3: World Energy Demand by Source (Ej/yr)**



Source: IEA Electricity Information 2019

**Figure 4: World Final Energy Demand by Carrier (Ej/yr)**



Source: IEA Electricity Information 2019

Within the final energy demand stack, electricity demand is expected to accelerate and more than double during the next 30 years as the manufacturing, commercial building, and transport sectors rely more heavily on electricity as opposed to direct fossil fuels as an energy source (Figure 5 World Electricity Generation Mix). Meeting this increased electricity demand with zero and lower carbon electricity generation alternatives such as solar, wind, and natural gas, is the key to the success of the energy transition. In the International Energy Administration (IEA) forecast in Figure 5, renewables are expected to grow from a single digit contribution to almost two-thirds of electricity supply by 2050, while natural gas consumption grows slightly and coal use for electricity generation declines to very low levels. Fulfillment of these objectives will require a mix



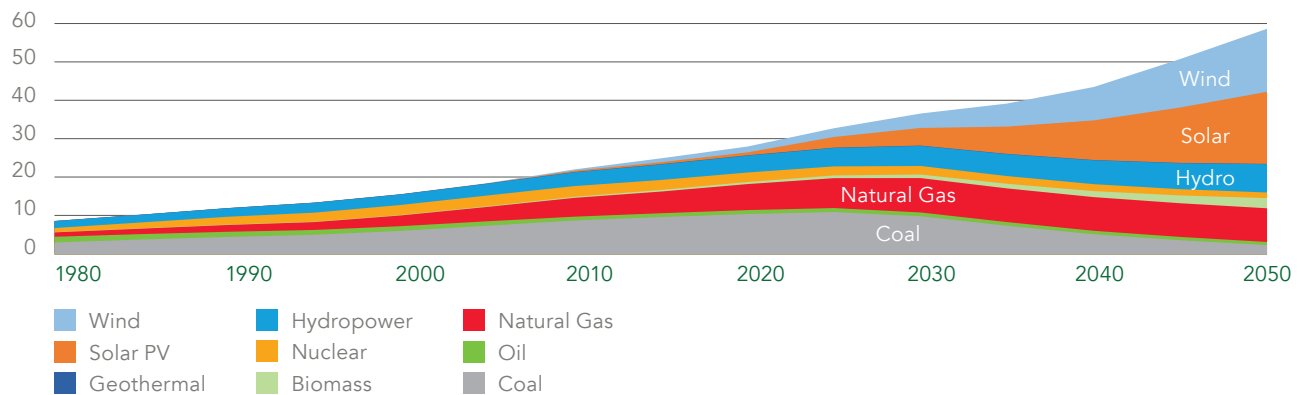


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of both lower carbon conventional supply and zero carbon new builds over the next few decades along with policy support from governments around the world, as well as a significant amount of capital.

**Figure 5: World Electricity Generation by Power Station Type (PWh/yr)**



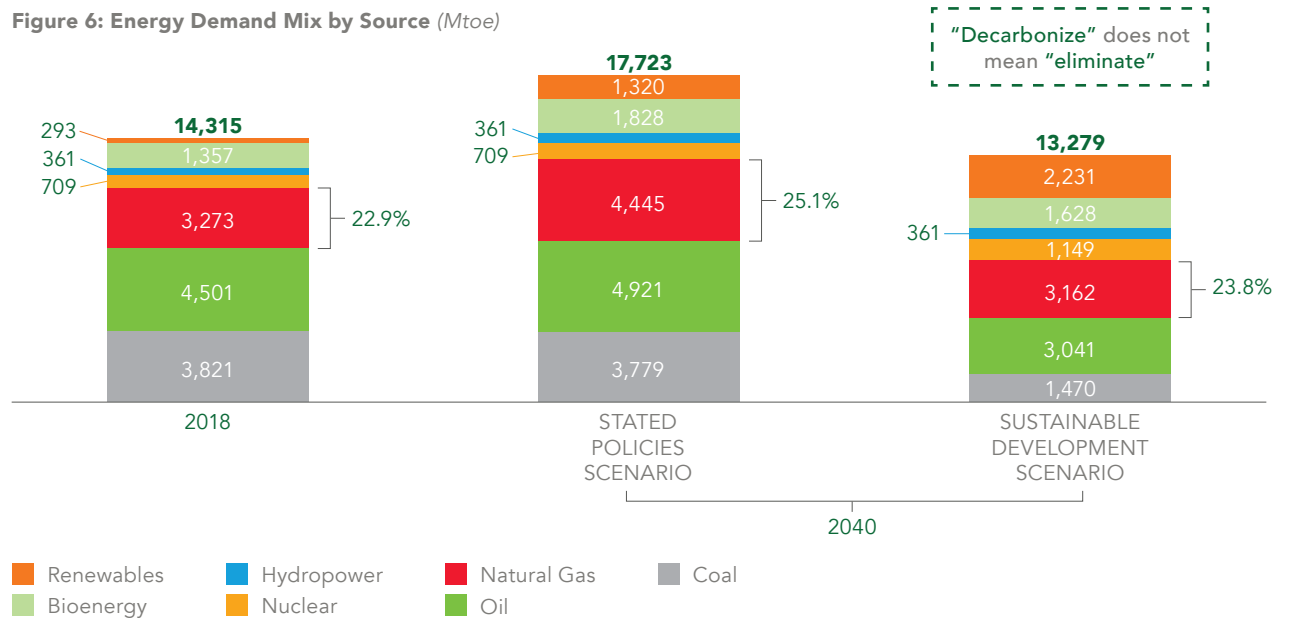
Source: IEA Electricity Information 2019

Most recently, the 2015 Paris Agreement aims to hold the increase in global average temperatures to well below 2 degrees Celsius above pre-industrial levels. The IEA, in turn, has developed two long term projections for energy supply and demand. The importance of these projections cannot be overstated as even under the IEA's Sustainable Development Scenario, which is "Paris Agreement-aligned", natural gas consumption is forecast to grow slightly between 2018 and 2040 as its share of the global energy demand mix increases from 22.9% to 23.8% (Figure 6 Energy Demand Mix by Source). Moreover, under the IEA's Stated Policy Scenerio, natural gas consumption is forecast to increase by 35.8% and contribute 25.1% of the global energy demand mix by 2040. Given the scale of global energy demand and the capital



and incentives required to meaningfully shift the mix, decarbonize does not mean eliminate all hydrocarbons over the next 20 years.

Figure 6: Energy Demand Mix by Source (Mtoe)



Source: IEA World Energy Outlook 2019





## SUMMARY

In short, investors, creditors, the communities in which we operate, and employees can be stakeholders in a hydrocarbon business that is natural gas focused while at the same time meeting high environmental sustainability, safety, and governance (ESG) standards. Antero meets or beats all of those standards. It is clear that the only way to reduce the carbon footprint while addressing the needs of a growing global economy and population is to transition to an energy supply stack with much less coal, eventually less oil and a growing baseload of natural gas and renewables, primarily delivered in the form of electricity.

Our outstanding ESG performance exemplifies our unwavering commitment to make every effort to do the right thing, take accountability for our actions and maintain our position as a world-class sustainable energy producer, partner, and employer of choice. We are dedicated to adapting and leading and operating ethically and responsibly. This commitment is evident in our performance and culture as we proactively care for our employees, contractors, community, and the environment. In sum, we are intensely focused on, and have unwavering confidence that the Antero companies are doing the right things, the right way, for the right reasons.

**PAUL M. RADY**  
Chairman and CEO  
Co-Founder

**GLEN C. WARREN, JR.**  
President, CFO and Director  
Co-Founder





# OUR COMPANY



3RD LARGEST U.S. NATURAL GAS PRODUCER



LARGEST FIRM TRANSPORTATION PORTFOLIO IN APPALACHIA



ONE OF THE LARGEST SUPPLIERS TO U.S. LNG



2ND LARGEST U.S. NGL PRODUCER

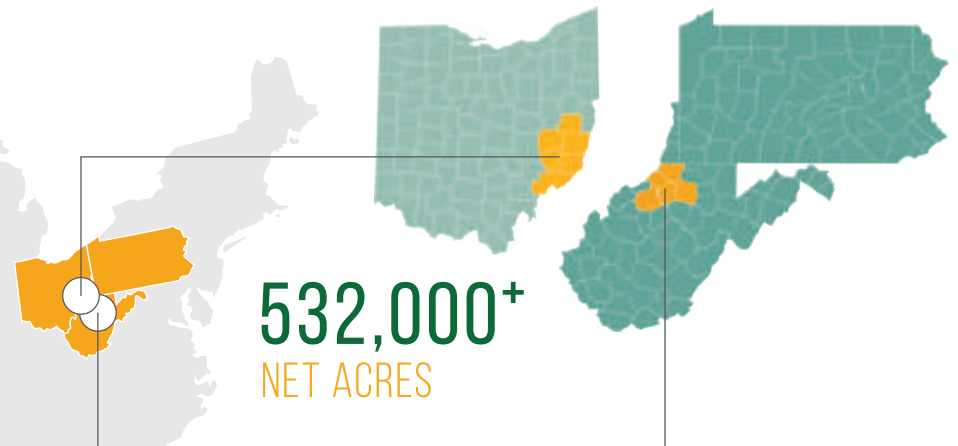


LARGEST PRODUCER EXPORTER OF NGLs IN THE U.S.

**AM LISTED NYSE**

OWNS 29% OF ANTERO MIDSTREAM—INTEGRATED GATHERER, PROCESSOR, WATER PROVIDER

Antero Resources (NYSE: AR) is an independent natural gas and natural gas liquids producer engaged in the acquisition, development, and production of unconventional properties located in the Appalachian Basin. In conjunction with its affiliate, Antero Midstream (NYSE: AM), Antero is one of the most integrated natural gas companies in the U.S.







# REPORT HIGHLIGHTS

## 2025 GOALS

### CONTINUED ENVIRONMENTAL IMPROVEMENT



**50% Reduction** in already low methane leak loss rate to under 0.025% by 2025



**10% Reduction** in GHG Intensity by 2025

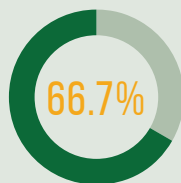


Endeavor to Achieve **Net Zero Carbon Emissions** by 2025



Align with TCFD and SASB Guidelines in meantime

### STRONG GOVERNANCE



Independent Directors



Formed **ESG Committee** of Board to Guide and Govern ESG Initiatives



Proactive Engagement with Shareholders Regarding ESG Performance and Management Compensation

### GENDER DIVERSITY

33% of Independent Directors are **Female**

22% of Directors, SVPs, and VPs including Head of Operations, Head of Geology, Chief Accounting Officer, and General Counsel are **Female**

### COMMUNITY ENGAGEMENT



Contributed **\$570,000** to Community and Civic Organizations in 2019



**3,200 Employee** Hours Volunteered in 2019



## REPORT HIGHLIGHTS



One of the Lowest **GHG Emission Intensity Metrics** in the Industry in 2019



**0.046% in 2019**  
One of the Lowest **Methane Leak Loss Rates** in the Industry



**100%** of Fresh Water Used was **Transported by Pipeline**



Water Pipeline **Eliminated 590,000 Truck Trips** in 2019



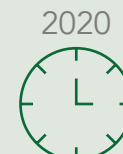
**88%** of Total Produced Water Generated was **Reused in 2020**



**41%** of Total Water Used is **Recycled and Reused** Water YTD



**Near Zero**  
Natural Gas Flaring



**0.026 Lost Time Incident Rate**  
in 2019, one of the Lowest in the Industry  
7,556 Employee Safety Training Hours





## SUSTAINABILITY LEADERSHIP, STRATEGY, & GOVERNANCE

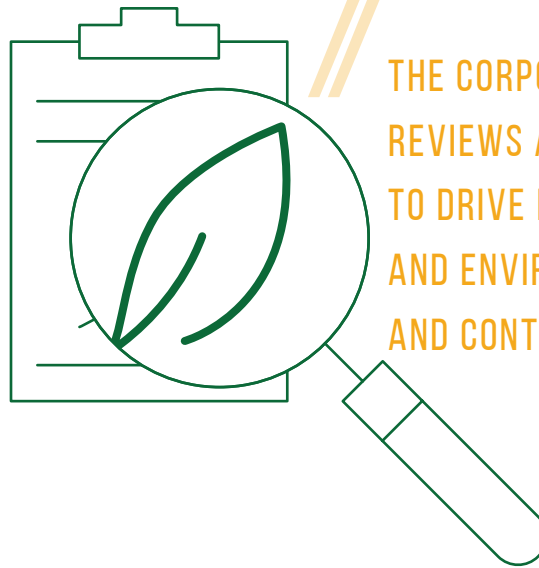
Our forward-looking, beyond-compliance, and proactive approach allows us to assess and manage risks and opportunities effectively. Management employs prospective strategies to mitigate risks and reduce the impact on people, the environment, and the community. The company relies upon technical expertise and an experienced employee base to drive solutions and innovation related to risks and opportunities.

In 2019, we continued to focus on managing greenhouse gas emissions, reusing produced water from our operations to reduce fresh water use, and the health and safety of our employees and the public. We focused on enhancing our safety and environmental management systems and continued open, honest, and transparent dialogue with our shareholders, communities, industry peers, and regulators. Our plan for 2020 includes continued improvement of our management systems, developing a disclosure strategy to align with both the Task Force for Climate-related Financial Disclosures (TCFD) guidelines and the Sustainability Accounting Standards Board (SASB).



## OUR LEADERSHIP

HSSE leadership at Antero starts at the very top of the organization, with executives and senior management driving the HSSE culture of the company. A focus on health, safety, security, and preservation of the environment (HSSE) puts people and the community first. It also makes good business sense. Dedicated environmental stewardship and a strong safety culture reduces risk and enhances productivity. We have earned a reputation as a safe and environmentally responsible operator through continuous emphasis on our HSSE performance. This reputation also makes Antero an employer of choice in Appalachia.



THE CORPORATE SUSTAINABILITY COMMITTEE (CSC) REVIEWS AND PROVIDES FEEDBACK ON HSSE INITIATIVES TO DRIVE IMPROVEMENT IN OUR EVOLVING SAFETY AND ENVIRONMENTAL WORK PRACTICES FOR EMPLOYEES AND CONTRACTORS.





Corporate and field senior staff members, including the Chairman/CEO and President/CFO for Antero Resources, congregate weekly in an Antero operations meeting which begins with reviews of Antero HSSE incidents, incident rates, and initiatives. The tone for our safety culture and environmental sensitivity is set at the top of the organization.

Antero's senior management actively participates in committees like the Corporate Sustainability Committee (CSC) and the Field HSSE Committee (FHSSEC). The CSC consists of the Chief Administrative Officer/SVP of Appalachian Region, SVP of Production, VP of Operations, and VP of HSSE, along with other key senior staff. The CSC committee reviews and provides feedback on our HSSE initiatives to drive improvement in our evolving safety and environmental work practices for employees and contractors. The CSC meetings are well attended and occur quarterly.

The Field HSSE Committee consists of thirty key senior field staff who are responsible for reviewing and updating new programs and technology in support of Antero's commitment to achieving the best safety and environmental practices in the industry. This Antero committee meets once a quarter to review relevant items from Antero's safe and environmental work practices, management of change, safety and environmental data systems, and key leading and lagging performance indicators. The FHSSEC presents new initiatives to the CSC for approval.



## OUR STRATEGY

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Commitment to the health and safety of our employees, security of our assets, and preservation of the environment are all core values of our organization and essential to our ability to add sustainable value as a business. We focus on maximizing shareholder value, while maintaining a heavy commitment to health, safety, security, and the environment.

Antero Resources is committed to the following:

- 🗨️ Conducting our business in compliance with applicable health, safety, and environmental (HSE) laws, rules, and regulations
- 🗨️ Using natural resources and energy efficiently
- 🗨️ Expecting every employee and contractor working for, and on Antero Resource's behalf, to share our values and commitment to Zero Incidents, Zero Harm, Zero Compromise
- 🗨️ Proactively working and operating to protect our people, the community, the environment, and our assets
- 🗨️ Empowering employees through our HSSE Leadership model which encourages people to speak up about safety, security, and environmental concerns, and take responsibility for their actions through our Stop Work Authority program
- 🗨️ Implementing and monitoring continual improvement workflows necessary to create quantifiable, resilient HSSE programs (the "HSSE Management Systems")
- 🗨️ Investing in HSSE training and coaching, promoting risk assessments, and encouraging visible HSSE leadership
- 🗨️ Reducing emissions, releases, and increasing efficiency by evaluating and implementing new technologies while continually improving our designs and workflows



- 🗨️ Maintaining emergency preparedness systems and Crisis and Field Incident Management Teams (IMT)
- 🗨️ Monitoring and reporting sustainability performance regularly
- 🗨️ Conducting routine assessments and inspections to assess and improve our performance
- 🗨️ Minimizing waste at the source and, when generated, to handle such waste in an environmentally safe and compliant manner
- 🗨️ Engaging with investors, customers, employees, contractors, local communities, regulatory agencies, surface and mineral owners, and peers to provide an opportunity for transparent dialogue, information sharing, and problem solving

Our risk management process involves a review of short and long-term risks. Quarterly, the risk lead for each department identifies and reviews new and previously identified risks and proposed mitigation actions, and presents them for approval by the department vice president or senior vice president. Upon approval, the Internal Audit, Compliance, and Risk Department compiles all risks for tracking purposes. Annually, we discuss long-term risks with the executive team and incorporate them into the company risk register. We present a full update of short- and long-term risks to the Board of Directors regularly, and have more substantive conversations with the Board on a specific risk area at least three times in a year.





## CORPORATE GOVERNANCE

Antero's corporate governance foundation is laid in its Certificate of Incorporation; By-Laws; Audit, Compensation, Nominating and Governance and ESG Board Committee Charters; and in its Corporate Code of Business Conduct, its Financial Code of Ethics and its Corporate Governance Guidelines, each of which are publicly available on our website.

The Board of Directors of Antero Resources has delegated advisory authority to the Environment, Sustainability, and Social Governance (ESG) Committee, a committee of independent directors appointed by the Board on matters relating to ESG, including climate-related risks. The purpose of the ESG Committee is to:

- ☞ Provide guidance to the Company and its Board on matters relating to the identification, evaluation, and monitoring of environmental sustainability, corporate citizenship and social and political trends, issues, and concerns
- ☞ Oversee and provide advice on improvements to corporate sustainability or other public policy initiatives, policies, and practices to enhance its alignment with, and promote the achievement of, the Company's strategy in a manner consistent with its values
- ☞ Advise the Board and management on significant public policy issues that are pertinent to the Company and its stakeholders

The ESG Committee meets regularly throughout the year.

Members:

Vicky Sutil – Chair | Robert J. Clark | Benjamin A. Hardesty | Jacqueline C. Mutschler



## COMMUNITY & STAKEHOLDER ENGAGEMENT

Antero's economic impact in North Central West Virginia and Southeast Ohio is significant. With 276 direct employees and more than 3,000 contract personnel, the company is a meaningful contributor to regional employment. Further, Antero paid \$680 million in royalties and lease bonuses, and \$121 million in severance, ad valorem and sales tax in 2019 – enabling state and municipal governments to provide needed services to West Virginians and Ohioans.

Antero is committed to generating solutions to community issues, promoting economic opportunities, and building relationships with people in the communities where we operate to help those communities develop and thrive. Antero's senior management team proactively responds to concerns logged in a dedicated system for monitoring social issues. We expect our employees to be kind, courteous, and good neighbors to those in the community.

A high level of engagement with our customers, employees, contractors, local communities, regulatory agencies, surface and mineral owners, shareholders and bondholders, and peers is critical to our success. Open dialogue with our stakeholders about important issues creates opportunities for information sharing and problem solving. The following are ways we maintain and build stakeholder engagement:

- ① Antero provides investors, via our website, with financial presentations, SEC filings, and press releases. Antero senior management attends equity and bond conferences, meets with institutional investors, and communicates to investors interested in sustainability issues. Antero's Investor Relations team maintains contact with investors on an ongoing basis and responds to investor requests for sustainability information.



- ① Antero engages contractors through daily tailgate meetings, site orientations, recognition programs, training, and performance management through a vendor management service. Antero holds an annual Contractor HSSE conference in West Virginia to provide relevant training, new HSSE initiatives, and recognition for performance to our contractors and vendors. Antero held a hands-on environmental workshop for its contractors in 2019 to focus on sustainability and regulatory compliance issues.
- ① Our communities include emergency management agencies (EMAs), residents, and elected officials. We promote transparency by providing tours of our facilities to local and state officials, including during active drilling and completion operations. We meet regularly with EMAs to discuss emergency preparedness plans and conduct drills. Antero has donated emergency response equipment to EMAs. For the past several years, we sponsored the Emergency Management Association of Ohio spring conference.
- ① Antero meets with local, state, and federal regulatory agencies regularly. Our engagement includes discussing regulatory issues and sharing lessons learned, and current industry perspectives.
- ① We work with state and local elected officials to serve their constituents through job creation, environmental stewardship, and community development. We provide technical marketing expertise to state development offices eager to capture the downstream economic growth that comes from natural gas liquids. We sit on boards, panels, and sponsor conferences, all working toward stimulating the Appalachian economy.





- ① Antero employees serve on local county oil and gas task forces. Some examples of local task force initiatives include operational traffic curfews to avoid interacting with school bus traffic on local roads, traffic planning programs, provision of pilot vehicles to guide traffic on rural roads, and road repairs.
- ② Feedback received from our 24/7 hotline goes to our Community Relations team for review and resolution. Antero implements operational best practices in response to community feedback. Examples include the restricted use of Jake brakes by commercial vehicles, the placement of flaggers and escort vehicles in high volume traffic areas, and the use of dust suppressant to mitigate dust on roads with heavy traffic. Since 2013, Antero has spent over \$200 million on local road maintenance and upgrades.
- ③ Before building any site, Antero's land agents meet with surface owners to negotiate their land use. Once agreements are in place, Antero conducts impact studies to mitigate concerns such as light, noise, dust, vibrations, odor, and traffic in the design of the site. Measures to combat those concerns include the installation of sound walls and light shields, and the use of dust suppressant.
- ④ Antero provides snow removal and ice control to many of the communities where we operate, relieving some financial impact on local WVDOH and county offices. Often, several pads are built off one access road, keeping drilling and completion equipment moves on lease roads, and off state and local routes. When feasible, we perform operations simultaneously to lessen the timeline for disruption in the community.



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Antero's Community Relations hotline is a telephone and email system that collects reports of issues such as noise, dust, speeding, road maintenance, and property damage. Our hotline contact information is broadly distributed to surface owners, at community events, on social media, and provided to our vendors. We make every effort for a live representative to answer calls made to the hotline during regular business hours, or return calls within 24 hours. Complaints are assigned to the appropriate department for review and resolution. A site visit is often scheduled to investigate further. Our Community Relations staff has broad authority to address problems and dedicate resources. We consistently follow up with each caller to discuss our response and resolution before closure.

We proudly invest in our communities and charitable and civic groups. Antero donated \$570,000 to local causes and organizations in 2019.





# THE ANTERO FOUNDATION

The Antero Foundation was established to cultivate Antero's rich history of charitable giving. It focuses on expanding community involvement and cultivating new charitable partnerships, while ensuring future giving aligns with Antero's core values of protecting our people, communities, and the environment.

## MISSION AND AREAS OF FOCUS

**Mission:** We strive to build thriving and healthy communities by supporting nonprofit organizations where Antero operates, and where our employees work and live.

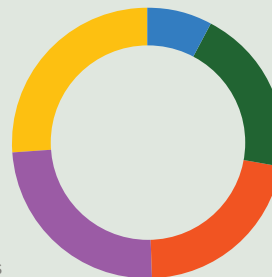
**Areas of Focus:** Education, Community Development, Health and Human Services, Environmental Causes, Arts, and Culture.

**Geographic Focus:** We focus our giving on communities located in West Virginia and Ohio. Additional geographic areas may be added from time to time, should Antero's operational area diversify, and as determined by our Board of Directors.

## HISTORICAL GIVING

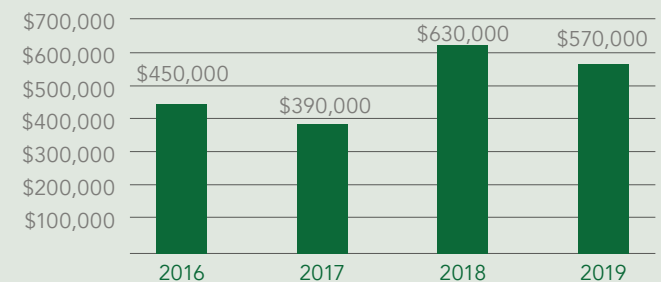
Antero Historical Giving:  
\$2.0 million over previous four year period

- Environmental Causes \$160,000
- Arts and Culture \$410,000
- Community Development \$440,000
- Education \$500,000
- Health and Human Services \$530,000



## FUTURE GIVING

Approximately \$500,000 annually











## ENVIRONMENT

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Stewardship of the environment is a fundamental value in our overall business strategy. We strive to:

-  Proactively manage environmental risks and hazards, and achieve or exceed regulatory compliance to protect and respect the communities and resources where we operate
-  Minimize our impacts on the environment and natural resources
-  Improve overall performance by utilizing a plan-do-check-act model, core to our environmental management system
-  Actively work with the regulatory community, industry trade associations, and the localities where we operate, to achieve beneficial environmental outcomes





## ENVIRONMENT

# ENVIRONMENTAL MANAGEMENT SYSTEMS

Antero's Environmental Management System (EMS), influenced by the ISO 14001:2015 standard, establishes requirements for managing environmental risks and compliance requirements. Antero's management fully supports the EMS, which applies to all employees and contractors working for, or on behalf of, Antero. The EMS is a constantly evolving tool for Antero.

As part of the plan-do-check-act process, we focused our improvements to the EMS by measuring overall environmental performance and providing weekly updates to management on environmental and regulatory targets, established by Antero's senior management. Environmental and regulatory metrics and targets including greenhouse gas metrics are part of our EMS.

The EMS has 11 elements, which are:

1. Environmental Leadership, Compliance, and Commitment
2. Organization, Roles, and Responsibilities
3. Risk and Hazard Assessment/Risk Registers
4. Incident Reporting and Investigation
5. Training and Competency
6. Document Management
7. Emergency Preparedness and Planning
8. Communication Planning
9. Environmental Compliance Program
10. Standard Operating Procedures and Guidance
11. Performance Measurement and Evaluation

Employees can view and access the Environmental Management System via the company's intranet.



## RISK AND HAZARD ASSESSMENT AND RISK REGISTERS

Our risk and hazard assessment programs document potential environmental and regulatory risks for each phase of operation in our risk register. Antero's proprietary risk matrix quantifies potential risks and impacts to our employees, contractors, assets, and communities. Antero uses the risk matrix during a risk assessment to define the level of risk by considering the probability against the severity of the consequence. The risk matrix is a simple mechanism to increase the visibility of risks and assist management decision-making.

## INCIDENT REPORTING SYSTEM

Environmental and near miss incidents are reported and tracked in our incident reporting system, per the requirements of the incident reporting system detailed under the Health & Safety section.

We identify factors that contribute to the incident and develop a comprehensive plan with corrective and preventive actions to prevent reoccurrence.

We track regulatory agency interactions in our incident management system. We define regulatory agency interactions as interactions with a regulatory agency that are proactive in nature or have resulted in a request for corrective action. Tracking and trending this information allows us to evaluate the issue and apply corrective and preventive actions across our operations. This information is presented to the CSC quarterly as part of our overall HSSE performance metrics.





## ENVIRONMENTAL TRAINING

Antero conducts extensive training on relevant environmental and regulatory subjects. Our subject matter experts receive and conduct training in their area of expertise. We provide training across operations and other ancillary service teams to provide an understanding of what is required and how to assure compliance. The HSSE team conducts training and provides regular updates to its contractors and employees at tailgate, weekly, monthly, and annual meetings. In 2019, the Environmental team held a field workshop for its contractors to review requirements, best practices, and evaluate performance towards our environmental goals.

## EMERGENCY PREPAREDNESS AND PLANNING

Our HSSE teams work collaboratively on emergency preparedness and planning and utilize the same processes and procedures identified under the Health and Safety section. Environmental team members are often first to respond to spills and releases. We conduct and participate in emergency response scenario drills with regulatory agencies, local EMAs, and other operators. Antero has placed spill equipment throughout its operational area to allow for a swift response and environmental impact mitigation.



## CONTRACTOR COMPLIANCE

Antero's Contractor Compliance Program strives to verify work performed at Antero sites meet Antero HSSE minimum expectations. Antero collaborates with a leading third-party data management service to collect and evaluate environmental and regulatory compliance information from our contractors. We apply our unique risk profile and grading specifications to the data to review contractor performance against Antero's expectations. Per master agreements, Antero requires that each contractor and service provider develop, and are fully compliant with, their own environmental risk, hazard mitigation, and incident management programs, and have policies in place to ensure their compliance with relevant environmental laws prior to performing work for Antero.



## ENVIRONMENT EMISSIONS

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Antero is focused on managing and reducing its greenhouse gas and air pollutant emissions. We participate in voluntary emission reduction programs, report our emissions of greenhouse gases (GHGs), including methane, criteria and hazardous air pollutants, and continuously evaluate the feasibility of emission control and mitigation technologies to be implemented across our operations.

In 2019, we reported our GHG and methane emissions to our management and board of directors. The commitment and oversight of our executives and board of directors drive our actions to reduce and mitigate emissions and climate-related risks. We reported a climate-related risk discussion in our [Form 10-K](#).

We set a goal of reducing our methane leak loss rate by 50%, to under 0.025%, and reducing our GHG intensity by 10% by 2025. We also endeavor to reach net zero Scope 1 carbon emissions by 2025. These goals will be achieved through the implementation of operational improvements, work practices, technologies, and through the purchase of carbon credits.

In 2020, we plan to integrate climate-related risks into our existing risk management system and align our disclosures with the Task Force for Climate-related Financial Disclosures (TCFD) guidelines and the Sustainability Accounting Standards Board (SASB) standards for the Oil and Gas Exploration and Production sector.





## ENVIRONMENT / EMISSIONS

# GHG & AIR POLLUTANT EMISSIONS

Antero's GHG intensity decreased 39% between 2016 and 2019, even though gas and liquid production volumes increased materially each year. We attribute this significant improvement to our commitment to GHG emission reduction practices.

**TABLE 1: GHG EMISSIONS INTENSITY**

	2016	2017	2018	2019
GHG Emissions Intensity <sup>1,2</sup> metric tons CO <sub>2</sub> e/MMscfe	0.61	0.57	0.44	0.38
GHG Emissions Intensity <sup>1,3</sup> metric tons CO <sub>2</sub> e/MBOE	3.69	3.40	2.67	2.26
Methane Leak Loss Rate <sup>4</sup> %	0.048%	0.050%	0.055%	0.046%
Gas-equivalent Production <sup>5</sup> MMscfe	689,668.1	805,743.2	960,253.7	1,122,219.4
Oil-equivalent Production <sup>6</sup> MBOE	114,944.7	134,290.5	160,042.3	187,036.6

1. RY2016, RY2017 and RY2018 emissions intensities have been updated from previous reports to utilize a more representative calculation methodology.
2. The GHG Intensity ratio is calculated by dividing the metric tons of CO<sub>2</sub>e reported to the EPA under Subpart W by the gas-equivalent of production (MMscfe). This includes produced gas and liquids. This is a change from years past.
3. The GHG Intensity ratio is calculated by dividing the metric tons of CO<sub>2</sub>e reported to the EPA under Subpart W by the oil-equivalent of production (MBOE). This includes produced gas and liquids. This is a change from years past.
4. The methane leak loss rate is calculated by dividing methane emitted by the methane produced. The methane leak loss rate represented in this report conforms with the ONE Future calculation protocol.
5. Gas-equivalent of production in MMscfe includes gas and liquids.
6. Oil-equivalent of production in MBOE includes gas and liquids.



Scope 1 emissions are a result of our production of natural gas. They are direct emissions that occur at our facilities during drilling, completions, and production. Antero reports under the EPA's Greenhouse Gas Reporting Program (GHGRP). As part of the requirement, Antero discloses Scope 1 direct GHG emissions covered under the GHGRP at a basin-wide level (Appalachian Basin and Appalachian Basin Eastern Overthrust) to EPA. Antero also discloses methane emissions as part of total organic compounds released to the Ohio EPA. We calculate emissions using a combination of actual measurements, engineering calculations, and emission factors, as required by each reporting program. The following table presents our total GHG Scope 1 emissions as CO<sub>2</sub>e, the applicable GHGs covered under the Kyoto Protocol, along with other metrics requested in SASB EM-EP-110a.1.

**TABLE 2: GHG SCOPE 1 (SASB EM-EP-110A.1)**

	2016	2017	2018	2019
Total GHG Scope 1 Emissions <sup>1,2,4</sup> metric tons CO <sub>2</sub> e	424,139	456,889	427,049	422,132
Total Carbon Dioxide (CO <sub>2</sub> ) Emissions <sup>1</sup> metric tons CO <sub>2</sub> e	290,362	292,138	223,226	219,712
Total Methane (CH <sub>4</sub> ) Emissions <sup>1,3</sup> metric tons CO <sub>2</sub> e	133,402	164,288	203,335	201,998
Total Nitrous Oxide (N <sub>2</sub> O) Emissions <sup>1</sup> metric tons CO <sub>2</sub> e	374.7	463.0	488.4	421.1
% Gross Scope 1 Emissions from Methane	31.5	36.0	47.6	47.9
% of Emissions Covered under Emission Limiting Regulation	1.3	0.3	0.6	0.3

1. IPCC 4AR GWP.

2. Total GHG emissions are based on emissions reported to the EPA under Subpart W. RY2017 and RY2018 emissions have been updated from previous reports to utilize a more representative calculation methodology.

3. Methane emissions have been updated from previous years to reflect the value in CO<sub>2</sub> equivalent (CO<sub>2</sub>e). CO<sub>2</sub>e= CH<sub>4</sub> x 25.

4. Antero does not emit hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride.





Total GHG Scope 1 emissions have consistently declined since 2017 and were below 2016 levels in 2019. Emission sources covered under an emission limiting regulation, NSPS OOOO/OOOOa, include tanks, fugitive components, and completion activities. Since the EPA regulates these emission sources to limit their associated emissions it results in a very small percent of our Scope 1 emissions.

Antero's 2019 Scope 1 emissions can be broken into five categories: combustion, vented emissions, fugitive emissions, flared hydrocarbons, and process emissions. Figure 7 shows the breakdown of emissions in each category.

Figure 7: 2019 Scope 1 Emissions (CO<sub>2</sub>e)



The main source of Scope 1 emissions is from combustion activities that occur during drilling and ongoing production activities followed by venting emissions from pneumatic devices and liquids unloading after wells are brought online. Emissions from flared hydrocarbons are negligible. As described under the Emission Mitigation Efforts section, Antero does not flare saleable quality natural gas as a way to manage or dispose of the product.



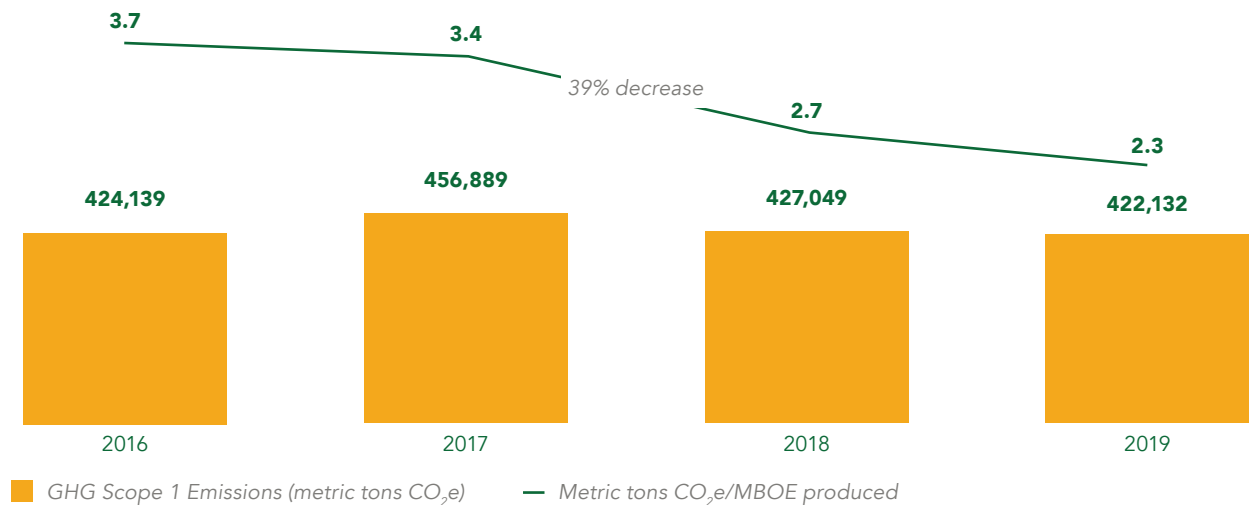


Antero's short-term strategy to manage Scope 1 emissions includes:

- ☀ Our GHG/methane reduction team meets quarterly to discuss emission reduction opportunities
- ☀ Subject matter experts stay abreast of leading technologies and research from the science community
- ☀ Participation in voluntary emission reduction programs
- ☀ Monitoring of state and federal regulations

We have explored and implemented a number of emission reduction initiatives due to the efforts outlined above. Figure 8 shows a steady decline in our GHG Scope 1 emission levels and emission intensity. A list detailing these initiatives is provided under the Emission Mitigation Efforts section. (EM-EP-110a.3.)

Figure 8: Total GHG Scope 1 Emissions and GHG Emission Intensity





Scope 2 emissions are a result of the electricity usage required to power Antero’s operations. A third party entity, typically a utility, generates these emissions at their facility. A summary of our Scope 2 emissions for the previous three years is in the following table.

### TABLE 3: GHG SCOPE 2 EMISSIONS

	2017	2018	2019
Total GHG Emissions <i>metric tons CO<sub>2</sub>e</i> <sup>1,2</sup>	3,525	4,129	5,112

1. World Resources Institute GHG Protocol: Scope 2 Guidance.

2. eGRID2018 average emission factors.

Scope 3 emissions are a result of consumer use of our product, as well as other indirect emissions that occur as part of our supply chain. Antero is currently evaluating its Scope 3 emissions data to provide in future reports.





## CRITERIA AND HAZARDOUS AIR POLLUTANT EMISSIONS

Antero’s operations emit criteria and hazardous air pollutants (HAPs). Table 4 summarizes these emissions. We calculate air emissions using engineering calculations, emissions tests, process simulations, and EPA AP-42 emission factors.

**TABLE 4: AIR QUALITY EMISSIONS (SASB EM-EP-120A.1)**

	<b>2019</b>
NO <sub>x</sub> Emissions <i>metric tons</i>	813
SO <sub>x</sub> Emissions <i>metric tons</i>	4
VOC Emissions <i>metric tons</i>	1,151
PM Emissions <i>metric tons</i>	76
HAP Emissions <i>metric tons</i>	42

Antero’s strategies to reduce VOC emissions are the same as those to reduce methane emissions because we are controlling both pollutants in the same manner. Our reduction efforts for the remaining criteria and hazardous air pollutants include identifying operational efficiencies and taking emission sources out of service as soon as they are no longer needed.

Zero percentage of our air emissions are in or near areas of dense population because our operations are located in rural areas of West Virginia and Ohio. For this analysis, Antero compared the counties in which we operate with counties defined as part of metropolitan statistical areas, as defined by the Office of Management and Budget, and there is no overlap (at the time of that analysis).



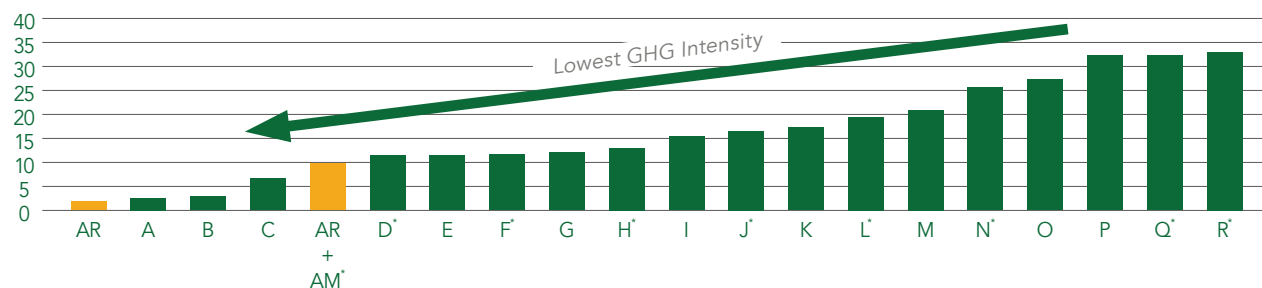
# LEADERS IN EMISSION REDUCTION



Antero actively participates in a number of voluntary programs that focus on reducing emissions: EPA Natural Gas STAR Program, ONE Future, and API’s Environmental Partnership. As shown in Figure 9, being a leader in emission reduction efforts has translated into better GHG emission intensity performance when compared to major and independent companies that report the pertinent data. Both Antero Resources (AR), and AR combined with Antero Midstream (AM), are shown in the graph since some of the companies we are comparing ourselves with are upstream only, and some have midstream operations.

Antero joined the EPA Natural Gas STAR Program in 2017. By joining the EPA program, we expanded our commitment to evaluate and implement methane reduction projects. We transparently report voluntary reductions of methane emissions and participate in information sharing and technology transfer by working with our peers to keep up with industry trends.

**Figure 9: 2019 Antero vs 2018 Industry GHG Emission Intensity** (CO<sub>2</sub>e metric tons/MBOE)



\*Company’s GHG intensity includes their midstream and/or downstream operations.

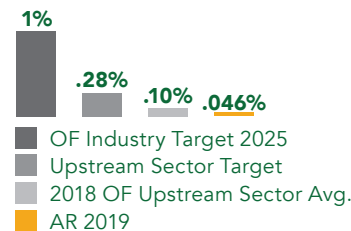
Comparisons for independents and majors who report include: BP, CHK, CNX, COP, CVX, DVN, ENI, EOG, EQNR, FANG, HES, MPC, NBL, RRC, RDS, SWN and XEC.

Source: Data retrieved from 2018 and 2019 sustainability reports or calculated from 2018 sustainability and public disclosures. Antero Resources’ intensity is based on the total GHG emissions reported to the EPA under Subpart W of the Greenhouse Gas Reporting Rule Program (GHGRP). Previous years have been updated as of 8/2020 and is subject to change.



In 2018, Antero Resources became a member of ONE Future. ONE Future is an industry collective focused on voluntarily reducing methane emissions across the natural gas supply chain, with a goal to lower emissions to 1% or less of total natural gas production by 2025. ONE Future’s target is a science-based methane emission intensity target. The target seeks to ensure that fuel switching to natural gas will create GHG reduction benefits. Antero’s methane leak loss rate was at 0.046% in 2019, which is well ahead of the ONE Future cumulative industry goal of 1.0% and the gas production segment goal of 0.28% by 2025. At 0.046%, Antero outperformed their industry peers in 2018 who had an average leak loss rate of 0.10%. ONE Future releases an annual report that is available for public review [here](#).

**Figure 10: Methane Leak Loss Rate**



In 2018, Antero Resources also joined API’s Environmental Partnership (the Partnership). Their mission is to “continuously improve the industry’s environmental performance by taking action, learning about best practices and technologies, and fostering collaboration in order to responsibly develop our nation’s essential natural gas and oil resources.” To meet this commitment, Antero conducts leak detection and repair inspections at all permitted sites. In addition, as a participant in the Partnership, Antero has committed to submit annual metrics to track the progress of our emission reductions. An annual report is released to document the Partnership’s efforts and is available to the public for review [here](#).

In 2018 and 2019, Antero participated in the CDP Climate Change questionnaire.



## EMISSION MITIGATION EFFORTS

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### LEAK DETECTION AND REPAIR:

Our methane and air emission controls include a robust leak detection and repair (LDAR) program. We repair detected leaks found during periodic inspections promptly to minimize emissions. Antero has committed to conducting LDAR surveys at all of our permitted pads every quarter. In most cases, this commitment exceeds federal and state (WV and OH) monitoring requirements. Conducting leak surveys more frequently saves approximately 920 metric tons of methane per year, which is equivalent to the electricity use of 3,894 homes for one year or 4.5 times the amount of our Scope 2 emissions. The LDAR program inspections utilize a state-of-the-art Optical Gas Imaging Forward Looking Infrared Radar camera to identify leaks. We employ two full-time technicians to conduct and record the results of the LDAR inspections. Inspections are normally conducted by an LDAR inspector and operations maintenance personnel. By dedicating a maintenance technician to LDAR, detected leaks are typically repaired during the inspection, thereby eliminating emissions as quickly as possible. If the repair cannot occur during the inspection, the leak is tracked in our maintenance ticketing software and is repaired as soon as practicable, but no later than 30 days, unless there is justification for placement on our Delay of Repair list. Antero conducts quarterly LDAR inspections at 100% of its permitted facilities. In 2019, 540 LDAR surveys were conducted, 75% of leaks identified were repaired during the inspection, and the 25% of leaks that could not be fixed immediately were repaired, on average, within 10.6 days.





## FLARING REDUCTION:

Our exploration and development activities are supported by the natural gas gathering and compression assets of Antero Midstream and by third-party gathering and compression arrangements. Our relationship with Antero Midstream allows us to obtain the necessary gathering and compression capacity for our anticipated production, which limits flaring of salable quality natural gas.

To minimize flaring emissions during completion activities, Antero utilizes balanced drill outs. This technique limits the amount of gas that reaches the surface during completions. Since the amount of gas that reaches the surface is minimal, the amount of gas required to be flared is also minimal. The minimal gas that reaches the surface is not of a saleable quality, and is destroyed by a flare with a control efficiency of at least 98%.

Antero Resources' flaring intensity (natural gas flared during drilling and completions, divided by natural gas produced) is de minimus at 0.0021%. We attribute this to the infrastructure we have in place to take the gas produced when the well is ready for production and our use of balanced drill outs.



...ANTERO UTILIZES BALANCED DRILL OUTS.  
THIS TECHNIQUE LIMITS THE AMOUNT OF GAS  
THAT REACHES THE SURFACE DURING COMPLETIONS.





### THREE PHASES OF SEPARATION AND VAPOR RECOVERY:

Antero makes every effort to capture all of the natural gas it produces and accomplishes this goal by using multiple stages of separation, along with vapor recovery units and vapor recovery towers during peak production. This engineering control minimizes the amount of working, breathing, and flashing emissions generated from the storage tanks. Emissions from the storage tanks are captured by a vapor recovery system to be sent into the pipeline, burned in an enclosed combustion device with a control efficiency of at least 98%, or a combination of both.

### ADDITIONAL GHG MITIGATION EFFORTS

- ⊗ Operation of a burner management system with three stages of pressure control to optimize combustor efficiency. We utilize combustors that are certified by the manufacturer to meet EPA performance standards.
- ⊗ Implementation and operation of three stages of pressure control on our storage tanks.
- ⊗ Use of low-pressure separators (green completion units) during initial well flowback operations to recover methane and send it down a sales line. This enables the recovery of salable product and reduces methane emissions during flowback operations.
- ⊗ Pressure relief valves are tested and repaired or replaced as necessary, reducing the amount of methane that is accidentally released.



- ☒ Periodic plugging and abandoning of certain older vertical wells that were acquired in conjunction with property acquisitions. Plugging and abandoning older, lower producing wells can reduce methane emissions.
- ☒ Transition from intermittent bleed to low-bleed and air-controlled pneumatics at all new production facilities. We installed air-controlled pneumatics on 12 pads in 2019 where purchased power was available.

Antero's GHG/Methane Reduction team, comprised of company leaders across different functional groups, reviews, analyzes, and determines whether emerging methane detection and quantification technologies can be implemented, best management practices, and new reduction technologies applicable to our operations. The standing agenda includes a discussion and status update of previously identified opportunities, new and emerging mitigation opportunities to explore, an update on our reporting and volunteer commitments, and a discussion on climate-related risks.





## ENVIRONMENT ENERGY USE

We are working to make our operations more efficient while providing a cleaner source of energy to our customers. Antero utilizes energy sources, including electricity, natural gas, and diesel for drilling and production operations. In 2019, 32.5% of the electricity Antero Resources utilized was derived from carbon-free sources (nuclear and renewables).

**TABLE 5: ENERGY USE**

	2018 <sup>1</sup>		2019	
Total Energy Use (GJ)	3,133,044		2,903,869	
Non-Renewable	3,128,430	99.85%	2,899,990	99.87%
Renewable	4,614	0.15%	3,879	0.13%
Total Electrical Use (kWh)	7,417,147		9,378,299	
Non-Renewable	6,135,562	82.72%	8,300,770	88.51%
Coal		44.60%		44.50%
Natural Gas		23.22%		22.16%
Oil		0.15%		0.22%
Other Fossil		0.35%		0.52%
Nuclear		14.35%		21.03%
Unknown or Purchased Fuel		0.05%		0.03%
Renewable	1,281,585	17.28%	1,077,529	11.49%
Biomass		0.45%		0.52%
Wind		9.37%		6.60%
Solar		0.84%		0.49%
Hydro		6.62%		3.88%
Consumed Energy from the grid		0.85%		1.16%

1. 2018 data has been updated from previous report to represent better available data and utilize a more representative calculation methodology.






## ENVIRONMENT



# NATURAL RESOURCES & BIODIVERSITY

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Antero highly values streams and wetlands, rare, threatened, or endangered species, and cultural resources. We strive to contribute to the maintenance of healthy and diverse ecosystems and communities in the areas where we operate. Our natural resources and biodiversity policy outlines our approach and framework for assessing projects in areas of high ecological and cultural importance to ensure that management of biodiversity is integrated into our project development and operations throughout their lifecycle. We are committed to continuously assessing and managing our environmental risks to minimize impacts on the diverse ecological systems that exist where we operate, in accordance with the applicable regulatory requirements and through the implementation of one or more of the following approaches:

-  **Avoidance** – We evaluate proposed project scopes to identify avoidance options by working with the surface owner(s), design, and construction teams to consider primary and alternative locations and scope and/or timing of project construction to avoid impacts to a vulnerable species and/or sensitive ecosystems. We survey medium to high probability areas for potential cultural sites and avoid identified sites.
-  **Minimization** – We evaluate minimization options by working with the landowner, design, and construction teams to consider proposed project constraints that may require primary and alternative locations and scope and/or timing of project construction to avoid impacts to a vulnerable species and/or sensitive ecosystems, and known cultural sites, when possible. To the extent possible, projects are designed to utilize existing rights-of-way and avoid biologically diverse, protected, or other sensitive areas.
-  **Restoration** – During planning and post-construction, we work with the surface owner(s) to conduct on-site restoration to the extent practicable, to reestablish an ecosystem’s composition, structure, and function to maintain a healthy state





- ✿ Mitigation – We develop and achieve measurable conservation outcomes that can mitigate unavoidable impacts after appropriate avoidance, minimization, and restoration measures have been applied

In the planning, development, and construction process, Antero takes measures to:

- ✿ Understand and comply with laws and regulations intended to protect and preserve the ecosystems in which we operate, including the requirements to conduct baseline studies and impact assessments
- ✿ Train employees on the importance of environmental protection and provide information on the species or habitat sensitivities on the location or project which they are working
- ✿ Engage with stakeholders on biodiversity issues pertaining to our proposed, new and ongoing operations
- ✿ Implement industry best practices and lessons learned from previous projects





Antero evaluates the impacts of projects in critical habitats or other areas with recognized high biodiversity value and High Conservation Value areas.

We perform an extensive desktop analysis in the early planning stages, utilizing the project's proposed limits of disturbance (LOD). We developed a checklist to document the results of our project research. We utilize tools, regulations, and guidance provided by regulatory agencies such as the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service (USFWS), West Virginia and Ohio State Historic Preservation Office (SHPO), Ohio Environmental Protection Agency, WV Division of Natural Resources (WV DNR), Ohio Department of Natural Resources, WV Department of Environmental Protection, WV DNR Office of Land and Streams, and





county floodplain ordinances. Antero evaluates an expanded area of interest (AOI) beyond the proposed limits of disturbance of a project (e.g., 150 feet in both directions from the outer limits of disturbance on linear projects and 150 feet from the outer limits of disturbance of non-linear projects). Through this analysis, we consider and evaluate the following:

-  Known aquatic features and hydric soils, utilizing the USFWS National Wetland Inventory (NWI) and Natural Resources Conservation Service Soil Web Soil Survey, occurring within an expanded AOI
-  Threatened, endangered or otherwise protected species and their designated critical habitat as defined in our Protected Species Matrix utilizing the USFWS Information for Planning and Consultation online tool (IPaC) and our environmental viewer, an internal environmental mapping tool displaying state-protected aquatic species' habitat locations occurring within an expanded AOI
-  Known cultural resources finds and other medium and high probability sites for historic properties by utilizing historical aerial photographs, U.S. Geological Survey (USGS) maps, our internal GIS viewer (which shows landscape types more likely to have a high probability of cultural finds), and state SHPO viewers
-  Federal Emergency Management Agency data to determine if the project is in a floodplain



- 🌱 How earthmoving and grading activity may affect stormwater runoff, in order to develop erosion and sediment control plans to protect aquatic resources
- 🌱 Determine whether the project LOD occurs in a Total Maximum Daily Load watershed
- 🌱 State protected waters
- 🌱 Sensitive areas or sites of concern identified during this stage of project planning

Following the desktop analysis and upon receipt of landowner permission, we conduct a field assessment to investigate and evaluate the aforementioned resources further. During this subsequent investigation, a Qualified Wetland Professional (and, if applicable, a Protected Species and Habitat Specialist and Cultural Resources Specialist) conducts a field assessment of the proposed project area. We maintain historical project data in our internal environmental viewer and mapping system, which allows us to better plan for future project construction in our operational areas. When impacts are unavoidable, we consult with the appropriate state and federal agencies on a permitting strategy that incorporates minimization, restoration, and offsetting of the potential impacts.

Only 34% of proved reserves is in or near sites with protected conservation status or endangered species habitat. We evaluated a number of data sets for this determination, including available mapping of protected mussels, aquatic buffers, NWI, IPaC analysis, and terrestrial habitat preservation and restoration from the WV Watershed Resources Registry. (SASB EM-EP-160.a.3)

Antero implements best management practices in its construction and development activities. For example, when we cut trees for projects, they are stacked strategically





to enhance wildlife habitat. During the initial assessment and before construction, all aquatic features are marked with flagging. We stabilize and reseed the rights-of-way with seed mixes that provide habitat and food sources for wildlife.

Antero understands the importance of cultural resources. If there is a federal nexus and we determine that cultural sites exist, or have the potential to exist within our project area, a third party cultural expert performs a field survey. We then work with SHPO to first avoid, and then minimize and offset impacts on cultural resources.

Often, Antero goes beyond what is required by performing voluntary due diligence on projects. At several sites, we have documented historic properties through local interviews, architectural drawings, and written accounts. Artifacts found during Antero cultural surveys are documented and returned to the landowners where they were found. If the owner does not want to retain the artifacts, Antero curates and donates them to West Virginia's Grave Creek Mound Archeological Complex or the Ohio History Connection for permanent curation.

Antero created an inadvertent discovery plan that details what to do if cultural resources are found during construction. The plan includes halting all work immediately, bringing in a cultural expert to determine if the resources are historical, and consulting SHPO if needed.



## ENVIRONMENT



# WATER RESOURCES & MANAGEMENT

The availability of water resources is critical to Antero's drilling and completion operations. Antero is committed to reducing the need for fresh water resources and increasing reuse and recycling of produced water (produced water and flowback). Our relationship with Antero Midstream allows us to obtain the necessary fresh and recycled water for use in our drilling and completion operations, as well as services to recycle and reuse, or dispose of produced water resulting from our operations.

Antero Resources utilizes an extensive network of fresh water pipelines and impoundments across our acreage, maintained and operated by Antero Midstream, to provide a reliable source of fresh water to active locations, and reduce the number of water trucks traversing local roads in and around the communities where we operate. During seasonal dry periods, Antero's fresh water impoundments provide an alternative source of fresh water to alleviate stress on local streams and reservoirs in these low flow times of the year.

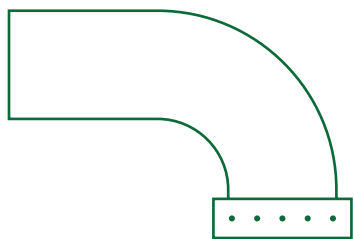
Operational improvements and recycling/reuse initiatives are reducing the amount of fresh water needed to conduct our operations. The Pioneer Water Facility, a water blending and recycling facility, and surface water lines were added to our water-recycling infrastructure. Antero Resources recycled and reused approximately 13.4 million barrels of produced water in 2019, which was approximately 66% of the total produced water generated.





## WATER QUALITY

Antero has been testing water sources near our operations for over a decade. The protection of water quality within all areas of our operations is of the utmost importance. Antero assesses (with landowner permission) domestic water wells, springs, ponds, or streams within a 2,000-foot radius of the well pad in West Virginia and within a 2,500-foot radius of the well pad in Ohio, which goes beyond the state-required sampling distance of a 1,500-foot radius in West Virginia and Ohio. Water samples are collected by third-party environmental consultants and analyzed at state-certified laboratories. Water samples are analyzed for a list of parameters that go beyond those required by regulation in both WV and OH. Sample results are shared with the landowners and state regulators, and archived electronically by Antero.



WATER SAMPLES ARE ANALYZED FOR A LIST OF PARAMETERS THAT GO BEYOND THOSE REQUIRED BY REGULATION IN BOTH WV AND OH.



## FRESH WATER USE

Antero’s drilling operations and water withdrawals in West Virginia and Ohio have an overall low to medium water risk, according to the World Resources Institute Aqueduct Water Risk Assessment for Oil and Gas. Antero withdraws 0% of its fresh water from regions with high, or extremely high baseline water stress. Although fresh water is an abundant resource in the Appalachian Basin, Antero is committed to reducing the use of fresh water throughout all of our operations through an active produced water recycling program.

**TABLE 6: ANTERO RESOURCES FRESH WATER WITHDRAWAL** *(THOUSAND BARRELS)*

	<b>2019</b>	
<b>Total</b>		
Surface Water	43,906	98%
Water Utilities	682	2%
Groundwater	0	0%

The majority of fresh water is used in the completion of wells. However, a significant amount of fresh water is used in the drilling process to maintain the consistency of the drilling mud and to protect shallow fresh water aquifers. Additionally, we use fresh water during the construction of well pads to meet compaction standards, as well as across Antero’s roads and pads to reduce dust from truck and heavy equipment traffic.





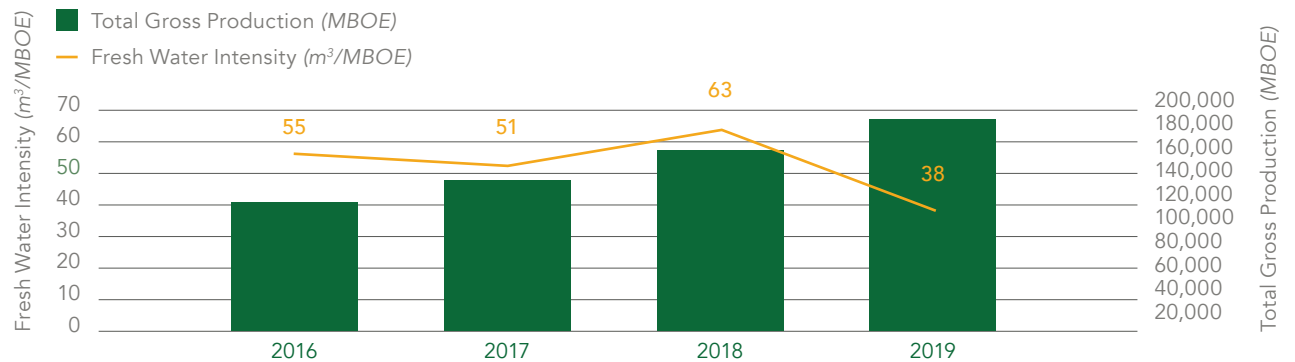
## FRESH WATER INTENSITY

Antero's fresh water intensity is calculated using the amount of fresh water withdrawn from sources listed on the previous page, in cubic meters ( $m^3$ ), divided by the net volume of natural gas Antero produced for the given year. Calculating water intensity is a conventional method for comparing water usage or consumption year over year compared to energy production. Table 7 represents Antero Resources' fresh water intensity from 2016 through 2019. Antero Resources fresh water intensity decreased by 40% in 2019, primarily due to the increased water recycling and reuse efforts across its operations.

**TABLE 7: ANTERO RESOURCES FRESH WATER INTENSITY ( $m^3/MBOE$ )**

Metric	2016	2017	2018	2019
Fresh Water Withdrawn ( $m^3$ )	6,269,415	6,888,737	10,022,668	7,077,046
Total Gross Production (MBOE)	114,945	134,291	160,042	187,037
Fresh Water Intensity ( $m^3/MBOE$ )	55	51	63	38

**Figure 12: Fresh water intensity compared to total gross production**





## PRODUCED WATER MANAGEMENT

We store produced water (primarily produced and flowback water from well pads) in temporary and permanent tanks on producing well pads. Most water is recycled and the remainder is injected into disposal wells owned by third parties. To mitigate spills and leaks, all storage tanks on producing well pads are located within secondary containment and the perimeter of the well pads have an earthen berm to prevent materials from migrating offsite, acting as tertiary containment.

In 2019, Antero Resources implemented operational changes to increase the reuse of produced water downhole in completion activities. Antero Midstream provided localized mobile treatment facilities to treat and recycle produced water from Antero operations. Antero Midstream blended treated water with fresh water and transported it, using trucks or pipeline infrastructure, directly back to an Antero Resources well pad for downhole use in completion operations. In 2019, 66% of total produced water generated was treated and reused downhole in completion operations. Year to date as of August 31, 2020, the percentage of produced water generated that was reused in operations is 88%.

Table 8 provides a summary of produced water generated by Antero Resources operations since 2017 and the various methods used to reuse or dispose of the produced water. It is important to note the increasing trend in recycled and reused water volumes and a decrease in the volume of water sent to injection since 2017.



**TABLE 8: ANTERO RESOURCES PRODUCED WATER (THOUSAND BARRELS)**

	2017		2018		2019	
<b>Total</b>	13,587		17,948		20,201	
Recycled <sup>1</sup>	2,522	19%	5,473	30%	12,395	61%
Reused <sup>2</sup>	*	0%	*	0%	958	5%
Offsite Disposal	193	1%	331	2%	201	1%
Injection	10,871	80%	12,145	68%	6,647	33%

1. Antero considers produced water treated at the centralized Antero Clearwater Facility or at local blending treatment facilities to be "Recycled" water.

2. Water taken directly to a well pad for use downhole, such as stormwater or water accumulated in secondary containment, is included under the "Reused" category.

Antero does not currently utilize residuals or waste products from the company's operations for purposes other than hydraulic fracture stimulation and brine generation for downhole use.

Antero does not dispose of its produced water by discharging to the surface or waterways. All of Antero's produced water is either treated for reuse downhole, sent for disposal via underground injection wells, or sent for solidification and offsite disposal, thereby minimizing exposure to human and environmental receptors.

Hydrocarbons are recovered to the extent feasible and sent to a used oil recycler for processing and reuse (e.g. fuel oils, heat recovery, etc.). Additional details of the oil recycling program can be found in our Waste Summary section.





Over the past two years, and in partnership with Antero Midstream, Antero Resources has dramatically increased its field level recycling and reuse of produced and flowback water. Since 2017, Antero Resources has increased the volume of produced water recycled from 2% of overall water used downhole to 41% of overall water used downhole year-to-date in 2020. 59% of water used downhole is fresh water from our fresh water infrastructure. Produced water recycling is primarily done at in-field water blending facilities.

**TABLE 9: TOTAL WATER USED DOWNHOLE** *(THOUSAND BARRELS)*

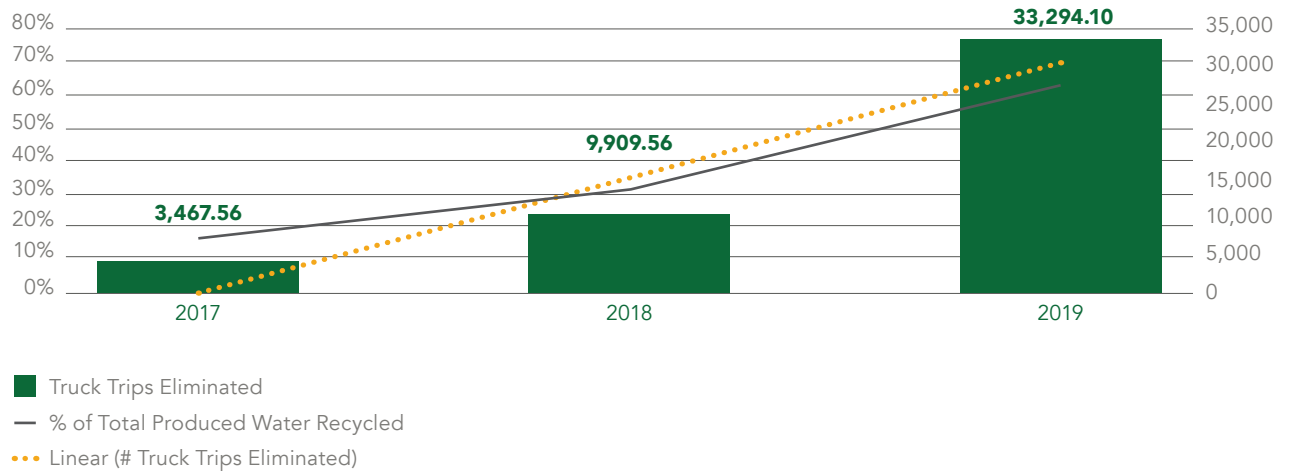
	2016		2017		2018		2019		2020 <i>(as of 8/31/20)</i>	
Total Water Used Downhole	46,568		57,343		71,868		51,853		31,897	
Fresh water	45,112	97%	56,261	98%	69,082	96%	47,369	91%	18,869	59%
Recycled Water	1,455	3%	1,082	2%	2,786	4%	4,484	9%	13,028	41%

By increasing recycling and reuse of water for downhole operations, Antero has proportionally reduced the number of truck trips on roads in and around our operating areas. From 2017 through year-to-date 2020, Antero Resources has recycled nearly 20 million barrels of produced water from its operations. This resulted in a reduction in just over 2 million miles of truck traffic on local roads. In turn, the reduced truck traffic has eliminated 8,930 metric tons of CO<sub>2</sub>e emissions since 2017. For 2019, the reduction is equivalent to carbon sequestration of 8,286 acres of U.S. forests in one year, according to the EPA equivalency calculator.



Figure 11 illustrates that in 2019, over 33,000 truck trips were eliminated as a result of increased produced water recycling and reuse.

**Figure 11: Reduction in truck trips due to increased produced water recycling and reuse**





## SPILL PREVENTION, MANAGEMENT & PERFORMANCE

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In the event of an incident, our spill response program includes a vast network of on-call spill response contractors who remediate impacted areas.








Our program includes:

- 🍃 Implementing SPCC plans in accordance with federal regulations to help prevent and minimize the impacts of spills
- 🍃 Utilizing secondary and tertiary containment systems such as:
  - Polyethylene liners for water blending and recycling activities
  - Lined secondary containments for storage tanks and equipment
  - Double-walled tanks
  - Catchments at load out areas
  - Fluid recovery systems for pigging operations
  - Skid-mounted compressors with skids capable of catching potential spills
- 🍃 Strategically placing Antero spill response trailers for large-scale incident response
- 🍃 Creating Emergency Response Plans to streamline interactions with first responders and emergency services during a large-scale incident
- 🍃 Providing training to pertinent personnel on regulatory and internal environmental programs
- 🍃 Setting goals and creating initiatives to reduce environmental incident rates
- 🍃 Using web-based programs to track environmental incidents and generate metrics which can be utilized for continuous improvement





When a spill occurs, Antero responds by determining the source and type of the spill and utilizes the following corrective actions:

-  Safely isolating and controlling the source of the spill
-  Containing spilled material to prevent migration
-  Initiating remediation activities such as removal or treatment of contaminated material
-  Analytical testing of soil/water, when necessary, to verify completion of spill remediation
-  Reporting spills to agencies in accordance with local, state, and federal regulations
-  Disposal of contaminated materials in accordance with local, state, and federal regulations
-  Internal documentation of incidents in web-based programs for reporting and metric trending

Spills are tracked and ranked according to the actual and potential risk to the environment, and based on severity, corrective actions and lessons learned are developed and communicated to stakeholders.

Antero defines reportable spills as a spill, release, or discharge to the environment that must be reported to a state or federal agency per the regulations. Antero's spill rate is defined as volume of reportable spills over the total barrels of fluid handled. Antero Resources did not have any spills occurring in the Arctic or in unusually sensitive areas.



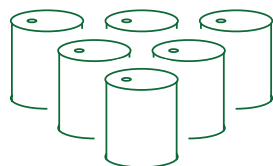
**TABLE 10: ANTERO RESOURCES REPORTABLE SPILLS**

	2017	2018	2019
Total Spills	35	13	13
Produced Water	11	3	2
Hydrocarbons	16	7	1
Other	8	2	10
Volume of Reportable Spills (barrels)	138.8	48.3	55.0
Produced Water	99.8	46.0	12.0
Hydrocarbons	20.3	1.8	10.3
Other	18.7	0.5	32.7

**TABLE 11: ANTERO RESOURCES REPORTABLE SPILLS<sup>1</sup>**

	Total Barrels Handled	Total Number of Spills	Total Volume of Spills (barrels)	Spill Rate
<b>2019</b>	216,034,169	13	54.9	0.000028%
<b>2018</b>	256,712,730	13	48.3	0.000020%
<b>2017</b>	209,405,874	35	138.8	0.000066%

Total Barrels Handled



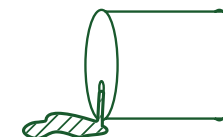
Total Number of Spills



Total Volume of Spills (barrels)



Spill Rate



1. This table has been updated from previous reports to utilize a more representative calculation methodology.

## ENVIRONMENT



# WASTE MANAGEMENT & RECYCLING

Special permits, mandates, and company responsibilities related to waste are developed at the corporate level. Waste program details, such as standard operating procedures, regulatory compliance, safe work practices, and vendor (e.g. supplier and contractors) audits, are developed at the field level and approved at the corporate level to guarantee quality and consistency. The inclusion of field level operational staff promotes a well-balanced platform to monitor and regulate waste on a day-to-day basis.

The typical waste hierarchy involves four steps: Identification & Source Reduction, Recycle/Reuse, Treatment, and Disposal. Steps are taken by operations to eliminate, minimize or recycle waste streams with oversight provided by Antero's HSSE department. Data is collected and reported at the corporate level.

### THE WASTE HIERARCHY INVOLVES FOUR STEPS:

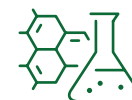
Identification &  
Source Reduction



Recycle/Reuse



Treatment



Disposal



Waste generated from all of Antero's operations are characterized, managed, and disposed of in accordance with regulatory requirements. Waste streams are primarily treated, recycled, or disposed of within the Appalachian Basin: West Virginia, Ohio, and Pennsylvania. Each state's regulatory requirements dictate the organization and direction of the disposal process. The only instances whereby waste is disposed of





outside of these three states has been for NORM/TENORM waste that exceeds the acceptance criteria for oil and gas waste, as defined by state-specific regulations. These NORM/TENORM wastes are disposed of at approved facilities outside the Appalachian region.

Prior to onboarding and regardless of waste type, disposal facilities are subject to a pre-approval process where subject matter experts perform an audit of regulatory records. Antero representatives conduct routine site visits and audits of our approved disposal facilities.

Antero tracks waste from cradle to grave, regardless of operational origin and characterization. Non-hazardous waste manifests are generated at the point of origin and signed by Antero representatives. Manifests identify the type and quantity of waste, transportation company, final disposal facility, and require signatures to identify the responsible parties. For production and flowback waters, “Bills of Lading” are used to track the same information as the non-hazardous waste manifest. Antero’s permanent facilities at well locations are equipped with electronic metering devices that send live data from the well sites to confirm produced water volumes leaving the site. The non-hazardous waste manifests and Bills of Lading are returned to Antero when the disposal facility submits its invoices, which are filed in an Antero database.

Antero’s HSSE Department has developed and implemented a Safe Work Practice as part of Antero’s identification and management of NORM/TENORMs associated with our operations, such as produced water pit cleanouts and tank cleaning operations. The



safe work practice requires Antero's contractors and subcontractors who perform or supervise work-related functions involving NORM/TENORM on Antero's assets to have a Radiation Protection Program (RPP) in place. At a minimum, their RPP shall comply with workers' and members of the public regulatory occupational dose limits, outline as low as reasonably achievable (ALARA) principles, and provide for audits to verify compliance. The level of NORM/TENORM is generally ascertained through either a dose rate survey of activity (uR/hr or mR/hr) or lab analytical samples of radionuclide concentration (pCi/g). Based on these results, Antero and our contractors will determine the most appropriate means of transport, treatment and/or disposal. In addition to the safe work practice, Antero maintains a Radiation Safety Officer, a trained, full-time employee who oversees radiation activities so that they are performed safely and in accordance with regulatory requirements, ALARA principles, and Antero's policies and procedures.

Antero's waste streams associated with the exploration, development or production of natural gas are considered non-hazardous, in accordance with EPA's Resource Conservation and Recovery Act (RCRA) Exclusion for Oil and Gas E&P Waste. There are certain activities, such as production tank cleanings, that may cause waste to be classified as a hazardous material under current U.S. DOT regulations. DOT hazardous materials require proper packaging, segregation, marking, labeling and placarding for the transport of the material, but does not dictate whether or not the material is a hazardous waste under RCRA regulations.



**TABLE 12: ANTERO RESOURCES WASTE MANAGEMENT & DISPOSAL<sup>1</sup>**

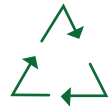
	2019	
Hazardous Waste (tons)	0	0%
Non-Hazardous Waste (tons)	145,959	100%
Landfilled	145,503	99.69%
Incinerated	0	0%
Recycled/Reused	455	0.31%

1. The above numbers do not include completions, production and water from activities such as frac tank, production tank and pit cleanouts and drill-outs. Antero started tracking these waste totals in 2018 and will be reporting them in the future. Antero does not incinerate its waste.

Antero strives to reduce residual waste from exploration and production processes whenever possible. Examples of waste reduction in drilling and completions include:

- ⇒ Closed loop systems. Drilling utilizes a closed loop system for managing our drilling residual waste in both the Marcellus and Utica plays. The closed loop system is used for both the air/mist drilled section and the fluid section. In each section, all water, brine, and oil is processed on location and reused in the drilling process. The drill cuttings are processed using solids control systems and dryers with the objective of minimizing retention of liquid residue. This reduces the amount of waste sent to the landfill.
- ⇒ Completions uses the Sand X system. This system more efficiently separates water from sand, and significantly reduces the amount of water remaining in the sand following completions. As a result, drier sand and less tonnage is sent to an approved landfill. The separated water is utilized, as noted in Antero's water management and water recycling programs.



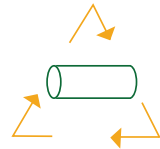


## ENVIRONMENT / WASTE MANAGEMENT & RECYCLING

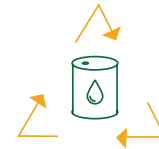
# RECYCLING

In 2019, Antero recycled or reused 455 tons of waste that included metal tubing, metal production tanks and containment liners. We also implemented a program to reuse containment liners. When operations are completed at a particular site, the containment liners are evaluated for reuse on a new site. If deemed suitable for continued use, the liners will be taken to another Antero site for use. If it cannot be reused, it is evaluated for recycling or will be properly disposed of in an approved landfill. Also, our corporate headquarter building in Denver, CO is Gold LEED Certified, and all Antero office buildings have implemented an extensive recycling program.

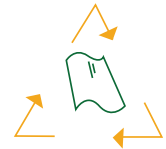
### WHAT ANTERO RECYCLES:



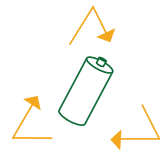
Plastic water pipelines



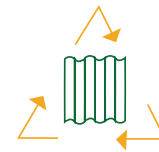
Produced Water  
(flowback & produced waters)



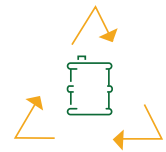
Plastic liners



Batteries, from both  
operations and office use



Metal



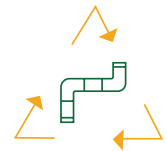
Used oil



E-waste  
(Computers, cell phones, electronics)



Office paper and general trash  
recycling



Steel pipe



## HEALTH & SAFETY

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We sponsor emergency preparedness programs, conduct regular audits to assess our performance, and celebrate our successes through the annual Contractor HSSE conference, where we acknowledge employees and contractors alike who have exhibited strong HSSE leadership during the course of the year. These efforts combine to create a culture of HSSE excellence throughout the company and positively influence our contractor community.

Through our HSSE challenge coin program, Antero leaders acknowledge individuals or groups that have demonstrated exceptional operation safety service either in an office or field environment. There are three levels of recognition in the program which include peer to peer, supervisory, and executive level recognition.

Antero meets periodically with contractors to review HSSE performance, collaboratively solve problems, address public concerns, provide an open forum, and most importantly, recognize our contractor's dedication and commitment to upholding Antero HSSE ideals.

Antero's HSSE representatives are available on site 24/7 during every significant operation, including drilling, completions, flowback, and production.





## HEALTH & SAFETY

# SAFETY MANAGEMENT SYSTEM

The Antero Resources Safety Management System (SMS) is utilized by all employees and contractors working for, or on behalf of, Antero Resources entities. The managerial principles outlined in the Occupational Health and Safety Assessment Series 45001 heavily influenced our SMS. The objective of the SMS is to establish requirements for managing health and safety risks.

The SMS is comprised of 13 elements, which are:

1. Safety Leadership, Compliance, and Commitment
2. Organization, Roles and Responsibilities
3. Risk and Hazard Assessment/Risk Registers
4. Incident Reporting and Investigation
5. Training and Competency
6. Safety Manual and Safe Work Practices/Guides
7. Security and Sustainability (Travel, Personal Safety)
8. Emergency Preparedness and Planning
9. Safety Communications
10. Occupational Health and Wellness
11. Contractor Safety Management
12. Business Continuity and Resiliency
13. Performance Measurement and Evaluation

Antero's employees can view and access the Safety Management System on the company's intranet.



## HEALTH & SAFETY



# RISK ASSESSMENT & HAZARD RECOGNITION

Risk assessments, hazard recognition programs, and risk registers are critical components of the Antero SMS. Antero utilizes a proprietary risk matrix during a risk assessment to define the level of risk by considering the probability against the category of consequence severity for an incident or risk. This is a simple mechanism to increase visibility of risks and assist management decision-making.

A Job Safety Analysis (JSA) must be completed and documented prior to the start of work on an Antero location. Antero expects each worker involved in a task, whether an employee or a contractor, be fully briefed on related hazards and acknowledge them by signing the JSA.

At the core of Antero's risk assessment and hazard recognition program is Stop Work Authority (SWA). SWA establishes the responsibility and authority of every worker on an Antero location, to stop work when an unsafe act or condition is discovered.

### SWA STEPS

**STOP** —> **NOTIFY** —> **INVESTIGATE**

—> **CORRECT** —> **RESUME** —> **FOLLOW-UP**



Antero expects mitigation of any identified risk or hazard to a level as low as reasonably practical before beginning or resuming work. Antero maintains a library of safe work practices to guide our contractors and service providers on how to mitigate any identified unsafe act or condition. These documents evolve as laws and regulatory requirements change and are updated when necessary.

In 2019, Antero developed and implemented the Take 5 Program, which supports contractors and operations while driving improvement in areas of safety performance and responsibility. The Take 5 Program demonstrates Antero's support for taking five minutes on any Antero owned, operated, or leased worksite to verify that hazards and risks associated with the job task or activity are mitigated and controlled.

**Take 5**

**Antero RESOURCES** **Antero Midstream**

Zero incidents  
Zero harm  
Zero compromise

- 1 IDENTIFY WORK BEING PERFORMED.** (i.e. identify tasks and activities, resources, tools, equipment and people on location)
- 2 PERFORM A TAKE 5 SAFETY REVIEW.** (i.e. review task or location specific JSA/ JHA/ AHA)
- 3 COACH ON SAFE/ POTENTIAL HAZARDS AND RISK MITIGATION.**
- 4 AGREE ON CORRECTIVE ACTIONS OR PREVENTATIVE ACTIONS.**
- 5 UPDATE JSA IF NEEDED.**

## HEALTH & SAFETY



# INCIDENT REPORTING SYSTEM

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Antero's incident reporting system facilitates data collection, investigations, and information tracking on incidents that occur on our sites. We identify factors contributing to the incident and develop a comprehensive plan to help prevent reoccurrence. We use incidents as learning opportunities to create safety alerts, bulletins, and reminders for distribution to our contractors.

All incidents are categorized using Antero's HSSE Risk Matrix, and are investigated to determine the root cause and contributing factors so we can take action to reduce and, where possible, eliminate factors that led to the incident or near miss. The HSSE and Operations teams review near miss incidents for systemic trends (frequency, location, phase of operation, cause) and implement corrective and preventive actions to avoid reoccurrence. We use a RACI (responsible, accountable, consulted, informed) process to assign and track completion of corrective actions. We create HSSE alerts to communicate the incident and findings to other operational groups to improve awareness, and when appropriate, to other industry parties, regulatory agencies, and first responders.

We define a 'near miss' as an unplanned event that did not result in injury, illness, or damage, inclusive of spills, but under slightly different circumstances, would have had the potential to do so. Near miss incidents are reported to the Antero operations or HSSE teams, are tracked in our incident and behavior-based safety management system, and are reported in our performance metrics. We use the same process for near miss incidents involving service providers and contractors, with the exception that the contractor completes the investigation and identifies the root cause(s) and subsequent corrective actions. Antero then verifies completion of corrective actions.



## HEALTH & SAFETY



# HSSE, SOCIAL & GOVERNANCE TRAINING

We influence safety behaviors by developing our employees' knowledge, skills, and awareness of safety-related issues, leading to improved safety performance. Our employee safety-training matrix specifies the required training for every employee job description (office and field) within the company. Safety training starts at the beginning, continues throughout an employee's career, and includes refresher training at appropriate intervals.

Antero's training process describes how we:



IDENTIFY  
TRAINING  
NEEDS



DESIGN  
TRAINING



PRODUCE  
AND CONTROL  
MATERIALS



SELECT  
OR QUALIFY  
COMPETENT  
TRAINERS



SCHEDULE  
TRAINING



DELIVER  
TRAINING



MAINTAIN  
RECORDS



MONITOR  
AND REVIEW  
TRAINING





Training is assigned to each employee through the learning management system and all completed training is tracked within their training transcript.

Antero also provides an on-site HSSE orientation, which is required for all employees and contractors who plan to visit an Antero field location. The on-site orientation describes Antero’s expectations upon arrival at an Antero location and covers topics such as general PPE requirements, training requirements, Short-Service Employees, driving on-site, JSAs, and Stop Work Authority. Employees may not perform certain tasks without required safety training.

**TABLE 13: ANTERO RESOURCES ALL EMPLOYEE TRAINING (SASB EM-EP-320A.1)**

	<b>2018</b>	<b>2019</b>
<b>HSSE Training Hours</b>	4,288	6,037
HSSE Training Hours per Employee	6.9	10.5
<b>Social &amp; Governance Training Hours</b>	2,934	1,824
Social & Governance Training Hours per Employee	4.7	3.3
<b>Total Training Hours</b>	7,221	7,556
Training Hours per Employee	11.6	13.8

*Antero Resources and Antero Midstream share employees and resources. Data is based on 547 combined employees as of December 31, 2019.*

## HEALTH & SAFETY



# EMERGENCY PREPAREDNESS & PLANNING

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Our Crisis and Field Incident Management Teams (IMT), based on the U.S. Department of Homeland Security's National Incident Management System (NIMS), incorporates existing best practices into a comprehensive national approach to domestic incident management, and is applicable at all jurisdictional levels and across all functional disciplines. This system applies across all phases of incident management: prevention, mitigation, preparedness, response, recovery, and resumption.

Antero uses the Incident Command System (ICS) designed by the NIMS. Our model of the ICS allows for a rapid, flexible, and efficient response to incidents. The ICS is modular and scalable, allowing the response to (de)escalate uniformly with the incident without loss of command continuity.

Antero's IMTs are comprised of a Crisis Commander-Corporate Activities (CC), Incident Commander-Field Activities (IC), Command Staff, and General Staff. The CC and IC are responsible for the overall management of the response, including the coordination of Command and General Staff activities. The Command Staff includes the Public Information Officer, Safety Officer, Legal Officer, Liaison Officer, and Security, Information, and Intelligence Officer.

Antero uses a notification system to communicate with external stakeholders in the event of an emergency. The third party notification system is a web-based notification service, offering immediate and simultaneous one, to many communications using wired










and wireless communication devices (telephone, SMS devices, and email). The system provides automated and remote problem-solving capabilities to improve communication in large organizations—both internally and externally. It enables the recipient to send an immediate reply to resolve an issue and/or convey a new status condition to the appropriate person(s) or groups.







The system sends time-sensitive notifications through multiple devices, including cell, one- or two-way SMS devices, and email. Messages may be sent to all communication devices at the same time, or in any defined order. Other features of the system are:

-  Delivery of notifications in real time
-  Recipients can select any number of predefined response choices
-  Allows secure storage and management of user contact data
-  Allows grouping of users to better organize contacting recipients
-  Allows grouping of notifications and delivery of unique messages to different groups of recipients and devices



Antero's company-wide pandemic, business continuity, and disaster recovery policies and procedures allow for continued communication and continuity of significant operations across the Appalachian region. During a pandemic, Antero expects employees and contractors who exhibit pandemic disease symptoms to quarantine themselves. In 2020, we implemented a work-from-home program where 85% of our workforce has worked remotely, with minimal interruption to established business processes. Our executives rely upon situation progress reports to make decisions concerning the workforce. The Antero Crisis Team works with local officials and emergency management agencies to assist with procedures for activating and terminating the pandemic response plan. Strong execution of our pandemic plan has resulted in ZERO Antero work-related COVID-19 infections to date.

Preventive measures implemented as part of our pandemic plan to combat COVID-19 include:

-  Use advanced disinfectant and cleaning processes
-  Temperature screening kiosks
-  Adaptive PPE program
-  Health questionnaires
-  Mobile testing protocols for field operations
-  Implemented a work-from-home program



## HEALTH & SAFETY

# CONTRACTOR SAFETY MANAGEMENT

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Antero's Contractor Safety Management Program strives to verify that work performed at Antero sites meet Antero HSSE minimum expectations. Antero collaborates with a leading third-party data management service to collect and evaluate health and safety information from our contractors. We apply our unique risk profile and grading specifications to the data to review contractor performance against Antero's expectations.

Per master agreements, Antero expects that each contractor and service provider are fully compliant with their own JSA, SWA, risk, hazard mitigation, and incident management programs, and have policies in place to ensure their compliance with relevant health and safety laws prior to performing work for Antero.

## SAFETY IMPROVEMENT PLANS

Antero partners with its insurance broker, to provide our contractors with a complete SMS review. We identify contractors that can benefit from a professional, third-party review of their SMS. After our insurance broker conducts the assessment, they share identified learning opportunities with the contractor.

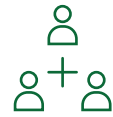




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## CONTRACTOR PROGRAM REVIEWS

Antero strives for continuous improvement of its Contractor Management program, which includes a structured review, research, evaluation, and implementation of industry best practices. We conduct a thorough review of our contractor's written safety and training programs, and leading and lagging performance indicators. We review our contractor's Department of Transportation (DOT) programs to assess compliance with regulatory requirements. We monitor a contractor's on-site performance and adherence to the regulations and Antero's site-specific procedures.



## HEALTH & SAFETY

# OCCUPATIONAL HEALTH

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Antero has adopted an Occupational Health Surveillance Program, which is a framework for evaluating impacts on Antero employees' and contractors' health. Occupational Safety and Health Administration (OSHA) regulation 29 C.F.R. § 1910.1000 contains the Z tables that list analytics or agents that have specific regulations that mandate baseline evaluation or monitored health surveillance requirements.

## DOT TESTING

Antero is a drug- and alcohol-free workplace. Per PHMSA requirements, we conduct random drug screening on 25% to 50% of employees who perform work on pipeline and liquefied natural gas facilities on a yearly basis. The company screens each of those affected employees before their first day of employment, after an accident, or upon reasonable suspicion. These drug-testing standards comply with PHMSA DOT 49 CFR, Parts 40 and 199. In addition, Antero assesses its contractor's written drug and alcohol programs including a review of the testing policy, testing techniques, and the panel of drugs screened.





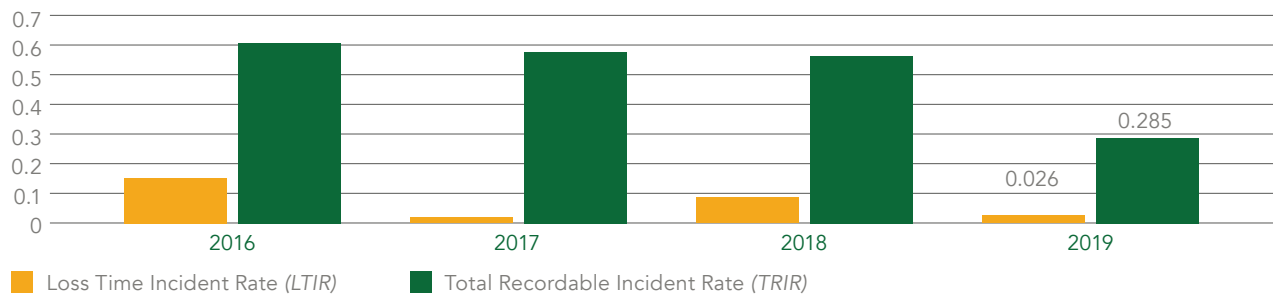
## HEALTH & SAFETY

# HEALTH & SAFETY PERFORMANCE

We track, trend, and analyze employee and contractor health and safety performance. We use leading and lagging indicators to pinpoint opportunities for improvement to our safety program. We track fatalities, lost time incidents, total recordable incidents, near misses, and their respective rates.

In 2019, Antero Resources had an employee and contractor Lost Time Incident Rate (LTIR) of 0.026, an 83% decline from 2016. Antero Resources and Antero Midstream work locations experienced zero employee or contractor fatalities, a combined employee and contractor LTIR of 0.035, a 75% reduction on a combined basis since 2016. The Antero Resources employee and contractor Total Recordable Incident Rate (TRIR) of 0.285 represents a 53% reduction from 2016. The combined Antero employee and contractor TRIR of 0.285 represents a 47% improvement since 2016. In comparison, the 2019 ISNetworld onshore oil and gas benchmark averages for our industry are 0.32 LTIR and 0.95 TRIR. As part of our behavior-based safety program, we track and evaluate near misses—those events that did not result in injury, illness, or damage, inclusive of spills, but under slightly different circumstances, would have had the potential to do so.

**Figure 12: Health & Safety Performance Metrics** (incidents per exposure hours)



TRIR is calculated as the total number of OSHA recordable injuries x 200,000 hours/# of exposure hours.

LTIR is calculated as the total number of lost time or restricted time injuries x 200,000 hours/# of exposure hours.





## SECURITY

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Antero Resources is committed to the safety and security of our organization and the communities in which we operate. We strive to plan, prepare, prevent, and recover from adverse security incidents that could injure, harm, disrupt, or affect our workers, sites, business, or communities. Through strategic alignment with our business and operational teams, we can efficiently and swiftly identify and direct resources to preserve and safeguard our assets, both tangible and intangible.

Our efforts to initiate the Security and Safety committee through our membership in the West Virginia Oil and Natural Gas Association (WVONGA) is a good example of our leadership in this area. The Security and Safety committee is a valuable collaboration of industry peers sharing information and education on mitigation and emergency response efforts related to security and crime-related matters.

Our field security personnel are certified Terrorism Liaison Officers (TLO) through the West Virginia Intelligence Fusion Center. A TLO is a public citizen of the United States trained to report suspicious activity observed during the course of their normal occupation as part of the United States' War on Terror. Our strong relationship with federal, state, and local first responders strengthens our commitment to keeping our communities and homeland safe.



## CYBER SECURITY:

The traditional model for information technology security has changed. The Confidentiality, Integrity, and Availability Triad has evolved to include Safety. Antero leverages information technology in significant ways; traditionally, in the areas of Operational Technology, and the Internet of Things. As the company's use of technology continues to advance, so do our cybersecurity strategies. Our commitment to sustainable governance and security best practices helps us navigate the ever-changing threat landscape.

We take a comprehensive and holistic approach to our cybersecurity efforts. This approach incorporates our people, processes, and technology to effectively prevent, mitigate and remediate issues.

The Board of Directors approved a Protection of Personal Identifiable Information (PII) Policy in 2019. The purpose of the policy is to protect the PII of its employees and other individuals whose PII may be collected by Antero in the course of doing business.

## HYDRAULIC FRACTURING



# WELL INTEGRITY

Antero undertakes the following practices to prevent impacts to the environment as a result of communication to nearby oil and gas wells.

During the surface hole portion of drilling, Antero employs a variety of measures to comprehensively prevent and reduce impacts to nearby wells and other environmental receptors such as groundwater resources. These measures include the following:

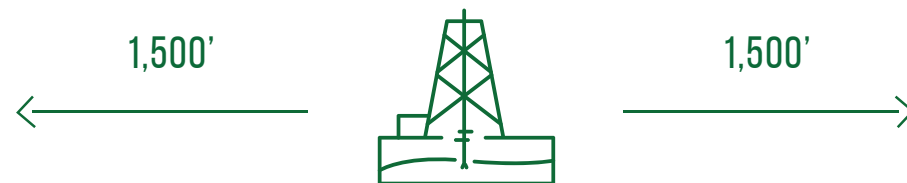
- ① Use of air instead of drilling mud to remove cuttings from the wellbore. The use of air during the drilling process significantly mitigates the potential impact on other nearby shallow wells and groundwater resources
- ① Utilization of numerous anti-collision measures to prevent the drilling well from colliding with offset wells
- ① Deployment of a casing program engineered to prevent the impact to offsetting wells and formations adjacent to our wellbore. Specifically, the surface casing depth and cement program are designed and permitted so that groundwater resources are protected prior to drilling in the hydrocarbon bearing intervals. As part of the final wellbore construction, two subsequent casing strings are run and cemented in place. Depending on the phase of operation being performed, the designed casing and cement program creates up to six barriers between Antero's drilling/completion operations and adjacent rock formations and nearby wells. We perform several tests to confirm the integrity of these casing strings prior to their use as a protective barrier. This includes running cement bond logs and pressure testing to maximum anticipated pressures associated with subsequent operations





During the completion phase of operations, potential communication with nearby wellbores is proactively addressed in several ways, including:

- ① Integrity of the casing tubulars, which provide a physical barrier between high fracture pressures and the shallower completions of nearby vertical wells
- ① Pressure monitoring and testing, as the integrity of the final casing string and its associated cement sheath is crucial to preventing impacts to nearby wells and environmental receptors. Antero's final casing string and cement sheath were engineered to withstand the higher pressures associated with fracture stimulations, and were tested using cement bond logging and hydrostatic pressure testing to the highest expected treating pressures. During pumping operations, relevant pressures are monitored by on-site personnel, and in the event of observed anomalies, operations can be ceased in order to significantly reduce the potential to impact nearby wells



**ANTERO NOTIFIES OPERATORS OF OFFSETTING VERTICAL WELLS WITHIN 1500' OF ANTERO'S WELLBORES, WHICH IS 1000' GREATER THAN A NEW REQUIREMENT OF 500' RECENTLY IMPLEMENTED BY WVDEP.**





- ① In West Virginia, Antero uses a combination of regulatory agency information, our own data, discussions with offset operators and/or landowners, and physical field surveys to identify active, inactive, orphaned, abandoned, and P&A wells located within 1500 feet of new well locations, from surface through the entire wellbore length. Antero proactively notifies offset well owner/operators with wells within a 1500 foot radius two to three months prior to initiating nearby well completion operations and again one month prior to start of operations, well beyond the 500 foot regulatory requirement. When applicable, Antero also provides a final reminder five days before the start of a nearby well completion operation. If agreed upon between parties, Antero works with offset well operators to review existing well conditions, including confirming its current operating condition and downhole status. Antero alerts regulatory agencies if orphaned wells are discovered. Once offset wells are located and evaluated, Antero develops and implements a well monitoring plan for those identified wells, if applicable. Local geology is also assessed through reviewing historical data, data from previously drilled wells, and seismic survey data. The results of this assessment are used to identify geologic faults and mitigate risks associated with those faults. For both safety and efficiency reasons, Antero relies on technical analysis prior to and during active operations to closely monitor and prevent/mitigate communication between active wells and related potential subsurface issues
- ① Inspection program of vertical wells assessed as having an elevated risk for being impacted by Antero's operations. This inspection program promotes the integrity of wellhead and surface equipment at these nearby vertical wells. In some instances, Antero installs pressure-monitoring devices at these wellheads

During the post-completion phase of operations, maintaining well integrity is proactively addressed in several ways, including:

- ① Ultrasonic testing of pipe thickness at the wellheads and Gas Production Units (GPUs) on high exposure sites



- ✓ Use of semi-permanent sand traps (up to six months) to catch produced sand and reduce erosion of equipment
- ✓ Remote and local Emergency Shut Downs on the tubing, casing and GPU
- ✓ Electronic measurement of pressure on the tubing and casing
- ✓ Determination of flow velocities throughout the system to stay below erosional velocity in the tubulars and production equipment
- ✓ Annulus pressure monitoring and reporting that meets or exceeds current state requirements
- ✓ Supervisory Control and Data Acquisition system for local and remote surveillance of pressures, temperatures, flowrates and hydrocarbon gas detection. In addition to 24/7 human monitoring, the system includes automated alarms, reports and notifications
- ✓ Pressure testing of tubulars during remedial well servicing operations
- ✓ Use of eco-meters (acoustic logs) to read liquid levels and verify tubular integrity
- ✓ Use of up-sized wellhead valves and piping to maximize erosional resistance

Of the 416 wells completed since 2017, 0% have experienced subsurface well integrity failures that resulted in a release to the environment. As a result of new downhole completion technology that became available in 2018, Antero began pressure testing all horizontal Marcellus wells to at least 9,500 psi, and all horizontal Utica wells to at least 11,000 psi prior to commencing completion work.

Antero has 1,137 producing horizontal wells, 259 producing vertical wells, and 89 wells which are drilling, completing, or waiting on completion.



## HYDRAULIC FRACTURING



# CHEMICAL DISCLOSURE

Antero is an active participant in FracFocus, the national hydraulic fracturing chemical registry. All Antero fracture-stimulated wells are reported to FracFocus.

Additionally, Antero seeks vendors committed to environmental sustainability and transparency; however, it is noted that our vendors may exclude some information due to confidential business information. Several of our hydraulic fracturing vendors have endorsed the Hydraulic Fracturing Code of Conduct from the Working Energy Commitment. The goal of the Working Energy Commitment is to provide transparency when it comes to chemical disclosure in fracturing operations.

Antero requests that our vendors avoid the use of trade secret or proprietary designations when reporting their chemical disclosures, and to the extent they are unable to do so, provide the relevant contact information for the person seeking trade secret coverage, per current FracFocus requirements.

1. <https://www.psc.ca/wp-content/uploads/WEC-Code.pdf>



## HYDRAULIC FRACTURING

# SEISMICITY



Antero proactively addresses seismicity issues by carefully evaluating the location of disposal wells before use. Antero does not own or operate disposal wells, but uses properly permitted and operated third-party Class II UIC wells for produced water disposal. Third-party disposal wells are vetted in a rigorous selection process before wells are utilized for produced water disposal. The process begins with locating existing disposal wells close to Antero's areas of operation. Potential disposal wells undergo a desktop audit first by the HSSE department, and a subsequent audit and assessment by our Geology department. A location that exceeds Antero's risk tolerance is not authorized for use.

During the Geology department's investigation, the disposal well's proximity to known mapped faults or seismic events, proximity to other wells, and the targeted injection zone are assessed via USGS datasets. According to the USGS 2014 Seismic Hazard map, Antero's operations are located in very low risk areas, meaning low risk of occurrence of the potential for horizontal acceleration. Per the USGS 2018 Short-term Induced Seismicity model, Antero's area of operations is in the lowest (<1%) chance of potentially minor-damage ground-shaking events. Additionally, Antero evaluates company wells within two miles of the third-party disposal well to identify open zones in common with the disposal well; in case of overlap, the company wells are recommended as a candidate for plugging. Additionally, during this assessment and audit process, Antero evaluates the planned injection interval of the third-party disposal well to understand



where Antero wells are stratigraphically in relation to nearby wells and actively producing zones. If a location is approved by the Geology department, the Antero HSSE department conducts follow-up on site audits of the third-party disposal wells during the on-boarding process. Once the onsite audit is conducted and there are no findings of concern, Antero's operational team is given the authorization to utilize the third-party well for produced water disposal.

In the Ohio Utica play, there have been reported instances of induced seismicity likely related to basement faults in connection with hydraulic fracturing and produced water disposal. The Ohio Department of Natural Resources (ODNR) has their own seismic monitoring array in place across the state. In areas where they have identified the potential for seismic activity, they may request operators to install additional monitoring equipment. As part of this program, there is a set of tiers that determine whether operations can continue, must be modified, or must be halted entirely. Antero has made arrangements with vendors to support this increased monitoring if it is deemed necessary by the ODNR. Monitoring of this nature includes a series of geophones and accelerometers that are localized around a specific completion activity. These sensors gather data continually and relay it to the vendor and Antero personnel for the data to be processed and managed. At this small scale, the resolution of the data is more precise than the statewide array. Although there is no known history of seismic activity across our area of operations, this monitoring capability is available to us in our operations areas in both West Virginia and Ohio.





## CAUTIONARY STATEMENTS

*While we believe all historical calculations presented herein were completed consistent with current industry standards, the numbers provided have not been audited by a third party audit firm.*

*Some of the information in this Corporate Sustainability Report may contain “forward-looking statements.” All statements, other than statements of historical fact included in this Corporate Sustainability Report, regarding our strategy, future operations and forecasts of future events, including our environmental goals, are forward-looking statements. Words such as “may,” “assume,” “forecast,” “position,” “predict,” “strategy,” “expect,” “intend,” “plan,” “estimate,” “anticipate,” “believe,” “project,” “budget,” “potential,” or “continue,” and similar expressions are used to identify forward-looking statements, although not all forward-looking statements contain such identifying words. These forward-looking statements speak only as of the date of this report and are based on our current expectations and assumptions about future events and currently available information as to the outcome and timing of future events. When considering these forward-looking statements, investors should keep in mind any cautionary statements in this Corporate Sustainability Report, as well as the risk factors and other cautionary statements in our filings with the Securities and Exchange Commission (“SEC”). These forward-looking statements are management’s belief, based on currently available information, as to the outcome and timing of future events. Although we believe that the plans, intentions and expectations reflected in or suggested by the forward-looking statements are reasonable, there is no assurance that these plans, intentions or expectations will be achieved. Therefore, actual outcomes and results could materially differ from what is expressed, implied or forecast in such statements. Except as required by law, we expressly disclaim any obligation to, and do not intend, to publicly update or revise any forward-looking statements.*

*In addition, many of the standards and metrics used in preparing this Corporate Sustainability Report continue to evolve and are based on management expectations and assumptions believed to be reasonable at the time of preparation, but should not be considered guarantees. The standards and metrics used, and the expectations and assumptions they are based on, have not been verified by any third party.*

*Factors that could cause our actual results to differ materially from the results contemplated by such forward-looking statements include:*

- our ability to execute our business strategy;*
- our production and oil and gas reserves;*
- our ability to obtain debt or equity financing on satisfactory terms to fund additional acquisitions, expansion projects, working capital requirements and the repayment or refinancing of indebtedness;*
- natural gas, natural gas liquids (“NGLs”) and oil prices;*
- impacts of world health events, including the coronavirus (COVID-19) pandemic;*
- timing and amount of future production of natural gas, NGLs, and oil;*
- our hedging strategy and results;*
- our ability to execute our debt repurchase program and/or our asset sale program;*



## CAUTIONARY STATEMENTS

- our ability to meet minimum volume commitments and to utilize or monetize our firm transportation commitments;
- our future drilling plans;
- our projected well costs and cost savings initiatives, including with respect to water handling and treatment services provided by Antero Midstream Corporation;
- competition and government regulations;
- pending legal or environmental matters;
- marketing of natural gas, NGLs, and oil;
- leasehold or business acquisition;
- costs of developing our properties;
- operations of Antero Midstream Corporation;
- general economic conditions;
- credit markets;
- expectations regarding the amount and timing of jury awards;
- uncertainty regarding our future operating results; and
- our other plans, objectives, expectations and intentions contained in our filings with the SEC.

We caution investors that these forward-looking statements are subject to all of the risks and uncertainties incidental to our business, most of which are difficult to predict and are beyond our control. These risks include, but are not limited to, commodity price volatility, inflation, availability of drilling, completion, and production equipment and services, environmental risks, drilling and completion and other operating risks, marketing and transportation risks, regulatory changes, the uncertainty inherent in estimating natural gas, NGLs, and oil reserves, and in projecting future rates of production, cash flows and access to capital, the timing of development expenditures, conflicts of interest among our stockholders, impacts of world health events, including the COVID-19 pandemic, potential shut-ins of production due to lack of downstream demand or storage capacity, and the other risks described under the heading “Risk Factors” in our filings with the SEC.

Should one or more of the risks or uncertainties described therein occur, or should underlying assumptions prove incorrect, our actual results and plans could differ materially from those expressed in any forward-looking statements.

This Corporate Sustainability Report contains statements based on hypothetical or severely adverse scenarios and assumptions, and these statements should not necessarily be viewed as being representative of current or actual risk or forecasts of expected risk. While future events discussed in this report may be significant, any significance should not be read as necessarily rising to the level of materiality of certain disclosures included in our SEC filings.



## CONTACT US



### ANTERO RESOURCES CORPORATION

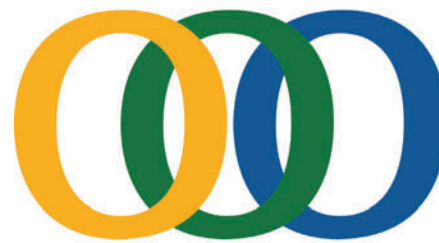
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