Feature Story: Giving Back to Our Communities

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2019 Virginia Oil and Gas Association Informational Guide

Giving Back to our Communities

Yellow Door Foundation

It was a chance conversation with a friend over dinner that led JoAnne and Jeff McTague, of Barboursville, Va., to begin exploring the idea of how to help the families of children being treated at the UVA Children's Hospital who were travelling from out of the area for the services the hospital provides and who were also saddled with hotel bill costs to stay near the hospitalized child.

After a little more investigation, JoAnne, who is retired from American Express and who now works with her husband flipping houses, decided that starting the Yellow Door Foundation was the way to meet those needs. One of her first encounters as she researched and worked to develop the foundation was with a friend she had met at a dinner party -- Virginia Oil and Gas Association (VOGA) Board of Directors Secretary, Ann Marie Gathright, who also works with VOGA member Environmental Standards Inc.

The relationship forged along the way ultimately saw VOGA and its membership agree to donate the proceeds from a 50/50 raffle at its summer meeting and the VOGA member winner of that raffle – Debbie Orrison -- donate her winnings back to Yellow Door Foundation. Combined with some additional contributions made by VOGA members, the Yellow Door Foundation received a donation in excess of \$6,100 from the industry and its members following that meeting.

It was as she was developing the Yellow Door Foundation concept that McTague met Brooke Chastain; Brooke's daughter, Maggie; and Brooke's mother, Traci Warner, who works with VOGA and in the gas industry. The McTagues opened their home to Brooke and her family as they brought Maggie to UVA for her medical needs and they have done so more than once as Maggie has undergone additional therapy.

For Brooke and Traci and Maggie, their affiliation with Yellow Door Foundation all started over cheesecake.

"Two summers ago, Traci Warner called me asking where she could find the best cheesecake in Charlottesville," Gathright recalled. "Brooke was in the hospital with Maggie, and she wanted to try and have some of Maggie's favorite dessert delivered. I knew just the place and brought the cheesecake to them at UVA hospital. Later, at the VOGA summer meeting, I told Traci that she and Brooke and their family were always welcome at my house when they were in Charlottesville for Maggie's treatment. I didn't want them to endure the ridiculous hotel expenses there.

"Of course, the first time Traci asked me for help, I was out of town and unable to host Brooke and Maggie," Gathright said, noting that was how they connected with the McTagues. "I sent out a request to my friends asking if anyone could help. JoAnne came to the rescue. She was just getting Yellow Door Foundation started at that time. Not only did JoAnne host Brooke and Maggie then, she has hosted them many times since. Now, JoAnne and her husband, Jeff, are like family to them."

"JoAnne and Jeff have been amazing people to get to know," Chastain said. "There are roughly 2,500 kids from Southwest Virginia who travel yearly to UVA Medical Center for services, so the need is great. The Yellow Door Foundation takes care of the whole family and they have just gone above and beyond."



VOGA is really like family and its members care about the community and the people in the community.

She continued, "I have volunteered for years with VOGA and it means a lot to me to see them step up and help this way. A lot of times the oil and gas industry gets a terrible rap, but in my experience, VOGA is really like family and its members care about the community and the people in the community."

"Brooke and Maggie were an impetus for the creation of the Yellow Door Foundation," McTague said, noting the foundation gets its name from a drive she made through Charlottesville. She saw a blue house with a red door, but there was already a red door name out there. She thought of other colors and chose yellow for the color's meaning of hope, positivity and sunshine.

Yellow Door now has three furnished apartments at Stone Creek Village -- just three miles from the hospital -- that provide family lodging for as long as the child is being treated at UVA. Since the foundation was formed, 11 families have been assisted.

Later this spring, due to a donation made by Gathright and her husband, Gerry, a fourth unit will be added. That unit will be named in honor of Gathright's mother, Rosie.

"My own experience with UVA hospital and the experience of being my mom's advocate provided me a deep understanding of a caregiver's struggles with exhaustion, confusion and fear -- all while trying to remain a strong and steady constant for the person for whom they are advocating," Gathright said. "Trying to imagine that struggle as a parent is beyond my capabilities of thought. And, so it has been my privilege to be associated with Yellow Door. This December, my husband Gerry and I put forth a donation such that the next two-bedroom unit Yellow Door offers will be named in honor of my Mom. It will be called, "Rosie's" house. "It is my hope that VOGA will continue to support Yellow Door and JoAnne's good works," Gathright added.

McTague said by the end of 2019, Yellow Door Foundation hopes to have six units available.

"Every family deserves a home away from home while their child fights cancer or undergoes a transplant, but over 40 percent cannot afford it," she said. The apartments offered through Yellow Door are specifically for immunocompromised patients.

VOGA President Ian Landon said VOGA's membership is appreciative of the good work done by the McTague's through the Yellow Door Foundation.

"We appreciate all they have done for the families they have served thus far," Landon said. "We hope to be able to continue to support Yellow Door Foundation and the good work that it does in the years ahead."

"What the folks there at VOGA have done is a lot of the reason this has grown," McTague said. "We are grateful for their continued support."

McTague is slated to be a guest speaker at the VOGA 2019 annual meeting in June where she will update VOGA members and other attendees on the Yellow Door Foundation.

For more information on Yellow Door Foundation, visit www.yellowdoorfdn.org.



VIRGINIA: WHERE WE LIVE, WORK AND VOLUNTEER

Each year VOGA member companies and their employees donate tens of millions of dollars and countless volunteer hours to Virginia charities.

From assisting local schools in meeting the needs of extracurricular and sports programming, to support for area food pantries, to supporting habitat restoration or helping to create multi-use trail systems for both local residents and tourists to enjoy, Virginia Oil and Gas Association member companies are generous in their community outreach endeavors.



One of the industries most successful community projects has been the industry's work with the Rocky Mountain Elk Foundation, Department of Game and Inland Fisheries and a local sportsmen's club in the elk restoration project. That project has repeatedly shown and continues to show that industry and the environment can and do co-exist. In fact, because of the seed mixes and plantings along pipeline rights of way, those areas remain some of the favorites for elk seen grazing on them in Southwest Virginia.

"Without the support of the natural gas and coal industries in Southwest Virginia, this project would not have been possible," Leon Boyd, a member of the DGIF, chairman of the Southwest Virginia Coalfields Chapter of the Rocky Mountain Elk Foundation and president of the Southwest Virginia Sportsman's Club, has noted in the past when talking about the elk restoration project.



The first elk were released into the habitat area in 2012 and two subsequent releases followed in 2013 and 2014 to bring the release number to 71 over three years. At last count, the herd, which has multiplied is now estimated to number near 200.

EnerVest Operating LLC (EnerVest) one of the companies that has helped to support the elk heard was recognized this previous year by Virginia DMME with an award for its work donating money and employees' time to local charities, schools, clubs, events and churches. EnerVest began a community outreach initiative, within the company, by giving each employee 16 hours per calendar year to use for volunteering within their communities, however they see fit. Employees of EnerVest donated more than 265 hours in 2017 to the communities of Southwest Virginia. From April 2017 through April 2018 EnerVest also donated financially to non-profit group and school programs operating in Southwest Virginia.

Another member company, who was also recognized by DMME with a community outreach award, CNX Resources Corporation (CNX) has worked closely with the Southwest Regional Recreation Authority's Spearhead Trails System. CNX assisted in the development of recreational trails in Buchanan County -- a crucial part of the county's tourism expansion efforts. CNX allowed for an additional 11 acres of its land to be used recreationally by ATVs, UTVs, cyclists, hikers and horseback riders. This particular project opened an additional 4.5 miles of trails that display the beauty of Buchanan County. The additional trails provide increased economic growth potential.



We live here and we work here, it's important to our member companies and their employees that we are involved in our communities, both as financial givers and as volunteers.

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In the past, SRRA has recognized both CNX and EnerVest and its predecessor, Range Resources, for their generosity in working with Southwest counties and SRRA to develop the trail system. In fact, SRRA Director Shawn Lindsey has credited the gas industry in past remarks with opening up the region to the great outdoors and refers to the industry as "the gateway for outdoor recreation in the Cumberlands."

"Spearhead Trails was made possible by the partnerships extended to us by the extractive industries from the gas, coal and timber industries," Lindsey said. "With the help of our gas partners, Spearhead Trails has been able to build more than 400 miles of trails ... and it is expected with their support, we will continue this growth with more than 100 miles of new trails per year for several years."

The support and outreach did not only reach SWVA however.

Virginia Natural Gas working with, Tidewater Community College & Virginia Gas Operators Association were also recognized by the DMME/VOGA awards program for their work in the Virginia Values Veterans Program. The program worked to train veterans to fill needed roles in the natural gas industry. A week-long certification program at TCC's Virginia Beach campus, led by natural gas industry



professionals from Virginia, focused primarily on natural gas pipeline safety, code compliance and operations.

Participants learned basic pipeline safety standards and proper field techniques, including line locating and pipe installation, through classroom instruction and hands-on training. Those who successfully completed the program, received a certificate signed by VNG, TCC and the VGOA, which they could then add to their resume to aid in securing employment in the industry.

Through a partnership with The Nature Conservancy, VNG worked to support efforts to restore the Longleaf Pine back to its former prominence in Southeastern Virginia, VNG set out to plant 150 longleaf pines in Virginia Beach - Lake Lawson/Lake Smith Natural Area and Mount Trashmore Park.



The Virginia Oil and Gas Association, working with its partners, the American Petroleum Institute, the Virginia Cooperative Extension, (an extension of Virginia Tech) and the Virginia Coal and Energy Alliance, hosted it's inaugural Virginia Energy Bowl competition held in Dickenson County, Va. The Energy Bowl follows a game show-type format, guizzing students on their knowledge of energy, including coal, gas, wind, solar and biofuels. The program was offered for the first time this year and was piloted in Dickenson County. Sixth grade students participating were given study guides by their teachers earlier in the year to prepare for the competition. Information in the study guide was reviewed by the Virginia Department of Mines, Minerals and Energy, API, Virginia Cooperative Extension agents and the two sponsoring organizations. Questions asked correlated to Virginia Standards of Learning material. Based on the success of the inaugural program, plans are to expand the competition to additional counties next school year and to see the program continue to grow.

Virginia's Natural Gas Industry Providing Energy to Millions

Did you know: Virginia produced 115.5 billion cubic feet of gas in 2017 alone?

To put that into perspective, it's enough fuel to provide electricity to power approximately 1 million households -- nearly one-third of Virginia's needs for a year.



History of Natural Gas in Virginia 1898: Virginia's first natural gas well drilled in Wise County (not commercial) Virginia alone has 120 years of history in natural gas 1931: First commercial gas well in Virginia exploration. The first well drilled in Scott County was drilled 120 years ago in Pipelines begin to develop in Virginia 1940s: *1898 in Wise County. The first* commercial well was drilled 1950s: Hydraulic fracturing begins in Virginia in 1931 in Scott County. In *2017, the state had 8255* 1972: Conventional drilling programs ramp up producing wells. Buchanan *County remains as the largest* 1988: Coalbed Methane (CBM) gas development begins producer of gas in the state, followed by Dickenson County. 2007: Horizontal drilling begins in the Huron shale Gas production also occurred in Russell, Tazewell and Wise 2012: Virginia natural gas industry members counties. win IOGCC Environmental Stewardship Award for assisting with reintroduction of Virginia's elk 2013: Virginia's Spearhead Trails Open on Natural **Gas Properties** 2014: Virginia Natural Gas suppliers announce need for increased infrastructure, begin pipeline expansion projects 2015: EPA study reaffirms safety of Hydraulic Fracturing

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Life Cycle of a Natural Gas Well

Requires

Regulatory

Oversight

- Geologic mapping to determine well spot
- Surface/mineral owner mapping
- Lease land within unit
- Board hearing if necessary
- Permit well/pipeline through DMME
- Build well location (1-2 weeks)
 - Drill well (2-10 days)
 - Complete well Includes Hydraulic Fracturing (1-2 days)
 - Build pipeline
- Maintain well, location and pipeline
- Approximate life of a well = 20-60 years
- Coalbed Methane (CBM) Gas Wells Natural gas in coal seams produced above 3,000 ft accounts for 80% of Virginia's production
- Tight Gas Sand Wells Non-coal formations (sandstone & limestone) Deeper than 3,000 ft (typically 3,000-6,000 ft)
- Horizontal Wells (shale and tight gas sands) Target single formation (4,000-6,000 ft deep)

Virginia is Unconventional - An unconventional reservoir cannot be produced economically without stimulation (hydraulic fracturing). In Virginia, more than 9,700 wells have been drilled with no cases of groundwater contamination associated with hydraulic fracturing.





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Hydraulic Fracturing, What is it?

There are many misconceptions about what hydraulic fracturing, or "fracking," is, but modern hydraulic fracturing is a safe and proven process which has been around since 1947. Since that time, nearly three million frac treatments have taken place. Over 90 percent of all oil and gas wells drilled in the United States are hydraulically fractured each year and have been for decades with no proven record of harm to groundwater. And while modern hydraulic fracturing has been around since 1947, fracturing has been around since 1860.

What is Hydraulic Fracturing? Hydraulic fracturing is the process through which fluid pressure is applied to reservoir rock causing the rock to crack, or fracture. Some confuse fracking and drilling as being one and the same, when in fact they are two separate processes. Drilling involves the actual drilling of a wellbore to depths well below groundwater and in that process, the wellbore is isolated from the ground around it through multiple layers of steel pipe and concrete.

After drilling is complete, the fracture treatment takes place and involves stimulating the rock deep below the surface by placing fluids down the wellbore at a pressure greater than the rock (reservoir) pressure to create a fracture network of small cracks in the rock. The fluid used is comprised mostly of nitrogen and water, a small amount of additives further detailed below and a proppant (typically sand). The sand in the frac treatment keeps the cracks open, which in turn allows methane gas trapped in rock to flow out of the rock and be captured and brought to surface through the wellbore.

Dr. Stephen Holditch, Texas A&M University, noted that concerns expressed by some related to the rock fractures and their ability to crack rock to surface are unfounded. "I have been working in hydraulic fracturing for 40 plus years and there is absolutely no evidence hydraulic fractures can grow from miles below the surface to the fresh water aquifers," Holditch said. Based on work done in Virginia fracturing coal ahead of mining for over 30 years to produce the methane and prevent mine explosions, we know from direct observation that hydraulic fractures can't grow up into fresh water aquifers.

When you hear in the news about "fracked gas," it is important to understand that virtually all oil and gas is

"fracked." So whether it's the gasoline you use in your vehicle, the natural gas which powers the gas logs in your living room, to the medications we take, the cloths we wear, the food we eat, or electricity to your home, fracking is ultimately what brought it to you.

The additive materials used in a frac treatment are disclosed by companies on the website fracfocus.org as well as the Department of Mines Minerals, and Energy's Division of Gas and Oil website. The FracFocus website is maintained by the Groundwater Protection on Council and the Interstate Oil and Gas Compact Commission. Most horizontal shale wells in Virginia are stimulated (fractured) using only nitrogen.

The rock properties of the Lower Huron shale are different from other Appalachian Basin shales and make the use of nitrogen the best method to utilize to capture it.

Vertical wells in Virginia are mainly stimulated using fresh water and nitrogen. Water and nitrogen are combined at different percentages to create a foam based material. Typical foam in Virginia is made up of 70-75 percent nitrogen and 25-30 percent water and other components.



Typical water usage is approximately 45,000 gallons which is significantly lower than a typical frac uses in other areas. This is significantly less than water used to water a golf course for a week.

The safety of fracking is well-documented and the experts agree on it.

Ken Salazar, former Secretary of the Interior, was also quite clear when he summed up hydraulic fracturing, noting, "I would say to everybody that hydraulic fracking is safe."

Heather Zichal, former Climate Advisor to President Obama, noted "We know that natural gas can safely be developed, and to the credit of the industry there are many companies that are leaning into this challenge and promoting best practices for safer and more efficient production."

With more than 10,000 wells drilled in Virginia the record of safe production in Virginia is clear.

Common Components in Virginia

- 70-75% Nitrogen: An inert commonly occurring gas in the atmosphere which makes up ~78% of the air we breathe.
- 18-24% Water: An average of approximately +/-45,000 gallons depending on treatment/stimulation design.
- 4-9% Sand: A specialty sand with strict quality control parameters regulating criteria such as: sphericity, angularity, acid solubility, etc.
- 2% Hydrochloric Acid: Typically a 7.5-15% solution. Also known as Muriatic Acid and contains the same properties as gastric acid which is found in the human body. Commonly used in medications and other pharmaceutical components, and as pH control for swimming pools.
- 0.4% Additives: Small amounts of additives are used such as clay stabilizers, iron control additives, biocides for water treatment, friction reducers and fluid loss additives

Additive Examples include:

- Gelling agent also used as an ice cream thickener and in ketchup
- Surfactant foamer/friction reducer also used in dish detergent, fabric softener, shampoo and
- toothpaste
- Biocide bacteria control also used in swimming pools, municipal water treatment, and as a hospital disinfectant





Regulation of Virginia's Natural Gas Industry

The Virginia Department of Mines, Minerals and Energy's Division of Gas and Oil regulates all aspects of natural gas drilling in Virginia. Other regulating bodies include: Virginia Department of Environmental Quality, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Virginia Marine Resource Commission, Virginia Department of Conservation and Recreation, and the Virginia Department of Labor and Industry. The industry is also regulated under the Clean Water Act and Clean Air Act.

The Virginia regulatory program has been reviewed several times as part of the State Review of Oil and Natural Gas Environmental Regulations (STRONGER). STRONGER reviews were issued in April 2004 and a follow up review was issued in 2017. Reviews of the Department of Mines, Minerals and Energy's (DMME) Division of Gas and Oil (DGO) in Virginia found that generally, Virginia's regulatory programs provided adequate protections related to STRONGER requirements and in fact that in some areas, the Virginia program exceeds those requirements.

The Commonwealth also recently participated in a State Oil and Gas Regulatory Exchange (SOGRE) peer assessment in late 2018.

In November of 2018 the Virginia Department of Mines, Minerals and Energy was part of historic signing of memorandum of understanding with the U.S. Environmental Protection Agency (EPA) and STONGER.

Several casing strings are cemented to surface to isolate natural gas from contacting fresh water sources as illustrated in the diagram at left

Building Blocks of Everyday Life





Who uses natural gas? The answer to that question is simple. We all do.

Natural gas is a building block of everyday life. Not only does it heat our homes, provide a fuel source for cooking, or fuel for our vehicles, but it is also an important feedstock for many other items we use each day. For more than 100 years, Americans have relied on natural gas and oil to enhance their quality of life.

The cars we drive, the food we eat, the medicines we take – each product is touched in some way by America's oil and natural gas industry. Natural gas is a key component in a vast majority of manufactured goods. Whether it's through life-saving medicines, surgical equipment, electronics, computers, phones, CDs, paint, make-up or clothing, the natural gas and oil industry supports our day-to-day lives.

The fact is -- every American has benefitted from America's energy revolution in the last several years. Affordable energy impacts people's wallets. Domestic natural gas has transformed the U.S. economy, made our U.S. companies more competitive, created jobs and put money back in the pockets of working Americans. In the jobs arena, it means good paying jobs for hard working Americans. And in the national security arena, it also makes a difference.

"As a retired captain in the United States Navy, I can tell you that domestic oil and natural gas production provides our military with critical energy resources, without which it could not effectively protect our country," said Kenny Golden, of Virginia Beach, a member of Vets4Energy. "Energy independence provided by American oil and gas also makes us safer and less vulnerable to our enemies. The petroleum industry employs tens of thousands of veterans, who served our country in uniform and are now serving it by ensuring we have the energy we need." The need for natural gas and the many products it makes possible is not going away. Total natural gas demand is poised to increase by 40 percent in the next decade to meet the needs of manufacturing and power generation. U.S. supply is expected to increase by 48 percent in the next decade to meet new demand.

The facts speak for themselves. Natural gas supplies nearly one-fourth of all of the energy used in the United States. There are more than 68 million residential customers and more than five million commercial enterprises using natural gas in the United States. And it's not a new industry. It's a proven and safe industry with a long history.

What that means is that natural gas will continue to serve a growing economy, contribute to making a more secure America and continue in its role as the building block for everyday life.

Transportation and Infrastructure

Natural gas is a major part of our modern everyday lives. Through electricity, life-saving medicines and surgical equipment, computers, phones, make-up, safety equipment or clothing, the natural gas and oil industry helps to keep us healthy, warm and safe.

Transporting energy across the Commonwealth of Virginia and across the country is predominantly done by pipeline which is a critical component of Virginia's energy infrastructure. It is an infrastructure that is both proven and safe in moving natural gas from the regions in which it is produced to the end user.

In fact, if it wasn't for pipelines already in existence,



Virginia would have a tough time meeting its energy needs since the Commonwealth is a net importer of natural gas. Thousands of miles of pipeline already run safely through Virginia and under our communities throughout the country. Including both onshore and offshore lines, there are more and 300,000 miles of interstate and intrastate transmission pipelines and 2.5 million miles of distribution pipelines already in place which deliver natural gas service to 177 million Americans. However, it's still not enough to meet the ever-growing demand for natural gas which exceeds what can be served through current pipeline infrastructure. Affordable natural gas energy is a big draw for Virginia-based manufacturers looking to expand and for new companies looking to move to the United States and to Virginia.

Currently, natural gas supplies nearly one-fourth of all of the energy used in the United States. Natural gas is found across the country and in fact, 33 states are now producing, or have produced it. Virginia is fortunate to be one of those states and as a result is able to supply some of its own energy needs. Natural gas is leading the way to provide that energy due in part to the fact it has the smallest physical footprint of all other energy sources and it also provides both affordable and reliable energy.

All operators of natural gas pipelines are required to follow the federal pipeline safety code that falls under the enforcement of the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA). Pipeline safety regulations apply to all pipelines in the United States.

The gas industry nationwide spends billions of dollars each year to ensure the safety and reliability of natural gas infrastructure. Natural gas utilities are subject no only to their own stringent internal controls, according the American Gas Association, but they must also meet rigorous federal and state oversight with inspections performed regularly by state regulators to ensure compliance is met.

Virginia currently has several pipeline projects in the approval process, including the proposed Atlantic Coast Pipeline (ACP) and the Mountain Valley Pipeline (MVP). These pipeline projects, once operational, will provide the fuel needed by natural gas power plants to in turn provide energy to thousands of Virginia homes and businesses, as well as to existing and/or new manufacturers. Much of the U.S. electrical system predates the turn of the 21st century. The American Society of Civil Engineers (ASCE) noted that the electrical grid is currently running at full capacity across most of the country, and that with increased power generation needed from natural gas, greater attention needs to be paid to increase in demand. Without replacing and upgrading infrastructure, Americans will likely face longer and more frequent power interruptions.

Matt Yonka, president of the Virginia State Building & Construction Trades Council, noted not only will new pipelines bring the fuel to provide clean electricity and home heating to millions of citizens, but at the same time, he said the projects will put thousands of Virginians to work.

"By connecting our region to the most affordable and abundant supply of domestic energy in our nation, the pipeline will lower energy bills for all Virginians and fuel the resurgence of Virginia Manufacturing," Yonka said previously of the ACP project. "Construction of the pipeline is estimated to generate nearly 8,800 jobs in Virginia. There would be a highly trained, experienced and skilled labor force working on this project – pipefitters, welders, industrial equipment operators who have built thousands of projects like this, all of which have been built safely."

Projected pipeline economic benefits include more than \$17 million paid in taxes annually; hundreds of millions in Virginia infrastructure development costs (equipment, material, labor and services); and thousands of new permanent jobs due to both operational and expected growth in manufacturing and industry sectors due to increased availability of a reliable and affordable energy source.

Pipeline operators take proactive steps to ensure that health, safety, security and environmental concerns are addressed at all stages, including in the planning, construction and operational phases of any pipeline installation and operation. Pipeline companies fund millions of dollars worth of research into new facility inspection technologies and spend millions of dollars on pipeline and public safety initiatives each year. Significant dollars are spent on corrosion inspection technology and in engaging the general public and landowners to help them understand the importance of pipeline safety and protecting pipeline facilities from third-party damages through the use of the 811 "Call Before You Dig" law.

Natural Gas Industry Adds Billions to Virginia Economy

The role of the natural gas and oil industry in growing the state and the U.S. economy is readily evident and verified in two recent studies performed which examined the impact of natural gas on the economy. The results? In Virginia alone, the impact to the state's economy totaled some \$11.97 billion and supported 125,000 jobs in 2015, the year examined in the studies.

The results are found in two studies – one by the National Association of Manufacturers (NAM) Center for Manufacturing Research and IHS Economics and the other by a Pricewaterhouse Coopers study commissioned by the American Petroleum Institute. Both studies point to not only the increasing demand for natural gas as an energy source to fuel manufacturing, but also to its impact on jobs, taxes and more.

In looking at the impact of the gas industry in Virginia, it is important to note Virginia's natural gas industry producers, suppliers and contracting companies have offices here in Virginia and employ thousands of Virginia residents, providing them with family wage-sustaining jobs and benefits. Industry members live in Virginia and work in Virginia and are active in their communities.

Their impact is further seen when one considers Virginia Oil and Gas Association member companies donated approximately \$10 million to Virginia charities in 2018 alone. Locally, they paid taxes, supported local community initiatives and throughout the long history of the industry in Virginia, have paid hundreds of millions of dollars in royalties to natural gas owners.

The NAM and API studies further showed that of the 125,000 jobs in Virginia supported by the industry, 46,100 are filled by industry employees; 43,600, service employees; 9,600, wholesale and retail; 4,800, manufacturing; 1,400, construction; 4,900, transportation and warehousing; and 15,100 are classified as "other." Coast-to-coast, the oil and gas industry supports more than 10 million jobs.

The two recent studies provide further evidence of the benefits of natural gas to communities. The NAM study illustrates how natural gas has strengthened manufacturing and encouraged U.S. manufacturing growth and employment. It also highlights the positive impact to communities not only in Virginia, but throughout the United States. Manufacturers use natural gas for fuel, such as drying, melting, machine drive and space heating and as a feedstock in refining, chemicals and primary metals sectors, according to NAM representatives. Domestic natural gas, they say, has transformed the U.S. economy, made its companies more competitive, created jobs and put money back in the pockets of working Americans.

"Over the next decade our nation's demand for natural gas is only going to grow and much of that growth is from manufacturing," NAM President and CEO Jay Timmons said in talking about the study. "This study unequivocally shows that if our growing demand is not taken seriously by policy makers we will have a serious lack of infrastructure that will jeopardize our growth."

Whether a state is an energy producer or simply an energy consumer, the API study findings show that in all 50 states, benefits from the natural gas and oil industry are seen.

"This study validates the role of the natural gas and oil industry in growing the U.S. economy and supporting more than 10 million workers from coast-to-coast," according to API President and CEO Jack Gerard. "Natural gas and oil touches virtually every facet of our life – from heating our homes and fueling transportation to life-saving medical devices and cosmetics at the drug store. This study is further proof of the positive impact that U.S. resources have on workers and communities across the nation."

Virginia Petroleum Council Executive Director Miles Morin pointed to the benefits of the industry in Virginia and the potential for its future growth.

"The oil and gas industry has supplied high-paying jobs throughout the Commonwealth and is indispensable in economically stressed areas like Southwest Virginia," Morin said.

According to the Bureau of Labor Statistics, the average wage paid by the natural gas and oil industry in 2016, excluding retail station jobs, was \$101,181 which is nearly 90 percent more than the national average. In Virginia, that amounted to wages of nearly \$7 billion. Natural gas and oil activity support a wide-array of jobs, including everything from petroleum engineers, environmental experts and rig hands to truck drivers, caterers and contractors that benefit from the industry's economic activity.

Virginia Oil and Gas Association www.vaoilandgas.com