# ENERGIZING MANUFACTURING
## NATURAL GAS AND ECONOMIC GROWTH

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Center for Manufacturing Research

Center for Manufacturing
Research

A new comprehensive study from IHS Economics and the National Association of Manufacturers (NAM) reveals how natural gas has strengthened manufacturing, encouraged U.S. manufacturing growth and employment and highlights the positive impact to communities around the United States. Manufacturers use natural gas for fuel, such as drying, melting, machine drive and space heating as well as a feedstock in refining, chemicals and primary metals sectors. Domestic natural gas has transformed the U.S. economy, made our companies more competitive, created jobs and put money back in the pockets of working Americans.

But the story doesn't end here. Over the next decade, demand for natural gas will increase dramatically, driven by manufacturing growth and electric power generation. The United States has more than enough supply to meet this growing demand. However, we will need major investments in new infrastructure, particularly natural gas pipelines, to ensure manufacturers have a steady, reliable stream.

## By the Numbers:

- Expanded energy access—**1.9 million jobs economy-wide in 2015**
- Shale gas put an **extra $1,337 back in the pocket of the average American family**
- New pipelines meant more than **347,000 jobs, with 60,000 in manufacturing**
- Total **natural gas demand is poised to increase by 40%** over the next decade. Key drivers will be manufacturing and power generation. **U.S. supply is expected to increase by 48%** over the next decade to meet new demand.

## "Direct access to natural gas pipelines is vital to local production and environmental stewardship."

For us, access to natural gas pipelines is about commonsense and sustainability. As the largest brick manufacturer in the United States, we produce a product that is heavy, so moving natural gas via pipelines to where the bricks are made is far more efficient than moving heavy bricks long distances.

We've been making the bricks that build schools and homes across America for 125 years. Although "sustainability" is a fairly new term, the basic concept has been part of ACME Brick Company since its founding. Direct access to natural gas pipelines is vital to local production and environmental stewardship.

**ACME Brick Company**

Photo © David Bohrer/NAM.

## “Affordable and abundant supplies of natural gas present U.S. manufacturers with an energy advantage.”

Affordable and abundant supplies of natural gas present U.S. manufacturers with an energy advantage. This benefits companies like ours, because we use it as both a fuel source and a raw material to manufacture products that save far more energy than it takes to produce them. For example, our polyurethane insulation can significantly reduce a building’s energy consumption, while our lightweight polycarbonate increases fuel efficiency in vehicles, thereby reducing CO2 emissions.

**Jerry MacCleary**
**President**
**Covestro LLC**

We need reliable, affordable sources of energy, and that’s why natural gas pipelines are important to our success. For Caterpillar, this is twofold.

## “We rely on energy as we design, test and build our products.”

Caterpillar machines also help build the pipelines, and our reciprocating engines, gas turbines and compressors are used to produce the gas and move it through pipelines to businesses and communities across America.

## “In the end, a robust pipeline system helps everyone—manufacturers and consumers alike.”

**Jim Umpleby**
**Group President, Energy & Power Systems**
**Caterpillar Inc.**

## “...when gas prices were off the charts, it was crazy—we couldn’t be competitive with China.”

As a small business nestled along the Ohio River in Paden City, West Virginia, Marble King, Inc., is small but mighty. Its 28 full-time employees make more than 1 million marbles a day at one of the only marble manufacturers left in the United States. And abundant supplies of natural gas help make this possible.

In a business where pennies separate winners from losers, innovative thinking is imperative. Beri Fox, president of family-owned and -operated Marble King, is working hard to continue the long-standing tradition of innovation that the company is famous for. When Fox’s father returned from World War II, he found a job as office manager at Marble King. Putting his engineering background and love of science to work in the business, he developed processes that saved the business time and money—like a reforming process that lets the manufacturer recycle glass.

Marble King’s rich history of sustainable and environmentally responsible practices is something for which it is proud. The marbles manufactured for industrial applications are made from 100 percent recyclable glass, so it is not being dumped in landfills. As Fox explained, “We’re helping keep American workers working and helping recycle huge amounts of material.”

But in a global economy, energy cost is something that worries Fox. “We’re a high-volume gas consumer, and when gas prices were off the charts, it was crazy—we couldn’t be competitive with China.” Natural gas powers the process that turns leftover pieces from stained glass window making, other art glass and even old bottles into tiny spheres. “Today, we can be more competitive and a lot of that is because of the lower gas costs,” says Fox.

As a result, one of the last American marble makers continues increasing its presence in new and different industries domestically and around the globe. America was made great by small manufacturers with big dreams. And that’s the power of small.

**Marble King, Inc.**

## “Without natural gas…not only would our production and competitiveness be impacted, so would the 6,000 men and women who work on our shop floors.”

From tractors and combines to powertrain solutions for on and off road and marine, CNH Industrial designs, produces and sells “machines for work.” Without natural gas and the pipeline infrastructure to access these energy resources, not only would our production and competitiveness be impacted, so would the 6,000 men and women who work on our shop floors. Energy and energy infrastructure like pipelines is essential to our businesses and success.

**Brad Crews**
**CNH Industrial**

Photo © David Bohrer/NAM.

Energy is the foundation for virtually every aspect of our lives. Investing in better ways to make and deliver clean, safe, reliable and affordable energy—including the modern infrastructure that moves energy to families and businesses across America—is essential to grow the economy, create jobs and improve lives.

Developing the full portfolio of resources—nuclear, 21st-century coal, natural gas, renewables and energy efficiency—gives us a way to strengthen our energy security, economic security and national security.

## “We have the ability, through energy, to continue providing real customer solutions, especially for those who continue to struggle to make ends meet.

## Inventing the future of energy also means imagining new technologies to use energy more efficiently and make lives better.”

Things like energy storage capability, higher-performing electric vehicles, enhanced security systems and sensors for more effective control of our electronic devices—these and many other exciting developments point to energy’s vast potential to benefit customers and communities.

**Thomas A. Fanning**
**Chairman, President and CEO**
**Southern Company**

## “Increased growth and development of natural gas resources…allows us to create more jobs, more paychecks and more opportunities…”

For almost a century, TIW Corporation has been a leader in the design, development and delivery of reliable tools and technologies for the energy sector. Not only because oil and gas producers are our customers, but also because we are energy users—natural gas is essential to our business.

Increased growth and development of natural gas resources across the United States allows us to create more jobs, more paychecks and more opportunities for members of our community.

**Steve Pearce**
**President**
**TIW Corporation**

## From Poverty to Prosperity

In a small town once praised for its inspiring ability to overcome obstacles and win support for a high school rocket-building project, there's another story of opportunity on the horizon. A new pipeline is bringing natural gas to a diverse community in a remote part of the Southwest.

Even after building a 10 megawatt solar facility in recent years, energy was still at a premium, and bringing economic development to Presidio, Texas, has been a real challenge. But as the new pipeline winds its way south, a chili processor is now willing to invest in the city's future.

Previously, the lack of natural gas had prevented investment, but Don Biad, managing partner of the Biad Chili Company, explained that the pipeline is a game-changer for small manufacturers. "It's the difference between whether or not our company is profitable or not profitable."

While this economic opportunity brings a wave of hope, the pipeline also brings environmental protection into view for the local communities because much of the natural gas will power modern electricity just across the border in Mexico. Building the pipeline is also helping to rebuild the railroad—once the lifeblood of trade through the town. That's because transporting the steel pipes sparked investments in the rails that moved them from manufacturing facilities to the pipeline construction.

Presidio sits where the Rio Conchos joins the Rio Grande in the Big Bend of Texas; as the hardworking people in this international port town like to say, the rivers join us. So when you talk to Brad Newton, executive director of the Presidio Municipal Development District, his can-do-it optimism is anchored in unity.

"We've been stuck in the politics of poverty, but now we're turning the page to the promising politics of progress. And natural gas is our best new hope for a future—a bright future."

As Newton put it, "The people of Presidio aren't looking for a handout; we just want a level playing field in a world economy. That's what natural gas gives us—a chance to compete."

### "...helping fuel manufacturing through investments exceeding $13 billion..."

Energy Transfer Partners and its affiliates are investing in communities, creating and supporting jobs and helping fuel manufacturing through investments exceeding $13 billion in new natural gas, natural gas liquids and crude oil pipeline infrastructure projects within the United States. And we spend about 40 percent of our total costs on manufactured goods when building pipelines. These pipeline projects, such as the Rover Pipeline Project, the Mariner East projects and the Dakota Access Pipeline, will provide access to affordable energy supplies that are vital input goods to manufacturers large and small."

**Joey Mahmoud**
**Senior Vice President of Engineering**
**Energy Transfer Partners**

### "Critical infrastructure projects allow us to...[turn]... natural resources into a competitive advantage."

Critical infrastructure projects allow us to translate the United States' wealth of natural resources into a competitive advantage for our workers, communities and consumers. For example, CF Industries partnered with Northern Natural Gas to construct a new pipeline in Nebraska and Iowa to bring natural gas safely and efficiently to our expanded plant site in Sergeant Bluff, Iowa. This will allow our site—located in America's Corn Belt—to produce enough fertilizer to nourish more than 10 percent of the total area planted to corn nationally.

**Nick DeRoos**
**General Manager, Port Neal Nitrogen Complex**
**CF Industries**

## A Quarter-Century-Old Fleet of Natural Gas Vehicles Moves into the Future

At UPS, our business depends on fuel to power our trucks. At the end of 2015, we had more than 6,500 alternative fuel and advanced technology vehicles in operation, and this ground fleet has traveled more than 500 million miles since 2000 with a goal of driving a billion miles by 2017. That is a goal we believe we will reach.

More than half of that alternative fuel fleet operates on natural gas. UPS began investing in natural gas in the 1980s to reduce our emissions and make use of an affordable domestic resource. Our investments in natural gas vehicles grew slowly at first, but in recent years, our investment has grown exponentially. In 2014, all new tractor trailers that we purchased for our domestic, small-package delivery business ran on natural gas. In one year, these purchases nearly doubled the number of UPS natural gas vehicles in the United States. By year's end, UPS had more than 1,000 compressed natural gas (CNG) medium "package cars" and 1,297 heavy tractors operating on liquefied natural gas (LNG) or CNG. To support our growing natural gas fleet, which is among the largest in the world, we have also invested in more than 30 LNG and CNG fueling operations across 10 U.S. states, with planned additions in several others.

UPS is preparing to meet our continued sustainability challenges by gradually lowering the carbon emissions of some of these trucks even further. For example, in Sacramento, California, we have operated a fleet of CNG trucks since 1991, and now we are able to run those same trucks on very low carbon "renewable natural gas," made by capturing the methane waste from landfills, cleaning it up and putting it in the natural gas pipeline as a "drop-in" fuel for those natural gas vehicles. The fuel works perfectly well, giving UPS a transition strategy to gradually move our natural gas fleet into a low carbon future. Innovative solutions like this offer great promise for the transportation industry as it paves the way toward a more sustainable future.

# The NAM Perspective

### Competitive Advantage

The rapid increase in domestic natural gas production continues to reshape the U.S. economy and redefine America's competitive advantages within the global economy, especially within the manufacturing sector. According to IHS, "Lower gas and electricity prices serve to directly reduce the energy costs of households and businesses. Going forward, consumers have greater purchasing power and higher confidence, businesses experience higher profits, and **domestic manufacturers are more cost-competitive relative to their international competitors as a result of lower natural gas prices.**"

### Money in Your Pocket

The U.S. economy also enjoys reductions in inflation and unemployment as a result of technologies that unlock shale gas. Taking last year as an example, Americans saw significant gains. IHS estimates that **as a result of the increase in domestic shale gas production, we saw real GDP increase by $190 billion and 1.4 million more jobs.** Shale gas meant more than $150 billion more dollars in real disposable income last year. That means the average American family had an extra $1,337 in disposable income.

### Manufacturing Opportunity

Because manufacturing relies on both natural gas and electricity, lower natural gas prices not only reduce the cost of purchasing natural gas for fuel, but manufacturers also see an indirect reduction in costs through the use of less expensive electricity. The combination of **increased access to shale gas and the pipelines that deliver that affordable energy to manufacturers across America meant 1.9 million jobs** in 2015 alone. As our pipeline network grows, so does manufacturing opportunity.

### Multiplier Effect

Pipeline construction means more than just reliability and energy security. It generates increases in economic activity when inputs like steel pipe, coatings, construction equipment, compressor motors, gauges and instruments, sand and gravel, or engineering and design services. And when workers spend disposable income, there is a multiplier effect to the broader economy. In a nutshell, **the construction of new natural gas transmission lines meant more than 347,000 jobs in 2015, with almost 60,000 of those in manufacturing.** When you also consider the ongoing impacts of operation and maintenance of existing pipelines as well, it adds up to **nearly $50 billion in GDP.**

### Room to Grow

Total natural gas demand is poised to increase by 40 percent over the next decade—double the growth of the past 10 years. And by improving technology and increasing productivity, supply growth continues at a strong pace despite falling prices for both gas and oil and significantly lower rig activity. But according to IHS, "There is a mismatch, geographically, in the growth in natural gas demand and supply in the U.S. lower 48." **New pipeline and processing infrastructure expansion will be a key to connecting new supply sources with new and growing sources of demand.**

## "As our pipeline network grows, so does manufacturing opportunity."

Beyond these numbers, the changing dynamics of the global energy market has had profound geopolitical and economic impacts. On the former, a few years ago, it would have been difficult for one to predict a time where growth in energy production would come from North America and not the Middle East. This additional output has pushed energy costs dramatically lower, helping to reduce the cost of production for manufacturers in the United States.

Nowhere is this more evident than in the chemical sector, with at least 262 announced investments in that category in recent years, 61 percent of which has been foreign direct investment. Manufacturing construction has already soared, with more jobs and exports expected to follow. As our pipeline network grows, so does manufacturing opportunity.

**Chad Moutray**
**Chief Economist**
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