



Natural Gas Fuels Growth and Opportunity for Tennessee

From the bluffs in Memphis overlooking the Mississippi River to the Great Smokey Mountains, there's a lot to love about the Volunteer State. The quality of life families and communities can enjoy in Tennessee is enhanced by access to affordable energy, particularly natural gas, which not only heats and cools homes across the state, but also provides the building blocks for Tennessee's 21st century manufacturing economy.

Prior to challenges associated with the COVID-19 pandemic, Tennessee enjoyed substantial economic and population growth in regions near Nashville and Chattanooga. According to the University of Tennessee, since 2010 the state economy created 496,300 jobs, reflecting a compound growth rate of 1.8 percent, ahead of pace for job creation nationwide.¹ The U.S. Census Bureau found that two of America's 15 fastest growing cities are located in Tennessee.²

Tennessee's substantial growth was aided by the availability of reliable and affordable natural gas that has saved households, businesses and manufacturers more than \$14.3 billion from 2008-2018.³ Residential users alone saved almost \$3.8 billion. Based upon current population estimates, this equals more than \$555 per citizen.⁴ Commercial and industrial natural gas users saved more than \$10.5 billion combined.

The Importance of Affordable Energy and Consumer Savings from Natural Gas

Many American families struggle daily to pay for rising energy costs. The U.S. Energy Information Administration released a survey in 2018 noting that nearly one-third of American households struggled to pay their energy bills to light, heat, and cool their homes. The survey found that roughly "one in three households reported reducing or forgoing basic necessities like food and medicine to pay an energy bill, and 14 percent reported receiving a disconnection notice for their energy service. Households also used less energy than they would prefer to – 11 percent of households surveyed reported keeping their home at an unhealthy or unsafe temperature."⁵



\$14.3
BILLION

The amount Tennessee consumers saved between 2008 and 2018 because of natural gas.




18,475
JOBS

The number of new jobs supported by low cost natural gas and investments in infrastructure in Chattanooga since 2011.

On average, each Tennessee resident spent \$4,001 on their energy needs in 2018.⁶ For those living at or below the poverty line, this translates to almost a third of their income going toward energy expenses.⁷ In 2018, 15 percent of Tennessee's population lived in poverty - that is 980,000 men, women and children.⁸ The need for affordable energy from natural gas is more important than ever as Tennessee's economy continues to recover from the COVID-19 pandemic, and more than 307,000 residents are currently suffering from unemployment.⁹ Fortunately energy assistance programs are available and infrastructure investments have been made in Tennessee to help communities, businesses, families, seniors and those struggling to get by to realize the benefits of affordable natural gas and save money on their energy bills. Available supplies of affordable natural gas incentivize industry to invest in Tennessee. These large employers will encourage economic growth and help the state rebound as quickly as possible.

Robust natural gas supplies and continued investments in infrastructure help avoid bottlenecks and keep natural gas prices down across Tennessee. Consider where prices were just a decade ago. In July 2008, industrial natural gas prices in the state hit \$14.17 per thousand cubic feet. Fast-forward to April 2020, natural gas prices dropped by nearly 75 percent to \$3.73 per thousand cubic feet.¹⁰ These energy savings create opportunities for investment and ensure continued economic development across Tennessee. Citygate prices, or the wholesale/wellhead price of natural gas plus the cost of pipeline transmission to a local gas utility for distribution, have also seen a tremendous drop in price since 2008. The cost of citygate gas in Tennessee averaged \$9.43 per thousand cubic feet in 2008; by 2019 that figured dropped to \$3.19 per thousand cubic feet – or a price decline of nearly two-thirds.¹¹

Gas distribution utilities reinvest these savings to work on behalf of customers and businesses by expanding service, pipeline safety and keeping pace with Tennessee's growth. For example, in 2019 Chattanooga Gas spent \$38 million on piping, safety enhancements, and infrastructure upgrades and increased its capital spending, which was more than triple its 2012 levels, to accommodate the expanded demand of residential, commercial and industrial customers.¹²

In 2018 and 2019, Chattanooga Gas added nearly 2,000 residential customers and almost 250 commercial customers. Despite this upward pressure on demand, capital expenditures, and service, the company's rates are still over 4 percent lower than a decade ago.¹³ According to the company, its customers pay less now for natural gas priced at \$0.46 per therm, or 100 cubic feet of natural gas,



75%

The amount the industrial rate of gas has decreased since summer of 2008.

than in 2017, when prices were \$0.58 per therm. When compared to peak prices in 2008 of \$1.20 per therm, the average price of gas for customers has dropped over 60 percent.¹⁴ These are remarkable savings for families, seniors and those struggling to get by or for businesses to help make payroll, expand their benefits and invest in their companies to expand operations and production.

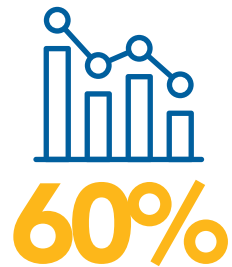
Natural Gas Powers Tennessee's Economic Engine and Manufacturing Rebound

In 2018, manufacturing in Tennessee accounted for more than \$56 billion, greater than 15 percent of the total output in the state, and employed more than 351,000 people.¹⁵ Annual compensation for manufacturing jobs in Tennessee was nearly \$71,000 a year in 2017,¹⁶ which is nearly \$19,000 more than the state's median household income.¹⁷ According to the Tennessee Department of Economic and Community Development, the state exports over \$24 billion in manufactured goods a year and outpaced the nation in job creation, with an employment concentration 42 percent higher than the national average.¹⁸

Tennessee's industrial sector is the state's largest consumer of natural gas. In 2019, Tennessee industry consumed more than 148 billion cubic feet of gas¹⁹ – to put that into perspective, 1 billion cubic feet of gas could provide over 24,300 homes with electricity for an entire year.²⁰

A 2017 study by ICF International found that the natural gas value chain contributed 86,700 jobs and \$12.94 billion to the state's economy.²¹ In 2019, natural gas use by Tennessee's electric power sector hit a record high and was roughly 32 times greater than a decade earlier, according the U.S. Energy Information Administration.²²

Affordability and availability of natural gas supplies will play an increasingly important role in keeping Tennessee competitive – especially in advanced manufacturing where it remains a leader. One of the many great success stories of Tennessee's attractive investment climate is the construction of Volkswagen's Chattanooga assembly plant, which runs on natural gas. This service is vital to the day-to-day operation of the region's largest economic development engine that produces nearly 150,000 vehicles per year. A 2017 study by the accounting firm Ernst and Young estimated the plant supports over 16,400 jobs across the state, nearly \$74 million in local tax revenue and over \$8.56 billion in state economic activity.²³ In November 2019, Volkswagen announced another \$800 million expansion for a new electric vehicle assembly plant that will provide another estimated 1,000 jobs and bringing the total investment in the Chattanooga region at over \$2 billion.²⁴



The percent decline in the average price of gas for Chattanooga Gas customers since 2008.



Natural gas service and infrastructure has been a key driver in attracting tremendous regional job growth and economic development opportunities for Chattanooga. Some recent examples include:

| COMPANY | YEAR | JOBS | CAPITAL INVESTMENT |
|--|--|--------------------|-----------------------------------|
| Gestamp | 2015 , 2018 , 2019 | 700 | \$255.5 million |
| Whirlpool | 2012 | 130 | \$200 million |
| ADM | 2012 | 25 | \$24-\$27 million |
| Woodbridge Chattanooga Formed Plastics | 2013 | 70 | \$8.5 million |
| Volkswagen Assembly Plant | 2011 | 16,400 | \$2.3 billion |
| Volkswagen (Expansion) | 2019 | 1000 | \$800 million |
| Nippon Paint | 2019 | 150 | \$60 million |
| | | 18,475 | \$3.6 billion |

Since 2011, natural gas has contributed to the locating and expansion of numerous industries and large employers to the region, such as Volkswagen, Nippon, and Whirlpool and more. These projects are responsible for investing more than \$3.6 billion and hiring at least 18,475 jobs, contributing greatly to the region's unprecedented growth.

Natural Gas Improves Tennessee's Environmental Footprint

Even as metro areas and manufacturing have boomed state wide, emissions have declined significantly across the state due in large part to increased use of natural gas and investments in the state's natural gas infrastructure.

From 1990 to 2019, Tennessee's emissions of key pollutants have decreased across the board:

- 75 percent reduction in nitrogen oxides (NO_x)
- 97 percent reduction in sulfur dioxide (SO₂)
- 69 percent reduction in carbon monoxide (CO)
- 61 percent reduction in volatile organic compounds (VOCs)
- 39 percent reduction in fine particulate matter (PM_{2.5})
- 51 percent reduction in coarse particulate matter (PM₁₀)²⁵

Additionally, Tennessee's energy-related carbon dioxide (CO₂) emissions fell 6.2% from 1990-2017, according to the U.S. Energy Information Administration.²⁶



These are remarkable reductions in light of Tennessee’s strong economic and population growth – two factors which are usually accompanied by rising emissions because of increased activity. From 1990-2019, the state’s gross domestic product (GDP) grew 304 percent²⁷ and its population expanded by almost 40 percent.²⁸

A recent study by paleBLUEdot documented a similar trend in Chattanooga. From 2008-2018 the city’s greenhouse gas emissions declined more than 25 percent while the GDP grew almost 45 percent and the population grew more than 14 percent. It is important to note that during this same time frame residential and commercial natural gas use increased by 2 percent and 5.5 percent, respectively, as Chattanooga Gas was investing in modernizing its infrastructure.²⁹ The Chattanooga region’s progress is even more noteworthy as it has the lowest per capita level of greenhouse gas emissions even though it has the highest share of manufacturing jobs among the four largest metro areas in the state.³⁰

Industry efforts are also underway, with support from utilities like Chattanooga Gas and research institutions to create endeavors such as the Low Carbon Resources Initiative (LCRI). LCRI is a multi-million dollar investment with the goal of accelerating the development and demonstration of low-carbon energy technologies.³¹ Southern Company Gas is also part of ONE Future, an industry collaborative working to ensure the future of natural gas as a clean energy source by reducing methane emissions associated with the production, processing, transmission and distribution of natural gas.³²

Conclusion

Despite the current challenging economic times, Tennessee’s comeback will be aided by affordable natural gas and continuing to make infrastructure investments. Consumers and families have saved billions on their energy budgets and companies now have resources to invest in their employees, make payroll, and attract new economic development to get the economy back on its feet. Not only that, Tennesseans can have assurances that natural gas is not only fueling their lives but is leading to a cleaner future and more opportunity for all.

Even as metro areas and manufacturing have boomed state wide, emissions have declined significantly across the state due in large part to increased use of natural gas and investments in the state’s natural gas infrastructure.



¹ <https://haslam.utk.edu/sites/default/files/erg2020.pdf>

² https://www.thecentersquare.com/tennessee/pair-of-tennessee-cities-among-fastest-growing-in-u-s/article_65119a16-9b83-11ea-aa94-4b83b147f42a.html

³ Calculations developed by Orion Strategies. \$7.590 billion saved by industrial users, \$3.795 billion saved by residential users, and \$2.960 billion saved by commercial users. This number was calculated by using the annual average price per thousand cubic feet of natural gas for residential, commercial, and industrial consumers, via the U.S. Energy Information Administration (EIA). This EIA price was then applied to the total MMcfs consumed in Tennessee, also sourced by EIA. The Consumer Price Index utilized by the Bureau of Labor and Statistics was applied to each year's price in order to adjust each price to 2018 dollars. Residential data was only available through 2018.

⁴ <https://www.census.gov/quickfacts/fact/table/TN/PST045219>

⁵ <https://www.eia.gov/todayinenergy/detail.php?id=37072>

⁶ https://www.eia.gov/state/seds/sep_sum/html/pdf/rank_pr.pdf

⁷ <https://aspe.hhs.gov/poverty-guidelines>

⁸ <https://talkpoverty.org/state-year-report/tennessee-2018-report/>

⁹ <https://www.bls.gov/eag/eag.tn.htm>

¹⁰ <https://www.eia.gov/dnav/ng/hist/n3035tn3m.htm>

¹¹ http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_stn_a.htm

¹² <https://www.timesfreepress.com/news/business/aroundregion/story/2020/may/29/chattanooga-seeks-higher-rates-recover-record/524180/>

¹³ Ibid.

¹⁴ <https://www.chattanoogagas.com/residential/pricing-and-rate-plans.html#:~:text=In%20October%202018%2C%20Chattanooga%20Gas,customer%20had%20a%20similar%20increase>

¹⁵ <https://www.nam.org/state-manufacturing-data/2019-tennessee-manufacturing-facts/>

¹⁶ Ibid.

¹⁷ <https://datausa.io/profile/geo/tennessee>

¹⁸ <https://tncd.com/industries/advanced-manufacturing/#:~:text=Tennessee%20leads%20the%20nation%20in,billion%20in%20manufactured%20goods%20annually.&text=Advanced%20manufacturing%20job%20creation%20in,higher%20than%20the%20national%20average>

¹⁹ <https://www.eia.gov/dnav/ng/hist/n3035tn2A.htm>

²⁰ https://www.youtube.com/watch?v=jIjYH5xc_1A&feature=youtu.be

²¹ <https://www.api.org/~media/Files/Policy/Natural-Gas-Solutions/API-Natural-Gas-Industry-Impact-Report.pdf>

²² <https://www.eia.gov/state/?sid=TN>

²³ <https://www.timesfreepress.com/news/business/aroundregion/story/2019/feb/25/vw-impact-16400-jobs-tennesseer-report-cite/489400/>

²⁴ <https://www.knoxnews.com/story/money/2019/11/13/volkswagen-build-electric-suv-chattanooga-add-1-000-jobs/4159279002/>

²⁵ https://www.epa.gov/sites/production/files/2018-07/state_tier1_caps.xlsx

²⁶ <https://www.eia.gov/environment/emissions/state/excel/table2.xlsx>

²⁷ <https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1>

²⁸ <https://www.macrotrends.net/states/tennessee/population>

²⁹ <https://static1.squarespace.com/static/53fbb928e4b0eafa4734317f/t/5f21aefc89035c1ccdf56d/1596043025224/Chattanooga+GHG+Inventory+Report+2020.pdf>

³⁰ <https://www.timesfreepress.com/news/business/aroundregion/story/2020/jul/29/chattanooga-cuts-carbon-emissions/528629/>

³¹ <https://www.southerncompany.com/newsroom/2020/aug-2020/southern-company-joins-industry-decarbonization-effort.html>

³² <https://onefuture.us/who-is-one-future/>