

Natural Gas Usage and Market Development

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On a national scale, according to the American Chemistry Council, plentiful and affordable natural gas supplies have transformed America's chemical industry from the world's highest-cost producer five years ago to among the lowest-cost producers today. The United States now enjoys a decisive competitive advantage in the making of basic petrochemicals. Companies from around the world are investing in new U.S. production capacity, leading to an industrial revival and new jobs.



A 2018 analysis by the American Chemistry Council found that 333 new chemical facility projects were in development and construction in the U.S., constituting a total investment of \$202 billion. Those projects are estimated to support 431,000 direct and indirect jobs by 2025, along with a total economic output of \$292 billion.



TRANSPORTATION FUEL CONVERSIONS

Natural gas has been fueling vehicles since the early 20th century. Because it is a gas, it must be stored in either a compressed gaseous (CNG) or liquefied state (LNG), the difference being primarily vehicle specific. For example, most consumer vehicles can run on

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a dedicated CNG supply or a bi-fuel application, having the flexibility of CNG and gasoline.

Most LNG applications are available for commercial trucks that need a longer range. Heavy duty trucks that run on two fuels are referred to as "dual-fuel" vehicles.

The use of CNG as a transportation fuel is continuing to emerge as an emissions-reducing and cost-effective alternative to diesel and gasoline, with estimates of a 10% growth in usage by 2025 worldwide. Pennsylvania has seen a number of transit agencies, delivery services, waste hauling vehicles and heavy-duty trucking companies make the switch to CNG in the past decade, thanks to abundant and lower-cost natural gas supplies. PIOGA members are directly involved in this market segment, providing engineering, mechanical and contractor expertise.

Among the advantages of CNG over other types of transportation fuel are reduced maintenance costs and engine wear and tear, increased life of lubricating oils and cleaner emissions. Emissions of carbon dioxide, carbon monoxide, nitrogen oxide, sulfur dioxide, particulate matter and unburned hydrocarbons from CNG are all far lower than those from diesel or gasoline, and equivalent fuel costs for CNG are about \$1 less per gallon than the cost of diesel. It is estimated that the pay-back period to recover the cost to convert an engine to CNG fuel is 18-24 months.

Pennsylvania continues to install CNG fueling stations to serve both private fleets and the public. The state currently offers 90 such public stations along the turnpike and state and federal highways, with many more planned for the years ahead.

DID YOU KNOW?

Natural gas is fueling electric vehicles too. Pennsylvania natural gas is fueling approximately 33% of Pennsylvania's electric grids.

One-third of all new transit buses run on natural gas

Replacing one older diesel bus with a natural gas bus is the equivalent to taking 21 cars off the road. **30% of heavy-duty trucks will convert to natural gas by the end of 2025.**

ELECTRIC GENERATION

The electric power sector has grown rapidly in recent years and is projected to become the largest consumer of natural gas in Pennsylvania by 2020. Because of its environmental benefits, natural gas used for electricity generation has increased dramatically. According to the Energy Information Agency (EIA) it's estimated that by 2032, 40% of electric generating capacity will be fueled by natural gas. Its flexibility for use during times of peak consumption will be invaluable to future power generation. Because natural gas pipelines and infrastructure are situated near areas of demand, electricity generated using natural gas saves consumers on congestion costs.



ENVIRONMENTAL BENEFITS OF ELECTRIC GENERATION

The use of natural gas for electricity generation is increasing steadily in the United States, and is a major factor in the significant reductions of key air pollution measures monitored by state and federal agencies. Approximately 6.9 million cubic feet (MMcf) of gas was dedicated to electricity production in 2008, and grew to almost 10 MMcf in 10 years. Electric utilities accounted for the largest jump in that amount, burning 2.7 MMcf in 2008 and 4.7 MMcf in 2017. Natural gas combined-cycle plants made up 40% of the total proposed energy production capacity scheduled to come on line in 2017 in the U.S., and more than 45 new gas-fired electric generators are in various stages of planning and permitting in Pennsylvania, as of the end of 2017.

This information came from pioga.org website.

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