



VIRGINIA - GEORGIA TRANSFORMER  
ONE SOURCE-ONE COMMITMENT

# RELIABLE TRANSFORMERS FOR LNG

## NATURAL GAS: THE FACTS

Discover more about natural gas – including where it comes from, how it is produced and the various ways in which we use it every day.

### What is natural gas?

Natural gas is a naturally occurring mixture of gases, mainly methane. It is formed when layers of decomposing plant and animal matter are exposed to intense heat and pressure under the surface of the Earth over millions of years.

### Where is it found?

Natural gas is found in rock formations, sometimes on its own and sometimes alongside oil. Some deposits are relatively easy to extract, while others are trapped kilometers beneath the Earth's surface.

### How is natural gas produced?

Natural gas is often found in huge reservoirs called sedimentary basins. To gain access to these reservoirs, a hole or well is drilled through the rock to allow the gas to escape and be collected. Natural gas is most commonly extracted by drilling vertically from the Earth's surface.

### What is shale gas and tight gas?

Shale gas is natural gas that is trapped within shale formations of rock. The rock is impermeable, meaning liquids cannot pass through, which makes it harder to extract. Tight gas is held in rock pores 20,000 times narrower than a human hair. A special technique, known as hydraulic fracturing, is needed to extract it.

### What is fracking?

A technique known as hydraulic fracturing or fracking is used to break open rock and release natural gas. This involves pumping fluids into the well at high pressure. The fluids are made up of around 99% sand and water, with 1% chemicals added to help the gas flow more freely. Hydraulic fracturing typically takes place a kilometer or more (thousands of feet) below drinking water supplies. Concrete and steel barriers are inserted into the wells to prevent any drilling or fracturing fluids from entering local water supplies.

### How is natural gas transported?

Natural gas can be transported by pipeline or ship to where it is needed. By using pipes, gas can be cost-effectively transported over long distances as part of an integrated gas transport network. If lined up together, the total length of the world's natural gas pipelines would stretch to the moon and back eight times. When pipelines cannot cost-effectively reach consumers, natural gas can be cooled to make a liquid, shrinking its volume for shipping to where it is needed.



### What is natural gas used for?

It is one of the few energy sources that can be used across all sectors of the global economy. It is used to generate electricity, provide heat for essential industrial processes, heat homes, and fuel the transport of people and goods.

Shell's gas-to-liquids (GTL) technology converts natural gas into high-quality liquid products that would otherwise be made from crude oil. These products include transportation fuels, motor oils and the ingredients for everyday necessities like plastics, detergents and cosmetics.

### Why can't we replace natural gas with renewables?

Despite the significant role of renewable energy sources, they cannot provide all the world's energy needs today. Renewables mainly power electricity, which only meets around 18% of global energy demand. For renewables to have a bigger impact, electricity must play a larger role in other key sectors of the economy.

Natural gas can help to support renewables because it can quickly compensate for dips in solar or wind power supply and rapidly respond to sudden increases in demand. Natural gas is a good partner for hydropower, providing secure electricity supply when there is limited rainfall.

## PRODUCT RANGE

Up to 400 MVA 525 kV

BIL 1675 kV

LTC / DETC

Medium Power Transformers

Large Power Transformers

GSU Transformers

Auto-Transformers

Padmount Transformers

Traction Transformers

Rectifier Transformers

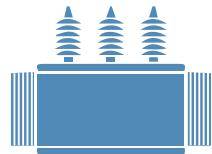
67,000 MVA Annual Capacity



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VTC-GTC LNG 10-2023

# WHAT WE OFFER



## TRANSFORMER USE AT LNG FACILITIES

Transformers are one of the most important components of the modern electrical grid, enabling the safe and efficient transmission of electricity from power stations to homes and businesses.

Transformers are used in power systems to transform (step down) voltages while maintaining the same frequency. Electrical engineers designing power systems for liquefied natural gas (LNG) or petrochemical facilities typically use two-winding transformers to feed multiple process units in redundant distribution schemes throughout the facility. This method is repeated further to derive different voltage levels to feed process loads. As the industry moves towards larger production facilities which increase the power demand, multiple large two-winding transformers are utilized. This approach leads to increases in substation footprints, switchgear equipment, power feeders, site works, etc. Engineers may develop alternative designs using three-winding transformers for LNG or petrochemical facilities. The input and output of a three-winding transformer generally consists of one primary (H) input and two outputs defined as secondary (X) and tertiary (Y). Three-winding transformers are connected in a redundant configuration to feed multiple process units. There are different types of three-winding configurations and construction (radial or axial) methods. The ideal configuration and build depend on the installation method, application of tap changers, and overall system performance, as well as defining impedance parameters, applications, and specification requirements.



### What Virginia Transformer Does

At Virginia Transformer, we collaborate closely with project developers and EPCs, especially during the front-end engineering design (FEED) phase. We specialize in tailoring custom-built transformers to precise customer specifications, addressing challenges like space limitations, unique voltage configurations, and harsh environmental conditions. Our track record of surpassing these requirements has solidified Virginia Transformer's renowned status as the industry leader in power transformer manufacturing.

### Virginia Transformer's Contribution to the LNG Market

Virginia Transformer is a major contributor to the oil and gas sector, supplying reliable, high-quality energy solutions to LNG projects across North America. We offer transformers from 500 kVA to 300 MVA, 230 kV class, with proven expertise in powering LNG plants, pumping stations, compression substations, and more. Our track record includes significant contributions to completed LNG projects such as the Sabine Pass and Corpus Christi terminals, as well as ongoing ventures such as the Driftwood and Rio Grande LNG projects.

Virginia Transformer stands out as the leading transformer manufacturer, renowned for our engineering excellence and dedication to quality. Our commitment to continuous improvement and exceptional customer service allows us to consistently offer the shortest lead times in the industry.

### LNG Market & Outlook

The global LNG market is expected to be tight over 2022-2026, as Europe's quest to reduce its dependency on Russian gas increases demand for LNG. This will curb gas demand growth in China and emerging Asia as the European market outbids these buyers for the limited amount of flexible LNG supply. To attract the LNG needed to replace Russian pipeline gas to Europe, BNEF expects US LNG netbacks for European TTF prices to be higher than Asia's benchmark JKM for the forecast period 2022-2026.

With tight supply anticipated in the coming five years, prices are expected to remain at elevated levels compared to historical averages over 2017-2019, before COVID-19. The ramp-up of new supply projects, especially in the US, is forecast to raise global supply to 460 million tons, up 19% from 2021. LNG demand growth is likely to be constrained by supply between 2021-2026, with 18% growth estimated, although Europe is expected to see imports spike during the period.

**With five manufacturing plants in North America, Virginia - Georgia Transformer is the largest US-owned manufacturer of power transformers and offers the broadest product range.**



**We are the Commitment Company – Providing Reliable Power Solutions with the Shortest Lead Times for More Than 50 Years.**