# Helium

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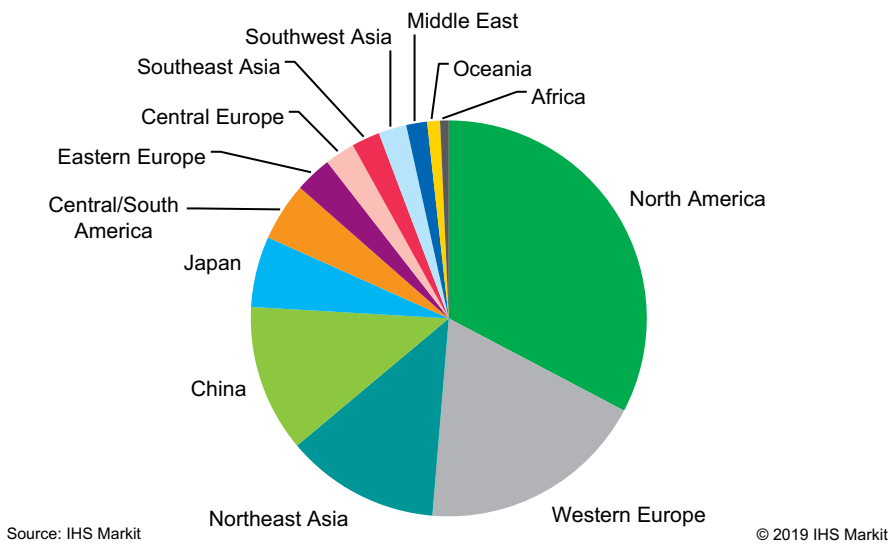
## Abstract

The global helium market suffered under massive supply constraints during 2011–13, which caused severe shortages and greatly reduced demand as consumers started to either substitute or recycle helium. The situation improved toward the end of 2013, when the Qatar Helium II (RLH2) project came onstream midyear, but swung quickly into oversupply with additional capacity from the expansions in Algeria and the United States at the end of 2013 and in 2014. This oversupply continued through 2016 as a result of the start-up of several helium capacity expansion projects. In the beginning of 2017, a slight supply surplus remained from the large RLH2 plant that had finally reached full production in 2015. However, throughout 2018, helium was in tight supply caused primarily by the reduction of US helium production that started with the Qatar embargo in June 2017.

Because of the short supply in 2018, major helium suppliers were allocating all supply to historical helium consumption to prevent panic shopping and stockpiling. However, large projects announced in Qatar and Russia should secure the helium supply during the forecast period.


The following pie chart shows world consumption of helium:

**World consumption of helium—2018**




Helium is an inert gas and the lightest of all gases except hydrogen. Helium is produced in the natural environment continually by the radioactive decay of uranium and escapes into the atmosphere. Since the concentration of helium in air is very minimal, extraction of helium from air is not economically viable. Helium is typically extracted from helium-bearing natural gas. It is also extracted from the vent gases from some liquefied natural gas (LNG) processing plants.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Five fields alone supply about 80% of the world's helium. Production outages or slowdowns from one of these five fields will have a severe impact on the global helium supply, making the helium supply chain sensitive to shock. The United States is still the major producer, but most new sources are developing elsewhere. The bulk of US production is related to the BLM (Bureau of Land Management), which manages the world's largest helium reserve. In recent years, BLM-related production has diminished considerably. Helium is a global product in tight supply and any disruptions create shortages and dislocation.

Growth in the global demand for helium is driven by rising demand for magnetic resonance imaging (MRI), along with growth in the electronics, semiconductor, LCD, and fiber optic industries, which are centered in China, India, South Korea, Taiwan, and the Middle East. Up to 20% of global helium demand is estimated to come from the manufacture and operation of MRI scanners alone.

In 2018, an estimated 25% of global helium was consumed in liquid form, with this share being higher in developed regions. In the major consuming regions—the United States, Western Europe, Japan, China, and Other Asia—MRI was the largest application for liquid helium, followed by fiber optics, semiconductors/electronics, and metals processing (welding cover gas).

One of the largest uses for gaseous helium is in welding, where it provides an inert gas shield to protect the weld zone from the atmosphere. The two major welding processes that use helium are gas tungsten arc welding (GTAW) and gas metal arc welding (GMAW).

The semiconductor and electronics industry is a significant consumer of helium. Demand growth has been driven mainly by the emergence of larger-diameter silicon wafers. As the electronics industry is now preparing for the 450-millimeter-diameter wafer, it is expected that the electronics industry will use considerably more helium to satisfy its cooling needs.

The future growth of helium is expected to be driven by demand from electronics manufacturers in Asia. Semiconductor manufacturing, flat-panel display manufacturing, and optical fiber manufacturing are all significant consumers of helium in Asian markets.

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