MARKET DISRUPTION BRIEF

Helium (updated April 3)

While the Federal Helium System sale occurred Jan. 25, there is still much uncertainty about how it will impact the supply chain. Once finalized, the buyer will own about 425 miles of pipeline covering Texas, Kansas and Oklahoma.

Current conditions

With the U.S. government sale of its Federal Helium System reserves to Messer Americas in January, there is still uncertainty about how it will affect the market. “A new owner will need to create some sort of lease to use the enrichment unit, or build their own unit to enrich the helium,” explained Rich Gottwald, chief executive officer of the trade group Compressed Gas Association. “There’s a whole host of issues that need to be resolved and the concern is, until they’re resolved, the system will need to shut down.” Helium is used in everything from party balloons to magnetic resonance imaging (MRI) machines and quantum computers.

Currently, the helium market is stable even as there is a tight supply predicted until at least the end of this year. But hospital supply chain experts are concerned that even a temporary shutdown as the facility passes from government to private ownership “could have serious consequences for health care down the road – especially when it comes to MRIs.” Other issues include reconciling laws across the three states the facility spans, which the federal government did not need to do, and the new private owner will need a lease to use a helium enrichment system owned by four private companies that include Messer, or it will have to build its own.

The Amarillo, Texas, facility – that has the remaining government reserves, which provide up to 30% of the country’s helium, and a distribution pipeline – is the only large-scale storage facility in the world, and has served as a buffer to sharp price increases, releasing product in much the same way oil is released from the U.S. Strategic Oil Reserve to tamp down gasoline prices, according to University of New Mexico economist Janie Chermak, who helped write a report that concluded selling the reserve “is not in the best interest of U.S. taxpayers or the country.”

Prior to the sale, those from the industrial gas, semiconductor, medical and aerospace sectors joined together to warn the “sale could disrupt supplies of the indispensable element” that already has “stiff prices.” It is produced typically as a byproduct of natural gas, primarily in the U.S., Qatar, Algeria and Russia, with increasing demand in the market. Also, accidental explosions, natural disasters or geopolitical events in any of these countries can affect pricing. Experts also expect some relief in the next few years with new plants coming online. In addition, high prices have encouraged producing helium as a primary product not as a byproduct, opening up new possibilities, including Avanti Helium, a Canadian company planning to open a plant in Montana in 2024. A “dream” discovery was also made when a high concentration of helium was discovered in Minnesota’s Iron Range – a feasibility study is next. Russia’s Amur Gas Processing and Helium Plants are also expected to positively affect the market as they come online, even potentially leading to an oversupply, according to gasworld reporting. In addition, a semiconductor chip slump in Asia has helped increase helium supply.

As the reserve is sold, federally funded scientists especially worry about pricing as they have been receiving discounted product from the government. And small consumers also struggle to get helium when supplies are short and prices are high. Even a bipartisan group of senators requested a pause in the sale which was originally scheduled for mid-November. Ten percent of annual global production could be affected if there are issues at the reserve, with higher prices, according to Maura Garvey, president of Intelligas Consulting. Garvey advocates a three-year delay to sell 45 million cubic meters of already-purchased crude helium in the ground. The reserve has 51 million cubic meters also sold in January.

Market background

Helium cannot be synthesized, manufactured or substituted in many cases. It is listed on the critical materials lists for the U.S., EU, China and other major economies.

The helium market is worth $4.4 billion globally, and the demand is expected to grow more than 12% annually between 2022 and 2023. The market is divided into gaseous helium and liquid helium. In the U.S., all the natural gas processed for helium comes from fields in Colorado, Kansas, Oklahoma, Texas, Utah and Wyoming. Key players of the global helium market include Air Liquide, Air Products and Chemicals, Qatar Liquefied Gas, Praxair, Linde, Messer SE & Co., Matheson Tri Gas, Gulf Cryo, nexAir and Noble Helium Limited.

In healthcare, helium is used in at least two significant ways: breathing observation and MRI. Helium and oxygen are combined to treat acute and chronic respiratory conditions because they reach the lungs faster together. And In 2021, 30% of the global share of helium consumption was attributed to the use in MRI machines. Helium aids in maintaining the low temperatures necessary for running the machines.

Geopolitics like the Russia/Ukraine war and resulting sanctions continue to create delays related to production start-up companies and restarting companies that were to provide some shortage relief.

To learn more, please contact:
Vincent Aguilera, Lead Program Svc, Mgr..,
disasterresponse@vizientinc.com.

As the nation’s largest member-driven health care performance improvement company, Vizient provides solutions and services that empower health care providers to deliver high-value care by aligning cost, quality and market performance. With analytics, advisory services and a robust sourcing portfolio, we help members improve patient outcomes and lower costs.

Other factors affecting price and supply

- Russian energy company Gazprom reported significantly ramping up production capacity "by a factor of eight in 2023" and "100 ISO tanks were shipped from September to December … for more than 400 metric tons."
- Maintenance at two of three helium plants in Qatar; reduced production from Algeria and Darwin, Australia; and a fire at a natural gas processing plant in Haven, Kan., cut supplies.
- South African company Renergen expects to start commercial helium extraction within the next few months, processing it and selling it to customers. Renergen had hoped to do so in 2023 but there were delays after a leak in the vacuum seal of the helium cold box was discovered.
- Moving to the *green economy* presents a structural deficit long-term as much of helium is pulled from natural gas and other energy sites. "Green helium" is produced from underground gas accumulations that contain very small amounts of hydrocarbons or CO2.
- North American start-ups are approaching first production. Avanti Helium, Blue Star Helium, Desert Mountain Energy, First Helium, and Royal Helium are nearing production, and if they succeed, could add 100 to 150 million cubit feet of production the North America by mid-2024.

Health care impacts

Using non-toxic and non-combustible helium has no carbon footprint. It is produced as a stand-alone, not as a natural gas byproduct.

Liquified helium is crucial to the operation of *MRI machines* to keep them cool. As of January 2023, according to Radiological Society of North America (RSNA), clinical MRI units throughout the U.S. remain unaffected, and patient care has not been compromised.

There are no alternatives for this product.

Conservation strategy

- Providers should keep *cylinder valves for helium cannisters tightly closed*. This prevents unneeded leakage and product loss. Cylinders used are mostly for respiratory lung diffusion mixes and heliox mixtures (blended cylinders of helium and oxygen).
- For imaging helium, the best recommendation is to have *service contracts* that include helium.

Additional resources

Supply assurance webpage; Vizient Newsroom

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