Speaker 1 (00:00):

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Nikki Wise (00:16):

Welcome back to GT's E2 Energy Law Podcast, where we explore the future of energy and innovations shaping the world. I'm your host, Nikki Wise, an attorney in the Greenberg Traurig's Houston office. Today, we're discussing a little known energy issue that is impacting the world in unexpected ways, the current global shortage of helium. We are fortunate to have with us today, Bill Garner, co-chair of GT's Global Energy Practice Group, and a lawyer who specializes in industrial gases like helium.

(00:50):

Welcome to the show, Bill.

Bill Garner (00:51):

Thank you, Nikki. Today, we're talking about something that most people associate with party balloons, but which actually is critical to modern technology and medicine, helium.

Nikki Wise (01:02):

Specifically, we're exploring the reasons behind the current global helium shortage and what it means for industries, researchers, businesses, and consumers around the world.

Bill Garner (01:13):

The answers turn out to be a lot more interesting and important than most people realize.

Nikki Wise (01:18):

Let's start with the basics. Why is helium such a big deal?

Bill Garner (01:21):

Well, most people know helium because it makes balloon float and gives people funny voices when they inhale it, but that's actually one of its least important uses. Let's start with what helium is. Most people have no idea where it comes from. Helium is the second lightest element after hydrogen. Helium forms naturally underground and usually is found mixed with other gas deposits like natural gas or carbon dioxide. You do not find it in the Earth's atmosphere. It actually is formed as a gas from the decay of heavy radioactive minerals like uranium or thorium. Earth's gravity is not strong enough to keep this light element from escaping into space. After formation, it rises to the surface over millions of years, but sometimes is trapped in the same reservoirs as natural gas, hydrogen, or carbon dioxide. It is important to note that helium is not a hydrocarbon and is formed differently than hydrocarbons.

Nikki Wise (02:15):

Interesting. So where is helium really used?

Bill Garner (02:19):

Helium is essential to a number of high-tech applications. Hospitals use liquid helium to cool MRI machines. Semiconductor manufacturers use it to help make computer chips. It's also important in aerospace, fiber optics, scientific research, and even certain welding operations. Certain developers of microfusion reactors have claimed they intend to use helium as a coolant.

Nikki Wise (02:47):

And helium must have some unique properties.

Bill Garner (02:47):

Exactly. Helium is extremely light, non-flammable, chemically inert, and remain a liquid at incredibly low temperatures. In fact, it's the coldest practical liquid substance available, which makes it ideal for cooling sensitive equipment. Unlike hydrogen, helium does not combine with other elements.

Nikki Wise (03:06):

So if helium becomes scarce, we're not just talking about fewer party balloons.

Bill Garner (03:10):

Yeah, not at all. We're talking about potential impacts on healthcare, technology, manufacturing, scientific research, and national security industries.

Nikki Wise (03:20):

Let's get to the main question. Why is the world experiencing a helium shortage?

Bill Garner (03:26):

There are several reasons and they all come together to create a perfect storm today.

Nikki Wise (03:31):

What's the first factor?

Bill Garner (03:32):

The biggest issue is that helium is a finite natural resource. Unlike many industrial gases, helium can't simply be manufactured from the air when demand rises. It only is found in certain parts of the world mixed with other gases. There are no 100% pure helium reservoirs. The raw helium must be separated from those other gases and liquefied through an extensive cryogenic process. Accordingly, to make helium separation economic, you need a high percentage of helium in the gas stream. And by high, it must be at least around 0.1 to 0.2% of the produced gas stream, which is obviously not very much. Any discovery above 0.5% is considered world-class.

Nikki Wise (04:19):

So supply is limited from the start because of its scarcity.

Bill Garner (04:21):

Exactly. Only a relatively small number of places in the world contain economically recoverable helium reserves. Production is concentrated in a handful of countries, including the United States, Qatar,

Canada, Algeria, Russia, and Poland. At one time, the United States was the OPEC of helium and it was illegal to sell helium to any party other than to the US government. Major helium plants have been built in the panhandle of Texas, Southwestern Kansas, and Central Wyoming, but American helium reserves are in decline.

Nikki Wise (04:55):

It sounds risky to have helium production limited to this small number of countries.

Bill Garner (05:00):

Yes, it is. When production is concentrated in a few locations, including the Middle East and/or sanctioned nations, any supply disruption can have major global consequences.

Nikki Wise (05:10):

What kind of disruptions?

Bill Garner (05:12):

Geopolitical events, plant shutdowns, transportation bottlenecks, and even accidents. For example, previous shortages were worsened by technical failures and fires at a major helium production facility like in Algeria. Delays at Russia's gas processing complexes also reduced expected supplies. Explorationists are active in South Africa, Namibia, Tanzania, and Mongolia, but these generally are not well-developed nations and it will be difficult to move these supplies to market.

Nikki Wise (05:44):

And there have been more recent geopolitical issues as well?

Bill Garner (05:47):

Yes. In 2026, damage to major liquefied natural gas facilities in Qatar by Iran significantly reduced helium availability. Industry reports suggest that roughly one third of global supply was affected, causing rationing and higher prices in some markets.

Nikki Wise (06:05):

So today we have limited reserve availability, limited production, infrastructure problems, and geopolitical instability all at the same time.

Bill Garner (06:14):

That's right. Analysts expect helium growth to continue to be about 4% year-over-year. And when demand keeps growing, why supply struggles to keep up, shortages become inevitable and prices rise. Today, liquid purity helium sells for something between 1,000 to $1,500 per thousand cubic feet or roughly 400 to 500 times the value of natural gas in the United States. When I first began working with helium about 30 years ago, it sold for about $100 per thousand in 2026 dollars. At these prices, party balloons cost a lot more and yet they don't stay inflated as long. This is because the helium gas its side is diluted by nitrogen.

Nikki Wise (06:57):

Let's talk about the consequences other than party balloons. Which industries fill the shortage the most?

Bill Garner (07:03):

Healthcare is near the top of the list. MRI machines rely upon liquid helium to keep their super conducting magnets operational.

Nikki Wise (07:11):

So a prolonged shortage can affect hospitals.

Bill Garner (07:14):

Potentially, yes. Healthcare providers are often prioritized during shortages, but higher prices and tighter supplies can still create challenges. Some suppliers have implemented allocation programs to ensure critical medical facilities receive helium first.

Nikki Wise (07:29):

Interesting. What about the technology sector?

Bill Garner (07:31):

Semiconductor manufacturing is heavily dependent on helium. As the world demands more computer chips for artificial intelligence, smartphones, electric vehicles, and data centers, helium demand continues to rise.

Nikki Wise (07:43):

And scientific research is affected too, right?

Bill Garner (07:46):

Definitely. Research laboratories use helium in particle physics, cryogenics, and advanced material science. A shortage can slow experiments and increase operating costs. Scientists have reported concerns about maintaining equipment that requires continuous helium cooling.

Nikki Wise (08:04):

What broader economic effects are we seeing?

Bill Garner (08:08):

As mentioned just a moment ago, the most visible effect is price increases. When supply tightens, helium prices rise. Businesses can pass some of those costs onto consumers, which make everything from medical imaging to electronics manufacturing more expensive.

Nikki Wise (08:23):

Could this shortage also change how companies use helium?

Bill Garner (08:26):

Absolutely. Many organizations are investing in helium recycling systems. Instead of venting helium into the atmosphere after use, they capture and reuse it.

Nikki Wise (08:36):

Because once helium escapes, it's gone forever.

Bill Garner (08:38):

It's gone forever. Helium is so light that it eventually escapes Earth's atmosphere. The Earth's gravity is not strong enough to keep it from escaping into space nor keep in hydrogen for that matter. That's one reason why many experts consider helium a strategic resource rather than just another industrial gas.

Nikki Wise (08:57):

So is there any good news?

Bill Garner (08:59):

Yes, some. New helium projects are being developed around the world and industries are becoming more efficient with the helium they use. With global prices so high today, marginal helium reserve prospects are now becoming economic. Also, and curiously, wildcatters are now searching for natural hydrogen deposits in North America and Europe. When some natural hydrogen deposits are discovered, helium can be found in the gas stream with the hydrogen gas. With the price of helium so high, it makes you wonder if the hydrogen producers should focus on the helium production instead of hydrogen.

Nikki Wise (09:34):

In any event, the problem of helium supply is not a quick fix.

Bill Garner (09:37):

Nope. Finding helium in commercial quantities and building new production facilities takes years. Geopolitical risks remain a challenge. Many experts believe the helium market will remain vulnerable to disruptions for the foreseeable future.

Nikki Wise (09:51):

Which means conservation, recycling, and diversification of supply are likely to become even more important.

Bill Garner (09:57):

Yeah, that's right.

Nikki Wise (09:59):

To summarize, today we learned that helium is much more than a party balloon gas. It's a critical resource supporting healthcare, technology, science, and industry.

Bill Garner (10:09):

And the current shortage highlights how dependent modern society is on a resource that is not well known, supply limited, difficult to replace, and vulnerable to global disruptions.

Nikki Wise (10:19):

Well, thank you for your insights, Bill. Let me close by thanking our listeners for joining us for another episode of GT Energy Horizons on the GT E2 Podcast. I'm your host, Nikki Wise. Stay curious, stay energized, and keep looking towards the horizon.