Explainers › Helium


# There's a shortage of helium and the pricing environment is right – if explorers can find any

8 hours ago | **Emma Davies**

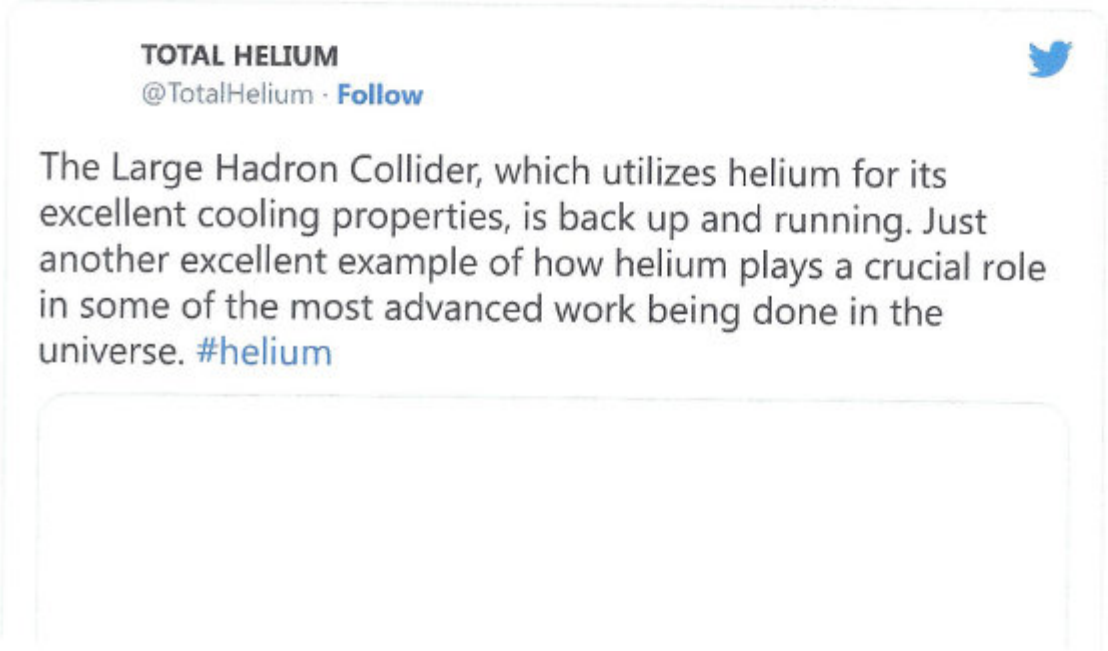
SHARE

- **Helium had a bad year in 2022 with explosions, fires and new sources not coming online**
- **Helium shortage 4.0 could subside this year, if production ramps up at Gazprom's Amur plant**
- **Prices probably won't rise as much as last year, but its still a good time to be a helium explorer**

Last year was a bit of a shocker for helium, with several events – including **an explosion at a new source**, fires at existing sources, the US Bureau of Land Management's (BLM) pipeline shutting down for 6 months and the Ukraine war – compounding the current helium shortage situation.

But more on that later, first let's delve into the helium market as it stands.

Helium isn't just used in balloons. It's a critical – and often irreplaceable – component in the semiconductor, medical, research, space and defence industries – with NASA a major consumer – and it's used in cooling superconducting magnets in MRIs, manufacturing semiconductor chips and in fibre optics, welding, and cryogenics.




It is also quite rare on Earth, with more than 95% of production globally a by-product of natural gas production by energy companies like ExxonMobil and Qatar Petroleum, which is then distributed by major gas companies like Air Products and Chemicals, Air Liquide and Linde.

## End user market worth around $6 billion

Some analysts forecast the global market size will grow from $4.45 billion in 2022 to $6.48 billion by 2027 – but **Kornbluth Helium Consulting** founder and president Phil Kornbluth says it's probably closer to a $6-7 billion a year market – at the end user level.

"Helium is a very opaque business, with major players not sharing a lot of macro level information and no ground level survey work to determine that market demand for MRI is X and demand for electronics is Y," he said.

"I'd say the value of the market at the source is more than $2 billion and closer to $6 billion at the end user level, but it's important to note that the demand growth is often overstated" Kornbluth said.

"Because we've had a series of shortages since 2006, skyrocketing prices have killed some of the demand through things like increased recycling so there's less demand for virgin helium."


US spot market prices hit as high as US$2,000/mcf last year (an increase of around 300% since 2021) and so to save money, end users have become more efficient in their use of helium.

"There's substitution, recycling, greater efficiency in how you use helium, for instance MRI scanners are much more efficient in their helium usage than they used to be," Kornbluth says.

"For all those kinds of reasons, demand hasn't grown a lot, so if demand hasn't grown why are we having a shortage?

"Well, each of these shortages has been more about depletion and decline or outages of existing sources than they've been about demand growth and the shortages have been cured, generally, by new sources coming online, or a demand shock, caused by COVID or a major

recession, until there's an uptick in demand or a further decline in supply, then there's another shortage."

## Russia's Amur plant fire and the Ukraine war

One of the big events last year that put pressure on the helium market was the explosion at Gazprom's Amur plant in Russia on January 5, which sent shockwaves through the industry, because Amur was supposed to ramp up production from their first of three helium plants in 2022, start up their second plant in 2022 and the third plant in 2024-25 which would total up to 2.25 BCF of capacity when all three plants were up and running at full capacity.

That's a lot of helium – for context, global capacity today is around 6.4 BCF, Kornbluth says, so Amur would be adding about another third on top of that.

"New production from Amur was supposed to create a transition from tight markets to plentiful supply, but not only did we not get the new supply from Gazprom, we had a handful of other things that went wrong," he added.

"The war in the Ukraine has complicated things beyond just when will Amur actually produce helium, but how will it be able to get the product to market?"

Gazprom says that the Amur plant is around 87% complete – as of 31 December 2022.

## US BLM Pipeline & Federal Helium Reserve shut for 6 months

Another big factor impacting the helium market last year was that the **US Bureau of Land Management closed its crude helium enrichment unit (CHEU)** from January to June.

The crude helium coming out of the Federal Reserve is not pure enough to be used as feed gas for the four privately owned helium plants that are connected to the pipeline so the CHEU purifies it to 80% before sending it to the plants.

"But when the crude helium enrichment unit is down, these four plants are getting either no feed gas, or very reduced amount of feed gas – and the world loses more than 10% of helium capacity," Kornbluth said.

"Then you had planned maintenance at two of the three plants in Qatar, the big plant was down in February, that took about 35% of its production out of the market.

"The first plant that's about half as large as the second plant was down in March, that took about 40% of that plant's production out of capacity.

"And due to the war in Ukraine, some of the Algerian gas that normally is processed for helium extraction at their two LNG plants, was diverted to undersea pipelines to Europe, so you have less feed gas to the LNG plants where helium is extracted which means less feed gas for helium production."

Added to that, the offshore gas field that provides feed gas for Linde's helium plant in Darwin, Australia has been depleted, taking Darwin's production out of the market, and there was also a fire at the Tenawa Haven Midstream Gas Plant in Kansas, taking around 50 million feet per year out of production.

"What it boils down to is the big new source, Amur, didn't make it into the market and some of the existing sources, under-performed, blew up, they had fires, but it was just a really bad year for helium supply," Kornbluth said.

**Blue Star Helium Limited**
@HeliumBlue · **Follow**

Following the loss of the BLM source of helium, NASA has done a potential deal with Air Products to supply helium for over $1,100/mcf. #BNL will be providing high-grade helium into the US market from its Voyager and Galactica/Pegasus discoveries. For more:

## Supply chain logistics and sanctions

The big question is, how long is the shortage going to last? How long will prices stay elevated? And will they continue to go up from where they are now?

Kornbluth says there's a huge amount of uncertainty right now about what's going to happen in the helium market in the next couple of years.

It really boils down to if and when Amur gets production up and running, because it has the potential to make a significant contribution to supply and to help moderate prices.

But let's not forget that sanctions may also come in to play.

"Gazprom has been telling their customers to expect the first helium plant to restart no later than April, so that's potentially 750 million feet of production, it's a significant 11% increment to capacity," Kornbluth says.

"And they're saying that their second plant will start up a couple of months later. Will that happen? Maybe, maybe not. If I had to place a bet, my bet would be probably not."

Then there's the added complication of sanctions.

Currently there are no direct sanctions on helium exports from Russia, but Western shipping companies are not allowed to call on Vladivostok, so there's a lot fewer sailings in and out, going to a lot fewer destinations, and it's more difficult to get the helium containers that need to be filled with helium in and out of Russia.

*Western shipping companies are not allowed to call on Vladivostok. There's not been a heap of complaints… yet. Getty*

Basically, the logistics have become more much more challenging as far as getting the helium to market, Kornbluth says.

"If sanctions come into play, and if any of these contracts that Gazprom has with the helium majors to buy their helium unravel, that could cause a pretty big problem," Kornbluth said.

"And the reason it would cause a problem is because, like the shipping chaos of the early pandemic days, there's a potential issue around the availability of the cryogenic containers that are utilized to transport liquid helium.

"There's only two manufacturers of these containers right now that are established, one has been quoting 18-month lead times and the other has been quoting 24 month lead times, so it's not a trivial matter to go out and buy several hundred containers."

On a positive note, if the existing buyers are unable to buy the helium due to sanctions there's enough demand for the helium in non-sanctioning countries like China, like Korea, like Taiwan, like Singapore, like India, to absorb it all.

The problem is that the new buyers wouldn't have enough containers, and not only would they have to wait 18 months for the first one, Kornbluth estimates they'd need to acquire around 300-400 in total to move the full capacity of Amur's first 2 helium plants to market.

## Helium shortage could subside late 2023…maybe

If everything goes right (no more explosions for example) Gazprom gets the two plants running, they run at a level relatively close to capacity, sanctions don't screw things up, the logistics challenges can be overcome, and the helium starts flowing into the Asian market. That's your optimistic, "thread the needle" scenario.

But if sanctions come into play, their existing offtake agreements unravel partially or fully, and the inability to secure containers is a significant impediment to getting the helium to market then it could take an extended period of time to fully absorb the Amur production into the market – that's a scenario that says the shortage could continue into 2024, maybe even into 2025, Kornbluth says.

"That's not a prediction, it's just one scenario," he said.

"The likelier scenario is somewhere in between, that there will be production from Amur in 2023 from one or two plants – probably not full capacity from either one of them – but there will be helium flowing in the second half of the year and some or all of that helium will start making its way into the Asian market and we will start seeing the helium shortage subside in the second half of 2023 – but perhaps not come to an end."

**Blue Gem Research**
@BlueGemResearch · **Follow**

This implies a current helium spot price of c.$800/mcf (nearly 2.0x our input assumptions of $390/mcf when we last valued REN)! A materially positive event for Renergen.

> **Argonon: making helium a more mainstream comm...** @ArgononHeli...
> This is a major milestone towards creating a transparent spot price for trading Helium.
> The tender being ex-Works without transport & the maiden load from a new plant, the bids range translates into a whopping $0.80-0.875 per ARG!
> Keep buying & HODLing, this is just the start!

5:04 AM · Aug 17, 2022

19 Reply Copy link

Read 1 reply

## Prices probably won't rise as much this year

Kornbluth thinks prices will continue to trend up, as long as we are waiting around for a significant contribution from Amur.

"I don't believe prices will go up as much in 2023 (as they did in 2022), but when Amur begins to sustain material production, prices would be expected to moderate."

When it comes to how quickly they would come down and by how much, he points to the fact that in the past when shortages are followed by oversupply, the industry typically held on to about half of the price increase they got on the way up.

It's a solid pricing environment for helium explorers on the hunt for new sources.

Beyond Amur, Qatar is planning its fourth plant for 2027, which is expected to produce 1.5 BCF which is about a 25% increment on current supply – but that's a few years away.

"There's quite a lot of uncertainty between now and 2027, a lot of activity aimed at developing new sources and it's a great time for a start-up to be producing helium and earn a nice return, if they can get into production," Kornbluth said.

"They're exploring, they're raising money, they're drilling, they're really producing a lot of press releases, but most of them are not yet producing helium.

"If they can find it in the ground, they can probably produce it if they find a sufficient quantity of reserves.

"Selling it is the easy part right now, and you can sell it for very good prices if you can produce it," he said.

## Who are the ASX helium plays?

### Blue Star Helium (ASX:BNL)

Blue Star has recently added four approved wells to its list of development well locations following final approval from the Colorado Oil and Gas Conservation Commission.

The wells will be drilled as offset development wells to the JXSN#1 and JXSN#2 helium discoveries at the Galactica/Pegasus project in Las Animas County and are expected to be

production wells.

And Sproule is currently finalising a resource update for Galactica/Pegasus, which is expected to result in the declaration of contingent helium and CO2 resources.

The $63m market cap company expects to permit Galactica/Pegasus in parallel with the Voyager development, which will be achieved using a **leased processing facility** with first helium sales targeted for the second half of 2023

### Noble Helium (ASX:NHE)

A relative newcomer to the scene that listed in April last year, $33m market cap company Noble Helium is still at an early stage of exploration for its suite of assets in the United Republic of Tanzania.

The company's key focus in 2022 was to advance exploration activities at the North Rukwa Project, with the aim of addressing every structural closure for its helium prospectivity to ensure selection of the two most promising drill candidates in 2023.

NHE says its fully funded through these drilling preparations and a farmout process is underway, with multiple parties expressing interest.

In combination with the legacy airborne gravity gradiometry and 2D seismic exploration dataset, the company also has a goal to develop a Prospective Resource Estimate in 2023, following the same process that achieved an independently certified unrisked summed mean helium prospective resource of 176BCF at North Rukwa.

**Noble Helium**
@Noble_Helium · **Follow**

$NHE.AX has 5,464km2 of premium #helium exploration acreage in Tanzania's EARS with direct access to port in Dar es Salaam.

#NHE has fast-tracked exploration at its North Rukwa Project & is on track for the first 2 exploration wells in Q3 2023.

More: bit.ly/3BvpJc2



9:00 PM · Jan 9, 2023

18 Reply Copy link

Read 2 replies

### Grand Gulf Energy (ASX:GGE)

Last week the company announced the expansion of an existing Gas Sales & Processing Agreement (GSPA) with Paradox Resources **to include the Jesse-2 well.**

Paradox is owner of the advanced Lisbon helium processing plant, 20 miles north of GGE's Red helium project in Utah, USA, which has a maiden prospective gross project unrisked P50 helium resource of 10.9 billion cubic feet of helium.

"The expansion of the offtake agreement with Paradox continues the relationship with a proven helium refiner and seller with deep helium processing and marketing experience," GGE managing director Dane Lance said.

"Grand Gulf is well placed to capitalise on one of the world's most critically scare commodities with the ability to quickly monetise a commercial well with minimal time and cost."

Notably, last year the company was advised of US spot prices in excess of US$2,000/mcf for research grade helium (160mcf tube trailer) and Paradox advised of purified gaseous helium sales exceeding $500/mcf – that's a 300% rise in spot prices over the last year.

The $41m market cap company said that in the event of a successful well, the GSPA provides a path to monetization of the Jesse-2 – which is scheduled for spud Q1 2023.

### Renergen (ASX:RLT)

South Africa-focused Renergen is a lot closer to producing helium than the other ASX plays with, progressing with the commissioning the Phase 1 plant for its Virginia project in South Africa in 2022.

Late last year the company released its quarterly report, noting that helium plant commissioning has been slower than anticipated due to the detection of a leak in the vacuum walls of the pipes of the helium system.

The leak has now been located and corrected, allowing the team to move to the final step of commissioning with the integration of the helium compressor with the LNG system offering the necessary pre-processing of the gas stream for helium liquefaction.

"This process is now at an advanced stage, and we believe we should be able to communicate the successful production of liquid helium to the market once this has been achieved," the company said.

Phase 1 is expected to produce about 350kg (about 74,620 cubic feet) of helium per day, and the company has previously flagged proved (1P) reserves of 7.2Bcf of helium.

RLT has a market cap of $267m.

## BNL, NHE, GGE and RLT share prices today:

**BNL** Blue Star Helium Ltd

| Mkt Price | High | Open | Volume |
|---|---|---|---|
| **$0.039** | **$0.039** | **$0.038** | **563,235** |
| **+0.001** +2.6% | Low | Prev. Close | Turnover |
| 2:43 pm | **$0.038** | **$0.038** | **$21,851** |

1 mth 3 mths 1 yr 2 yrs 5 yrs 10 yrs

Click for other stocks

BNL NHE GGE RLT

**Share prices and news by StockNessMonster**
**Prices and news delayed by 20 minutes**

*At Stockhead we tell it like it is. While Blue Star and Grand Gulf are Stockhead advertisers, they did not sponsor this article.*

## EXPLORE MORE


Investor Guide: Energy FY2023

## READ MORE

HELIUM

## Featured Companies

**ASX: NHE**
Noble Helium

**ASX: BNL**
Blue Star Helium

**ASX: RLT**
Renergen

**ASX: GGE**
Grand Gulf Energy

## You might be interested in