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Helium sell-off risks future supply

Jan 27, 2010 2 comments

In short supply

The US must stop selling off its helium reserves so that the country has enough of the gas to meet the needs of researchers and medical programmes. That is the view of a new report, *Selling the Nation's Helium Reserve*, published by the National Academy of Sciences (NAS). It says that failure to halt the sale of helium could lead to a drop in supply for the gas, which is vital for research into magnetic resonance imaging (MRI) techniques and low-temperature physics.

Helium is mostly produced by extracting it from natural gas fields, which contain up to 7% helium. There is estimated to be about 8.6 million tonnes of helium in the world, with the US having the biggest fraction of reserves at 35% and Qatar with 20%. About 32,000 tonnes of helium were produced around the world in 2008, three-quarters of which came from the US alone.

The US began building a huge stockpile of helium in 1925 as a strategic supply of gas for airships, and the reserve later became an important source of coolant for rockets during the Cold War. In 1996, however, the Helium Privatization Act came into law allowing US companies to recover and sell the helium, which is mainly stored in Amarillo, Texas, in a natural geological gas storage rock formation. The act was deliberately designed to exhaust the US stockpile by 2015 so the government could recoup the cost of setting up the facility.

However, the report says that selling off the helium stockpile "has adversely affected critical users of helium and is not in the best interest of the US taxpayers or the country." One problem posed by the selling off the stockpile, which the report says accounts for up to a third of global demand, is that the price for helium is low being "not set by current market conditions but by the terms of the 1996 Act". The fear is that once the supplies run out, the price will shoot up.

The NAS report, written by an 18-strong panel led by geologist Charles Groat from the University of Texas, recommends opening the price of federally owned helium to the market. They also warn that the US will become a net importer of helium in the next 10–15 years if it does not stop selling its reserves and will have to get its helium from new sources such as from the Middle East or Russia.

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NAS report

Charles Groat

"US government sales are assumed to end by 2015, with future supplies coming from new extraction plants both in the US and elsewhere," says William Nuttall, from the Cambridge Judge Business School, who, in collaboration with the Culham Centre for Fusion Energy in Oxfordshire and the gas-supplying firm BOC developed a model for the future of helium supply and use. "Supplies in the US are steadying while those in Europe, the Middle East and Asia are increasing."

MRI uses the biggest chunk of the world's helium, requiring 7000 tonnes (22% of the total) every year to cool the superconducting magnets that lie at the heart of these devices. However, large-scale research facilities also use lots of helium, with the Large Hadron Collider (LHC) at CERN requiring 150 tonnes of liquid helium last year to cool the 27 km ring and the ITER fusion project that is being built in France planning to use 50 tonnes once it is up and running in 2018.

One option to relieve the demand for helium is to develop new technologies that do not need the gas. "Intermittent shortages and price rises have now become an unwelcome feature of helium use and this encourages high-tech users, particularly those using cryogenics, to substitute technologies," says Richard Clarke at the Culham centre. He also adds that investment in new helium production facilities is necessary.

About the author

Michael Banks is news editor of *Physics World*

2 comments

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1 **jjeherrera**
Jan 28, 2010 1:29 AM
Ciudad Universitaria, Mexico

> Quote:
> One option to relive the demand for helium is to develop new technologies that do not need the gas.

A good reason to develop better high temperature superconductors.

By the way, this raises an important question regarding magnetic confinement fusion. What good will it be to have devices running on "virtually inexhaustible fuel", if there isn't the necessary helium to keep them working?

Edited by jjeherrera on Jan 28, 2010 1:48 AM.

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2 **Crackmonkey74**
Jan 28, 2010 12:09 PM

These 50 tons of helium are pretty much meant for the whole lifetime of the power plant, as it is used in a closed cooling cycle for the magnets, i.e. it is not 'used up'. Of course, there might/will be losses due to diffusion and the likes, so can add some percent to this number. The magnets of the LHC could give indications about the rough loss rate, as the also use superconducting magnets.
Currently, there are about 440 fission power plants in service, 60 more are being built (www.iaea.org...). If all of them were to be replaced by fusion power plants and we assume that the latter will need about the same amount of helium for cooling as ITER, we would need ~ 25000 tons of helium.
The annual world production of helium was about 30000 tons in 2008 (minerals.usgs.gov...helium.pdf).

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