

HELIUM

HELIUM IS THE SECOND MOST ABUNDANT ELEMENT IN THE UNIVERSE AND IS CRUCIAL TO INDUSTRY, RESEARCH, MEDICINE & DEFENCE

WHY IS HELIUM IMPORTANT?

- Helium is a rare commodity
- Helium becomes economically viable to extract from natural gas at concentrations as low as 0.1%
- The Virginia Gas Project's average concentration of helium is 3.4%
- Tetra4 is placed at the forefront of exciting new discoveries for global helium supply

WHERE DO WE FIND HELIUM ON EARTH?



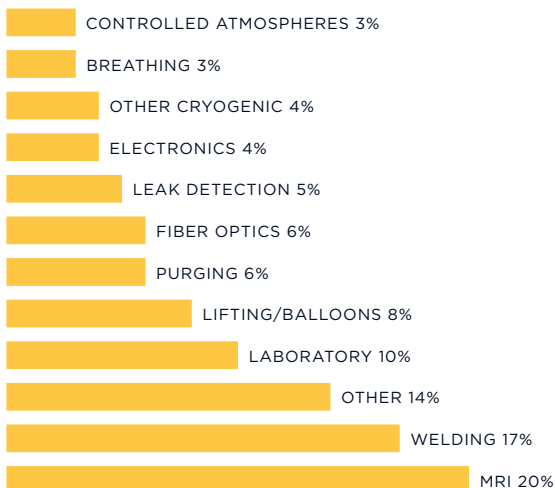
Lighter than air and most of it in the Earth's atmosphere bleeds off into space



Helium is a by-product of radio active decay, and is associated with natural gas

HELIUM USES

Helium is a vital and irreplaceable element in many modern industries.



THE PROPERTIES OF HELIUM

Helium is best known for being lighter than air, but it actually has many unique qualities that make it important for applications in technology.



INERT

Doesn't react chemically with other elements



NON-TOXIC

It's colourless, odorless and tasteless



LIGHTER THAN AIR

Ability to lift and/or float



BOILING POINT -268.9°C

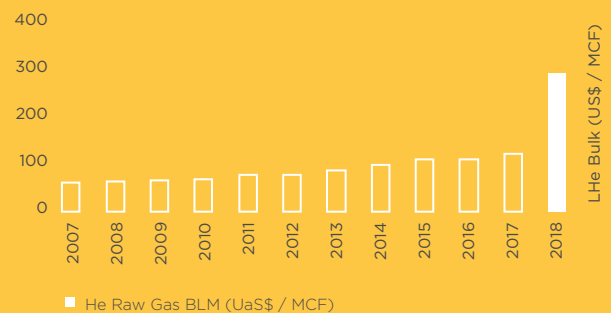
Does not solidify at atmospheric pressure



SUPERFLUID

The only substance with no viscosity in liquid form making it critical in use for high energy physics

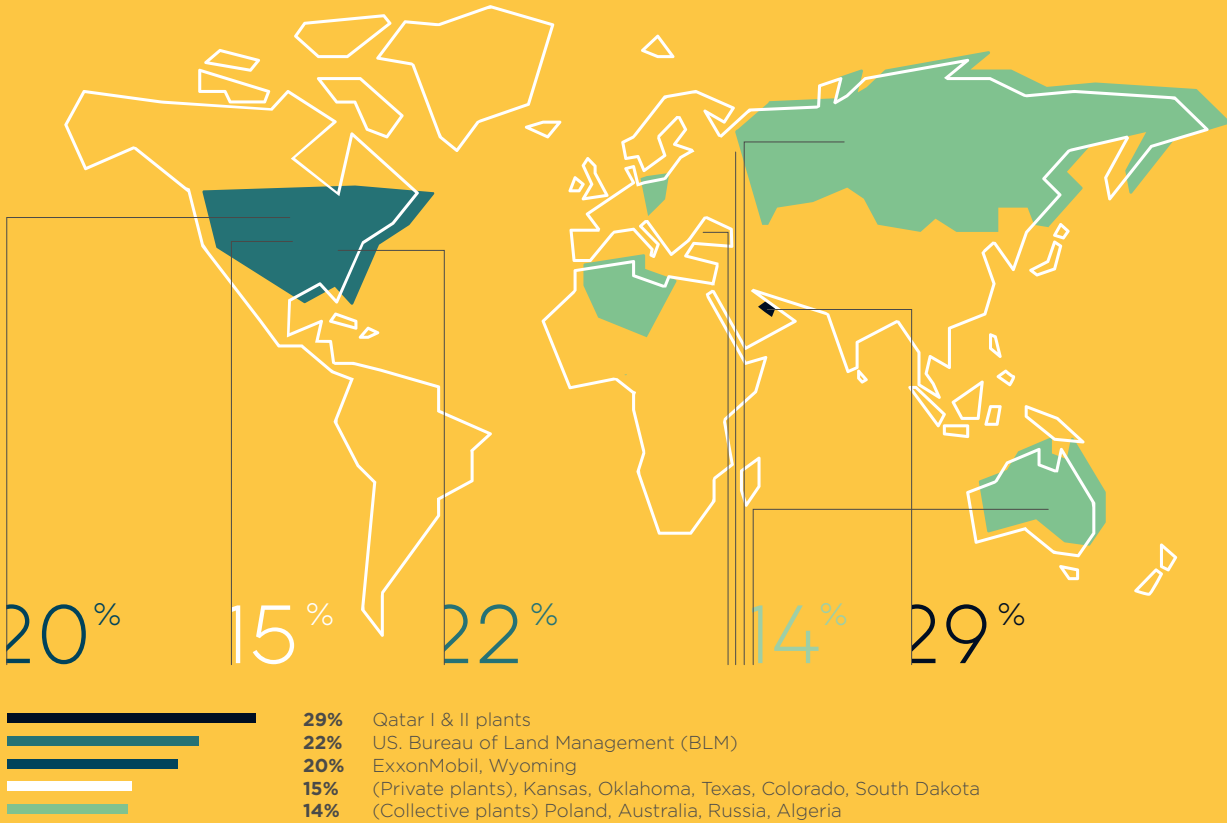
WHAT IS THE CURRENT PRICE OF HELIUM?



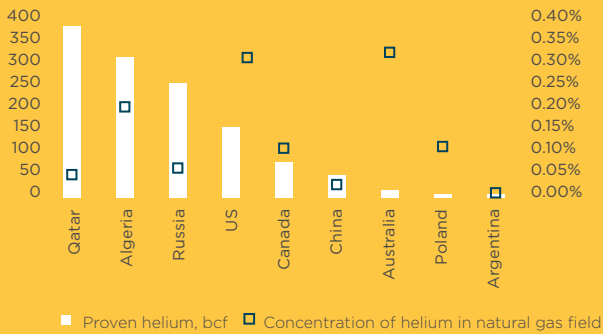
Source: Edison, USGS and BLM

WHERE IS THE WORLD'S HELIUM PRODUCED?

The world's helium is extracted by 20 liquefaction plants located in the US, Poland, Russia, Australia, Algeria and Qatar.

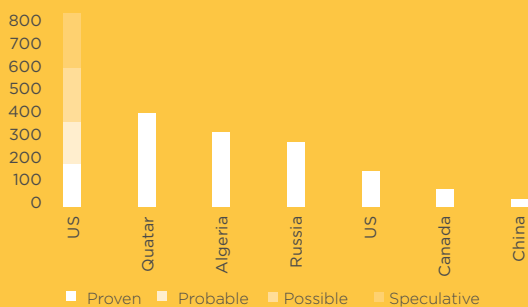


RESERVES OF HELIUM GLOBALLY, INCLUDING FROM NATURAL GAS FIELDS



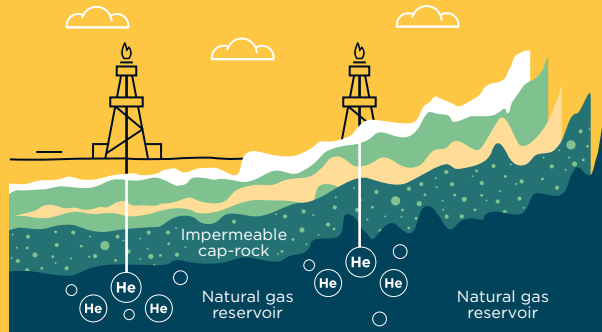
Source: BLM "BLM — Determination of fair market value pricing of crude Helium."
 Note: Proven helium reserves are given in bcf. Estimates made in 2013.

USGS SUMMARY OF GLOBAL HELIUM RESOURCES (INTERMEDIATE FINDINGS)



Source: USGS Mineral Commodity Summaries, January 2016.
 Note: Converted using a 36cf/m ratio.

HOW IS HELIUM MADE/EXTRACTED?



Naturally occurring helium

This comes from deep inside the Earth. Radioactive elements such as uranium and thorium decay and turn into other elements. The by-product of these reactions are tiny fragments called alpha-particles, which consist of two neutrons and two protons. Those particles pick up electrons from the environment around them and turn into helium, which gradually rises up through the crust and is emitted into the atmosphere, where it keeps rising until it escapes from the earth's atmosphere.

Natural gas by product

Helium is usually produced as a by-product of natural gas processing. There has to be a certain amount of helium in the natural gas, to justify the separation process from natural gas. Impurities such as water, carbon dioxide and hydrogen sulphide are removed from the gas. Finally, a process called cryogenic processing is used to cool the gas and remove the methane, leaving behind a crude form of helium.