



Royal Netherlands
Meteorological Institute
*Ministry of Infrastructure
and Water Management*

Helium or Hydrogen?

Arnoud Apitluley (KNMI, NL),
Richard Querel (NIWA, NZ),
Ankie Pipers (KNMI, NL)

Helium 'crisis'

- As early as 1925, the US Helium Act identified the gas as a war material and ordered the creation of a strategic reserve. Later, helium use in the space race and missile programme gave rise to the 1960 Helium Amendment Act, paying for helium separation and storage in a federal facility at Bush Dome near Amarillo. In 1996, the Clinton administration ordered the Bureau of Land Management to sell off this reserve. Although disruption to the market price was intended to be minimal, with so few sources and suppliers this destabilised the price of helium – providing little incentive for future discovery or investment while the Federal Helium Reserve supplies up to 40% of the world market.
- Allocation of the gas by major helium suppliers continues a period of uncertainty that goes back to disruptions of supply from Qatar in June 2017, when Saudi Arabia blocked shipments out of the country. Though the interruption was short lived, more recent upsets in supply from Qatar as well as from other U.S. and international producers have tightened supplies during a period of increasing demand. Shortages may get worse before conditions improve in 2019, when new capacity comes online in Qatar.
- Other new sources are on the way. Linde and other industrial gases firms recently reached deals to distribute helium from a Gazprom plant in eastern Russia set to come online in 2021.
- Since helium is only a byproduct, it's hard for other helium suppliers to step up when something like the Gulf crisis happens. Producing a little bit more helium requires producing a lot more natural gas—and energy companies aren't going to do that for the sake of their secondary helium businesses.



In practice

- It seems that the majority of the radiosondes (by operational services) are filled with hydrogen.
- Helium is also used, but more related to scientific purposes.



Switch to Hydrogen?

- Technical aspects
 - Delivery in pressurized bottles
 - On-site generation
 - Electrolytic
 - Chemical
 - Other?
- Economical considerations
 - Return on investment
 - Costly adaptations may be needed
 - Cost of equipment and maintenance



Switch to Hydrogen?

- Regulatory
 - Safety concerns
 - Flammable
 - Work environment
- Will be (very) different from country to country
 - Filling procedures
 - Filling infrastructure



