



Helium

Cryousers Conference – September 2024

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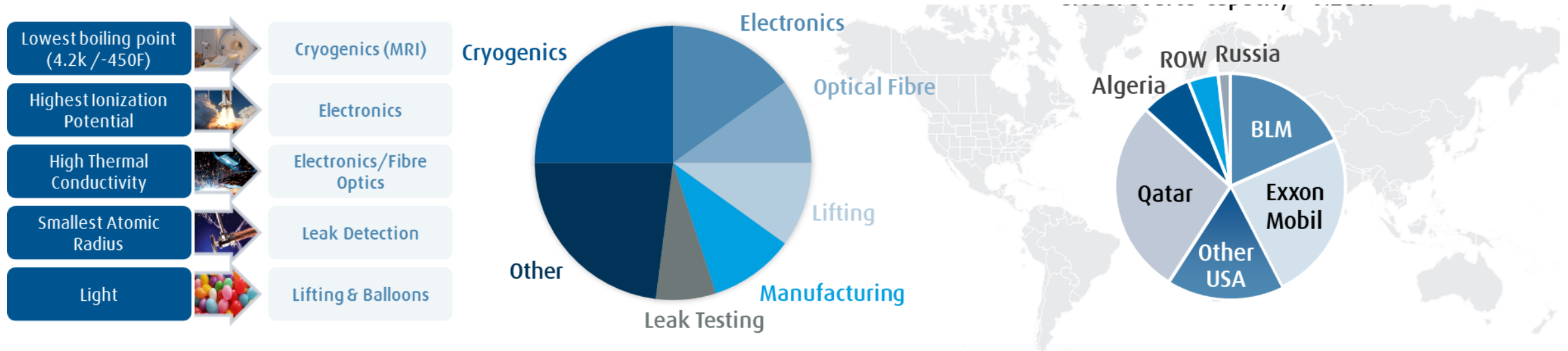
Making our world more productive



Helium



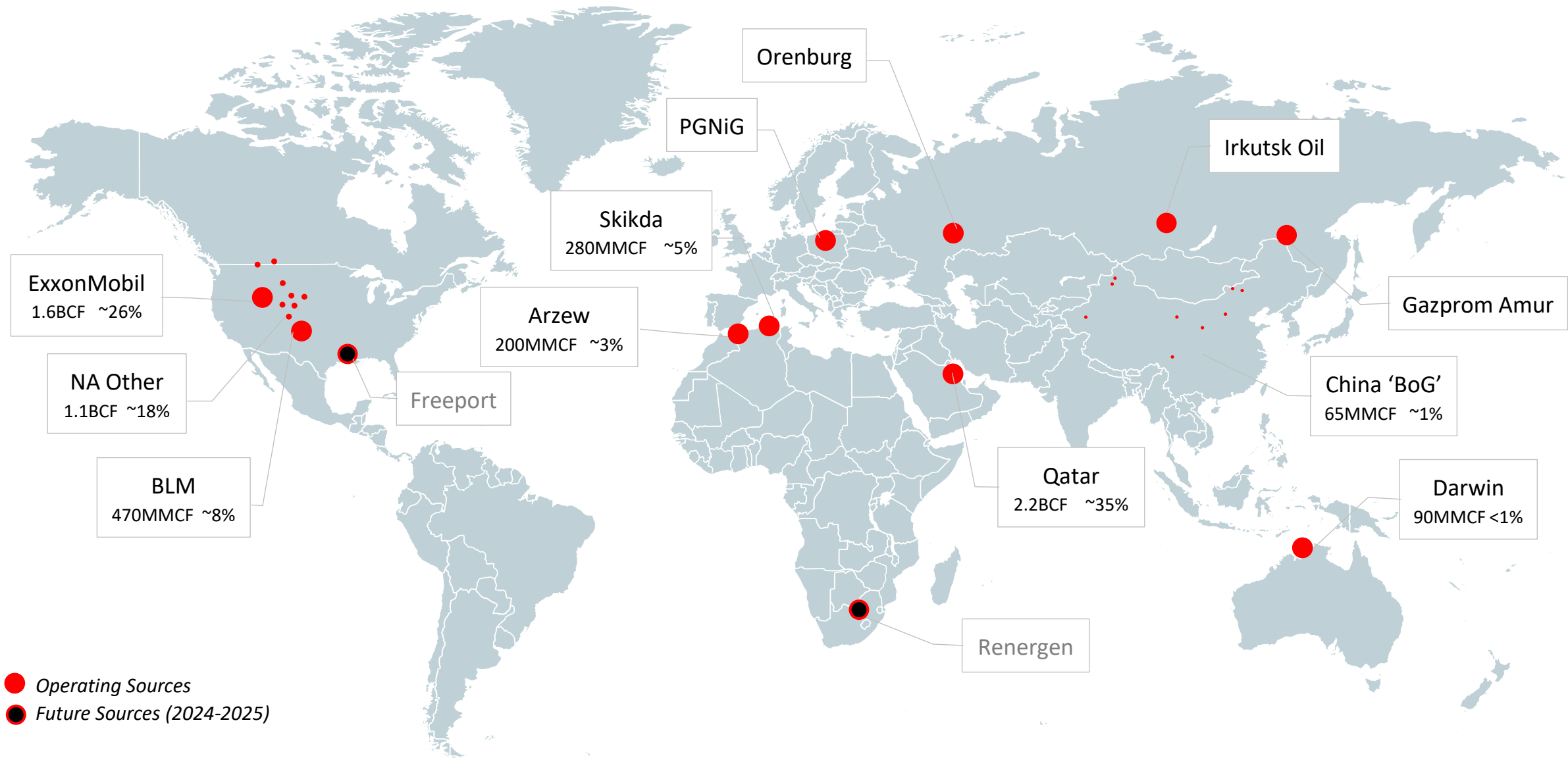
- Helium is formed as a by – product of natural gas. It is extracted form reservoirs and delivered to purification plants where pure liquid helium is produced.
- Liquid helium is then shipped worldwide in ISO containers
- Liquid & Gaseous helium is supplied to customers



Global Source Capability

~6.2BCF (175 million cubic meters)

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Helium Availability

Good availability of helium globally as the market has shifted from supply constrained to demand driven. This is down to a number of reasons:

- Downturn in the electronics market (this is cyclical so is expected to pick up Q4 2024)
- Downturn in economics in general
- Efficiencies made after a period of global allocation/shortage

- Russian Helium Supply – Amur & Irkutsk re-started in Q3 2023, with minimal output, mainly to China. Volumes are uncertain and limited due to sanctions passed by the EU, where helium has now specifically been named as an illegal product to import from Russia. The UK is expected to follow suit.

- BLM - the BLM related assets have been sold to the Messer Group. Messer has been operating the BLM assets for the last several years. The US-government crude inventory underground has not yet been sold.

- All sources have been running well throughout 2024

Pricing

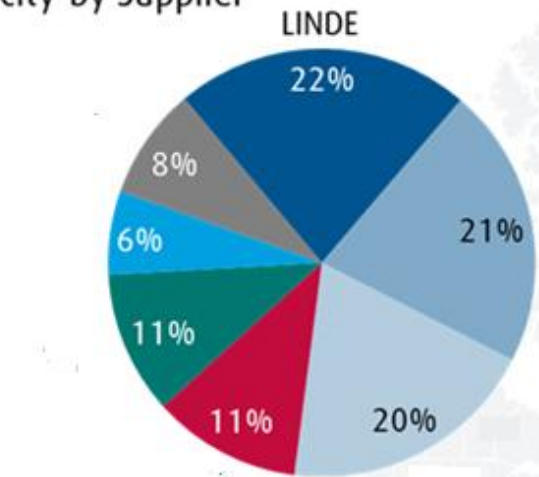
- Middle East tensions restricting westbound Qatar shipments & increasing freight rates
- Extended period of shortage has driven source costs up for all suppliers

Global Supply Capability

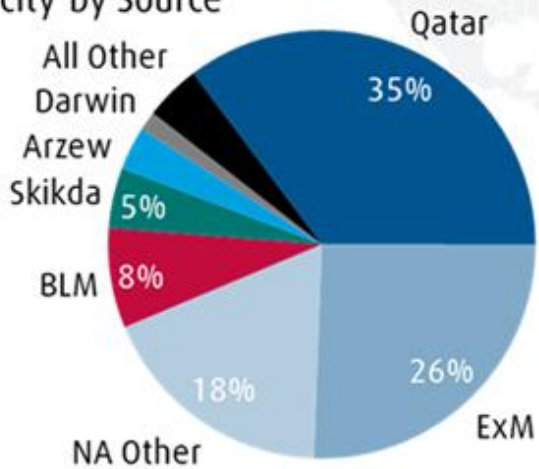
Estimations of Supplier & Source Share



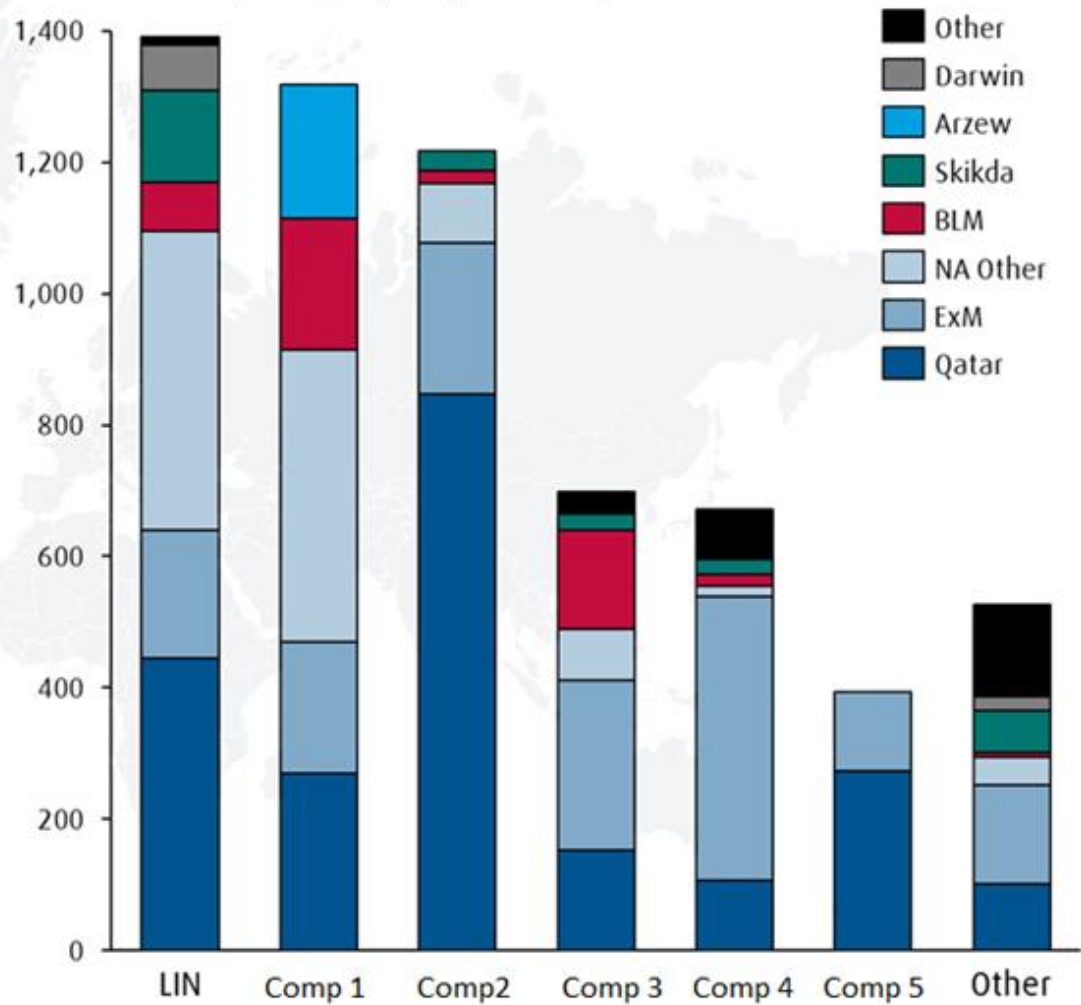
Global Capacity by Supplier



Global Capacity by Source



Global Capacity by Supplier & by Source



Gazprom Amur GPP

New Capacity of ~2.1BCF. Uncertain Outlook

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Operational Outlook

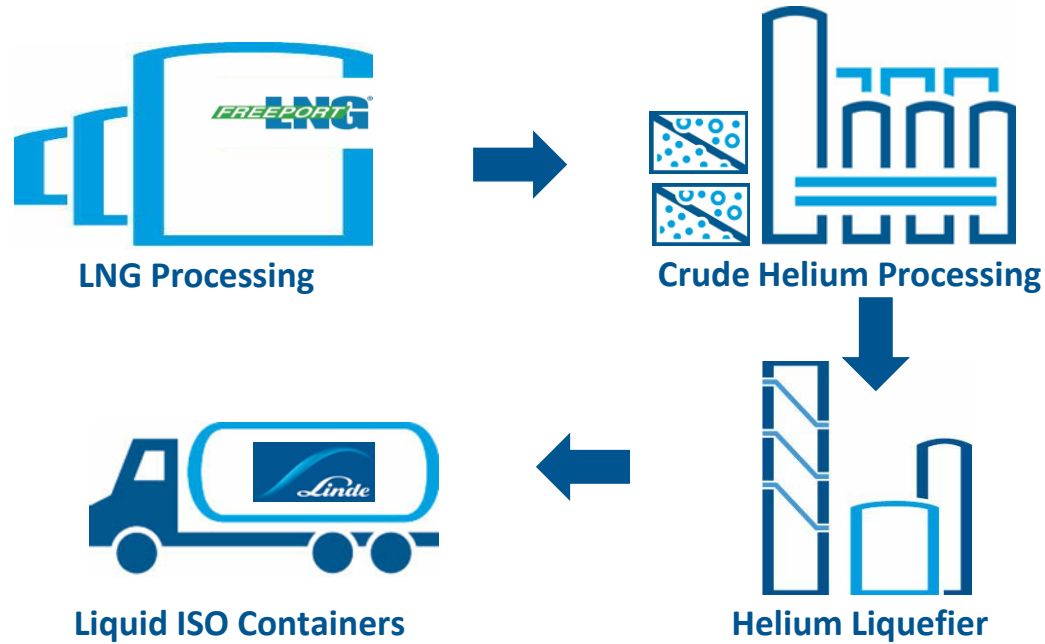
- Two significant incidents during commissioning in 2022 resulted in delay to Amur operation.
- Restart in Sep23 – with minimal output
- Minimal loads have been exported out of Gazprom in 2024
- All product out of Russia has been exported into China
- For now this source (and Irkutsk) has been deferred indefinitely due to sanctions worldwide.



Linde New Source in North America

Freeport LNG – 100% Linde due Q4 2024

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- Freeport LNG will provide crude helium supply to Linde
- Linde process, purify and liquefy helium
- Commissioning Q4 2024
- Capacity 180 MMCF





Demand

- Upturn expected in Electronics demand from Q4 2024 will drive helium demand.
- Emerging space market – helium is used to pressurise the liquid fuels that power rockets driving space exploration. We expect to see an upturn in demand based on this application
- The MRI market, the largest consumer of liquid helium, is expected to remain flat. While the installed based will continue to grow, the new MRIs use significantly less helium compared to the old units

Sources

- Linde Freeport US source – Q4 2024
- Russian sources (Irkutsk & Amur) deferred indefinitely – subject to sanctions
- Qatar IV – 2027
- Qatar V - 2028





Any Questions?