



Looking over the Horizon to prepare for US Chip Expansions



Electronics Materials Information

Helium for Chip Production

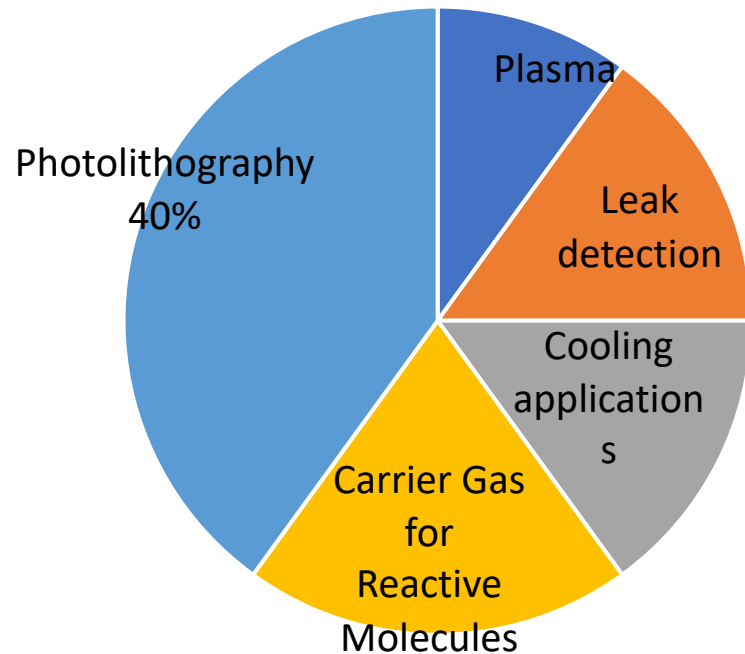
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President & CEO

TECHCET

Chip Manufacturing Use of Helium by Process Application

He Semiconductor Applications



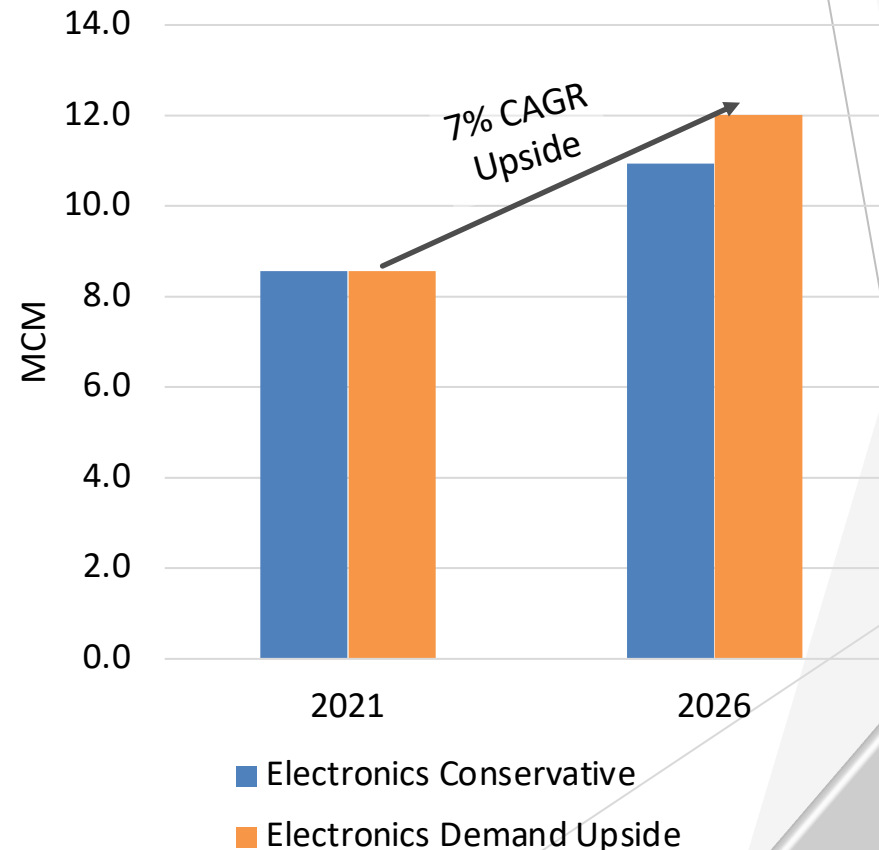
- Photolithography is the single largest use application for helium in semiconductor device (“chip”) production
 - highly sensitive to changes in purity, i.e. THCs, O₂, and H₂O
 - 5Ns, 5N5
- Plasma generation and carrier gas for advanced chip manufacturing require higher purity, e.g. 6Ns or 7Ns

Market Size and Growth

5-Year Demand

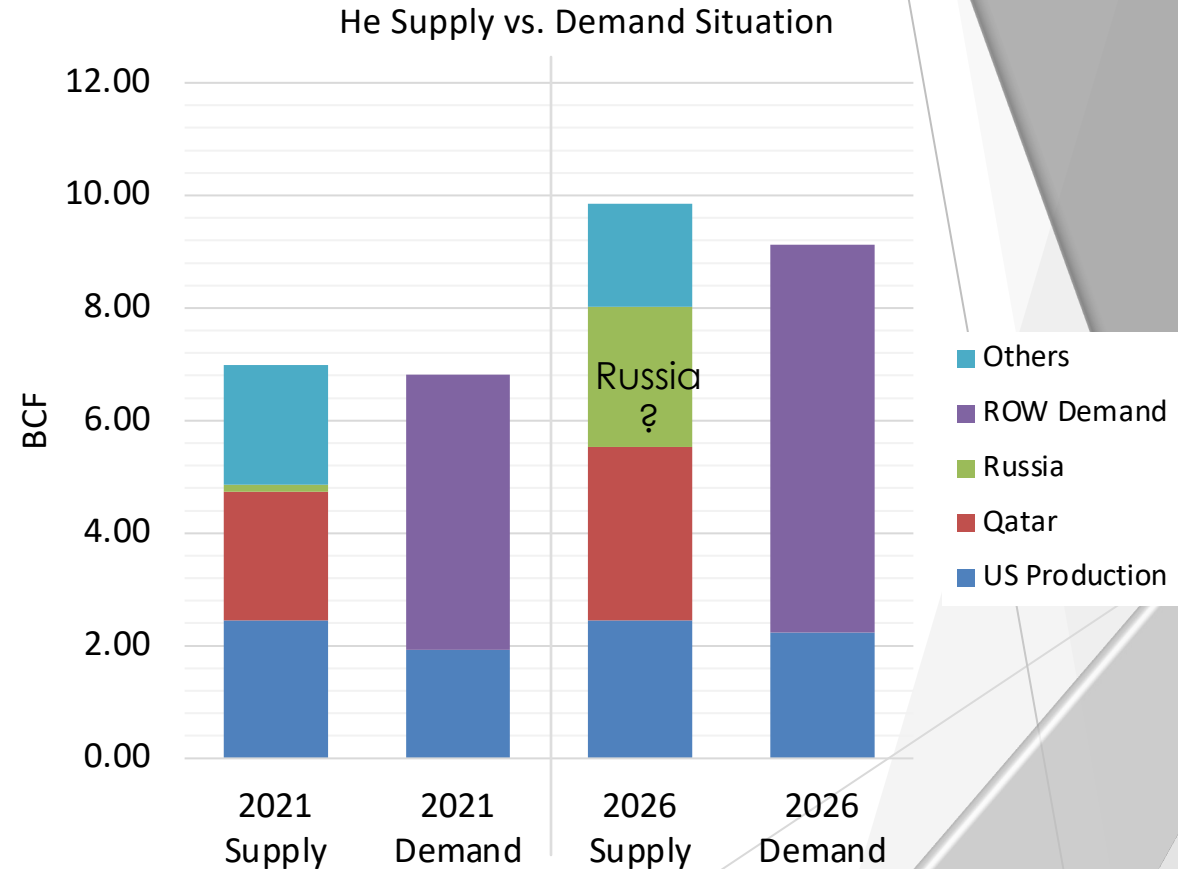
- 16% of WW helium demand is used for semiconductor “chip” manufacturing
 - 2021 demand volume of approx. 8.6 MCM
 - 5%-7% expected in 2022
 - 5-year CAGR 5% to 7%

HELIUM Electronics Market Demand (MCM)



He WW Supply and Demand

- US Supply currently running above demand by ~20%.
- As demand increases over time, this gap will close causing strain in the supply-chain.
- In order to lessen US dependency on foreign sources, it needs to continue growing helium production/resources.



THANK YOU!

For more Info check out

<https://techcet.com>

<https://cmcfabs.org>

cmcinfo@techcet.com

TEHCET's Critical Materials Markets & Supply-Chains Expertise

1	CMP Consumables (Pads/Slurry)	Sarah Okada	
2	CMP Equipmt Consumables	Diane Scott, PhD	
3	CVD /ALD Hi K Precursors	Jonas Sundqvist, PhD	
4	CVD DIELECTRIC Precursors	Jonas Sundqvist, PhD	
5	Equipment Components – Quartz	Kuang-Han Ke	
6	Equipment Components – Silicon	Allan Wiesnoski & Shaoyan Luo	
7	Equipment Components – SiC/Ceramics	Kuang-Han Ke	
8	Gases - Electronic Specialty, Bulk & Rare	Jonas Sundqvist, PhD	
9	Metal Plating Chemicals+	Terry Francis	
10	Photoresist, Ancillaries & Extensions.	Warren Montgomery	
11	Sputter Targets	Dan Tracy, PhD	
12	Silicon Wafers	Dan Tracy, PhD	
13	Wet Chemicals / Specialty Cleans	Terry Francis	
14	Impact of Chip Expansions – US	Bruce Lipisko	
15	Impact of Chip Expansions – EUROPE	Dan Tracy, PhD / Lita Shon-Roy	
16	Packaging Materials	Dan Tracy, PhD	