SEMICONDUCTOR INDUSTRY ASSOCIATION

SIA-OMB MEETING

Phasedown of Hydrofluorocarbons: Review and Renewal of Eligibility for Application-specific Allowances

RIN: 2060-AV98

June 26, 2025

AGENDA

1. Introducing SIA and the Semiconductor Industry
2. Brief Review of SIA-EPA Engagement & Background on the AIM Act
3. Importance of Issuing a Final Rule
4. Need for a Semiconductor-Specific Allocation Method
5. Discussion/Questions

SIA MEMBERSHIP

CHARTER

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ANALOG DEVICES
BROADCOM
CIRRUS LOGIC
CREDO we connect.
GlobalFoundries
IBM
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LANSDALE Semiconductor, Inc.
LATTICE SEMICONDUCTOR
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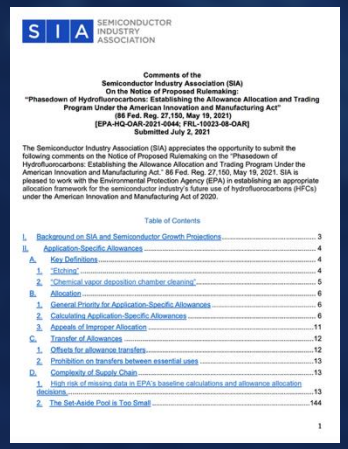
BRIEF REVIEW OF SIA-EPA ENGAGEMENT

Public Comment

July '21

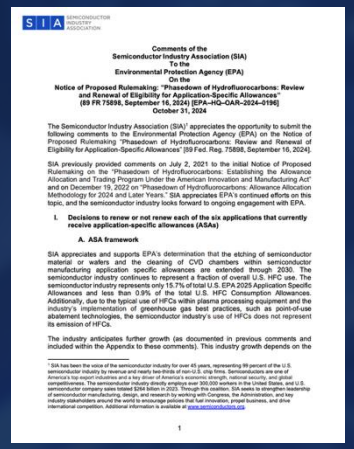


Comment ID:
EPA-HQ-OAR-2021-0044-0107

Dec. '22

Comment ID:
EPA-HQ-OAR-2022-0430-0036

Oct. '24



Comment ID:
EPA-HQ-OAR-2024-0196-0032

SIA Meetings with EPA Staff in 2025

- February 28
- March 7
- March 21

SIA Meeting on May 15 with Aaron Szabo, Sr. Advisor to the Administrator and nominee to be Assistant Administrator of the Office of Air and Radiation

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SIA KEY MESSAGES & REQUESTS

1. A strong domestic semiconductor supply chain is critical to U.S. economic and national security objectives and important to the Administration and Congress
2. The semiconductor industry relies on specialized HFC gases to perform essential fabrication process steps
3. Accordingly, Congress requires EPA to provide the semiconductor industry with "the full quantity of [HFC] allowances necessary based on projected, current and historical trends"
4. Without sufficient allowances, U.S. chipmakers could face supply chain disruptions and a restricted ability to manufacture domestically
5. Therefore, EPA/OMB should adopt a final rule in time to provide 2026 HFC allowances to the semiconductor industry, and
6. The final rule should adopt a semiconductor-specific allowance approach that is based on projected industry HFC usage and accommodates industry growth and increasing device complexity

AMERICAN INNOVATION & MANUFACTURING (AIM) ACT

Provides for the phasedown of hydrofluorocarbons (HFCs)

1. HFC Allocation Program

Subsection (e) – Phasedown of Production and Consumption of HFCs

2. Emissions Reduction & Reclamation Program

Subsection (h) – Management of Regulated Substances

3. Technology Transitions Program

Subsection (i) – Technology Transitions

***Note:* SIA supported SEMI petition for reconsideration**

- EPA should provide an extension until 2030 for small and medium-sized chillers and IPR equipment used in semiconductor facilities.
- SIA encourages EPA to finalize the revised rule prior to January 1, 2026 – or to announce enforcement discretion until the revised rule is finalized.
- EPA should also clarify that temperature restrictions apply to equipment "as designed" and not "as operated."

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HFC ALLOCATION PROGRAM

Congress provided a special accommodation in the AIM Act for certain sectors, including semiconductor manufacturing. EPA must review these allowances every 5 years.

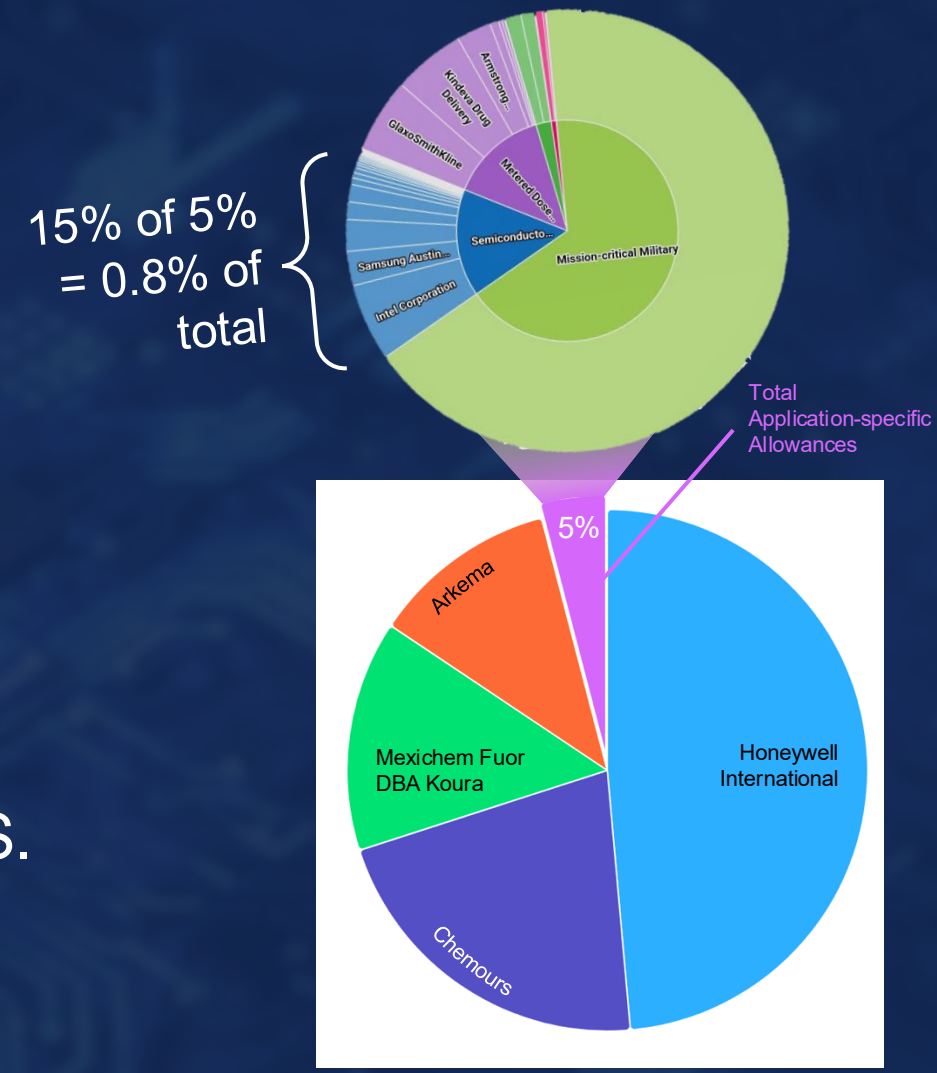
"The Administrator shall allocate the full quantity of allowances necessary, based on projected, current, and historical trends"

Proposed EPA method:

- Based on 3-year historical average growth rate and last year's HFC usage as a baseline
- **Does not provide a comprehensive mechanism in the base calculation to account for projected trends, as required by law, resulting in insufficient allowances for the semiconductor industry**

CHIPMAKING & HFCS

- The semiconductor industry relies on specialized, high-purity HFC gases for essential process steps. These gases are not readily available on the market.
- HFC gases have essential uses in targeted semiconductor process applications (e.g., plasma etch and deposition, chamber cleans, etc.)
- The semiconductor industry depends on a small fraction of HFC allowances – just **0.8%** of total U.S. HFC consumption allowances
- **Insufficient allowances could result in:**
  - Critical supply chain disruptions
  - Delays in buildout of new factories and expansions



Source: U.S. EPA
Note: The semiconductor industry represents ~0.2% of HFC emissions, despite comprising 0.8% of allowances, due to industry technology and abatement

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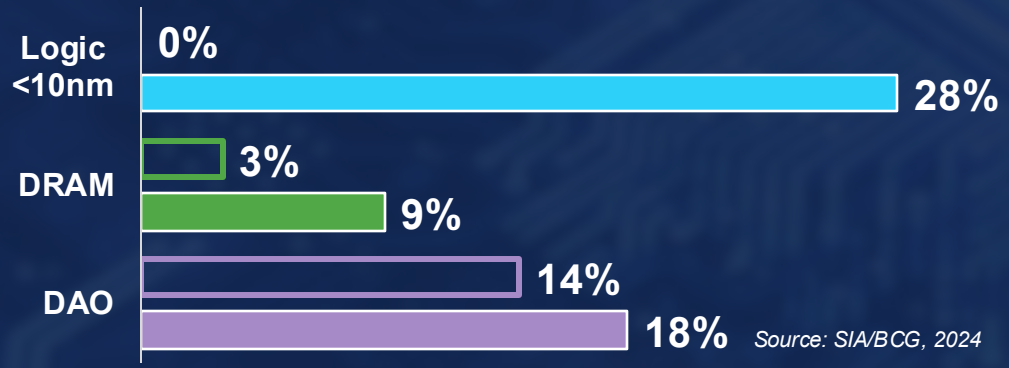
THE SEMICONDUCTOR INDUSTRY IS PROJECTED TO GROW & INNOVATE

U.S. semiconductor manufacturing capacity is projected to triple by 2032 – including new capabilities in leading-edge logic, leading-edge memory, and current-generation and mature-nodes

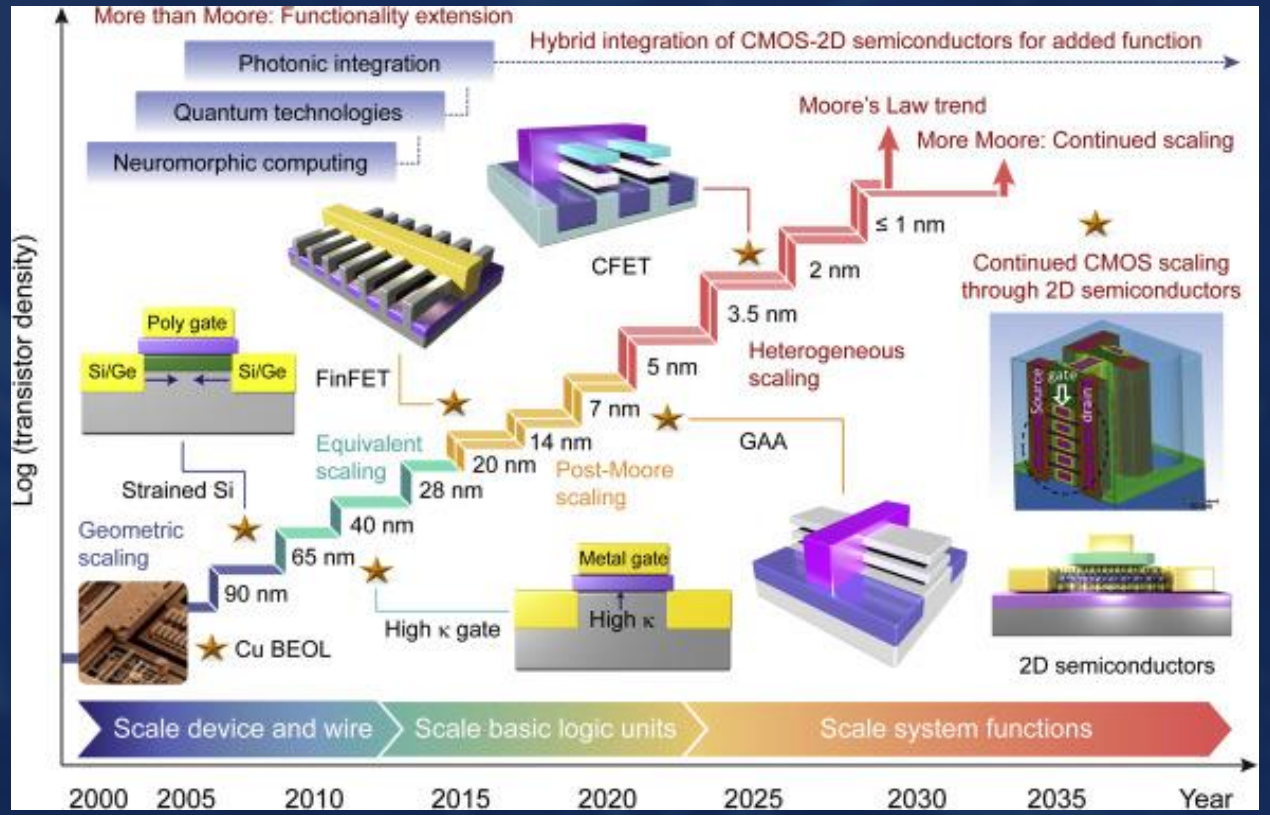
U.S. Share of Global Fab Capacity, by Segment, 2022 vs. 2032F



Source: SIA/BCG, 2024

HFCs are critical to the industry and innovation. Without sufficient HFCs, the U.S. will not be able to make advanced chips or increase its manufacturing capacity.

Increasing complex transistor architecture, transistor density, and mask layers – all requiring more HFC consumption



Source: https://www.sciencedirect.com/science/article/pii/S2589004222014328,
Two dimensional semiconducting materials for ultimately scaled transistors

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IMPORTANCE OF ISSUING A FINAL RULE

SIA encourages OMB and EPA to promptly issue a final rule in order to provide EPA with sufficient time to complete the 2026 HFC allowances cycle and provide sufficient allowances for semiconductor manufacturing

- Ensures no interruption to ability to purchase and consume HFCs, providing important supply chain certainty
- Without allowances, semiconductor manufacturers may face supply chain constraints, as there are no currently available replacements
- Improvements to the proposed rule are needed to ensure the semiconductor industry receives the full quantity of allowances necessary
- Changes should not result in a delay of the final rule

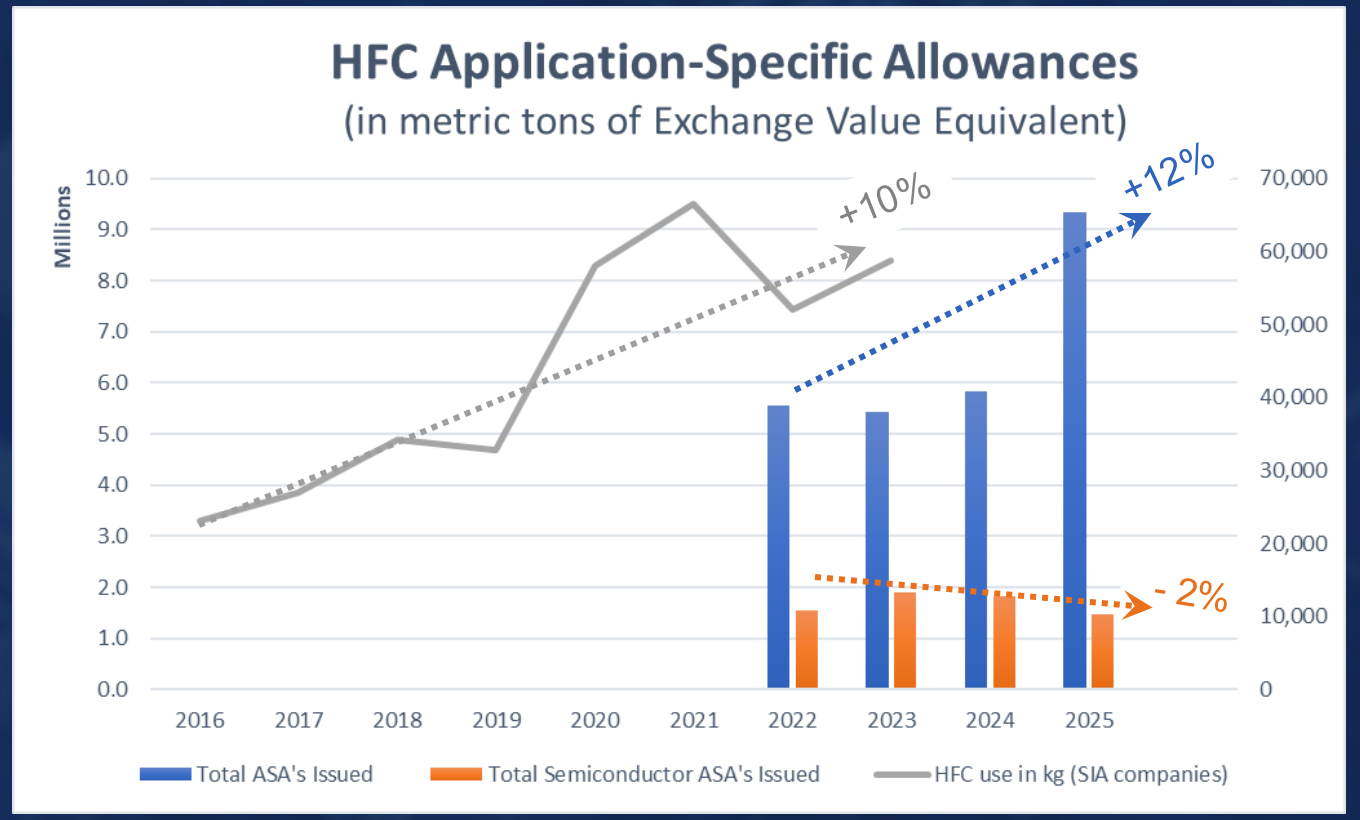
NEED FOR A SEMICONDUCTOR-SPECIFIC ALLOCATION METHOD

The current EPA methodology – based on 3-year historical average growth – is inadequate to accurately forecast the projected HFC usage of the chip industry

Despite long-term growth, the chip industry is notoriously cyclical

With the current EPA calculation, a one-year downturn reduces the next 3 years of allocations, even if a rebound is expected to occur

- 2023-2024 downturn resulted in insufficient allocations for 2025 **(overall 20% decrease from 2024 allowances)** and will likely do so again for 2026 without a change to the methodology, despite increasing HFC usage
- Individual companies could have more dramatic swings in growth rates and usage



Source: U.S. EPA & internal SIA HFC use data

In 2024, semiconductors were 32% of ASAs. In 2025, that share fell to 15%.

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HOLISTIC, FORWARD-LOOKING APPROACH NEEDED

Current calculation method is not accurate to predict chip industry HFC needs, and unique circumstances and acceptable documentation are restrictive and do not account for all factors

SIA Recommendations:

EPA should issue a final rule in a timely manner that includes:

- Application-specific allocations for the semiconductor industry beyond 2025, and
- **A sector-specific allocation methodology for semiconductors, with allocation based solely on projected company needs** (rather than a 3-year, backward-looking average growth rate)

Cannot rely on unique circumstances provision to ensure the "full quantity of allowances necessary"

Unique factors affecting HFC demands include:

- HFC purchase and inventory cycles
- Changing production levels and fab utilization rates, with cyclical customer demands and product lead times on the order of weeks to months
- Swift technological advances (every 2 to 3 years) and increasing device complexity
- Risk management in manufacturing and supply chain resilience

SIA RESPONSE TO ADDITIONAL SUGGESTIONS

Suggestion	SIA Response
Companies can use unique circumstances to demonstrate the need for additional allowances	• The industry should not have to rely on unique circumstances to receive the "full quantity of allowances necessary" as required by the AIM Act. • Relying on unique circumstances adds uncertainty to the supply chain and forces companies to rely on EPA discretion to provide sufficient allowances • The proposed unique circumstances do not cover *all* reasons that a company may have increased HFC usage • Acceptable documentation for unique circumstances is too restrictive
If companies need additional allowances, they can purchase them on the open market	• HFCs used in the semiconductor industry are not typically available on the open market due to specialty purity and performance requirements • Ultra-high purity chemicals and gases are required, with HFCs requiring purity between 99.999%-99.9999% (semiconductor HFCs cannot have more than 1-10 ppm total impurities) • Suppliers have already indicated they will not provide HFCs without ASAs
There have been unused allowances in the past	• The semiconductor industry is notoriously cyclical – the 2023 downturn was the seventh downturn since 1990. But the industry is projected to grow substantially in the coming years, including capacity at the leading-edge, and continue transitioning to more complex chip devices • It is preferable to have unused allowances (at most, a fraction of 0.8% of allowances) versus insufficient allowances that could result in supply chain disruptions • Companies do not typically purchase supplies they do not think they may need, and most inventory has a shelf-life of ~1.5-2 years

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THANK YOU
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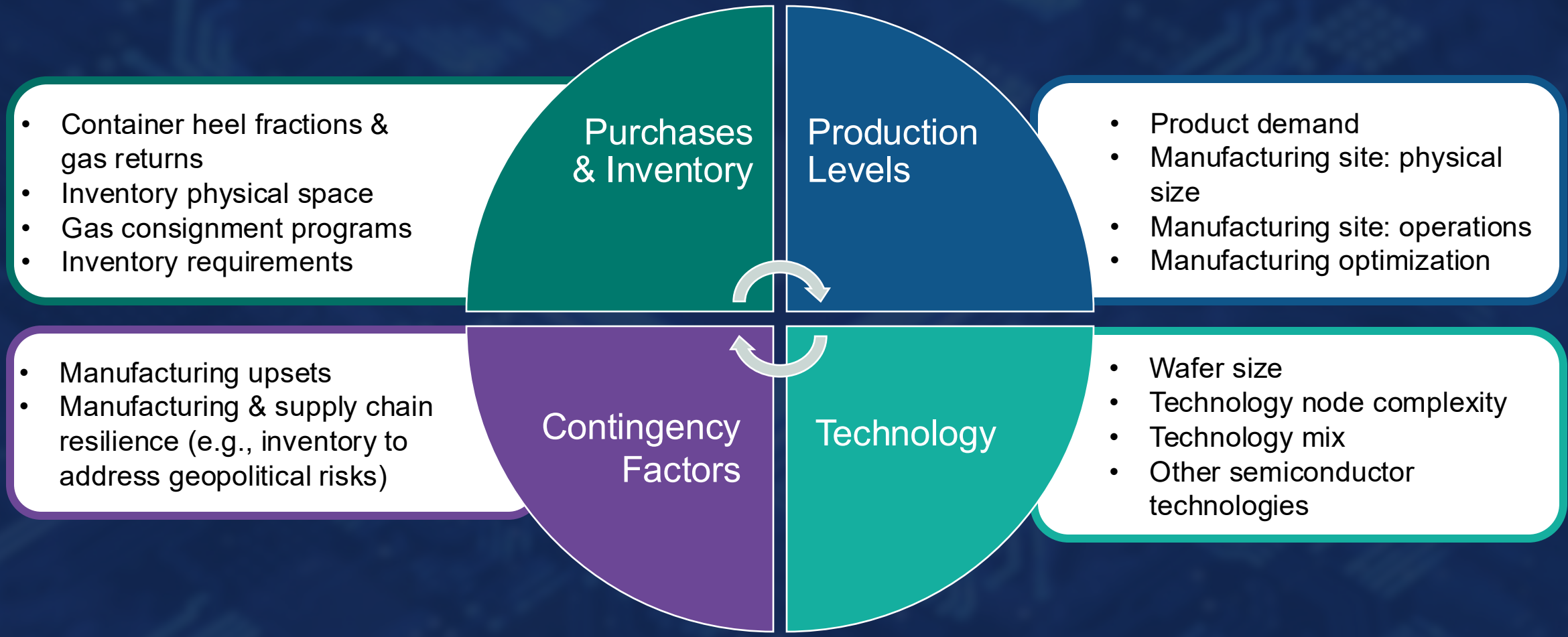
FACTORS AFFECTING HFC DEMAND NOT FULLY CONTEMPLATED BY THE PROPOSED RULE



Due to these wide-ranging factors, allowances for the semiconductor industry should be based only on company-projected needs – not a 3-year historical average growth rate that does not accurately predict future needs

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