Comments of the
Semiconductor Industry Association (SIA)
On the Notice of Proposed Rulemaking:
"Phasedown of Hydrofluorocarbons: Establishing the Allowance Allocation and Trading Program Under the American Innovation and Manufacturing Act"
(86 Fed. Reg. 27,150, May 19, 2021)
[EPA-HQ-OAR-2021-0044; FRL-10023-08-OAR]
Submitted July 2, 2021

The Semiconductor Industry Association (SIA) appreciates the opportunity to submit the following comments on the Notice of Proposed Rulemaking on the "Phasedown of Hydrofluorocarbons: Establishing the Allowance Allocation and Trading Program Under the American Innovation and Manufacturing Act." 86 Fed. Reg. 27,150, May 19, 2021. SIA is pleased to work with the Environmental Protection Agency (EPA) in establishing an appropriate allocation framework for the semiconductor industry's future use of hydrofluorocarbons (HFCs) under the American Innovation and Manufacturing Act of 2020.

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I. BACKGROUND ON SIA AND SEMICONDUCTOR GROWTH PROJECTIONS

The Semiconductor Industry Association (SIA) is the trade association representing leading U.S. companies engaged in the design and manufacture of semiconductors. The U.S. is the global leader in the semiconductor industry, and continued U.S. leadership in semiconductor technology is essential to America's economic growth, technology leadership, and national security. More information about SIA and the semiconductor industry is available at www.semiconductors.org.

The semiconductor industry is expected to experience rapid growth in coming years, and the industry's use of HFCs may also grow, due to the following factors: (1) rapid growth in the use of semiconductors throughout the economy; (2) increased semiconductor fabrication in the U.S. to meet this growth; and (3) increased process complexity to fabricate advanced semiconductors. It is critical for EPA to take into account this projected growth to meet the requirement of the AIM Act to provide "the full allocation of allowances necessary" for the use of HFCs in semiconductor manufacturing.

Semiconductors play a fundamental enabling role in technological innovation throughout the economy, ranging from information and communications technology to clean energy and transportation to health care. Major growth areas of the economy – including electric and autonomous vehicles, the Internet of Things (IoT), clean energy and smart grid, artificial intelligence, remote work and school, telemedicine, and others – are all enabled by semiconductor technology. As the use of semiconductors becomes integrated in an increasing number of products throughout the economy, semiconductor sales and manufacturing growth are expected to grow rapidly. Worldwide semiconductor sales increased from $149.4 billion in 1999 to $412.3 billion in 2019, a compound annual growth rate of increase of 5.21 percent per year.[1] Going forward, the global semiconductor market is forecast to grow significantly, with some estimating the market to be $750 billion in 2030 compared to $440 billion in 2020.[2]

This market growth will require an increase in manufacturing capacity to meet this demand at a similar growth rate, and this increased manufacturing capacity will require a corresponding increase in use of HFCs. According to a report by the Boston Consulting Group and SIA, growth in global semiconductor demand is projected to require a 56 percent increase in manufacturing capacity over the next 10 years.[3] As discussed further below, policies being considered by the Administration and Congress may result in a significant increase in semiconductor manufacturing in the U.S.

In addition to the projected increase in semiconductor manufacturing in the U.S., usage of materials such as HFCs can also be expected to increase due to advances in manufacturing processes. Semiconductor devices are becoming increasingly complex, with billions of transistors imprinted on a surface of a square centimeter, and innovation continuing at a rapid pace. This increasing complexity has required an increased number of mask layers per wafer which leads to an increase in the process steps that require F-GHG, and this trend will likely continue in the future. We anticipate this increasing manufacturing process complexity will necessitate an increase in the use of industrial gases such as HFCs. The industry has experienced increased usage in other process gases, such as other F-GHGs to meet new

[1] 2020 SIA Factbook, page 2, based on data from the World Semiconductor Trade Statistics (WSTS) program and SIA estimates.
[2] Dale Ford, ECIA, presentation during SIA public webinar, February 4, 2021. Webinar accessed at: https://www.semiconductors.org/events/webinara-review-of-the-2020-semiconductor-market-and-a-look-to-2021/. 2020 market size of $440 billion from the WSTS December 2020 Bluebook report.
[3] https://www.semiconductors.org/turning-the-tide-for-semiconductor-manufacturing-in-the-u-s/.

technology demands, and we anticipate similar or potentially higher increase in HFC usage over time. Notably, for SIA members, 2020 HFC use was 2.08 times 2019 levels[4].

Although the use of HFC in our applications is critical to our industry and downstream manufacturing in the United States, our industry's HFC usage and emissions is extremely small. Based on 2019 data, SIA company HFC emissions represent only 0.13% (weighted by CO2e) of all U.S. HFC emissions attributed to industrial processes and product use (including those due to ODS substitutions), and the entire electronic sector's HFC emissions, of which semiconductors is a subset, were only 0.17% (i.e., .3 MMTCO2e vs. 174.6 MMTCO2e) of all U.S. HFC emissions (including those due to ODS substitutions).[5]

II. APPLICATION-SPECIFIC ALLOWANCES

For certain essential applications, the AIM Act requires EPA to "*allocate the full quantity of allowances necessary, based on projected, current, and historical trends, for the production or consumption of a regulated substance for the exclusive use of the regulated substance in an application solely for*" those applications.[6]

A. Key Definitions

The AIM Act establishes as an essential application "the *etching* of semiconductor material or wafers and the *cleaning of chemical vapor deposition chambers* within the semiconductor manufacturing sector."[7] EPA proposes two definitions to elaborate on these terms, which EPA asserts are both closely based on the definitions in the electronics manufacturing source category in the GHGRP (40 CFR 98.90(a)(a)). EPA has, however, introduced variations from the GHGRP definitions for each term, without explaining the rationale for its adjustments. SIA recommends that EPA revise these rules to harmonize them to the analogous definitions used in the GHGRP, to promote consistency with that program, which SIA members have long experience with implementing. We can find no reason for departing from the long-used GHGRP definitions and instead introducing additional complexity in our internal record-keeping and data collection.

1. "Etching"

For AIM Act purposes, EPA proposes this definition of etching:

> *"Etching* means, in the context of semiconductor manufacturing, a process type that **uses plasma-generated fluorine atoms and other reactive fluorine-containing fragments that chemically react with exposed thin-films** (e.g., dielectric, metals) **or substrate** (e.g., silicon) **to selectively remove portions of material**."[8]

The GHGRP defines "plasma etching" slightly differently, as—

> "a process type that **consists of any production process using fluorinated GHG reagents to selectively remove materials from a substrate during**

[4] SIA PFC survey.
[5] Sources: Source: *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019, Chapter 4.* https://www.epa.gov/sites/production/files/2021-04/documents/us-ghg-inventory-2021-chapter-4-industrial-processes-and-product-use.pdf; EPA FLIGHT data; SIA data.
[6] 42 U.S.C. § 7675(e)(4)(B)(I).
[7] 42 U.S.C. § 7675(e)(4)(B)(I)(dd).
[8] 40 C.F.R. § 84.3 (proposed regulatory text at 86 FR 27207).

> **electronics manufacturing.** The materials removed may include SiO2, SiOX-based or fully organic-based thin-film material, SiN, SiON, Si_3N_4, SiC, SiCO, SiCN, etc. (represented by the general chemical formula, $Si_wO_xN_yX_z$ where w, x, y and z are zero or integers and X may be some other element such as carbon), substrate, or metal films (such as aluminum or tungsten).[9]

SIA recommends using this GHGRP definition for "etching" in the final rule rather than the definition as proposed, for consistency with the GHGRP practices, implementation and recordkeeping. For the same reason, we also recommend that the definition of "etching" in the final rule be expanded to include "wafer cleaning," a closely related process which EPA combined together with plasma etching in establishing default emission rates under the GHGRP. SIA also wishes to note that both definitions fail to capture an important feature of these processes and the chemicals that are required for them: a carbon atom is required in addition to the fluorine atoms (CF_2) in order to form polymers on the sidewalls of features to facilitate anisotropic etching and CFx fragments are used to facilitate the etch process; fluorine alone is insufficient.

2. "Chemical vapor deposition chamber cleaning"

For AIM Act purposes, EPA proposes this definition of CVD chamber cleaning:

> "*Chemical vapor deposition chamber cleaning* means, in the context of semiconductor manufacturing, **a process type in which chambers used for depositing thin films are cleaned periodically using plasma-generated fluorine atoms and other reactive fluorine-containing fragments**."[10]

The GHGRP defines "chamber cleaning" differently, as a broad "process type" that consists of one of the following "process sub-types"

> "(1) In situ plasma process sub-type consists of the cleaning of thin-film production chambers, after processing substrates, with a fluorinated GHG cleaning reagent that is dissociated into its cleaning constituents by a plasma generated inside the chamber where the film is produced.
>
> "(2) Remote plasma process sub-type consists of the cleaning of thin-film production chambers, after processing substrates, with a fluorinated GHG cleaning reagent dissociated by a remotely located plasma source.
>
> "(3) In situ thermal process sub-type consists of the cleaning of thin-film production chambers, after processing substrates, with a fluorinated GHG cleaning reagent that is thermally dissociated into its cleaning constituents inside the chamber where thin films are produced."[11]

Here too, SIA recommends that EPA align the definition of CVD chamber cleaning with the long-used terminology that is already well-understood and utilized within our sector and include the broader chamber clean definition.

[9] 40 C.F.R. § 98.98 (defining "plasma etching")
[10] 40 C.F.R. § 84.3 (proposed regulatory text at 86 FR 27207).
[11] 40 C.F.R. § 98.98 (defining "chamber cleaning").

B. Allocation

1. General Priority for Application-Specific Allowances

EPA proposes a six-step framework for issuing allowances for a given period of the phasedown.[12] The first step would be to multiply the production and consumption baselines by the applicable percentage available for allocation.[13] EPA proposes that the next step would be to subtract the quantity of application-specific allowances necessary from the phased-down baseline figures.[14] This subtraction for application-specific allowance holders would occur before any other allowances are distributed.

SIA supports EPA's proposal to prioritize application-specific allowances above any other allowance (although we propose a preferred alternative arrangement in Section VI). Provided that EPA properly calculates the "full quantity of allowances necessary" for these essential applications,[15] as discussed further below, subtracting these allowances off the top reflects the intent of Congress to immunize these essential sectors from the early years of the phasedown.[16]

2. Calculating Application-Specific Allowances

EPA proposes that application-specific allowances would be determined by looking at each semiconductor company's use of HFCs in the prior year (e.g., 2020 use) multiplied by the *higher* of either (1) that company's average growth rate of use over the last three years (e.g., 2018–2020), *or* (2) the average growth rate of all semiconductor manufacturers requiring application-specific allowances.[17] However, the semiconductor industry's growth does not correlate with GDP growth and will likely increase significantly due to recent federal initiatives and post-pandemic economic demands. In addition, the proposed rule falls short of Congress's requirement – and EPA's objective – to support the expansion of domestic manufacturing in this critical sector. The AIM Act requires EPA to allocate "the full quantity of allowances necessary, based on projected, current, and historical trends," for designated applications in the semiconductor manufacturing sector.[18] For the reasons described below, the current and historical trends on which EPA has proposed to rely for application-specific allowances may be sufficient for other sectors, but are completely inadequate to accurately forecast the near-certain growth of the semiconductor industry. SIA urges EPA to use an alternative approach to allocate projection-based allowances that would allow for significantly greater growth – and therefore HFC use – of the semiconductor industry.[19]

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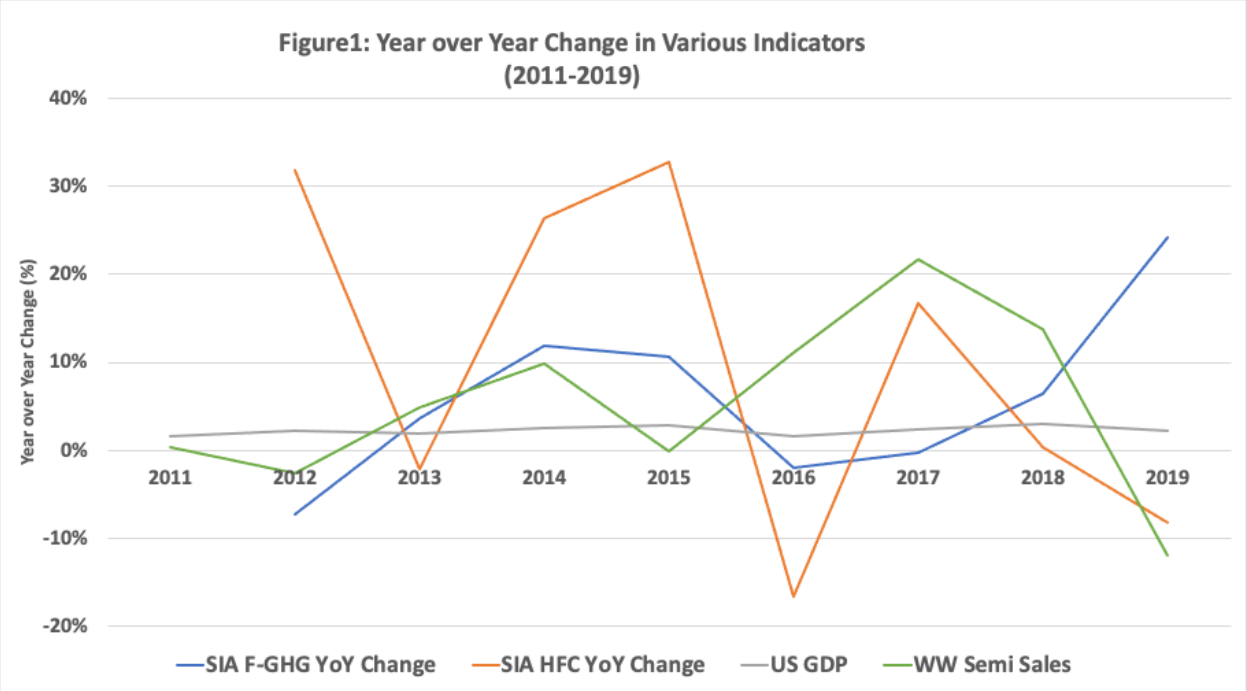
[12] 86 FR at 27171.
[13] 86 FR at 27171/1; *see* 42 U.S.C. § 7675(e)(2)(B)(ii) (requiring this calculation).
[14] 86 FR at 27171/1–2.
[15] 42 U.S.C. § 7675(e)(2)(D)(iv)(I).
[16] Legislative history quotes from Senate EPW hearing that led to adoption of "mandatory allocation" amendment, *available at* https://www.epw.senate.gov/public/index.cfm/2020/3/s-2754-american-innovation-and-manufacturing-act-of-2019-written-testimony-and-questions-for-the-record]]; *see, e.g.*, "Kennedy, Barrasso, Carper Announce Agreement on HFCs Amendment to Energy Bill"," Sept. 10, 2020 (press release) (quoting Sen. Barrasso, then-Chairmen of the Environment & Public Works Committee, referring to "the critical uses" of HFCs), *available at* https://www.kennedy.senate.gov/public/2020/9/kennedy-barrasso-carper-announce-agreement-on-hfcs-amendment-to-energy-bill.
[17] 40 C.F.R. § 84.13(c)(1)–(2) (proposed regulatory text).
[18] 42 U.S.C. § 7675(e)(4)(B)(I).
[19] As described below, EPA's

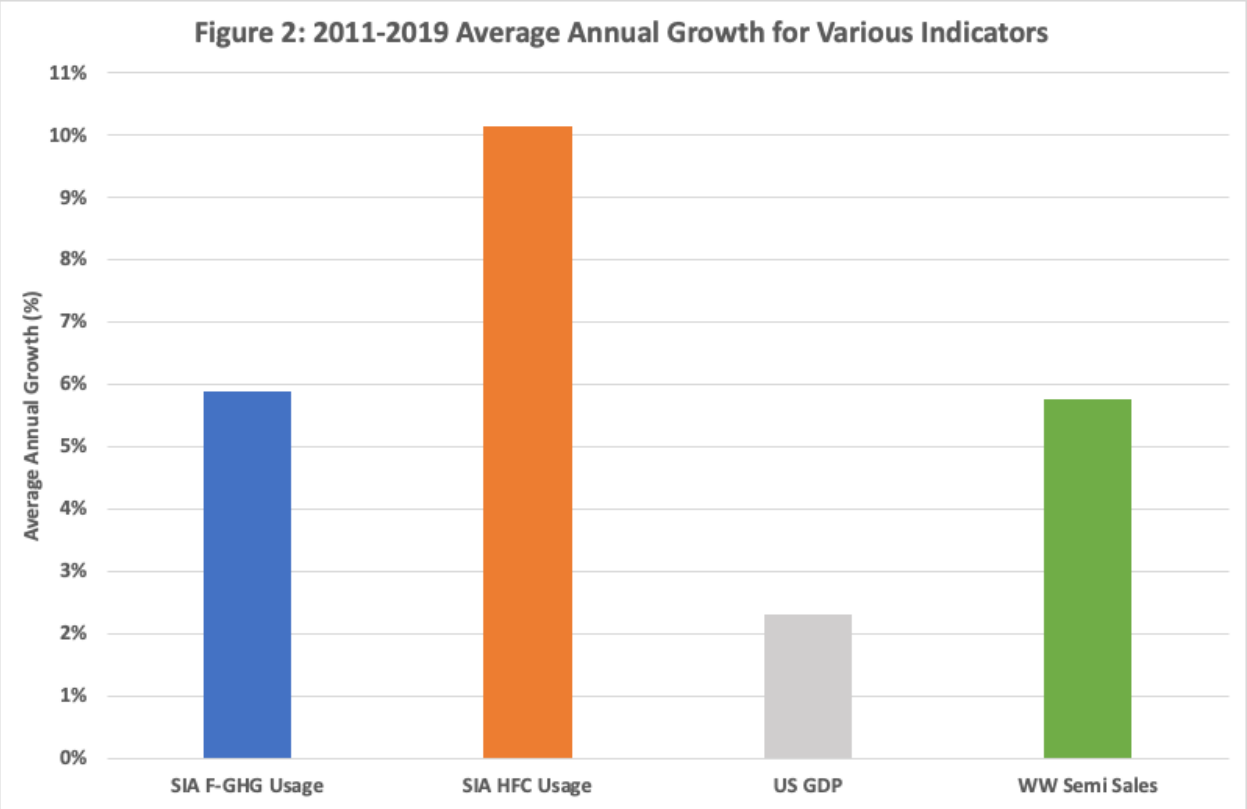
a. It is unreasonable to determine "the full quantity of allowances necessary" for the semiconductor industry based solely on an historical linear growth rate.

EPA's historical linear growth approach does not take into account the semiconductor industry's unique growth patterns and its use of HFCs. (Note that SIA previously provided the information below to EPA in our comments to the NODA, submitted on February 25, 2021.) Historically, the use of HFCs and fluorinated greenhouse gases (F-GHG) by SIA member companies have not corresponded with either GDP growth generally or semiconductor company growth (see Figure 1).



Source: SIA data collection and analysis.

While the rate of change in annual GDP remained relatively stable over the years from 2011-2019, HFC and F-GHG usage varied widely. The average annual growth in F-GHG usage increased at a rate of 5.9% and HFC usage at 10.1% (see Figure 2). HFCs are an important alternative to longer lived and more potent perfluorocarbons (PFCs) and required for use in anisotropic etch processes. The industry has adopted CH_3F and CH_2F_2 where feasible as alternatives to more potent F-GHG.



Source: SIA data collection and analysis.

Projections by the industry and outside analysts predict semiconductor sales to grow rapidly in coming years and far exceed GDP growth. New semiconductor fabs are currently under construction in the U.S., and several additional major projects have been announced. Semiconductors are the fundamental enabling technology of modern electronics that has transformed virtually all aspects of our economy, ranging from information technology, telecommunications, health care, transportation, energy, and national defense. Major areas of the economy – including electric and autonomous vehicles, the Internet of Things (IoT), clean energy and smart grid, artificial intelligence, remote work and school, telemedicine, and others – are all enabled by semiconductor technology.

In turn, the use of HFCs will continue to increase based on growth projections for the semiconductor industry. The industry growth is poised to exceed average prior growth rates – due in part to recently enacted legislation and presidential directives.

b. Recent federal reports, orders, and legislation emphasize the importance and inevitable growth of the semiconductor industry.

U.S. leadership in semiconductor manufacturing and research is increasingly acknowledged as a national priority, and Congress and the Administration are actively considering policy proposals to incentivize increased domestic semiconductor manufacturing. Given the prospect of substantial federal incentives for increased semiconductor manufacturing in the near future, EPA should build into its expectations the potential for increased manufacturing in the U.S.

In accordance with Executive Order 14017, the White House recently issued a report on the semiconductor supply chain highlighting the importance of semiconductors to the U.S.

economy and national security: "The semiconductor-based integrated circuit is the "DNA" of technology and has transformed essentially all segments of the economy, from agriculture and transportation to healthcare, telecommunications, and the Internet. The semiconductor industry is a major engine for U.S. economic growth and job creation. Semiconductors are used in virtually every technology product and underpin state-of-the-art military systems." [20] The Pentagon's industrial policy report issued earlier this year highlights the importance of semiconductors to the economy and national security:

> Microelectronics are critical to producing and maintaining existing military systems, for advancing emerging technologies like AI, 5G, and quantum computing, and for sustaining critical infrastructure and indeed, our entire modern economy. Microelectronics are in nearly everything, including the most complex weapons the Department of Defense buys, such as Aegis warships, the F-35 joint strike fighter, soldier systems, and our nuclear weapons and their command-and-control – which together form the backbone of our national defense. [21]

Given the strategic importance of semiconductors, there is growing recognition within Congress and the Administration that our country faces dangerous vulnerabilities in the semiconductor supply chain, posing risks to our economy, critical infrastructure, and national security.[22] To address these concerns, Congress and the Administration are considering proposals to incentivize increased semiconductor manufacturing in the U.S. In Congress, the Senate overwhelmingly passed legislation (S.1260) that includes $52 billion in emergency supplemental funding for semiconductor manufacturing and research,[23] and the Administration has expressed support for this legislation.[24] This bill funds the programs authorized in the FY21 defense authorization law (P.L. 116-283), and the House will soon be considering such legislation.

The Biden Administration has expressed strong support for these initiatives. In March 2021 President Biden called for Congress to invest $50 billion on semiconductor manufacturing and research as part of its infrastructure and jobs plan. [25] Similarly, the administration's supply chain report in response to E.O 14017 recommends for Congress to support "at least $50 billion in investment to advance domestic manufacturing for leading edge semiconductors; expand capacity in mature node and memory production to support critical manufacturing, industrial, and defense applications; and promote R&D to ensure the next generation of semiconductor is developed and produced in the United States."[26]

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[20] A Report by the White House, "Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth: 100-Day Reviews under Executive Order 14017" at p. 21, available at https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf.

[21] OSD A&S Industrial Policy, "Fiscal Year 2020 Industrial Capabilities: Report to Congress" (Jan. 2021) available at https://www.businessdefense.gov/Portals/51/USA002573-20%20ICR_2020_Web.pdf?ver=o3D76uGwxcg0n0Yxvd5k-Q%3d%3d.

[22] White House Supply Chain Report at 25. ("A sudden supply chain shock could have a far-reaching and unforeseen impact in any of these areas [of the economy], not only for specific industries, communities, and workers, but also potentially affecting national security and critical infrastructure.")

[23] https://www.congress.gov/bill/117th-congress/senate-bill/1260/text, section 1002, "Creating Helpful Incentives to Produce Semiconductors (CHIPS) for America Fund." The Senate is also considering legislation, the Facilitating American-Built Semiconductors (FABS) Act (S.2107), to provide a 25 percent investment tax credit for the construction and equipping of new semiconductor fabs.

[24] Statement of Administration Policy (S.1260 – Endless Frontier Act) available at https://www.whitehouse.gov/wp-content/uploads/2021/05/SAP-S.-1260.pdf

[25] President Biden's $50 billion request is at https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan. The CHIPS Act manufacturing incentives are in P.L. 116-283, Sec. 9902.

[26] White House Report, "Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth," June 2021 available at https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf

According to the Boston Consulting Group, incentives of this magnitude could result in the U.S. capturing as much as 24 percent of new fab capacity, resulting in as many as 19 new fabs in the U.S. While this funding is not yet final, there is a strong likelihood significant funding will be appropriated to incentivize semiconductor manufacturing in the U.S., with the result being the construction of additional new fabs and/or the expansion of existing fabs. As a result of this new fab construction in the U.S., domestic fabs will necessarily result in increased use of critical materials such as HFCs.

c. The use of HFCs is anticipated to increase due to increased demands for HFCs for advances in manufacturing technologies.

In addition to the projected increase in semiconductor manufacturing in the U.S., HFC usage will likely also increase due to advances in manufacturing processes. Semiconductor devices are becoming increasingly complex, with billions of transistors imprinted on a surface of a square centimeter, and innovation continuing at a rapid pace. This increasing complexity has required an increased number of mask layers per wafer, which leads to an increase in the process steps that require F-GHG. This trend will likely continue in the future: the industry has no alternatives to HFCs yet. We anticipate this increasing manufacturing process complexity will necessitate an increase in the use of process gases such as HFCs. The industry has experienced increased usage in other process gases, such as other F-GHGs to meet new technology demands, and we anticipate similar or potentially higher increase in HFC usage over time.

d. Adoption of new manufacturing technologies in existing facilities, new tool installations and new fab startup require additional HFC allocations.

In addition to the drivers above, growth in the industry's manufacturing base will necessarily lead to additional HFC needs to accommodate requirements associated with installation and startup of new equipment. Installation of new equipment at existing facilities and tool retrofits will require additional chemical usage and emissions for testing, recipe set up, and process qualification. The same thing is true of new fab startup and new equipment startup processes. These additional demands are part of the reason that HFC demand curves are not directly proportional to industry growth curves. As a dynamic and growing industry that depends on innovation, we need to have our installation of new technology, new equipment and new fab startup taken into account in our projected allowance allocation needs. Without that flexibility and assured supply, the rulemaking could negatively impact availability of HFCs for semiconductor production.

e. Recommendation: EPA should adopt a sector-specific methodology for fast-growing sectors, like semiconductors, for the initial allocation, and should provide a fallback allocation pool for semiconductor specific allocations to cover underallocations and new mid-year entrants in our sector.

EPA must revise the proposed rule to adopt a sector-specific flexible methodology for projecting growth for HFC users in the semiconductor industry. Specifically, we need a methodology that will allow manufacturers to request allowances based on projected HFC requirements *using any reasonably supported methodology*, including sectoral growth

projections, company-specific growth projections, and technology-based HFC needs projections, on a company-by-company basis.

In addition, EPA should create a separate allocation pool that sets aside additional application-specific allowances as a margin of safety to ensure sufficient allowances are available for in-year growth in our sector that exceeds projections at the time EPA issues the allocations for next year, as well as for new entrants (e.g., new fabs) that begin operation during 2022, as described in further detail in Part V of our comments below.

3. Appeals of Improper Allocation

The AIM Act requires EPA to conduct its mandatory allocation "through a rulemaking."[27] EPA proposes to advise companies of their application-specific allowance allocation "through a letter" issued to each entity by October 1.[28] There can be no doubt that individual companies' allocations are final agency actions subject to judicial review. The formal letter gives notice of the consummation of EPA's decision-making process, and the allocation determines rights/obligations (or at minimum has legal consequences).[29]

In some cases, a company may believe that EPA has erred in its calculations, or otherwise disagree with EPA's decision regarding whether certain uses of HFCs fall within the mandatory allocation categories. For the benefit of allowance-holders, and EPA itself, the Agency should create a process documenting any unique decision-making regarding a company's allocation so that the agency has an administrative record to support the allocation upon judicial review.

EPA must establish an efficient process for companies to quickly challenge (and the Agency to reconsider) any allocation. EPA could accomplish this by providing notice of a preliminary allocation to application-specific allowance holders well in advance of the October 1 deadline, with an opportunity for the recipient to contact EPA to challenge or inquire about the basis for its preliminary allocation. EPA could then address any problems early without potentially requiring a reworking of the general consumption/production allowance pool allocation to correct any errors in the application-specific allowance allocation process. Given the statutory mandate to allocate "the full quantity necessary" of application-specific allowances, the rule should provide that EPA will provide the full amount requested to any eligible semiconductor manufacturing sector recipient that objects to its preliminary allocation, unless EPA is able to demonstrate why the applicant's request is unwarranted.

Additionally, EPA should acknowledge in the final rule that—once final on October 1—an individualized allowance allocation is a final agency action subject to judicial review. The final rule should also indicate whether such allocations are nationally applicable actions subject to review only in the D.C. Circuit.[30]

[27] 42 U.S.C. § 7675(e)(4)(B)(iv)(II).
[28] 40 C.F.R. § 84.13(d) (proposed regulatory text).
[29] *See generally Bennett v. Spear*, 520 U.S. 154, 177–78 (1997).
[30] Although the letter is issued under the AIM Act, the Clean Air Act's judicial review provisions apply to "any rule, rulemaking or regulation" of the AIM Act as though the AIM Act was located in Clean Air Act title VI. 42 U.S.C. § 7675(k)(C) (citing 42 U.S.C. § 7607).

C. Transfer of Allowances

1. Offsets for allowance transfers

EPA proposes that transfers of production and consumption allowances should be subject to an "offset" (essentially, a tax that devalues the transferred allowance) somewhere between 1% and 10%.[31] EPA bases this proposal on its interpretation of the AIM Act, as requiring that "transfers of allowances…result in less overall production or consumption than would have occurred absent the transfer."[32]

EPA proposes a similar offset for transfers of application-specific allowances. In EPA's view, the statute "appears" to apply "generally to transfers of allowances and does not exempt any allowances from its requirement."[33] EPA proposes a lower transfer offset for application-specific allowances (1%), and takes comment on whether it should be as low as 0.1%.[34]

SIA opposes any offset for transfers of application-specific allowances as contrary to the AIM Act. The purported offset requirement applies only to "transfers under this subsection"—i.e., 42 U.S.C. § 7675(g). That subsection directs EPA to promulgate rules governing the transfer of allowances for "production"—i.e., what the subsection later refers to as "production allowances."[35] The offset requirement is effectuated as limit on "the transferor of the allowance" in terms of an "enforceable and quantifiable reduction in annual production…"[36] But application-specific allowance holders do not have limits on annual production—they do not themselves produce HFCs. Accordingly, the exchange priority provisions of subsection (g) do not apply beyond transfers of production allowances and—for the same reasons—consumption allowances.[37] Although application-specific allowances may *authorize the act* of production (or import), they are not themselves held by producers (or importers).

Contrast that with the requirement for the mandatory allocation categories, for which EPA must allocate the "full quantity of allowances necessary" for the production and consumption of HFCs in these applications.[38] An offset for application-specific allowances would result in a net loss of allowances to these critical sectors, contrary to the clear congressional intent to immunize these sectors from the earliest effects of the phasedown.

If EPA insists on finalizing a rule that includes offsets for application-specific allowances, that figure should be *de minimis*, or as close to zero as possible. In that event, EPA should finalize a 0.1% offset so that the practical effect on these critical industries is as minimal as legally possible.

EPA also proposes that the mere act of conferring an application-specific allowance to a producer or importer is not a "transfer" subject to offsetting.[39] SIA supports this commonsense approach.

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[31] 86 FR at 27175–76.
[32] 86 FR at 27175 (citing 42 U.S.C. § 7675(g)).
[33] 86 FR at 27176.
[34] Proposed regulation to be codified at 40 C.F.R. § 84.19(a)(2)(vii).
[35] *Compare* 42 U.S.C. § 7675(g)(1), *with id.* § 7675(g)(2)(B) ("production allowances").
[36] *Id.* § 7675(g)(2)(B).
[37] *Cf.* 42 U.S.C. § 7675(g)(2)(C) (providing for regulations on transfers of consumption allowances "in the same manner as applicable…to the trading of production allowances).
[38] 42 U.S.C. § 7675(e)(4)(iv)(I).
[39] Proposed regulation to be codified at 40 C.F.R. § 84.13(h).

2. Prohibition on transfers between essential uses

EPA proposes that transfers of application-specific allowances should remain within the same application.[40] SIA supports this element of EPA's proposal. This limit on transferring allowances will ensure the integrity of the allowance supply for sector-specific uses, including for semiconductor manufacturing. Further, an option to change applications for application-specific allowances would contradict the statutory language that mandatory allocations be provided "for the exclusive use of the regulated substance in an application solely for" one of six specific industry uses.[41]

D. Complexity of Supply Chain

1. High risk of missing data in EPA's baseline calculations and allowance allocation decisions.

EPA may have incorrectly presumed that application-specific allowance holders will only confer their allowances *directly* to producers or importers. This misconception appears in both the rule's preamble[42] and draft regulatory text.[43] In reality, the semiconductor industry supply chain is far more complex than this two-step conferral suggests. Domestic semiconductor manufacturers rely upon numerous HFC suppliers, who in turn rely on additional rungs of suppliers in the supply chain ladder. They generally do not obtain HFCs from producers or importers. The industry supply chain is incredibly complex, and numerous HFC suppliers provide materials to manufacturers. We are concerned that EPA underestimated this complexity and is not aware of many of the HFC suppliers that are essential to the process. A report of the Market Characterization of the U.S. Semiconductor Industry, which was prepared for the Stratospheric Protection Division of EPA's Office of Air and Radiation, identifies only four HFC suppliers – which supply "some semiconductor manufacturers with HFC compounds (i.e., HFC-23, HFC-32, and HFC-41)".[44] Moreover, based on our member feedback, three of the four suppliers identified in that survey do not supply directly to end device manufacturers – a further indication of the supply chain complexity. ICF acknowledged that "further research would need to be conducted to identify all HFC suppliers to semiconductor manufacturers."

Indeed, SIA conducted a Supplier Survey to gain insight into how many HFC suppliers provide HFC compounds to SIA members. Ten HFC suppliers – more than three times the number identified in the Market Characterization report – responded. Of the 10 that responded, seven are likely not included in EPA's request for information, because they do not appear to

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[40] Proposed regulation to be codified at 40 C.F.R. § 84.19(a)(2)(viii).
[41] 42 U.S.C. § 7675(e)(4)(B)(I) (emphasis added).
[42] For example, EPA's preamble states, "EPA is proposing that an application-specific allowance holder could confer their allowances *to an importer or producer*, who would procure the HFC for the end user…." 86 FR at 27176 (emphasis added); *see also id.* at 27174 (noting that a benefit of application-specific allowances is that semiconductor manufacturers and similar essential industries can "choose which producer or importer they would confer their allowances to").
[43] *See, e.g.*, 86 FR at 27176 40 C.F.R. § 84.13(b)(2)–(3) (proposed regulatory text at 86 FR 27211 requiring application-specific allowances to report the allowances they conferred to domestic producers vs. importers, and appearing to conflate both with "the supplier"); *id.* § 84.31(c)(1)(iv) (proposed regulatory text at 86 FR 27220 appearing to assume that application-specific allowance holders will place orders directly with importers); *id.* § 84.31(*i*)(1)(ii)–(iii) (proposed regulatory text at 86 FR 27222 requiring application-specific allowance holders to report the quantities of their HFCs acquired from imported vs. domestic production sources); *id.* § 84.31(*i*)(3)(ii) (proposed regulatory text at 86 FR 27222 requiring application-specific allowance holders to keep records of certifications "provided to producers and/or importers when conferring allowances").
[44] 2021 HFC Supplier Survey Results v.1 at 16; EPA-HQ-OAR-2021-0044-0042_attachment_3.pdf at 5 (https://downloads.regulations.gov/EPA-HQ-OAR-2021-0044-0042/attachment_3.pdf).

report under the GHG Mandatory Reporting Rule, Subpart OO.[45] There is therefore a risk that many participants in the HFC production and refining supply chain may be unaware of the EPA rulemaking in this area, and have not provided sufficient information to EPA necessary to establish a proper baseline or identify company-specific needs.

2. Conferral of Allowances

SIA supports EPA's proposal to allocate allowances to end-device manufacturers. It is our understanding that EPA plans to allocate allowances to individual device manufacturers, who may then confer those allocations to their suppliers.[46] At the outset, this will allow end-users the flexibility to change suppliers when necessary.

However, given the complexity of the supply chain, SIA requests EPA to clarify that allowances for semiconductor manufacturers may be conferred several rungs up the supply chain as HFC materials are manufactured, processed, and refined. EPA should clarify that an application-specific allowance can be conferred multiple times up the supply chain, provided that the HFCs acquired with that allowance still benefit the original allowance-holder, for the specified purpose of that allowance.

As with "one-step" conferrals (directly from allowance-holder to a producer/importer), moreover, the final rule should confirm that a multi-step conferral up multiple levels of a supply chain still would not be a "transfer" subject to any offset. SIA requests that EPA confirm that a multi-step conferral is not considered a "transfer" subject to another offset.

3. The Set-Aside Pool is Too Small

In light of the concerns above about anticipated growth in semiconductor manufacturing and the complexity of the semiconductor supply chain, and in response to EPA's specific request for comment on the size of the set-aside pool, SIA believes that the 5 MMTCO2e of consumption allowances and 1 MMTCO2e of production allowances are unlikely to be sufficient. We anticipate a need for additional allocations for application-specific allowances from the set-aside pool to support semiconductor manufacturing operations, above and beyond the uses that are identified to EPA during the current comment window. We therefore support the highest end of the set-aside range identified in the preamble to the proposed rule – 15 MMTCO2e – as the minimum size of the set-aside pool.

As further described in Part V below, moreover, we suggest that EPA create an entirely separate and additional pool of allowances that would be available to accommodate growth in our sector that is not otherwise addressed in the initial allocation or in subsequent allocation round from the set-aside pool.

4. Appropriate Calculation of Semiconductor HFC Requirements – Purity Adjustment Requirement

EPA proposes that application-specific allowances be based on "HFC use *by the [allowance-holding] company* in the specific application."[47] However, production or import of HFCs necessary to meet the needs of the semiconductor manufacturing sector will require consideration of more than just the HFCs directly used by end device manufacturers. Commercially synthesized HFCs are specified to 95%-97% purity levels (30,000-50,000 ppm of impurities). Purifiers and refiners in our supply chain then purify those HFC to meet the high

[45] 40 CFR Part 98.
[46] As discussed in June 1, 2021 Chamber of Commerce Webinar
[47] 86 FR at 27155 (emphasis added)

purity requirements of end device manufacturers, converting 95% pure raw materials into 99.999% or greater purity materials. That refining process necessarily results in losses of HFCs during the purification process. One refiner estimates that 1.06 kg of raw HFCs are required to produce 1.0 kg of semiconductor grade HFC.[48] Because there are losses in the purification process, a simple 1:1 conferral based on end use HFC data will not suffice to meet the full etch-wafer clean/chamber cleaning needs of the semiconductor manufacturing sector—which EPA is unambiguously required to do.

In order to ensure that EPA satisfies its statutory requirement to the semiconductor industry, it should provide an application-specific multiplier – we suggest at least 1.1, although EPA may have better information that supports a higher number, based on information provided to it (or available to it) from suppliers – to the HFCs directly used for semiconductor application-specific uses as reported to EPA by the semiconductor manufacturers, in order to capture actual HFC allowance requirements needed to produce HFCs for these application-specific uses.

E. Sale or Transfer of HFC chemicals acquired with application-specific allowances

EPA proposes that if a semiconductor company uses an application-specific allowance to acquire HFCs, then it could sell or transfer the HFCs themselves to another company—but only if that other company was also using the HFCs for qualifying semiconductor uses.[49] SIA generally support this flexibility, even with the qualifier that the transferred HFCs may only be used for qualifying semiconductor uses. That limitation preserves the integrity of the application-specific allowance program overall, and ensures that the HFCs acquired with those allowances are used for the critical purposes that Congress intended.

However, EPA also proposes that the transfer of such HFCs between semiconductor companies be pre-approved by EPA.[50] Affirmative EPA pre-approval before a transfer is not necessary, provided that the Agency is provided in advance with the information necessary to ensure compliance. We are concerned that EPA may become back-logged with requests to transfer HFC chemicals among semiconductor companies (and other application-specific users), and that the administrative backlog would unduly burden the market for these critical products. Transfers might be used frequently as fabs (and therefore HFC requirements) are transferred among companies. The administrative burden associated with obtaining EPA pre-approvals in such a case does not appear to be warranted. Accordingly, SIA proposes that EPA's proposed 10-day window for affirmative approval be eliminated in the final rule. Alternatively, if retained, it should instead be restructured to allow a presumption that transfers of allowances for eligible uses among semiconductor manufacturers will be presumptively allowed, with at most a 10-day window for EPA to object to the transfer and to explain the rationale for its objection. If 10 days passes without an EPA objection, then the transfer could proceed. Of course, companies could always seek formal EPA approval (or even an opinion) before conducting the transfer. But in the vast run of cases, the transfer will be documented and fairly straightforward—there should be no requirement to await EPA concurrence.

If EPA is adamant that it will require concurrence for every single transfer of semiconductor-limited HFCs between companies, then EPA must provide guardrails in the regulations that outline *how* it will exercise its objection authority. For example, EPA should be required to concur unless it determines that the request for concurrence is incomplete, fraudulent, or for a purpose ineligible for the mandatory allowance.

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[48] *See, e.g.,* Public Hearing Comments of Matt Adams, V.P. of Electronic Fluorocarbons (June 3, 2021).
[49] 40 C.F.R. § 84.21(a)(1) (proposed regulatory text at 86 FR 27214–15).
[50] 40 C.F.R. § 84.21(a)(2) (proposed regulatory text at 86 FR 27215).

EPA also proposes that companies submit to EPA certain cost, quantity, "specific product" information, and other information traditionally considered CBI in order to transfer between semiconductor companies any HFCs originally acquired using application-specific allowances.[51] We do not see the need for EPA to request cost data, or to request information about "specific products" produced in our sector, beyond information that substantiates that the HFCs produced or imported with application-specific allowances are being used in a process that meets the eligibility criteria. We therefore believe that EPA should eliminate these requirements from the final rule.

If EPA nevertheless retains these information-provision measures, EPA must provide assurances that it will treat this particularized information as CBI if a valid CBI claims is made for it. It should also clarify that the "specific product" information can be satisfied by reference to a general category of product, such as "integrated circuits" or "semiconductor devices" in order to minimize the amount of sensitive business-confidential information that companies must provide and that EPA must protect. Additionally, EPA should clarify whether the "cost of the regulated substance" at issue in the "sale or transfer" refers to the cost paid by the transferee to receive the HFCs, or the cost paid by the transferor to originally acquire the HFCs.

Finally, with respect to compliance, EPA proposes to place the burden of proof on the transferee (recipient) of the traded HFCs to retain records proving that the sold/transferred regulated substance is used only for the stated application. SIA supports this allocation of the compliance burden. Application-specific allowance holders should only be responsible for ensuring compliance regarding their own conduct. A semiconductor company transferring HFCs to another company has no method of tracking how its competitor subsequently uses those HFCs. Except for maintaining records of the transfer, the transferor's responsibility for the transaction ends when the transfer is effectuated.

F. Miscellaneous

In some proposed regulatory text EPA uses the words "allocation-specific allowances" when it clearly meant "application-specific allowances."[52] EPA should fix these typos in the final rule text. EPA should also clarify in the record that all preamble references to "allocation-specific" allowances were typos intended to be "application-specific" allowances.

III. HFC-23 BYPRODUCT EMISSIONS

For the most part, EPA proposes to adopt the same definition of "produce" as the AIM Act itself—essentially, "the manufacture of a regulated substance from a raw material or feedstock chemical,"[53] with an exclusion for "the inadvertent or coincidental creation of insignificant quantities during a chemical manufacturing process, resulting [1] from unreacted feedstock, [2] from the listed substance's use as a process agent present as a trace quantity in the chemical substance being manufactured, or [3] as an unintended byproduct of research and development applications." Unintentional production that is not from those three sources (or that exceeds the "insignificant quantity" threshold) will be considered "production" that triggers a requirement for production and consumption allowances.

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[51] 40 C.F.R. § 84.21(a)(2)(i)–(v) (proposed regulatory text at 86 FR 27215).
[52] *See, e.g.*, 86 FR at 27222 (proposed regulation to be codified at 40 C.F.R. § 84.31(*i*)(3)(v)); *id.* at 27224 (proposed regulation to be codified at 40 C.F.R. § 84.33(b)(4)). Similar typos are in the preamble. *See* 86 FR at 27189; *id.* at 27193; *id.* at 27196.
[53] 42 U.S.C. § 7675(b)(7)(A); 40 C.F.R. § 84.3 (proposed regulatory definition of "Production/Produce," at 86 FR 27208).

We are concerned that the proposed rule could be read to include HFC byproducts created in semiconductor plasma processes within the scope of "production" that would trigger the expenditure of production and consumption allowances, although we understand that this is not EPA's intent. The semiconductor industry are users, not manufacturers, producers, or processors of chemicals. HFC byproduct production is a fraction of the semiconductor industry's already small relative contribution to HFC emissions and are already tracked via the GHGRP where it is set in the default EF/BEF tables. We understand that the reference to "during a chemical manufacturing process" would exclude *semiconductor* production activities from scope, but request that EPA clarify this point in the final rule.

For *HFC-23*, moreover, whether intentionally produced or created as an inadvertent byproduct, EPA proposes additional constraints: byproduct HFC-23 must be captured and sold only for "consumptive uses" (which EPA defines in the preamble to include semiconductor etching) or captured and destroyed using an approved technology. These requirements, which EPA styles as a condition on its establishment of production and consumption allowances, amount in effect to a prohibition (or severe restriction) on the release of HFC-23, even where the production of that HFC-23 has required the expenditure of allowances.

These requirements appear to have been intended to cover only relatively simple chemical production processes where HFC-23 is created as a byproduct, due to its extremely high GWP. However, because the precise scope of the requirements to capture and destroy HFC-23 is ambiguous in the proposed rule, we request that EPA clarify the final rule to make clear that HFC-23 emissions from semiconductor manufacturing operations are out of scope**.**

HFC-23 has important applications as an intentionally introduced substance in the etching process. That process results in the transformation of a substantial proportion of HFC-23. As EPA is aware, and as specifically contemplated in the reporting requirements under Mandatory Greenhouse Gas Reporting Rule, Subpart I, the etching process does not result in complete transformation of HFC-23 used in that process. A substantial portion of HFC-23 (up to 51%, depending on the production process) are not fully reacted, and are vented (and reported to EPA under subpart I). It is not technologically or economically feasible to capture or destroy those HFC emissions in all cases. Semiconductor companies already provide information on any abatement they use via the MRR, Subpart I. Indeed, as EPA has itself identified the etching process as an illustrative example of a consumptive use for which sales of captured HFC-23 would be expressly authorized, it makes no sense to then require the device manufacturer to capture the unreacted HFC-23 resulting from that expressly allowed use. When abatement can be installed, the MRR, Subpart I sets default destruction/removal efficiencies of 97% and not 99.99% specified in the preamble.

In addition, as EPA should be aware, HFC-23 is formed as a byproduct of plasma processes. Those amounts are also reported in subpart I GHG reports by semiconductor manufacturers. Installing HFC-23 abatement technology or HFC capture technology would require technically and economically infeasible alterations to existing facilities, including installation of abatement equipment on hundreds of process chambers per production line where space and infrastructure may not exist or infeasible HFC-23 capture technology on exhaust lines where the HFC-23 is present at part per billion levels.

To the extent that EPA has authority under the AIM Act to impose additional controls on HFC-23 byproduct emissions from chemical production processes through the AIM Act, it should exercise that authority in a way that excludes or exempts the small contributions of HFC-23 emissions from semiconductor uses, many of which are technically and economically infeasible to control or abate.

IV. RECORDKEEPING & REPORTING REQUIREMENTS (INCLUDING CBI CONSIDERATIONS)

A. Protection of Confidential Business Information

EPA places a significant emphasis on the need for transparency.[54] It has suggested that it "intends to make public the amount of allowances – provided on an exchange value weighted basis – allocated to each company. EPA also intends to release updated aggregate production, import, and export data," and while it understands "that there is a possibility for a company to back calculate information based on what is released, … [it] cannot make any assurances against this or fully predict it in advance."[55] SIA is concerned that this fails to respect EPA's obligation to protect confidential business information (CBI)—particularly in the application-specific allowance categories.

1. EPA has discretion to withhold sensitive information, as it does for the application-specific "mission-critical military use" category, and should use discretion to limit the information released that is claimed confidential.

We understand that EPA is taking comment on "whether to release all HFC data, unaggregated and in a format similar to how it would be reported to EPA," even though the agency recognizes that much of these data have previously been recognized as CBI.[56] SIA urges EPA to clarify that any release of such data would not apply to data submitted by the companies requesting application-specific allowances.

Semiconductor manufacturers view both specific supplier identity and the quantity of specific HFCs used as CBI. Both provide vital information about the type of materials used in manufacturing, which gives manufacturers competitive edges over imposter or copycat companies. If data about usage or volumes is released, then competitors could reverse engineer that data and infer demand for the manufacturer's product. They could further determine supplier identity. We believe that this would frustrate congressional intent to *support* the manufacturing innovations of the semiconductor manufacturing sector by perversely requiring companies to sacrifice their CBI (*i.e.,* suppliers, quantities, and substances) for the allowances intended to immunize the companies from any AIM Act consequences in the early years of the phasedown.

EPA has suggested that the release of information is appropriate because "[c]ompanies have a choice if they want to continue participating in the U.S. HFC market."[57] That is perhaps true for producers and importers generally, but for essential uses – like the semiconductor industry – Congress intended for them to be immunized from the early effects of the phasedown. EPA must keep confidential the data submitted by these companies. To do otherwise would either expose CBI to the world (including the Chinese government), or open the competition for HFCs to the open market – in the exact way that Congress sought to avoid.

[54] *See, e.g.*, 86 FR at 27197 ("EPA is proposing to maximize transparency of the allocation program under the AIM Act.").
[55] Z. Pilchen email correspondence with Nikita Naik.
[56] 86 FR at 27198 & nn.84–85.
[57] 86 FR at 27198.

2. Alternatively, EPA proposes to release only certain aggregated national data, in addition to "any company or chemical specific information that is already publicly available."

We understand that EPA plans to release updated aggregate production, import, and export data and an updated list of companies undertaking these activities.[58] EPA's alternative approach will likely lead to publicizing the total aggregated, nationwide amounts of each individual HFC flowing through the economy. We suggest that EPA only release information on an aggregated basis based on GHG tonnage. This will mask specific volumes used for processing and manufacturing and protect specific HFC usage. SIA supports this alternative approach as we believe it will better protect confidential information from public disclosure.

B. Reporting

EPA proposes that application-specific allowance holders would be required to submit to EPA the quantity of HFCs acquired (including a breakdown of domestic producers vs. imports), the names of suppliers, any HFCs acquired from the open market, and other requirements.[59]

SIA understands the need for reporting requirements, but is concerned about the breadth of some information required to be reported to EPA, as well as EPA's treatment of the underlying reported data.

First, EPA must respect requests that this granular information be treated as CBI, for the reasons stated above regarding transparency.

Second, the information reported to EPA as a consequence of being an application-specific allowance holder should be limited to the information actually relevant to application-specific allowance holders. We assume this is merely an unintentional lack of clarity in the regulatory drafting, and that EPA intended for this information to be only limited to the HFCs for which application-specific allowances are sought.[60]

At most, companies should be required to report the quantify of HFCs that they *used* during a reporting year, not the amounts that they acquired, because this use information will (in addition to their prior year allocation) help to inform EPA's judgment about future-year allocations.

In addition, companies should not be required to report to EPA the quantity of HFCs that they acquire on the domestic open market, for any purpose, whether or not related to semiconductor etching or CVD chamber cleaning.[61] The AIM Act does not require the use of allowances for such transactions, because acquiring HFCs domestically is not itself either production or import. Even if limited to HFCs acquired for semiconductor etching or CVD chamber cleaning, it is outside of EPA's authority to require reporting whether a company—perhaps for strategic business reasons—is acquiring HFCs on the open market, *without*

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[58] "HFC Production and Consumption – Proposed Rule," Stratospheric Protection Division, Office of Air and Radiation (OAR), USEPA, April, 5, 2021, *available at* https://downloads.regulations.gov/EPA-HQ-OAR-2021-0044-0046/attachment_7.pdf.

[59] 40 C.F.R. § 84.31(*i*)(1)(i)–(viii) (proposed regulation at 86 FR 27222).

[60] A similar lack of clarity was present in the letters and forms seeking information from semiconductor manufacturers and other essential application users regarding their HFC uses. (https://www.epa.gov/climate-hfcs-reduction/collection-data-support-establishment-hfc-allowance-allocation-and-trading) For example, the form asks companies to submit information on "each HFC" it used, purchased, or held in inventory. In subsequent communications with EPA staff, they clarified that the information sought was intended to be information solely relevant to the application-specific use. We assume the same intention here.

[61] 40 C.F.R. § 84.31(*i*)(1)(v) (proposed regulatory text at 86 FR 27222).

expending allowances. These concerns are even graver if EPA refuses to provide adequate assurances that it will respect valid CBI claims related to these acquisitions.

As another example, many of these requirements as drafted appear to apply to *any* HFCs that semiconductor companies acquire—even for irrelevant purposes like use as coolants in company vending machines.[62] Such unnecessary reporting would overburden semiconductor manufacturers (even though Congress intended to make the phasedown easier). It would make it more difficult for our members to collect the information necessary for reporting within EPA's 30-day deadline for biannual reports (thus jeopardizing timely allocations). And it would inundate the Agency with reams of irrelevant information (thus diverting limited EPA resources).

C. Third-Party Auditing

EPA should clarify that its proposed third-party auditing requirement would not apply to application-specific allowance holders. EPA's proposed rule extends third-party auditing requirements to anyone "receiving" production allowances, consumption allowances, or application-specific allowances.[63] As drafted, this language could be read as applying to application-specific allowance holders. Other indications in the regulatory text demonstrate that this was not EPA's intention. The regulatory text references auditors reviewing "quarterly" and "annual" reports,[64] but the proposed text only requires application-specific allowances to prepare biannual reports. We think this is a wise approach. The AIM Act ultimately regulates two things: the production and import of HFCs. Accordingly, these extensive and costly auditing requirements should only apply to the conduct that Congress was actually concerned about restricting, rather than to the industries like semiconductor manufacturers that Congress wanted to alleviate of any restrictive phasedown effects.

If a third-party auditing requirement is maintained in the final rule (even for other allowance holders only), moreover, EPA should in any event eliminate the requirement that the audit be conducted by certified public accountants. CPAs do not have the relevant auditing expertise to evaluate the validity of reports of this nature, and requiring a CPA audit will needlessly complicate and increase the costs of any third-party auditing requirement.

V. ALTERNATIVE ALLOWANCE ALLOCATION SYSTEM FOR SEMICONDUCTOR MANUFACTURING – ESTABLISHING A "MARGIN OF SAFETY" ALLOWANCE POOL FOR GROWTH AND NEW SEMICONDUCTOR MANUFACTURING ENTRANTS

EPA's proposed rule establishes allocations based on past needs, not projected trends as required by the AIM Act. In their application-specific allowances reporting template, the Agency asks companies to report usage for the past three years (2018-2020), not their projections of future needs. This is likely to result in an under allocation to semiconductor companies. Going to the market to obtain what was not initially allocated for a company's allowance is not a solution for this industry and its complex supply chain.

SIA encourages EPA to establish a distinct allowance allocation system for semiconductor production. Such an approach would be justified, taking into account (1) the critical nature of the semiconductor manufacturing sector to the U.S. supply chain, (2) the uniquely dynamic and high-growth nature of our sector, (3) the extremely small proportional contribution of HFC emissions from our sector, (4) the unique nature of the semiconductor uses

[62] *See* 40 C.F.R. § 84.31(*i*)(1)(v)–(viii) (all referring to quantities of "regulated substances" or "each regulated substance," with no textual limit on whether those regulated substances are at all relevant for the application-specific use at issue under the program).
[63] 40 C.F.R. § 84.33(a).
[64] 86 Fed. Reg. at 27223 (proposed reg text for 40 C.F.R. § 84.33(b)).

of HFCs, a substantial proportion of which are fully consumed and transformed when they are ionized in plasmas (in contrast to more dispersive uses in refrigerants and propellants); and (5) our concerns about the availability of sufficient HFC allowances under the rule as proposed. The AIM Act does not confine EPA to the allocation system proposed here.

As an alternative, EPA should consider an allocation system that creates a separate and additional set-aside safety margin pool for use by the semiconductor sector. We believe a pool that reserves, for example, 2.5 times the 2020 baseline data attributed to semiconductor uses would be appropriate to reflect the need for future growth, including amounts that might be needed by new market entrants after both initial allowance allocation periods are closed, and the concern that baseline data does not capture all of the etch and CVD cleaning needs for our sector. It is particularly important to have a mechanism to allow EPA to allocate HFCs to new entrants that begin operations after the allocation processes are completed for the following year. Under the rule as proposed, we see no mechanism for EPA to consider such new entrants, and no pool of allowances available to meet those new entrant needs. An additional set-aside pool, established *ex ante* at this stage of the rulemaking, would solve that problem. EPA could calculate and issue allowances to such new entrants using various methodologies, notwithstanding the absence of a baseline for such new entrants, based on any reasonable estimation methodology proposed by the new market entrant.

This concept is familiar to EPA and in fact has been proposed by EPA in the proposed rule. EPA's set aside of application-specific, production, and consumption allowances permits qualifying persons to draw additional allowances from a pool.[65] In certain circumstances, the pool would be drawn from on a *pro rata* basis when requests received exceed the remaining quantity of allowances. EPA should apply the same rationale here, given the complexity and fluidity of growth forecasts for HFC usage in the growing semiconductor industry, to create a specific margin of safety allowance pool for this critical sector.

[65] 40 C.F.R. 84.15 (proposed regulatory text).