Comments on Proposed Rule

Phasedown of Hydrofluorocarbons: Establishing the Allowance Allocation and Trading Program Under the American Innovation and Manufacturing Act

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We appreciate the opportunity to comment on the EPA's proposed rule for the phasedown of hydrofluorocarbons (HFCs), an important greenhouse gas (GHG). Our comments specifically address environmental justice issues raised in the preamble and draft Regulatory Impact Analysis (RIA). We have two background remarks and six specific comments.

Background

1. *Environmental justice and price-based policy instruments*

   Policies to phase out HFCs and other GHGs raise important issues of environmental justice due to releases of hazardous co-pollutants during their production and/or consumption. It is sometimes assumed that reductions in GHGs necessarily translate into reductions in co-pollutants, and that cap-and-permit systems (or pollution taxes) will not significantly exacerbate environmental disparities in relative terms, let alone result in higher pollution burdens in absolute terms in some communities that already bear disproportionate cumulative impacts. These assumptions are contradicted by both theoretical reasoning and empirical evidence.

   The efficiency (cost-effectiveness) case for price-based instruments for GHG reduction is precisely that they provide flexibility to firms and facilities in choosing the extent to which they reduce emissions in response to the price. In the absence of additional constraints, this flexibility includes the option of increasing emissions at specific facilities even as overall (and hence average) emissions decline. In the case of carbon, for example, the shift from coal-fired to gas-fired electricity may entail a shift in location as well as fuel source, leading to increased co-pollutant emissions at gas-fired facilities. The draft RIA cites some relevant literature on equity concerns (Sec. 6.6 & Sec. 6.7, n74); an additional important reference is Cushing et al. (2018).[1] In the case of HFCs, a further issue involves potential pollutant releases associated with production of substitutes, as noted in the preamble and draft RIA.

[1] Cushing, L., Blaustein-Rejto, D., Wander, M., Pastor, M., Sadd, J., Zhu, A., & Morello-Frosch, R. (2018). Carbon trading, co-pollutants, and environmental equity: Evidence from California's cap-and-trade program (2011–2015). *PLoS Medicine*, 15(7).

2. *Risk-Screening Environmental Indicators Geographic Microdata (RSEI-GM) could provide an alternative or additional assessment of the local impact of releases related to HFC-producing facilities.*

   The US EPA's RSEI Model (https://www.epa.gov/rsei) combines quantity, toxicity, and population exposure to characterize the aggregate human health risk from toxic releases from industrial facilities. The RSEI fate and transport model yields high-resolution spatial data over a radius of 50 km (31.1 miles) from each Toxics Release Inventory (TRI) facility with the individual units of analysis in the RSEI Geographic Microdata being the 810 m by 810 m cells that partition the 50-km radius surrounding the facility. For each TRI release to air, the AERMOD plume model provides estimated concentrations for each airborne toxic release on a cell-by-cell basis. RSEI applies a toxicity-weight to each release, flagging releases of high-toxicity chemicals. Finally RSEI enables the overlay of the estimated pollution plume with sociodemographic data from the Census or the American Community Survey which enables identification of the number and the demographic composition of differentially affected people within the 50-kilometer radius.

   Additionally, RSEI tracks and models toxics transferred for offsite incineration and assigns the estimated population risk to the original source facility. The RSEI Score gives substantial insight into the impact of toxic releases, beyond the simple quantity of pounds released, by virtue of the modeling of toxicity and exposure. As a transparent and comprehensive integration of these essential components of risk, RSEI is a valuable tool for rapid assessment and public communication of risk from industrial toxic releases. The RSEI Geographic Microdata, available from US EPA (https://www.epa.gov/rsei/rsei-geographic-microdata-rsei-gm), provide access to concentrations, toxicity-weighted concentrations, and RSEI scores for every release for every individual 810 m by 810 m cell in the 50-km radius around each facility.

Comments

1. *RSEI-GM compared to 1-mile & 3-mile radii:*

   Comment in response to Section 6.3, Aggregate Average Characteristics of Communities with HFC Production Facilities.

   Concerning use of 1- and 3-mile radii for demographic assessment, the Risk Screening Environmental Indicators Geographic Microdata (RSEI-GM) opens new possibilities for geographic assessment, both in terms of the gross human health risk created by polluting facilities and in terms of the distribution of the health risk with respect to EJ populations. A key concept in the environmental justice literature is that the area of analysis should correspond to the areal distribution of possible harm. The draft RIA employs 1-mile and 3-mile radii for demographic assessment to address environmental-justice concerns. We tabulated the RSEI Geographic Microdata (which cover a 50-km, or 31.1 mile, radius) for the facilities identified in the draft RIA. We find that a 3-mile radius around each facility accounts for between 4.5% and 35.8% of the RSEI score; in all but two cases, the 3-mile radius accounts for less than 20% of the total RSEI score for the facility (see the column "Share of 50-km RSEI Air Score in 3-mi radius" in Table 1). The variation in coverage is caused by the physical and chemical properties of the releases and of the releasing facility, e.g., whether the release occurs through a stack or at ground-level. The small share of the full impact suggests that the 3-mile radius is not adequate to characterize the health risk generated by the facility for the surrounding population. Even at 10 miles, only 26% to 80% of the RSEI Score is included for the HFC-producing facilities. An

analysis of the outer edge of the 50-km radius suggests that while many releases still have some measurable impact at or beyond 50 kilometers, almost all of the total human health risk impact is captured within the 50-km radius.

Table 1: TRI Pounds and RSEI Score, by Medium

Facility	Air Pounds	Air Score	Share of 50-km RSEI Air Score in 3-mi radius	Water Pounds	Water Score	POTW Pounds	POTW Score
MDA Manufacturing Inc (Decatur, AL)	137,565	2,747	15.8%	0	0	0	0
Daikin America Inc (Decatur, AL)	169,339	1,956	15.8%	18,607	1	0	0
Chemours El Dorado (El Dorado, AR)	26,038	548	12.2%	0	0	0	0
Iofina Chemical Inc (Covington, KY)	20	399	12.2%	0	0	125	195
Chemours Louisville Plant (Louisville, KY)	657,191	2,314	30.1%	0	0	256	1,003
Arkema Inc (Calvert City, KY)	243,194	1,150	14.5%	896	12	0	0
Honeywell International Inc Geismar Plant (Carville, LA)	122,651	13,679	4.5%	4,722	79,973	0	0
Mexichem Fluor Inc (Saint Gabriel, LA)	22,593	204	4.5%	40	349	0	0
Chemours Chambers Works (Deepwater, NJ)	21,896	5,331	35.8%	532,865	9,112	0	0
The Chemours Co (Gregory, TX)	61,295	3,892	19.6%	0	0	0	0

Sources: Draft RIA, US EPA EJScreen, and tabulations from RSEI and RSEI-GM RY2019.
Notes: The pounds and scores include the full set of releases from the facility, including chemical releases that are not necessarily associated with the production of HFCs. The MDA Manufacturing facility in Decatur, AL, has the same FRS ID and address as the Daikin America facility, but has a distinct TRI ID and filed a separate TRI report. Only the Daikin America facility is reported in the RIA. The Iofina plant is referenced but not analyzed in the draft RIA. The 3M Cordova plant analyzed in the draft RIA is not an HFC producer according to https://www.regulations.gov/document/EPA-HQ-OAR-2021-0044-0046 Attachment 1.

2. *RSEI-GM as supplement to EJScreen for identification of communities and facilities of concern:*

Comment in response to Section 6.4 Characteristics of Communities with HFC Production Facilities by Facility.

An EJ analysis undertaken with the EJ shares of the RSEI Score can vary substantially from the results generated by the demographic analyses with the 1-mile and 3-mile radii. This difference is not surprising given the small fraction of the human health risk captured in the 1-mile and 3-mile radii. With large industrial facilities, a 1-mile radius may be substantially occupied by the facility itself, and the facility itself may be located in an industrial area. Thus, the 1-mile radius tends to have low population density, and the demographic composition of the 1-mile radius is often not representative of whether the facility has a substantial impact on EJ communities. The 1-mile radius may be a doughnut hole with respect to the affected population and its demographic composition. In the case of every HFC facility, even if the Black share of the population in the 1- or 3-mile radius or of the RSEI Score is not high, there are Census tracts in the area of RSEI impact that have a high Black population share.

Table 2: Environmental Justice Analysis of HFC-Producing Facilities

Facility	1-mi radius Black population share	3-mi radius Black population share	Black share RSEI Air Score	Nonwhite share RSEI Air Score
MDA Manufacturing Inc (Decatur, AL)	59%	39%	22%	38%
Daikin America Inc (Decatur, AL)	59%	39%	22%	38%
Chemours El Dorado (El Dorado, AR)	1%	1%	36%	43%
Iofina Chemical Inc (Covington, KY)	1%	2%	12%	21%
Chemours Louisville Plant (Louisville, KY)	37%	64%	38%	47%
Arkema Inc (Calvert City, KY)	0%	0%	3%	8%
Honeywell International Inc Geismar Plant (Carville, LA)	38%	34%	35%	44%
Mexichem Fluor Inc (Saint Gabriel, LA)	75%	42%	40%	49%
Chemours Chambers Works (Deepwater, NJ)	7%	20%	20%	35%
The Chemours Co (Gregory, TX)	2%	2%	3%	62%

Sources and Notes: See Table 1.

The RSEI-GM data also allow assessment of cumulative risk from multiple facilities. The HFC-producing facilities are generally located in industrialized parts of the country, and the individual HFC-producing facilities generally account for a small proportion of the total chronic

human health risk (RSEI Score) from all of the TRI facilities affecting the communities impacted by the HFC facilities. On a census-tract basis, the share of the RSEI Score accounted for by the HFC facilities never exceeds 12% of the RSEI score (rising to 16% if extreme values of the RSEI Score are trimmed). In most cases, many tens of facilities affect the same Census tracts that are affected by the HFC-producing facilities. In some cases the count of additional facilities affecting the same communities as the HFC-producing facility exceeds 100. Because HFC-producing facilities are located in areas with substantial cumulative impacts from other facilities, an integrative model such as RSEI can better identify cumulative impacts on communities of concern by capturing overlapping plumes where inward trade of HFC production permits may potentially increase HFC-related releases in areas with high existing cumulative impact.

3. *TRI to screen for additional HFC-producing facilities:*

   Comment in response to Section 6.2 Analysis of Potential EJ Concerns.

   The Toxics Release Inventory (TRI) can serve as a screening tool to identify other potential HFC producers that may not show up in the GHGRP screen. Applying the TRI data of the facilities identified in GHGRP can provide a "fingerprint" based on industrial classification and pollutant profile that can be used to identify other TRI facilities with similar classification and profile. After identifying potential producers based on the TRI profile, using multi-dimensional clustering algorithms, direct contact with facilities that are potential matches may identify additional producers. This approach may expand the number of facilities to which the rule pertains.

4. *Air and water monitoring for impact assessment:*

   Comment in response to the request in the preamble (Sec. III, p. 27159) for "comments on whether changes in emissions, particularly in communities that are already disproportionately affected by air pollution, could occur as the result of the HFC phasedown, the associated ability to transfer allowances, or other unrelated [sic] changes in the market."

   There is unquestionably a risk that increases in emissions in communities that are already disproportionately affected by air pollution could occur. This could happen as the result of changes in the location of continued HFC production under the rule, or as a result of conversion of production lines to substitutes for HFCs, or both. It is uncertain, however, what the actual impacts of the rule will be. For this reason we recommend installation of air quality monitors in proximity to all HFC-producing facilities, including monitors placed in all communities impacted by emissions from the facilities that already bear disproportionate cumulative air pollution burdens. Similarly, we recommend installation of water quality monitors, noting that the draft RIA (Table 6.4) reports substantial water releases of TRI-listed chemicals, too. We further recommend that data recorded by air and water quality monitors be made publicly available online in real time. These data can serve as a basis for remedial actions as needed, and as an input into 2023 rulemaking for the next stage of the HFC phasedown.

5. *Reporting requirement for production-line data:*

   Comment in response to one-time reporting requirements listed in the preamble (§ 84.31(b)(1)(v), p. 27218).

   We recommend that reporting of emissions at the production-line level be mandated as an annual requirement, rather than a one-time requirement, and that this requirement be extended to include not only HFC production lines but also HFC substitutes produced at the same facility or other facilities. This information is important for assessment of the dynamic effects of a rule or policy that encourages shifts in activity.

   We suggest the following guidelines for data collection:

   Require exact pound reporting rather than range reporting; audit facility reports; directly monitor source releases and receptor concentrations; and include data collection on facility-specific information to facilitate modeling.

   Require identification of releases by chemical species for those groups (which include species of several heavy metals, such as arsenic and chromium, as well as organic compounds such diisocyanates) for which current TRI reporting requirements allow group reporting: the toxicities of different species within the same group can vary by orders of magnitude. Data collection should include releases of pollutants not now included in the Toxics Release Inventory (such as the criteria pollutants: particulate matter, sulfur dioxide, nitrogen oxides, ozone, and carbon monoxide). Data analysis should expand to include products of chemical decay.

6. *EJ-sensitive allowance allocation and transfer provisions:*

   Comment in response to the request in the preamble (Sec. III, p. 27159) for "comment on whether there are remedies that could be applied as part of the design of the program in the event the Agency determines such unintended distributional impacts [on communities that are already disproportionately affected by air pollution] exist.

   We recommend that the Agency consider, both as an *ex post* remedy in the event that adverse distributional impacts are determined to exist and also as an *ex ante* preventive measure, restrictions on the allocation of allowances (including purchases at auction, if/when allowances are distributed in this way) and subsequent transfers of allowances. These restrictions would limit the quantity of allowances available to facilities whose emissions are determined to have significant impacts on communities that bear disproportionate cumulative pollution burdens. Minimally, the restrictions should mandate that production of HFCs and any attendant releases of co-pollutants from such facilities shall not exceed the overall HFC production limit set by phasedown policy (e.g., 90% of the baseline level in the first stage and 60% in 2024). Further and more stringent reductions at specific facilities could be mandated in cases where strongly adverse impacts are determined to exist.[2]

[2] For an analysis of the economic and environmental effects of such mandates in decarbonization policies for the electricity sector, see Bridget Diana, Michael Ash and James K. Boyce, *Green for All: Integrating Air Quality and Environmental Justice into the Clean Energy Transition*. Amherst, MA: Political Economy Research Institute, University of Massachusetts Amherst, March 2021.

As a corollary, we strongly endorse implementation of allowance allocation and transfer tracking at the facility level rather than the firm level. The preamble (Sec. XI, p. 27204, point 2) mentions this as a possible approach for future rulemaking. We recommend that instead it be implemented from the outset. We note that the additional administrative burden, if any, will be very modest since the number of facilities impacted by the rule is small.

Adjustments to "transfer offsets" are another option mentioned in the preamble (Sec. XI, p. 27204, point 1). This would be akin to differential trading ratios in a zonal permit system. But the extent of adjustment that would be necessary to remedy or prevent adverse EJ impacts is uncertain. Asymmetric trading restrictions that prohibit allowance transfers from elsewhere to facilities of EJ concern would be a more straightforward and surer way to address this problem. We note that southern California's Regional Clean Air Incentives Market (RECLAIM) for NO_x and SO_x successfully implemented such an asymmetric system, prohibiting allowance transfers (and hence migration of emissions) from the inland zone to the coastal zone.[3]

[3] See Lata Gangadharan, "Analysis of prices in tradable emission markets: an empirical study of the Regional Clean Air Incentives Market in Los Angeles," *Applied Economics* 36, 2004.