Air Resources Board
California Environmental Protection Agency
1001 I Street, PO Box 2815
Sacramento, CA 95812

EIA Comments on HFC Measures in the Proposed Short Lived Climate Pollutant Reduction Strategy

January 17, 2017

Dear Chairwoman Nichols,

The Environmental Investigation Agency (EIA) appreciates the opportunity to comment on the Revised Proposed Short Lived Climate Pollutant Reduction Strategy (hereafter "the SLCP Strategy") released in November 2016. In addition to supporting efforts to phase down hydrofluorocarbons (HFCs) under the Montreal Protocol, EIA has worked domestically in the U.S., EU, Canada, China and India to promote policies focused on phasing down domestic consumption of HFCs and incentivizing transitions to low-global warming potential (GWP) and energy efficient technologies.

California has an opportunity to advance measures on reducing HFCs beyond any other jurisdiction to date and to continue its role as a global climate leader. EIA supports the California Air Resources Board (CARB) in this Proposed SLCP Strategy and urges the Board to vote to approve the strategy to be able to adopt rules and regulations on HFCs. Timely adoption is critical in order to meet 2030 emission reduction targets and achieve near term climate mitigation. California's efforts to mitigate HFC emissions will ensure strong implementation and acceleration of the global HFC phase-down efforts under the Kigali Amendment to the Montreal Protocol. As a substantial portion of the U.S. market demand for HFCs, California can drive broader change across the U.S. market and demonstrate by example that further policy measures are needed and feasible at the federal level

EIA presents the following comments regarding urgent formulation of rules to implement HFC measures within the scope of the SLCP Strategy:

Kigali Amendment Implications for California HFC Strategy

Strong domestic policy actions will be fundamental to effective implementation and enforcement of the recently agreed upon global HFC phase-down under the Kigali Amendment to the Montreal Protocol (Kigali Amendment). Through effective implementation and acceleration, this landmark climate agreement may avoid up to 100 billion metric tons of CO_2 equivalent and

almost half a degree Celsius warming by 2100.[1] Policy instruments proposed by CARB in the SLCP Strategy, such as strong bans on HFC refrigerants and refrigeration equipment above a GWP threshold of 150 can continue to follow the example set by the EU F-Gas Regulation and lead the way for U.S. policy to implement and accelerate HFC reductions under the global phase-down.

It is important to note that CARB's mandate under SB 1383 to achieve emission reductions of 40% below 2013 levels by 2030, will not be met by adhering solely to the Kigali phase-down commitments and additional HFC measures under the SLCP Strategy will be necessary. Under the Kigali Amendment phase-down schedule, developed countries including the United States will commit to reducing *consumption* of HFCs by 40% in 2024 and 70% in 2029.[2] However, a reduction in HFC *consumption* could take years to result in significant emissions reductions given the long lifetimes of existing equipment using HFCs (the installed base) and the continued use of recycled HFCs. Many large commercial and industrial refrigeration and air conditioning systems that have the longest average lifetimes of up to 20 to 50 years, consume the largest quantity of HFCs, and also tend to have the some of the highest leak rates.[3]

Thus, bans on the sale of new systems must go into effect many years ahead of reaching emission goals. It is vital that CARB begin the process of writing new regulations to take effect as soon as feasible in order to achieve needed reductions by 2030. There is no reason to wait since the alternatives to HFCs in many of the refrigeration and air conditioning uses to be targeted by CARB's proposed measures are both available now and energy efficient.

The Importance of Accelerating Beyond Global and Federal Actions on HFCs

Under the current U.S. policies, many refrigeration and air conditioning applications will be legally permitted to transition new systems and equipment to using mid-range-GWP HFCs (such as HFC-32) and HFC-HFO blends.[4] While somewhat less harmful to the climate than their predecessors, these transitional refrigerants still have GWPs hundreds and thousands of times more potent than carbon dioxide. Transitioning to these alternatives in new equipment would slow the uptake of truly low-GWP alternatives and lead to a potential second costly phase-out of another wave of transitional refrigerants.

HFC measures under the SLCP Strategy can play an important role in accelerating direct uptake of the most climate friendly and energy efficient alternatives available. With a strong mandate to reduce HFC emissions, CARB has authority to set GWP thresholds low enough to restrict the use of these high-GWP transitional chemicals from being used and to require new equipment to be designed to limit the use of mid-range-GWP HFCs and HFC-HFO blends to only

[1] White House Fact Sheet: https://www.whitehouse.gov/the-press-office/2016/10/15/fact-sheet-nearly-200-countries-reach-global-deal-phase-down-potent

[2] Kigali Amendment text available at: http://conf.montreal-protocol.org/meeting/mop/mop-28/final-report/English/Kigali_Amendment-English.pdf

[3] Supermarket systems containing 4,000 pounds of HFC refrigerant have been found to have a 25% average leak rate. See EPA, https://www.epa.gov/sites/production/files/documents/GChill_Retrofit.pdf

[4] See EPA SNAP Notices 29-31 for recent listing of R-448A, R-449A, R-513A, and R-450A. Available at: https://www.epa.gov/snap/snap-regulations#notices

retrofitting old equipment to expedite the transition away from truly high-GWP HFCs as soon as feasible.

CARB's proposed measures on HFCs represent a significant step beyond current federal policies and regulations, and have already sent some strong signals to the market in support of expanding the use of low-GWP alternatives. For example, in the past two years since releasing the first draft SLCP Strategy, a greater number of food retailers are piloting and installing transcritical CO_2 supermarket systems and low-GWP standalone refrigeration cases using propane in the state of California.[5] The ambition and clarity in CARB's proposed measures have helped encourage market leaders at the forefront of implementing this trend.

Early Refrigerant and Equipment Bans

CARB should continue to look at dates at minimum consistent with those contained in the EU F-Gas Regulation, for timing refrigerant and equipment bans. In certain sectors the market readiness is higher, making it feasible for CARB to even more ambitious.

Stationary non-residential refrigeration, where alternatives are already widely available for most uses should be targeted for early bans to take effect in 2021-2022. With rapid advances in secondary loop and cascade systems using a small primary charge of propane or ammonia on the roof with CO_2 as the secondary refrigerant, CARB should continue to re-evaluate the need for any exception to continue allowing the use HFCs in central charges for refrigeration.

EIA also reiterates comments made on the previous draft SLCP Strategy in support of re-evaluating the 750 GWP threshold for equipment bans in stationary air conditioning. As outlined in previous comments and in the table below, given the rapid developments in specific applications, such as chillers, certain equipment classes may warrant being separated into more targeted bans where a lower GWP threshold is feasible.

A ban on the sale of virgin HFC refrigerant will also accelerate the pace of the transition to lower-GWP systems by reducing supply and forcing a market choice between servicing equipment using reclaimed and recycled refrigerant or retrofitting/replacing existing equipment. An initial ban on HFCs with GWP greater than 2500 will predominantly impact refrigeration sectors where federal rules under the Significant New Alternatives Policy (SNAP) Program have already banned the use of substances in new equipment such as R-404A, and R-507A. A subsequent ban on refrigerants with a GWP greater than 1000 will encompass use of additional high-GWP HFCs such as HFC-410A and HFC-134a, which are also scheduled for phase-out under SNAP rules in chiller applications in 2024.

[5] See Accelerate America, October 2016, P 28. Whole Foods alone has opened four Transcritical CO2 stores in the state of California since 2014. Available at: http://publication.shecco.com/upload/file/org/5807a82e7ba361476896814TerAt.pdf See also: Target Hits a Bullseye for Climate-Friendly Refrigeration in the U.S.: https://eia-global.org/blog-posts/target-hits-a-bullseye-for-climate-friendly-refrigeration-in-the-us

Recommended Refrigerant Bans:

GWP Threshold	Effective Date
2500 or greater	January 1, 2022
1000 or greater	January 1, 2025

Recommended Equipment Bans:

Sector	GWP Threshold*	Effective Date
Stationary residential refrigeration	10 or greater	January 1, 2021
Stationary non-residential refrigeration	10 or greater	January 1, 2022
Stationary air conditioning: Chillers	10 or greater	January 1, 2024
Stationary air conditioning: Self-contained room AC	10 or greater	January 1, 2024
Stationary air conditioning: Multi-split and unitary	10 or greater	January 1, 2027

*GWP threshold of 10 reflects the availability of alternatives with near zero GWPs. A 150 GWP threshold consistent with the EU F-Gas Regulation would accomplish a substantially similar market outcome.

Financial Incentives for Low-GWP Refrigerants and Energy Efficiency

In October 2015, California enacted SB 350, calling on state agencies and utilities to work together to double cumulative efficiency savings by 2030. An opportunity exists to use financial incentives to achieve California's legislative goals on both HFCs and energy efficiency. Refrigeration and air conditioning (RAC) equipment is a major consumer of electricity, but low-GWP refrigerants used in the new generation of RAC equipment to replace HFCs such as hydrocarbons, CO_2, and ammonia can yield efficiency improvements of between 10 to 35 percent over existing RAC systems using HCFC and HFC refrigerants.[6] Financial incentives have been proven effective for encouraging the transition to low-GWP technologies. CARB should create an incentive program to reward end users for purchasing and installing new commercial RAC equipment using low-GWP and more energy efficient refrigerants.

Incentives should also be extended to consumers for purchasing low-GWP domestic refrigerators using hydrocarbons, which are emerging as the market replacement for HFC-134a.[7] Additional household rebate incentives should be extended to new energy efficient appliance models using HFC-free refrigerants.

[6] See EIA, Putting the Freeze on HFCS, available at https://eia-global.org/reports/putting-the-freeze-on-hfcs ; See also Cool Technologies, Efficiency Comparisons between fluorocarbons and hydrocarbons, http://www.cooltechnologies.org/content/efficiency-comparisons-between-hydrocarbons-and-fluorocarbons

[7] Press Release, Samsung Earns Energy Star Emerging Technologies Award for 20 refrigeration models in 2017, accessed 1/17/17 at https://news.samsung.com/global/samsung-earns-energy-star-emerging-technology-award-for-20-refrigeration-models-in-2017

In addition to allocating funds to implement an incentive program directly, EIA urges CARB to work jointly with the California Public Utilities Commission (CPUC), the California Energy Commission (CEC) and private utilities to identify opportunities under existing or new programs such as those under the Electric Program Investment Charge (EPIC)[8] to provide additional incentives for use of equipment employing low-GWP refrigerants based on their contribution to reducing electricity demand.

Potential Incentive Programs:

Sector	Applications	Form of Incentive	Efficiency Benefits Applicable to Utility Programs
Commercial Refrigeration	Supermarkets, Convenience Stores, Food Retail and Restaurants	Competitive Grant Program	Yes
Domestic Refrigeration	Household refrigerators and freezers	Utility Rebate	Yes

Continued Engagement on Research and Standards Development

California continues to demonstrate leadership on standards for safe use of alternative refrigerants by funding additional research and testing through a solicitation administered under the California Energy Commission (CEC) EPIC Program. CARB's commitment to actively engaging with industry standard groups and other stakeholders in the standards development process remains essential to achieving transparent, technology neutral, and timely movement to overcome any technical hurdles remaining in the standards process.[9] CARB should continue this proactive engagement through participation in the newly formed UL 484 task group on hydrocarbon refrigerants in room air conditioners and by participating in information sharing toward processes initiated under the Montreal Protocol for regular consultations on national, regional, and international safety standards.[10]

[8] http://www.energy.ca.gov/research/epic/

[9] EIA, The Need for Smarter Standards and Codes in Cooling, 2016. Available at: https://eia-global.org/reports/the-need-for-smarter-standards-and-codes-in-cooling

[10] Report of the Twenty Eighth Meeting of the Parties to the Montreal Protocol, P 36-37. Available at: http://conf.montreal-protocol.org/meeting/mop/mop-28/final-report/English/MOP-28-12E.pdf

Conclusions

EIA commends CARB for creating a strong and achievable strategy to significantly curb use and emissions of HFCs. To summarize our main points and recommendations going forward for implementation:

- Adopt rules for early measures to meet 2030 emission reduction goals, such as immediate equipment bans targeted at stationary refrigeration sectors where equipment is available.
- Equipment bans must encourage a direct transition to the lowest-GWP threshold feasible in new equipment, while retrofits to transitional refrigerants may be permitted.
- Re-evaluate 750 GWP threshold for the ban on stationary air conditioning equipment and pursue targeted bans at a lower GWP threshold for applications where alternatives are available.
- Incentives for installing energy efficient low-GWP equipment will be pivotal to accelerating technology adoption.
- Expand incentives to additional applications such as domestic refrigeration, including through partnership with other agencies and utilities to implement energy efficiency rebate programs for HFC-free appliances.
- Continue leadership and engagement with relevant standards setting organizations nationally as well as regionally and internationally.

We look forward to continued dialogue with CARB on ways to further enhance the strategy and to ensure that this plan begins to be implemented into law in 2017.

Sincerely,

The Environmental Investigation Agency

Contact:
Christina Starr
Climate Policy Analyst
Environmental Investigation Agency
Phone: +1 202 483 6621 | cstarr@eia-global.org

Avipsa Mahapatra
Climate Campaign Lead
Environmental Investigation Agency
Phone: +1 202 483 6621 | amahapatra@eia-global.org