

Air Resources Board
California Environmental Protection Agency
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EIA Comments on ARB’s Rulemaking Proposal and Workshop on Reducing Emissions of Hydrofluorocarbons (HFCs)

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Attn: Glenn Gallagher, Pamela Gupta

The Environmental Investigation Agency (EIA) appreciates the opportunity to comment on the California Air Resources Board (ARB) proposal for Draft Regulatory Language and future measures under the Short Lived Climate Pollutant (SLCP) strategy to reduce emissions of hydrofluorocarbons (HFC). EIA supports ARB in the two-stage rulemaking strategy and has some substantive comments on the scope of the Draft Regulatory Language for the first rulemaking. More importantly, we stress the urgency and feasibility of taking timely and ambitious actions beyond the first rulemaking in order to meet 2030 emission reduction targets.

Comments on Proposed Rulemaking

EIA supports the Draft Regulatory Language as a reasonable foundational step to ensure that the current U.S. market transition away from the highest-global warming potential (GWP) HFCs continues. Putting prohibitions in place at the state level that mirror those under the Environmental Protection Agency’s (EPA) Significant New Alternatives Policy (SNAP) Program will help provide much needed certainty to the market, which has already invested in transitioning away from these substances. The timelines for effective dates of the prohibitions under the SNAP Program rules range from already-in-effect to 2024.

In the stationary retail refrigeration sector in particular, retailers have already met or made plans to meet SNAP rule requirements for using alternatives to HFC-404A, HFC-507A, and HFC-134a in various central and standalone equipment. Retail giants that are part of the Consumer Goods Forum have already committed to go well beyond the SNAP rules, and committed voluntarily to using alternatives with a GWP below 150, consistent with ARB’s plan for a stationary refrigeration equipment ban in the second stage rulemaking.¹ ARB should move quickly to put existing SNAP measures in place and concurrently begin holding sectoral workshops on proposed measures to meet 2030 emission reduction targets.

With regard to the scope of the first proposed rulemaking, EIA urges ARB to examine the best means of covering all end-uses within the scope of existing SNAP rules in either the current proposed rulemaking or the second stage rulemaking to be finalized by the end of 2019. A

¹ See Consumer Goods Forum Refrigeration Resolution (October 2016), available at <http://www.theconsumergoodsforum.com/sustainability-strategic-focus/sustainability-resolutions/refrigeration-resolution>

substantial reduction in emissions from the motor vehicle air conditioning (MVAC) sector for passenger vehicles will also need to be achieved in order to meet 2030 emission reduction goals. The light-duty MVAC sector constituted 19% of California’s HFC emissions by end-use sector in 2016, making it the second largest source of emissions by end-use behind retail food refrigeration.² The 2021 SNAP deadline to transition away from HFC-134a in light duty passenger vehicles is highly feasible. HFC-134a has been banned in Europe since the beginning of 2017, with several European car manufacturers including Daimler, manufacturer of Mercedes-Benz having selected R-744, a non-flammable natural substance with a GWP of 1, to meet the European F-Gas regulation.³ R-744 also has particular design and efficiency advantages in hybrid and electric vehicles, which allows use of a hermetic electric compressor and was shown to be more efficient than HFC-134a in tests conducted by Toyota.⁴

Recommendations for Additional Measures Needed to Meet 2030 Emission Goals

EIA strongly agrees with the conclusions of ARB’s initial model assessment that additional measures are required to meet the ambitious 2030 emission reduction goals under SB 1383. EIA urges ARB to prioritize the stage 2 rulemaking process and move forward urgently with considering additional measures to further curb HFC emissions. As ARB notes in the assessment of the impact of the Kigali Amendment on emissions in California, there is a long time lag between a reduction in consumption of HFCs and a corresponding reduction in emissions. This time lag makes achieving a 40% reduction in emissions by 2030 challenging. EIA believes this will require tackling both a reduction in consumption of virgin HFCs in new equipment, as well as measures to increase the recovery and proper disposal of the so-called refrigerant ‘bank’.

EIA therefore recommends a two-pronged approach to achieving the rapid emission reductions that will be needed to achieve a 40% reduction by 2030, through measures that i) reduce consumption in new equipment through bans and financial incentives and ii) additional measures to control emissions of HFC refrigerants in the existing ‘bank’ through recovery and destruction:

- i) Reduction of HFC consumption in new equipment through equipment bans and financial incentives*

ARB should prioritize putting in place equipment bans and corresponding financial incentives that will accelerate the market transition to very low-GWP refrigerants in new equipment. The technologies using very low-GWP refrigerants exist for nearly every end-use and are as or more energy efficient than existing HFC technologies, but face barriers to widespread and rapid uptake

² CARB GHG Inventory 2016, as cited in CARB Kigali Amendment Reductions Methodology Final Draft (15-October-2017)

³ Daimler: <https://www.daimler.com/sustainability/product/further-environmental-technologies/co2-air-conditioning-system.html>; See also Volkswagen Group: <http://www.volkswagengroupus.ru/en/press/news/volkswagen-to-use-co2-as-future-refrigerant-for-air-conditioning-systems/>

⁴ http://www.sae.org/events/aars/2002/inui_toyota.pdf

due to lacking economies of scale or needed updates to standards and codes (in the case of flammable alternatives only).

The timing of equipment bans in order to achieve emission reductions by 2030 should be no later than 2021. In this instance, low-GWP should be defined as no higher than 150. Any allowances for continued use of refrigerants with a higher-GWP should be clearly defined as ‘medium’ GWP and ‘transitional’ solutions. By clearly defining the end goal in terms of GWP, ARB will encourage a more efficient and cost-effective transition to the lowest-GWP technology, rather than a more prolonged and costly process of multiple conversions to equipment using HFCs or HFC blends with GWPs ranging from 600 to 1,400. While allowing end-users to retrofit existing equipment to transitional medium GWP refrigerants, bans on HFCs in new equipment must target the lowest feasible GWP threshold in order to maximize emission reductions. The retrofitting of existing equipment is likely to be highly incentivized by the more gradual consumption phase-down schedule under the Kigali Amendment, while CARB’s equipment bans will be more effective at accelerating HFC consumption in new equipment.

Incentives are another important area for ARB to prioritize. EIA strongly supports the use of funds from the Greenhouse Gas Reduction Fund (GGRF) in order to create a dedicated incentives program for low-GWP refrigerant technologies. Incentives will help achieve much faster emission reductions than other measures alone, by covering incremental costs of low-GWP technologies and helping create economies of scale for manufacturing of these alternatives. Such a program would be designed to compliment existing efforts to generate incentives to reward the energy efficiency co-benefits of low-GWP refrigerant technologies. For example, incentives for installing a transcritical CO₂ supermarket system with efficiency boosting technologies could be paired with the ‘Savings by Design’⁵ utility incentives currently available to reward the efficiency aspects of the new system. Household incentives for efficient appliances under the “Energy Upgrade California” program⁶ could be paired with an incentives for purchasing a domestic refrigerator using low-GWP energy efficient hydrocarbon refrigerant and implemented via an existing GGRF program to target low-income households.⁷

ii) Additional measures to control emissions from refrigerant ‘banks’

Many of the measures currently under consideration by ARB including equipment bans and refrigerant bans, are designed to reduce future consumption of HFCs. Additional measures to address the existing bank of HFCs already in use is an important area for ARB to examine. Such measures would help overcome the so-called ‘inertia of the installed base’ and achieve more rapid emission reductions to meet 2030 targets.

The refrigerant bank can be defined as the total amount of substances contained in existing equipment, chemical stockpiles, and other products not yet released into the atmosphere.⁸ It is therefore similar to but not exactly corresponding to what is often referred to as the ‘installed base’

⁵ <https://energy.gov/eere/femp/energy-incentive-programs-california>

⁶ <https://www.energyupgradeca.org/home-energy-efficiency/rebates-incentives/>

⁷ Low-Income Weatherization Program, <http://www.csd.ca.gov/liwp.aspx>

⁸ IPCC/TEAP, 2005.

as is includes both equipment and stockpiles. According to a new report, the global bank of ODS and HFCs is currently just below 15Gt CO₂ equivalent, with HFCs making up a rapidly growing percentage of the bank.⁹ Unfortunately, little has been done to fully address the issue of high-GWP refrigerant banks under the Montreal Protocol, making this an area where California's leadership could be transformative on the global stage.

There are a number of potential policy strategies to reduce emissions from stockpiles and the installed base, which focus mainly on increasing recovery and destruction. These strategies include some that are already in place under California's existing Refrigerant Management Program, such as reporting and periodic leak inspections. Additional measures to increase the rate of recovery and destruction of HFCs that may be considered are:

- Refrigerant bans on the sale of high-GWP HFCs such as those already being considered by CARB under the SLCP strategy
- A fee/rebate scheme covering high-GWP refrigerants to encourage higher rates of recovery and destruction
- Requirements for mandatory recovery and destruction of high-GWP HFCs in priority sectors and end-uses

EIA recommends as a first step, that ARB undertake an initial assessment of the current and projected recoverable HFC refrigerant banks in California's various refrigeration and air conditioning sectors. Such an assessment should examine the feasibility and cost-effectiveness of various additional measures designed to increase recovery and destruction. Based on the outcome of this study and stakeholder feedback, ARB should include additional measures under the SLCP strategy to address this issue.

Conclusions

EIA commends ARB on initiating a multi-stage rulemaking process to reduce HFC emissions. Our recommendations include rapid adoption of the current proposal to enact existing federal SNAP rules followed by concurrent prioritization of additional measures in the second stage rulemaking. ARB should ensure the significant portion of MVAC sector emissions from light duty vehicles are addressed in either the first or second stage rulemaking. Additional measures included in the second stage rulemaking should include equipment bans, incentives, and one or more measures to address emissions from refrigerant banks.

Sincerely,

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⁹ See GIZ 2017, Global roadmap on ODS bank management, available at <https://www.giz.de/expertise/html/4809.html>