

April 18th, 2016



Comments of the Environmental Investigation Agency (EIA) on the Proposed Amendments to the Regulation for Small Containers of Automotive Refrigerant

The Environmental Investigation Agency (EIA) appreciates this opportunity to comment on the Air Resources Board (ARB) “Staff Report: Initial Statement of Reasons” regarding “Proposed Amendments to the Regulation for Small Containers of Automotive Refrigerant” released on March 1, 2016 (“the Proposal”). The Proposal introduces several amendments to the Regulation for Small Containers of Automotive Refrigerant (“the Regulation”) which EIA strongly supports. Additionally, below we cite potential examples for the effective implementation of the proposed amendments.

EIA has been closely involved in international ozone and climate negotiations for more than two decades. 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 the promulgation of regulations focused on phasing-down HFCs and incentivizing transitions to energy efficient, low-GWP alternatives to HFCs and ozone depleting substances.

EIA is particularly supportive of the proposed amendments to expand the scope of the Regulation to allow funds to be spent by manufacturers on “other greenhouse gas reduction programs, projects or measures, as directed by ARB.” Outlined below are some additional education measures and projects to support research, evaluation, and promotion of low-GWP refrigerants that would have significant impacts toward avoiding greenhouse gas emissions in the motor vehicle air conditioning (MVAC) sector and can also support refrigerant emission reductions from other air conditioning and refrigeration sectors. These include expanded research to support the updating of U.S. standards and codes, as well as enhanced education to avoid incorrect use of HFC-134a to recharge new low-GWP MVAC systems, to enable a smooth transition for “do-it-yourself” (DIY) air-conditioning repairs and servicing to low-GWP refrigerants. Such projects would support implementation of the other greenhouse gas reduction measures for HFCs contained in ARB’s Proposed Short Lived Climate Pollutant (SLCP) Strategy that was released on April 11, 2016.

Impacts of the Current Regulation on Greenhouse Gas Reductions

It appears that although the Regulation has resulted in a lower than expected volume of recycled refrigerant from returned cans due to introduction of the self-sealing valves, that the Regulation is still having significant impacts on reducing emissions. As the Proposal notes, a 40% reduction in the sales of small cans of automotive refrigerant occurred from 2007 to 2015 during which time annual sales decreased from 1.92 million to 1.1 million.¹ While this decrease of 820,000 small containers annually may be in part attributable to improved leak-resistance of MVAC systems, given such a steep rate of reduction over such a short period that coincides with implementation of the Regulation, the majority of this reduction is likely a direct result of the

¹ The Proposal, Page 4.

Regulation. The reduction in use is likely driven primarily by a change in consumer behavior, caused by the self-sealing valves allowing for increased multiple re-use of automotive refrigerant contained in small cans and added up-front costs of the \$10 deposit reducing the savings from DIY air conditioning repairs.

Additional Programs, Projects and Measures to Reduce HFC-Refrigerant Emissions

EIA has identified two areas, outlined in more detail below, where unclaimed funds from the deposit-refund scheme could be allocated in order to achieve further greenhouse gas emissions reductions from refrigerants in the automotive sector and in several key stationary air conditioning and refrigeration applications.

A. Additional Consumer Education to Avoid Incorrect Recharging of New Low-GWP MVAC Systems with HFC-134a:

ARB should consider quickly implementing additional consumer education programs providing information on the different technical, environmental, and safety issues when using low-GWP refrigerants which may include both HFO-1234yf and carbon dioxide (CO₂ or R-744) instead of HFC-134a. While the deadline under the U.S. EPA Significant New Alternatives Policy (SNAP) program does not require car manufacturers to transition away from HFC-134a until model year (MY) 2021, millions of cars are already using HFO-1234yf² and other car manufacturers are signaling that they plan to introduce models using CO₂ (R-744) by 2017.³ One report states that there are already 7 million cars on the road using HFO-1234yf, with about half of those in the United States.⁴

ARB should quickly implement programs to educate consumers and “do-it-yourself” car owners in particular on best practices for servicing cars with these new refrigerants, warning them not to recharge systems using HFO-1234yf or R-744 with R-134a. Such incorrect recharging could threaten the performance and fuel efficiency and also cancel out the direct emissions reductions of transitioning car models to use of low-GWP refrigerants. Additionally, R-744 systems are anticipated to operate under higher pressures than HFC-134a systems so special equipment may be necessary to perform repairs on these new systems.

It is likely that implementation of such education programs would require minimal additional resources as they could be added to supplement the existing enhanced educational programs by placing additional posters at retail automobile sales and service locations displaying information about the transition to low-GWP refrigerants and accompanied by prominent warning signs to communicate the importance of using the correct refrigerant when self-servicing an automobile air conditioner.

² MACS: Nine vehicle models will use R-1234yf this year, By Elliot Maras, Jan 23, 2014. Available at: <http://www.vehicleservicepros.com/news/11298838/macs-nine-vehicle-models-that-will-use-r-1234yf-this-year>

³ R744.com, Mercedes commits to CO₂ MAC from 2017. Available at <http://www.r744.com/articles/6709/mercedes-commits-to-co-sub-2-sub-mac-from-2017>

⁴ Seidel, Ye, and Andersen, Technological Change in the Production Center under the Montreal Protocol, October 17, 2015. Available at: <http://www.c2es.org/publications/technological-change-production-sector-under-montreal-protocol>

B. Investment in Research to Demonstrate the Safety of Low-GWP Refrigerants and Support Evidence-based Updates to Charge Size Thresholds in Standards and Codes:

It is now widely recognized that there is an urgent need to update standards and codes, which stand as the biggest impediment to U.S. market penetration of low-GWP and HFC-free technologies already widely in use in other major markets, such as the EU and China. Funds from this small cans program would be well spent if directed to projects that support additional research and testing to demonstrate the safety of low-GWP refrigerants, particularly with a focus on factors affecting charge size thresholds for hydrocarbons and other low-GWP natural refrigerants for both air conditioning and refrigeration. While significant funding has been made available to test many synthetic alternatives, there has been a severe lack of resources allocated in the U.S. to support research and evaluation of natural low-GWP refrigerants. Additional funding for research in this area would contribute to an evidence-based approach for adopting updated UL and ASHRAE safety standards and building codes.

Projects supporting such research would greatly amplify the impact of and support implementation of measures to reduce HFC emissions under ARB's proposed Short-Lived Climate Pollution Reduction Strategy ("the Proposed SLCP Strategy"). The Proposed SLCP Strategy includes measures such as bans on the sale and distribution of high-GWP refrigerants beginning in 2020 and bans on most new stationary air conditioning and refrigeration equipment using HFCs above certain GWP limits or thresholds.

ARB's discussion in the Proposed SLCP Strategy on the availability of low-GWP alternatives in new equipment once bans on high-GWP HFCs go into effect notes the following:

Current fire and appliance codes do not allow the use of hydrocarbon refrigerants, which are flammable, unless the system is below a small charge size threshold of 150 grams for commercial refrigerators, and 57 grams for household refrigerators. Experience in Europe and other jurisdictions demonstrates that these codes can be designed to allow for the use of these refrigerants while ensuring safety, where current limits are 150 grams for household refrigerators and up to 1.5 kg for commercial uses.⁵

As this discussion above suggests, there are a number of low-GWP alternatives to HFCs that are available in other jurisdictions outside the United States, but have been prevented from entering the U.S. markets due to outdated standards and codes promulgated primarily by the Underwriters Laboratory (UL), which is the most widely recognized standards setting body here in the U.S.

An important aspect of this research for the purposes of the small can program is that it is inherently scalable. Projects could be awarded through an RFP process to fund research, surveys, and/or testing on a variety of scales depending on availability of funds. Several examples are given below of types of equipment covered under ARB's Proposed SLCP Strategy where additional research is needed to examine various aspects of low-GWP refrigerant safety, including leak rate testing, installation heights, use of shut-off valves, and other safety mechanisms. Additional research, ideally leading to publication in peer reviewed journals, would

⁵ Air Resources Board, Proposed SLCP Strategy, (April 11, 2016). See Page 89.

help inform technical experts participating in standard setting panels and other relevant decision makers to enable them to take an evidence-based approach to re-assessing allowable charge sizes for flammable refrigerants, including hydrocarbons. Project areas that require additional research focus include:

Room air conditioning:

Room air conditioners using low-GWP refrigerants are manufactured and sold in a number of countries outside the United States and allowed under the federal EPA SNAP program, however are severely limited due to small charge sizes allowed under the U.S. standard, UL484. Testing and research to support the commercialization of low-GWP room air conditioning technologies is needed, in particular focused on demonstrating the safety of low-GWP A2 and A3 refrigerants in window and single-split air conditioners. This research would support ongoing work to advance future proposals by IEC TC61D Working Group 16⁶ and subsequent charge sizes adopted under UL 60335-2-40 which will replace UL484 as of 2018.

Domestic/Residential refrigeration:

Currently, most of the approximately 150 million domestic refrigerators in the U.S.⁷ use HFC-134a with a GWP of 1,430. In the vast majority of countries around the world, including the EU, Japan, China and elsewhere, low-GWP hydrocarbon refrigerants are the norm for this sector, with over 700 million HFC-free refrigerants operating on the market.⁸ This difference is due to smaller allowable charge sizes in the U.S. under UL250 which limits hydrocarbon charge sizes to 57 grams compared to the internationally recognized IEC standard, which allows 150 grams of hydrocarbons. Voluntary goals set by the U.S. home appliance industry in 2024 are 3 years behind date of 2021 in ARB's Proposed SLCP Strategy for banning HFCs with GWPs >150 in domestic refrigerators. These measures will face significant implementation challenges unless U.S. standards for hydrocarbon (isobutene, propane and blends) charge sizes in domestic refrigerators are increased. A project to fund research to establish safe charge sizes for residential refrigerators using hydrocarbons based upon current technologies, science, safety devices and warnings would support an accelerated process of updating standards to expand charge sizes to allow a transition from HFC-134a to low-GWP refrigerants.

Conclusions

Thank you for this opportunity to provide feedback on the Regulation for Small Containers of Automotive Refrigerants and the Proposal for amending the Regulation that EIA strongly supports. We hope our comments provide useful context and information on the promise for using some of the funds retained by manufacturers from the deposit-refund scheme for projects to achieve even greater emission reductions for the State of California and support the Proposed SLCP Strategy to reduce HFC emissions in other air conditioning and refrigeration sectors.

⁶ http://www.iec.ch/dyn/www/f?p=103:14:0:::FSP_ORG_ID,FSP_LANG_ID:12590,25.

⁷ U.S Department of Energy, Refrigerator Market Profile, 2009.
http://apps1.eere.energy.gov/states/pdfs/ref_market_profile.pdf.

⁸ US, Canadian home appliance industry to phase down HFC refrigerants,
http://www.hydrocarbons21.com/articles/6879/us_canadian_home_appliance_industry_to_phase_down_hfc_refrigerants.

Respectfully Submitted,

The Environmental Investigation Agency

Contact:

Lisa Handy, Senior Policy Advisor, lisahandy@eia-global.org

Mark Roberts, Senior Counsel and International Policy Advisor, markroberts@eia-global.org

Christina Starr, Climate Policy Analyst, cstarr@eia-global.org

P.O. Box 53343

Washington, DC 20009

www.eia-global.org