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May 26, 2016

Mr. Richard Corey  
Executive Officer  
California Air Resources  
1001 I Street  
Sacramento, CA 95814

RE: AHRI Comments on California Air Resources Board Proposed Short Lived Climate  
Pollutants Reduction Strategy

Dear Mr. Corey,

These comments are submitted by the Air-Conditioning, Heating and Refrigeration Institute (AHRI) in response to the California Air Resources Board (ARB) proposed short-lived climate pollutants (SLCP) reduction strategy.

AHRI is the trade association representing manufacturers of heating, cooling, water heating, and commercial refrigeration equipment. More than 300 members strong, AHRI is an internationally recognized advocate for the industry, and develops standards for and certifies the performance of many of the products manufactured by our members. In North America, the annual output of the HVACR industry is more than \$20 billion. In the United States alone, our members employ approximately 130,000 people, and support some 800,000 dealers and contractors.

AHRI and its members have been strong proponents of measures that reduce emissions of high Global Warming Potential (GWP) refrigerants. We supported ARB when it strengthened its regulations on the management of high GWP refrigerants several years ago. More recently, we supported the U.S. Environmental Protection Agency (EPA) when it proposed extending the provisions of Section 608 of the Clean Air Act (CAA) to hydrofluorocarbons (HFCs). AHRI has actively supported industry-led efforts to promote refrigerant management. Last year, we partnered with other stakeholders to establish the Global Refrigerant Management Initiative (GRMI), an effort aimed at reducing refrigerant emissions.

AHRI believes that federal requirements and international agreements provide the most effective way to reduce emissions of high global warming potential (GWP) refrigerants. The US EPA has over the past year taken additional steps to de-list high GWP refrigerants and foam blowing agents from the Significant New Alternatives Policy (SNAP) program. We strongly feel that a uniform federal mandate is more desirable

and effective than a state-by-state effort which could lead to inconsistent requirements between regions and added costs of compliance being passed to consumers. For reasons that are explained in more detail below, we believe that the proposed strategy to reduce the use of HFCs in the air conditioning and refrigeration sectors is premature and should not be implemented.

**The proposed GWP limits and implementation dates are unrealistic**

AHRI has been testing and researching low GWP alternative refrigerants for several years. We launched the Low-GWP Alternative Refrigerants Evaluation Program (Low-GWP AREP) in 2011 and tested over 55 alternatives in various end uses. Over 70 test reports were generated and can be downloaded from our website at <http://www.ahrinet.org/Resources/Research/AHRI-Low-GWP-Alternative-Refrigerants-Evaluation-Program.aspx>. The program has demonstrated that viable low-GWP alternatives exist. The program has also shown that the vast majority of these alternatives are flammable and will require significant changes in equipment design, safety codes/standards, and the way they are handled in the field. As explained below, these changes cannot realistically be implemented by 2020 or 2021.

The last refrigerant transition away from ozone depleting substances took 20 years. This next transition to low-GWP alternatives will be more complex as certain products will require the use of flammable refrigerants. The use of flammable refrigerants in air conditioning and refrigeration products increases the complexity because it requires the update and inclusion of product and equipment room safety standards which then need to be included in state building codes.

Our industry has mobilized to accelerate the update of these safety codes and companies are dedicating personnel and significant funding for research to ensure these standards are updated in a timely manner. AHRI members committed in October 2015 \$1 million to undertake independent, 3rd party reviewed research that provides risk assessment and mitigation methods to allow these refrigerants to be used safely in air conditioning and refrigeration equipment. Since then, ASHRAE and the Department of Energy committed an additional \$4.2 million towards that research program. Even with this unprecedented effort, these safety standards will not be available for use before 2018 and are unlikely to be included in model building codes before 2021.

On behalf of its chiller manufacturers, AHRI, jointly with NRDC, petitioned EPA to phase out several high GWP refrigerants in all chillers effective January 1, 2025. The effective date was carefully selected and took into consideration many factors including, availability of the alternatives for that end-use, the time it takes to redesign equipment, and when the revisions of safety codes and standards will be completed. However, while an effective date of 2025 is acceptable for chiller manufacturers, more time will be needed to introduce low GWP refrigerants in the residential air conditioning sector.

**Many of the low GWP alternative refrigerants are not EPA SNAP approved**

The GWP limits proposed by ARB will require the use of alternative refrigerants that are not yet approved under the EPA SNAP program in the air conditioning and refrigeration



sectors. Therefore, and until such a time where EPA approves them, they cannot be used by manufacturers. EPA's SNAP approval of these refrigerants hinges on the availability of safety codes and standards that properly address their use. As stated above, these safety codes and standards will not be ready until around 2021 at the earliest. However, these safety requirements are also needed by manufacturers to design compliant products. This means that manufacturers are unlikely to transition product lines to these alternatives until well after 2021.

**Manufacturer costs to transition away from high GWP HFCs can be high**

The cost associated with the transition to lower GWP refrigerants will be significantly higher than what was estimated by ARB. Most manufacturers have multiple product lines and compressor types that share engineering resources, test labs, and marketing teams. To re-engineer a single product line for a new refrigerant requires significant investments in time and money. The costs to redesign can be in the millions of dollars and the time needed to commercialize new products is on average 5 years. Changing multiple product platforms simultaneously further increases the costs and resource burden. Accelerating this process by several years will significantly impact manufacturers. ARB should better estimate these costs and should correct its cost-benefit accordingly.

**Minimum energy efficiency standards effective dates must be taken into consideration to avoid multiple equipment redesign**

The energy efficiency of most air conditioners and commercial refrigeration equipment is currently regulated by the Department of Energy (DOE) and/or the California Energy Commission (CEC). These minimum energy efficiency standards are updated on a regular basis and their effective dates must be taken into account to avoid having to redesign products twice in a short period of time to meet the energy efficiency minimums and to accommodate low GWP refrigerants. For example, according to ARB's proposal, manufacturers of residential air conditioners will be required to redesign their products by 2021 to use low GWP refrigerants. However, these same manufacturers will be required to redesign a second time by 2023 to meet the new DOE federal minimum energy conservation standards. The same is true for a variety of products including commercial air conditioners and commercial refrigeration equipment.

**The flammability of the new refrigerants requires safety upgrades of manufacturing facilities and increased training for workers**

As discussed before, most viable low GWP alternatives are flammable. Since the refrigerants used today are nonflammable, major modifications will be required to existing manufacturing plants to ensure safe handling, storage, and use of alternative refrigerants. Additionally, standardized handling procedures and processes will need to be developed and tested prior to the commercialization of the new products. The transition requires capital investments that need to be planned well in advance and accelerating the timing increases the risk of accidents due to rushed implementation.

**Training gaps pose challenges to the safe adoption of flammable refrigerants**

The majority of technicians servicing air-conditioning and refrigeration equipment in the United States have not been trained to service equipment with flammable refrigerants. Prior to placing equipment with flammable refrigerants, a comprehensive standardized training program must be developed and implemented to ensure technician and operator safety. Additionally, service trucks must be modified and equipped to transport flammable refrigerants and include the necessary tools and equipment to ensure safe charging, recovery, and recycling. Manufacturers can only control the training of their own service technicians, whereas, independent service providers also need to adopt best practices and certify employees.

**Accelerating the transition to lower GWP refrigerants will not necessarily result in lower CO<sub>2</sub> emissions**

The GWP limits proposed by ARB and the short time frame given to transition to lower GWP refrigerants may force manufacturers to use alternatives that are not as efficient as the refrigerants they intend to replace. Without equipment modifications to increase efficiency, these less efficient refrigerants will result in higher total emissions. Most if not all air conditioning and refrigeration equipment impacted by ARB's proposal is federally regulated or regulated by the California Energy Commission. Consequently, manufacturers will be required to invest in product development to compensate for less efficient refrigerants which will add costs. In some cases, these cost increases could be as much as 25%, depending on equipment type, and will ultimately be borne by end users. If these end users invested instead that amount of money in more efficient equipment using current refrigerant technologies, the reduction in total CO<sub>2</sub> equivalent emissions could be significantly more than converting quickly to lower GWP refrigerants.

**Requiring only reclaimed high GWP refrigerants may not be achievable by 2020**

While the promotion and use of reclaimed refrigerants is a fundamental part of good refrigerant management, the requirement of its use over newly manufactured versions of the same refrigerants may be premature in 2020. As the industry strives to complete the transition out of ozone depleting refrigerants, the reclamation of HFCs is not fully realized. Currently, there is no industry data to quantify who or how much high GWP refrigerants are being reclaimed so equipment could be stranded if there is not enough reclaimed HFCs. We request that ARB be flexible while this segment of the reclamation grows and becomes quantifiable.

**Incentive program to encourage use of low GWP refrigerants**

AHRI supports the proposed incentive program to promote the use of low GWP refrigerants. As mentioned previously, it is very likely that the cost of Low GWP refrigeration and air conditioning equipment will increase significantly and helping end users offset some of the upfront cost will help drive the adoption of newer technologies. Additionally, incentives might increase early adoption of the low GWP refrigerant technologies prior to any compliance deadlines further helping meet California's SLCP and greenhouse emission targets sooner.

**Considering all these issues, mandating the proposed GWP limits and effective dates for air conditioners and refrigeration equipment is not realistic**

- The required safety standards will not be ready until 2018-2020
- Model building codes will not be ready until 2021-2024
- Manufacturers require about 5 years to design and launch dramatically new and different air conditioning products. Most of these 5 years must occur after safety standards and building codes are finalized.
- Significant service training is unlikely to be completed until 1-2 years after products are commercially available.

AHRI appreciates the opportunity to provide these comments. If you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,



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