

## Attachment:

### Air Conditioning, Heating and Refrigeration Institute (AHRI) Air Conditioning Proposal Background Document and Proposed Regulatory Text

#### Background

Building codes in California currently prohibit the use of commercially available refrigerants for air conditioning (AC) with a global warming potential (GWP) less than 750 GWP. The Air Conditioning, Heating and Refrigeration Institute (AHRI) has worked tirelessly to update the codes to comply with a proposed 2023 transition requirement in hopes that this would align with energy efficiency changes mandated by the Department of Energy (DOE). DOE typically allows 5 years for a transition to take place, but AC manufacturers (AC OEMs) committed through AHRI to transition within 2 years of the building codes being finalized in California to try to meet their commitment to the California Air Resource Board in 2018 in their request to delay the transition from 2021. It has become clear that the codes will not be updated by January 1, 2021 since AB 3316, the legislation that would have required that the building codes be updated, did not move forward with this requirement. The next opportunity for a change to the building code is January 1, 2023.

In light of the delay in the necessary code changes and the challenges in preparing for a transition due to the pandemic, the California Air Resources Board must delay the transition date for the 750 global warming potential (GWP) limit for air conditioning refrigerants in new equipment in California until January 1, 2025.

AHRI proposes the following to help recover lost 2023 and 2024 emissions because of this delay.

#### **AHRI Proposal:**

*Air conditioning (AC) original equipment manufacturers (OEMs) will enable refrigerant recovery from 2022 to 2030 to offset the quantity of refrigerant higher than 750 GWP the OEM placed in new equipment shipped to and not exported from California in 2023 and 2024 in carbon dioxide (CO<sub>2</sub>) equivalent (eq) units (using CARB's Standardized Regulatory Impact Assessment (SRIA) leak rates and equipment lifetimes), GHG<sub>I</sub>). The amount to be offset will be adjusted up or down (GHG<sub>A</sub>) to recognize the refrigerant used in new equipment sold between 2023 and 2030 by: (1) Changes in refrigerant charge size and (2) Refrigerant GWP less than 750 GWP.*

*OEMs may facilitate recovery, purchase or use reclaimed refrigerant, or enable the destruction of recovered refrigerant in the equivalent quantity in CO<sub>2</sub> eq units from 2022 to 2030 to compensate.*

In spite of best efforts by AHRI, the building codes will not enable the use of low GWP refrigerants in sufficient time to allow for an orderly transition in 2023 in California. AHRI members are willing to help recover lost 2023 and 2024 emissions by enabling better refrigerant recovery. It has been well-established that recovery of refrigerants at the end of life of equipment is minimal both in the U.S. and internationally. Although SB1013 requires CARB to reduce emissions of HFCs by 40% in 2030, AHRI believes that their work to enable better refrigerant recovery will lay the

groundwork by developing supply chains and practices to improve recovery long-term enabling meeting and possibly exceeding the required reduction in emissions in 2030.

There is limited supply of R-410A available in the near term and so there is a limit as to the total amount that could be reclaimed due to the timing of equipment nearing the end-of-life. Additional credits could be considered depending upon the ultimate availability of supply. However, AHRI believes that with this proposal, CARB has an opportunity to lead the country in the effort to increase the use of reclaimed refrigerant and could build on this with future efforts to reduce emissions in 2030 by significantly improving recovery rates.

This proposal was developed to allow options and credits (GWP and charge size) for air conditioning manufacturers similar to those allowed in the proposed regulation for retailers in their selection and use of commercial refrigeration equipment.

The following information is provided as background to this proposal.

### Availability of R-410A for Recovery in California

Using CARB's estimated market volumes in 2017, AHRI estimates of R-410A that would be removed from the market and could be, at least in-part, recovered based on CARB's model. Note that not all refrigerant can or will be recovered and there are losses during the recovery process. In addition, it has been estimated that 0.5 to 30% of refrigerants are lost during the reclamation process in part due to recovery practices.

Estimated Metric Tons	2021	2022
Refrigerant at end-of-life	1711	1763
<b>Note that not all refrigerant can or will be recovered and there are losses during recovery and an estimated 0.5% to 30% losses during the reclamation process largely dependent on recovery practices</b>		

Estimated Metric Tons	2025	2026	2027	2028	2029	2030
Refrigerant at end-of-life	1844	1813	1668	1427	1128	3428
<b>Note that not all refrigerant can or will be recovered. There are losses during recovery and an estimated 0.5% to 30% losses during the reclamation process largely dependent on recovery practices</b>						

If California contractors reclaimed 10% of the total R-410A reclaimed nationally, then California would have reclaimed approximately 118 tons of R-410A last year.<sup>1</sup> In the United States, 8,410

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<sup>1</sup> According to sector-based equipment reporting in the Energy Information Administration (EIA)'s Commercial Building Energy Consumption Survey and Residential Energy Consumption Survey, between 8.5 and 12 percent of any HVACR product sector's market share is in California.

metric tons of refrigerant were reclaimed in 2019. Of that amount, 1,177 metric tons of R-410A were reclaimed.<sup>2</sup><sup>[OBJ]</sup>

### California Refrigerant Market

AHRI reviewed public and internal data to estimate the refrigerant market in California. By blending multiple approaches and using a wide variety of corroborated data sources, AHRI estimates that there are approximately 60,000-63,000 metric tons of R-410A in California and that approximately 6,600-7,200 metric tons of R-410A are shipped to California each year.

- Approximately 2,700-3,100 metric tons of R-410A are used for servicing existing equipment in California each year.
- Approximately 3,800-4,300 metric tons of R-410A are used for charging new units entering service in California each year.

AHRI took three approaches to calculate the refrigerant use in California: (1) Equipment Shipment-Based Approach, (2) California Air Resources Board (CARB) Model-Based Approach, and (3) Refrigerant Shipment-Based Approach.

### Equipment Shipment-Based Approach

AHRI used publicly available data from the Energy Information Administration (EIA)'s 2012 [Commercial Building Energy Consumption Survey](#) (CBECS) and 2015 [Residential Energy Consumption Survey](#) (RECS) and queried the data for residential AC, commercial AC, commercial heat pumps, and chillers. The weighted sums of each installation within the United States were used as the baseline of installed equipment. That data was then split into census divisions identified within CBECS and RECS. Population-weighted subsets of data were extracted for California to estimate the installed base of each type of equipment within the state. These baselines installed unit estimates were multiplied by California's growth rate from its Standardized Regulatory Impact Assessment (SRIA) to estimate the installed HVACR equipment base in 2023 (Appendix 1).

AHRI used refrigerant distributions from the Environmental Protection Agency (EPA)'s refrigerant [Vintaging Model guidance document](#) (page 230) to simulate the distribution of refrigerant type in each installation.<sup>3</sup>

Charge sizes, equipment lifetime, and leak rate were estimated from AHRI and DOE literature and California's SRIA.<sup>4</sup>

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<sup>2</sup> Summary of Refrigerant Reclamation Trends. Environmental Protection Agency. Accessed from <https://www.epa.gov/section608/summary-refrigerant-reclamation-trends>.

<sup>3</sup> AHRI set up a probabilistic model that took the refrigerant distributions for each type of equipment in EPA's Vintaging Model guidance. These distributions were summed for all equipment to find a weighted average for the proportion of each refrigerant in the installed base. These proportions were used in AHRI's calculations to estimate the R-410A installed base in California.

<sup>4</sup> DOE offers factsheets for [AC equipment](#), [chillers](#), [heat pumps](#), and their respective lifetimes. Refrigerant charge guidelines can be found in [AHRI Standard 340/360](#) and [AHRI Standard 210/240](#). California's SRIA includes this information for its measurement of HVACR equipment in California.

AHRI used this information and recorded the following parameters:

	Residential AC Units	Commercial AC Units	Commercial Heat Pump Units	Chillers
Equipment lifetime (years)	15	15	15	30
Charge Size (lbs) <sup>5</sup>	8.157	38	38	100
Leak Rate (per year) <sup>6</sup>	5%	5%	5%	5%
R410A Installed Market Share	86%	86%	86%	30%
R22 Installed Market Share	14%	14%	14%	0%
R134a Installed Market Share	0%	0%	0%	70%
R404A Installed Market Share	0%	0%	0%	0%

The leak rate was multiplied by the charge size and total number of units installed in California to estimate the amount of refrigerant used for servicing existing equipment per year. The result was multiplied by the proportion of equipment with R-410A to estimate the amount of R-410A used for servicing existing equipment each year, which was 2,736 metric tons per year.

Total number of units installed in California were divided by each installation's respective equipment lifetime to estimate the number of new units per year. This was multiplied by charge size and proportion of equipment with R-410A to estimate the amount of R-410A used for charging new equipment each year, which was 3,861 metric tons per year.

#### California Air Resources Board (CARB) Model-Based Approach

AHRI reviewed CARB's November 2017 HFC Emission Factors modeling document to estimate the amount of refrigerant used in new equipment and for service in California. The total number of installed units were multiplied by refrigerant charge size to estimate the installed base of refrigerant. AHRI assumed a 5% leak rate and a 15-year lifetime based on the SRIA to calculate refrigerant used for service and to charge new equipment in California.

The leak rate was multiplied by the charge size and total number of units installed in California to estimate the amount of refrigerant used for servicing existing equipment per year. Approximately 3,000 metrics tons of refrigerant are used for servicing existing equipment in California.

Total number of units installed in California were divided by each installation's respective equipment lifetime to estimate the number of new units per year. Approximately 4,000 metric tons of refrigerant are used for charging new equipment installed in California each year.

<sup>5</sup> Shipment-weighted average based on California's SRIA and AHRI's [public shipment data](#).

<sup>6</sup> [Clodic](#) (2010) estimates leak rates for HVACR equipment. These leak rates are consistent with the SRIA.

### Refrigerant Shipment-Based Approach

AHRI reviewed refrigerant consumption data from the [Consumer Cost Impacts of U.S. Ratification of the Kigali Amendment](#) to estimate the amount of refrigerant used in California each year. Total exports of refrigerant were subtracted from total imports and production of refrigerant to estimate the total amount of refrigerant used each year. AHRI split the proportion of different types of equipment into census divisions identified within CBECS and RECS. Population-weighted subsets of data were extracted for California to estimate the installed base of each type of equipment within the state.

Based on this approach, approximately 4,200 metric tons of refrigerant are used for servicing existing equipment in California and approximately 3,058 metric tons of refrigerant are used for charging new equipment installed in California each year.

### Economic Impact of AHRI's Recovery Proposal

Based on the range of refrigerant used in new equipment (3,800-4,300 metric tons per year) and the reduction in charge size and GWP from new refrigerants, between 426<sup>7</sup> and 1,850 metric tons of refrigerant must be recovered to offset the CO<sub>2</sub> equivalent for R-410A being used in California in 2023 and 2024 rather than a refrigerant with a GWP below 750.<sup>8</sup>

AHRI Project 8018 found that cost to recover refrigerant ranges from \$1.20-\$1.60 per pound.<sup>9</sup> The cost to the industry to offset the use of R-410A for 2023 and 2024 will range from approximately \$1,127,000 to \$7,232,000.

It is AHRI's understanding that shipping fluorocarbons costs approximately \$0.05 per pound.<sup>10</sup> This will add approximately \$46,900-\$226,000 in shipping costs to the industry.

The total cost to manufacturers for recovery of refrigerant is estimated to cost between \$1,174,000 to \$7,458,000.<sup>11</sup>

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<sup>7</sup> See attached spreadsheet for more details.

<sup>8</sup> AHRI assumed that 3,800-4,300 metric tons per year of R-410A refrigerant were installed between 2023 and 2025, resulting in a total installed refrigerant base between 7,600-8,600 metric tons of refrigerant during this time. These values were multiplied by 5.6% and 21.5%, respectively to obtain a range of refrigerant recovery needed to meet CARB's goals.

<sup>9</sup> [AHRI Project 8018 Final Report](#). January 2016. Page 15 and 24. Canada and Australia have had success with their refrigerant recovery and reclaim programs. In the research report, AHRI found that a \$1.20-\$1.59 per pound of refrigerant rebate was needed to incentivize the recovery of refrigerant (\$3.50 CAD per kg and \$5 AUD per kg, respectively).

<sup>10</sup> Shipping costs are minimal, however both [AHRI Project 8018](#) and an [ACHR News survey of refrigerant recovery businesses](#) (Reclaim Survey: Where to Go, What it Costs, 2008) found minor shipping costs are still included within the business costs associated with refrigerant recovery and reclamation.

<sup>11</sup> AHRI multiplied the cost per pound of recovery by the pounds of refrigerant recovery needed to estimate recovery costs. Shipment costs per pound of refrigerant were also multiplied by the refrigerant recovery needed to estimate shipping costs. These two values were summed to calculate total cost to industry.

Finally, AHRI understands that contractors can pay up to \$25 per cylinder to return refrigerant to a distributor.<sup>12</sup> In the future, contractors would likely save the \$25 refrigerant recovery fee. Contractors are responsible for the cost of dedicated recovery cylinders.<sup>13</sup> Since these cylinders typically carry 24 pounds of refrigerant, between 18 and 78 cylinders will need to be returned.<sup>14</sup> Contractors may already own these cylinders.

Please note that AHRI is working to refine the economic information and will provide additional data if it would be helpful.

### Administrative Controls

AHRI understands that CARB requires any proposal to be enforceable and easy to administer. AHRI proposes that equipment manufacturers self-certify and declare their progress to CARB annually, subject to auditing by CARB upon request. This will create a minimal burden to the industry (less than 24 hours per year) and ensure CARB will achieve its GHG reduction goals

### Examples of Compliance Options

OEMs may enable or facilitate the recovery of refrigerant at the end of life by a number of actions including but not limited to the following. OEMs may combine these options. Other options may not have been explored at this writing.

- OEMs may use reclaimed refrigerant in new AC systems during 2023 and 2024
- OEMs may include contractual agreement that distributors return a certain amount of recovered refrigerant to reclaimers
- OEMs may include contractual agreement that distributors sell a certain amount of recovered refrigerant to reclaimers
- OEMs may provide incentives to their channel partners to recover refrigerant
- OEMs may provide incentives to their channel partners to use reclaimed refrigerant.
- OEMs may buy credits for recovery / reclaim from competitors or reclaimers.

Finally, OEMs may convert a portion of their products in 2023 and 2024 to a low GWP refrigerant.

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<sup>12</sup> [ACHR News survey of refrigerant recovery businesses](#) (Reclaim Survey: Where to Go, What it Costs, 2008) found cylinder return as a typical cost of business.

<sup>13</sup> AHRI reviewed currently available recovery cylinders on the market and found costs ranged between \$180-\$500.

<sup>14</sup> [Examining Recovery Cylinder Capabilities](#). 2007. *ACHR News*.

## Air Conditioning, Heating and Refrigeration Institute (AHRI)

### Proposed Regulatory Text for the Air Conditioning Refrigerant Transition in California

- (i) Air Conditioning Equipment, Stationary installed in the state of California may only contain refrigerants having a global warming potential (GWP) of less than 750 by January 1, 2025.
- (ii) Air conditioning (AC) original equipment manufacturers (OEMs) will enable refrigerant recovery from 2022 to 2030 to offset the carbon dioxide (CO<sub>2</sub>) equivalent units (EQ) quantity from refrigerant with a GWP higher than 750 GWP the OEM placed in new equipment shipped to and not exported from California in 2023 and 2024 in carbon dioxide (CO<sub>2</sub>) equivalent (eq) units (using CARB's Standardized Regulatory Impact Assessment (SRIA) leak rates and equipment lifetimes), (Greenhouse Gas Impact or GHG<sub>i</sub>). The amount to be offset will be adjusted up or down (Greenhouse Gas Adjustment or GHG<sub>A</sub>) to recognize the refrigerant used in new equipment sold in California between 2023 and 2030 by:
  - a) Changes in refrigerant charge size and
  - b) Refrigerant GWP less than 750 GWP.
- (iii) Definitions
  - a. Air Conditioning Equipment, Stationary: "Air-conditioning Equipment" or "Air-conditioning System" means equipment that cools or dehumidifies spaces in residential or non-residential settings, for comfort cooling and other purposes, including but not limited to room air conditioning such as window units, packaged terminal air conditioners (PTAC), packaged terminal heat pumps (PTHP), and portable air conditioners; central air conditioners (i.e., ducted); non-ducted systems (both mini and multi splits); packaged rooftop units; water-source and ground-source heat pumps; and dehumidifiers. Air-conditioning also includes computer room and data center cooling and remote condensing units for comfort cooling applications. Chillers are defined separately from "air-conditioning equipment." For the purposes of this regulation, "air-conditioning equipment" applies to stationary air-conditioning equipment and does not apply to mobile air-conditioning, including those used in vehicles, rail and trains, buses, aircraft, watercraft, recreational vehicles, recreational trailers, and campers.
  - b. Enable refrigerant recovery: includes facilitating recovery, purchasing or using reclaimed refrigerant, or enabling the destruction of recovered refrigerant.
  - c. Greenhouse Gas Adjustment (GHG<sub>A</sub>):  $GHG_A = [ \sum(\text{Charge} \times [750\text{-GWP}]) \text{ for equipment designed to use a refrigerant less than 750 GWP shipped to and not exported from California} + \text{RCR} \times \text{charge}] \times \text{SRIA Leak Rate} \times \text{SRIA Equipment Lifetime}$
  - d. Greenhouse Gas Impact (GHG<sub>i</sub>):  $GHG_i = \sum(\text{Charge}) \times (2088\text{-GWP}) \text{ for equipment designed to use a GWP greater than 750 shipped to and not exported from California from January 1, 2023 and January 1, 2025} \times \text{SRIA leak rate} \times \text{SRIA equipment lifetime}$
  - e.  $GHG_p = \sum (\text{Charge} \times \text{GWP}) \text{ shipped to and not exported from California}$
  - f. Original equipment manufacturer: Company that fabricates air conditioners or other products

- g. Reclaim<sup>15</sup>: To reprocess recovered refrigerant to at least the purity specified in the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Standard 700-2016 and to verify this purity using the analytical methodology prescribed in the standard. Per EPA Section 608, Reclamation requires specialized machinery not available at a job site or auto repair shop. The technician will recover the refrigerant and then send it either to a general reclaimer or back to the refrigerant manufacturer.
- h. Recover<sup>16</sup>: To remove refrigerant in any condition from an appliance and store it in an external container without necessarily testing or processing it in any way.
- i. Recycle<sup>17</sup>: When referring to a refrigerant, recycle means to extract refrigerant from an appliance (except MVACs) and clean refrigerant for reuse in equipment of the same owner without meeting all the requirements for reclamation. In general, recycled refrigerant is refrigerant that is cleaned using oil separation and single or multiple passes through devices, such as replaceable core filter-driers, which reduce moisture, acidity, and particulate matter.
- j. Refrigerant Charge Reduction (RCR) - The inherent refrigerant charge reduction is the ratio of the average liquid and vapor densities of refrigerant multiplied by 80% based on the observed charge size reduction of 20%.<sup>18</sup>

$$\text{Inherent charge reduction} = \frac{(\text{Liquid Density} + \text{Vapor Density}) \text{ for new refrigerant}}{(\text{Liquid Density} + \text{Vapor Density}) \text{ for base refrigerant}} \times (1 - 20\%)$$

Refrigerant charge size reduction table<sup>19</sup>

Refrigerant	Charge Size Relative to Current R-410A Charge
R-32	80%
R-454B	85.4%

- (iv) GHG<sub>i</sub> will be compensated for as GHG<sub>A</sub> and GHG<sub>p</sub> of recovered, destroyed, installed reclaimed refrigerant enabled by the OEM. The remaining commitment calculated as GHG<sub>i</sub> - GHG<sub>A</sub> - GHG<sub>p</sub> of enabled refrigerant must be zero by January 1, 2030
- (v) Reporting Requirements: On or before April 1, 2023 and each April 1 thereafter until the OEM has shown compliance, AC OEMs that ship equipment into California that will not be exported from shall register in the R3 database and provide the following information:
  - a) Name of Company.
  - b) Company Federal Tax Identification Number.

<sup>15</sup> <https://www.epa.gov/section608/definitions-section-608-terms>

<sup>16</sup> <https://www.epa.gov/section608/definitions-section-608-terms>

<sup>17</sup> <https://www.epa.gov/section608/definitions-section-608-terms>

<sup>18</sup> Cold Hard Facts 3 for The Australian Government by The Expert Group

<https://www.environment.gov.au/system/files/resources/bd7fa5d0-8da1-4951-bd01-e012e368d5d0/files/cold-hard-facts3.pdf>

- c) Company mailing address including a street address, city, state, and zip code.
- d) Company location address including a street address, city, state, and zip code.
- e) Company contact person.
- f) Company contact person phone number.
- g) Company contact person e-mail address; and
- h) Compliance Information:
  - i) The total volume of refrigerant having a GWP greater than 750 that is shipped to and not exported from California.
  - ii) The total volume of refrigerant having a GWP less than 750 that is shipped to and not exported from California.
  - iii) The company's RCR
  - iv) The company's GHG<sub>I</sub>
  - v) The company's GHG<sub>A</sub>
  - vi) The GHG<sub>p</sub> of and quantity of recovered refrigerant that the company has enabled, and the methodology used to enable its recovery.
  - vii) The GHG<sub>p</sub> of and quantity of reclaimed refrigerant used in new equipment.
  - viii) The GHG<sub>p</sub> compliance credits purchased from another entity along with the name and contact information for that entity.

(vi) Recordkeeping Requirements. As of the effective date of this subarticle, any person who ships equipment into California that will not be exported from California from January 1, 2022 to January 1, 2030 shall maintain for five years and make available, upon request by the California Air Resources Board's Executive Officer, the following records:

- a) The means by which the GHG<sub>I</sub> is calculated.
- b) The means by which the GHG<sub>A</sub> is calculated.
- c) The GHG<sub>p</sub> and quantity of recovered refrigerant that the company has enabled, and the methodology used to enable its recovery.
- d) Each refrigeration system charge reduction, including the full charge size before a refrigerant charge reduction and after a refrigerant charge reduction.
- e) The GHG<sub>p</sub> and quantity of reclaimed refrigerant used in new equipment.
- f) The GHG<sub>p</sub> compliance credits purchased from another entity along with the name and contact information for that entity.
- g) The calculations and spreadsheets used to create the reported information under section 95375(4); and
- h) The recordkeeping requirements of section 95375(5) shall include documentation including but not limited to, invoices, receipts, records of shipments, plans, or work details, that are generated or supported by information from a third party, such as a service technician or refrigerant reclaimer.

## AHRI Proposal to Require the Use of Reclaimed Refrigerants on January 1, 2025

On July 31, 2020, AHRI proposed that CARB require the use of reclaimed refrigerant for servicing in California starting on January 1, 2025. CARB informed AHRI that it was unlikely that they would be able to implement this proposal. As this proposal could provide a significant emissions reduction in 2030. AHRI has provided the proposal here to encourage stakeholder feedback around this beneficial concept.

Proposal to Prohibit the Use of Newly Produced Refrigerant to Service Equipment in California January 1, 2025

**AHRI proposes that CARB delay the 750 GWP limit until January 1, 2025 with the following provisions and commitments.**<sup>20</sup>

As a result of the challenges related to the building codes and the pandemic, AHRI is seeking a delay in the January 1, 2023 transition date limiting GWP of refrigerant to below 750 to January 1, 2025 with a limit of 750 GWP. AHRI understands that CARB still needs to meet the statutory mandate and makes the following proposal to compensate for a delay until January 1, 2025.

### AHRI Proposal

- January 1, 2025
  - 750 GWP limit for newly manufactured stationary air conditioning equipment, understanding that safety standards and the California codes need to be aligned
  - Prohibit the sale, re-sale, transfer and/or import for use in California of newly produced R-410A, except for export from California
- Require the collection of all refrigerants at end-of-life
- Require reclaimed refrigerant to meet purity requirements of AHRI 700 standard
- Allow nationally reclaimed R-410A to be used in California<sup>21</sup>
- Equipment manufacturers will promote and encourage the recovery of R-410A through education of their service and dealer networks

A “Seller” of R-410A must report sales to CARB as a registered seller. Registered “Reclaimers” of R-410A must also report sales to CARB. Any “Reclaimer” or “Seller” must keep records of any sales to end-users. This should provide a mechanism to check reports from both “Sellers” and “Reclaimers”<sup>22</sup> which should ease the enforcement burden and ensures compliance and attainment of necessary emission reductions.

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<sup>20</sup> AHRI made this proposal in a meeting on July 22, 2020 to CARB and is formalizing the proposal through this correspondence.

<sup>21</sup> If we assume an average lifetime of air conditioning equipment of approximately 20 years, then 5% are replaced annually and that refrigerant can be reclaimed for use which precisely matches the need for servicing refrigerant if leak rates approximately 5% (including emissions during servicing equipment). Although, this seems like a perfect match, there are additional losses during the reclaim process, so additional reclaim will be needed from other states to support California.

<sup>22</sup> An initial and ending inventory could also be reported annually to further check transactions.

Reclaim would be used for servicing equipment instead of new equipment because of the logistical challenges regarding equipment manufacturing facilities which are not designed to use multiple types of refrigerants. Also, equipment sales are not segregated by state. Generally, equipment is sold to wholesale distributors and the location of final installation is unknown to manufacturers which could result in newly produced refrigerant entering California. This also prevents concerns of labeling units as “new” while containing reclaimed refrigerant.

This proposal more than compensates for the two-year delay requested by AHRI. In addition, the required use of reclaimed refrigerant for servicing also encourages best practices necessary for a safe transition to lower GWP refrigerants and to prepare for the Kigali HFC phase-down nationally. It also broadens industry engagement in the effort to reduced HFC emissions to those most able to reduce them.