Proposed Prohibitions on High-GWP HFCs in New Refrigeration and Air-conditioning

January 30, 2020

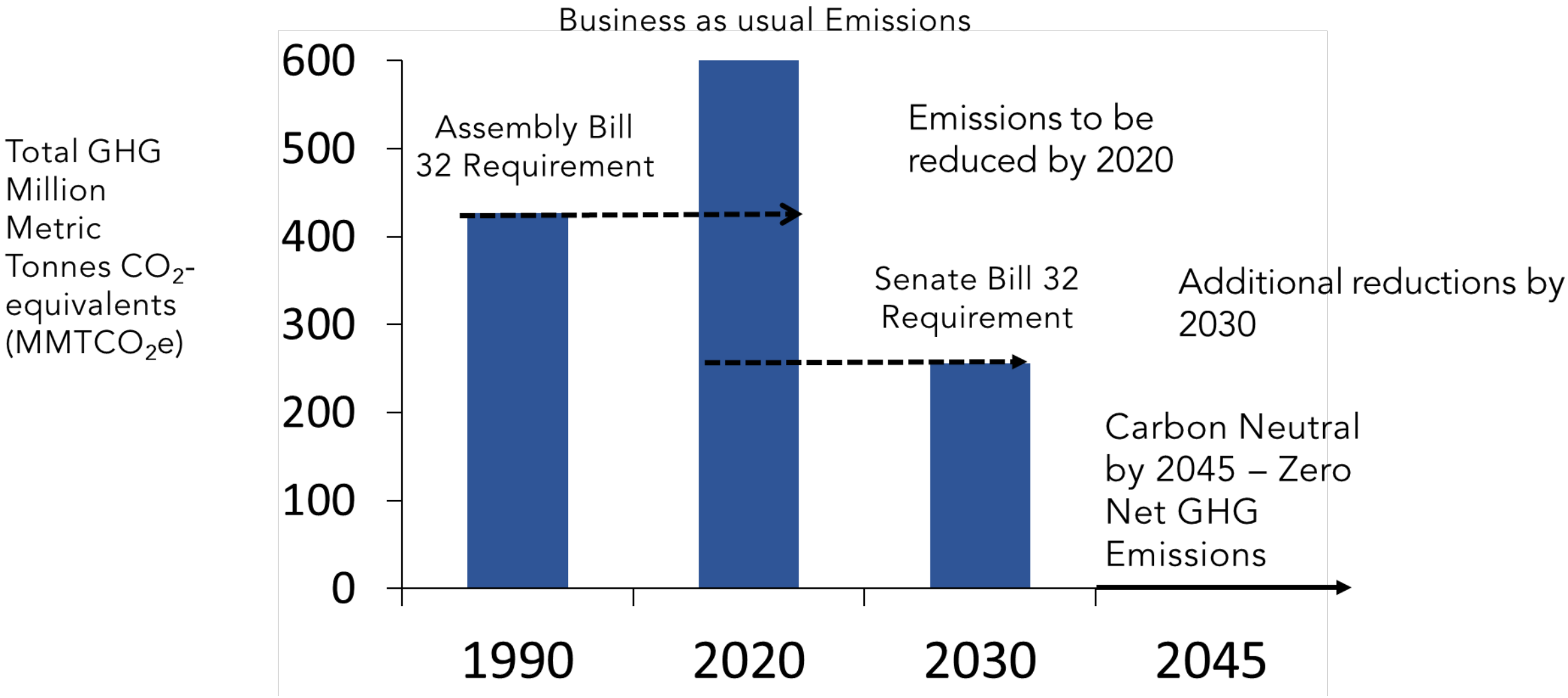
CALIFORNIA
AIR RESOURCES BOARD

For Remote Attendees:

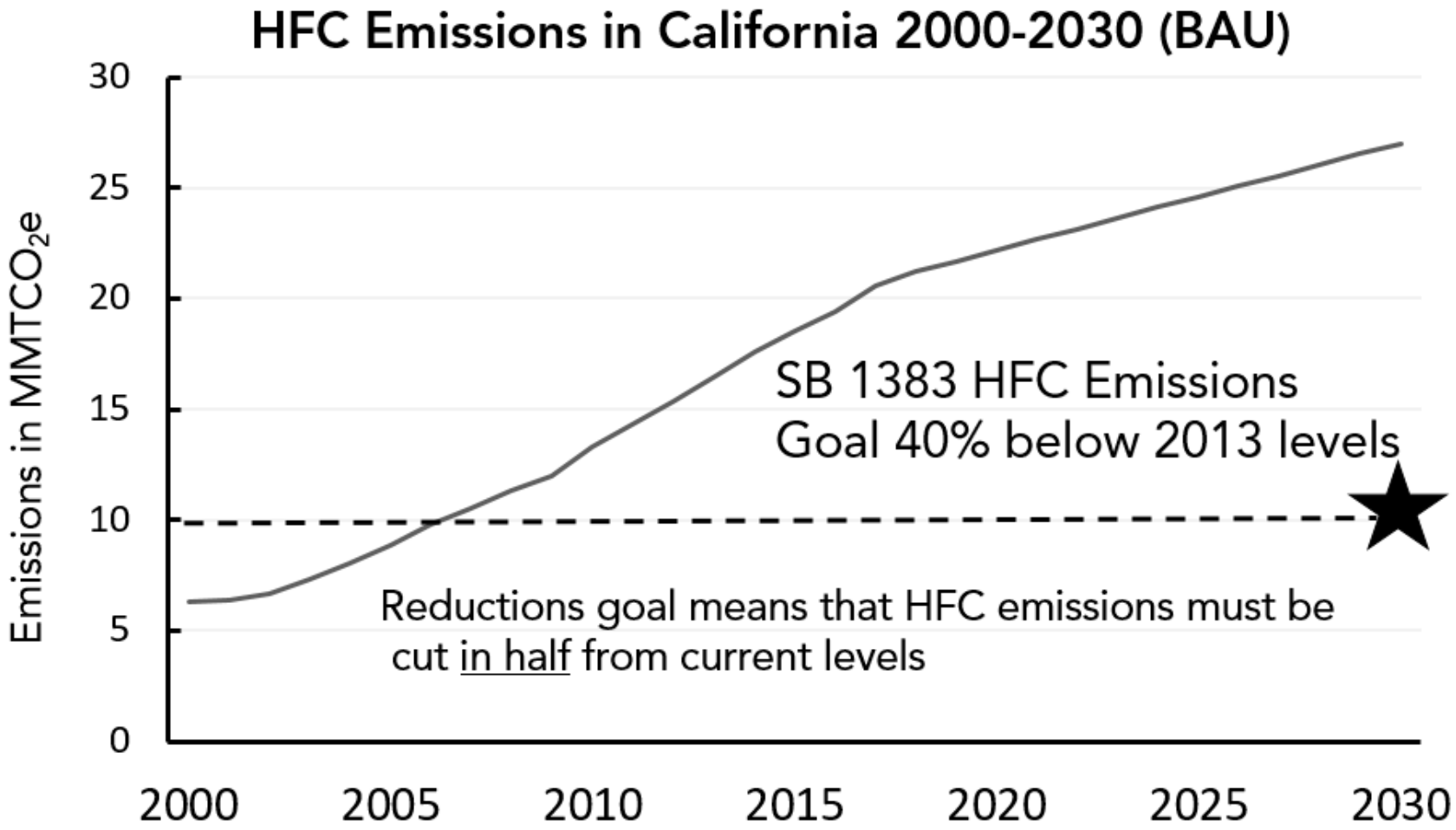
Please email your questions to:

Auditorium@CalEPA.ca.gov

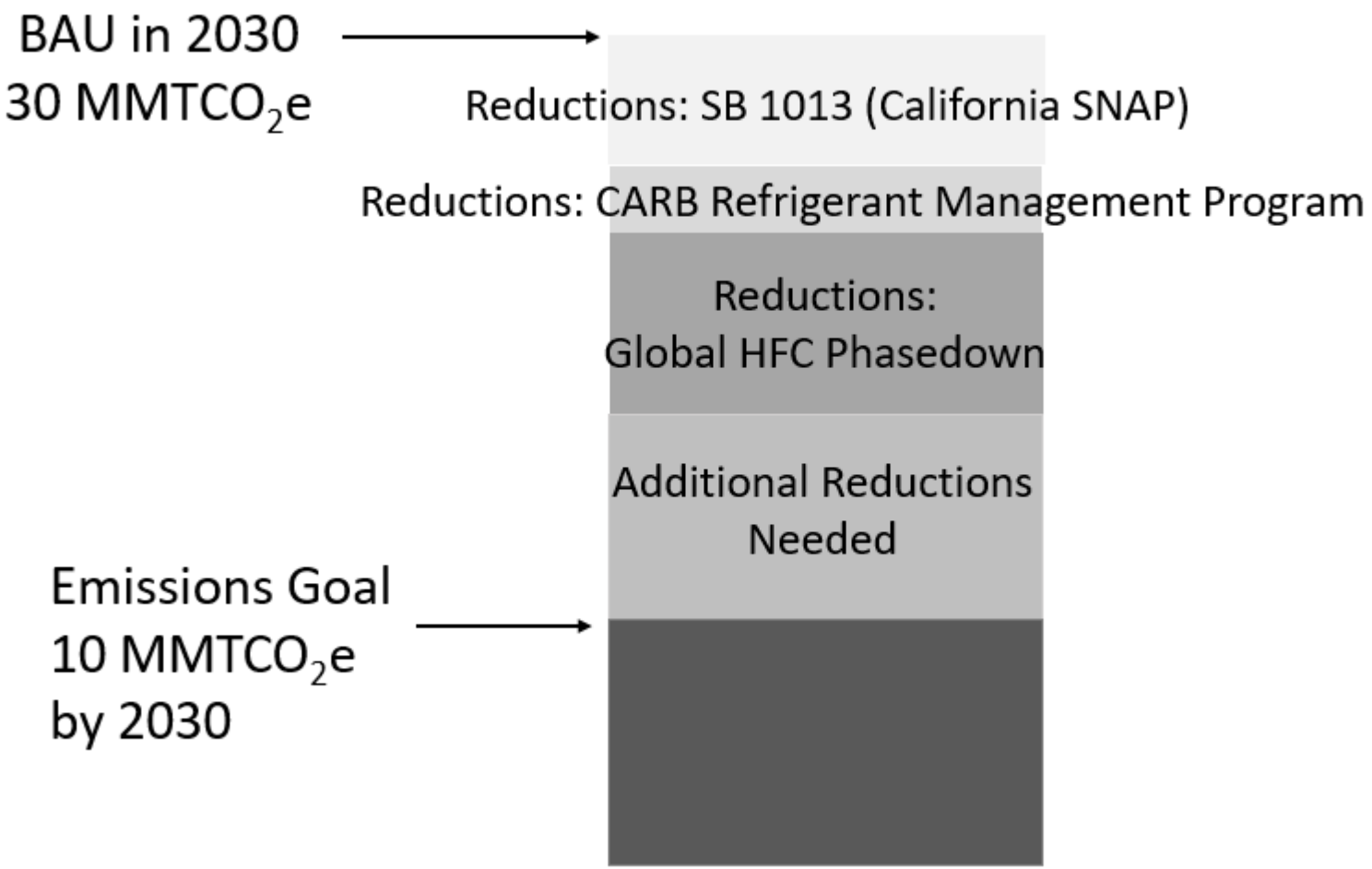
Why HFC reductions? Part of Comprehensive GHG Emissions Reductions Goals in CA, from All Sources



SB 1383 Requires a 40% reduction in HFCs



Four HFC Reductions Strategies in California: All four are needed to meet SB 1383 reductions goal



Administrative Updates to HFC Regulation

Initial HFC Regulation Adopted March 2018

Refrigeration, Foams

+

SB 1013 Signed September 2018

Aerosols, Chillers, Cold Storage, Additional Foams, Refrigerator

→ **California SNAP**

Administrative Update to California SNAP Regulation now includes SB 1013 prohibitions January 2020 (Section 100)

Admin Updates to HFC Regulation (cont.)

- March 2018 requirements have not changed.
- SB 1013 requirements have not changed.
- They are now one regulation in one place.
- Proposed regulations (to be discussed today), will be added to the 'California SNAP' regulation.

Questions?

Webcast: email questions to:

Auditorium@CalEPA.ca.gov

Draft regulation text:

https://ww2.arb.ca.gov/our-work/programs/hfc-reduction-measures/meetings-workshops

Public Workshop

Proposed GWP Limit for New Stationary Air Conditioning Equipment

January 30, 2020

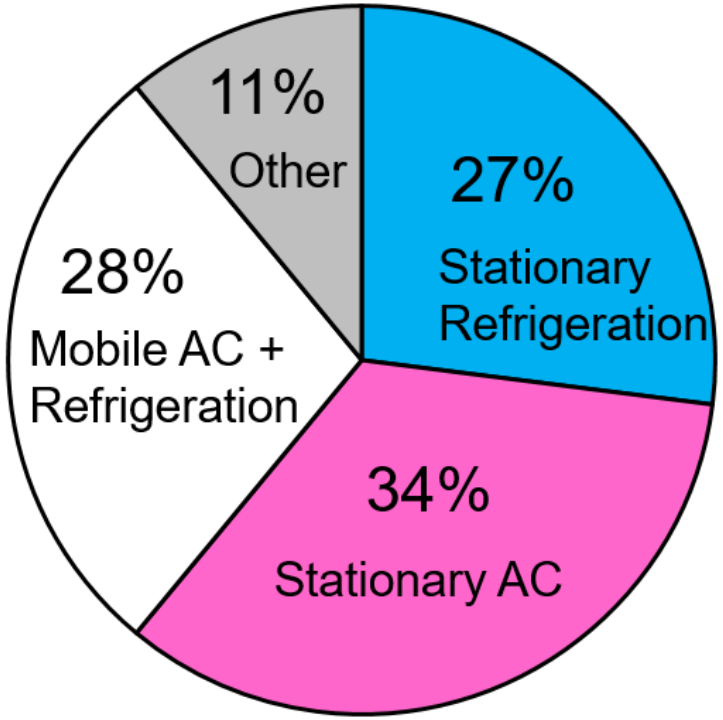
Greenhouse Gas Reduction Strategy Section
Research Division
California Air Resources Board
kathryn.kynett@arb.ca.gov
Phone: (916) 323-8598

Today's Presentation

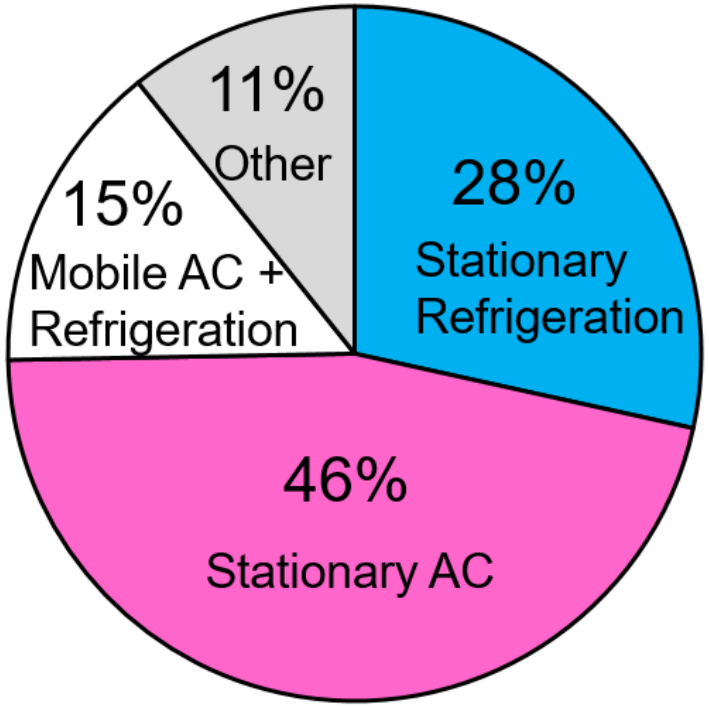
- Background
- Draft Regulatory Text
- Next Steps and Anticipated Timelines
- Discussion

Background

HFC Emissions in California



Year 2018



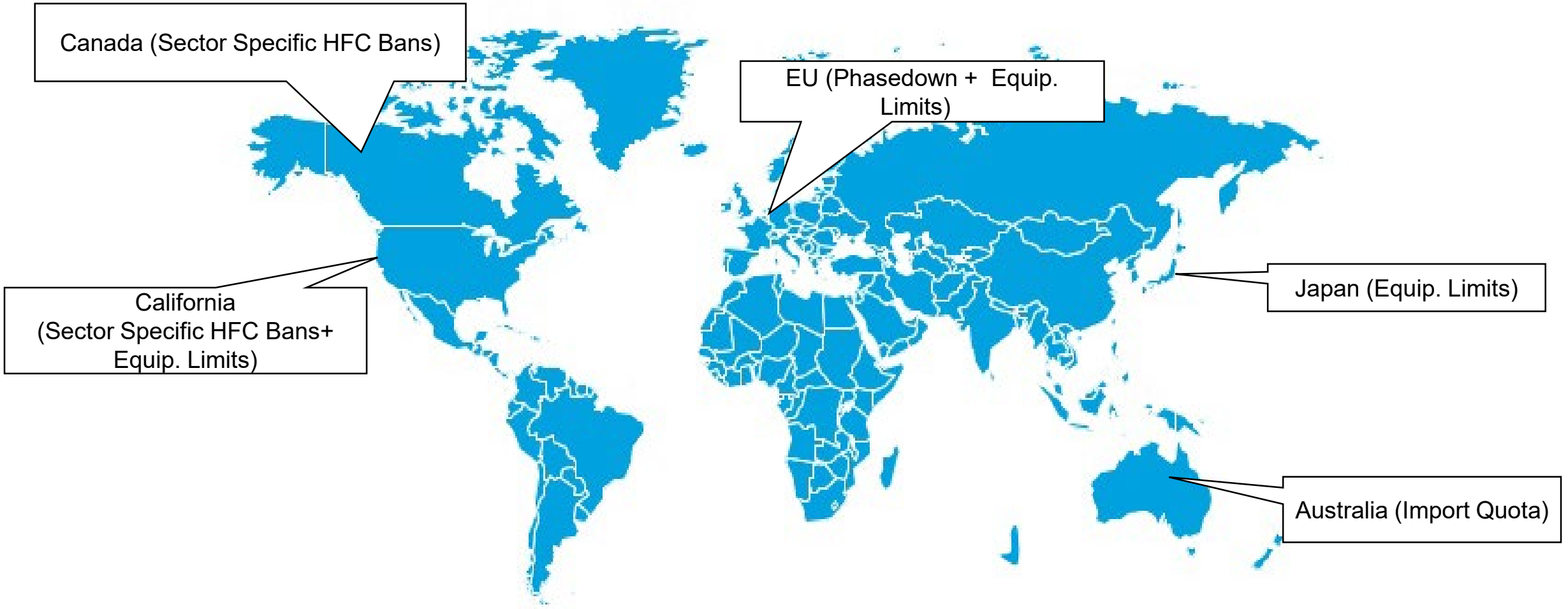
Year 2030 (Projected)

[Source: CARB F-Gas Inventory, 2017]

Proposed GWP Limit on AC Equipment

Effective January 1, 2023, new air conditioning systems must use a refrigerant with a global warming potential (GWP) value < 750

How does California fit in with Policies Driving Refrigerant Changes in AC Globally?



Status of <750 GWP Alternatives

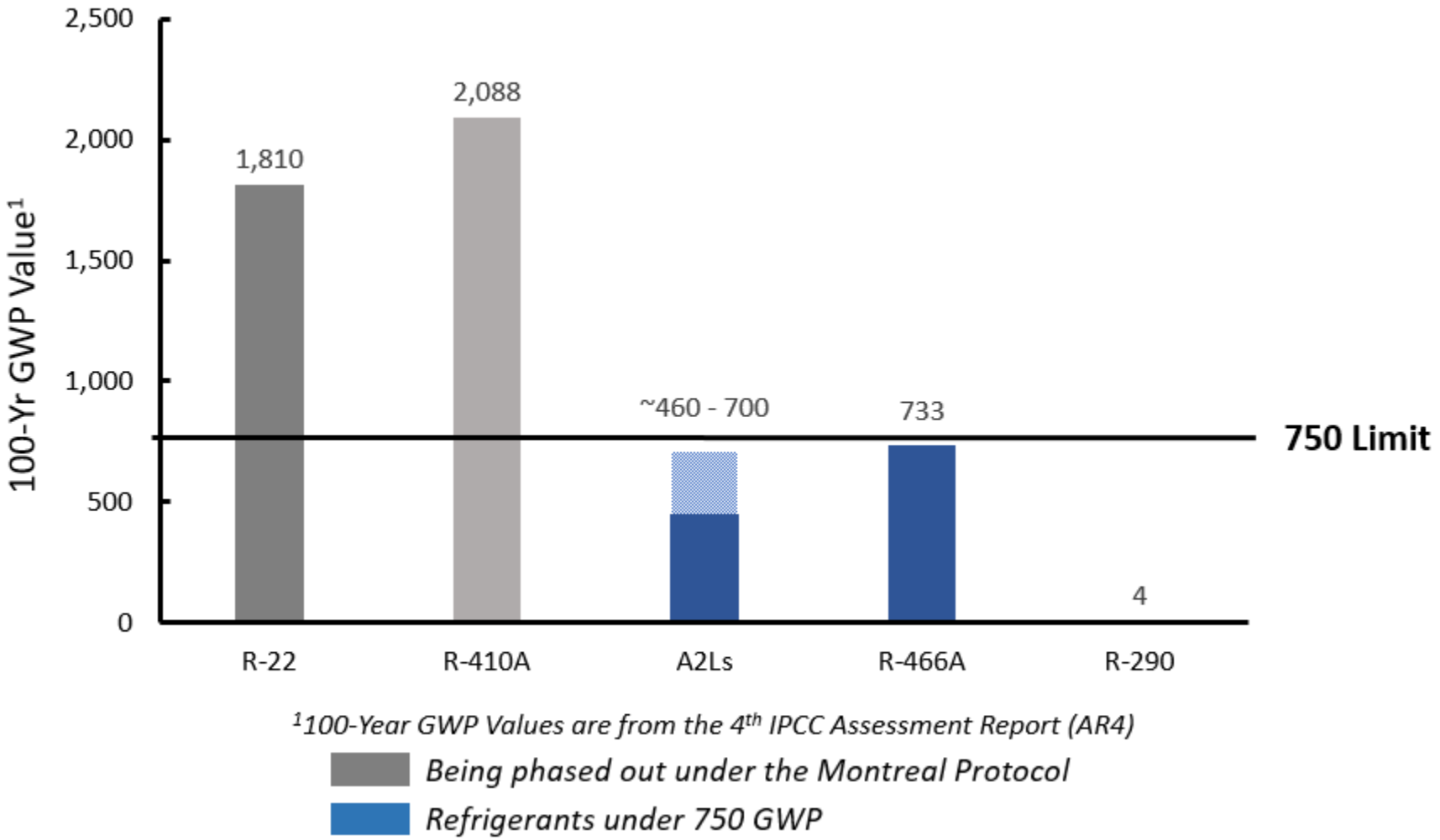
Category	Global Status	California Status
Room AC (window/wall + portable)	●	●
Ductless split systems	●	◕
Ducted split + package systems	◕	◕
Small VRV/VRF	●	◕
Larger VRV/VRF	◕	◕

● commercially available

◕ Product under development or pending codes/standards updates

[Source: Adapted from "The Future of Air Conditioning for Buildings, 2016]

R-410A Refrigerant Alternatives <750 GWP



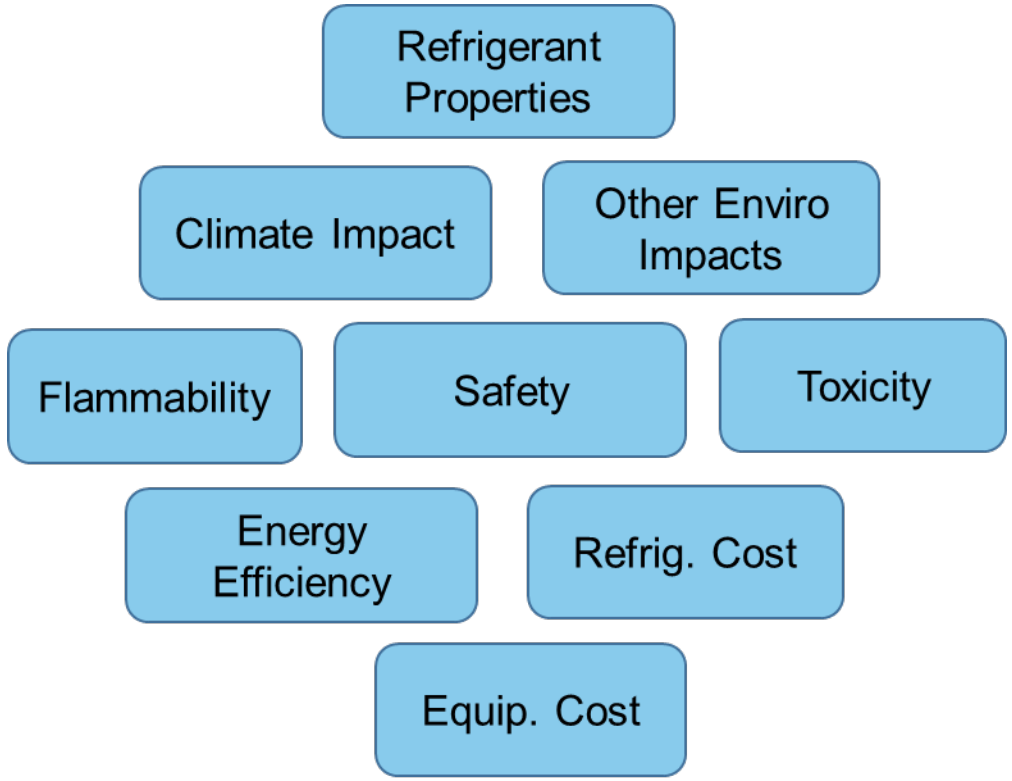
[1]100-Year GWP Values are from the 4th IPCC Assessment Report (AR4)

Being phased out under the Montreal Protocol

Refrigerants under 750 GWP

How are refrigerants evaluated?

- Product and Application Safety Standards
- U.S. EPA SNAP
- California Building Code



Evaluation Criteria

Regulatory Text

GWP Limit for Stationary AC

§ 95374. List of Prohibited Substances.

Part of Table 3 in the draft regulatory text

General End-Use	Specific End-Use	Prohibited Substances	Effective Date
Air-conditioning			
Air-conditioning equipment	Air-conditioning equipment (new), residential and non-residential	Refrigerants with a GWP of 750 or greater	Prohibited as of January 1, 2023

Requirements

§95377. Requirements Applicable to Table 3 of Section 95374(c).

(a) *Prohibitions.* No person shall sell, lease, rent, install, use, or enter into commerce in the State of California, any end-use equipment or product manufactured after the effective date, that does not comply with Table 3 of section 95374(c) of this

AC Equipment Categories

residential + non-residential

Room AC + Dehumidifiers

portable

window and through-the-wall

packaged terminal AC (PTAC)
packaged terminal HP (PTHP)

dehumidifiers

Ducted/Ductless

smaller ductless, ducted split and packaged systems used in residences

ductless and ducted systems used in commercial/nonresidential applications

GWP <750 beginning 2023

Definition of AC Equipment

§ 95373. Definitions.

"Air-conditioning Equipment" or *"Air-conditioning System"* means equipment that cools enclosed spaces in residential or non-residential settings, including 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 other products. Air-conditioning also includes computer room and data center cooling. Chillers are defined separately from "air-conditioning equipment."

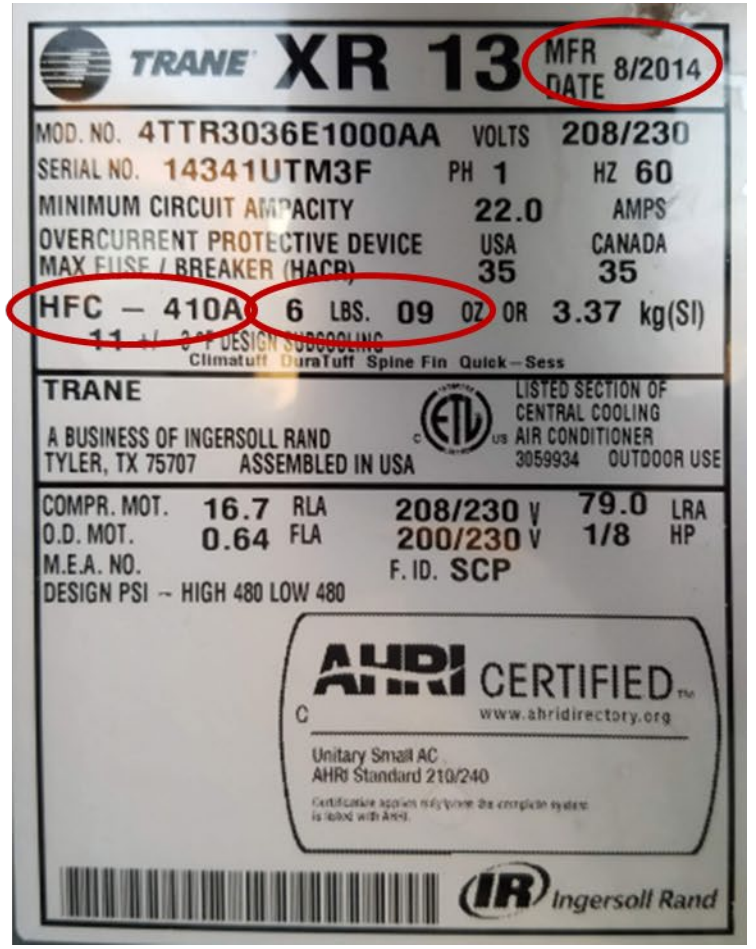
Definition of New AC Equipment

§ 95373. Definitions.

"New Air-conditioning Equipment" means any air-conditioning equipment that is first installed using new or used components, or a new condensing unit in an existing system, or a new evaporator unit in an existing system.

Requirements that Support Enforcement

- Recordkeeping (manufacturers)
- Labeling: date, refrigerant type + amount



Recordkeeping Requirements

§95377. Requirements Applicable to Table 3

- Recordkeeping: Any person who manufactures new AC equipment shall maintain for five years and make available, upon request:
  - Contact details of purchaser (name, address, telephone, email).
  - Model and serial number of the equipment and / or components where applicable.
  - Date of manufacture of the equipment.
  - Date of sale of the equipment.
  - The refrigerant type(s) the equipment is designed to use.
  - The refrigerant and full charge capacity of the equipment, where available.

Labeling Requirements

§95377. Requirements Applicable to Table 3

❖ Labeling: Display a label on the equipment that clearly and visibly indicates:

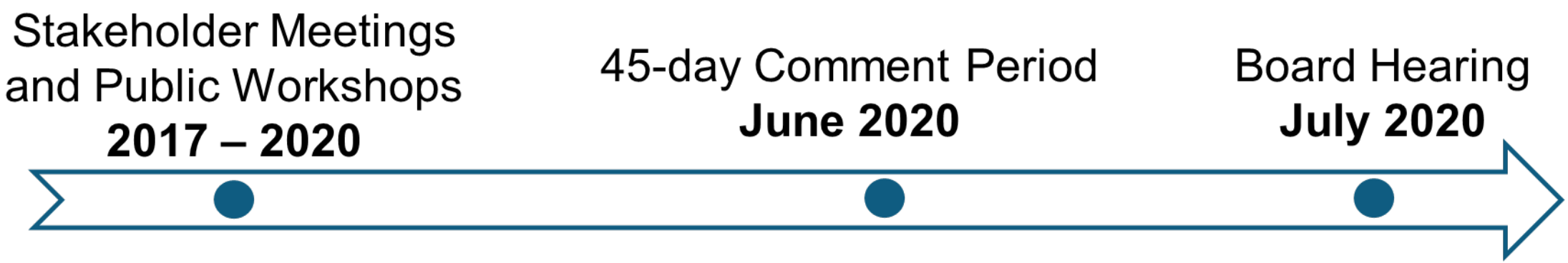
- The type of refrigerant.
- The refrigerant charge size in ounces, pounds, or kilograms; and
- The date of manufacture, indicating at a minimum, the four digit year of manufacture in standard format.
- Existing labels meeting these requirements may be used.

Next Steps

Next Steps and Anticipated Timelines

Stationary AC Equipment	
Public workshops and Stakeholder meetings	October 2017, October 2018
	Technical Working Group: March 6, 2019
	Technical Working Group: August 6, 2019
	2nd Workshop: January 2020
45-Day Notice	June 5, 2020
Board Meeting	July 23/24, 2020
Regulation Effective Date	January 1, 2023

Rulemaking Overview



Staff present regulatory concepts

Solicit stakeholder input

"Major" Regulation Econ Analysis - SRIA

Staff publishes proposal, costs and impacts in the "Initial Statement of Reasons" (ISOR or staff report)

Public may submit written or verbal comments on staff proposal to Board

Staff present proposal to Board

Board may accept proposal or direct staff to make changes

Feedback and Questions – Contact Us

Richie Kaur, Proposed HFC Regulation on Refrigeration
richie.kaur@arb.ca.gov

Kathryn Kynett, SB1013 and Proposed HFC Regulation on AC
kathryn.kynett@arb.ca.gov

Glenn Gallagher, SB1013 and Proposed HFC Regulations
glenn.gallagher@arb.ca.gov

Aanchal Kohli, Incentive Funding and Proposed HFC Regulations
aanchal.kohli@arb.ca.gov

Pamela Gupta, Manager, Greenhouse Gas Reduction Strategy Section
pamela.gupta@arb.ca.gov

Michael FitzGibbon, Branch Chief, Research Division
michael.fitzgibbon@arb.ca.gov

For more information, please visit:
https://ww2.arb.ca.gov/our-work/programs/stationary-hydrofluorocarbon-reduction-measures

Proposed Regulatory Language for Refrigeration Equipment

January 30, 2020

CALIFORNIA
AIR RESOURCES BOARD

Today's Presentation

- Background on Rulemaking Development
- Updated Proposed Rules for Refrigeration Equipment
- Draft Regulatory Text
- Next Steps and Anticipated Timelines

Background on Rulemaking Development

Original Proposal

Stationary Refrigeration: New equipment containing more than 50 lbs. of refrigerant, GWP < 150, starting January 1, 2022

All new equipment would be subject to this, irrespective of whether installed in new facilities / remodels / existing facilities

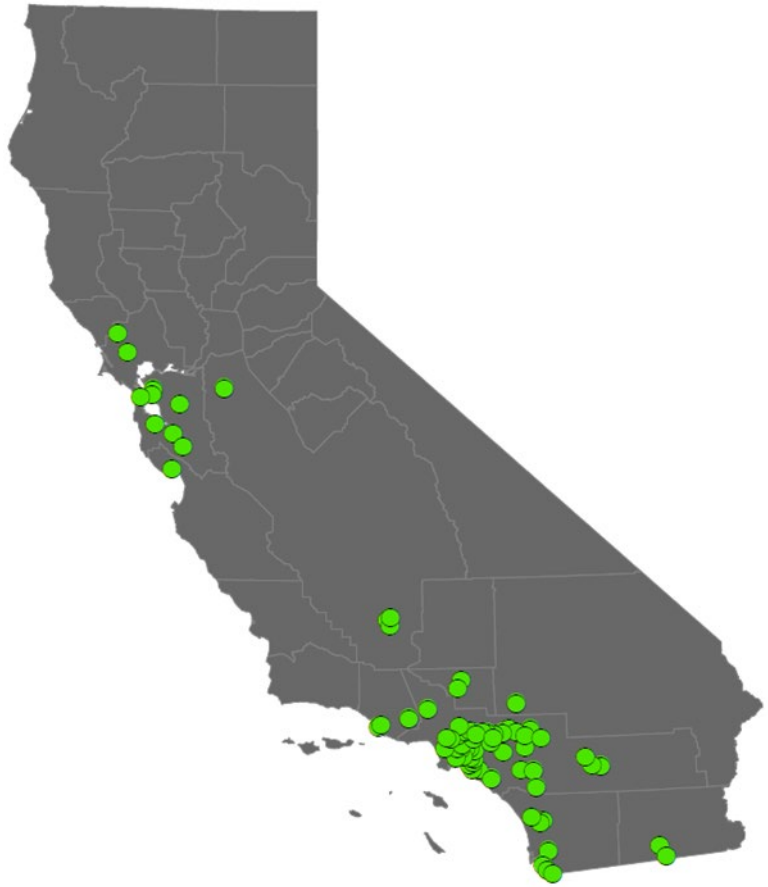
Affected Sectors for Stationary Refrigeration

- Commercial Refrigeration
- Industrial Process Refrigeration
- Cold Storage

Currently subject to RMP

Refrigeration Technologies GWP < 150

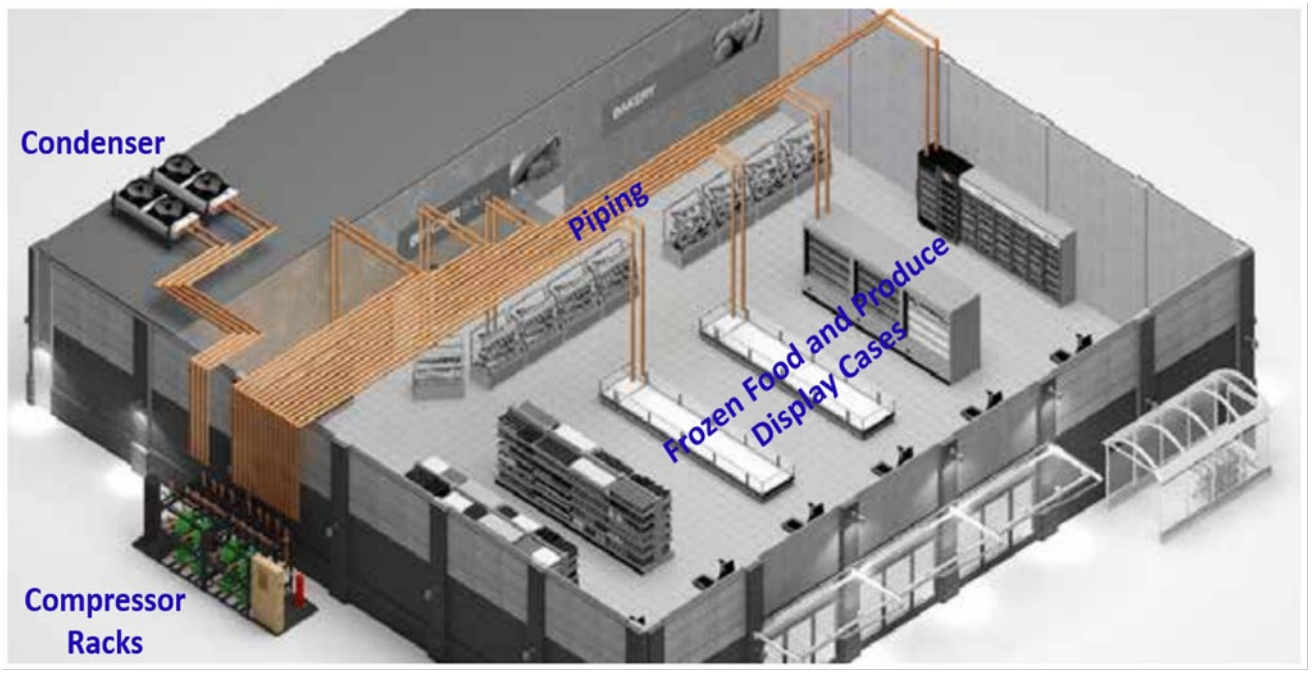
End-Use Sector	Low-GWP Options Currently Available
Retail Food Refrigeration (e.g., Supermarkets and grocery stores)	• Transcritical CO_2 • Ammonia/CO_2 cascade • Propane/CO_2 cascade • Micro-distributed Propane systems • HFO/CO_2 or HFOs-based systems
Industrial Process Refrigeration and Cold Storage	*Majority already use ammonia* others: Transcritical CO_2, NH_3/CO_2, Low-charge ammonia, HFO-based systems



80+ supermarkets in California using low-GWP refrigerants in 2019

Stakeholder Input to CARB about GWP < 150

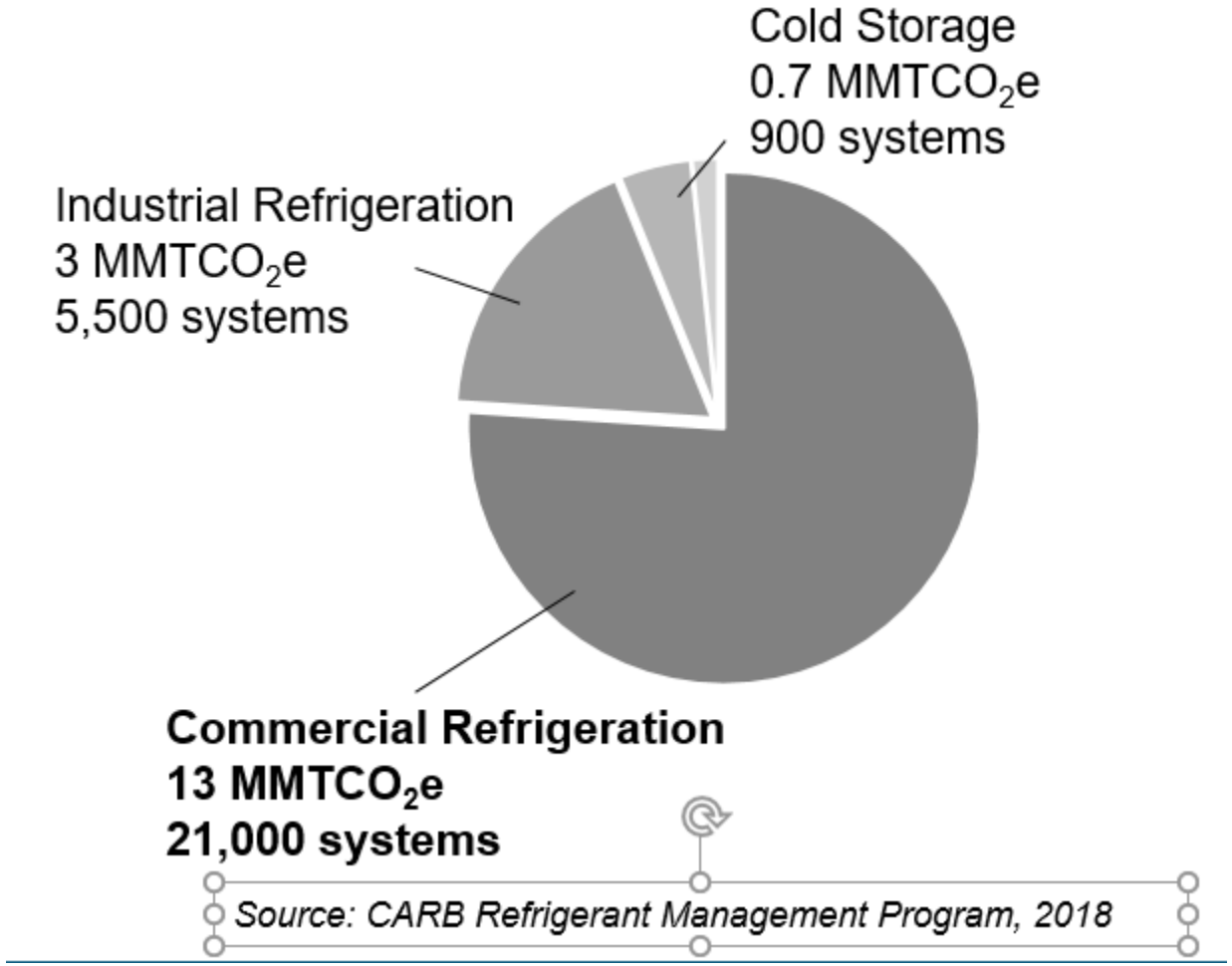
- GWP < 150 feasible in new construction and remodels
- Currently, in existing facilities:
  - GWP < 150 is expensive and logistically challenging



Original Image Source: Kysor Warren

Challenge: Feasibility of GWP < 150 in Existing Facilities

- Only 1 – 2% new facilities + remodels annually
- Most of the new systems will go into existing facilities
- Existing facilities / stores have the highest potential for emissions and reductions



How can Existing Facilities Reduce their Emissions?

HFC emissions (in CO_2 equivalents) =

System charge × Refrigerant GWP × Leak Rate

Ways to guarantee emissions reductions:

- GWP reduction
- Charge reduction (verification can be complicated)

(Leak rates factored under RMP)

End-user Input to CARB

CARB Proposed HFC Reduction Measure

New Systems
<150 GWP
(in new construction / remodels / existing facilities)

Hurdles

In Existing Stores
<150 GWP
Cost, Logistics, Capital cost threshold

End-User Alternative Proposals

New *Systems*
<150 GWP in New Construction / Remodels

Existing Stores Option 1:
Prescribed Retrofits

Existing Stores Option 2:
GHGp Reduction

CARB "Hybrid" Option

Existing Stores Option 3:
Weighted GWP Reduction

Option 1 for Existing Facilities

Prescribed Retrofits to GWP < 1,400

- Existing systems retrofit to GWP < 1,400 by 2030
- Certainty of emissions reductions, straightforward implementation
- Lacks flexibility – potentially every system (above 50 pounds) using high-GWP refrigerants would be affected

Option 2 for Existing Facilities

Greenhouse Gas Emission Potential (GHGp) Reduction

- GHGp = Σ(Charge × GWP)
- Reduce GHGp by 55% below 2018 baseline by 2030
- A per-company target, not per-system or per-store
- Flexible – don't have to convert / retrofit every single store or system
- Credit for charge and GWP reduction

Potential Challenges

- Tracking and reporting each company's baseline (sales, transfers etc.)
- Charge reduction – verification is difficult, needs additional recordkeeping / reporting
- No credit for "nominal" charge reduction; must accompany significant changes

Updated Proposed Rules for Stationary Refrigeration

Current (Updated) CARB Proposal for Refrigeration Equipment

I. New equipment in newly constructed facilities / major remodels, GWP < 150

II. For existing retail food facilities – Two compliance pathways: (1) weighted-average GWP reduction, (2) GHGp reduction

- Flexibility to plan over 8 – 10 years
- Prepares sector for future HFC phase-down / sales ban

Draft Regulatory Text

In the draft regulatory text -

- Existing CA SNAP / SB 1013 prohibitions are listed in Tables 1 and 2.
- New requirements are listed in Tables 3 and 4.

I. New Refrigeration Equipment

Requirement for New Refrigeration Equipment

§ 95374. List of Prohibited Substances.

Part of Table 3 in the draft regulatory text

General End-Use	Specific End-Use	Prohibited Substances	Effective Date
Refrigeration Equipment	Refrigeration equipment (new), non-residential, containing more than 50 pounds refrigerant	Refrigerants with a GWP of 150 or greater	Prohibited as of January 1, 2022

- Chillers and Ice Rinks have separate GWP limits (covered later)

Definition – New Refrigeration Equipment

§ 95373. Definitions (This definition applies to Table 3 only)

"New Refrigeration Equipment": Any refrigeration equipment that is first installed using new or used components or a combination of new and used components in the following:
(A) New construction; or
(B) In an existing facility not previously used for retail food, commercial, cold storage, or industrial refrigeration; or
(C) In an existing facility, replacement of 75 percent or more of: compressors, condensers, and connected evaporator loads.

Question: Does (C) adequately cover "major remodels"?

Requirements for Equipment Manufacturers

§95377. Requirements Applicable to Table 3

- Labeling: Display a label on the equipment that clearly and visibly indicates:
  - The type of refrigerant.
  - The refrigerant charge size in ounces, pounds, or kilograms; and
  - The date of manufacture, indicating at a minimum, the four digit year of manufacture in standard format.
  - Existing labels meeting these requirements may be used.

Question: Do existing labels meet the above requirements?

Requirements for Equipment Manufacturers

❖Recordkeeping: Any person who manufactures new motor-bearing refrigeration equipment shall maintain for five years and make available, upon request:

- Contact details of purchaser (name, address, telephone, email).
- Model and serial number of the equipment and / or components where applicable.
- Date of manufacture of the equipment.
- Date of sale of the equipment.
- The refrigerant type(s) the equipment is designed to use.
- The refrigerant and full charge capacity of the equipment, where available.

Similar requirements as under the original 2018 "CA SNAP" regulation (Section § 95375)

II. Existing Retail Food Facilities

Requirements for Existing Retail Food Facilities

§ 95374. Table 4: Compliance Requirements for Companies with Retail Food Facilities.

Retail Food Facilities	Requirement	Effective Date
Companies owning or operating 20 or more retail food facilities	Attain a company-wide weighted-average GWP of 2,500 or a 25% reduction in GHGp below 2018 levels	January 1, 2026
	Attain a company-wide weighted-average GWP of 1,400 or a 55% reduction in GHGp below 2018 levels	January 1, 2030
Companies owning or operating fewer than 20 retail food facilities	Attain a company-wide weighted-average GWP of 1,400 or a 55% reduction in GHGp below 2018 levels	January 1, 2030

Weighted-average GWP and GHGp calculated based on refrigeration systems > 50 pounds of refrigerant only

Applicability and Relevant Definitions

§ 95373. Definitions.

❖"*Company*" means all businesses, affiliates, brands, subsidiaries, or franchises, owned under the same parent company.

❖"*Retail Food Facility*" means a facility that sells food and uses at least one retail food refrigeration equipment or refrigeration system with more than 50 pounds of a refrigerant with a GWP of 150 or greater. Retail food facility includes supermarkets, grocery stores, convenience stores, restaurants and other food service establishments.

<u>Retail food facilities subject to CARB's RMP will be subject to these requirements.</u>

Weighted-Average GWP and GHGp - Definitions

§ 95373. Definitions.

- *Weighted-Average GWP* = $\frac{\Sigma(\text{charge} \times \text{GWP})}{\Sigma\ \text{charge}}$
- *GHGp* = Σ(Charge × GWP)
- *Baseline Greenhouse Gas Potential*" or "Baseline GHGp" means the greenhouse gas potential (GHGp) of a company's retail food facilities in calendar year 2018.

- The 'Baseline GHGp' will be revised when any of the following occur:

(A) Retail food facilities that are sold, transferred, or closed will be removed from the baseline GHGp.

(B) Acquired retail food facilities will be added to the baseline GHGp using their 2018 GHGp levels, and the current GHGp of acquired stores will be used to calculate the current GHGp.

Registration Requirements for Retail Food Facilities

§95378. Requirements Applicable to Table 4

- *Choosing a Compliance Requirement for Retail Food Facilities.*
  - Weighted-average GWP Reduction by default.
  - Opt-in for GHGp Reduction by March 1, 2022, via R3

- One-time registration for GWP < 150 facilities (systems > 50 pounds)
  - No implementation fee
  - Same system details as given currently under CARB's RMP

  (RMP: Refrigerant Management Program)

§95378. Requirements Applicable to Table 4

Starting 2022, annually report company's weighted-average GWP or GHGp if opted-in, along with RMP annual reports

Via R3, by March 1 of the following calendar year

NOTE: Additional reporting requirements for verification of charge reduction are being considered.

Recordkeeping Requirements for Retail Food Facilities

§95378. Requirements Applicable to Table 4

❖Records showing your GHGp / weighted-average GWP calculations for each year (spreadsheets etc.)

❖When any changes are made to GWP of the refrigerant and / or charge of a system, keep records:

Full charge, before and after
Means by which full charge was determined, before and after
Type of refrigerant, before and after
Amount of refrigerant removed, amount stored / sent, where it was sent
Date of system retirement / removal
For retired systems - amount of refrigerant removed, where it was sent afterwards
The records must include documentation such as, invoices, receipts, records of shipments, plans, or work details, that are generated from a third party, such as a service technician or refrigerant reclaimer.

III. Chillers

Definition for Chillers

§ 95373. Definitions.

"*Chiller*" means a water or heat transfer fluid chilling equipment package custom built in place, or a factory-made and prefabricated assembly of one (1) or more compressors, condensers and evaporators, with interconnections and accessories including controls, designed for the purpose of cooling or heating water or a heat transfer fluid. A chiller is a machine specifically designed to make use of a vapor compression refrigeration cycle or absorption refrigeration cycle to transfer heat from a cold water or heat transfer fluid circulating system to the air, a heat transfer fluid, or other heat exchange media. Chillers can be water-cooled, air-cooled, or evaporatively cooled. Chillers include rotary chillers, centrifugal chillers, and positive displacement chillers, including reciprocating, scroll, and screw chillers. For the purpose of this regulation, "chiller" includes those used for comfort cooling, or space and area cooling, or industrial process cooling.

Question: Input on the definition?

GWP Limit for Chillers

§ 95374. List of Prohibited Substances.
Part of Table 3 in the draft regulatory text

General End-Use	Specific End-Use	Prohibited Substances	Effective Date
Chillers – Air conditioning, Industrial Process Cooling			
Chillers	Chillers (new) designed for minimum evaporator temperature > -15 °F (-26 °C)	Refrigerants with a GWP of 750 or greater	Prohibited as of January 1, 2024
Chillers	Chillers (new) designed for minimum evaporator temperature -15 °F (-26 °C) through -58 °F (-50 °C)	Refrigerants with a GWP of 2200 or greater	Prohibited as of January 1, 2024

Definition of New Chillers

§ 95373. Definitions.

"New Chiller" or *"New Chiller Equipment"* means any of the following:

(A) First installed using new or used components, or a combination of new or used components; or

(B) Modified such that:

(i) The capacity is increased through the addition of motor-bearing components, including evaporators, compressors, or condensers, or

(ii) The system has experienced replacements of motor-bearing components in full or exceeding 50 percent of the capital cost of replacing all the motor-bearing components in the entire chiller system.

GWP Limit for Ice Rinks

§ 95374. List of Prohibited Substances.

Part of Table 3 in the draft regulatory text

General End-Use	Specific End-Use	Prohibited Substances	Effective Date
Ice Rinks			
Ice Rinks	Refrigeration Equipment (new) and Chillers (new) used in Ice Rinks	Refrigerants with a GWP of 750 or greater	Prohibited as of January 1, 2024

Next Steps and Anticipated Timelines

Next Steps and Anticipated Timelines

Stationary Refrigeration Equipment	
Public workshops and Stakeholder meetings	October 2017, October 2018
	Technical Working Group: August 6, 2019
	2nd Workshop: January 2020
45-Day Notice	June 5, 2020
Board Meeting	July 23/24, 2020
Regulation Effective Date	January 1, 2022

Please provide feedback on the draft regulatory text by Friday, February 21st by emailing us at HFCReduction@arb.ca.gov

Question Recap – CARB requests your feedback

- New Refrigeration Equipment
  - Definition of "New Refrigeration Equipment" part (C) adequately cover "major remodels"?
  - Do existing labels meet the labeling requirements?

- Existing Retail Food Facilities
  - Reporting requirements to verify charge reductions

- Any other topics?

Thank you for listening!

CARB welcomes your feedback.

Feedback and Questions – Contact Us

Richie Kaur, Proposed HFC Regulation on Refrigeration
richie.kaur@arb.ca.gov

Kathryn Kynett, SB1013 and Proposed HFC Regulation on AC
kathryn.kynett@arb.ca.gov

Glenn Gallagher, SB1013 and Proposed HFC Regulations
glenn.gallagher@arb.ca.gov

Aanchal Kohli, Incentive Funding and Proposed HFC Regulations
aanchal.kohli@arb.ca.gov

Pamela Gupta, Manager, Greenhouse Gas Reduction Strategy Section
pamela.gupta@arb.ca.gov

Michael FitzGibbon, Branch Chief, Research Division
michael.fitzgibbon@arb.ca.gov

For more information, please visit:
https://ww2.arb.ca.gov/our-work/programs/stationary-hydrofluorocarbon-reduction-measures

SB 1013 Incentive Program

F-Gas Reduction Incentive Program (FRIP)

January 30, 2020

FRIP Workshop Agenda

- GGRF Requirements and Guidelines
- Process and Timeline of Funding Program
- Eligible Technologies and Funding Amounts
- Agency and Utility Announcements
- Stakeholder Feedback

Background

- SB 1013 established an incentive program to "promote the adoption of new refrigerant technologies to achieve short- and long-term climate benefits, energy efficiency, and other cobenefits…"
- $1 million allocated in the FY 2019-20 budget from the Greenhouse Gas Reduction Fund (GGRF) (AB 74, Budget Act of 2019)
- GGRF appropriations fall under the umbrella of California Climate Investments

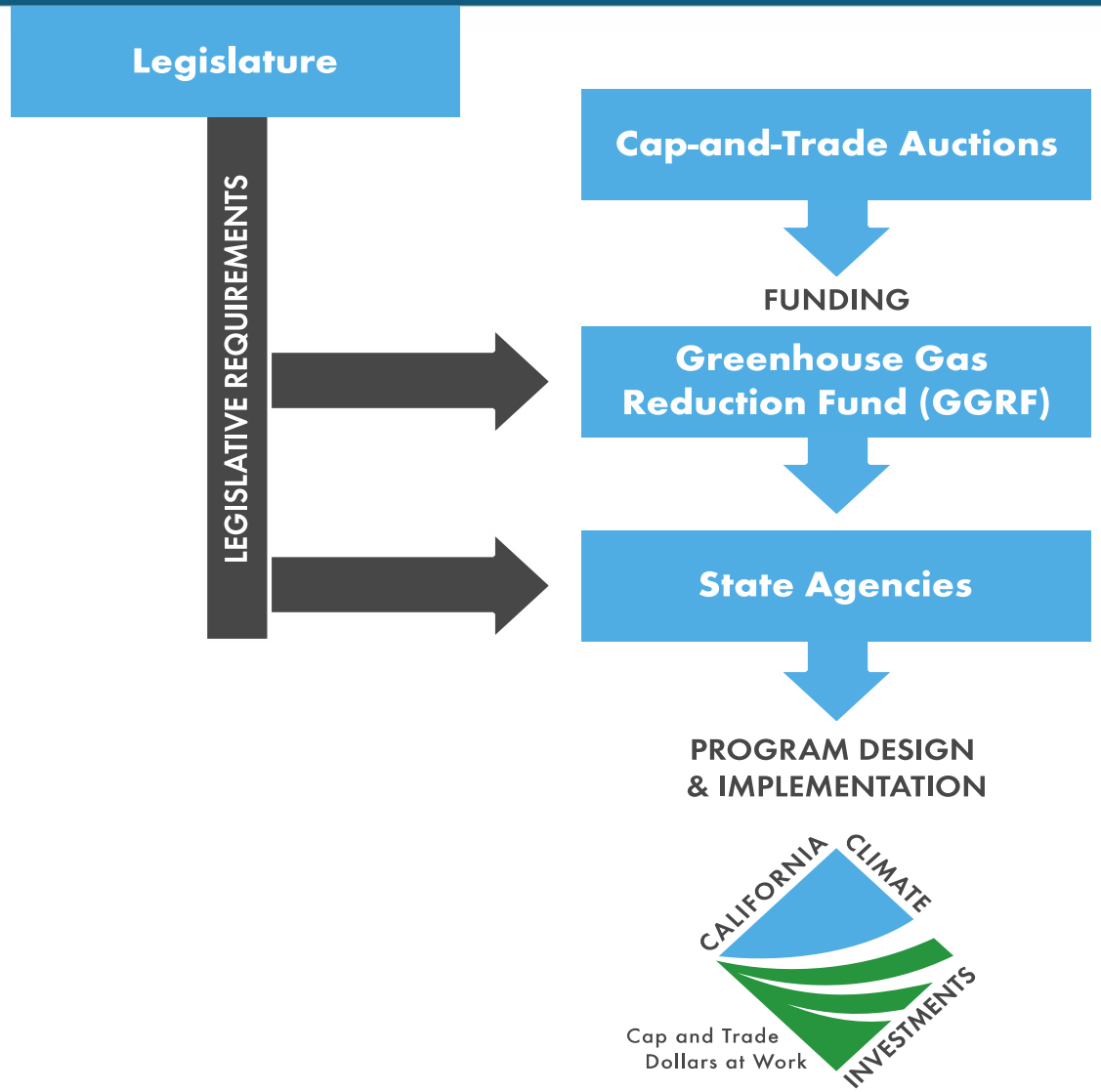
Image source: Depositphotos.com

California Climate Investments (CCI)

What is California Climate Investments?

A statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy and improving public health and the environment—particularly in disadvantaged communities.

California Climate Investments



California Climate Investments

Requirements	Recommendations
GHG emission reductions	Encourage projects that contribute to other State goals
Benefit priority populations	Coordinate investments to provide multiple benefits and maximize benefits
Maximize economic, environmental, and health co-benefits	Conduct outreach to help applicants access funding
Foster job creation and job training	
Avoid burdens to priority populations	
Ensure transparency and accountability	

CCI Program Steps and Resources

Step	Purpose
Expenditure Record	Legal document that describes how the program will meet the statutory requirements of California Climate Investments.
Program Guidelines	Provide applicants information on the program structure and requirements, who and what technologies are eligible, funding amount available, project selection criteria, application procedures and key deadlines.
Quantification Methodology	Excel-based tool provided by CARB for applicants to quantify GHG emission reductions from project.
Solicitation/Application Materials	Materials that need to be submitted by potential applicants

FRIP Program Timeline

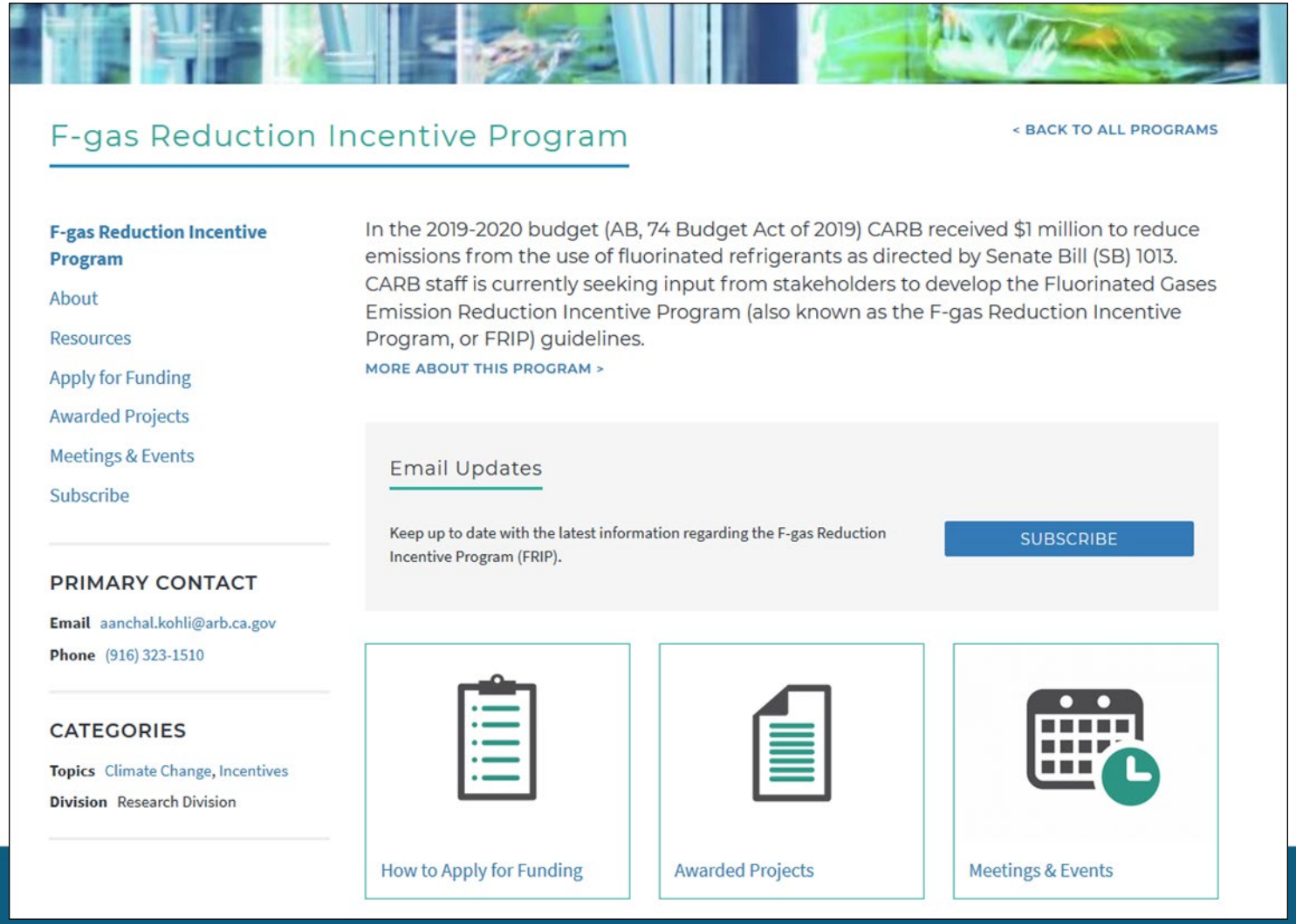
1st Public workshop	January 30, 2020
Expenditure Record	January 2020 (complete)
Stakeholder input on Program Structure	January-March 15, 2020
Draft program guidelines release	April 2020
2nd Public Workshop/Webinar	May 2020
Program Solicitation Open	Summer 2020 (8 weeks)
Awards Announcement	Fall 2020
Funds disbursement	Reimbursement system
Encumbrance Deadline	**June 30, 2021**
Liquidation Deadline	**June 30, 2025**

Proposed Application Process

- Open solicitation period 8 weeks in summer 2020
- Technical assistance before and during application process
- Applicants expected to submit the following materials:
- Project Narrative
- GHG Emission Reductions and other co-benefits using Quantification Methodology
- Plan for training contractors in low-GWP technologies
- Other materials

FRIP Website

https://ww2.arb.ca.gov/our-work/programs/f-gas-reduction-incentive-program



Proposed Funding Eligibility

- "Eligible applicants shall be users of systems of refrigerant technologies (SB 1013)"
- Open funding only to the retail food sector (i.e. owners and operators of refrigeration systems)
- Discussion of Funding eligibility
  - Retail food sector only
  - Systems > 50 lbs. only

Preliminary Ideas for Eligible Technologies and Funding Amounts

Proposed Eligible Technologies and Funding Amounts

- Tier I – Innovative Technologies ($500,000)
  - Partial or full installations of systems using ultra-low GWP refrigerants (GWP <10) in new and existing stores
- Tier II – Conventional Technologies ($500,000)
  - Refrigerant Retrofits from R-404A/R-507A to R-448A/R-449A
  - Refrigerant retrofits from R-404A/R-507A to R-448A/R-449A accompanied by permanent charge reduction of 25% (or greater) through system architectural changes

Proposed Tier I Funding ($500,000)

- Funding amount available - Maximum amount of $150,000 per applicant or 100% of the cost premium, whichever is lower
- Examples of eligible technologies for partial or full retrofits/new installations
  - CO_2 condensing units
  - HFC-free HVAC integrated refrigeration systems
  - CO_2 transcritical with ejectors or other enhancements
  - NH_3 or propane or HFO/CO_2 cascade systems
  - R-290 microdistributed systems

Proposed Scoring Criteria for Tier I Funding

- Competitive solicitation
- Technical Merit for technology type
- GHG reductions possible through refrigerant reductions and energy efficiency
- Requirements for funding recipients
  - Training in low-GWP technologies open to contractors in the area
  - Prepare case study after 6 months of operation
- Extra Points
  - Match funding from utility
  - Existing store
  - Facility located in disadvantaged community or independently owned

Tier I Funding Discussion

- Match funding requirement
- Prescriptive about eligible technologies
- Connecting OEMs with eligible technologies to retailers
- GHG Emission Reduction Baseline
  - Refrigerant baseline: R-448A/R-449A
  - Energy efficiency baseline: R-448A/R-449A with/without adiabatic condenser
- One incentive/company and potentially two incentives/company for CO_2 condensing units

Proposed Tier II ($500,000)

- Refrigerant retrofit cost estimated at $45/lb.
- Incentives offered for:
  - 25% of refrigerant retrofit cost (~$11/lb.)
  - 50% of refrigerant retrofit cost if also accompanied by a permanent charge reduction of 25% or greater? (~$22/lb.)

Proposed Scoring Criteria for Tier II Funding

- Rolling basis with some scoring criteria
- GHG reductions with refrigerant retrofit and charge reduction relative to baseline (R-404A/R-507A → R-448A/R-449)
- Requirements:
  - Guidance documents for retrofits included in the grant agreement
  - Reclaimed refrigerant must be properly managed
- Extra points:
  - Match funding from utility
  - Located in disadvantaged community or independently owned

Tier II Funding Discussion

- 25% of retrofit costs
- Is a 25% or higher permanent charge reduction reasonable?
- What about 50% of the refrigerant retrofit cost for a 25% charge reduction and refrigerant retrofit?
- Leak management after retrofits
- Prescriptive guidance documents for retrofits
- Management of recovered refrigerant
- Factoring in energy efficiency of retrofits

Proposed Funds Disbursement

- GGRF funds are disbursed on a reimbursement system
- Reimbursement:
  - Paying for engineering design services rather than equipment cost (although that amount may not be enough for the funding award)
  - Paying for partial equipment
  - Paying for the wholesale refrigerant purchase and/or valves for the refrigerant conversion, which should cover 25% of the cost of a refrigerant retrofit

Timeline and Supermarket Planning

- Solicitation period (8 weeks) and supermarket planning over the next few months

Public Agency Announcements

- California Public Utilities Commission (CPUC)
- Southern California Edison (SCE)
- Los Angeles Department of Water and Power (LADWP)
- Sacramento Municipal Utility District (SMUD)

Stakeholder Feedback

Please provide feedback by March 15, 2020

Aanchal Kohli, D. Env.

F-Gas Reduction Incentive Program Lead

Aanchal.Kohli@arb.ca.gov

(916)-323-1510