

THE STATE OF REFRIGERANT REGULATIONS

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The United States Environmental Protection Agency (EPA), which regulates refrigerant use and handling, issued SNAP Rules 20 and 21 in 2015 and 2016 to eliminate the use of refrigerants with high global warming potential (GWP). Amongst those were R-404A and R-507A, two essential refrigerants used in commercial refrigeration and cold storage warehouses for decades.

In 2017 and 2019, those rules were vacated by the Washington, D.C., Circuit Court of Appeals, which ruled that the EPA did not have jurisdiction to restrict use of HFC refrigerants, and the EPA withdrew the rules to comply with the court's decision. Since then, several states have formed the United States Climate Alliance (USCA), pledging to implement SNAP Rules 20 and 21 at the state level.

With each state responsible for implementing their own rules, the state-by-state regulations vary enough to be confusing. Generally, each state adopts the same EPA requirements to eliminate R-404A and R-507A, but the states use different effective dates and varying definitions of "new" or "retrofit" equipment. This is where Zero Zone can help decipher this complex puzzle. Consider this article as a resource for state regulations of refrigerants and refrigeration applications.

The Mission of the U.S. Climate Alliance

The United States Climate Alliance (USCA) is a group of states and governors who have committed to reducing greenhouse gas emissions and carbon pollution. Their goals mirror the goals of the 2016 Paris Agreement to reduce greenhouse gas emissions by at least 26-28% below 2005 levels by 2025. In 2018, the USCA reported that their states generated 40% of U.S. greenhouse gas emissions, making them equivalent to the world's sixth largest emitter. This means there is a lot of opportunity to make a global impact by reducing emissions. In fact, the USCA reported that these states have already reduced greenhouse gas emissions by 14% from 2005 to 2016.

While the USCA is not a governing organization with the authority to create laws, they are a coalition that calls for states to lead the way toward climate change. States within the USCA are accomplishing this by implementing policies that are similar to the vacated EPA SNAP Rules 20 and 21. The USCA brings these states together in a place where they can report their progress, share their successes, and learn from each other. The USCA works closely with states and the industry in an effort to maintain uniformity as much as possible.

Banned Refrigerants

The EPA SNAP Rules 20 & 21 targeted the phase out and elimination of refrigerants with very high GWP. The most widely used of these were **R-404A** and **R-507A**.

- **Supermarket Systems (new):** HFC-227ea, **R-404A**, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, **R-507A**.
- **Supermarket Systems (retrofit):** **R-404A**, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, **R-507A**.
- **Remote Condensing Units (new):** HFC-227ea, **R-404A**, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, **R-507A**.
- **Remote Condensing Units (retrofit):** **R-404A**, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, **R-507A**.
- **Stand-Alone Units (retrofit):** **R-404A**, **R-507A**.
- **Cold Storage Warehouses (new):** HFC-227ea, R-125/290/145a/600a, **R-404A**, R-407A, R-407B, R-410A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-423A, R-424A, R-428A, R-434A, R-438A, **R-507A**, and RS-44.

We recommend contacting your own state's environmental regulatory department to determine whether a project would be considered "new," "retrofit," or a "remodel." Brand new equipment or retrofit refrigerant may be obvious, but a remodel may or may not qualify because the definitions can be broad (**Figure 1**).

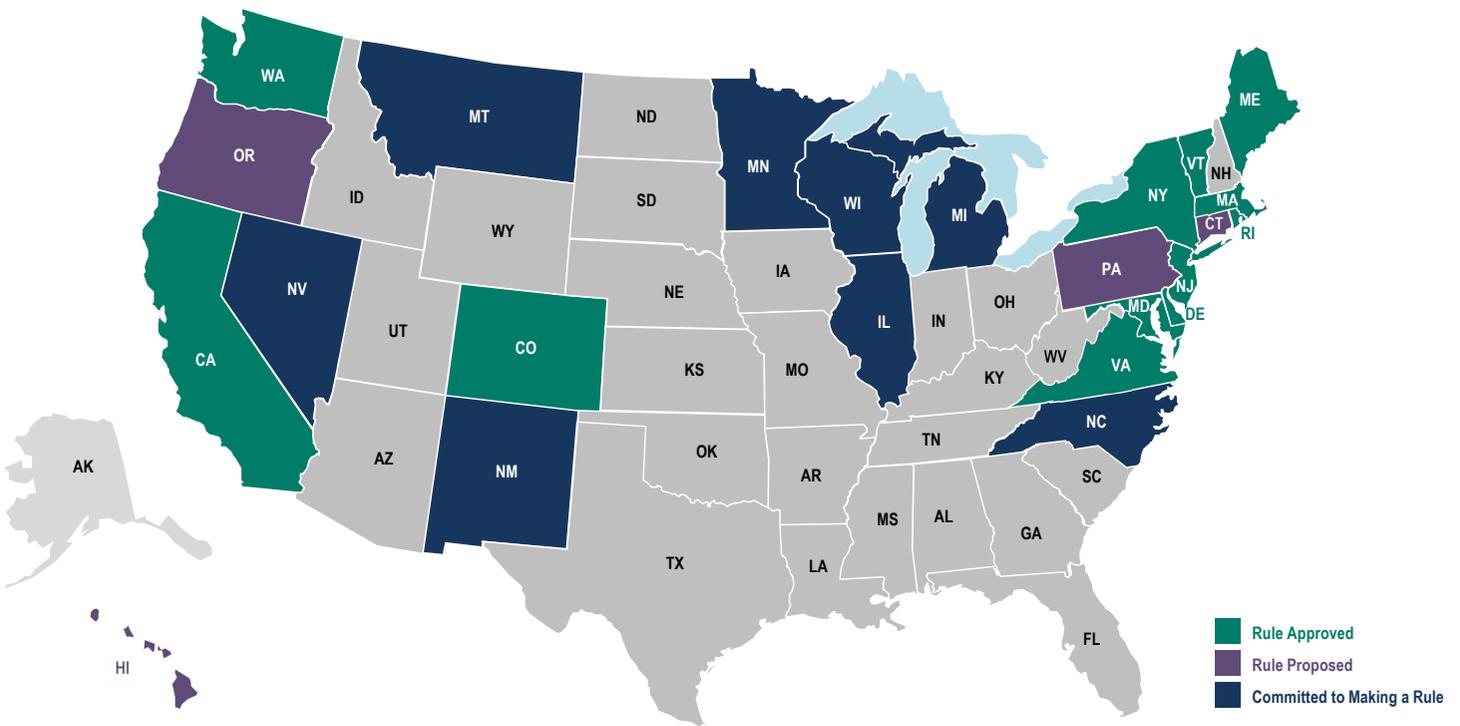
FIGURE 1: Example of Colorado Definitions

I.B.24. "New" means products or equipment that are manufactured after the date of prohibition or equipment first installed for an intended purpose with new or used components after the date of prohibition, expanded by the addition of components to increase system capacity after the date of prohibition, or replaced or cumulatively replaced such that the cumulative capital cost of replacement after the date of prohibition exceeds 50% of the capital cost of replacing the whole system.

State-by-State Refrigerant Regulations Map

Every USCA state has committed to making rules, and they are in various stages of the rulemaking process. No states outside of the USCA have made that commitment. On our map (Figure 2), "Rule Approved" means that the rule has been approved, but the effective date has not necessarily passed. Check the implementation dates in "Figure 3: Effective Dates by State" on page 5.

FIGURE 2: Refrigerant Regulations Map by State



This map will be updated as more states announce regulations.

Effective Dates

States have been using the date the system is operational/charged or installed as the effective date. When components are assembled into a system, some states may define the effective date as the installation date instead of the component manufactured date. The date a system is turned on can be difficult to predict, and it shortens the time available to purchase equipment. **It is critical to verify how your state defines the effective date.**

FIGURE 3: Effective Dates by State

State	Basic SNAP 20 & 21 Rules	Supermarket (new)	Supermarket (retrofit)	Supermarket (major remodel)	Condensing Unit (new)	Condensing Unit (retrofit)	Cold Storage Warehouse	Definition of Effective Date
California	Rule Approved	1/1/2019	1/1/2019	1/1/2019	1/1/2019	1/1/2019	1/1/2023	
Colorado	Rule Approved	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2023	Operational Date
Connecticut	Rule Proposed	TBA	TBA	TBA	TBA	TBA	TBA	
Delaware	Rule Approved	9/1/2021	9/1/2021	9/1/2021	9/1/2021	9/1/2021	1/1/2023	Installation Date
Hawaii	Rule Proposed	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2023	
Illinois	Committed to Making a Rule							
Maine	Rule Approved	1/1/2022	1/1/2022	1/1/2022	1/1/2022	1/1/2022	1/1/2023	Manufacture Date
Maryland	Rule Approved	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2023	Operational Date
Massachusetts	Rule Approved	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2023	Operational Date
Michigan	Committed to Making a Rule							
Minnesota	Committed to Making a Rule							
Montana	Committed to Making a Rule							
Nevada	Committed to Making a Rule							
New Jersey	Rule Approved	7/1/2020	7/1/2020	7/1/2020	7/1/2020	7/1/2020	1/1/2023	Installation Date
New Mexico	Committed to Making a Rule							
New York	Rule Approved	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2023	Operational Date
North Carolina	Committed to Making a Rule							
Oregon	Rule Proposed	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2023	
Pennsylvania	Rule Proposed	TBA	TBA	TBA	TBA	TBA	TBA	
Rhode Island	Rule Approved	1/1/2022	1/1/2022	1/1/2022	1/1/2022	1/1/2022	1/1/2023	Installation Date
Vermont	Rule Approved	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2021	1/1/2023	Installation Date
Virginia	Rule Approved	1/1/2022	1/1/2022	1/1/2022	1/1/2022	1/1/2022	1/1/2023	Installation Date
Washington	Rule Approved	1/1/2020	1/1/2020	1/1/2020	1/1/2020	1/1/2020	1/1/2023	Installation Date
Wisconsin	Committed to Making a Rule							

This table will be updated as more states announce regulations.

California Air Resources Board (CARB)

California has been leading the way with the USCA by planning regulations beyond the SNAP 20 and 21 requirements. The California legislature passed Senate Bill (SB) 1383, which requires that HFC refrigerant levels must be reduced by 40% from 2013 levels by 2030. The California Air Resources Board (CARB) has been developing regulations to comply with that law.

The proposed regulations can be found on the CARB website by searching for [“Prohibitions on Use of Certain Hydrofluorocarbons.”](#) These regulations will limit some systems with more than 50 lbs. of refrigerant to refrigerants with GWP as low as 150 (Figure 4). **Please note that the following proposed limits and effective dates are not finalized.**

FIGURE 4: California Air Resources Board (CARB) Proposal for New Equipment

Type of System	Less Than 50 lbs. of Refrigerant			More Than 50 lbs. of Refrigerant		
	Proposed GWP Limit	Effective Date	Definition of New	Proposed GWP Limit	Effective Date	Definition of New
Retail Food Equipment - All Facilities	See Footnote A	1/1/2019	See Definition 1	150	1/1/2022	See Definition 2
Cold Storage - All Facilities	See Footnote B	1/1/2023	See Definition 1	150	1/1/2022	See Definition 2
Industrial Process Refrigeration - New Facilities (excludes chillers)	No Rules			150	1/1/2022	See Definition 2
Industrial Process Refrigeration - Existing Facilities (excludes chillers)	No Rules			2,200	1/1/2022	See Definition 2
Ice Rinks - New Facilities	No Rules			150	1/1/2024	See Definition 2
Ice Rinks - Existing Facilities	No Rules			750	1/1/2024	See Definition 2
Chillers > 35°F - New Facilities ^c	750	1/1/2024	See Definition 3	750	1/1/2024	See Definition 3
Chillers -10°F to 35°F - New Facilities ^c	1,500	1/1/2024	See Definition 3	1,500	1/1/2024	See Definition 3
Chillers -58°F to -10°F - New Facilities ^c	2,200	1/1/2024	See Definition 3	2,200	1/1/2024	See Definition 3
Other Refrigeration ^d	No Rules			150	1/1/2022	See Definition 2

^a Banned refrigerations from EPA SNAP Rules 20 & 21: HFC-227ea, **R-404A**, R-407B, R-421B, R-422A, R-422C, R-422D, R-428A, R-434A, **R-507A**.

^b Banned refrigerations from EPA SNAP Rules 20 & 21: HFC-227ea, R-125/290/134a/600a (55.0/1.0/42.5/1.5), **R-404A**, **R-407A**, R-407B, R-410A, R-410B, R-417A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-423A, R-424A, R-428A, R-434A, R-438A, **R-507A**, and RS-44 (2003 composition).

^c CARB defines the chiller temperatures as the “fluid leaving temperature.”

^d “Other Refrigeration” refers to either a) stationary, non-residential refrigeration equipment that is not used for retail food, cold storage, industrial process refrigeration, ice rinks, or air conditioning, or b) stationary, non-residential refrigeration equipment that is used for two or more applications.

One prevailing question is about the definition of new vs. existing equipment and new vs. existing facilities. The definitions below, which use language from the CARB proposal, explain when modifications cause a system to be considered new.

- **Definition 1: New Refrigeration Equipment (systems below 50 lbs.)** means any refrigeration equipment that is:
 - (A) First installed using new or used components, or a combination of new or used components, or
 - (B) Modified such that (i) the nominal compressor capacity is increased, or (ii) the system has experienced cumulative replacements, within any 3-year time period, of components in full or exceeding 50% of the capital cost of replacing the entire refrigeration system, excluding the cost of refrigerated display cases.
- **Definition 2: New Refrigeration Equipment (systems above 50 lbs.)** means any refrigeration equipment in a new facility that is first installed using new or used components, or a combination of new or used components, in the following:
 - (A) New construction, or
 - (B) An existing facility not previously used for cold storage, retail food refrigeration, commercial refrigeration, industrial process refrigeration, or ice rinks, or
 - (C) An existing facility used for cold storage, retail food refrigeration, commercial refrigeration, or industrial process refrigeration with a replacement of 75% or more of evaporators (by number), 100% of compressor racks, 100% of condensers, and connected evaporator loads.

- Definition 3: “New Chiller” or “New Chiller Equipment” (systems above or below 50 lbs.)** means any chiller equipment or chiller system that is:
 - (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 cumulative replacements, within any 3-year time period, of motor-bearing components in full or exceeding 50% of the capital cost of replacing all the motor-bearing components in the entire chiller system.
- Definition 4: “New Facility”** means any refrigeration end use that is:
 - (A) New construction, or
 - (B) An existing facility not previously used for cold storage, retail food refrigeration, commercial refrigeration, industrial process refrigeration, or ice rinks, or
 - (C) An existing facility used for cold storage, retail food refrigeration, commercial refrigeration, or industrial process refrigeration with a replacement of 75% or more of evaporators (by number), 100% of compressor racks, and 100% of condensers.

CARB has proposed regulations to require existing retail locations to convert to lower GWP refrigerants. The formulas in **Figure 5** and **Figure 6** and effective dates in **Figure 7** would move stores toward the law’s requirement for HFC reductions.

FIGURE 5: Greenhouse Gas Potential Reduction

$$GHGp = \Sigma (\text{Charge} \times GWP)$$

FIGURE 6: Weighted Average GWP Reduction

$$WAGWP = \frac{\Sigma (\text{Charge} \times GWP)}{\Sigma \text{Charge}}$$

FIGURE 7: California Air Resources Board (CARB) Proposal

Existing Facilities	Reduction Below 2019 Levels	Effective Date
More than 20 Stores	GHGp > 25% or WAGWP < 2,500	1/1/2026
Both More or Less than 20 Stores	GHGp > 55% or WAGWP < 1,400	1/1/2030

CARB recognizes that new technology with lower GWP may be more expensive than HFC options, so they are developing incentive programs which will help stores by easing their transition. More information is available on the CARB website: <https://ww2.arb.ca.gov/resources/documents/low-gwp-incentives>.

CARB has proposed a provision for building permits, which would be useful for any in-progress projects. “**Approved Building Permits:** The prohibitions in Section 95374(c) (“**Figure 3: Effective Dates by State**” on page 5) do not apply to any facility with new refrigeration equipment that received an approved building permit before the effective date.” Please note that the application process can take time, so we recommend pursuing this soon.

What’s happening in Canada, eh?

With the exception of Quebec, Canada will be limiting refrigerants for certain applications based on their GWP (**Figure 8 on page 8**). In each of these cases, R-404A and R-507A would no longer be available, and many other refrigerants would be restricted in certain categories.

FIGURE 8: Canadian Regulations (except for Quebec)

Type of System	GWP Limit	Effective Date
Self-Contained Medium-Temperature Systems	1,400	1/1/2020
Self-Contained Low-Temperature Systems	1,500	1/1/2020
Centralized Systems	2,200	1/1/2020
Condensing Units	2,200	1/1/2020
Chiller System with Primary and Secondary Coolant	750	1/1/2025
Mobile Systems (Transportation)	2,200	1/1/2025

Quebec took a separate approach on refrigerant regulations that accounts for the power rating of the unit. These regulations took effect on 1/1/2021.

- Food preservation equipment that is larger than 50 kW (67 HP) must use a refrigerant with a GWP lower than 150. Equipment that is smaller must use a refrigerant with a GWP lower than 1,500.
- Commercial, industrial, and institutional equipment must use a refrigerant with a GWP lower than 1,500, regardless of the size of the equipment.

Canada is also working on phasing down all HFC refrigerants, a plan that started in 2018 and will continue until 2036, when their HFC consumption will be reduced by 85%.

Summary

Some U.S. states have taken responsibility for regulating the reduction of HFC refrigerants with high global warming potential (GWP). This will push both commercial and industrial refrigeration toward using HFCs and HFOs with lower GWP or toward natural refrigerants such as ammonia and CO₂.

While states are generally targeting the same refrigerants, they tend to adopt differing definitions for new or retrofit equipment and for effective date. It is best to contact your state's environmental regulatory agency to ensure you understand your state's requirements. These are complicated times, but Zero Zone is happy to partner with you and help you maintain compliance.

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