



U.S. Developments on PFAS Policies, Heat Pumps, and Decarbonization

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Advocate for 330+ HVACR and
water heating manufacturers


Developer of 100+ international
industry standards and guidelines

Administer of 40+ certification
programs



Our Members are Manufacturers

Cooling and heating products for
residential, commercial and industrial applications

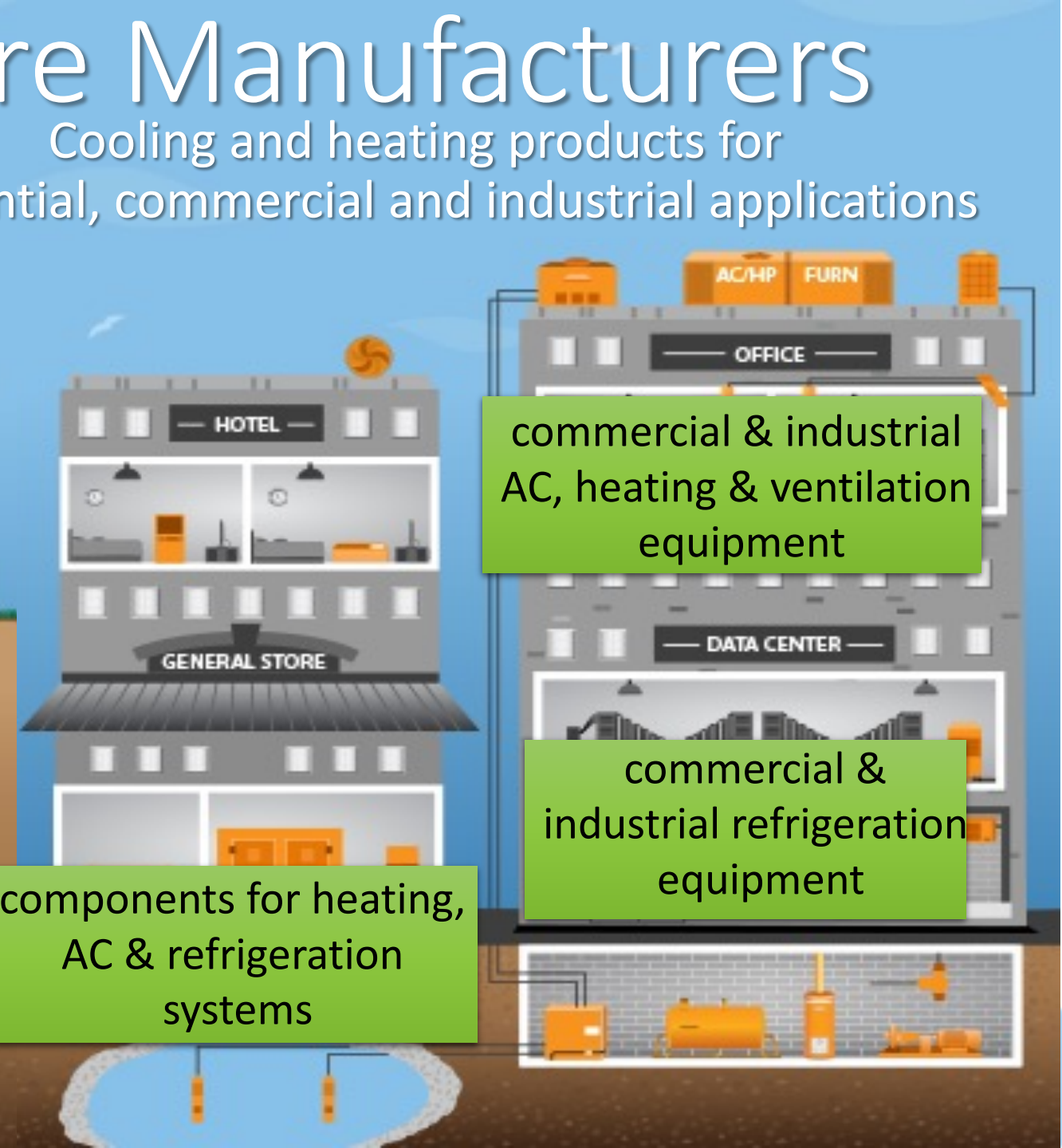


A detailed cross-section of a two-story house. On the roof, there is a large orange HVAC unit with pipes running down the side of the house. Inside, there are radiators in the living room and bedroom. In the basement, there is a furnace and a water heater, both in orange, with a network of pipes connecting them to the rooms above. A water tank is also visible on the roof.

central AC &
heating equipment

hydronic heating
equipment

water heating equipment



A cross-section of a multi-story commercial building. The building has several floors labeled: 'HOTEL' at the top, followed by 'GENERAL STORE', and 'DATA CENTER' at the bottom. On the roof, there are two orange HVAC units labeled 'AC/HP' and 'FURN'. Inside, there are various pieces of equipment, including a large orange unit in the basement. The building is connected to a network of pipes and ducts. A pond is visible in the foreground.

components for heating,
AC & refrigeration
systems

commercial & industrial
AC, heating & ventilation
equipment

commercial &
industrial refrigeration
equipment

Headquarters Office: Arlington, Virginia USA

Global Offices



China (Hefei)



MENA (Dubai)



Latin America (Mexico City)



India (Mumbai)



Canada (Toronto)

For Discussion Today

Energy Efficiency Incentives

PFAS – A North American
Perspective

Refrigerant Transition

Decarbonization

Our Industry Has a History of Environmental Stewardship

The products and equipment manufactured by our members require energy – there's no getting around that fact

For more than 50 years, we have prioritized energy efficiency and environmental stewardship

Our industry has:

- Improved overall efficiency 50 percent over the past 20 years
- Innovated “green” HVACR and water heating products such as geothermal and thermal heat pumps, tankless and solar-powered water heaters, dual-fuel hybrid heating systems, zone controls, ECM motors, variable frequency drives, and lower-GWP refrigerants

Incentives for Energy Efficient Equipment: Inflation Reduction Act of 2022

A 10-year extension and expansion of Energy Efficient Home Improvement Tax Credit (25C)

An expansion and 10-year extension of residential tax credits for geothermal equipment

New point-of-sale rebates for the purchase of efficient electric heating and cooling equipment

An expansion of the investment tax credit to include thermal energy storage technology

\$250 million in Defense Production Act funding for increasing heat pump manufacturing capacity

Energy Efficient Home Improvement Tax Credit (25C)

- Up to 30 % Tax Credit on installation cost of HVACR and water heating products, up to:
 - \$600 per air conditioner
 - \$600 per furnace
 - \$600 per boiler
 - \$2,000 per heat pump
 - \$2,000 per heat pump water heater
- Equipment must meet the highest CEE efficiency tier (but not advanced)

High Efficiency Electric Home Rebate Program

Administered by state energy offices – \$xxxx
in Federal funds available until expended.

- Low-income household: 100% of costs with a maximum benefit for items listed below:
- Moderate-income household: 50% of costs, with a maximum benefit for items listed below:
 - \$8,000 for heat pump
 - \$1,750 for heat pump water heater
 - \$4,000 for electrical service upgrade
 - \$1,600 for insulation, air-sealing, and ventilation improvements
 - \$2,500 for electric wiring changes
 - Max rebate total: \$14,000



Inflation Reduction Act of 2022

Training Grant Funds

Energy Auditor Training	Bipartisan Infrastructure Law	\$40 million, fiscal years 2022 - 2026	Through the states	Grants to train individuals to conduct energy audits
Career Skills Training	Bipartisan Infrastructure Law	\$10 million available until expended	Through not-for-profits	Grants to programs that have classroom and OJT training for industry related certification to install energy efficient building technologies.
Contractor Training Program	Inflation Reduction Act	\$200 million available through 9/30/23	Through the states	Grants to train contractors involved in the installation of home energy efficiency and electrification improvements

United States PFAS Policy

- EPA is considering requiring retroactive PFAS reporting from 2011
 - Definition is much narrower than that proposed in Europe and excludes refrigerants and trifluoroacetic acid (TFA)
 - Would require manufacturers and importers to document, report, and retain records of PFAS manufacturing and import since January 1, 2011
 - Does not exclude chemicals in “articles” or components and parts, such as articles containing PFAS as part of surface coatings
- State Activity - Maine – most active on PFAS so far
 - Broad definition, like that proposed in Europe
 - Reporting required for PFAS, including refrigerants, starting in 2023
 - Bans on PFAS, including refrigerants, unless exempted, starting in 2030

PFAS Definitions

The European Union (EU) definition includes refrigerants and trifluoroacetic acid (TFA), which are not PBTs

- “Substances that contain at least one aliphatic -CF₂- or -CF₃ element”

The U.S. EPA definition excludes refrigerants and TFA

- “For the purposes of this proposed action, the structural definition of PFAS includes per- and polyfluorinated substances that structurally contain the unit R-(CF₂)-C(F)(R')R”. Both the CF₂ and CF moieties are saturated carbons and none of the R groups (R, R' or R'') can be hydrogen.”

States are considering a wide array of definitions

- Maine law and California legislation (vetoed by the Governor) uses a definition similar to EU
- Delaware law definition (supported by the industry) proposes to use something closer to EPA

AHRI PFAS Position

- We support a definition that:
 - Explicitly targets persistent, bioaccumulative, and toxic (PBT) chemicals, such as PFOA and PFOS
 - Does not directly or indirectly include critical chemicals, such as refrigerants, that do not pose a risk to public health

Example:

- *“PFAS” means non-polymeric perfluoroalkyl and polyfluoroalkyl substances that are a group of man-made chemicals that contain at least 2 fully fluorinated carbon atoms, excluding gases and volatile liquids. “PFAS” includes PFOA and PFOS.*
- Working with broad coalitions including US Chamber of Commerce, National Association of Manufacturers, American Chemistry Council, Sustainable PFAS Action Network (SPAN)

U.S. Refrigerant Transition Status

Kigali Amendment and implementing legislation (AIM Act) approved

EPA allows A2L and A3 refrigerants in certain applications, subject to safety standards

Standards and building codes are being updated in states to allow the new refrigerants (see map)

Manufacturers have made their refrigerant choices, and all are in the equipment research and development stage

Comfort Cooling and Foams

January 1, 2025

Comfort Cooling	GWP	Date
Chillers – comfort cooling	700	1/1/2025
Residential and light commercial air conditioning and heat pump systems	700	1/1/2025
Residential dehumidifiers	700	1/1/2025
Residential and light commercial air conditioning – variable refrigerant flow systems	700	1/1/2026

Foam Blowing Agents (Proposed Compliance Date 1/1/25)	GWP
Polystyrene – extruded boardstock and billet	150
Phenolic insulation board and bunstock	150
Rigid polyurethane – slabstock and other	150
Rigid polyurethane – appliance foam	150
Rigid polyurethane – commercial refrigeration and sandwich panels	150
Rigid polyurethane – marine flotation foam*	150
Rigid polyurethane – low pressure, twocomponent spray foam	150
Rigid polyurethane – one-component foam sealants	150
Flexible polyurethane	0
Integral skin polyurethane	0
Polystyrene – extruded sheet	0
Polyolefin	0
Rigid polyurethane and polyisocyanurate laminated boardstock	0

Commercial Refrigeration: January 1, 2025

	Refrigeration Equipment (Proposed Compliance Date 1/1/25)	GWP
Industrial Process Refrigeration	Systems with refrigerant charge capacities of 200 pounds or greater	150
	Systems with refrigerant charge capacities less than 200 pounds	300
	High temperature side of cascade systems	300
	Chillers	700
Retail Food Refrigeration	Stand-alone units	150
	Refrigerated food processing and dispensing equipment	150
	Supermarket systems with refrigerant charge capacities of 200 pounds or greater	150
	Supermarket systems with refrigerant charge capacities less than 200 pounds charge	300
	Supermarket systems, high temperature side of cascade system	300
	Remote condensing units with refrigerant charge capacities of 200 pounds or greater	150
	Remote condensing units with refrigerant charge capacities less than 200 pounds	300
	Remote condensing units, high temperature side of cascade system	300
	Vending machines	150
Cold Storage Warehouse	Systems with refrigerant charge capacities of 200 pounds or greater	150
	Systems with refrigerant charge capacities less than 200 pounds	300
	High temperature side of cascade system	300
	Ice rinks	150
	Automatic commercial ice machines – selfcontained with refrigerant charge capacities of 500 grams or lower (Note: Does not align with petition)	150
	Transport refrigeration – intermodal containers	700
	Residential refrigeration	150

Proposed Refrigerant Bans for Refrigeration Applications

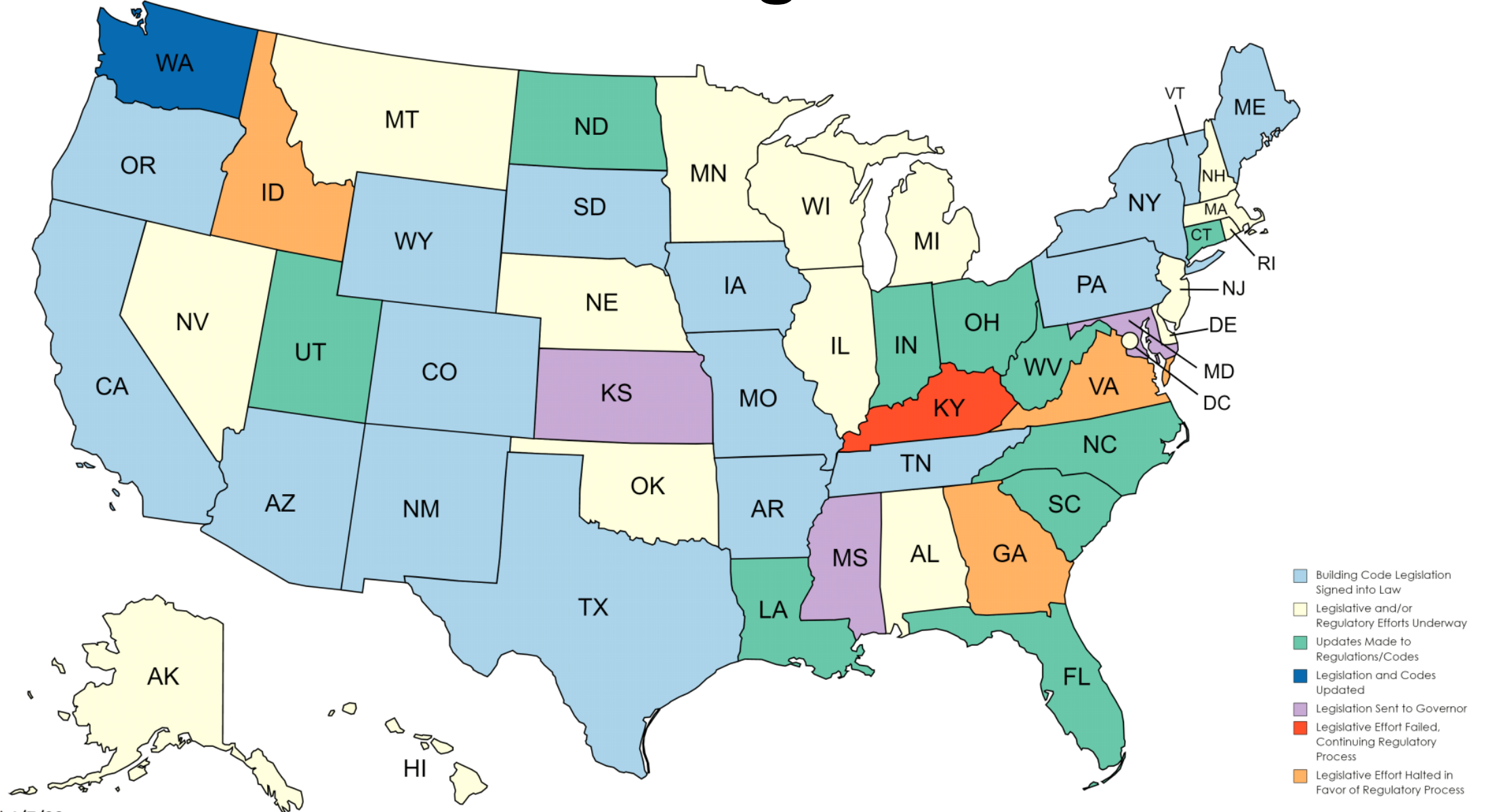
Refrigeration Refrigerant Bans (Proposed Compliance 1/1/25)	
Automatic commercial ice machines – self-contained with refrigerant charge capacities more than 500 grams	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B, R-407A, R-410A, R-442A, R-417C, R-407F, R-437A, R-407C, RS-24 (2004 formulation), HFC134a
Automatic commercial ice machines – remote	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B
Transport refrigeration – road systems	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B
Transport refrigeration – marine systems	R-404A, R-507, R-507A, R-428A, R-422C, R-434A, R-421B, R-408A, R-422A, R-407B, R-402A, R-422D, R-421A, R-125/R-290/R134a/R-600a (55/1/42.5/1.5), R-422B, R-424A, R-402B, GHG-X5, R-417A, R-438A, R-410B

Approval Needed to use Refrigerant in Specific Applications

- In the U.S., new refrigerants must be approved by the EPA and standards adopted into building codes
- States either adopt or modify model building codes, so AHRI has taken a two-pronged approach:
 - Work with national building code developers to allow new refrigerants
 - Work with state legislatures or agencies to ensure adoption of the latest model codes or enact legislation permitting EPA-approved refrigerants



Low GWP Building Code Status



Updated 4/7/23

We have more
work to do...

- AIM Act petitions for sector-based controls
 - Final Rule Expected early October
- Increase refrigerant recovery and reclaim
 - Proposed Rule Expected in September
- Have EPA list SNAP approval of additional new refrigerants
- Building Codes
 - Have Model Building Codes adopt latest standards
 - Have states adopt latest building codes enabling use of new refrigerants
- Have U.S. Department of Transportation update regulations regarding shipping of chillers, horizontal cylinders, and mid-sized systems
- Work with Canadian and Mexican governments to harmonize implementation of the Kigali Amendment

Decarbonization

- Decarbonization efforts in the United States are currently underway mostly in states and localities
- California, Washington, Oregon, Massachusetts, New York are most active
- AHRI's Board-approved decarbonization policy states:
 - AHRI and its members, which are HVACR and water heating manufacturers, are committed to and support greenhouse gas (GHG) emission reductions, while promoting sustainable, safe, reliable, and affordable access to the essential air and water heating and cooling provided by the products they manufacture
 - AHRI members support a single, national energy policy that...ensures continued safe, reliable, affordable access to critical heating and cooling services
- AHRI is currently exploring the potential for a bipartisan national decarbonization policy

Thank-you!

