National Refrigerants, Inc.

HFC REGULATIONS FACT SHEET

Your Guide to Federal and State HFC Regulations in North America for HVACR Refrigerants

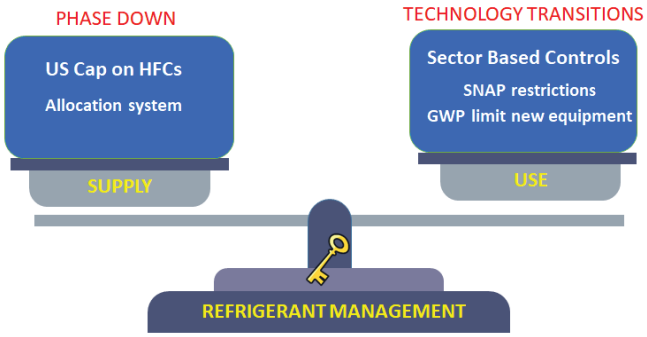
FEDERAL HFC LEGISLATION: AIM Act

The American Innovation & Manufacturing (AIM) Act is designed to:

- Phase down the production & import of HFCs
- Facilitate the transition to low global warming potential (GWP) refrigerants
- Maximize reclamation & minimize leaks from equipment

FACTS:

- The phase down is not refrigerant specific - no HFC has been banned
- The phase down is based on the CO2 equivalency of the GWP HFC refrigerants.
- Sector based, possibly application specific, controls will facilitate the transition to lower GWP refrigerants by establishing a maximum GWP for new equipment or restricting the use of certain high GWP HFCs in equipment
- Future regulations will address the management of refrigerant intended to maximize reclamation and minimize leaks by placing controls, as appropriate, related to activities pertaining to the installation, service, repair or disposal of HFC containing equipment.



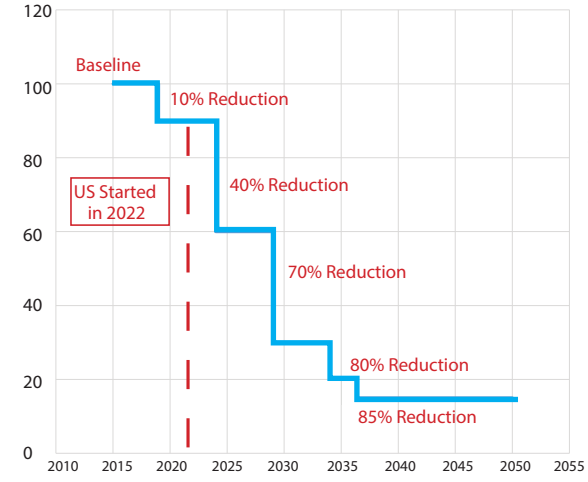
IMPORTANT: The Aim Act DOES NOT place or require limits on the servicing of installed equipment

HFC Phasedown Schedule (NOT phaseout)

Year	% of Baseline
2019*	90%
2022**	90%
2024	60%
2029	30%
2036	15%

* Start date for developed countries
** US start date

AIM Act Phasedown Schedule as % of US Baseline



Higher GWP Refrigerants will be under pressure to be switched to a lower GWP refrigerant

- New refrigerants will enter the market
- System architectures will change

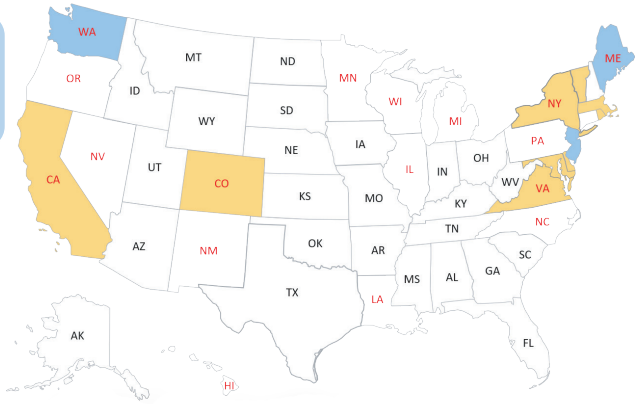
STATE REGS: SNAP 20 & 21 STATE BY STATE

Adopted definition of "NEW" that impacts servicing

Did not adopt definition of NEW that impacts servicing

Red = US Climate Alliance States

Yellow & Blue = adopted SNAP 20 & 21 as State law



Affects NEW Equipment & Refrigerant Retrofit in:

- Supermarket systems
- Remote Refrigeration Condensing Units
- Stand-alone Units
- Food processing/dispensing
- Cold Storage Warehouses
- Comfort CoolingChillers

In the absence of federal regulations and the reversal of the SNAP 20 & 21 restrictions, individual states adopted the SNAP restriction as state law. For more information, go to www.uri.com & click on the Refrigerant Regulatory Updates link for a summary of each state and the definition of 'new'.

Technology Transition: GWP LIMITS

AIR CONDITIONING

Sector	Sub Sector	Charge size	GWP Limit	Effective Date
AIR CONDITIONING	AC & heat pumps-packaged & split	Any	700	January 1, 2025
	VRF	Any	700	January 1, 2026
CHILLERS	Comfort cooling	Any	700	January 1, 2025
DATA CENTERS	Data centers, Computer Rooms AC & Information technology equipment cooling	Any	700	January 1, 2027

REFRIGERATION

Sector	Sub Sector	Charge size	GWP Limit	Effective Date
RETAIL FOOD	Stand-alone units /Vending machines	Any	150	January 1, 2025
	Supermarket systems (multiplex or centralized, direct or indirect; rack system parallel piped)	≥200 lbs.	150	January 1, 2027
		< 200 lbs.	300	
	Remote Condensing units	≥200 lbs.	150	January 1, 2026
		< 200 lbs.	300	
COLD STORAGE	Cold storage systems	≥200 lbs.	150	January 1, 2026
		< 200 lbs.	300	
INDUSTRIAL PROCESS REFRIGERATION	Industrial process refrigeration systems (not using chillers)	≥200 lbs.	150	January 1, 2026
		< 200 lbs.	300	
CHILLERS (stand-alone)	Industrial process refrigeration	Fluid ≥ -58°F & < -22°F	700	January 1, 2028
		Fluid ≥ -22°F		January 1, 2026
ICE RINKS	Ice rinks (incl. chillers)	Any	700	January 1, 2025

Technology Transition:

GWP limits apply to NEW equipment only

Service of existing equipment allowed

Components can be replaced

EFFECTIVE DATE = INSTALLATION DATE FOR A SYSTEM
System = Assembled from components and charged on-site

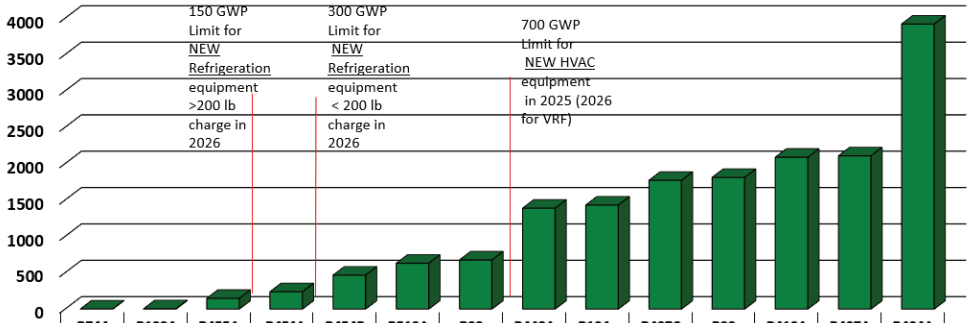
PRODUCT* SELL THROUGH PERIOD: 3YRS

DEFINITION – NEW:

- Assembled for the first time with new or used components
- Existing Systems:
  - Increasing cooling capacity (BTU/hr.)
  - Replacing 75%+ of evaporators &100% of compressor racks, condensers & connected evaporator loads

*If equipment requires a technician to make the System function for its intended use, then it is NOT considered a product

Global Warming Potential (GWP) – Refrigeration & AC



HFCs Will Continue to be Available for Service

	R744	R1234 yf/ze	R455A R454C	R454A	R454B	R513A	R32	R448A R449A	R134a	R407C	R22	R410A	R407A	R404A
GWP Values from IPCC 4th Report — GWP	1	4	147	238	466	629	675	1387	1430	1770	1810	2088	2107	3920
	A1	A2L HFO	A2L HFO/HFC	A2L HFO/HFC	A2L HFO/HFC	A1 HFO/HFC	A2L HFC	A1 HFO/HFC	A1 HFC	A1 HFC	A1 HCFC	A1 HFC	A1 HFC	A1 HFC
	Very high pressure / poor efficiency at cond temps >88F	R134a like pressures used in auto a/c & as component in low gwp blends	R407A / R448A pressure; high temp glide for new equip only	Similar to R407A & R448A capacity & efficiency; new equip only	R410A like pressure for new equip only	R134a like pressures, capacity & efficiency	R410A like pressure for new equip	R22 like pressure new equip & retrofit of refrig equip	Efficient but lower pressure; best in MT; low compr capacity in LT	Very similar to R-22; good for retrofit of R22 A/C equip	Phased out due to ozone depletion potential	Excellent capacity & efficiency in HVAC equip	R-22 like properties w/ lower discharge temps; R448A / R449A are similar	Excellent compr capacity & low compr discharge temps

Considerations below 1300 GWP:

- pressure
- capacity
- temperature glide
- charge limits
- energy efficiency
- flammability

Existing Systems - What to do now

R-404A & R-507 SYSTEMS

- ✓ System running well
- ✓ No or few leaks
- ✓ No good retrofit options
  - ➢ Cost?
  - ➢ Design?
- ✓ No cost justification
  - ➢ Small charge

- ✓ After large refrigerant loss
- ✓ Store remodel
- ✓ Available resources
  - ➢ Financial
  - ➢ Technicians
- ✓ R-407A/ R -448A/ R -449A

- ✓ Formulate plan
  - ➢ Short term
  - ➢ Longer term
- ✓ Manage refrigerant supply

REFRIGERANT MANAGEMENT

- REDUCE LEAKS
- RECOVER & RECLAIM
- BANK REFRIGERANT
- RETROFIT
- PRESERVE SUPPLY