Update on low global warming potential refrigerant costs

By Malcolm Hansell
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Refrigerant chemicals are crucial to many aspects of modern life, from home air conditioning to the cold-storage systems we use for food and medicine. Though these chemicals—and the refrigeration they make possible—are essential to society, they've presented a host of health, safety, and environmental concerns over the decades. The same chemical properties that make refrigerants work well can also make them hazardous, leading to a long and storied history of regulation and phase-outs. The best-known example of this regulation was the landmark global banning of ozone-depleting chlorofluorocarbons (CFCs) in the late 20th century, a famous success story for environmental regulations.

But regulation didn't stop in the 20th century, and today there is a new focus for refrigerant regulation: global warming potential (GWP).

According to the US Environmental Protection Agency (US EPA) in Understanding Global Warming Potentials, the Intergovernmental Panel on Climate Change defines GWP as "a measure of how much energy the emission of 1 ton of a gas will absorb over a given period of time, relative to the emission of 1 ton of carbon dioxide (CO_2). The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years."

Multiple factors influence GWP, but for this conversation the key ones are atmospheric durability and energy absorption. To have a high GWP, a chemical needs to:

1. Stay in the atmosphere without breaking down
2. Efficiently absorb solar energy

Hydrofluorocarbon (HFC) refrigerants, which are much less damaging to the ozone layer, have replaced CFC refrigerants. Still, those chemicals (like the widely adopted R-410A) have 100-year GWPs of around 2,000—meaning that 1 pound of HFC refrigerant in the atmosphere has about the same greenhouse gas (GHG) effect as 1 ton of CO_2 over a period of 100 years. Because refrigerant charges leak into the atmosphere over time or at end-of-life, this presents a meaningful environmental risk.

As regulatory bodies like the US EPA pay closer attention to the dangers of GHG effects and human-caused climate change, new GWP-focused regulations seek to phase out high-GWP refrigerants (mostly HFCs) and replace them with low-GWP alternatives. You can read about those regulations on the US EPA website: Regulatory Actions for Technology Transitions.

Two new commercial refrigerants meet the 2025 EPA rule requiring a GWP of less than 700: R-32 and R-454B.

Battle of the refrigerants

There are two competing refrigerants emerging in the market for the first time in history. So utilities need to understand how the costs and merits of these systems compare. Both are slightly flammable and are "A2L" refrigerants, according to their ASHRAE flammability categorization.

In both cases, using new A2L refrigerants will incur additional costs unrelated to the refrigerant charge itself. For example, we expect utilities to face:

- Soft costs from new training needs and equipment
- Confusion about which refrigerants and systems work together and qualify for the new regulations
- Higher equipment costs from new safety measures
- Less economies of scale for the new equipment

In most cases, switching to any A2L refrigerant system will cause higher costs. Rather than cost, the more relevant differences between R-454B and R-32 systems may be chemical availability and expected project delays.

While it's hard to quantify these costs exactly, the article A2L Refrigerant Switch HVAC Costs: Navigating the Impact on Your Budget from Carolina HVAC suggests:

> Due to their mildly flammable nature, A2L refrigerants require additional safety features, leading to an estimated **20–25% increase in refrigerant costs**. Additionally, HVAC systems designed to accommodate these new refrigerants are expected to be **20–30% more expensive** than their R-410A counterparts.

Still, there are important distinctions between R-454B and R-32, particularly relating to availability.

R-454B

This refrigerant is the replacement chosen by several top equipment manufacturers, such as Carrier, Trane, and Lennox. But there are severe refrigerant shortages, causing prices to more than double to $60 per pound, according to some industry sources. This price surge is exacerbated by an additional 42% surcharge on the chemical from top producer Honeywell, which it attributes to tariff-related import costs, according to ACHR News (Honeywell Announces 42% Surcharge on R-454B). This price surge may ease with time. Right now, the chemical is much more expensive than alternatives and difficult to source. One HVAC company quoted delays of up to 10 weeks to get a single order of R-454B for a system (R-454B Refrigerant Shortage: What Homeowners Need to Know | Bacon Plumbing Heating Air Electric).

R-32

Equipment manufacturers using R-32 include Daikin, Amana, and Goodman. One source claims that R-32 is easily accessible and "half the cost" of R-454B, thanks in part to its established position as a widely used refrigerant in other parts of the world (R-32 touted as A2L-compliant refrigerant while R-454B shortage persists | Facilities Dive). While this refrigerant isn't experiencing shortages or price surges, not all equipment can charge with R-32, and there will be additional upfront costs from using any A2L refrigerant compared to hydrofluorocarbons (HFCs).

Lawmakers or regulators may repeal, delay, or alter Biden-era US EPA regulations and legislation mandating the use of low GWP A2L refrigerants, especially considering increased consumer costs and shifting policy priorities. According to the ACHR News article EPA Proposes New Refrigerant Rule:

> On September 30 [2025], Environmental Protection Agency (EPA) Administrator Lee Zeldin issued a Notice of Proposed Rulemaking to revise the Technology Transitions (TT) subsection of the AIM Act of 2020, which restricts the use of high-GWP HFCs in HVACR products. If finalized, the proposed rule will extend the compliance deadlines on the use of HFCs in a number of subsectors, including residential/light commercial air conditioning, retail food refrigeration, and cold storage warehouses.… In response to this summer's R-454B supply chain issues, EPA is proposing to remove the installation compliance date for residential and light commercial air conditioning and heat pump systems, as long as components are manufactured or imported before January 1, 2025. The agency said this flexibility would help sell through remaining R-410A inventory. EPA is also seeking input on steps the government could take to address future refrigerant shortages and price spikes.

More recently, at the HARDI conference in January 2026, experts discussed these two refrigerants. They agreed that, even in a policy environment that favors deregulation, the industry has moved past R-410A and that reintroducing R-410A equipment makes less sense than moving forward with A2L refrigerant products (Political Insights at HARDI Conference). Manufacturers said returning to R-410A wouldn't lower costs because of redesign and recertification needs. There is too much supply chain momentum toward newer refrigerants. There's also some interesting commentary on how R-454 shortages fit into all of this in the article linked above.

R-454B shortages

The Facilities Dive article R-32 touted as A2L-compliant refrigerant while R-454B shortage persists describes the shortage, as well as how R-32 equipment may be a viable alternative:

> "Industry professionals are struggling to find even a single 20-pound cylinder [of R-454B]," Jorge Alvarez, co-founder of iGasUSA said in a commentary in ACHR News, an HVAC industry publication. "The cost of refrigerant has surged to $60 per pound, compared to $17 per pound in previous years.… The shortage has already driven up the price of air conditioning units. In 2025, the average cost of a system has risen by $3,000 compared to 2024, and by $5,000 compared to 2017."

Honeywell, one of the biggest manufacturers of R-454B, said earlier this year it was adding a 42% surcharge on top of other price increases to offset the cost of importing supplies to help it meet demand (Honeywell Announces 42% Surcharge on R-454B).

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