

Refrigerant Realities:

Six Things You Need to Know

1. THERE IS NO ONE REFRIGERANT SOLUTION FOR ALL SITUATIONS

More lower-global warming potential (GWP) refrigerant options exist than you might think, but none of them are perfect for all situations.

There are many solutions available to meet the needs of a variety of end-users, types of product, equipment requirements, local ambient temperatures, and budgets. Options include new-generation low- and reduced-GWP advanced refrigerant technologies that work well for retrofitting existing equipment and can be readily adopted by customers.

Industrial chemicals, often marketed as “natural refrigerants,” are also an option. Ammonia is a viable alternative with low GWP, but requires careful management as accidental releases can be harmful. CO₂ is another option that, with the right investment in energy efficiency improvements, can be a workable solution for certain applications. Hydrocarbons are also options where highly flammable gases can be safely used.

2. GLOBAL HFC REGULATION IS DRIVING TRANSITION

Hydrofluorocarbons (HFCs) are gradually being phased down globally, and the industry is working to transition to better options such as advanced climate technologies, which include low-GWP HFCs, hydrofluoroolefins (HFOs) and HFC/HFO blends.

You can continue to use high-GWP HFCs in the short term as you consider new-generation solutions, and low-GWP HFCs can be a great way to reduce environmental impact as you build your transition strategy.

3. HFOs ARE A LOW-GWP SOLUTION

HFOs are a new-generation refrigerant. The Montreal Protocol's Kigali Amendment does not include HFOs in the phase down, as they are low-GWP alternatives. HFOs and HFC/HFO blends are an excellent long-term solution since in many applications existing equipment can be retrofitted with a significantly reduced GWP blend, addressing one of the largest potential sources of GHG emissions from refrigerants—the installed base of existing equipment.

The industry has invested heavily in HFOs that adhere to current regulation and potential future environmental requirements - the industry believes HFOs are here to stay.

4. THERE IS MORE TO CONSIDER THAN JUST GWP WHEN CONSIDERING ENVIRONMENTAL SUSTAINABILITY

It is important to consider more than just GWP for overall safety, affordability, and environmental sustainability. These considerations also should include: energy efficiency, life-cycle impact, manufacturing processes, need for special handling, suitability to the widest range of uses, acute and chronic toxicity, and increased leak potential and associated health and safety impacts. The total cost of ownership (capital energy consumption, maintenance, training, etc.) and ability to convert existing systems are also important considerations, as these can pose barriers to entry to enterprises adopting new environmentally preferable technologies.

5. LOWERING GWP IS NOT THE ONLY STRATEGY

GWP is important when considering refrigerant options, but it does not tell the whole story. For example, CO₂ is a low-GWP refrigerant, but its energy usage in warmer climates in many cases negates any environmental benefits. That is why it is important to weigh the total impact - which includes direct and indirect emissions, energy efficiency, and overall costs. Total Equivalent Warming Impact (TEWI) and Life Cycle Climate Performance (LCCP) are more comprehensive approaches for determining overall environmental impact and energy consumption.

6. LOW-GWP ALONE ISN'T ENOUGH TO MINIMIZE ENVIRONMENTAL IMPACT

Lowering the GWP of a refrigerant is not the only way to minimize environmental impact. Much depends on how we behave as an industry. There are many opportunities for end users to reduce the carbon footprint of their system. Current trends toward smaller charge sizes, continued education on the importance of lowering leak rates—refrigerants that stay in the system don't impact the environment—use of reclaimed refrigerants, and different system design will allow a combination of products to be used long-term.