

# THE COLD TRUTH

A look at what is real, what is speculation, and what is hype in the HVACR Industry

## **MYTH**

*Fluorinated solutions are being phased out.*

## **FACT**

*“Fluorinated solutions are not being phased out and remain a viable solution for the long term.”*

Fluorinated solutions are not being phased out and remain a viable solution for the long term. The Kigali Amendment Fact Sheet produced by the United Nations Environment Programme (UNEP) summarizes elements of the protocol — none of which include the phase out of new-generation fluorinated solutions. The new generation of products — namely HFOs, blends, and select HFCs with lower Global Warming Potential (GWP) compared to previous products (collectively, “Advanced Climate Technologies” [ACTs]) — offer reduced GWP that enables end-users to reduce operating costs and meet environmental regulations.

## **MYTH**

*So-called “natural refrigerants” are natural.*

## **FACT**

*“‘Natural refrigerant’ is a marketing term; these products are industrial chemicals.”*

“Natural refrigerant” is a marketing term; these products are industrial chemicals. Dr. Dick Powell, a professor with more than 40 years of experience working with refrigerants, writes that “the distinction between ‘chemical’ refrigerants and ‘natural’ refrigerants is technically meaningless in chemical terms.” So-called “natural” refrigerants undergo intensive industrial processing to be brought to refrigerant specifications. For example, hydrocarbons such as propane, butane, and pentane are produced in oil refineries by “cracking” fossil fuels and separating out various byproducts through distillation. Carbon dioxide is brought to refrigerant specifications by industrial processing. While ammonia can be produced naturally by decomposition of animal waste, most of the ammonia used industrially is produced by a chemical process and is in fact synthetic. Powell concludes that referring to these chemicals by the term “natural” is an “ideological obfuscation.”



**MYTH***“Natural” refrigerants are best for the environment.***FACT***“The best-performing refrigerant will be different for everyone.”*

There is no single product that is best for the environment. There is more to measuring environmental impact than GWP. The best-performing refrigerant will be different for everyone. For example, so-called “naturals” can be energy inefficient, thus driving increased energy consumption. Energy consumption contributes to CO<sub>2</sub> emissions and, therefore, global warming. These “indirect” effects have a significant environmental impact; a 2018 UNEP report cites that “over 80% of the global warming impact of [refrigeration] systems is associated with the indirect emissions generated during the production of electricity used to operate the equipment.”

**MYTH***GWP is the best way to determine environmental impact.***FACT***“It is important to weigh the total environmental impact, which includes GWP, direct and indirect emissions, energy efficiency, manufacturing processes, and life-cycle impact.”*

GWP is important, but it is only one factor in determining overall environmental sustainability and impact. An academic study on the role of environmental metrics in refrigerant selection concludes that GWP may “overestimate the benefits of low-GWP refrigerant to environment, as it does not take into account many other affecting factors.” It is important to weigh the total environmental impact, which includes GWP, direct and indirect emissions, energy efficiency, manufacturing processes, and life-cycle impact. Environmental metrics such as Total Equivalent Warming Impact (TEWI) and Life Cycle Climate Performance (LCCP) offer a more holistic environmental perspective. Unlike GWP, TEWI measures both the direct and indirect emissions during the lifetime of a system. LCCP is an even more comprehensive metric, accounting for direct and indirect emissions and the environmental impact of substances emitted during refrigerant production and transportation.



**MYTH** *There is a “future-proof” solution.***FACT** *“No technology is future-proof. Products improve, regulations change, and business needs evolve over time.”*

The notion of a “future-proof” solution is nice to imagine, but it is just that — imaginary. “Future-proof” is a marketing buzzword. No technology is futureproof. Products improve, regulations change, and business needs evolve over time. End-users should focus more on what they can predict and manage — specifically, the lifespan, adaptability, and ability to properly and safely maintain systems over time.

**MYTH** *“Natural” refrigerants are cheaper to install and use.***FACT** *“So-called “natural” refrigerants all require the installation of a completely new system.”*

The best business option varies based upon a number of factors and considerations. So-called “natural” refrigerants all require the installation of a completely new system, whereas ACTs can take advantage of existing systems, thus saving money and environmental waste. Refrigerant performance will also be impacted by store size and climate.

**MYTH** *“Natural” refrigerants are a more popular option for operators transitioning to lower-GWP options.***FACT** *“It is up to the end-user to determine the refrigerant that works best for their situation.”*

No single refrigerant category, so-called “natural” or otherwise, is the heir apparent to incumbent refrigerants, such as R-404A or R-22. It is up to the end-user to determine the refrigerant that works best for their situation. This is made clear in shecco’s 2018 market trends update, which reports that “CO<sub>2</sub> TC stores account for less than 10% of total stores in Australia, Canada, Europe, Japan, New Zealand, South Africa and the USA.” Ultimately, end-users across the globe are deploying different refrigerants for different use cases, including Advanced Climate Technologies.

