

# Cracking the Myths About Propane

## The Swegon Blog – Alessandro Pinato

Over the years, EU regulations on synthetic refrigerants like CFC, HCFC and HFC have tightened, severely restricting or even banning their use. And a further tightening is underway with the update of the F-gas regulation which is currently under discussion.

### **Myth: “Propane is not a refrigerant, it’s a hydrocarbon and thus only good for burning.”**

This is definitely not true. Propane was one of the first candidates for refrigerants, has a long history, and is well-tested. It has excellent thermodynamic properties and can be used in a wide variety of HVAC appliances. And not to forget – it is smarted to use it in small quantity as a refrigerant in a heat pump instead of burning it in large quantity in a boiler (with 3 kg of propane you can heat a small building for a day by burning it in a boiler, or you can heat the building for 5 years if you use it as a refrigerant in a heat pump).

### **Myth: “The use of propane as a refrigerant is just a temporary fad pushed by the environmental movement.”**

In fact, Swegon now sees propane as a long-term solution that will not be displaced in the foreseeable future. Propane is already being used today as a refrigerant, for example, in supermarket display cabinets, domestic equipment and portable AC (have you ever check what is the refrigerant used in the refrigerator you have in your kitchen?). Its share is also growing fast in process and commercial comfort applications, and due to ongoing EU regulation updates it will become widely used in the HVAC market.

### **Myth: “As natural refrigerant, CO2 is better than propane.”**

CO2 is definitely a good refrigerant with a Global Warming Potential of just 1. It is already in use for cooling in many commercial refrigeration applications where it has replaced some synthetic refrigerants. Nevertheless if we look to heating and air conditioning appliances then it has some significant drawbacks (extremely high operating pressure with poor efficiency) that makes it suitable only in high temperature lift applications.

### **Myth: “Propane is too risky to use.”**

To be fair, all refrigerants have drawbacks. Leaving aside the environmental effects of some synthetic refrigerants, even if we focus on natural refrigerants only, we can see that CO2-based units need pressures of up to 90 bar, and ammonia-based units come with their own toxicity risks. In comparison to that, propane is relatively harmless. Yes, it is certainly flammable. But this can be properly addressed with guidelines and best practice instructions (think about how you properly deal with fuel pumps at a gas station for instance that is classified as an explosive area). And chances are that you already have propane in your home, happily burning it away on weekends: a cylinder for a propane-driven barbecue typically contains 5–10 times the amount of propane than what would be used in a chiller or heat pump for your residence. In HVAC applications, the propane is confined in a safe, closed system with monitoring of leakages and

with component designs that prohibit fire or explosions. And as we mentioned above, you probably already have propane circulating in your refrigerator without having given it a second thought.

**Myth: “The introduction of a new refrigerant in this phase could slow down the necessary transition from boilers to heat pumps.”**

It is true that propane cannot be used in any heating system, for example rooftop units or direct expansion systems like VRF/VRV. So, for specific applications we will still need synthetic refrigerants. But for most other heating systems propane is an excellent choice and will help support the boiler-to-heat pump transition. In particular, propane will be a key enabler in the European Commission Renovation Wave initiative, which will speed up the replacement of existing boilers with high temperature heat pumps. In newer buildings, the distribution system often works at low to medium temperatures, but radiators in older buildings often need water with higher temperature (60–75 °C). In these buildings, [heat pumps using propane](#), will be a perfect solution, thanks to their capacity to deliver water as hot as that from boilers. Heat pumps using synthetic refrigerants are not capable of this unless you choose more expensive cascade systems.

**Myth: “This is just a refrigerants business. Next year there will be a new next gen refrigerant candidate in place of propane.”**

Over the last few years there has been a rush in the refrigerant business, with many chemical companies investing heavily into finding “the perfect refrigerant”. So far, none have proven their worth. Furthermore, even existing synthetic refrigerants are increasingly being subjected to regulation revisions trying to mitigate their greenhouse effect. With the latest, low GWP synthetic refrigerant generation (HFO, hydrofluoroolefin), there are growing concerns about possible harmful compounds generated by decomposition in the atmosphere. The natural refrigerant propane has none of these problems. It is a mature solution, requiring no further long-running development work. It is already present in nature, and it is ready to use.

In short, propane is here to stay.

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