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What Do the Big Companies Say About the Future of Refrigerants?

By Björn Palm

A few weeks ago, I took part in a meeting organized by the **IEA Heat Pump Center**, where statistics on heat pumps and sales were discussed. One challenge with such statistics is the lack of harmonized definitions: in Sweden, a split unit is often used as a heat pump, while in Italy the same product is more commonly seen as an air conditioner. Should it be counted as heating or cooling? Without common definitions, comparisons are misleading. This meeting was a first step toward creating such standards to improve the quality of international statistics.

The Market Today

In earlier columns we mentioned the work of the **International Institute of Refrigeration (IIR)** to publish a technical brief on heat pumps using natural refrigerants [1]. For this, we wanted global data on refrigerants used in heat pumps—but such statistics proved impossible to find. The only detailed data came from Germany, based on government subsidy applications for heat pump installations.

According to these figures:

- **HFCs R410A and R32** still dominate. R410A is being phased out in favor of R32 due to EU F-gas limits.
- **Propan (R290)** grew strongly in 2022 and 2023, reaching about **20% of the German market** each year.
- The only synthetic refrigerant with **GWP below 600** visible in the data was **R454C**, with around 2% market share.

(It should be noted that split systems used mainly for cooling were not eligible for subsidies and therefore not included in the statistics.)

With the EU F-gas regulation progressively banning refrigerants with **GWP above 150** (and phasing out all F-gases in small systems), it is clear that **natural refrigerants** such as hydrocarbons and CO_2 will expand rapidly in Europe. But the effects reach far beyond Europe: many manufacturers are in Asia, and to sell into the EU they must develop products for natural refrigerants.

At **Chillventa 2024 in Nuremberg**, the impact was obvious: around **25 manufacturers displayed propane heat pumps**, and roughly 20 of them came from Asia, mainly China.

What the Major Manufacturers Are Saying

Daikin
On its European site [2], Daikin describes R32 as an important refrigerant "at least" until 2033. It calls CO_2 the next "logical step" for VRV systems and mentions propane as an efficient option "where safety allows." R454C (GWP just under 150) is promoted as a strong alternative to R32 in cases where propane is unsuitable. On its global site [3], Daikin also highlights R32, HFOs, CO_2, and hydrocarbons (though only for refrigeration). Unsurprisingly, given that Daikin is a major R32 producer, this refrigerant remains central to its strategy.

LG
LG's site [4] shows continued reliance on R32, but also HFC/HFO blends and natural refrigerants (see Fig. 1). Interestingly, it does not mention R454C at all, but instead **R454B**, with a GWP three times higher. LG also differentiates between Europe and the U.S.: propane is suggested for more applications in Europe than in the American market.

Mitsubishi
One Mitsubishi site [5] acknowledges the impact of the EU F-gas regulation, grouping refrigerants by substitution options:

- **Group 1:** R410A, R32, R454B
- **Group 2:** R134a compared with R513A and R1234ze (with R513A emphasized as non-flammable (A1) but with a "moderate" GWP of 629).
  CO_2 and propane are also mentioned positively. Another Mitsubishi site [6], focused on low-GWP goals, highlights almost exclusively HFOs (R1234yf, R1234ze(E), R1233zd(E))—with CO_2 included but **not hydrocarbons**.

Fujitsu
Fujitsu's U.S. website [7] discusses "next generation" refrigerants for the residential sector—listing only **R32 and R454B**, with no natural options. Yet at Chillventa, Fujitsu showcased a propane-based air-to-water heat pump, just as LG did.

Carrier
Carrier's European commercial cooling site presents propane plug-in cabinets and transcritical CO_2 systems for centralized refrigeration. But on its U.S. consumer heat pump site, natural refrigerants are absent, with R454B described as the latest option.

Conclusion

From this small sample, one trend is clear: the **largest manufacturers are cautiously preparing for natural refrigerants**. Most have at least one product line using CO_2 or propane, often for at least one application.

It also seems clear that **European regulation is shaping the global market**. Even companies outside the EU are developing natural-refrigerant solutions—because they know that without them, they cannot sell in Europe.

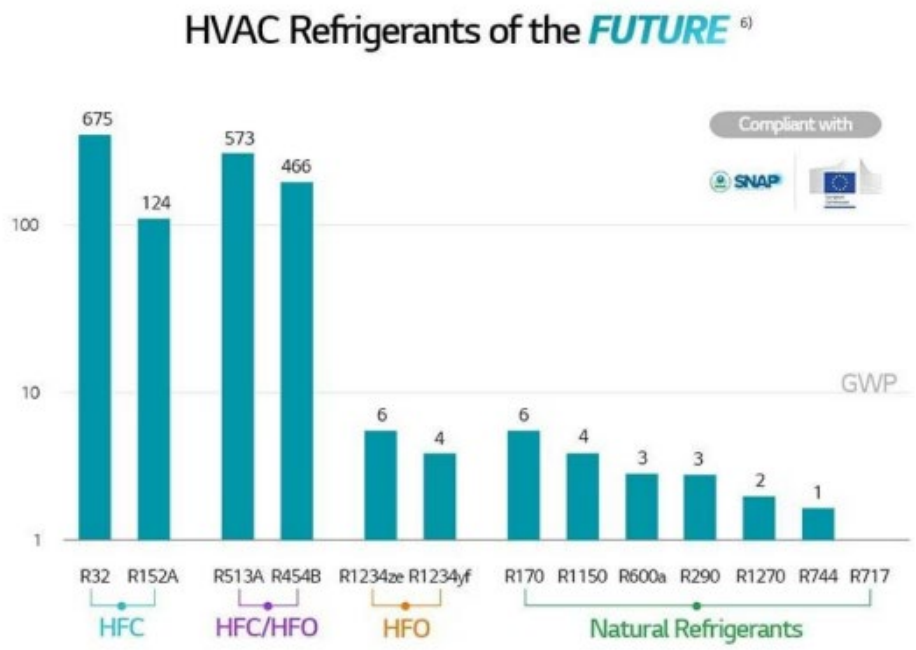

Figure 1. LG's outlook on the future of refrigerants [4]

References

[1] *Domestic heat pumps using hydrocarbons: current status and market overview*. IIR/IIF, Nov 2024.
[2] Daikin Europe: *An outlook on refrigerant alternatives in Europe*. https://www.daikin.eu/...
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