

Projected Growth of CO2 Refrigeration Systems

A U.S. Food Retailer Survey






Background

Both regulations and environmental and social governance (ESG) are driving the transition from traditional high global warming potential (GWP) hydrofluorocarbon (HFC) refrigerants, causing a growing body of U.S. food retailers to seek future-proof HFC-free alternatives.

Carbon dioxide (CO₂) is a natural, ultra-low GWP, non-toxic, and non-flammable refrigerant with no ozone-depleting properties, making it one of the leading alternative refrigerants.

In 2023, the North American Sustainable Refrigeration Council (NASRC) surveyed 13 major U.S. food retailer companies representing over 18,000 store locations to project the current and future demand for CO₂ refrigeration systems.

CO₂ (R-744) Profile

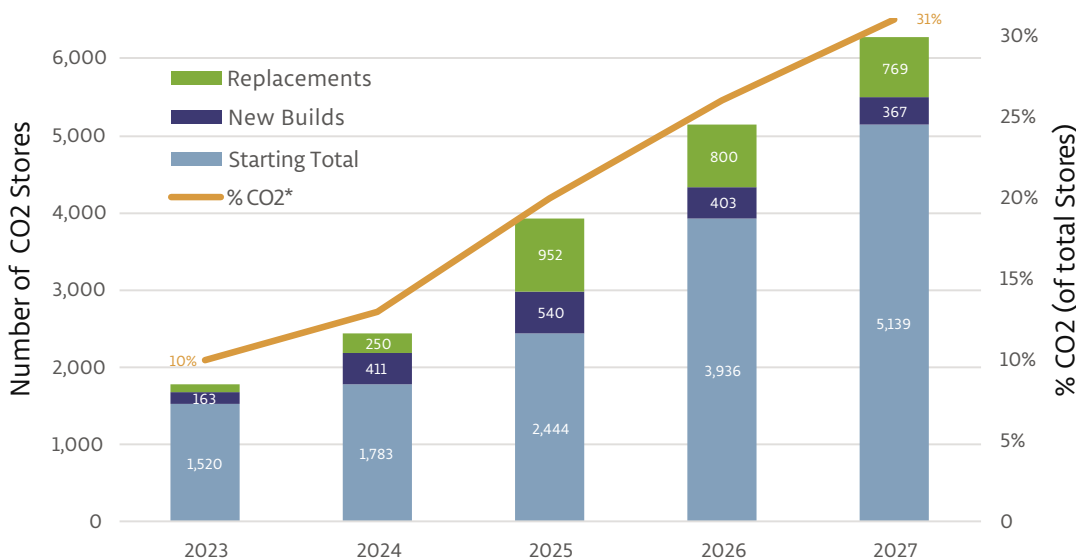
-  **Ozone Depleting Potential (ODP):** 0
-  **Global Warming Potential (GWP):** 1
-  **ASHRAE Refrigerant Class:** A1 (non-toxic, low flammability)

Key Takeaways



Survey Results

The data below and on the next page is based on survey results from 13 food retail companies representing over 18,000 U.S. store locations. Note: Projected growth in CO₂ stores represents respondents ONLY.



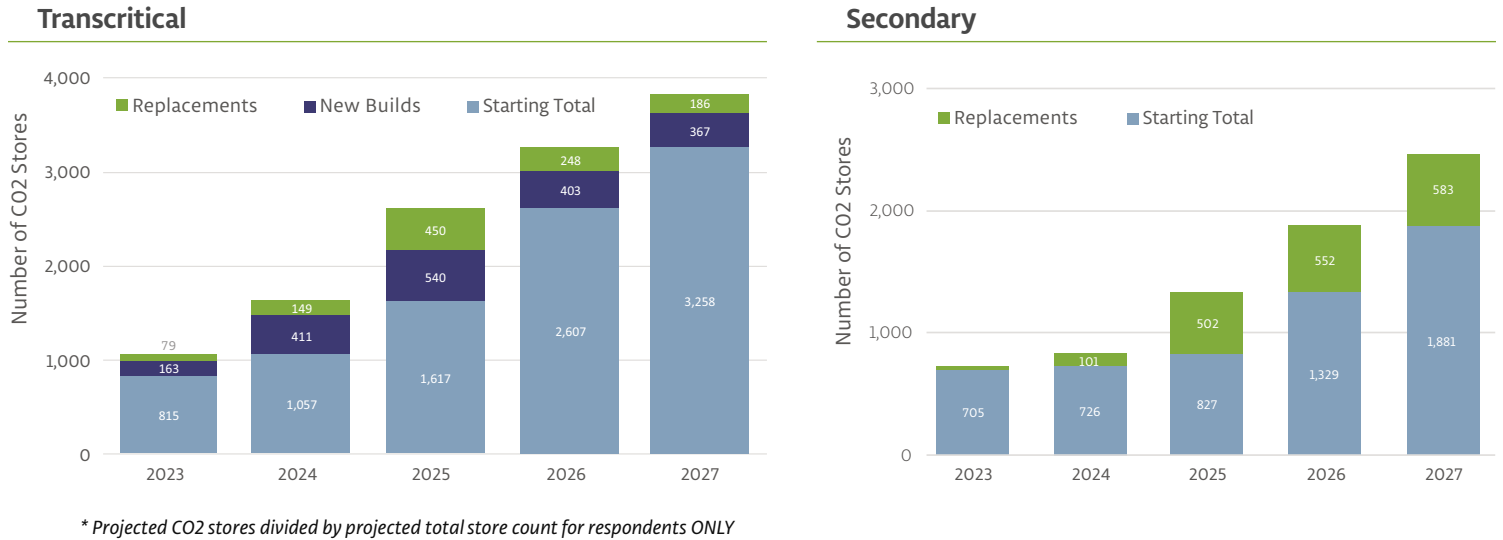
* Projected CO₂ stores divided by projected total store count for respondents ONLY

The count of CO₂ stores is expected to **grow by 313% between 2023 and 2027**. A significant jump is projected in 2025, which aligns with the proposed effective date of the Environmental Protection Agency (EPA) Technology Transition Rule under the AIM Act.

Note: Data includes both CO₂ transcritical and secondary system architectures.

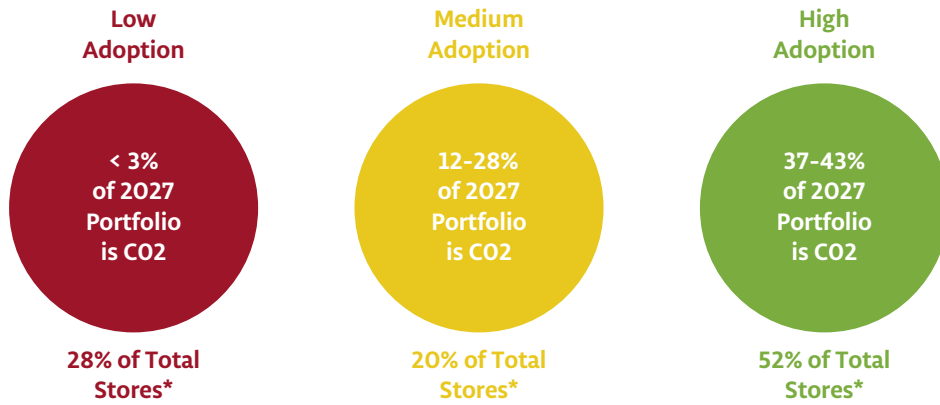
Survey Results (Continued)

Projected Count of Stores with CO2 Transcritical and CO2 Secondary Systems



The count of CO2 **transcritical** stores is projected to grow by **368%** and the count of CO2 **secondary** stores is projected to grow by **250%** between 2023 and 2027. The growth in transcritical systems comes from new store builds and system replacements in existing facilities. Notably, none of the 13 participating food retailers reported plans to build new CO2 secondary systems.

Respondent CO2 Adoption Comparison



The 13 respondents were categorized into three groups based on the projected portion of CO2 in their total stores in 2027.

Responses were weighted by total store count. Note that most stores are operated by retailers that fall in the high-adoption category.

**Current stores operated by retailers in respective category divided by the total stores currently operated by all respondents*

NASRC plans to expand and repeat this survey annually to continue tracking the forecasted growth in CO2 and other natural refrigerant systems in food retail applications. To submit suggestions, other complementary data, or questions, contact us at info@nasrc.org.



NASRC is a 501(c)(3) environmental nonprofit working to advance climate-friendly natural refrigerants and reduce greenhouse gas emissions caused by traditional HFC refrigerants. We collaborate with stakeholders from across the industry, including over 55,000 food retail locations, to eliminate the barriers to natural refrigerants in supermarkets.