



DECICCO & SONS LARCHMONT, NY

CASE STUDY #5, NOVEMBER 2016

System Type: Transcritical CO2	Refrigerant: R-744 (carbon dioxide)	GWP: 1
---	--	------------------

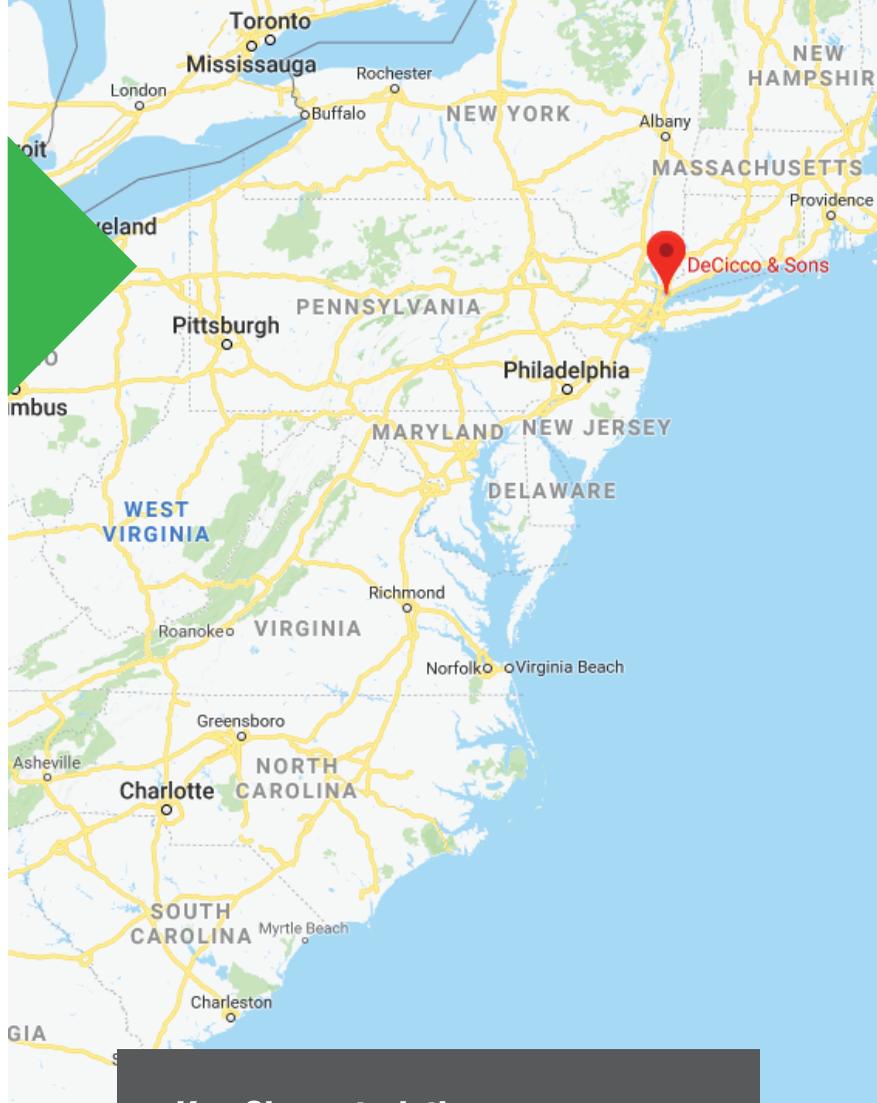
Store Size: 24,000 sq ft

ASHRAE Climate Zone: 4

Utility Provider: Con Edison

Average Electricity Cost: \$0.188/kWh & \$25-\$30/kW

System & Charge: Transcritical CO2 / 1,000-lbs R-744



DECICCO & SONS LARCHMONT, NY

Key Characteristics:

This is a Hillphoenix transcritical CO2 system utilizing a BAC adiabatic pre-cooler (i.e. a hybrid gas cooler that works using both evaporation and air to reject heat); goal of pre-cooling is to make CO2 a more efficient option in warmer ambient climates.

NASRC.ORG

SYSTEM BASICS

DeCicco & Sons installed a state-of-the-art transcritical CO2 booster system with adiabatic pre-cooling to improve the efficiency of the CO2 refrigerant in warmer months of the year.

Up and running in January 2016, this system was built to maximize efficiencies. It takes advantage of the high temperature waste heat and redirects it to the HVAC system. The store also installed solar panels in June 2016, uses LED lights, has doors on most cases, uses photo sensors and motion sensors, and has motorized and automated night curtains, (thus ensuring that the energy benefits of night curtains are fully realized).

In addition, this system uses electric defrost and has a sub-meter on nearly every device or panel, allowing for very precise energy use measurements. The energy savings and demand reduction shown on the next page are compared to a similar sized R-404a system in the same climate zone.

While the upfront cost of this R-744 system was 20-30% more than a typical HFC DX system (with case controllers), the installation costs were slightly less. The expected maintenance costs are about the same, while the cost of CO2 is less than that of HFC refrigerants.

CONTACT US

✉ info@nasrc.org www.nasrc.org

ENERGY & PERFORMANCE

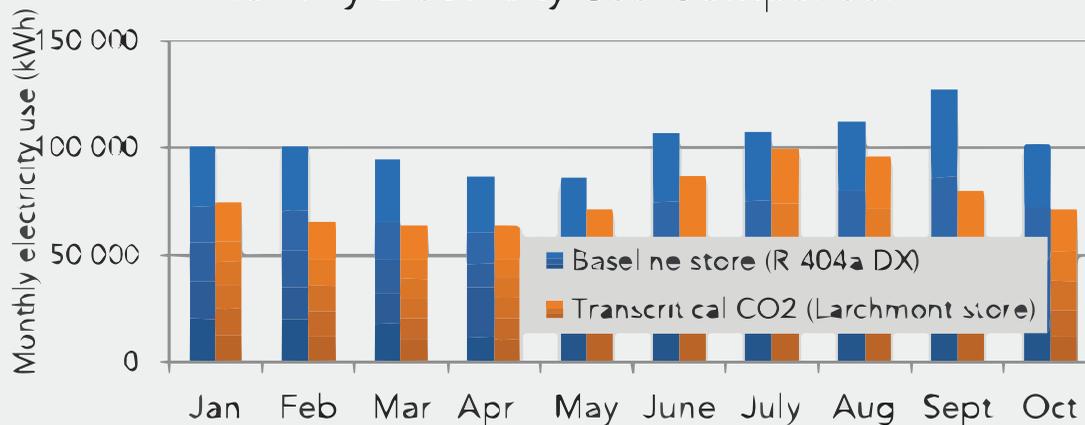
DeCicco's has 10 months of store-wide electricity and demand data from its new Larchmont store and a comparable store using R-404a. The CO2 system uses anywhere from 7 to 37 percent less electricity than the baseline system.

In addition to the kWh savings, Larchmont sees a decrease in monthly demand. Total cost savings from reduced electricity use and reduced demand were \$64,862 over 10-months, or \$77,834 when annualized.

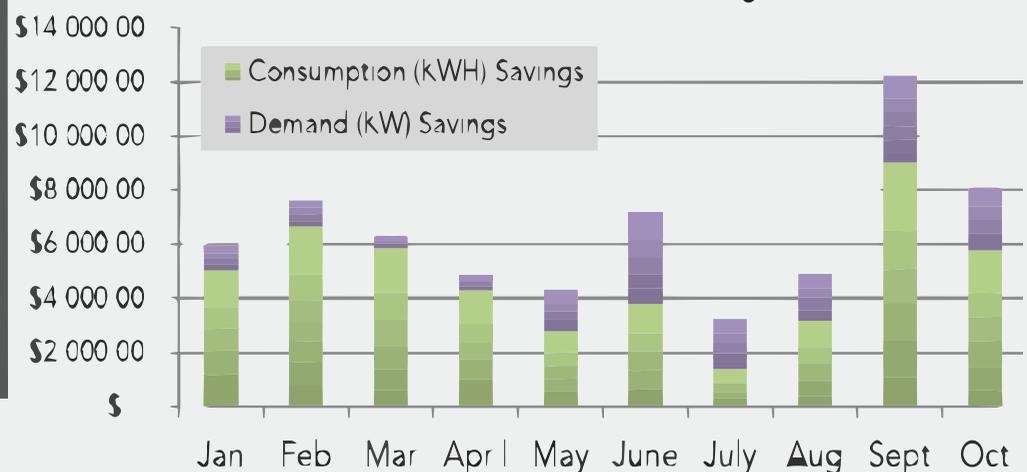
WHAT DECICCO SAYS

"I think that the CO2 system with the adiabatic gas cooler is a great investment, in fact I've already installed two more. I think the energy savings is terrific."

Monthly Electricity Use Comparison



Monetized kW & kWh Savings



The North American Sustainable Refrigeration Council is a 501(c)(3) nonprofit dedicated to advancing natural refrigerants and creating a more sustainable future for retail food refrigeration. Learn more at <http://nasrc.org>

NASRC.ORG



CONTACT US

✉ info@nasrc.org www.nasrc.org