



CASE STUDY

Sam's Food Store
 Energy Efficiency



65%
 average savings

3-5 year
 payback

\$3,850
 savings/year



Before the Airstream 9100 was installed at Sam's Food Store, the store's estimated energy use was about 59,150 kWh per year. Following installation, energy use is expected to decrease to about 20,650 kWh per year, a savings of 38,500 kWh per year or 65%.

This equates to roughly 3,850 kilograms of CO₂ not polluting the atmosphere, 0.80 cars off the road each year or 99 planted trees.

When Nasir Mehmood, owner of Sam's Food Store in Ajax, heard about an innovative technology that uses demand ventilation that harnesses cold outdoor air to cool his convenience store's walk-in cooler, he was intrigued about the potential energy savings such a technology could offer.

Mr. Mehmood contacted the technology's manufacturer, Airstream Free Energy Systems, to see if it might be a good fit for his store. After speaking with James Green, Airstream's Sales Director, Mr. Mehmood was pleasantly surprised to learn that he might qualify for a rebate through the Ontario Power Authority's (OPA) saveONenergy^{OM} RETROFIT PROGRAM.

In 2013, with Airstream's assistance, Sam's Food Store became the first business in Ontario to receive



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an OPA incentive for free cooling of their refrigeration system through Veridian Connections, the local electricity distribution company.

AIRSTREAM TECHNOLOGY

Airstream technology uses free cooling from the outdoor environment along with high-efficiency mechanical systems to control refrigeration. The technology, which can be applied to both new and existing refrigeration systems, controls the usage of various energy consuming aspects of a cooler or freezer.

Airstream 9100 System Operation

For Sam's Food Store, Airstream installed the Airstream 9100 Free Cooling system in the existing cooler. Installation of the Airstream 9100 required creating two 10-inch holes in the exterior building wall to draw air in and out, but was otherwise quite simple. With the new system, as soon as the cooler calls for cooling, the Airstream system checks the outside air temperature. If the outside temperature is below the cooler temperature, the Airstream System kicks in, drawing colder outdoor air into the cooler. Two small fans circulate air around the cooler,

keeping a uniform, cold temperature. In Toronto, low enough temperatures occur on average 145 equivalent days a year.

System Features

The Airstream 9100 system installed at Sam's Food Store includes the following features:

Free Cooling – During late fall, winter and early spring, when the outside air is below the cooler's temperature, the system uses outside air to cool. The compressor and evaporators are used only as a back-up when needed.

Door Heaters – The system monitors humidity and door glass temperatures to ensure the door heaters (used to prevent condensation and fogging) are used only when needed instead of 24/7, reducing their use by 80% on average.

Evaporator Fans – To help reduce energy costs, the system uses a circulating fan strategically placed to reduce the need for all the evaporator fans to be on when the compressor is off.

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Remote Monitoring and Data Logging –

Remote monitoring allows Airstream to pinpoint any issues that might arise and download operating history to determine up-to-date savings.

Back-up control – If any issues arise with the system, the original refrigeration system will come on as back-up until the system has been serviced.

Defrost – The system checks for ice and only turns on the defrost cycle when required. When the ice is gone, it turns off. This is more efficient than the original system, which turned on the defrost cycle three times per day for 20 minutes whether there was ice or not.

Time of Use Electricity Cost – The system is programmed to take advantage of Veridian's Time of Use Rates by allowing the cooler air to get colder when the electricity is cheaper, thereby extending the life of the desired temperature.

Night Set Back – The night set back feature of the system allows the compressor to stay off (in coolers with non-perishables) when the store is closed.

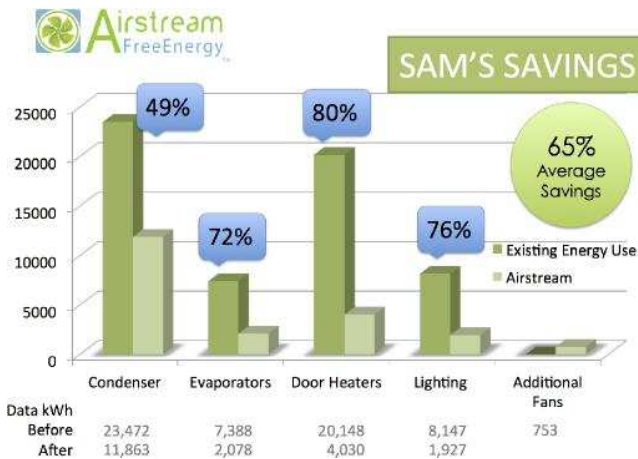
Lighting – The Airstream upgrade included changing the 15 existing T12 florescent tubes to 11 LED replacements. Additionally, the system is programmed to turn cooler lights off when the store closes or during peak periods.

BENEFITS

A major advantage of the Airstream technology is that it does not require a store to do anything it is not already doing. The system simply piggybacks on whatever system is already in place. Because it runs in tandem to the original system, if any issues arise, the Airstream system can be shut off and the coolers will continue to operate as before. This system not only reduces equipment wear, it can also increase energy savings and provide for a more efficient refrigeration system.

Before the Airstream 9100 was installed at Sam's Food Store, the store's estimated energy use was about 59,150 kWh per year. Following installation, energy use is expected to decrease to about 20,650 kWh per year, a savings of 38,500 kWh per year or 65%. This equates to roughly 3,850 kilograms of CO2 not polluting the atmosphere, 0.80 cars off the road each year or 99 planted trees.

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According to James Green, for coolers up to 120 square feet, the payback for the Airstream 9100 is about 4-5 years. For larger coolers above 140 square feet the payback is usually less than 3 years. With the system installed at Sam's Food Store, Mr. Mehmood expects savings of \$3,850 per year and a payback period of 2 years, 9 months. That represents a 65% net savings per year compared to the baseline and a 36% return on investment.

MOVING FORWARD

James Green said that they have many new products and programs coming over the next year that take advantage of free energy for heating and cooling all year round.

ABOUT AIRSTREAM FREE ENERGY

Airstream Free Energy Systems is part of the Virta Energy Consultants, which have more than 30 years of experience providing independent energy efficiency, conservation and management advice. Born out of experience in the Energy Consultation field, Airstream Free Energy Systems fulfill the need for more environmentally responsible solutions for heating, cooling and ventilation. In simple terms, Airstream uses computer based demand ventilation and outside air for free heating or cooling, depending on the application, as well as other intelligent controls to help reduce costs, maintenance and energy.

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