Minnesota Grocers Assoc.

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Organization Background

The Minnesota Grocers Association (MGA) was founded in 1897 and remains the state's only trade association for grocery and convenience stores, brokers, manufacturers, and wholesalers in the retail food industry. Headquartered in St. Paul, the MGA has 300+ members consisting of nearly 1,300 locations which employ over 150,000 people across the state. MGA dispenses educational material and topical information on the food retail industry, highlights and distributes member achievements, provides funding for community events and scholarships, and is involved in state government affairs and initiatives that support its members' interests.

"I am so grateful to MnTAP for allowing me the chance to work on a real-world energy efficiency and emissions tracking project. I know the professional and pollution prevention skills I've learned here will be invaluable for my future career." ~ PG

Project Background

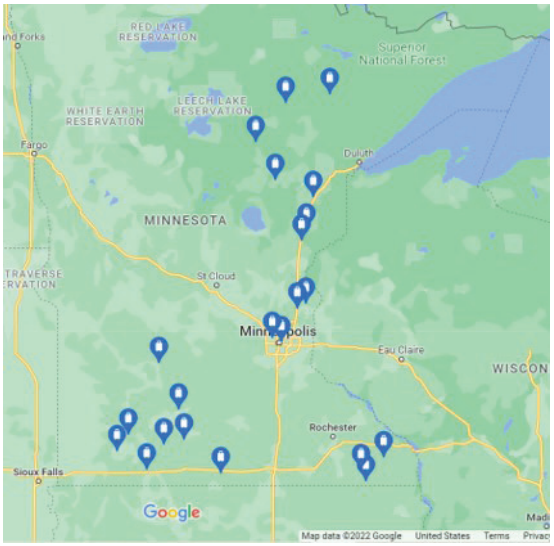
This project builds on a 2021 MnTAP intern project that developed a Best Practices in Commercial Refrigeration guide focused on optimizing the energy efficiency of grocery store refrigeration systems. This year's project goal was to check for refrigerant leaks and implement the best practices guide at small to medium-size grocery stores across the state. Priority was given to sites in areas of environmental justice concern.

Twenty-two refrigeration systems (see Site Map) were checked for leaks and other possible energy efficiency optimizations in the form of insulation repairs, condenser cleanings, proper case loading, gasket replacements, and evaporator de-icing. After each site assessment, store managers were given a list of any energy optimization recommendations (if any were found), along with estimated cost savings for each energy optimization measure, common refrigeration rebate options and their cost analyses, last year's original best-practices guide, and grant information for refrigeration system updates from the MPCA. Pursuant to the project goals, over half of the visited sites were in areas of environmental justice concern.

Incentives To Change

Grocery stores are indispensable community hubs across the state that offer employment, nourishment, and community funding for their neighbors. They also spend a large portion of their energy budget on refrigeration. Leaks of potent greenhouse gas refrigerants can contribute to urban pollution and climate change. Leaks, inefficient system setups, and neglected maintenance can all lead to over-use of these refrigerants, costing businesses money and time while also negatively impacting the environment. In severe cases, improper maintenance can lead to failure of the entire refrigeration system, leading to further losses in time, products, and the resources that brought them to the grocery store shelves. Helping stores eliminate refrigerant leaks and optimize the efficiency of their systems helps prevent pollution and saves money, since older refrigerant mixes are becoming more expensive to refill, and energy costs are currently high and uncertain.

Site Map



Solutions

Leak Testing

EPA estimates that around 25% of a supermarket's refrigeration load is expected to leak every year. However, no refrigerant leaks were detected at the 22 stores visited. Valve caps, piping joints, and fittings were tested with a portable leak detector probe in compressor rooms and walk-in freezers, around rooftop condenser units, and over front-of-house equipment. One possible reason that MGA members may be above average in this respect is regular maintenance by refrigeration contractors. Even the smallest stores had visible service logs exhibiting frequent system check-ups.

Energy Efficiency

A checklist based off last year's best practices guide was used at each store visit to scout for energy efficiency recommendations. Rooftop condensers were cleaned of sheets of dust, insulation repairs were recommended, iced-over evaporators were discovered, case loading was monitored, and case door gaskets were checked for damage. The implemented condenser cleanings helped save approximately 72,000 kWh of electricity, and the rest of the recommended actions combined would save an additional 110,000 kWh, for a total of 180,000 kWh saved. Based on a conservative figure of $0.10 per kWh, this represents potential cost savings of $18,000 for Minnesota businesses, with payback times ranging from immediately to just over two years. The energy use avoided also saves an estimated 140 tons of carbon dioxide every year, which is the equivalent of taking 30 gas-powered vehicles off the roads.

"The Minnesota Grocers Association greatly appreciated the opportunity to partner with the MnTAP summer intern program. This experience was an outstanding value to our membership. The professionalism and expertise provided achieved our collective objective to optimize the energy efficiency of grocery store refrigeration systems. The tangible solutions and valuable best practices benefit the grocery industry and the entire state. We are proud to have been a part of the summer intern project."

~ Jamie Pfuhl, President
Minnesota Grocers Association

Recommendation	Annual Reduction	Annual Savings	Status
Condenser Cleaning	72,000 kWh	$7,200	Implemented
Insulation Repairs	3,440 kWh	$344	Recommended
Case Loading	7,500 kWh	$750	Recommended
Gasket Replacements	26,940 kWh	$2,694	Recommended
Evaporator De-icing	68,400 kWh	$6,840	Recommended

MnTAP Advisor: Jane Paulson, Senior Engineer