2013 Case Study

Dillons Food Stores

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Major: Industrial Engineering

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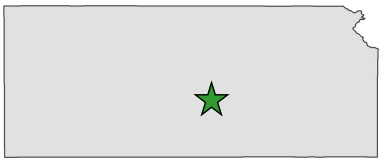

Hutchinson, Kansas

Company background

Dillons food stores joined with the Kroger Co. in 1983, creating a nationwide grocery chain providing employment for more than 339,000 associates and grocery services to thousands of customers across 31 states. Most locations have pharmacies and gas stations for convenience. Dillons' parent company, Kroger, has always held the highest moral, ethical, and legal standards for its companies, and strives to provide the best customer service possible.

Project background

The main goal of this internship was to visit stores showing high energy usage and find ways to lower the energy demand through lighting surveys. The Kroger Company has a set list of lighting standards for all stores involving lighting levels and fixture placement. Proposed lighting modifications were recorded for a total of 10 stores. In addition to the lighting reinvention project, the refrigeration systems of the 10 stores were checked for leakage of refrigerant gas that poses a threat to the environment.

Incentives for change

The Dillons division covers most of the Midwest region, and the energy use of each store within the division is recorded and analyzed each quarter. These quarterly reports make it clear that many stores are steadily increasing their energy usage, meaning inefficiencies are present in those stores. The utility bills show that electricity usage contributes to 80% or more of the cost of the bill. Improving energy efficiency in the stores with this trend helps keep the store out of debt and benefits the environment. The lighting reinvention project proved to be a quick hit that showed a fast turn around in energy and cost savings.

Projects reviewed for E2/P2 potential

1. Lighting reinvention

The lighting reinvention project was an already existing procedure carried out by the Dillons facility engineering department. Stores visited in the summer of 2013 had their lighting levels surveyed with the EXTECH foot-candle meter provided to determine if removing fixtures would still maintain illumination standards.

Occasionally, the proposed energy savings were as simple as switching to higher efficiency bulbs in an older store, and de-lamping fixtures that had become extraneous due to store remodels.

The low-temp refrigerated cases were recommended to be retrofitted with LED lights. LED lights run more efficiently than standard fluorescent tubes and operate at a lower temperature, reducing the required cooling load of refrigerated cases.

A net annual energy savings was estimated at 184,000 kWh/yr, yielding annual savings of $14,780/yr based on a loaded per kilowatt-hour charge of $0.0803.

2. Refrigeration

Commonly used refrigerants are made up of the chlorofluorocarbons CFC, HCFC, and SF_6, which fall under the brand name Freon. These substances are categorized under greenhouse gases and participate in ozone depletion. A small leak in the refrigerant system left unnoticed will result in these harmful gases remaining in the atmosphere for decades. Dillon's has agreed to phase out the more harmful refrigerants with the EPA-approved alternative by the year 2020.

Using the CPS electronic refrigerant gas detector in the equipment rooms and store floors resulted in discovering small easy-to-fix leaks in the stores.

Unfortunately, the amount of gas cannot be quantified since the amount of time the gas leak existed was unknown.

Summary of 2013 E2/P2 intern recommendations for Dillons Food Stores

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Store 3 lighting reinvention	47,983 kWh/yr	$3,853/yr	In progress
Store 7 lighting reinvention	10,448 kWh/yr	$839/yr	Recommended
Store 16 lighting reinvention	34,981 kWh/yr	$2,809/yr	In progress
Store 23 lighting reinvention	20,062 kWh/yr	$1,387/yr	Recommended
Store 41 lighting reinvention	26,663 kWh/yr	$2,141/yr	Recommended
Store 51 lighting reinvention	10,112 kWh/yr	$654/yr	Recommended
Store 71 lighting reinvention	8,257 kWh/yr	$663/yr	Recommended
Store 77 lighting reinvention	9,477 kWh/yr	$648/yr	In progress
Store 84 lighting reinvention	2,242 kWh/yr	$847/yr	In progress
Store 89 lighting reinvention	13,836 kWh/yr	$954/yr	Recommended
Refrigerant leak detection	Not calculated	Not calculated	Regular maintenance recommended
Total savings *	**184,247 kWh**	**$14,795**	
GHG reductions *	**131 metric tons CO_2e**		

* Does not include projects that are “not recommended” or where “further research is needed.”