

# Family Dollar – Duct Sealing

RILA Retail Energy Management Program: June 2015



## Implementation Model:

### HVAC Duct-Sealing Drives Savings

#### **BARRIER**

Leaky and inefficient air-ducts lower building performance and comfort.

#### **SOLUTION**

Upgraded and improved the duct sealing on its aging heating, ventilation, and air conditioning (HVAC) duct work at nearly 150 store locations with the help of utility rebates.

#### **OUTCOME**

Reduced in-store energy use by 5% and improved in-store ENERGY STAR Portfolio Manager Score.

## Overview

Family Dollar is one the nation's largest retailers with over 8,100 store locations, 50,000 employees and over \$10 billion in annual sales. The company strives to operate its store locations as efficiently as possible for the comfort of its customers and employees. After successfully benchmarking and collecting energy use data for nearly all 8,100 stores, the company identified opportunities for efficiency improvements and prioritized among them for investment. An HVAC duct-sealing program, incentivized by Dominion Virginia Power, was one such opportunity to reduce consumption and improve comfort, especially for its older stores.

The duct sealing work enabled the company to realize an average of 5% energy savings at 145 store locations in under 12 months.

*"Family Dollar realizes consistent returns on our energy efficiency investments. Our roadmap includes investments in maintaining the infrastructure in our existing buildings, so we can take full advantage of the benefits offered by new energy technologies."*

**Colin McGinnis**

*Senior Vice President, Store Operations, Family Dollar*



This Implementation Model was completed with support from the Department of Energy's Office of Energy Efficiency and Renewable Energy and the Better Buildings Initiative to highlight innovative proven energy solutions from market leaders in the Retail sector. Find more ideas at the Better Buildings Solution Center at [betterbuildingsolutioncenter.energy.gov](http://betterbuildingsolutioncenter.energy.gov)

HVAC accounts for 47% of energy use<sup>1</sup> and \$1.41 billion in potential savings across the retail industry.<sup>2</sup> The Retail Industry Leaders Association (RILA) Retail Energy Management Maturity Matrix identifies the following as an ‘Excelling’ HVAC practice: “Developing roll-out strategy for highest efficiency replacement and retrofit options”.<sup>3</sup> The following Family Dollar implementation model offers a template for retailers in search of innovative HVAC solutions.

## Process

The duct sealing work involved applying low volatile-organic- compounds (VOC) mastic and foil duct tape to all of the joints, terminations, and connections in the duct system. Family Dollar partnered with Sustainable Technology Institute, an approved contractor for Dominion Virginia Power, to develop the project. Dominion Virginia Power offered energy efficiency rebates for Family Dollar to seal off leaky ducts and HVAC air intakes. The stores where the retrofits took place are all located in the PJM Interconnection’s territory, a Regional Transmission Organization that coordinates the movement of wholesale electricity in over a dozen states, including parts of North Carolina and Virginia. This region has particularly high capacity costs – another driver for Family Dollar to invest in energy efficiency upgrades.

## Outcomes

Family Dollar reduced average duct leakage from 32% to 12%, which translated to an average 5% reduction of consumption and spend. These stores also saw an average improvement of two points in their EPA ENERGY STAR Portfolio Manager scores.

## By the Numbers:

The table below shows the cost savings over a ten-year life per store.<sup>4</sup> Absent utility energy efficiency incentives, these investments paid for themselves in less than three years. The table above shows how the pay back periods change depending on the size of the rebates utilities may offer for this work.

External Efficiency Rebates (%)	Internal Family Dollar Cost (%)	Pay Back Period
0%	100%	32 months
25%	75%	24 months
50%	50%	16 months
75%	25%	8 months
100%	0%	-

The range of leakage improvements and the corresponding reductions in consumption and energy spend varied considerably across the 145 stores. Family Dollar is now performing additional analyses to identify key building attributes such as building age, climate zone, and quantity of HVAC units that best respond to duct sealing. Based on those findings, Family Dollar will identify the subset of stores within their fleet that meet those store attribute criteria, and work with the finance team to develop a business case to scale this initiative to those stores.

1 Pacific Northwest National Laboratory & PECL. Advanced Energy Retrofit Guide for Retail Buildings. U.S. Department of Energy, Energy Efficiency & Renewable Energy. (September 2011). Retrieved from [http://www.pnnl.gov/main/publications/external/technical\\_reports/PNNL-20814.pdf](http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20814.pdf)  
 2 Jamieson, Meriah. A \$3 Billion Opportunity: Energy Management in Retail Operations. Schneider Electric. 2014.  
 3 Retail Industry Leaders Association (RILA). Retail Energy Management Maturity Matrix. Retrieved from <http://www.rila.org/sustainability/RetailEnergyManagementProgram/Pages/MaturityMatrix.aspx>  
 4 Key Assumptions: 10 year Life, 8% Discount Rate, \$900 annual cost savings per store.

Family Dollar’s energy and finance teams repackaged the results of this duct-sealing program to align with how Family Dollar and other organizations view their financial performance. Family Dollar’s duct sealing work can have a material impact on three drivers of business: Profit, assets, and people.<sup>5</sup>

**Profit:** The cost savings from duct sealing reduce selling, general, and administrative (SG&A) expenses, and have a direct impact on Family Dollar’s operating profit or earnings before interest and taxes (EBIT). Moreover, duct sealing helps reduce the risk of asset impairment and unplanned acceleration of asset depreciation. The average annual savings per store was \$900. This translates to \$18,000 of top line sales equivalents per store.

**Assets:** Duct sealing has a direct positive impact on asset utilization. HVAC systems are among the most expensive assets in Family Dollar’s fleet of stores. To ensure a strong and predictable return on those assets, Family Dollar must efficiently and effectively use these assets to generate profits (or avoid lost profits), and duct sealing helps to accomplish this.

**People:** Duct sealing helps contribute to a comfortable working and shopping environment. When Family Dollar Team Members are comfortable, they are more focused on providing excellent service to their customers, thus creating a culture that helps drive its business forward.

## Technology Spotlight: Top Ways to Save with HVAC

EPA ENERGY STAR estimates that as much as 50% of the energy consumption at a retail location can be in HVAC use. There are however, several easy and cost effective measures to boost building performance and save on the bottom line.<sup>6</sup>

### BENEFITS

- ▼ **Check your air filters regularly:** Check your filter every month, especially during heavy use months (winter and summer). If the filter looks dirty after a month, change it. At a minimum, change the filter every 3 months.
- ▼ **Tune up your HVAC equipment yearly:** A yearly tune-up of your heating and cooling system can improve efficiency and comfort.
- ▼ **Seal your heating and cooling ducts:** Ducts that move air to-and-from a forced air furnace, central air conditioner, or heat pump are often big energy wasters. Sealing and insulating ducts can improve the efficiency of your heating and cooling system by as much as 20 percent.

<sup>5</sup> Kevin Cope, *Seeing the Big Picture: Business Acumen to Build your Credibility, Career, and Company*. Greenleaf Book Group Press, 2012.

<sup>6</sup> Linda Hardesty, "Top 5 Ways to Save With AC", *Energy Manager Today*, August 25, 2014, <http://www.energymanagertoday.com/top-5-ways-save-ac-0104301/>

## RILA Energy Management Program

### Program Background

Retailers have a significant opportunity to reduce the energy consumption and associated greenhouse gases of their vast portfolio of locations, to the benefit of both companies and the environment. The Retail Industry Leaders Association (RILA) is committed to helping its members overcome barriers to enhanced energy performance across their building portfolio through its [Retail Energy Management Program](#).

### Program Workstreams:

RILA and its program members are working to (1) Develop Implementation Models, (2) Educate the Industry, and (3) Spur Adoption of Implementation Models with a focus on three key areas:

1. **Financial management**, by exploring how to “speak finance”, improve project proposal and piloting processes, create innovation funds, and utilize external financing.
2. **Leased store management**, by engaging landlords and internal real estate, construction, and store associate teams to overcome the additional energy management challenges faced in leased store locations.
3. **Renewable energy**, to partner with existing renewable energy organizations to educate energy managers on the landscape of renewable energy procurement options.

### Join the Program

Retail energy managers interested in participating should email Erin Hiatt, Senior Manager of Sustainability & Compliance, at [Erin.Hiatt@RILA.org](mailto:Erin.Hiatt@RILA.org).

Learn more at [rila.org/energy](http://rila.org/energy)

Find more Better Buildings resources at [betterbuildingssolutioncenter.energy.gov](http://betterbuildingssolutioncenter.energy.gov)

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