

CASE STUDY

FOR TRUCK REFRIGERATION, ELECTRIC IS BETTER

CHALLENGE

For years, trucks have idled their diesel engines during loading, unloading, and at mandated rest stops in order to keep refrigerated trailers filled with perishables cold. Risk of food spoilage necessitates exact temperature control and precise records of temperature history. But the exhaust, noise, and cost associated with idling on diesel are inefficient and unnecessary today, due to new electric truck refrigeration unit (eTRU) technologies.

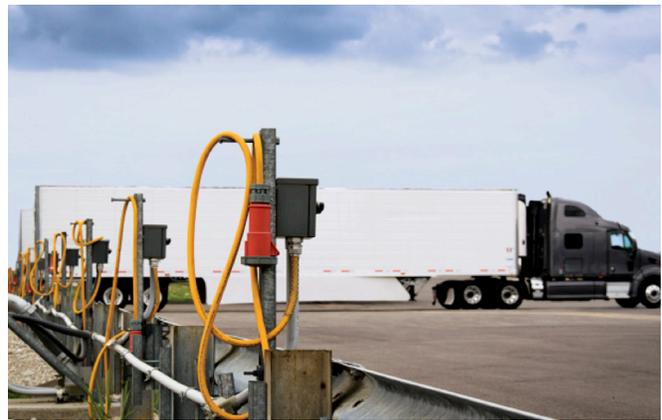
OLD WAY

Witte Brothers Exchange, Inc. of Troy, Mo., transports products that require temperature control throughout the continental United States. These products include produce, coffee, frozen foods, and consumer goods. The company used conventional TRUs, but was concerned about operating cost and wanted to minimize the carbon footprint of its diesel-powered truck and trailer system. Trucks in the fleet typically idled at the Troy location for two to three days, burning diesel, before going on the road to make their deliveries.

NEW WAY

The eTRU solution relies on electric motor-driven—instead of diesel engine-driven—compressors to provide the necessary cooling. Companies such as Carrier Transicold provide hybrid diesel/electric products for both on-road and off-road refrigeration.

In 2013, Witte Brothers installed 3-phase (460V) electric infrastructure at its Troy location to serve 50 Carrier Transicold Vector hybrid units that have electric standby for trailer refrigeration. By 2018, Witte Brothers had electrified 34 loading docks and installed an additional 120 freestanding receptacles in nearby staging areas for trucks to use after trailers are loaded. Witte Brothers now operates its entire fleet of 280 trailers using eTRUs, 150 of which are the latest Vector hybrid units.



Electric truck refrigeration unit parked at a staging area.

RESULTS

Conversion of the entire fleet of approximately 280 refrigerated trailers amounts to diesel fuel savings of approximately \$10,000 to \$17,000 per week, assuming diesel at \$3 per gallon and fuel consumption at a rate of 0.6 to 1 gallon per hour.

The operational data show that, apart from the time when refrigerated trailers are on the road (when diesel is the only option), the electric standby is enabled 30% of the available time at either the loading dock or a staging area. On average for the fleet, each eTRU displaces 1,000 hours of diesel runtime with electric runtime. Typically, this translates to 40% to 70% energy savings depending on costs of diesel and electricity. Hours idling and cost of diesel fuel vs. electricity are key factors in determining the feasibility of conversion and should always be assessed when quantifying the opportunity for eTRUs.

BOTTOM LINE

The company is satisfied with the eTRU conversion. Maintenance costs are expected to be lower, in part because electric/diesel hybrid equipment experiences less wear-and-tear than the purely diesel counterpart. And because of the reduced diesel operating time, the life of the trailer units has been extended to six to seven years, from a previous average of five years.

FOR MORE INFORMATION

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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