

# Hybrid delivery vans show nearly 20 percent higher fuel economy, study says

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(Phys.org)—The U.S. Department of Energy's (DOE)'s National Renewable Energy Laboratory (NREL) recently completed a performance evaluation report that showed significant fuel economy benefits of hybrid electric delivery vans compared to similar conventional vans.

"During the on-road portion of our study, the hybrid vans demonstrated a 13 to 20 percent higher [fuel economy](#) than the conventional vans," said NREL Project Engineer Michael Lammert. "During dynamometer testing, three standard drive cycles were chosen to represent the range of delivery routes. The hybrids showed a 13 to 36 percent improvement in fuel economy and up to a 45 percent improvement in ton-miles-per-gallon. This wide range in fuel economy is largely dependent on drive cycle."

The new NREL report—[Eighteen-Month Final Evaluation of UPS Second Generation Diesel Hybrid Electric Delivery Vans](#)— details the impact of hybridization on fuel economy and performance and identifies the conditions under which the hybrids offer maximum fuel savings.

The NREL team collected and analyzed in-service fuel economy, maintenance, and other vehicle performance data on 11 hybrid and 11 conventional step vans operated by the United Parcel Service (UPS) in Minneapolis. The team also performed dynamometer testing at the Renewable Fuels and Lubricants (ReFUEL) Research Laboratory in Denver.

"The reliability of the hybrids was slightly lower, 92.5 percent compared to 99.7 percent, in part due to troubleshooting and recalibration issues related to prototype components," Lammert added. "Differences in per-mile maintenance and operating costs were not statistically significant."

The hybrid vans feature [hybrid propulsion systems](#): 44 kilowatt electric motors, lithium-ion batteries and [regenerative braking](#) that captures energy normally lost during braking to power the electric motor. The comparable conventional vans were approximately the same age and were operated in similar conditions out of the same facility. The two vehicle groups switched route assignments during the study period to provide a balanced review of the vans on the same route.

NREL has been working in partnership with UPS for five years to track and evaluate the performance of its hybrid vehicles. The first study, performed in 2008, focused on first-generation hybrid vans operated by UPS in Phoenix. In 2010, UPS deployed 200 second-generation [hybrid](#) vans to eight U.S. cities, including the 11 under study in Minneapolis. These second-generation hybrids feature more advanced control algorithms and an "engine off at idle" feature that automatically stops and restarts the engine at stoplights and during other short-stop conditions.

Provided by National Renewable Energy Laboratory

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