

## HYBRID ELECTRIC TRU DEMONSTRATION PROJECTS

As a natural extension of the Diesel Idling Reduction Program, NYSERDA began a series of research projects focused on transport refrigeration units (TRUs) in 2004.

- Phase 1 (August 2004) commissioned an initial Market Study and Technology Assessment, which identified promising hybrid electric technology (eTRU) that was then only available in Europe. At the completion of the study, the eTRU technology was found to face a true “chicken-and-egg” dilemma similar to that faced by many technologies that require some supporting infrastructure. In addition, the eTRU, due to its less complicated nature, has the potential to be more affordable and with the development of an advanced, user-friendly electrical connection system to allow a shorepower connection at depots and warehouses. The study is posted on NYSERDA’s web site at the link below and was influential in Carrier Transicold’s decision to subsequently enter the North American market with the eTRU technology.

<http://www.nyserd.org/publications/ElectricPoweredTrailerRefrigeration.pdf>

- Phase 2 (September 2005) deployed ten of the Deltek eTRU units at Maines Paper & Food Services in Conklin, NY for a twelve month demonstration. The project was focused on developing the necessary electrical power infrastructure required in trailer parking areas, along with under-carriage wiring, connectors, breakers, power supplies, etc. NYSERDA project partners included Shorepower Technologies LLC, U.S. Environmental Protection Agency, Carrier Transicold, Maines Paper & Food Services, Penske Trucks, Great Dane Trailers, New York State Electric and Gas, PAR Logistics Management Services, and New West Technologies LLC.

Phase 2 is now complete and the Final Report was issued in January 2008 and is available on the web at the following link. <http://www.epa.gov/smartway/documents/adeq-nyserd-final-report.pdf> Two Phase 2 press releases are also available on the web at the following links:

<http://www.sbwire.com/news/view.php?sid=4835>

<http://yosemite.epa.gov/opa/admpress.nsf/8b770facf5edf6f185257359003fb69e/414a3f458da880c7852572ba0050f6ab!OpenDocument>

- Phase 3 (September 2006) deployed nine additional Deltek eTRU units at Willow Run Foods in Kirkwood, NY for a planned six month demonstration. Phase 3 was focused on developing the electrical power connections at the facility’s loading docks, along with safety systems to prevent unintentional drive-offs. As an additional refinement, Phase 3 also looked at the potential integration of the eTRU with the auxiliary power unit (APU) supplying hotel loads for the tractor sleeper cab. NYSERDA project partners included Shorepower Technologies LLC, U.S. Department of Energy, Carrier Transicold, Willow Run Foods, Ryder Trucks, Kidron Trailers, New York State Electric and Gas, PAR Logistics Management Services, Mullen Industrial Services, and New West Technologies LLC.

Phase 3 is now complete and the Final Report was issued in January 2009. An earlier report detailing the infrastructure installation was delivered to the U.S. DOE in June 2008; both reports are available upon request. The Phase 3 Press Release is available on the web at the following link:

<http://www.sbwire.com/news/print.php?sid=11827>

- Phase 4 (April 2008) is underway and is developing a TRU energy management system (EMS) at a NYS correctional facility in Rome, NY. The computer-based system will monitor a fleet of TRUs with electric stand-by capabilities and strive to reduce total energy cost and peak demand by coordinating simultaneous electrical draw by the TRUs and switch them from diesel to electric, as required. Additionally, the EMS will strive to reduce electric facility installation costs by “right-sizing” the electrical supply and distribution system and provide for tracking CO<sub>2</sub> reductions and air quality criteria emissions reductions when operating on electricity. NYSERDA project partners include Shorepower Technologies LLC, the New York State Department of Corrections, Oneida Correctional Facility, Carrier Transicold, New York State Electric and Gas, PAR Logistics Management Services, New West Technologies LLC, and the Edison Electric Institute.

The Phase 4 Press Release is available on the web at the following link:

<http://www.1888pressrelease.com/shorepower-technologies-to-develop-electrical-control-for-tr-pr-05n1w4pn2.html>