Hybrid Yard Tractor Development & Demonstration

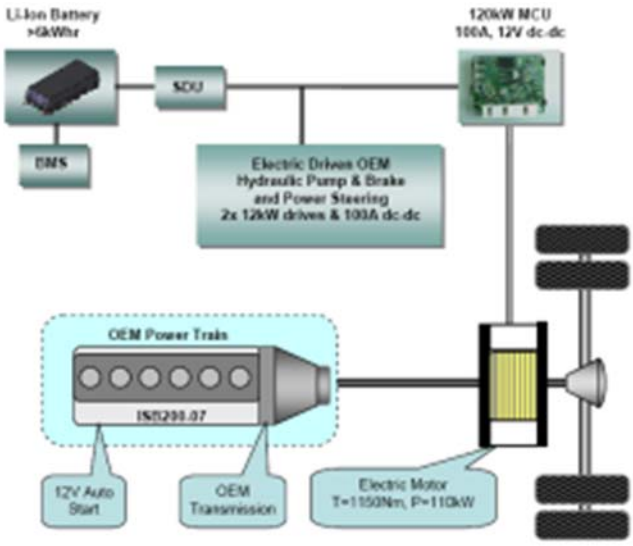
Technology Manufacturer
US Hybrid

Co-Participants
Port of Los Angeles, Port of Long Beach, CALSTART, U.S. Environmental Protection Agency, Kalmar Industries, Long Beach Container Terminal (LBCT)

Project Objective

Investigate the feasibility and commercial viability of using advanced technology drive systems in cargo handling equipment. The TAP, in partnership with the U.S. EPA's West Coast Collaborative, worked together to develop and test hybrid technology yard tractors for use at container terminals.

The Ports of Long Beach and Los Angeles partnered with CALSTART, a non-profit company that focuses on advancing cleaner technologies, to manage the demonstration of three (3) diesel-hybrid yard hostlers at the Long Beach Container Terminal (LBCT). The U.S. EPA also provided grant funds for the design and development of the hybrid drive system. Vehicle emissions and performance were evaluated relative to diesel yard hostlers, and a business case/lifecycle cost-benefit assessment was performed to determine the financial viability for large-scale use of hybrid yard hostlers in marine terminals.



Technology Description

US Hybrid was selected as the hybrid drive system supplier through a competitive bid process. US Hybrid designed and developed a diesel-electric parallel hybrid, post-transmission configuration system that was integrated into a Kalmar Industries Ottawa 4x2 terminal tractor.

Results

The three hybrid yard hostlers underwent six months of operation and in-use testing at LBCT and were able to perform all the tasks required of yard hostlers in real-world port operations, and were well accepted by drivers and maintenance staff. Fuel economy and emissions benefits were evaluated, but a difference discovered in the mechanical specifications of the vehicles limited comparability.

Benefits

Based on all the evaluations and analyses conducted, the hybrid system is estimated to provide a 12% to 18% improvement in fuel economy. Further development of the hybrid system is underway in an effort to improve fuel economy and emissions reductions. A follow-up study was conducted entitled "Hybrid Yard Tractor Development and Demonstration – Beta Test". The lifecycle cost assessment for large-scale use of hybrid yard hostlers showed that incentives of approximately $18,000 per vehicle would be needed to ensure payback of the hybrid system. The final report for this project is available for download from the TAP website.

Project Costs

The Ports contributed $300,000 each and the U.S. EPA contributed $300,000 through a West Coast Collaborative grant. LBCT and other project suppliers provided in-kind labor contributions estimated at $300,000. CALSTART provided technical project management assistance.

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