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Electric Truck Demonstration Project Fact Sheet

Overview

In 2007, the Port of Los Angeles and South Coast Air Quality Management District (SCAQMD) partnered to fund the prototype of the world's most powerful short-range heavy-duty electric truck from Santa Ana-based Balqon Corporation. The agencies split the \$527,000 investment to demonstrate a heavy-duty truck capable of hauling a fully loaded 40-foot cargo container.

The heavy-duty, all-electric truck now being tested at the Port of Los Angeles is a zero-emissions workhorse that could be a precursor to future short-range port and cargo terminal drayage operations worldwide. To advance this vision, the Port will place the first significant production order of these trucks with Balqon Corporation, to take delivery of 20 electric container terminal tractors, or "hostlers," and five on-road electric drayage trucks over the next 12 months.

The Balqon electric truck initiative augments the ongoing green technology efforts under the Technology Advancement Program, a component of the San Pedro Bay Ports Clean Air Action Plan (CAAP) approved by the ports of L.A. and Long Beach in November 2006. The ports are committing \$15 million over five years to fund the TAP. The mission of the TAP is to accelerate the verification or commercial availability of new, clean technologies through evaluation and demonstration to move towards an emissions-free port.

Performance

- ✓ Maximum speed: 40 mph
- ✓ Maximum range (empty): 60 miles/full charge
- ✓ Maximum Range (fully loaded): 30 miles/full charge

Charging Specs

- ✓ Charging Time (60% charge): 1 hour
- ✓ Charging Time (100% charge): 3-4 hours
- ✓ Price per truck: \$189,950 (yard hostler model); \$208,500 (on-road model)
- ✓ Price of charger: \$75,000, can charge 4 vehicles simultaneously
- ✓ Charger Connection: existing 440v system (total output 80kw)

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Reduced Energy Consumption and Costs

Electric Truck

2 kilowatt hours of energy units per mile

Operation cost: 20 cents per mile

Diesel Truck with 5 miles-per-gallon*

electrical equivalent of 8 kilowatt hours of energy units per mile

Operation cost: 80 cents to 90 cents per mile

** The above energy consumption and energy cost comparisons are based on a 100% duty cycle, which diminishes in the diesel truck when the truck is idling. A common 50/50 duty cycle in a diesel truck, reflecting 50 percent idling time, would increase the diesel truck's cost per kilowatt hour from .90 to \$1.80.*

Emissions Reduction Potential

An overall calculation of net emissions reductions still needs to be performed in order to take into account the emissions created in the generation of electric power used to charge the truck's batteries. However, based on the average emissions generated by the existing fleet of drayage trucks that serve the San Pedro Bay ports, Port of Los Angeles staff estimated the average pollution discharge generated by the estimated 1.2 million truck trips that occurred in 2006 between the ports and a local near-dock rail yard (the Intermodal Container Transfer Facility or ICTF). If those 1.2 million truck trips were to be made with zero emission electric trucks, an estimated 35,605.6 tons of tailpipe emissions would be eliminated in the following manners:

21.8 tons per year of Diesel Particulate Matter (DPM)

427.7 tons per year of localized Nitrogen Oxide (NO_x) emissions

168.5 tons per year of Carbon (CO)

34,987.6 tons per year of Carbon Dioxide (CO₂)

= 35,605.6 tons/year emissions

Background

The truck began initial testing at the Port in January 2008. Daily testing was recorded electronically as the truck was tested for speed, range, payload and charging capabilities. Energy-management and operational characteristics of this vehicle are micro processor and software controlled using state-of-the-art technology applied from the hybrid and electric vehicle industry. During the testing, software changes were made to improve vehicle energy efficiency (conversion of electric energy to mechanical energy) by more than 20%.

Before on-road testing, the truck will be tested at a Port of L.A. container terminal as an emissions-free "yard hostler." Fleets of hundreds of hostlers throughout the port complex – mostly diesel but some LNG test units -- move thousands of containers daily between the docks and terminal backland, and could potentially be replaced with electric vehicles.

While the truck tests in terminal operations are underway, the Los Angeles Harbor Commission in April approved a production order of 20 electric hostlers. Production will begin after the successful completion of the cargo terminal tests. In the third phase of the Port's program these 20 units will be deployed as part of a "green terminal" program at the Port of Los Angeles (terminal operator to be selected). The hostlers are expected to cost \$189,950 per unit.

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The third phase of this program will be the production of five on-road electric trucks. The on-road heavy-duty electric truck is expected to cost approximately \$208,500 per unit and will require the Port and manufacturer Balqon Corporation to work together with the Department of Transportation to obtain appropriate certification of the vehicle to be used on-road.

L.A.'s Vision for the Heavy Duty Electric Truck

All-electric drayage trucks could substantially reduce the emissions generated by an estimated two million or more very short-haul truck trips that occur each year between the port complex and local rail and warehouse facilities. Today, containers are hauled to and from the San Pedro Bay Ports by an aging fleet of diesel trucks that generate a substantial amount of emissions. Beyond the health impacts of smoke-belching drayage trucks, noise generated by trucks idling or driving near and through harbor-adjacent communities is also a nuisance to our communities.

As a provision of the first order of trucks by the Port of Los Angeles, Balqon Corporation has agreed to establish assembly plant operations at site roughly three miles from the Port, in the City of Los Angeles. Upon start-up, this operation will have approximately 30 "green collar" assembly line workers and a total of 47 employees. The plant will provide a new source of jobs and potentially millions of dollars in business revenue for the local area.

As one of the initial investors in the development of this technology (along with SCAQMD), and the first entity to place a fleet order, the Port of Los Angeles will be paid a royalty fee by Balqon Corporation for every unit that is sold or leased to third-parties worldwide. These funds will be put back into our Technology Advancement Program or other "zero emissions" initiatives that we are exploring as part of the ground-breaking San Pedro Bay Ports Clean Air Action Plan (CAAP) approved by the ports of L.A. and Long Beach in November 2006.

Container volume at the San Pedro Bay port complex is expected to more than double between now and 2020. To accommodate that growth, the San Pedro Bay Ports Clean Air Action Plan outlines dozens of unprecedented air emissions reduction measures. Clean fuels, electric power and other alternative fuel applications are important components in the overall "green growth" strategy being pursued at the San Pedro Bay Ports.

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