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# ACT NEWS LIVE

ACT EXPO 2019 - APRIL 25, 2019



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## Daimler Trucks Goes "All In" on Battery Electrics

Daimler Trucks North America has decided to make battery-electric trucks its focus for alternative fuels, downplaying fuel cells and compressed natural gas.



Daimler Trucks North America is going "all in" on battery-electric trucks, renovating a plant in Oregon to produce Freightliner electric vehicles, said Roger Nielsen, the manufacturer's chief executive, Wednesday at the Advanced Clean Transportation Expo.

"The road to emissions-free transportation is going to be driven with battery-electric vehicles," Nielsen said. "I believe the future is electric."

Daimler, the largest commercial maker of heavy-duty trucks in North America, had already indicated a preference for battery-electric trucks for local and regional use.

It is building 20 medium- and heavy-duty electric

trucks for Penske Corp. and NFI Inc., a major third-party logistics company, under a grant from the South Coast Air Quality Management District.

But Nielsen doesn't see electric powertrains replacing diesel engines throughout the industry. Daimler, which also owns the Western Star truck brand, believes diesel will remain the primary fuel for long-haul trucking for many years, he said.

### Too Early For Fuel Cells

Daimler's electric vision includes hydrogen-powered fuel cell trucks. But it does not see them as viable in the near term.

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## Major Announcements Today in the Expo Hall

**1:00 – 1:30pm** Capacity Trucks, California Energy Commission, and Port of Los Angeles Will Announce Arrival of 22 Ultra-Low Emission LNG Powered Yard Tractors for Demonstration at the Port of Los Angeles, **Booth #1359**

**1:30 – 2:00pm** North American Council for Freight Efficiency Will Discuss the Findings of their New Report, *Regional Haul: An Opportunity for Trucking*, **Booth #1963**

## Penske Installs More Fast Chargers in Anticipation of Electric Trucks

Penske celebrated the announcement of its new electric vehicle commercial charging capabilities at its La Mirada facility during a livestream ribbon-cutting event during the General Session.

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**eM2**



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## Daimler Trucks Goes “All In” on Battery Electrics



“I can see a glimpse of it over the horizon. But it will not be this generation of engineers who will be delivering it,” Nielsen said.

Daimler’s declaration runs counter to recent enthusiasm for fuel cell trucks.

Earlier this week at the Port of Los Angeles, Toyota Motor Corp. and Kenworth Truck Co. showed the first of 10 fuel-cell trucks they are co-developing for use on regular routes from ports to distribution centers.

Nikola Motor last week showed its Nikola Two fuel cell semi-truck, which is scheduled for production in late 2022. Nikola is building a new plant south of Phoenix. It also is investing in a nationwide network of hydrogen-fueling stations.

### Three Goals

Daimler’s road to emissions-free driving excludes plug-in hybrids that combine powertrains that run on electricity and another fuel such as diesel. Freightliner will continue to build near-zero-emissions natural gas medium- and heavy-duty trucks until it commercializes the battery-electric Freightliner eM2 and eCascadia.

Nielsen listed three goals that must be achieved to make battery-electric trucks viable:

- A common charging infrastructure
- Cheaper, lighter and more powerful batteries
- A low total cost of ownership driven by increased incentives and lower maintenance and energy costs.

A \$16 million grant from the South Coast Air Quality Management District partially funds

the Freightliner Electric Innovation Fleet shared by Penske and NFI. The ports of Los Angeles and Long Beach each contributed \$1 million.

“Every single box truck that you see operating in a city should be battery (powered),” said Chris Cannon, chief sustainability officer for the Port of Los Angeles. “Whatever comes to your house to bring your boxes should be a battery-electric vehicle.”

### Plant Renovation

Daimler will put nearly 50 battery-electric test vehicles on U.S. roads by the end of 2019. Its production electric-truck manufacturing will begin in 2021 at Daimler’s Silicon Forest plant

in Portland, Ore., where renovations started last year. The plant will run on 100 percent renewable energy and send no waste to landfills, the company said.

Daimler chose Portland for electric-vehicle production because it is close to California, where stringent rules to curb greenhouse gas emissions are driving demand for pollution-free electric vehicles.

Separately, its Thomas Built unit will assemble electric school buses in High Point, N.C., employing a battery-electric system from Proterra Inc., in which Daimler Trucks invested \$155 million.

Testing is the key to ensuring electric vehicles are ready for commercialization, Nielsen said. Daimler and its global affiliates have amassed millions of miles of electric driving on the track and in the real world, he said.

“We want them to test these vehicles to their extremes,” Nielsen said. “We want to see the failures so we can engineer solutions.”

### Electric Deliveries

Daimler delivered the first eM2 medium-duty truck to Penske in December 2018. Nearly 50 electric trucks are scheduled to be on the road by the end of the year, including a test fleet and the Freightliner Electric Innovation Fleet shared between Penske and NFI.

Affiliated brands Mitsubishi Fuso and Mercedes-Benz trucks have delivered the battery-electric eCanter and eActros in Asia, Europe, and North America. By the end of 2019, Daimler will have more than 150 battery-electric vehicles deployed for testing, co-creation and collaboration worldwide, Nielsen said. | **TRUCKS.COM**



Continued from page 1

## Penske Installs More Fast Chargers

**TRUCKS.COM** | Penske Truck Leasing [Booth #1147] held a grand opening for its growing network of DC fast chargers at its La Mirada, Calif., service center yesterday as it prepares to usher in a new era of zero emission medium- and heavy-duty trucks. Penske celebrated with a livestream ribbon cutting event with ACT Expo. Daimler Trucks North America electric Class 8 Freightliner eCascadia was on-hand as part of the charging demonstration.

"We are ready to charge them. We are ready to maintain them. We are ready to go," said Drew Cullen, senior vice president of fuels and facilities for Penske Truck Leasing.

"We're committed to being at the forefront of commercial vehicle electrification," said Brian Hard, president and ceo of Penske Truck Leasing. "We are investing to ensure our customers have access to the right vehicles, technology, charging infrastructure and information to help shape the future of mobility in our industry."

The Reading, Pa., company operates more than 311,000 vehicles in North America with 15,000 full-service lease customers at 750 service centers. But only one of those vehicles is currently electric – the Freightliner eM2.

"We took delivery of Penske's first eM2 in December. The last time I saw it, it was plugged in and charging up at our facility in Chino. It's very exciting," Cullen said.

Penske will add another 9 of the medium-duty eM2, as well as 10 of Freightliner's all electric Class 8 eCascadia, before the end of the year. The trucks are part of a testing program Penske is running with its large fleet customers, asking them to run Daimler's Freightliner electrics as they would every other truck in their fleet to provide feedback to Daimler Trucks [Booth #847] for its production models.

Daimler Trucks North America president Roger Nielsen told Trucks.com in December that the company will bring its battery electric trucks to market "in huge volumes in 2021."

To support those Daimler electric trucks and those from other manufacturers, Penske started the process of installing commercial heavy-duty electric vehicle charging stations, all DC fast chargers, at its Southern California facilities in September, Cullen said. It now has fourteen operating at service centers in La Mirada, San Diego, Chino,



and Anaheim. The company's near term plan includes adding at least six more DC chargers at its facility in Ontario, bringing the total number to twenty. Penske believes these are the first DC fast charging stations in the US designed specifically for heavy-duty commercial electric vehicles.

"All the locations have a diverse range of customers that have the ability to utilize

electric vehicles," Cullen said. The locations were also chosen because they had the requisite power to support 150 kilowatts of charge.

The chargers are from BTPower [Booth #1719] of Santa Ana, Calif. They charge an all electric Class 8 tractor from zero to 100% in less than half a work shift, or about five hours.

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## Fuso Debuts Medium-Duty CNG Concept Truck

**TRUCKS.COM** | Daimler Trucks division Mitsubishi Fuso [Booth #1435] unveiled a Class 4 concept truck powered by compressed natural gas (CNG), Wednesday at the 2019 ACT Expo.

The vehicle is called the Fuso FE CNG concept truck. It is intended to serve medium-duty functions such as Class 3 through Class 5 in sectors including food delivery, cargo shipment, and construction.

Fuso built the FE CNG truck in partnership with alternative-energy provider Agility Fuel Solutions. It is based on the Fuso FE Gas truck unveiled in March at the Work Truck Show in Indianapolis.

Agility provided two side-mounted CNG fuel systems and other components that feed compressed natural gas into the 6-liter V8 engine from General Motors. The new fuel systems deliver a maximum driving range of 190 miles.

"The partnership with Agility delivers a

reliable CNG option to Fuso customers," said Jasmin Kluge, project manager for alternative fuels at Fuso.

"The additional benefit is its total cost-of-ownership advantage: lower fuel cost, less maintenance, reduced emissions, and less noise, making this a win-win for truck fleets' bottom line and environmental stewardship," Kluge said.

Fuso took steps to ensure customers experience an easy transition from gas or diesel to compressed natural gas. The company installed a familiar fuel gauge instead of the "pressure valve" normally used on CNG vehicles. It also ensured the new system did not add too much weight to affect the vehicle's overall payload capacity.

Some fleets prefer CNG trucks because they produce much lower emissions than comparable gasoline and diesel vehicles. The FE CNG reduces greenhouse gas emissions by 15 to 20%, according to Fuso. It also features decreased amounts of sulfur dioxide and nitrogen dioxide emissions. The system is also simple compared to the complex exhaust treatment required of all new diesel trucks.

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# Meritor, TransPower Electrify Terminal Tractors

Meritor and TransPower awarded \$17.1 million contract to supply electric-powered terminal tractors for California ports.

**TRUCKS.COM** | Meritor Inc. will make electric drivetrain systems under its Blue Horizon technology brand for 38 terminal tractors that move goods around the ports of Long Beach and Oakland, Calif., the company announced Wednesday afternoon during a press conference at ACT Expo.

The terminal trucks are an example of how companies are developing electric vehicles designed to replace polluting diesel-fueled equipment at West Coast ports.

Several companies are testing quiet medium- and heavy-duty battery and fuel cell electric drayage trucks to haul freight from ports to inland distribution centers. The trucks' lack of emissions helps improve poor air quality in the communities through which they regularly travel.

The \$17.1 million Meritor contract was funded by a California Air Resources Board grant through California Climate Investments, which supports reduced greenhouse gas emissions from the sale of carbon credits.

"This is one of the largest contracts ever awarded for battery electric terminal tractors," said T.J. Reed, Meritor vice president of front drivetrain and electrification.

The terminal tractors come with TransPower Inc.-designed drive, powertrain controls, and accessory and energy-storage subsystems mated with Meritor axles and brakes. They are designed to operate on two eight-hour shifts a day and haul up to 130,000 pounds of cargo. The tractors will also be equipped with automated charging technologies to further reduce total operating costs. Their batteries would be recharged at night. Deliveries of the



Meritor President and CEO, Jay Craig, kicked off ACT Expo 2019 with the Welcome Address

vehicles are scheduled to begin later this year through October 2020.

Meritor has made two strategic investments in TransPower, but it has not disclosed how much. They are working together on a medium-duty electric chassis for Peterbilt Motors Co. displayed at the 2019 Consumer Electronics Show. Peterbilt is a unit of Paccar Inc.

Meritor and TransPower also have electrification projects from various manufacturers for 100 vehicles by 2020. Those include the terminal tractors.

They recently concluded two projects under a \$6 million grant awarded in 2015 by the California Energy Commission to test electric-powered yard tractors at the Port of San

Diego and other locations around the state.

Separately, TransPower has received grants and contracts to convert yard tractors and trucks to electric drive. It is also making electric drive kits for installation into yard tractors on manufacturer assembly lines.

"Zero-emission technologies have got to grow throughout the United States and across the world," said Chris Cannon, chief sustainability officer for the Port of Los Angeles. "It's only when they are manufactured in large numbers (that) you get the economies of scale."

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## Fuso Debuts Medium-Duty CNG Concept Truck

The use of compressed natural gas in medium-duty trucks has the potential to increase, according to Fuso. Currently, 160,000 CNG trucks operate in the US, and more than 1,600 refueling stations are available. Fuso is eyeing both the US and Canada for potential sales.

Fuso and Agility will conduct tests and market studies to determine next steps. Agility could provide an aftermarket CNG system by 2020.

"CNG is an excellent option for return-to-base and urban-delivery fleets, with an attractive total cost of ownership," said Brad Garner, president of powertrain systems for Fuso.

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# Volvo Links Advanced Technology Trucking Efforts

Swedish truck maker Volvo has adopted a holistic approach to electrification, autonomous, and connected vehicle technologies to burnish its sustainability credentials.

**TRUCKS.COM** | Volvo Trucks [Booth #1634] is taking a holistic approach to its electric, autonomous, and connected-vehicle efforts, looking beyond the truck to create sustainable transportation.

"It is no longer enough for Volvo to solely focus on developing and offering state-of-the-art trucks and services," said Peter Voorhoeve, president of Volvo Trucks North America.

Volvo wants to leverage its growing relationships with multiple partners to develop end-to-end solutions that will drive lower emissions and greater efficiency with improved road safety, he said Wednesday at the Advanced Clean Transportation Expo in Long Beach, Calif.

Volvo is managing a \$44.8 million grant from the California Air Resources Board [Booth #1727] to the South Coast Air Quality Management District [Booth #1724], which oversees air quality in Los Angeles, Orange, and San Bernardino counties.

The Low Impact Green Heavy Transport Solutions, or LIGHTS, project involves 16 partners working to transform freight operations at two trucking fleets, including NFI, a Camden, N.J.-based third-party logistics company with 4,000 trucks.

Volvo LIGHTS is part of California Climate Investments, which funds programs to reduce greenhouse gas emissions with money from

the sale of carbon credits. In addition to the grant, Volvo and its partners are investing \$45.9 million in electric trucks, 24 zero emission forklifts, 58 heavy-duty fast chargers, and related equipment.

"This investment by the state, matched by the project partners, will help speed up the

whose wireless chargers allow any type of vehicle to automatically connect to the electrical power grid without wires or cables. The charger, buried below ground or mounted to a parking surface, connects with a receiver mounted under the vehicle.

"From solar energy harvesting at our customer locations, to electric vehicle uptime services, to potential second uses for batteries, this project will provide invaluable experience and data for the whole value chain," Voorhoeve said.

Volvo Trucks will introduce five all electric versions of its VNR model in California later this year, followed by 18 in 2020. Commercialization is planned in North America in 2020. Following



number of zero emission trucks in communities and neighborhoods where they are needed most," said Mary D. Nichols, CARB chair.

Earlier this year, Volvo Group's venture capital arm invested in Momentum Dynamics,

testing, the trucks will be retrofitted at the company's assembly plant in Dublin, Va.

"The Volvo LIGHTS project exhibits the need for an interconnected approach of (truck makers), governments, energy providers, charging infrastructure, fleet owners, and others collaborating to further sustainable urban development," said Keith Brandis, Volvo Trucks vice president of product planning.

"Integrating connectivity and autonomous operation with electrification to improve safety and productivity is the right approach," said Sasko Cuklev, director of autonomous solutions for Volvo Trucks. He oversees a program in which six autonomous Volvo FH trucks drive themselves 3.1 miles to transport limestone from a Norwegian mine to a crusher.

"I would like to see them focus on (an electric) powertrain first," said Antti Lindstrom, an analyst with IHS Markit. "Connectivity and autonomous operation come as a second layer to that."

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# Allison Transmission Embraces Electrification

The manufacturer moves into electric propulsion with two new partnerships, two new e-axle systems, and the acquisition of two companies.



**TRUCKS.COM** | Allison Transmission, the world's largest maker of automatic transmissions for medium- and heavy-duty vehicles, is committed to advancing the electrification side of its business.

That's why it announced the acquisition of two companies, the introduction of two new products, as well as two new strategic partnerships during their Wednesday afternoon press conference at ACT Expo.

Allison acquired Vantage Power, a London-based company that specializes in electrified propulsion and connected vehicle technologies for medium- and heavy-duty truck manufacturers.

The Indianapolis-based manufacturer also acquired the electric vehicle systems division of AxleTech, a Troy, Mich., company that designs, engineers, and manufactures powertrains for on- and off-highway heavy-duty commercial vehicles.

"Each of these acquisitions align with Allison's position as a leading innovator in propulsion

technology," said David Graziosi, president and chief executive of Allison Transmission.

"Several years ago, (AxleTech) established our Electric Vehicle Systems group to develop electric vehicle solutions for on- and off-highway applications as a complement to our 100-year-old off-highway heritage," said Bill Gryzenia, AxleTech's chief executive officer.

Allison Transmission will help AxleTech "enter the next phase of development and commercialization," Gryzenia said.

These electric-drive technology investments are ones that Allison needed to make, said Alexander Potter, an analyst with Piper Jaffray & Co.

"Vehicle manufacturers and fleets are clamoring for EV prototypes, and Allison cannot afford to sit on the sidelines," Potter said. "It's smart for Allison to increase its focus on axle-related mergers and acquisitions, along with building expertise in battery management, system design, and other EV-related fields."

Allison Transmission also showed off two new electric axle systems—the AXE series for medium- and heavy-duty commercial trucks and the ABE series for transit buses.

The AXE is a fully integrated electric powertrain system that's designed to fit inside a standard

**"Each of these acquisitions align with Allison's position as a leading innovator in propulsion technology."**

frame along the truck's axles. It features electric motors, a two-speed gearbox, oil coolers and pumps. It is available in both single- and dual-motor options. The bolt-in system is intended to minimize the integration complexity manufacturers face when transitioning to electric propulsion.

Allison also announced a partnership with Peterbilt, which has already integrated the AXE into its trucks.

The ABE series is the first

e-axle advanced ultra-low-floor electric-bus powertrain bolt-in system on the market, according to Allison. It has dual electric motors, a single- or multi-speed gearbox, oil coolers, pumps, and power electronics. The ABE integrates into almost every transit bus configuration, from low- and ultra-low-floor models to double deckers, articulated models, and three-door vehicles. It replaces the entire traditional powertrain within the existing frame.

In combination with its ABE series announcement, Allison also said it had formed a strategic alliance with bus maker Alexander Dennis.

Allison Transmission was founded following the 1915 win of the Indianapolis 500 by race car owner James Allison. In the years since, the company has built transmissions for a range of vehicles, including US Army Abrams Battle Tanks, buses, and motor homes.

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# Dana Launches Light-Duty EV Powertrain

Dana Inc. will offer a light-duty electric powertrain to equip Class 2 through Class 6 work trucks.

**TRUCKS.COM** | Commercial vehicle supplier Dana Inc. [Booth #1847] will produce a light-duty version of its TM4 Sumo electric powertrain, the company announced Wednesday at ACT Expo.

The new system, called Sumo LD, is available for purchase now. There are three versions of the powertrain available, with up to 250 kilowatts of continuous power and 885 pound-feet of torque.

The Sumo LD is intended for Class 2 through Class 6 commercial vehicles, ranging from half-ton pickup trucks like the Chevrolet Silverado 1500 to medium-duty work vehicles like the Silverado 6500HD.

When the Sumo LD is combined with electrified axles made by Spicer Electrified, a Dana subsidiary, it can power larger vehicles up to heavy-duty Class 8 commercial trucks.

"The Sumo LD series has been engineered into multiple Spicer Electrified products and is able to be adapted to the architecture

requirements of our customers," said Christophe Dominiak, chief technology officer for Dana.

The Sumo LD joins the Sumo MD, Sumo HD and Sumo HP for high-performance vehicles that are already available. More than 12,000 electrified vehicles are currently powered by Sumo powertrains.

In addition to introducing the Sumo LD powertrain, Dana made two more announcements at the show.

First, the supplier will partner with commercial vehicle maker Nordresa Inc. [Booth #1755] to provide electrified axles on the Isuzu N-Series line of trucks.

Nordresa will pair its proprietary electric powertrain to the Spicer Electrified eS9000r e-Axle. The combination equips Isuzu trucks with up to 226 kilowatts of power and an electric range of 110 miles.



Second, Dana will also install the same Spicer e-axle on Ford F-550 chassis in a partnership with Motiv Power Systems [Booth #1327]. The trucks will use Motiv electric powertrains mated to the Spicer e-axle.

The powertrain provides 226 kilowatts of power and 90 miles of electric range in the truck. The project highlights strong demand for fully electric commercial vehicles, Dana said.

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## Dana Expands Training Series to Include EV Maintenance & Servicing

As fleets and vehicle operators begin to adopt electrified technologies, Dana is aiming to provide vital information on the key safety and maintenance tips uniquely needed for electric vehicles.

Dana's new videos provide overviews on electric vehicle architecture and maintenance, as well as important vehicle servicing safety tips.

"Dana is focused on driving the shift toward electrification in the commercial vehicle market, and we believe these latest 'Driveline Forensics' videos are critical to supporting the maintenance professionals who are servicing electric vehicles in the field," said Mark Wallace, president of Dana commercial vehicle

driveline technologies. "The safety of our people and products is our first priority, and this training installment succinctly covers critical safety and maintenance fundamentals for servicing hybrid and electric applications."

The video series will include an

architecture overview which comprises vehicle charging instructions, high voltage caution, and review of electric components. A maintenance overview includes pre-operation maintenance inspection, electric vehicle maintenance schedule, and guidelines on servicing a vehicle after impact or water submersion. And, importantly, safety tips cover high-voltage caution, personal protective equipment, primary shutdown method, and damaged battery procedures.

The training series is hosted by TV personality, vehicle builder, and performance driver Jessi Combs. Combs joined the Dana team at ACT Expo on Wednesday afternoon, promoting the launch of the "Driveline Forensics" program on the ACT Expo show floor.

Dana will continue to expand their newly launched "Driveline Forensics" training series throughout the year. The videos are currently available on the Dana website.



# AMPLY Pegs Dollar-Per-Gallon Cost for Electricity

AMPLY Power has calculated costs per dollar to charge an electric vehicle in the Top 25 US markets.



**TRUCKS.COM** | AMPLY Power Inc. [Booth #1913] has calculated how much it costs per dollar to charge an electric vehicle, finding the top 25 US cities could save more than a third by switching to electric buses and fleets from vehicles fueled by diesel or gasoline.

AMPLY used publicly compiled data from sources including the US Department of

Transportation and AAA to develop a rating. AMPLY says it is an apples-to-apples comparison between traditional fuels and electrification.

"The cost savings for commercial electrification are real," said Carla Peterman, former commissioner of the California Public Utilities Commission. "Until now, electrification has lacked a standard to showcase this economic value."

An AMPLY white paper showed fleets saved an average 37% compared with traditional fuels by electrifying their buses and light-duty vehicles. Fleets that charged during off-peak hours could save as much as 60%, the paper says.

An online map offers current electric versus gasoline price data by city.

Nineteen of the 25 cities could spend less

by using electricity instead of diesel or gasoline. Portland, Ore., leads with 82% savings by making the switch, followed by Tampa, Fla., at 79%, and Seattle at 78%.

"The metric allows for an accelerated transition to electric fleets," said Peterman, an AMPLY adviser.

The study does not account for the cost of buying electric vehicles. They typically cost more than cars, trucks, and buses powered by internal combustion engines.

"We partner with OEMs or truck leasing providers for the whole package," said Vic Shao, chief executive of AMPLY.

Shao's forecasting method looks at regional electric rates and demand charges. It also considers fleet charging strategies and vehicle classes. AMPLY uses a dollar range because of the complexity of electricity rate structures and vehicle fleet requirements.

"Savings from electric vehicles can be torpedoed if a fleet is charging at peak rate or charging activities trigger demand charges," said Simon Lonsdale, AMPLY head of sales and strategy.

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## The Lion Electric Co. Launches Class 8 'Urban Truck'

The Lion Electric Co. unveiled a "Class 8 urban truck" at ACT Expo on Wednesday.

**TRUCKS.COM** | As local delivery of large appliances and other goods grows with e-commerce, Canadian startup The Lion Electric Co. [Booth #1800] believes there's a market for a large electric truck to operate in cities.

That's why Lion unveiled what it calls a "Class 8 urban truck" at ACT Expo on Wednesday.

The Lion8 is an all electric heavy-duty truck that has a tight turning radius to more easily maneuver within cities and a cab-forward design to improve visibility around bicycles and pedestrians. Being electric, it also generates zero emissions and noise.

The company doesn't think it makes economic sense to use a truck designed for coast-to-coast freight delivery to run less than 200 miles a day making local deliveries.

About half of Class 8 trucks are being used for urban deliveries, said Nate Baguio, vice president of US sales for The Lion Electric Co.

"They go someplace, they stop, they're unloading for a period of time, and they go on to the next stop," he said.

That is the type of drive cycle that is efficient for an electric truck, he said. The business

case for a long-haul electric truck, by comparison, is more difficult because it would require a charging infrastructure along inter-



state highways. Drivers also won't want to sit idle while waiting for their trucks to charge.

Designed and manufactured as a purpose-built heavy-duty electric truck for urban use, the Lion8 takes a modular approach to batteries, allowing buyers to equip them with the appropriate amount for their needs. Offered with a maximum of six battery packs that store 480 kilowatts of power capable of traveling up to 250 miles per charge, the Lion8 can also be built with just two or four battery packs.

"So if you only need to do 125 miles a day, you can accomplish that with fewer batteries at a significantly lower sticker price," Baguio said.

The Lion8 is also using swappable batteries, "so if you have a truck that's running nonstop, you could have a rack of batteries charging and swap a battery out in 10 to 15 minutes with a standard forklift."

At a price of about \$400,000 for the 250-mile version, the Lion8 costs significantly more than a diesel Class 8 truck, which runs about \$125,000. But Baguio said the Lion8 reduces energy costs by 80% and operational costs by about 60%.

Based in Québec, Lion launched two years ago with an all electric school bus, then added to its lineup with a shuttle bus. "The next evolution," Baguio said, "was the Class 8 urban truck."

The Lion8 is already in production and will begin deliveries in the fall. Several companies in Canada and two companies in the US have already placed orders—including

the construction supplier Constar Supply in California and C&S Wholesale Grocers, based in New Hampshire.

"The Lion8 will be key to continue to successfully deliver over 140,000 different grocery items to 14,000-plus independent stores in the US in the most sustainable, financially feasible way possible," said Chris Trajkovski, vice president of transportation fleet maintenance and assets for C&S Wholesale Grocers.

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## School Bus Procurement Roundtable Discussion



The wheels on the school bus tend to go 'round long past the vehicle's useful life, due to the large upfront costs and competing budget priorities that school districts face. Attendees heard from school bus fleet operators, technology providers and funding program administrators during a roundtable discussion on removing barriers to school bus replacement and the opportunities for alternative fuel vehicles. There is a great opportunity to replace old and inefficient buses with an array of zero and near-zero emission options now on the market. Key takeaways included learning from school bus fleet operators how they have been able to leverage partnerships and incentives while decreasing fuel and maintenance costs to improve their bottom line. It all provides tremendous benefits to the children on the bus and the residential neighborhoods within which their vehicles operate.

# Trillium Unveils PowerUp Electric Truck Charging

Trillium introduces a system for the trucking industry that combines power from the grid with on-site energy generation and storage to control fuel costs.

**TRUCKS.COM** | Renewable and alternative fuels provider Trillium introduced a system for the trucking industry called PowerUp that combines power from the grid with on-site energy generation and storage to control fuel costs at ACT Expo in Long Beach this week.

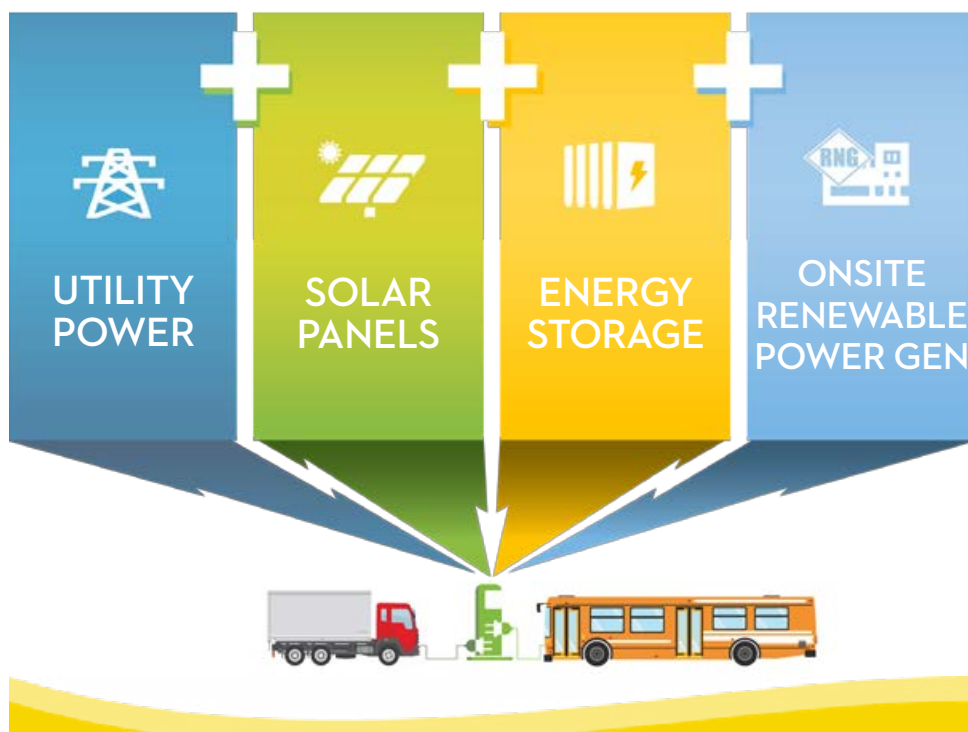
"When it's a commercial application and not your iPhone, fleet operators wonder, 'How much will this electricity cost me, and how can I manage those costs for my operation?' " said William Zobel, general manager of business development and marketing for Trillium.

Trillium already offers natural gas fueling and electric vehicle charging systems, as well as solar installations and on-site electricity generation. PowerUp combines them to reduce the uncertainty fleet operators may feel over fluctuating electricity rates charged by utilities.

■ *continued on page 13*

## CUSTOMIZABLE ENERGY SUPPLY PORTFOLIO

Trillium helps customers identify clean fuel and power supply sources that work best for their station. Our goal is to ensure customers have access to a steady supply of clean fuel at predictable prices, and that they avoid paying unnecessary charges related to transmission, distribution, or demand.



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# Women in ACT: Implementing Innovation with a Diverse Workforce

Women leaders in the transportation sector have made meaningful impacts.

Ford presented Women in ACT on Wednesday morning, a workshop that focused on why women are a critical component of the winning formula needed in today's advanced clean transportation industry. Speakers addressed why, in an era of rapidly shifting technology, demographics, and policy trends, it is imperative that the clean transportation industry have effective leadership to successfully navigate this changing transportation paradigm.

While many industries are struggling to attract the necessary talent and react to this dynamism, the female workforce presents an underutilized, high-potential talent pool from which to draw. Research has shown

Continued from page 12

## Trillium Unveils PowerUp Electric Truck Charging

Customers have the option of connecting to the utility grid for power, producing their own power with renewable natural gas or solar panels, and storing that electricity with a battery system. And they can do so in any combination.

"If you put those four together, you find the right balance for your fleet to understand and control your costs," said Zobel, adding that each system is customized to meet individual fleets' needs. "You can say I want nothing from the utility. I'm going to produce it all myself. Or you can say I'm going to go 20% utility and 80% from our own generation."

Trillium has yet to install its first PowerUp system, designed for installation at a truck operator's depot.

"There's still some uncertainty with heavy-duty electric trucks," Zobel said. "They're waiting for the trucks to prove themselves."

Zobel said in the short term, California's transit operators are the more likely customer. Not only did the state recently require them to transition to zero emissions within 10 years, but California also has some of the highest electricity rates in the country.

Be sure to catch all the trucking, freight and logistics news at [Trucks.com/news](http://Trucks.com/news).

that diversity within companies, from entry level to C-suite, to boards of directors, leads to higher performance, higher returns, and higher employee satisfaction. Attendees heard from women leaders in the commercial transportation sector who have made meaningful impacts and transformed the advanced clean transportation market. The audience learned how the women got their start, what motivates them to continue, and how businesses and organizations can attract more women; increasing the diversity of perspectives, improving the bottom line, and cleaning up emissions.

Rebecca Shelby, environmental regulatory engineer with Ford Motor Company, kicked off the conversation. She referenced a Deloitte study that surveyed hundreds of women working in the automotive sector to capture their views on the recruitment, retention, and advancement of women in the sector. The study notes there is currently a talent crisis in the global automotive industry, coming at the same time when megatrends like vehicle connectivity, self-driving cars, and shifting consumer preference are creating a complex mobility landscape. Female employees represent only a quarter of the sector's workforce, meaning there are endless opportunities for women in this environment that requires talented professionals with diverse perspectives, deep skills, and experience.

The report reinforced the critical need for companies in the transportation sector to

retain talented women, as only 53% of women surveyed would choose the industry again if given the chance to start over (down from 71% in 2015). "Don't be afraid to share your opinion; you have to speak your voice," was some advice Rebecca gave the audience.

Kim Okafor, electric vehicle manager with Trillium, continued this line of thought in reflecting on why it's so critical for women to be involved in the advanced clean tech sector. "Women are natural planners. For the success of alternative fuels, we need to be looking into the future at the end goal. We need to be thinking about all of the milestones along the way, and all the relationships we need to build today, in order to be strategically positioned for the future," she told the room.

When asking her leadership team to share how, as a leader, they would improve driver retention, Mari Roberts from Frito-Lay said, "I received wildly different ideas from the men and the women on my management team, and all of the ideas were great. I would have missed out on half of them without women in management."

Concluding the morning's presentations, Sherry Sanger with Penske revealed how a "Women's Network" was formed at the Penske corporate office to encourage professional development. This provides female managers access to senior leadership, and gives them the opportunity to hear senior leaders share their vision for the future of the company.





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# CityFreighter Electric Delivery Truck Focuses on Driver

The CityFreighter CF1 is a battery electric medium-duty delivery truck prototype with an ultra-low loading floor, keyless entry, and sleek modern design to make delivery jobs easier and more appealing.

**TRUCKS.COM** | E-commerce is booming, and it's only expected to grow – from \$505 billion in the US in 2018 to \$735 billion in 2023, according to Statista, a statistics-compiling website. And that's generating a huge need for green vehicles to deliver all those packages.

"There's a lot of stuff to handle, so the industry is looking for solutions," said Michael Schoening, president of the clean-tech startup CityFreighter [Booth #1926], which unveiled its delivery truck at Wednesday's ACT Expo in Long Beach.

Called the CF1, it's an all electric, last-mile, medium-duty delivery truck with an ultra-low floor that makes it easy to load and unload. The vehicle also incorporates a keyless entry system that remotely opens and closes the door with a modern design. It features a Tesla-esque navigation screen designed to appeal to younger drivers at a time when companies are struggling to recruit new delivery people.

Payload for the CF1 is 2.4 tons. Its cargo box has a minimum of 710 cubic feet. And its electric driving range is 100 miles.

"It isn't simply enough to change the combustion engine and put in an electric motor," Schoening said. "Nobody is buying an electric truck because it's electric. You have to show that you're saving operational costs, so one of our main focuses is a driver and customer-oriented design."

According to its website, CityFreighter customizes components in its vehicles to allow fleet



operators to choose their interior and exterior designs and battery configuration, for example.

Schoening said delivery people waste time loading and unloading packages with a lift that's only necessary because the truck floor is too high. With the CF1's electric air suspension, "when the driver opens the door and opens the shutter at the back, it's all electric and keyless. The truck automatically lowers down."

How low does it go? Down to 17 inches. By comparison, the Mercedes-Benz Sprinter cargo van has a loading edge of 21 inches.

"It makes it much easier for the operator to get in and out, so you don't need a step," Schoening said.

Other features are designed to make the delivery driver's job easier.

The key fob serves as an authorization. When the driver approaches the truck with the key, it automatically unlocks and opens the cargo doors. It also relocks and closes them when the driver walks away.

In development for two years, the CF1 incorporated feedback from CityFreighter interviews with United Parcel Service and DHL drivers. They can make up to 80 stops per shift.

"Any additional thing you need to do, whether it's opening a handle or pulling the key out of your pocket,

it adds up," Schoening said. "In the end, the package is driving this whole thing. The truck is designed for the last mile; it's part of the supply chain system."

Before starting Santa Barbara, Calif.-based CityFreighter, Schoening was president of mobile device accessories company Enblue Technology USA Inc.

With offices in the US, China, and Europe, CityFreighter plans to enter the US market first, followed by Europe. It has already pre-sold 500 CF1s to XPO Sales, a green leasing service based in Inglewood, Calif., that is focused on commercial fleet operators.

CityFreighter says it will outsource the manufacturing process.

"The CF1 will be a game changer for the industry," Remo Weber, chief executive of XPO Sales, said in a statement. "When we signed the initial letter of intent for the purchase of 100 trucks, there were only concept drawings in existence."

After seeing the prototype unveiled at this week's ACT Expo, XPO Sales increased its order to 500 trucks, which it will lease out to its fleet customers.

Be sure to catch all the trucking, freight and logistics news at [Trucks.com/news](https://www.trucks.com/news).

## Roundtable Covers Urban Mobility Culture Shift

A roundtable discussion at ACT Expo on Wednesday explored ways to shift the culture around alternative fuel vehicles. A diverse group of stakeholders from Amphitheater Public Schools, Washington State Department of Commerce, the Office of Los Angeles Mayor Eric Garcetti, and eIQ Mobility Inc. contributed to the

conversation, outlining vehicle procurement and utilization as key steps in the process.

Attendees learned the major challenges within fleet electrification, methods to take a policy idea and make it a reality, and how to ensure ROI with the new vehicles.

# LAX Implements Clean-Burning Propane Autogas Delivery Trucks From ROUSH CleanTech

HACOR's new alternatively fueled vehicles are 90% cleaner than EPA standard

ROUSH CleanTech [Booth #735], an industry leader in alternative fuel vehicle technology, announced Wednesday on the ACT Expo show floor, that Los Angeles airport catering company, HACOR Inc., will now be utilizing vehicles equipped with ROUSH CleanTech propane autogas fuel systems at Los Angeles International Airport. One of the HACOR propane autogas vehicles is on display in ROUSH CleanTech's booth.

Todd Mouw, president, ROUSH CleanTech; Jason Lee, general manager, HACOR; and Allan Canicosa, marketing manager, HACOR, gave remarks on Wednesday afternoon providing press and ACT Expo attendees with insights into how the clean-operating propane autogas vehicles will benefit both LAX and the surrounding Los Angeles community.

HACOR, an award-winning in-flight airline catering services provider, purchased seven Ford F-750 delivery trucks fueled by propane autogas, a domestically produced, clean and economical fuel. The company serves multiple airlines.

"LAX will significantly benefit from our low emission catering trucks, as will the nearby communities that we are operating from and within," said Jason Lee, general manager of HACOR, which delivers up to 15,000 airline meals per day out of LAX. "The versatility and reliability of these propane vehicles allows us to operate our standard delivery and operating



methods but with a low emission fuel."

Each of HACOR's vehicles is equipped with a Ford 6.8L V10 engine with a ROUSH CleanTech fuel system certified to 0.02 grams per brake horsepower-hour. This engine has the lowest nitrogen oxide (NOx) levels of any propane engine in Class 4-7 vehicles and is 90% cleaner than the Environmental Protection Agency's most stringent heavy-duty engine standard. Nitrogen oxides are strictly regulated under

federal air quality standards because they are known to be harmful to human health and to the environment.

"HACOR's new propane autogas vehicles emit fewer greenhouse gases, NOx and total hydrocarbon emissions, and virtually eliminate particulate matter," said Todd Mouw, president of ROUSH CleanTech. "They will help to significantly clean up the air around LAX airport."



**Global is a leader in zero emission street sweepers. The Global M4 is on display at ACT Expo for the first time.**

## Global Introduces First Electric Sweeper in North America

The first battery electric plug-in Class 7 street sweeper, jointly developed by Global Environmental Products, Inc. (Global) and US Hybrid [Booth #1663], was introduced on Wednesday, April 24. The electric street sweeper development and testing was managed by a team of engineers from Global and US Hybrid.

The Global M4 is a high-performance sweeper that can travel at speeds of 45 – 65 mph with a battery range of up to 9 hours. The sweeper boasts cutting edge innovative technology and produces zero emissions. Large cities to small towns will

be able to clean their streets while protecting the environment and building a cleaner future. At the end of a work shift, operators just plug in the sweeper, charge the batteries, and the sweeper will be ready for work the next day.

The M4 is also available in a compressed natural gas model and a hybrid electric model.

Global is a leading producer of specialized street cleaning equipment and is proudly manufacturing reliable, innovative and affordable products. Global will customize sweepers based on the needs of its customers.



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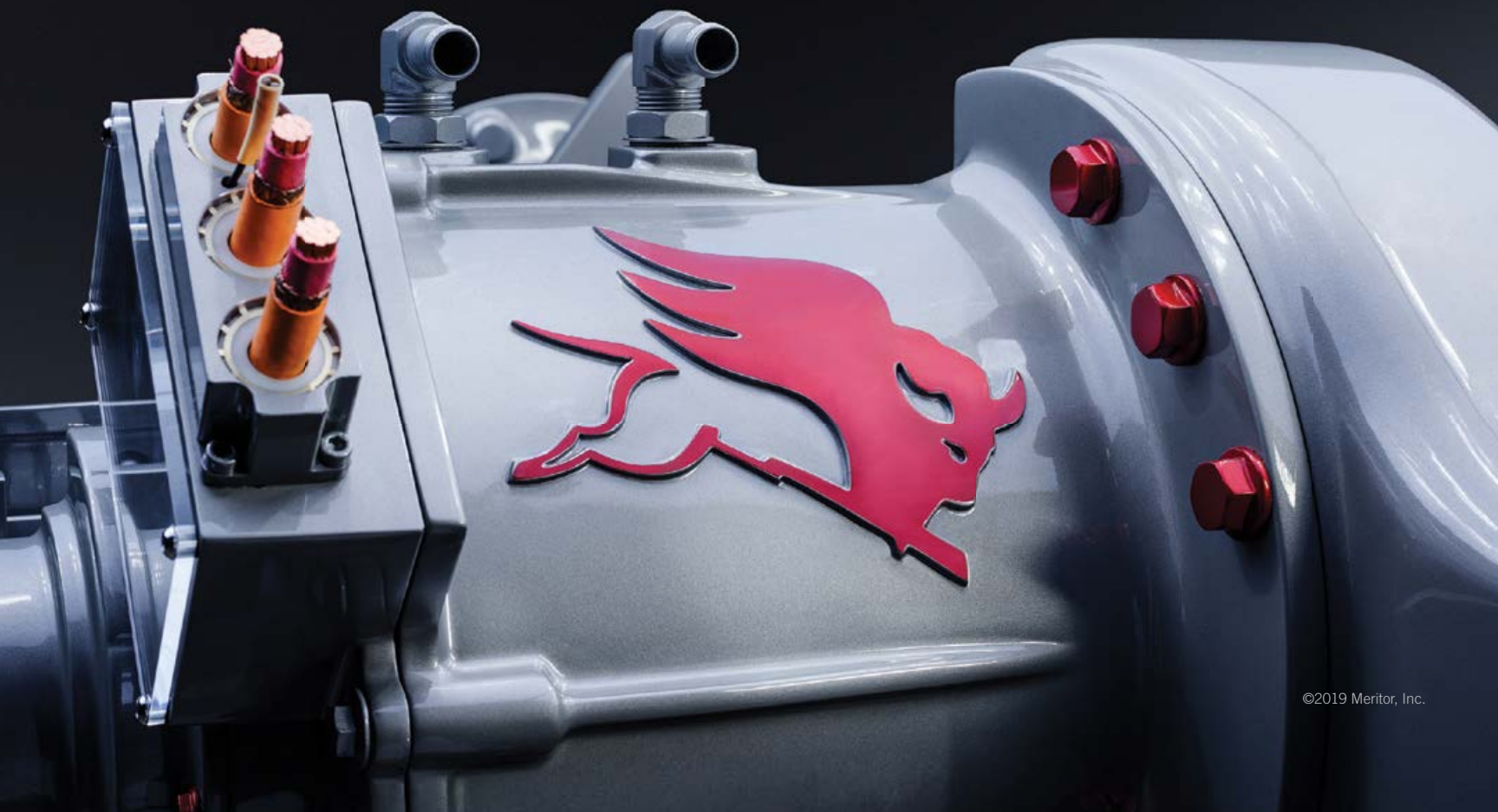


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# EV Connect Launches EV Charging Network

EV Connect, operator of a cloud-based electric vehicle charger management systems for motor carriers, has launched a certification program for station developers in a bid to standardize the industry.

**TRUCKS.COM** | Electric vehicle charging systems software firm EV Connect [\[Booth #1912\]](#) is launching a program aimed at standardizing EV charger management and use for both transportation fleets and charging-equipment developers.

The EV Charge Station Certification program already has been completed by seven of the industry's largest charger makers in North America, Europe, and Asia. They include Delta Group, EVBox, and Webasto.

The certification program is a bid to encourage charging-station and software developers to standardize on EV Connect's cloud-based charging-management platform, although there is no obligation to sign up for the company's services, said Jordan Ramer, EV Connect's chief executive.

By maintaining their own unique networks, charging station operators are perpetuating a VHS versus Betamax system that can deprive

motor carriers of data and services necessary to efficiently operate electric vehicles, Ramer said.

The so-called EVCS certification program builds on the international Open Charge Point Protocol that software developers can use to design communication systems linking charging stations to various charging networks.

Station manufacturers who obtain EVCS Certification demonstrate that their equipment operates properly with all "open charge" protocol software and on EV Connect's cloud-based platform, Ramer told Trucks.com.

That means drivers can use any of the linked charging stations, regardless of their manufacturer, and that fleet operators can collect all pertinent data from the stations, Ramer said. They can use smartphone-based apps to locate charging stations and check for prices and operating conditions.

Fleet operators also can use the networked systems to schedule charging times for periods when electricity rates are lowest, no matter what time of day the driver actually plugs their truck into the station.

The open-network charging system also permits charging-station providers to collect use and operating data by linking all of their machines on a single network through EV Connect if they choose to do so, Ramer said.

The EVCS program permit process can largely be done remotely to allow for self-certifying. A representative of EV Connect or a member charging-station developer makes a final, physical visit to an applicant's station to verify that it works properly. There is no cost to obtain certification, Ramer said.

Be sure to catch all the trucking, freight, and logistics news at [Trucks.com/news](https://www.trucks.com/news).

## Refuse Truck Experts Weigh in on Potential for Electrification

OEMs and end-users debate potential for EV to meet refuse collection demands.

On Wednesday, ACT Expo attendees listened to vehicle manufacturers and end-users discuss the potential for electrification within the refuse sector. Marty Tufte, corporate fleet director for Waste Management moderated a lively discussion on the current and future state of the market and the potential for commercial product availability in the near-term. Curtis Dorwart, refuse product manager at Mack Trucks; John Gerra, director of business development for BYD; Bill Kahn, principal engineer for Peterbilt; and Nate Baguio, vice president of sales at The Lion Electric Co. described the considerations required for those interested in deploying electric vehicles. Panelists also shared their experiences with existing demonstrations and early deployments. Attendees walked away understanding the various options for fleets looking to electrify. The stop-and-go, return-to-based routes of refuse trucks makes



Experts across the refuse collection sector weigh in whether EVs can meet the needs of the industry.

the sector ideal for early electric vehicle deployments. And with the advancement of medium- and heavy-duty electric drivetrains, early-stage demonstrations of this technology have come to fruition. Leading OEMs showcased the latest fully electrified refuse collection truck chassis and provided a bullish perspective on the potential of such a powertrain to meet the rigorous demands of this industry.

# Today's Latest Innovations

In Connected Vehicles, Efficiency Improvement Technologies, and Alternative Fuels—including Electric, Hybrid, Hydrogen, Natural Gas, Propane Autogas, and Renewable Fuels.

The 2019 ACT Expo show floor featured more than 75+ advanced technology vehicles, including dozens of exciting debuts!



**BYD Class 8 All-Electric Refuse Truck**



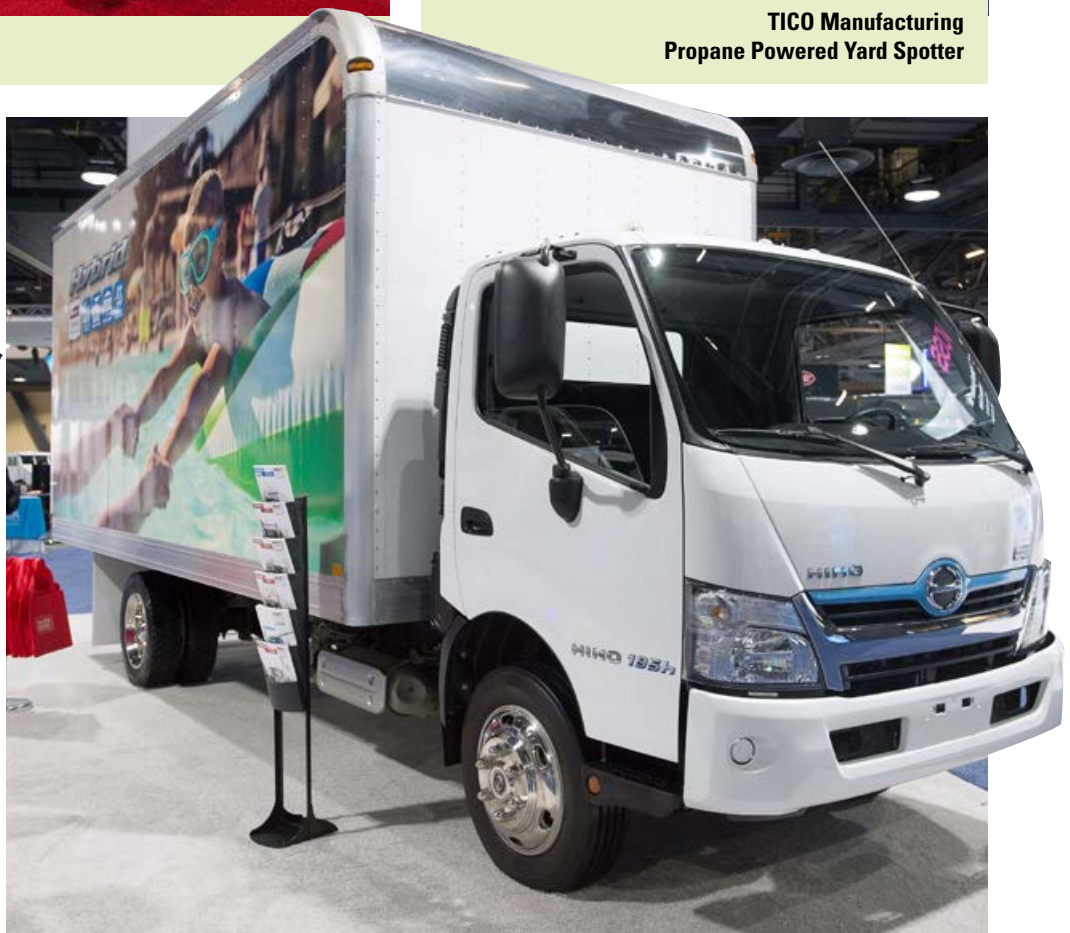
**TICO Manufacturing  
Propane Powered Yard Spotter**



**Adomani Electric All Electric Logistics Van**



**Peterbilt 220EV 63.5" Cab-Over Kit**



**Hino 195h Diesel-Electric Hybrid**





**MACK LR Model Natural Gas**

**Cummins Westport  
ISX12N Ultra Low NOx  
Natural Gas Engine**



**GreenPower EV STAR Multipurpose Zero Emission  
MINE-Bus**



**North American Council for Freight Efficiency Run on Less Volvo  
VNM Day Cab with Efficiency Technologies**



**Isuzu NRR EV**



**Peterbilt 520EV Refuse Truck**



**Chevy Tahoe equipped with eCoolPark system,  
rooftop solar, and no-idle A/C**



**Autocar Front Loader Refuse Truck w/L9N CNG Engine**



## Friday Features More Workshops and Two Ride & Drives

Take a spin in advanced clean vehicles and learn more about funding, greening aviation, and clean cargo handling equipment.



**ACT Expo Ride & Drive** — 9:00 am to 12:00 pm | Pine Avenue in front of the Convention Center

Check in at the ride & drive registration desk, located outside of the convention center main doors, on the walkway down to Pine Avenue. Show a valid driver's license, sign a waiver, and pick up your wristband to participate.

ACT Expo Ride & drive vehicles Include:

### DAIMLER TRUCKS NORTH AMERICA

- Freightliner eM2 Medium-Duty Electric Truck
- Freightliner eCascadia Class 8 Electric Truck

### DANA INCORPORATED

- Zenith Battery Electric Van - Spicer Electrified w/TM4® Electromechanical Powertrain
- Peterbilt 220 Medium-Duty Battery Electric Truck

### DULEVO INTERNATIONAL SPA

- D.zero<sup>2</sup> Electric Street Sweeper

### ELECTRA MECCANICA

- SOLO All Electric Vehicle (BEV)

### LIGHTNING SYSTEMS

- Battery Electric GM 6500XD Low Cab Forward Vehicle

### THE LION ELECTRIC CO.

- LionC Electric School Bus

### MACK TRUCKS

- Mack LR CNG Refuse Truck

### MAXWELL VEHICLES

- Range-Extended Electric Cargo Van

### MOTIV POWER SYSTEMS

- Zero Emissions Box Truck Built on All Electric EPIC Chassis

### NORDRESA

- Isuzu NPR HD

### ORANGE EV

- All Electric T-Series Terminal Tractor

### US HYBRID

- Class 8 Fuel Cell Electric Drayage Truck

### XOS TRUCKS

- ET-One All Electric Semi Truck

### ZERONOX

- All Electric Class 5 Truck

### PMSA Ride & Drive

12:00 pm to 1:30 pm | Long Beach Arena parking lot, east of the Convention Center

The Pacific Merchant Shipping Association (PMSA) has partnered with ACT Expo to provide a forum for terminal operators and other port stakeholders, including a separate ride & drive event. Take a spin in the advanced clean yard trucks and cargo handling equipment (CHE) options you've heard so much about. PMSA ride & drive vehicles will be located in the Long Beach Arena parking lot, to the east of the convention center main doors to Seaside Lane, turn right (east) on Seaside Lane, and walk for approximately three blocks. Show a valid driver's license, sign a waiver, and pick up your wristband to participate.

### BYD

- All Electric Gen 2 Yard Truck
- All Electric Forklift

### KALMAR

- T2e Electric Terminal Truck

### ORANGE EV

- All Electric Yard Truck

### ZERONOX

- All Electric Forklift

## Friday Workshops

Close out the conference with a workshop on funding, greening aviation, or clean cargo handling equipment.

Get back to basics at **Funding Fundamentals: Funding 101** at 8:00 am. With billions of funding available for fleets to install infrastructure and replace vehicle equipment, knowing where and how to start is half the battle toward getting funds for a project. Start your day with a crash course on how to find funding and submit a successful proposal.

At 9:00 am, join the **Funding Workshop** for an inside look at some of the top funding programs, such as the Volkswagen Settlement, and strategies fleets should be thinking about to pursue funding at the local, state, and federal level.

Or, attend the **Greening Aviation Workshop** on funding, equipment and vehicles at 8:00 am. Learn about the millions of dollars of funding available today for deploying alternative fuel and advanced technologies at airports, from ground support equipment to aircraft and airport shuttle buses. Plus, uncover everything operators need to know about impending

rules and regulations impacting advanced vehicle adoption. Explore the technologies on the market today to increase reliability, fuel efficiency, and emissions reductions.

Finally, the **Pacific Shipping Merchant Association (PMSA)** is hosting a full-day workshop on the future of clean cargo handling equipment, plus a ride & drive. Learn about the latest low- and zero-emission cargo handling equipment (CHE) technologies, including yard trucks, forklifts, top picks, and everything in between. Hear from suppliers about the range of commercially available technology solutions for yard trucks in the advance clean yard hostler showcase.

Suppliers and end users will provide a closer look at zero emission intermodal equipment and material handling equipment before heading outside for the ride & drive. Take a spin in the advanced clean yard trucks and CHE options you've learned about during the morning workshop sessions.

In the afternoon, hear from a range of experts on how operators can identify and apply for a range of funding opportunities and innovative financing opportunities to offset both CapEx and OpEx costs for clean cargo handling equipment.





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