



THE STATE OF SUSTAINABLE FLEETS

Key Findings

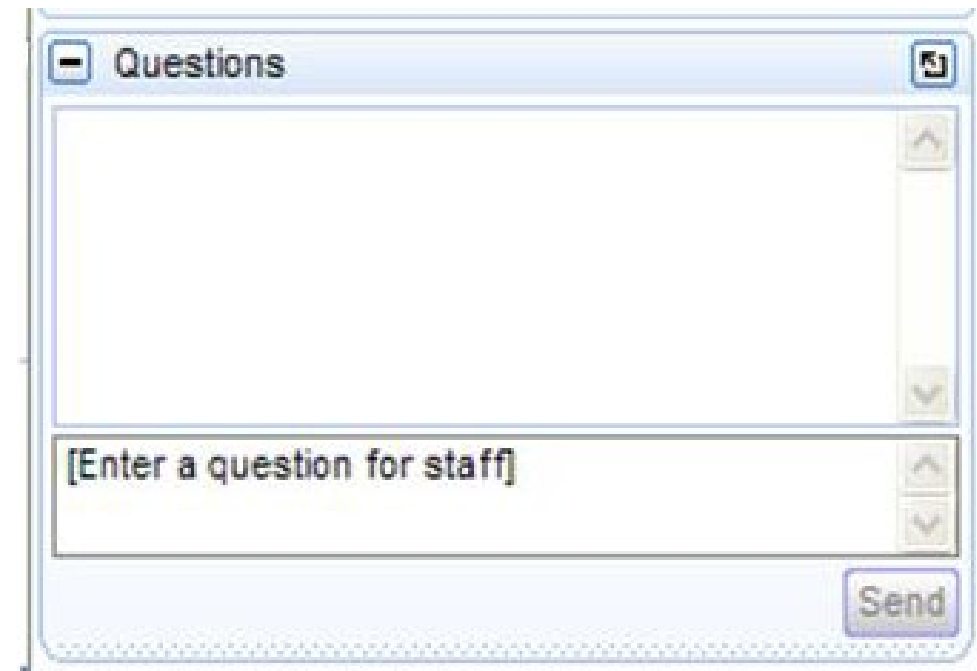
SmartWay Webinar

Mike Costanza
Director, Environmental Services
Penske Transportation Solutions

Nate Springer
Director, Market Development
Gladstein, Neandross &
Associates

Webinar Housekeeping

- Submit a question via the Questions box on your GoTo control panel.
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The presentation slides and recording will be available at:

<http://www.epa.gov/smartway/smartway-freight-matters-webinar-series>

PRESENTERS



NATE SPRINGER

Director, Market Development

Gladstein, Neandross & Associates
(GNA)

310-279-7760

nate.springer@gladstein.org



MIKE COSTANZA

Director, Environmental Services

Penske Transportation Solutions

610-775-6471

mike.costanza@penske.com

WHO IS GNA?



At its core, GNA has deep experience supporting fleets to use advanced, clean technology. We leverage that expertise to provide value to the full industry. Clients and events include:



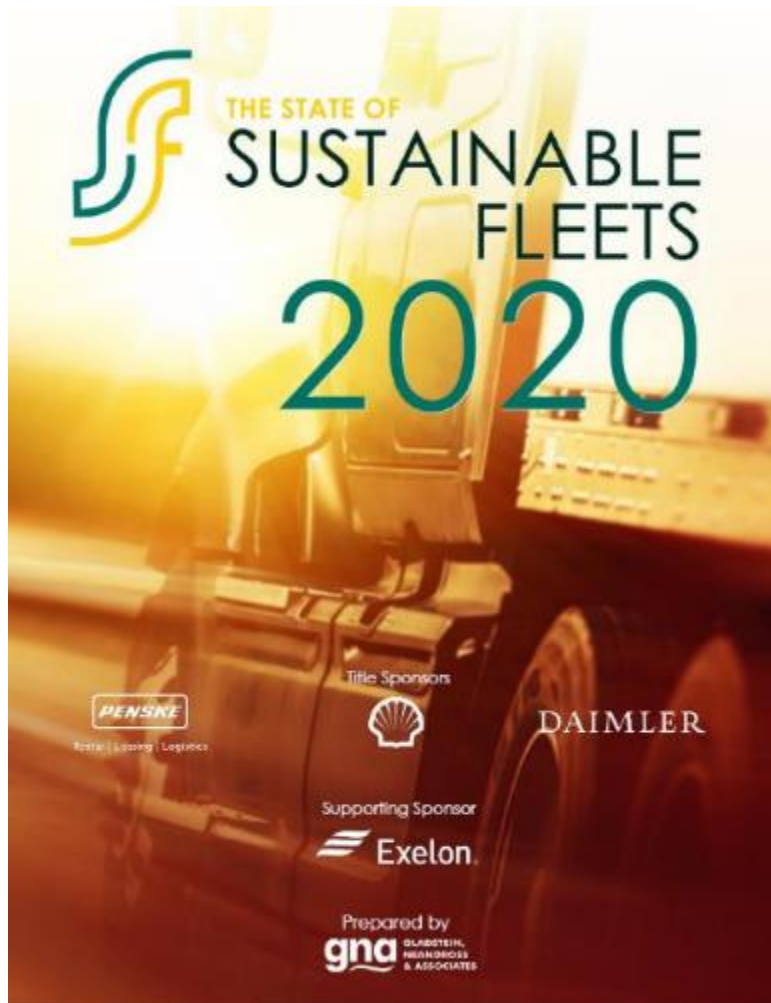


State of Sustainable Fleets

The Trends and Demand for a Sustainable Fleets Resource

Poll Question #1

STATE OF SUSTAINABLE FLEETS



TITLE SPONSORS



Rental | Leasing | Logistics



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SUPPORTING SPONSORS



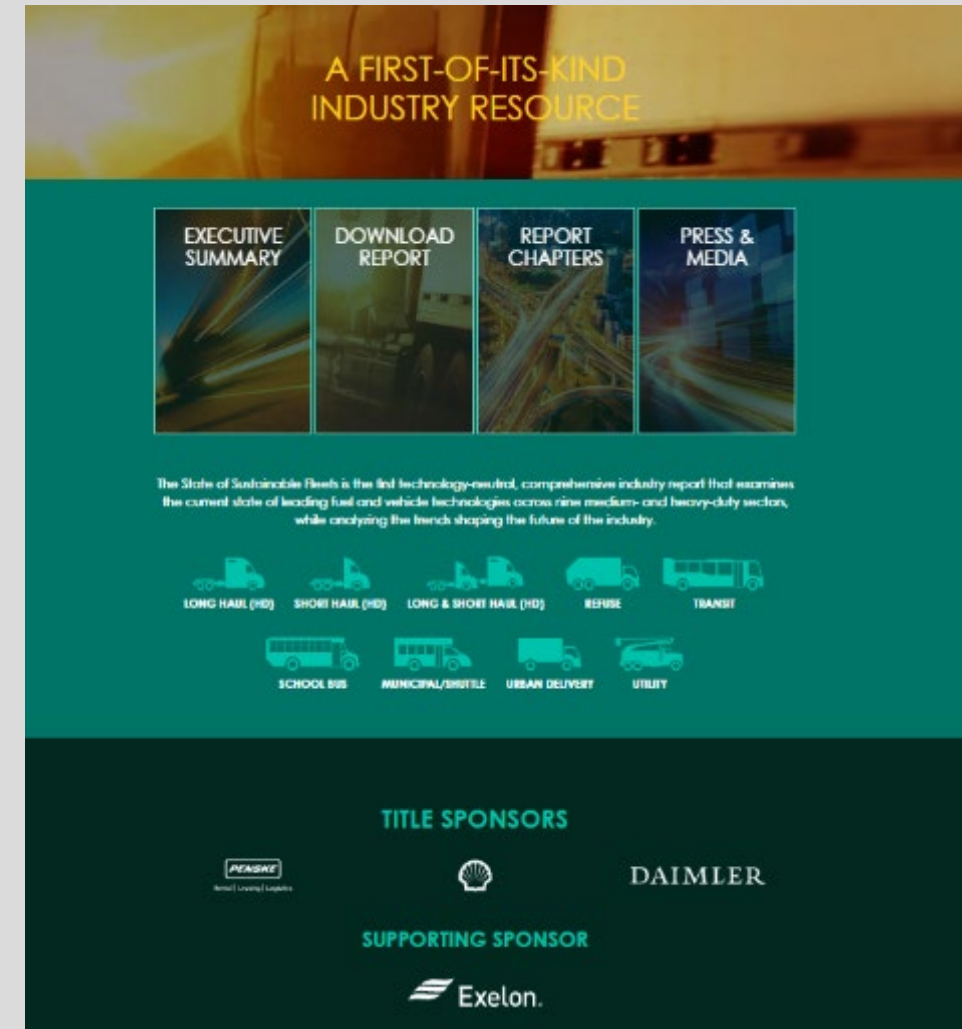
GEOTAB
management by measurement



A FLEET RESOURCE

- Diesel / gasoline efficiency and renewable fuels
- CNG, Propane, Battery Electric, Hydrogen Fuel Cell (and renewable energy for each)
- 9 fleet types including Regional Haul, Long-Haul, Delivery, Utility
- Survey data from 400+ fleets
- 6 years of vehicle sales data
- 10 years of fuel costs and station counts
- Biggest trends and headlines by market-makers

Comparison to diesel and gasoline vehicles used by fleets today.



A FIRST-OF-ITS-KIND
INDUSTRY RESOURCE




EXECUTIVE SUMMARY DOWNLOAD REPORT REPORT CHAPTERS PRESS & MEDIA

The State of Sustainable Fleets is the first technology-neutral, comprehensive industry report that examines the current state of leading fuel and vehicle technologies across nine medium- and heavy-duty sectors, while analyzing the trends shaping the future of the industry.

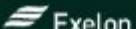
LONG HAUL (HD) SHORT HAUL (HD) LONG & SHORT HAUL (HD) REFUSE TRANSIT

SCHOOL BUS MUNICIPAL/SHUTTLE URBAN DELIVERY UTILITY

TITLE SPONSORS

SUPPORTING SPONSOR



Regulators and customers are ratcheting up requirements

Model Year	Class 2b-3 Group	Class 4-8 Group*	Class 7-8 Tractors Group**
2024	5%	9%	5%
2025	7%	11%	7%
2026	10%	13%	10%
2027	15%	20%	15%
2028	20%	30%	20%
2029	25%	40%	25%
2030	30%	50%	30%
2031	35%	55%	35%
2032	40%	60%	40%
2033	45%	65%	40%
2034	50%	70%	40%
2035+	55%	75%	40%

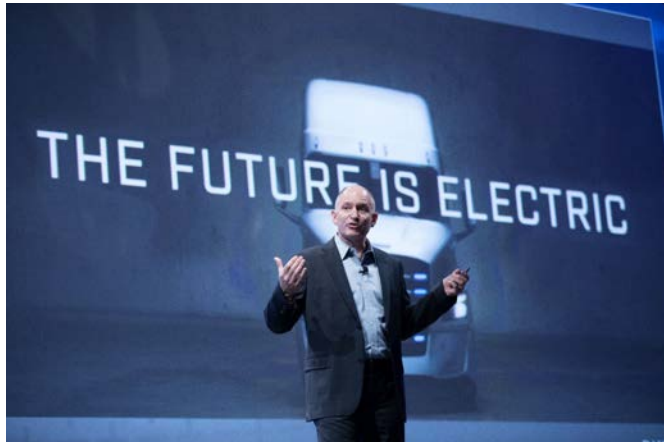


In 2020, California committed to 100% zero-emission passenger vehicles by 2035 and passed requirements for OEMs to sell 30-50% zero-emission vehicles for medium- and heavy-duty by 2030.

9 states (incl. NY, NJ, MD, OR) follow California's zero-emission vehicle requirements. 15 states & DC signed an MOU for zero-emission vehicles to reach 30% of sales by 2030.

Both Amazon and Walmart have set goals to transition their transportation networks to zero-emission vehicles in the 2030-2040 timeframe.

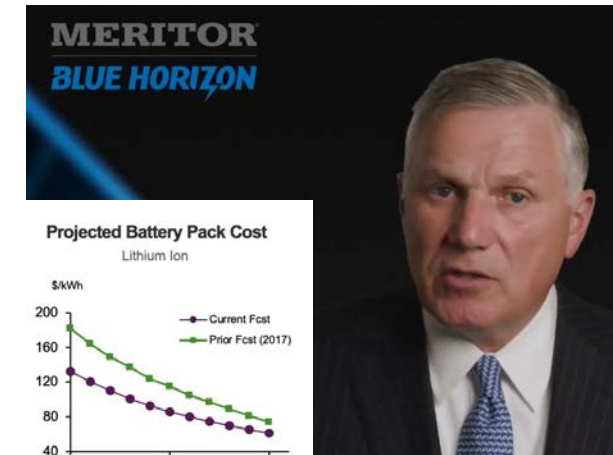
Market leaders across the full trucking value chain commit to lead the transition



Roger Nielsen, CEO of Daimler Trucks North America, the leading manufacturer of Class 8 tractors, announced in 2019 that his company would lead the EV transition.



In 2020, Shell and BP become the first global energy majors to commit to a net-zero emissions goal by 2050.



Jay Craig, CEO of Meritor, the leading producer of axles for heavy-duty trucks and other parts, sees a big opportunity when the total cost of ownership for EVs to reach parity, which Meritor expects in late 2020s.



State of Sustainable Fleets

Fleet Adoption of Sustainable Technologies

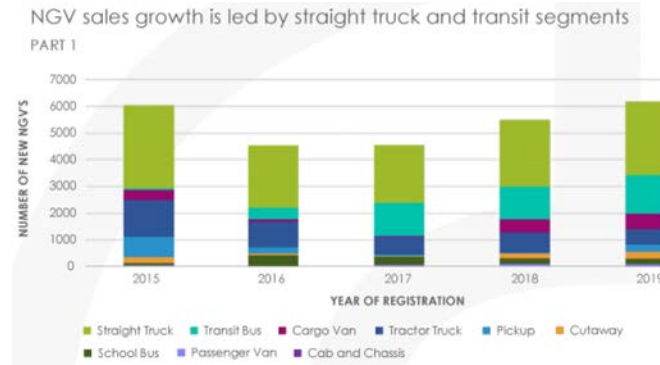
UNIQUE INSIGHTS ACROSS THE INDUSTRY



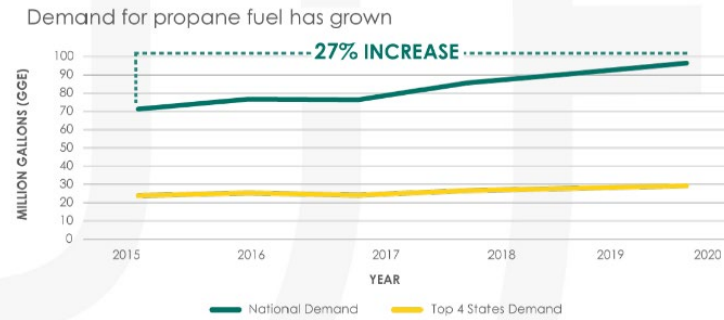
SUSTAINABLE FLEETS ARE GROWING

Sustainable vehicle and fuel use is growing across all categories of medium- and heavy-duty alternative fuel vehicles: natural gas, propane, battery electric vehicles, and hydrogen fuel cell electric vehicles.

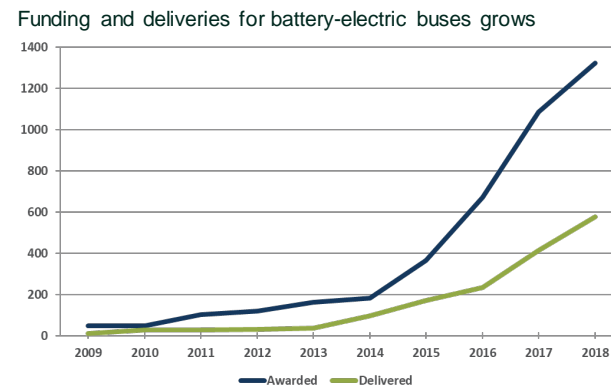
Natural Gas



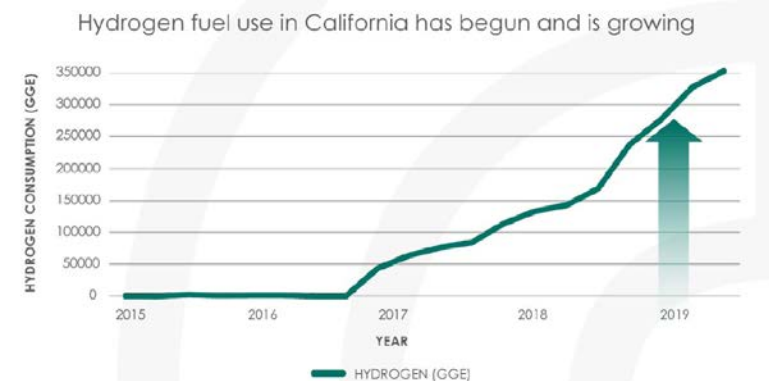
Propane



Battery Electric Vehicles



Hydrogen



Source: 2020 research. Does not account for economic impact of COVID-19.

UNIQUE INSIGHTS ACROSS THE INDUSTRY



SUSTAINABLE TECHNOLOGY MORE THAN A TREND

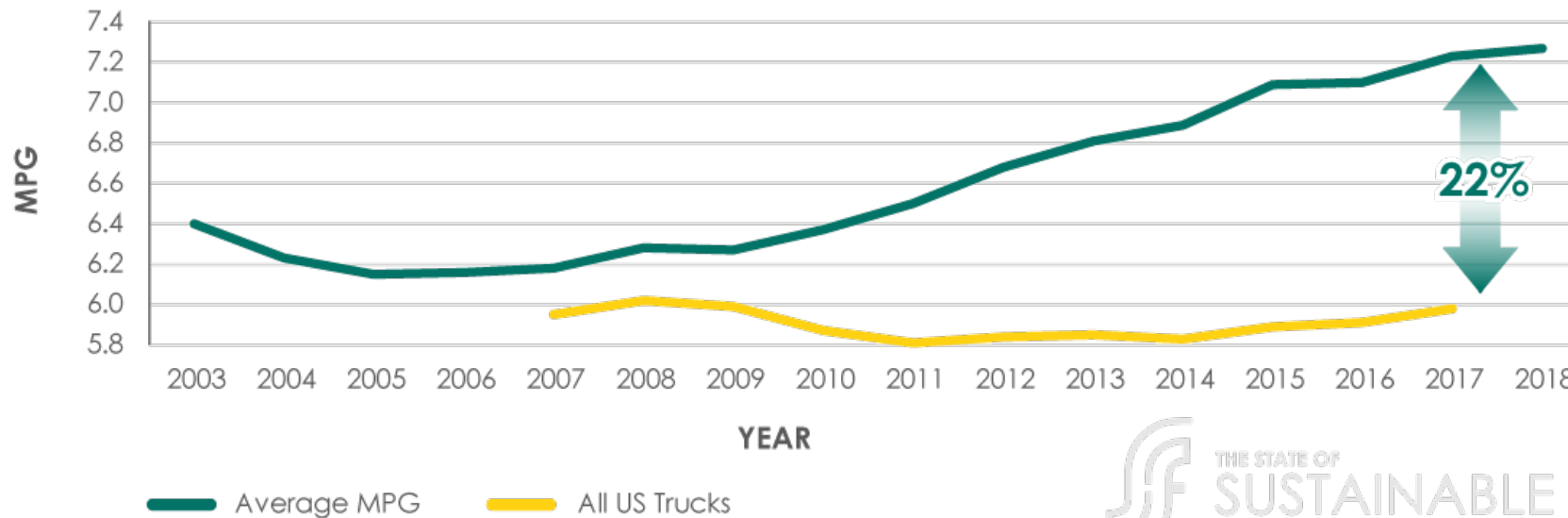
98% of fleets surveyed currently using sustainable technology expect to continue at the same level or increase their use of these vehicles and fuels.

EXPECTED USE OF CLEAN TECHNOLOGIES BY FLEET TYPE			
	GROW	CONSTANT	DECREASE
Municipal/Shuttle	20	2	1
Utility Truck	8	5	1
Urban Delivery	5	0	0
School Bus	22	5	0
Transit	28	3	0
Refuse	3	0	0
Heavy-Duty – Short Haul	13	1	0
Heavy-Duty – Long Haul	4	1	0
Heavy-Duty – Long/Short Haul	17	4	1
Totals	120	21	3
	83.3%	14.6%	2.1%

Source: 2020 fleet survey. Results being tallied now for 2021 are similar.

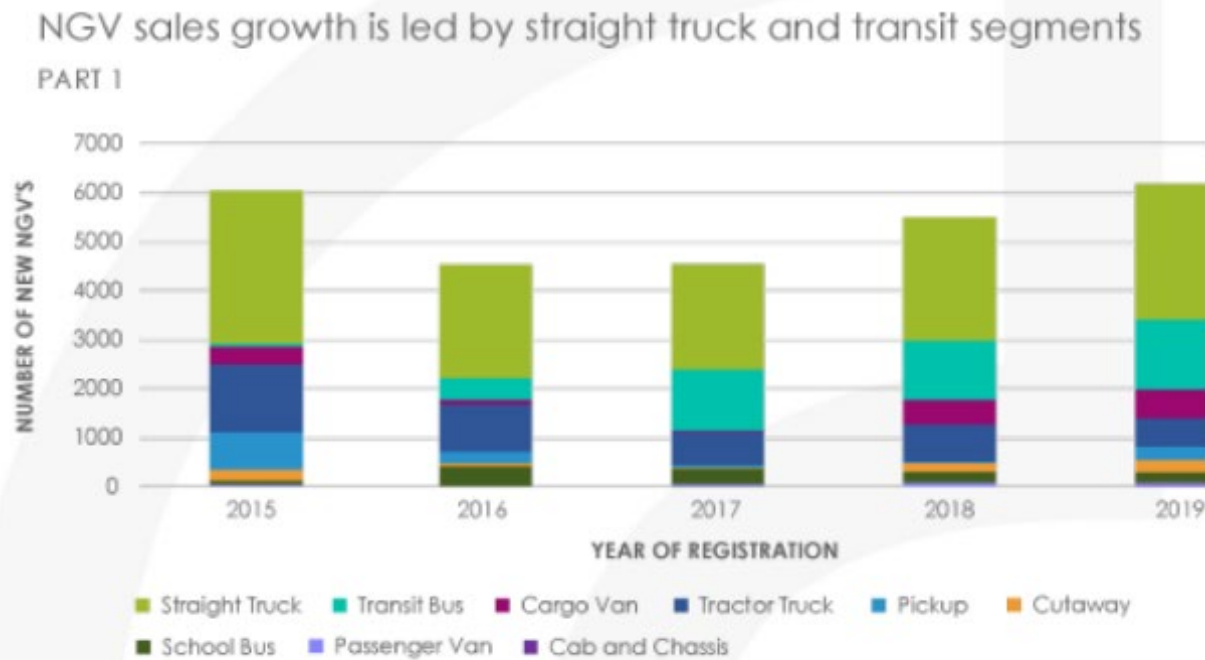
Key Findings: Diesel & Gasoline

Fuel economy of 21 heavy-duty fleets in an efficiency study is 22% higher than national average



Key Findings: Near-Zero-Emission Vehicles

NATURAL GAS VEHICLES



New registrations of Class 2a-8 natural gas vehicles between 2015 and 2019 by vehicle type and by year. Source: IHS Markit.

Fleet types leading adoption



HD SHORT HAUL



LONG & SHORT HAUL (HD)



REFUSE



TRANSIT



MUNICIPAL / SHUTTLE



URBAN DELIVERY



UTILITY

Key Findings: Near-Zero-Emission Vehicles

NATURAL GAS VEHICLES



RUNNING GREEN

California natural gas vehicle fuel reaches carbon negative

CARB data reveals the average carbon intensity of natural gas vehicle fuel in the state's Low Carbon Fuel Standard program was negative for the first time in program history.

NOV 16, 2020

Source: California Air Resources Board, published in FleetOwner

Fleet types leading adoption



HD SHORT HAUL



LONG & SHORT HAUL (HD)



REFUSE



TRANSIT



MUNICIPAL / SHUTTLE



URBAN DELIVERY



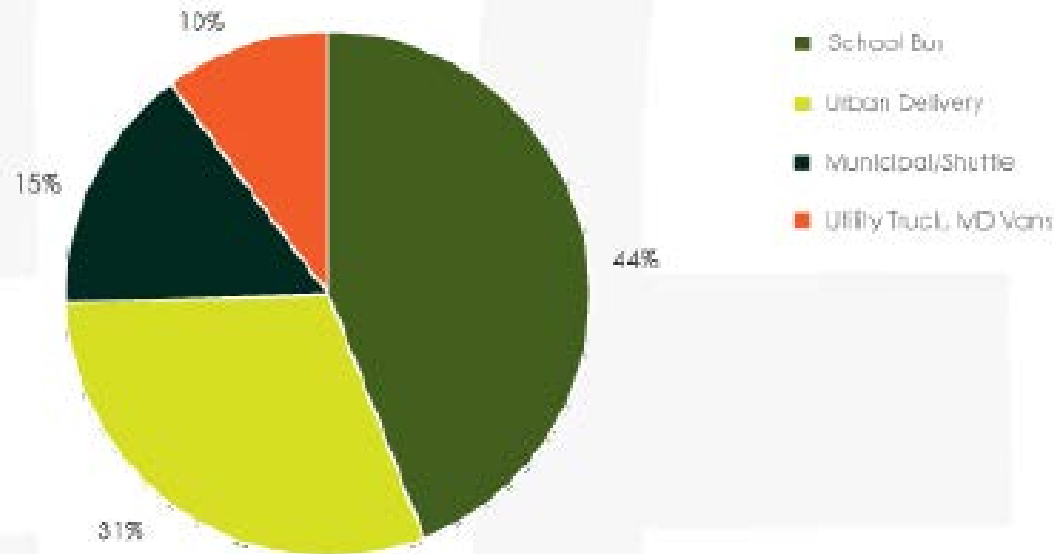
UTILITY

Key Findings: Near-Zero-Emission Vehicles

PROPANE (LPG) VEHICLES

School and delivery fleets lead propane vehicle registrations

PART 2



Sales of class 2a-8 propane vehicles between 2015 and 2019 by vehicle type. Source: OEM and Aftermarket sales data aggregated by Propane Education & Research Council.

Fleet types leading adoption



REFUSE



SCHOOL BUS



MUNICIPAL / SHUTTLE



URBAN DELIVERY

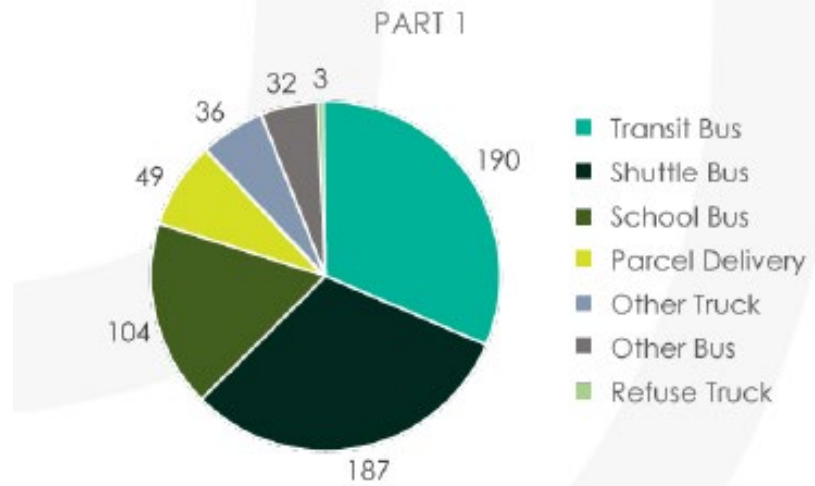


UTILITY

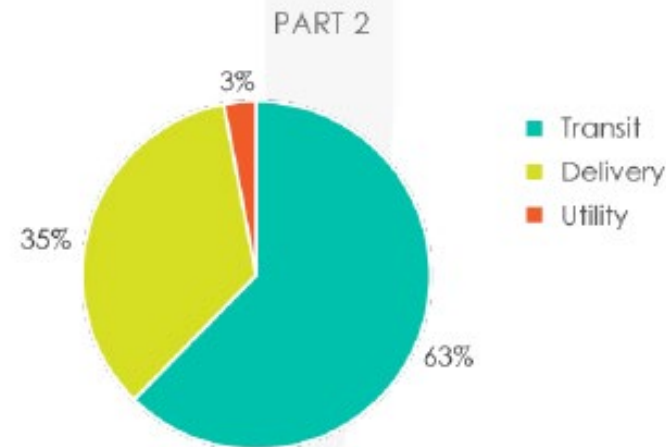
Key Findings: Zero-Emission Vehicles

BATTERY ELECTRIC VEHICLES

Transit, shuttle and school buses lead EV purchases in California's HVIP program



Transit and delivery fleets have the largest BEV counts in 2019



Fleet types leading adoption



HD SHORT HAUL



TRANSIT



SCHOOL BUS



MUNICIPAL / SHUTTLE



URBAN DELIVERY



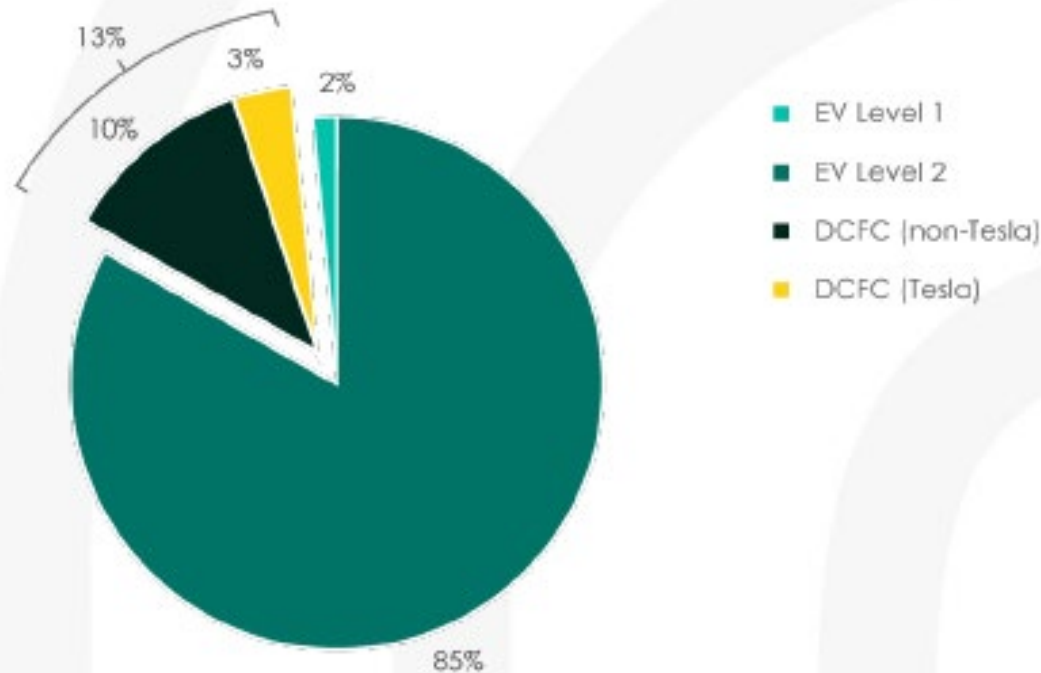
UTILITY

Around 2,000 total Class 3 – 8 BEVs are in the hands of fleets today, majority are transit and school buses (2019)

Key Findings: Zero-Emission Vehicles

BATTERY ELECTRIC VEHICLES

Only 13% of public charging stations provide DC fast charging rates



Public charging for fleets is lagging...

Fleet types leading adoption



HD SHORT HAUL



TRANSIT



MUNICIPAL / SHUTTLE



URBAN DELIVERY

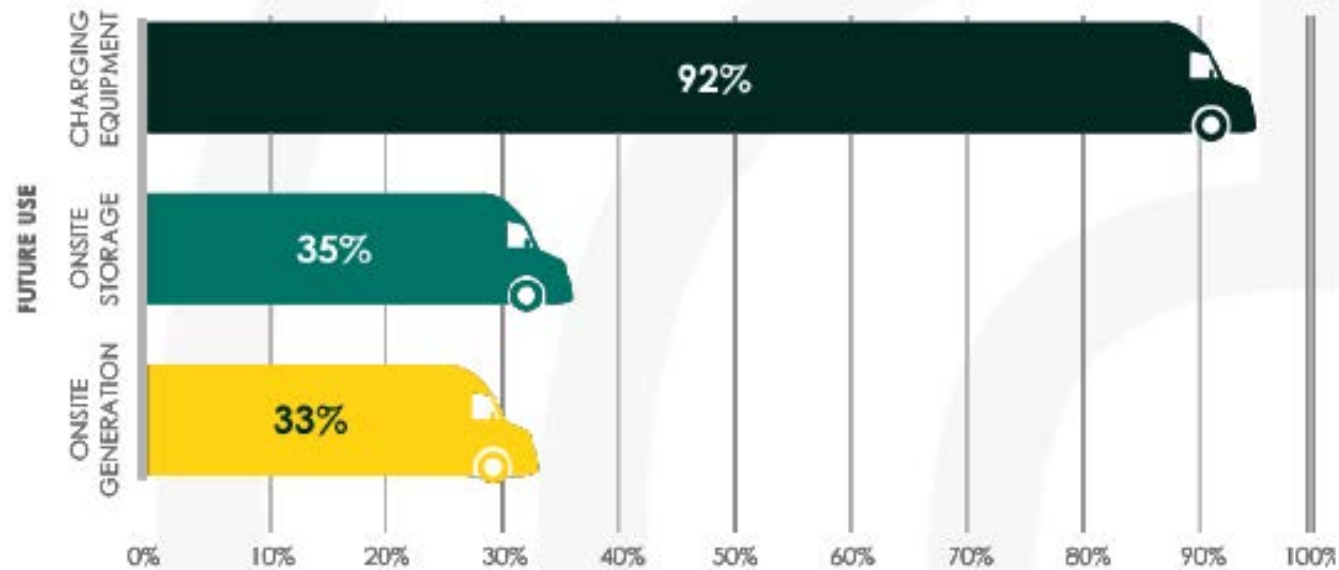


UTILITY

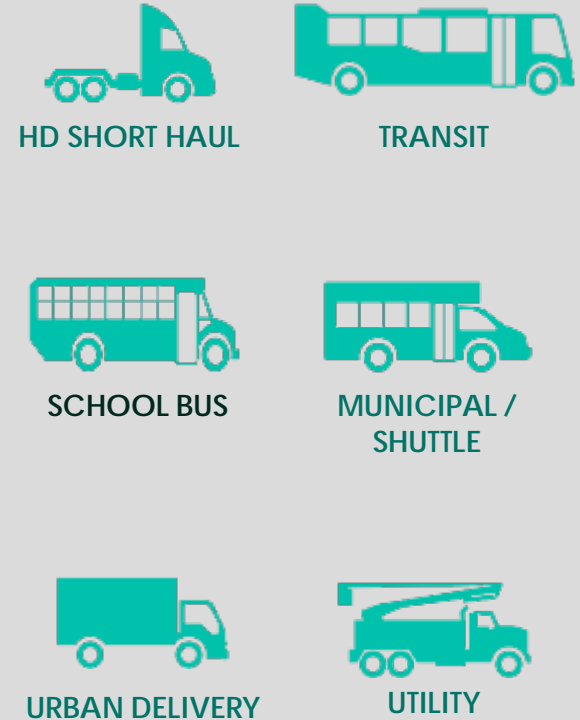
Key Findings: Zero-Emission Vehicles

BATTERY ELECTRIC VEHICLES

Nearly all surveyed fleets who plan to use BEVs will install their own charging. Around 1/3 will install storage and onsite generation



Fleet types leading adoption













...so most fleet adopters of EVs are installing depot charging.




Key Findings: Zero-Emission Vehicles












BATTERY ELECTRIC VEHICLES

CURRENT MEDIUM- AND HEAVY-DUTY VEHICLE OFFERINGS

	PICK-UP	CUTAWAY	CHASSIS CAB	CAR OVER	PASSENGER VAN	CARGO VAN	STRAIGHT TRUCK
			2			1	
						1	
	2			2		1	
	1	1	1	1	1	1	1
	1						1
				3		1	
			1			1	1
	7	16			1		10
							2
							1

FUTURE MEDIUM- AND HEAVY-DUTY VEHICLE OFFERINGS

	PICK-UP	CUTAWAY	CHASSIS CAB	CAR OVER	PASSENGER VAN	CARGO VAN	STRAIGHT TRUCK
	1 (2021)						
						2 (2021)	
	1 (2022)	1 (2022)	1 (2022)		2 (2021 - 22)		
			2 (2022)				
	1 (2021)						
			1 (2020)		1 (2022)		
				2 (2022)			
							1 (2020)
	1 (2021)						1 (2020)
			1 (2021)				
	1 (2022)						
							1 (2020)
	1 (2021)						
			2 (2020)				
	1 (2021)						
							1 (TBD)

	TRANSIT BUS	SCHOOL BUS (TYPE C-3)	REFUSE	TRACTOR
				1 (2020)
				1 (2022)
	1 (2020)			
			1 (2020)	1 (2020)
			1 (2020)	
		1 (2020)		
			1 (2020)	1 (2020)
			1 (2020)	
				1 (2021)
				1 (2021)
				1 (TBD)

More than 90 models of EVs were available in 2020, equivalent to CNG vehicle availability. Another 12+ are on the way in 2021-2022.

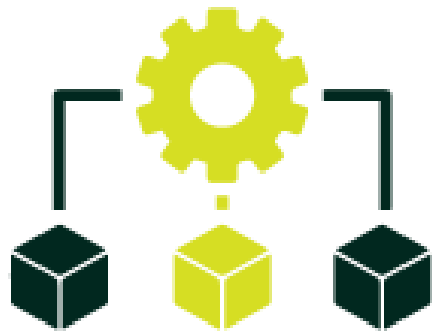
Key Findings: Zero-Emission Vehicles

HYDROGEN FUEL CELL ELECTRIC VEHICLES



Transit Leading the Way

Of the estimated 70 heavy-duty FCEVs deployed in the U.S., the **majority are early commercial transit buses**, including approximately 50 in California.



Cutting Fuel & Infrastructure Costs

Retail hydrogen fuel costs are roughly double the retail price of gasoline – but, prices have dropped by half over the past decade. Infrastructure providers have a goal to **cut costs in half again.**

Fleet types leading adoption



HD SHORT HAUL



TRANSIT



MUNICIPAL /
SHUTTLE








URBAN DELIVERY

Key Findings: Zero-Emission Vehicles

HYDROGEN FUEL CELL ELECTRIC VEHICLES



FUTURE MEDIUM- AND HEAVY-DUTY VEHICLE OFFERINGS



	PICK-UP	CUTAWAY	CHASSIS-CAB	CAB-OVER	PASSENGER VAN	CARGO VAN	STRAIGHT TRUCK
	2	2	2	2	1	1	1 (2020)
TRANSIT BUS		SCHOOL BUS (TYPE C-D)			REFUSE	TRACTOR	
							1 (TBD)
							1 (2021)
							1 (2023)
							1 (TBD)

2021 - 2023

CURRENT MEDIUM- AND HEAVY-DUTY VEHICLE OFFERINGS

	PICK-UP	CUTAWAY	CHASSIS-CAB	CAB-OVER	PASSENGER VAN	CARGO VAN	STRAIGHT TRUCK
NO CURRENT OFFERINGS AVAILABLE							
TRANSIT BUS		SCHOOL BUS (TYPE C-D)			REFUSE	TRACTOR	
	1						
	2						

2020

Fleet types leading adoption



HD SHORT HAUL



TRANSIT



URBAN DELIVERY



MUNICIPAL / SHUTTLE

OEMs will more than double the number of fuel cell vehicle models offered in the next two years.



State of Sustainable Fleets

Penske Transportation Solutions

Poll Question #2

Penske Transportation Solutions



Truck Rental

Operates one of the newest and most diverse truck fleets in North America providing both:

- Commercial Rental
- Consumer Rental



Truck Leasing

Is a leading transportation services provider in North America, offering:

- Full-Service Leasing
- Contract Maintenance



Logistics

Serves companies in North America, South America, Europe and Asia, offering:

- Dedicated Contract Carriage
- Freight Management
- Distribution Center Management

327,000+ Vehicles | 3,700+ Locations | 37,000+ Associates

Penske - SmartWay



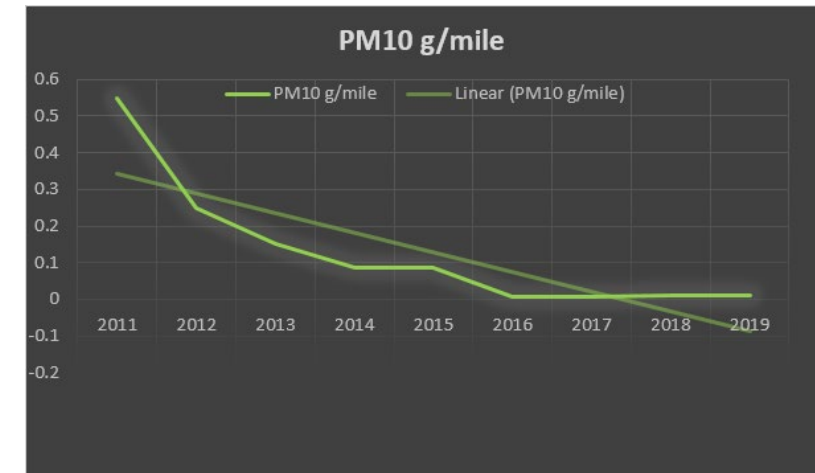
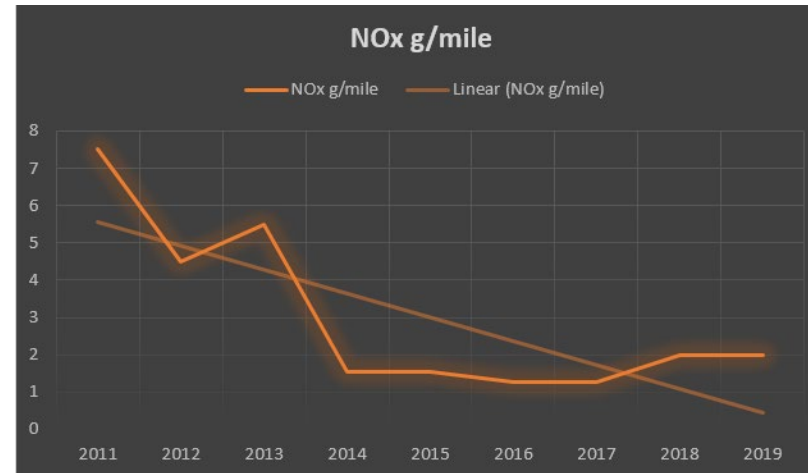
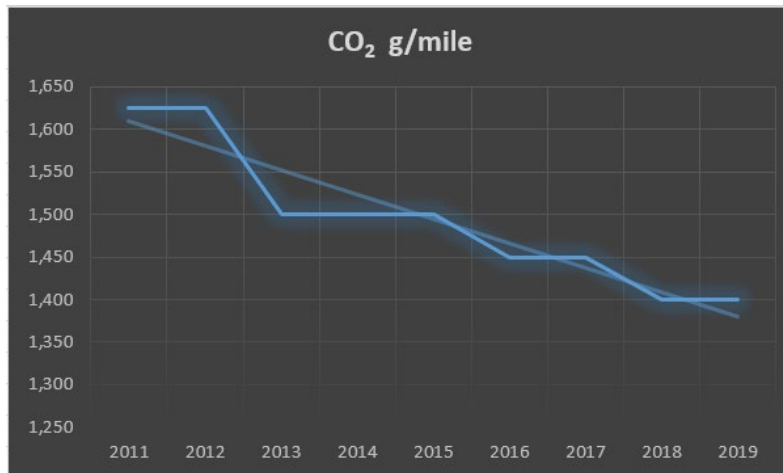
RECOGNIZED FOR A STRONG COMMITMENT TO CLEAN TRANSPORTATION AND FOR BEING AN ADVOCATE WITHIN THE TRANSPORTATION INDUSTRY

- SmartWay Transport Partnership and Canada SmartWay Transport Partnership
- SmartWay Affiliate Challenge Award (since 2015)
- SmartWay Excellence Award (since 2017)
- U.S. EPA Clean Air Excellence Award in the Clean Air Technology Category (2015)
- Additional activities & recognition include:
 - Top Green Provider, Food Logistics Magazine (since 2011)
 - Green Supply Chain Partner, Inbound Logistics (since 2010)
 - Supply and Demand Chain Executive Green Supply Chain Award (2013-18)
 - Green Freight Europe

Penske - SmartWay

SmartWay's Carrier Performance Rankings

- EPA compiles data from carriers and divides the data into five performance ranges
- Rankings are provided for CO₂, NOx and Particulate Matter (PM) on a per mile and per ton-mile basis
- Compare performance to your peers based on mode and category
- Track performance year-over-year
- Penske has submitted 100s of annual Truck Tools on behalf of our Customers since 2007



Penske – Alt. Fuel Profile

- 700+ non-diesel units (EVs, CNG, LNG, propane, hybrid)
- 6 EV charging facilities in S. California
- 35+ modified maintenance facilities to service NGVs
- Trained maintenance technicians
- Coordination of alt. fuel grants/funding
- On-going discussions w/ OEMs, startups, and charging equipment providers

Many of our Customers have made sustainability commitments and we are ready to assist as a trusted advisor.



Penske - Essential Partners

Penske has partnered with Daimler Trucks North America to co-create and operate the Freightliner Electric Innovation Fleet of eCascadia™ heavy-duty trucks and eM2 medium-duty trucks.

The Freightliner Innovation Fleet is supported by a partnership between:

- Daimler Trucks North America
- South Coast Air Quality Management District
- EPA
- Ports of Los Angeles and Long Beach

DAIMLER



Penske - EV Charging Infrastructure

Six locations in Southern California with DC fast charging (21 charging positions)

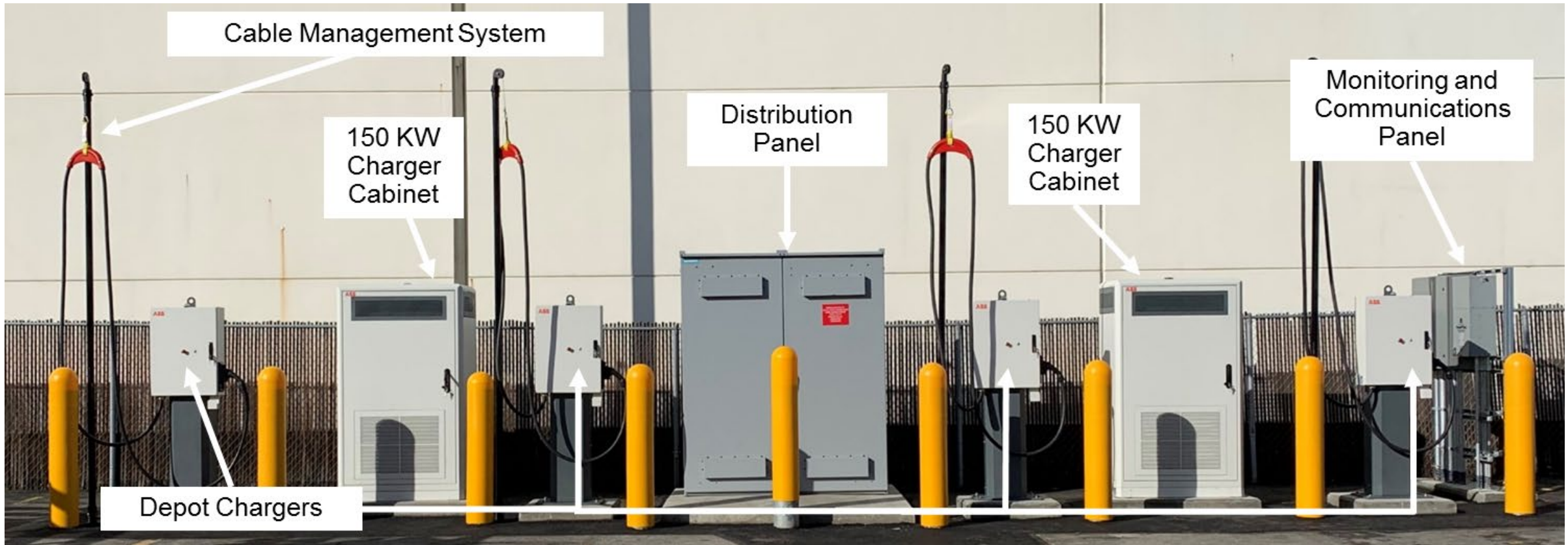
- Chino – 2 x 150 kW, 4 charging positions
- Anaheim – 2 x 150 kW, 4 charging positions
- La Mirada – 2 x 150 kW, 4 charging positions
- San Diego – 1 x 150 kW, 2 charging positions
- Temecula – 1 x 50 kW, 1 charging position
- Ontario – 3 x 150 kW, 6 charging positions, Fluence battery storage system

Charging times:

- eCascadia: 3 hours to charge from 0% to 80% state of charge (SOC)
 - 4 hours to charge from 0% to 100% SOC
- eM2: 2 hours to charge from 0% to 80% SOC
 - 3 hours to charge from 0% to 100% SOC



Penske - EV Charging Infrastructure



Penske – Other Sustainability Initiatives



- Green Power Partner since 2014
- Committed to using renewable energy
- 2020 - more than 700 EPA Green Power Partners were collectively using nearly 70 billion kilowatt-hours (kWh) of green power annually



- WasteWise Partner since 2016
- Committed to reducing/recycling solid waste
- During the 25 years of the WasteWise program, participants have kept 247 million tons of materials from going to landfills or incineration

Poll Question #3

Q & A



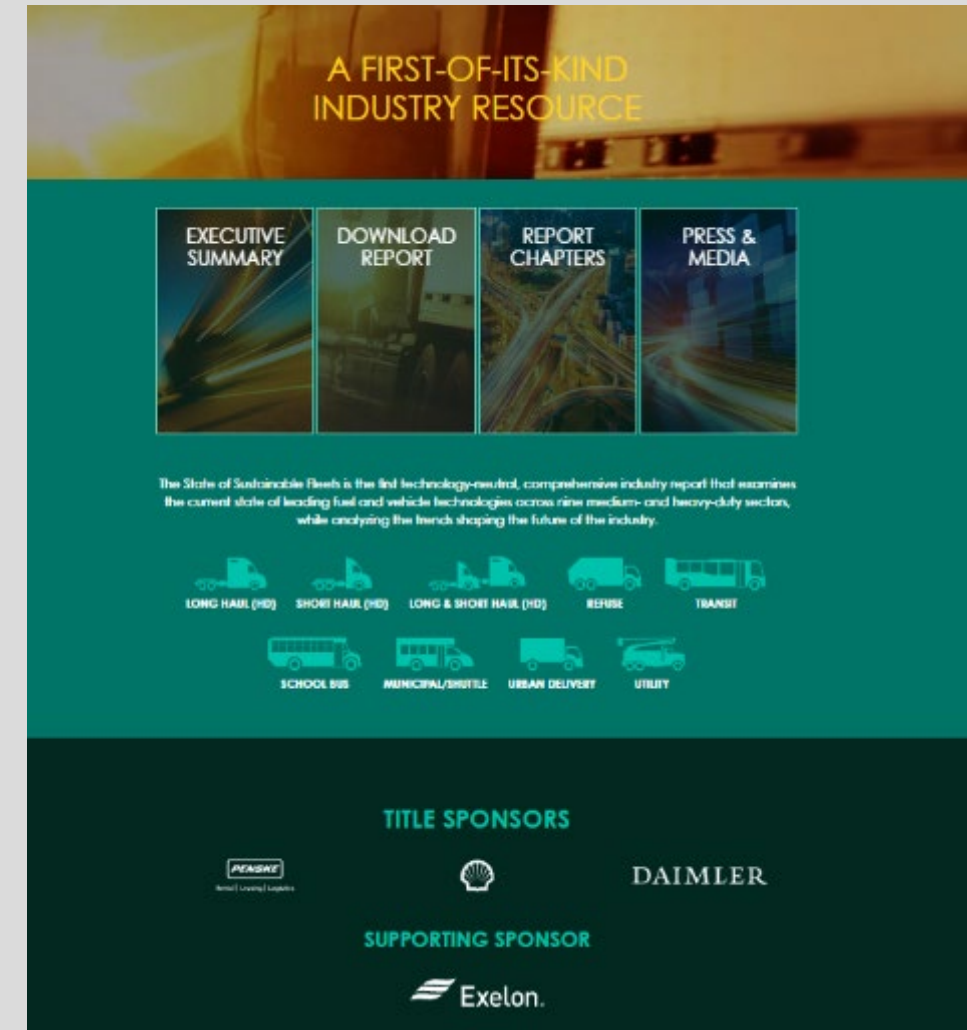
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SCHOOL BUS | MUNICIPAL/SWITEL | URBAN DELIVERY | UTILITY

TITLE SPONSORS

PENSKE | Shell | DAIMLER

SUPPORTING SPONSOR

Exelon.



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Director, Market Development
Gladstein, Neandross and Associates
(GNA)
(310) 279-7760

nate.springer@gladstein.org
[linkedin.com/in/nathanspringer](https://www.linkedin.com/in/nathanspringer)

Mike Costanza

Director, Environmental Services
Penske Transportation Solutions
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