Transportation: Driving Electrified Fleets into the Fast Lane
Transportation: Driving Electrified Fleets into the Fast Lane

MODERATOR
Ben Mandel, *Northeast Regional Director, CALSTART*

PANELISTS
Hilary Leifsen, *Sustainability Developer, Transport and Logistics Services America, IKEA Purchasing*
Christine Weydig, *Director, Office of Environmental and Energy Programs, NY/NJ Port Authority*
John Walsh, *Senior Vice President of Sales, Proterra Inc.*
Pathways to Decarbonization in the Northeast
August 29, 2019
Drive to Zero helps nations tackle climate change and urban pollution while spurring innovation

- Freight fuel consumption and GHGs are forecasted to grow four-fold through 2050.
- Urban regions suffer the worst impacts of air pollution in an increasingly urbanized world.
- HDVs represent a disproportionate share of energy consumption and emissions.
- Technology innovation can spur industrial development.

Source: ITF (2016)
Drive to Zero is a strategic international initiative to catalyze the growth of zero-emission MHDVs

**2025**

Beachhead near- and zero-emission applications for MHDVs are commercially viable and cost-competitive in target global markets.

**2040**

Zero-emission MHDVs dominate in their segments.
Our “beachhead” strategy targets vehicle segments where zero-emission technology is likely to succeed.
Momentum in e-buses creates first steps for commercial vehicles

**China E-Bus Players**
- BYD
- DEAC
- FG
- Foton
- Hunan
- Guangdong
- Nanjing
- Zhong Tong
- Zhejiang
- Yutong

**Europe E-Bus Players**
- ADL
- Alexander Dennis
- Albon
- Bluebus
- BYD
- Daimler
- Eneros
- IVECO
- Solaris
- Scania
- Van Hool
- VDL
- Volvo
- Wright Bus

**India E-Bus Players**
- Ashok Leyland Limited
- Electric Greenfield Limited
- Tata Motors Limited
- JBM Auto Limited
- Solaris Bus & Coach SA
- BYD Auto Co. Ltd.
- Eicher Auto Co.
- Optare PLC
- Decision Auto Limited
- Volvo Eicher Commercial Vehicles Limited

**N.A. E-Bus Players**
- Blue Bird
- BYD
- El Dorado National
- Gillig
- Green Power Bus
- Lion
- New Flyer Industries
- Nova Bus
- Phoenix Motors
- Proterra
- Thomas Built
- Zenith
Electric technology is highly transferable, speeding production across vehicle types.

BYD energy storage modules transferable across range of bus, truck and grid backup applications. Inverters, controllers and voltage distribution units have a high degree of transferability between bus and truck platforms.

- Volvo electric truck based off core bus electric powertrain
- Same power train in autonomous electric dump trucks, marine system

... inverters, controllers and voltage distribution units have a high degree of transferability between bus and truck platforms...
Drive to Zero focuses on the “HOW”

**TARGET ACTION**
- Target first-success beachhead markets where electrification works now. Typically urban applications where vehicles travel along known routes and return to base for charging.

**BUILD ECOSYSTEMS**
- Build supporting “ecosystems” of success in key first-mover regions made up of aligned policies, incentives, infrastructure, and pilot projects.

**COLLABORATE**
- Work concurrently and collaboratively between regions and industry worldwide to encourage global supply chain of critical components and manufacturers.

**EXPAND**
- Expand to succeeding success markets as supply chain grows, costs decrease, and business case expands.
Program was launched last September and has gained incredible momentum.
60+ organizations worldwide have signed the Pledge

The Pledge

Cities, governments, manufacturers, fleets and fuel suppliers agree to:

- Work together to accelerate early markets for zero- and near-zero emission trucks, buses and equipment.
- Share information with peer regions.
- Access best tools, research, assistance, data.

Catherine McKenna, Minister of Environment and Climate Change Canada, announces endorsement at Drive to Zero Vancouver Workshop
We are developing tools to drive market success

Resources for Transformation: https://globaldrivetozero.org/resources/
Thank you!

For more information:
www.globaldrivetozero.org

bmandel@calstart.org
IKEA TRANSPORT & LOGISTICS SERVICES AMERICAS

Heavy Duty EVs in Transport
Inter IKEA Group

- 15% absolute emissions from Transport & Logistics Services by 2030 compared to 2017 levels
- Fuel agnostic due to the varied nature of transportation routes

INGKA Group (IKEA Group)

- Zero emissions home delivery by 2025
- Zero emissions home delivery by 2020 in New York, Los Angeles, Amsterdam, Paris & Shanghai
LONG TERM AMBITION
FY17-FY30

-70% co₂e per transport work

-15% Absolute emissions

Baseline Year: FY17
About Proterra

Proterra’s Mission
Advancing electric vehicle technology to deliver the world’s best-performing heavy-duty vehicles

- Offices and manufacturing in CA and SC
- 500+ employees, with strong transportation expertise
- >90 customers; >700 vehicles sold
- >8,000,000 service miles
- >47,000,000 pounds of CO2 emissions avoided

Strong Transportation Expertise

World-Class Financial Partners
THE TRANSIT MARKET IS RAPIDLY SHIFTING TO EV

- **2010–2014**
  - $1.2M
  - Tech Proven
  - Small Orders
  - Safety
  - Reliability

- **2015–2016**
  - $800K
  - Full Route Adoption
  - Revenue Service
  - 1,000,000 miles
  - Mainstream Financing

- **2017–2018**
  - $700K
  - Fleet Replacement Begins
  - Price Parity to Hybrid
  - 10% Penetration
  - Best Practices Developed

UNIT SALES

PROTERRA PRICE

EV Evangelists

Early Adopters

Early Majority

THE TRANSIT MARKET IS RAPIDLY SHIFTING TO EV

- **2010–2014**
  - $1.2M
  - Tech Proven
  - Small Orders
  - Safety
  - Reliability

- **2015–2016**
  - $800K
  - Full Route Adoption
  - Revenue Service
  - 1,000,000 miles
  - Mainstream Financing

- **2017–2018**
  - $700K
  - Fleet Replacement Begins
  - Price Parity to Hybrid
  - 10% Penetration
  - Best Practices Developed

UNIT SALES

PROTERRA PRICE
NORTHEAST & MID-ATLANTIC PROTERRA CUSTOMERS

CT
GBT BRIDGEPORT

DC
DC CIRCULATOR WASHINGTON

DE
DART FIRST STATE DOVER

MA
WRТА WORCESTER
PVTA SPRINGFIELD

ME
SH-ZOOM TRANSIT BIDDEFORD
GREATER PORTLAND METRO PORTLAND

MD
BGE BALTIMORE
MCDOT ROCKVILLE

NY
MTA NEW YORK CITY
TOMPKINS CONSOLIDATED AREA TRANSIT ITHACA

PA
SEPTA PHILADELPHIA

VA
HAMPTON ROADS TRANSIT NORFOLK
MAJOR COMMITMENTS TO 100% EV TRANSIT

EV Transit Bus adoption continues to increase

Major cities adopting EV technology for transit buses

- **New York**
  - 100% EV by 2040
  - 4,700 buses
- **Chicago**
  - Piloting since 2014
  - 2,100 buses
- **Washington D.C.**
  - 100% EV by 2045
  - 1,900 buses
- **Seattle**
  - 100% EV by 2034
  - 1,500 buses
- **Philadelphia**
  - Piloting since 2017
  - 1,500 buses
- **Miami**
  - 50% EV by 2035
  - 800 buses

California mandates 100% electric transit buses by 2040

New purchase mandates

- 25% by 2023
- 50% by 2026
- 100% by 2029

12,000 buses across California

(17% of nationwide fleet)

Source: Frost & Sullivan Heavy Duty Transit Bus North America Powertrain Adoption Forecast

Source: National Transit Database; agency websites; 2017 American Public Transportation Association Fact Book