UTILITIES ROLE TO SUPPORT M&HDV ELECTRIFICATION IN NEW JERSEY

KATHY HARRIS
August 24, 2021
Why Is Transportation Electrification Important?

- Transportation Accounts for 41% of GHG Emissions in NJ
- MHDVs are responsible for
  - 7.6 million metric tons of GHG emissions each year (20% of all transportation)
  - 44% NOx pollution from the transportation sector
  - 39% of particulate matter from the transportation sector
- Highly concentrated emissions in urban areas, low-income communities and communities of color

Air Quality Benefits from Medium and Heavy-Duty EVs

Comparison of Medium and Heavy-Duty Technologies in California, ICF, 2019.
Additional Benefits of M&HDV Electrification

• Lower Total Cost of Ownership
  • Rebates and incentives available to help reduce delta
• More predictable and consistent fueling prices
• Provides environmental, health and air quality benefits
• Ensures that all New Jerseyans have access to clean transportation
• Cleans up trucks and buses that drive through communities (especially those by ports, highways, and warehouses)
Medium- and Heavy-Duty Vehicles in NJ

- **Freight & Vocational Trucks**
  - Class 3 - 8
  - 324,121 vehicles

- **Heavy-duty Pickups & Vans**
  - Class 2b
  - 241,101 vehicles

- **School, Shuttle, Coach, & Transit Buses**
  - Class 3 - 8
  - 56,122 vehicles

- **Tractor-Trailer Trucks**
  - Class 7 - 8
  - 63,136 vehicles

- **2020 vehicles**
Benefits of M&HDV Electrification

• Through 2050, clean truck rules will:
  • Save New Jerseyans 228 premature deaths and 135,770 illnesses
  • Reduce GHG emissions by 18.9 million metric tons
  • Reduce NOx emissions by 82 percent

Net Societal Benefits
State Programs and Policies

- **NJ 80x50 goal through the Global Warming Response Act**
- **NJ Zero-Emission Vehicle Incentive Program**
- **Medium- and Heavy-Duty Memorandum of Understanding**
  - Goal of 100% electric MHDV sales by 2050
- **EV Law**
  - Requires the installation of 200 public fast charging stations (400 ports) through 2025
- **Potential for ACT/HDO Rules**
  - Increases the number of electric M&HDV on the road
  - Cleans up the vehicles that can’t yet electrify
Utility Actions to Accelerate Transportation Electrification

- Infrastructure
- Rate Design and Grid Services
- Market Education & Outreach
Utility Transportation Electrification Investments
Utility M&HDV Investments

This dashboard contains details on filings related to EV charging.

Summary Statistics
- $1,146,174,949 Investment
- 11,686 L2 Charging Stations
- 475 DCFC
- 25,915 MD/HD Charging Stations

Utility Role by Initial Filing Date

Total Potential Charging Stations by Initial Filing Date

Filings by Filing Element and Filing Status

Filings by Filing Status and Target Use
THANK YOU

Kathy Harris
kharris@nrdc.org
Supporting Fleet Electrification Customers

Medium- and Heavy-Duty Ecosystem Panel
Kellen Schefter, Edison Electric Institute
kschefter@eei.org
Tuesday, August 24, 2021
About Edison Electric Institute (EEI)

- Organized in 1933, EEI represents all U.S. investor-owned electric companies.
- EEI members provide electricity for 220 million Americans and support more than 7 million jobs in communities across the U.S.
- EEI has more than 65 international electric companies and hundreds of industry suppliers and related organizations.
- EEI provides public policy leadership, strategic business intelligence, and essential conferences and forums.

https://www.eei.org/about/Documents/EEI%20Member%20Map.pdf
Different Fleet EV Use Cases Require Different Charging Solutions

Last-mile delivery
Package delivery
Overnight, depot charging

Source: Amazon

Short-haul freight
Grocery
Charging between shifts/routes

Source: Penske
Preparing to Plug In Your Fleet

Electric bill depends on charging strategy

<table>
<thead>
<tr>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 EV trucks charging at 150 kW</td>
<td>4 EV trucks charging at 50 kW</td>
</tr>
<tr>
<td>Charge for 2 hours (9 p.m. to 11 p.m.)</td>
<td>Charge for 6 hours (9 p.m. to 3 a.m.)</td>
</tr>
<tr>
<td>Peak demand: 600 kW</td>
<td>Peak demand: 200 kW</td>
</tr>
<tr>
<td>Daily energy delivered: 1,200 kWh</td>
<td>Daily energy delivered: 1,200 kWh</td>
</tr>
<tr>
<td>Monthly electric bill: $8,905</td>
<td>Monthly electric bill: $4,105</td>
</tr>
<tr>
<td>Effective electric cost: $0.37/kWh</td>
<td>Effective electric cost: $0.17/kWh</td>
</tr>
</tbody>
</table>

**Electric Company-Customer Engagement**

- **Engage early:** electric service upgrades for large-scale site may take 18-24 months
- **Strategic partnership:** understand the customer’s power needs and long-term plans
- **Communication is key:** customers need to work across silos and leverage account managers as the single point of contact
Electric Company Support for Fleet Customers

Business As Usual
- Power
- Interconnection
- Rates

Customer Programs
- Advisory Services
- EV Charging Infrastructure
- EV Charging Rates
Many States have Approved Electric Transportation Programs

52 electric companies
31 states plus DC
Approx. $3 billion
EV Charging Infrastructure Programs

Service Connection | Supply Infrastructure | Charging Equipment
--- | --- | ---
Electric company | Customer | Customer
Electric company | Electric company | Customer
Electric company | Electric company | Electric company

Incentive-based
Utility-constructed make-ready
Utility-owned/operated
Medium- and Heavy-Duty Ecosystem

New Jersey BPU Stakeholder Meeting
About Greenlots

Together with Shell and our partners, Greenlots is powering the transformation to electric mobility to create a more sustainable future. Our industry-leading software and services equip drivers, site hosts and network operators to efficiently deploy, manage, and leverage EV charging infrastructure at scale.

We provide what our customers need: expertise, solutions, and support to transition to electric and flexible solutions that deliver economically effective, reliable charging at scale.

- Founded in 2008 with over a decade of experience
- Headquartered in Los Angeles, California
- Acquired by Shell Renewables and Energy Solutions in January 2019
- Global footprint with offices throughout the US and in Canada, India, Singapore, and Southeast Asia
- Over 170 Employees and contractors worldwide
- Working with utilities, cities, automakers, fleet and retail customers across the US and the world
Major corporations are electrifying their fleets

- **Purchasing 10,000 electric delivery vans from Arrival**
- **100% electric by 2030**

- **Purchasing 100,000 electric delivery vans from Rivian**

- **Electrifying entire fleet by 2040, including 7,400 tractors**
Major transit agencies are electrifying their fleets

- San Joaquin RTD: Fully ZEB by 2025
- Los Angeles: Fully electric by 2030
- California Air Resources Board: Fully ZEB by 2040
- Chicago: Fully electric by 2040
- Montreal: Fully electric by 2040
- New Jersey: Fully ZEB by 2040
- New York City: Fully electric by 2040
- Seattle: Fully ZEB by 2040
- Toronto: Fully ZEB by 2045
- San Joaquin RTD: Fully ZEB by 2025
- Los Angeles: Fully electric by 2030
- California Air Resources Board: Fully ZEB by 2040
- Chicago: Fully electric by 2040
- Montreal: Fully electric by 2040
- New Jersey: Fully ZEB by 2040
- New York City: Fully electric by 2040
- Seattle: Fully ZEB by 2040
- Toronto: Fully ZEB by 2045
- San Joaquin RTD: Fully ZEB by 2025
- Los Angeles: Fully electric by 2030
- California Air Resources Board: Fully ZEB by 2040
- Chicago: Fully electric by 2040
- Montreal: Fully electric by 2040
- New Jersey: Fully ZEB by 2040
- New York City: Fully electric by 2040
- Seattle: Fully ZEB by 2040
- Toronto: Fully ZEB by 2045
Commercial EVs are projected to grow significantly

There are **over 1 million commercial EVs** on the roads globally including buses, delivery vans and trucks. Corporate fleet commitments, the rise of e-commerce, urban air quality concerns and growing regulatory pressure will keep the commercial EV market growing in the years ahead.

Data source: Electric Vehicle Outlook 2021, BloombergNEF
Main themes

- Think holistically
- Plan: plan ahead, and plan for scale
- Leverage software
Case Study: Volvo LIGHTS
Case Study: Volvo LIGHTS

- 16 Public & private organizations collaborating
- 23 Battery Electric Heavy-Duty Trucks
- 29 Battery Electric Equipment
- 58 Public & Private Chargers
- 2 Electric Truck After Market Service Centers
- 2 Colleges Designing Electric Truck Maintenance Programs
- 1.8 million kWh Solar Energy Generation
- 2 Ports Providing Infrastructure Planning
Volvo LIGHTS: Innovative charging solutions

The first heavy-duty fleet charging project to demonstrate the viability of **Class 8 battery electric trucks** and equipment.

- **3** 150 kW DC Fast Chargers across three trucking facilities
- **6** 50 kW DC Fast Chargers across three trucking facilities
- **15** Level 2 stations for light-duty vehicles
- **50** Electric forklift chargers for in-warehouse operations

**Lessons Learned:**

- Many stakeholders: site host fleet, utility, auto OEM (Volvo), hardware manufacturer – integrated PM approach is critical
- Although project is subsidized, it’s important to start to analyze path to cost parity with diesel
Think Holistically

• Electrification is more than just buying vehicles and chargers
• Rethinking operations can yield efficiencies and savings
• Resilience can entail on-site energy solutions
• Reliability requires end-to-end testing, validation and support
When Planning, Plan Ahead and for Scale

- Plan ahead for electrification at scale
- Energy management is a key operational element
- The utility has a key role throughout the process
- Public funding and incentives can make the difference
- Technology interoperability supports future-proofing and scalability
- Coordinate with local authority having jurisdiction
- Budget plenty of time to allow for unexpected challenges and delays
Leverage software-based EV charging to manage load

Smart charging enables “set it and forget it” load optimization

**EV Charging Load Sharing**

**Benefit:** Eliminate or reduce the need for infrastructure upgrades and install more EV chargers than the site’s transformer capacity would allow

**Working mechanism:** Automatic sharing of available power between EV chargers when charging load is expected to go beyond its limit

**EV Charging Load Scheduling**

**Benefit:** Reduce electricity costs by preventing or curtailing charging sessions during hours with high electricity costs

**Working mechanism:** Based on utility tariffs, site hosts can manually set the maximum site load for specific hours during a day when the cost of electricity is high

**Integrated DER & Storage**

**Benefit:** Reduce utility bills by pulling energy from the Distributed energy resources (DER), rather than the grid during peak demand charges

**Working mechanism:** Integrate DER, such as energy storage or solar PV, into EV charging systems
Example: Non-optimized Fleet Charging

Vehicles start charging as soon as they are connected. Extended periods where vehicles are connected but are not charging.
Example: Optimized Fleet Smart Charging

Vehicles don’t start charging as soon as they are connected. The load limit and the schedule will determine when the vehicle is to be charged.

Optimized Fleet Smart Charging Schedule

Vehicle 1
Vehicle 2
Vehicle 3
Vehicle 4
Vehicle 5
Vehicle 6
Vehicle 7
Vehicle 8

12PM 1PM 2PM 3PM 4PM 5PM 6PM
Case Study: Smart Charge Management

Minimizing charging speeds when utility rates are higher – or to avoid peak rates – while ensuring that fleet vehicles can meet their delivery obligations.

Each black line represents a daily charging profile for a site with delivery vans. The purple line represents a peak for the period and the green line represents an average.

Greenlots has worked with the customer to reduce charging speeds from 4-6 pm every afternoon to avoid super peak charges (each Sunday is not managed because super peak rate is not in place).
Open Standards and Protocols Enable a Smart, Flexible & Resilient EV Charging Ecosystem

OCPP & Open Standards

- Open Charge Point Protocol (OCPP) allows communication between charging stations, a central system, and utilities’ IT infrastructure using a single, open and royalty-free protocol

- Required of all Electrify America vendors and increasingly required in utility procurement programs

- Provides foundational capability to connect any central system with any charging station, regardless of the vendor

- Stations work after switching network provider; system works after switching charging stations—no vendor lock-in

- Open standards and protocols more broadly facilitate a seamless driver experience, minimize infrastructure investment risks, support ongoing competition and choice for customers through hardware and software switching capability, and allow for the efficient integration of EVs into the electric grid
Thank you!

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Director, Policy
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410-989-8121
Key State Agencies

• **California Air Resources Board (CARB)**: Oversees efforts to reduce air pollution and address climate change.

• **California Energy Commission (CEC)**: Funds efforts to research and deploy clean energy and transportation technologies.

• **California Public Utilities Commission (CPUC)**: Regulates the investor-owned utilities (IOUs) and authorizes IOUs’ transportation electrification programs.
Key MD/HD Electrification Policies

Executive Orders
• **N-79-20** (2020): 100% of new light-duty vehicles sales must be EVs by 2035; 100% of drayage and off-road vehicles must be ZEVs by 2035; all other MD/HD vehicles must be ZEVs by 2045.
• **B-48-18** (2018): Deploy 250,000 EV chargers by 2025 and 5 million ZEVs by 2030.

Legislation
• **SB 350** (2015): Established a goal of reducing GHG emissions 40% by 2030 (relative to 1990); Authorizes utilities to propose transportation electrification applications with the CPUC.
• **AB 617** (2017): Directs CARB to support communities most impacted by air pollution.

Regulations
• **Advanced Clean Trucks**: Require manufacturers to offer increasing numbers of ZEV trucks.
• **Advanced Clean Fleets**: Requires select truck fleets to convert to ZEV vehicles.
• **Innovative Clean Transit Rule**: Requires transit fleets to convert to ZEV vehicles.
• **ZE Airport Shuttle Regulation**: Requires airport shuttle operators to convert to ZEVs.
Advanced Clean Trucks

- Advanced Clean Trucks (ACT) requires truck manufacturers to sell an increasing percentage of zero-emission trucks beginning in 2024.
  - By 2035, zero-emission trucks would need to comprise:
    - 55% of Class 2b-3 truck sales;
    - 75% of Class 4-8 truck sales; and
    - 40% of truck tractor sales.
- Reporting requirements – Large employers and fleet operators are required to report information about shipments, shuttle services, and fleet operations.
- 15 states and D.C. have proposed adopting the ACT.
Advanced Clean Fleets (ACF) institutes ZEV purchasing requirements for all public fleets, drayage fleets, and Federal or other high priority private fleets with 50 vehicles or more.

• Deadlines:
  • From 2024-2026, 50% of new truck purchases must be ZEVs.
  • From 2027 onward, 100% of new purchases must be ZEVs.
• ACF is scheduled for CARB consideration in December 2021.
• **Innovative Clean Transit Rule (ICT):** Requires transit fleets to convert to zero emission buses (ZEBs).
  - Institutes different requirements for small and large transit fleets.
  - By 2029, 100% of all bus purchases must be ZEBs.

• **Zero-Emission Airport Shuttle Regulation:** Requires shuttle operators in select airports to transition to ZEVs.
  - Timeline:
    - 33% ZEV penetration by 2027.
    - 66% ZEV penetration by 2031.
    - 100% ZEV penetration by 2035.
California MD/HD Programs

• Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP): Funds point-of-sale vouchers for MD/HD vehicles.
  • Allocated approximately $160 million for 2021.

• Energy Infrastructure Incentives for ZE Commercial Vehicles (EnergIIZE): Funds MD/HD charging/refueling infrastructure.
  • Allocated $50 million in initial funding.
California MD/HD Pilots

• **ZE Drayage Truck and Infrastructure Pilot** – $44 million, joint agency pilot to deploy 50 Class 8 drayage trucks and supporting infrastructure to electrify port and intermodal travel.

• **Energy Commission Pilots** – Proposed pilots seek to address new technology applications, including bidirectionality, DER integration, and VGI functionality.

• **Utility Pilots** – CPUC has authorized numerous utility MD/HD pilots, including fleet demonstrations, make-ready infrastructure pilots, and port electrification initiatives.
Questions?
We have the energy to make things work ... for you.

Dawn Neville
Manager Electric Transportation
Renewables & Energy Solutions
August 24, 2021
**PSE&G – New Jersey’s largest:**

- Electric and Gas Distribution utility
- Transmission business
- Leading investor in renewables and energy efficiency
- Appliance service provider

<table>
<thead>
<tr>
<th>Customers 5-Year Annual Customer Growth*</th>
<th>Electric</th>
<th>Gas</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2.3 Million</td>
<td>1.9 Million</td>
</tr>
<tr>
<td></td>
<td>0.8%</td>
<td>0.7%</td>
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</table>

<table>
<thead>
<tr>
<th>2020 Electric and Gas Sales</th>
<th>Electric</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>39,666 GWh</td>
<td>2,370M Therms**</td>
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</table>

<table>
<thead>
<tr>
<th>Sales Mix (2020)</th>
<th>Electric</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>35%</td>
<td>60%</td>
</tr>
<tr>
<td>Commercial</td>
<td>56%</td>
<td>36%</td>
</tr>
<tr>
<td>Industrial</td>
<td>9%</td>
<td>4%</td>
</tr>
</tbody>
</table>

*ANNUAL CUSTOMER GROWTH USES 2014 AS BASE YEAR.
**GAS FIRM SALES ONLY.
***EXCLUDES CWIP. YEAR-END CWIP BALANCE WAS $1.6 BILLION.
CEF: Electric Vehicle Program

Investment
$166M
~6-Year Program

Development of smart charging infrastructure to facilitate EV adoption across a broad range of customers and segments

Environmental Benefits

- an electric mile is 70% cleaner than an average mile fueled by gasoline
- 14 million metric tons of CO₂ avoided through 2035

Subprograms*
1. Residential Smart Charging
2. Level 2 Mixed-Use Charging
3. Public DC Fast Charging

Other Benefits

- 270 direct clean energy jobs
- Advances NJ clean energy and EV goals

Mitigation of EV market barriers & reduction in range anxiety

* A 4th subprogram, Vehicle Innovation, for $45M investment in medium/heavy duty vehicles (MHDVs), is held in abeyance pending a MHDV stakeholder process
Why is a Utility Role Appropriate?

• Utility involvement is **appropriate** because
  ● Meeting strategic state goals needs cohesive involvement from all stakeholders
  ● Utilities have trusted relationships already established with MHD customers
  ● The utility has a regulatory obligation to help control costs
  ● Existing utility programs for LDVs will help optimize cost effectiveness of developing MHD programs

• Electrification **benefits** will extend to
  ● PSE&G customers
  ● Local communities
  ● Those traveling through the state
  ● Those residing in neighborhoods most impacted by air pollutants
Why is a Utility Role Necessary?

- Utility programs are **necessary** to attract private investment
  - Encourage private investment in the NJ market with improved project economics
  - Remove/resolve grid integration barriers to infrastructure investment
  - Utility funding in coordination with other funding (e.g. federal funds) will maximize adoption

- Coordinated utility involvement is **necessary** for managing load growth
  - Very high power charging of MHDVs
  - Concentrated loads associated with fleets
  - Long lead time for building new substations

- Utility involvement **also** helps meet other goals
  - Ensure safety, reliability, and cyber-security
  - Encourage equitable market development
  - Collect and analyze charging data for regulatory analysis, load forecasting, rate considerations, etc.
  - Optimize grid impacts to help control costs for all customers
Other Utility Considerations

• **Rate design** will be critical for encouraging fleet electrification
  - Electrification “fuel” costs will have a direct impact on fleet operational costs
  - Fleet customers will need to understand demand charges to optimize “fuel” costs
  - Only utilities can address rate design issues
  - Specialized rates will only be effective if lost revenues are captured from the full customer base

• Other **general** considerations
  - Equity goals
  - Strategic electrification opportunities (e.g. NJ Transit)
  - MHD vehicles are in many market segments that do not fit into the ‘One Size Fits All’ category
  - The policy developed through this stakeholder process will need the flexibility to adjust over time to be relevant during the multiple years of this program as the market and technology change
How to Encourage MHD Adoption

• Offer low cost make-ready solutions
  ● Make-ready is especially costly for MHDV charging infrastructure
  ● Make-ready infrastructure is a natural extension of the utility distribution infrastructure
  ● Make-ready build out is a key aspect of grid reinforcement cost control
  ● Utility investment can be capitalized long term, thus reducing customer impact

• Fleet owners will rely on many factors when deciding to adopt electrification
  ● Total cost of ownership and cost per mile calculations
  ● Clearly defined and understandable benefits of electrification
  ● Utility support to optimize charging design and load factors
  ● Integrated Distributed Energy Resources (DERs), such as batteries, to support peak load conditions and provide resiliency

• Solutions are needed for small fleets (2 vehicle minimum)
  ● Small businesses need utility support to participate and benefit from these programs
  ● Overburdened communities have a disproportionate volume of small business needing support
Medium & Heavy-Duty Ecosystem

Port Drayage Trucks: Current State & Challenges
Our Sustainability Goals

Agency-Wide Sustainability Goals
• 35% reduction in Port Authority greenhouse gas emissions by 2025
• 80% reduction in overall greenhouse gas emissions by 2050

Port Emission Reduction Goals
• Criteria Air Pollutants: 3% annual average decrease
• Greenhouse gas emissions: 5% annual average decrease
Heavy Duty Vehicle Emissions Relative to TEU Throughput

![Graph showing percent change in emissions from 2006 to 2019.](image)
PORT GHG EMISSIONS BY SOURCE

- Heavy Duty Diesel: 49%
- Ocean Going Vessels: 25%
- Harbor Craft: 3%
- Cargo Handling Equipment: 19%
- Locomotives: 4%

*NJ Transportation Sector GHG Emission By Source

Greenhouse Gas Emissions from On Road Vehicles

- 33.5%, Passenger Car
- 37.5%, Passenger Truck
- 5.7%, Combination Long-haul Truck
- 3.9%, Combination Short-haul Truck
- 0.1%, Motor Home
- 8.7%, Single Unit Short-haul Truck
- 5.5%, Light Commercial Truck
- 1.6%, Refuse Truck

[Other transportation sector details]
Hurdles to Electrification

Infrastructure Challenges:

• **Current State of the Grid**: substations, access points and future demand points.

• **Lack of Standards**: electrical outlets, charging and fueling and connecting devices.

• **Lack of Charging Stations**: in New Jersey and the broader region.
# Hurdles to Electrification

## Full Scale Commercial Availability:

<table>
<thead>
<tr>
<th>Make</th>
<th>Model</th>
<th>Powertrain</th>
<th>Availability</th>
<th>Max Range (miles)</th>
<th>Battery Capacity (kWh)</th>
<th>Min Price</th>
<th>Max Price</th>
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<tbody>
<tr>
<td>BYD</td>
<td>8TT</td>
<td>Battery</td>
<td>Available</td>
<td>167</td>
<td>409</td>
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<td>Freightliner (Daimler)</td>
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<td>Battery</td>
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<td>Hyundai</td>
<td>HDC-6 Neptune</td>
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<td>Kenworth (Paccar)</td>
<td>T680 (H2 - Toyota)</td>
<td>Hydrogen retrofit</td>
<td>Demo</td>
<td>300</td>
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<td>Kenworth (Paccar)</td>
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<td>VNR</td>
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<td>Demo 2021</td>
<td>150</td>
<td>264</td>
<td>NA</td>
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<td>Xos</td>
<td>ET-One</td>
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<td>150</td>
<td></td>
<td>$180,000</td>
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Hurdles to Electrification

Operational Challenges:

- **Rate & Duration of Charging**: effected by design of the charging station & the state of the batteries.

- **Weight of the Batteries**: likely to impact allowable payload to meet max GVW of 80,000 lbs.

- **Range Limit**: optimal range before needing a recharge is about 100 miles (dependent on temperature, payload, speed, battery condition)

- **Electricity Cost**: charging cost needs to be on par with the cost of diesel.
Hurdles to Electrification

Affordability

• > 19,000 trucks registered to service the Port.
• 9,000 unique trucks call the Port each month.
• Approximately 80% of the trucks are owned by Independent Owner Operators (IOOs).
• IOO’s typically purchase used trucks
• Class 8 ZE (battery electric) trucks with a charger are expected to cost around $470,000
  **** 5-10 times more than a used diesel trucks.
• Hydrogen fueled trucks are expected to be more expensive than a ZEV.
• Limited grant opportunities due to Buy America requirements.
Next Steps

• Drayage Truck Study to assess feasibility of electrification: currently underway in coordination with NREL

• Data collection for Electrical & Communications Infrastructure Assessment.

What is needed:

• Infrastructure Grants
• Regulation & Standardization – including Heavy Duty Inspection & Maintenance Regulation, and Emission Standards
• Funding for Pilot Projects & Studies
Thank You!

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New Jersey Board of Public Utilities
I/M/O Medium & Heavy Duty Electric Vehicle
Straw Proposal
MHD Ecosystem Stakeholder Panel

Presentation of
James Sherman, V.P. & Chief Operating Officer
Climate Change Mitigation Technologies LLC
August 24, 2021
Red Hook Container Terminal Ribbon-Cutting
10 BYD Heavy-Duty Zero Emission Terminal Tractors
BYD On-Road Day Cab Tractor

• Third Generation Technology
• Suitable for Port Dray trucking
• Standard Model (422 kwh) has working range of 125 miles with potential range of 200 miles
• Extended Range Model (566kwh) has working range of 165 miles and potential range of 250 miles
• Top Speed is 74 mph
• Full ADAS
BYD Garbage Trucks

- Class 6 (10yd3 capacity)
- Class 8 (25yd3 capacity)
- Rear-loaders
- Side-loaders
- Roll-off Container
- 22 class 8 garbage trucks on order and/or in delivery
Lightning eMotors Medium Duty
LMD Trucks & Shuttle Buses
Van Con V2G Type A Zero Emission School Bus

- Van Con Inc., Middlesex NJ
- Since 1973
- First and only V2G Type A school bus in nation
- Body is made in NJ
- Lightning eMotors electric drivetrain and batteries
- 6 buses on order
Emerging Business Models & Role of Private Companies, the Board, and the Utilities

• Role of Private Industry

• Emerging Business Models
  • Energy and Charging as a Service (ECaaS)
  • Transportation as a Service (TaaS)

• Companies
  • Nuvve
  • Amply
  • Greenlots
  • Viridity
  • Others

• Role of Board and Utilities

• NJBPU: Incentivize V2G

• Utilities:
  • Prioritization of MHD power supply upgrades and V2G interconnections
  • Timely compliance with FERC Order 2222
Thank You

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