Welcome

 EV SWG Vice-Chair

 Chair Jason Stanek, Maryland Public Service Commission

 NARUC Staff

 • Jeff Loiter, Jessica Diaz
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>3:00 PM</td>
<td>Welcome and Agenda Review: Chairman Jason Stanek of the Maryland Public</td>
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<td>Service Commission, EV SWG Vice-Chair</td>
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<td></td>
<td>• Agenda review</td>
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<td>• Reminder of resources</td>
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<td>• Welcome new members</td>
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<tr>
<td>3:04 PM</td>
<td>Webinar: Planning for Current and Future Fleet Electrification Needs</td>
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<td>• Speaker introductions</td>
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<td>3:10 PM</td>
<td>Setting the Stage: Kara Podkaminer, DOE</td>
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<td>3:15 PM</td>
<td>Presentation: Dave Schaller, Industry Engagement Director, North American</td>
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<td>Council for Freight Efficiency (NACFE)</td>
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<tr>
<td>3:30 PM</td>
<td>Presentation: David Treichler, Director of Strategy and Technology, Oncor</td>
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<td>Electric Delivery</td>
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<td>3:45 PM</td>
<td>Q&amp;A</td>
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<td>• Speakers will take questions from working group members</td>
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<td>4:05 PM</td>
<td>Closed Door Discussion &amp; Peer Sharing</td>
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<td>• Working group members will discuss their own views and the actions</td>
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<td>have taken to date. See discussion questions.</td>
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<td>4:30 PM</td>
<td>Adjourn</td>
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Resources for Reference

- **DOE’s EV Grid Assist webinar series** (June – November) recordings are posted at: [www.energy.gov/eere/evgrid-assist-accelerating-transition](http://www.energy.gov/eere/evgrid-assist-accelerating-transition)

- **Presentations and recordings of past EVSWG events** are available on the NARUC website: [www.naruc.org/cpi-1/energy-infrastructure-modernization/electric-vehicles/](http://www.naruc.org/cpi-1/energy-infrastructure-modernization/electric-vehicles/)

- **EVSWG Listserv**: NARUC-EVSWG@lists.naruc.org

- **ICYMI – 4 NARUC EV publications** released late 2022:
  - Models for Incorporating Equity in Transportation Electrification
  - Electric Vehicle Interoperability: Considerations for Public Utility Regulators
  - Considering Interoperability for Electric Vehicle Charging: A Commission Case Study
  - Transportation Electrification: State Level Roles and Collaboration among Public Utility Commissions, State Energy Offices, and Departments of Transportation
Welcome

Moderator: Chair Jason Stanek, Maryland Public Service Commission

Panelists

- Kara Podkaminer, Senior Advisor, Sustainable Transportation and Fuels, DOE EERE
- Dave Schaller, Industry Engagement Director, North American Council for Freight Efficiency (NACFE)
- David Treichler, Director of Strategy and Technology, Oncor Electric Delivery
Decarbonizing Medium- & Heavy-Duty On-Road Vehicles

• ZEVs can reach **total-cost-of-driving parity** with conventional diesel vehicles by **2035** for all MD/HD vehicle classes (without incentives).

• ZEV sales could reach **42% of all MD/HD trucks by 2030** assuming economics drive adoption
  • ZEV sales reach >99% by 2045, and 80% of the MD/HD stock transitions to ZEVs by 2050

• Not all trucks are the same: different size classes and use cases lead to different vehicle requirement and costs, determining opportunity for ZEV adoption

*Study results are sensitive to assumed fuel prices, additional details at: https://www.nrel.gov/docs/fy22osti/82081.pdf*
Planning for MHDV Decarbonization

EPRI’s EVs2Scale2030

*Bring together 3 sectors most critical to achieving large-scale electrification – OEMs, fleet operators and the utility industry*

- **Aim:** Improve visibility into EV charging plans to inform **proactive grid planning investments** that can **accelerate grid interconnects**
- **Result:** Heightened **confidence in electrification planning** is also critical for informing utility regulators
- **Approach:** Requires transparency and collaboration

**National Lab Data and Analysis Effort**

*Coordinated effort to identify tool, data and analysis that help answer stakeholder’s most pressing questions*

**Initial questions:**

1. What are projected charging load profiles and forecasted load growth?
2. How much of that load is flexible?
3. What are the system benefits associated with EV charging?
4. What data, commitments or other information is needed so utilities can build infrastructure proactively?
5. Are new regulatory approaches needed? What information is needed to inform this discussion?

Better understanding of the questions allows for better, more refined tool development.
Trucking: Transitioning To Cleaner Fuel

Dave Schaller
February 2023
North American Council for Freight Efficiency

- Unbiased, fuel agnostic, non-profit
- Mission to double freight efficiency
- All stakeholders
- Scale available technologies, *guide future change* and Run on Less demonstrations.

www.NACFE.org
www.RunOnLess.com
No Membership Fees: Thanks to Sponsors

2022 Fiscal Supporters
Run on Less – Electric Participants

- Purolator: Operating a Motiv-Powered Step Van in Vancouver, BC.
- Biagi Bros.: Operating a Peterbilt 579EV in Sonoma, CA.
- Frito Lay: Operating a Cummins Box Truck in Modesto, CA.
- RUAN: Operating an Orange EV Terminal Tractor in Orlando, FL.
- Servall Electric: Operating a Workhorse C1000 in Cincinnati, OH.
- DHL: Operating a Lightning eMotors Van in New York City.
- NFI: Operating a Kalmar Ottawa Electric Terminal Tractor in Chino, CA.
- NFI: Operating a Volvo VNR Electric in Chino, CA.
- Penske: Operating a Freightliner eCascadia in Los Angeles.
- ANHEUSER-BUSCH: Operating a BYD Tractor in Los Angeles.
- Ryder: Operating a Lennox Specialty Vehicles Terminal Tractor in Georgetown, KY.

Run On Less – Electric Fleet Locations
RoL–E Reports

January 12, 2022
Review Of Complete Demonstration:
Electric Trucks Have Arrived

March 6, 2022
The Use Case For
TERMINAL TRACTORS

April 11, 2022
The Use Case For
VANS & STEP VANS

May 5, 2022
The Use Case For
REGIONAL HAUL TRACTORS

June 28, 2022
The Use Case For
MEDIUM DUTY BOX TRUCKS

Other NACFE Whitepapers on Truck EVs:
https://nacfe.org/research/electric-trucks/
Drivers love EV trucks because:

• Acceleration rate is better
• Quieter
• No diesel and DEF to fill
• No fuel smell on their clothes and shoes

Driver Video: https://vimeo.com/746996242
### Truck Fleets

<table>
<thead>
<tr>
<th>Trucks</th>
<th>Tractors</th>
<th>Trailers</th>
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<tbody>
<tr>
<td>Drivers:</td>
<td>Company</td>
<td>Owned-Operators</td>
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<tr>
<td>Vehicles:</td>
<td>Owned</td>
<td>Leased</td>
</tr>
<tr>
<td>Facilities:</td>
<td>Owned</td>
<td>Leased</td>
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- Dozens of different applications
- Fuels: diesel, biodiesel, CNG, LNG, LP, DME, electric, hydrogen, renewable diesel, RNG, RLP, hybrids & more

### Utilities

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<tr>
<th>Services:</th>
<th>Generation</th>
<th>Transmission</th>
<th>Distribution</th>
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<tr>
<td>Ownership:</td>
<td>Independent</td>
<td>Municipal</td>
<td>Cooperatives</td>
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<tr>
<td>Rate Structures:</td>
<td>Time Of Use</td>
<td>Demand Charges</td>
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<tr>
<td>Fuels: NG, coal, hydroelectric, solar, wind, nuclear, and more</td>
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“**If you’ve seen one, you have only seen one.”**
Annual Fleet Fuel Study

New Release: December 2022

Adoption takes time

Hard things take longer
Adoption Timing: 5 Year Trade Cycle

Assumptions:

• 5 Years = 20% of fleet replaced yearly
• Years 1 & 2 validating a few trucks
• Year 3 = Half of the annual order
• Year 4 = Full adoption in order
Adoption Timing: 12 Year Life Cycle

Assumptions:

- Truck considered “dead” at 12 years
- 12 Year Life equates to 8% new trucks every year
- Years 1 & 2 validating a few trucks
- Year 3 = Half of the annual order
- Year 4 = Full adoption in order
Adoption Timing: Other Influences

- Timing will vary from fleet to fleet.
- Location will have a HUGE impact on timing.
- Fleets with multiple locations are likely to start in the most favorable locations.
- The fleet headquarters won’t necessarily be the starting point for electrification.
- Fleets with 100% electrification goals won’t necessarily put an EV in every location during phase in. They are more likely to focus their training, service and parts in strategic locations first.
- It is not unusual for a fleet to have multiple divisions that operate very differently from each other.
- Build where there is access to power

Report Link: https://nacfe.org/downloads/high-potential-regions-for-electric-truck-deployments-technical-appendix/
Run On Less – Electric Depots

2023 Concept:
• Scaling MD & HD Electric Trucks
• USA, Canada & Mexico
• 8 Depots
• At least 15 EV trucks at each depot
• Focus on Infrastructure & Charging Systems
• Second EV Truck Bootcamp Series
• Analyzing 100+ possible locations

Get Involved As A Depot or Sponsor
DEPOTS Electric Truck Bootcamp

2. Grants and Incentives for the Trucks and Infrastructure
3. Electric Truck Developments
4. Faster Charging — Opportunities and Challenges at 350KW and higher
5. Opportunities to Extend BEV Range (via charging technologies)
6. Electricity Resiliency and Availability (microgrids, renewable energy...)
7. Current and Future Regulations for Zero Emission Trucks
8. Managed Charging to Improve Availability, Cost and Range
9. Scaling Charging Infrastructure Equipment
10. Electric Depot Site Planning and Construction

Register here
Getting to Know Each Other

Primer: UTILITIES on FLEETS

Primer: FLEETS on UTILITIES

FLEETS

UTILITIES

January 2022
ICE & Electric Truck OEMs

February 2023
Let's Stay Connected... ... And charged up!

LinkedIn  NACFE (& Spanish: NACFE LATAM)

NACFE

@NACFE_Freight & @RunOnLess

NACFE

NACFE.org

RunOnLess.com

Dave Schaller
David.Schaller@NACFE.org
260-602-5713
Green Fleet Transition Planning

David Treichler | Director Strategy and Technology
Presentation to NARUC EVSWG
February 2023
The Problem Through My Eyes
Fleet Electrification

• North Texas has over 24,000 commercial fleets.
• With over 305,000 vehicles
• Serving approximately 12.9% of all US freight
  • more than next two states combined

Fleet Breakout:
• Light Duty: 153,774
• Medium Duty: 50,274
• S&T Buses: 14,508
• Heavy Duty: 86,470
Logistics Clusters in DFW Area

D/FW has four pockets of high concentrations of logistics and distribution centers, all are proximate to the interstates and/or DFW or Alliance airports.
Simple Math

Actual Inquiry:

- Logistics Center
- 435 Class 8 Trucks
- 600 kWh batteries in each truck

Overnight Charging = 40MW

Current site load = 100kWh

The Tesla Semi has a 1MWh battery

Automotive technology innovation is rapidly changing charging requirements
Fastest Movers: National Delivery Fleets

- Vehicles are available now
- Major OEMs: GM Brightdrop, Ford eTransit, Rivian
- Most charge overnight at depots
- Chargers up to 14 kW but many 7.2 kW
- May install one or more DCFC system for operational flexibility
- Require high reliability and resilience solutions
- Larger fleets may take primary service, smaller are more likely to use secondary.

Key Drivers

- sustainability commitments
- strong TCO
- aligned use cases
- customer expectation

Graphics source: West Monroe Partners
Electric Fleet Operation Affects Charge Times & Charge Load Intensity

Best electric fleet use cases in **2021:**
- Ranges within 200 miles
- Return to the charging hub
- Delivery, service, transit

Load: 1 customer site, 100 trucks:
- 1 to 50 MW peak load

Daily operation cycle dictates charging time and power intensity.

**2031:** technology enables all use cases
- range > 1,000 miles
- costs at parity

*Source: West Monroe Partners*
Oncor Efforts to Improve Transition Effectiveness

**EFFORT**
- Development of Oncor’s Green Fleets tool
- Adding data layers to tool for fleets/locations
- EV section of Oncor Website
- WJ Bradley & Associates Study
- PUCT Docket 49125 filing
- Analysis of Feeder Impacts from EV Adoption
- West Monroe Partners Study
- Video Clips for Fleet Dealers and Customers
- Propensity modeling for Fleet Adoption tool
- Portal for fleet owners

**EFFECT**
- Early review of feasible approaches to serve
- Identify clusters and service options
- Personal and Fleet outreach and education
- Forecast personal vehicle growth and trends
- Identify the shape of impacts on Oncor
- Identify CAPEX impacts from cluster adoption
- Forecast Fleet adoption and impacts
- Provide Why, When and How to contact Oncor
- Identify possible adopters and conduct outreach
- Register interest to start conversations
Other Transportation Electrification

Air-e-mobility –
  Fast charge loads between flights
  Capacity to top of building landing sites

Package delivery
  Short range, burst charging

Regional Passenger e-jets
  Fast charge loads at airport gates
  System protection challenges

Electric Locomotives:
  Currently 2.5MWh battery
  Project 16MWh battery systems
QUESTIONS:

Tackling the challenges of providing enough capacity to support initial fleet transition as well as in 3-4 years (when excess capacity is used up)

How to plan for growing electrification potential, so grid upgrades can be future-proofed or potentially proactively done; is that feasible?

What do utilities need to demonstrate to seek approval for pro-active investments?

Think about both today & near future needs for early adopter fleet electrification and project out/map where early adopters will likely be looking to connect in the next coming years

What information / evidence / action is needed by fleets and utilities related to managed charging to support adoption and reduce grid infrastructure needs?

David Treichler
Director Strategy and Technology
Oncor Electric Delivery
817-240-8823
david.treichler@oncor.com
Questions?

Raise your hand to ask a question or type a question into the question box.
Commission-Only Peer Sharing Discussion Questions

1. How involved is your commission in planning for or dealing with the influx of federal funding for transportation electrification?

**Illinois:**
- ICC wants utilities to make impactful reductions of costs utilizing federal funds to help reduce costs that otherwise would have led to rate increases.
- Illinois passed the Climate and Equitable Jobs Act (CEJA) which calls for an equitable climate and clean energy transition, with the responsibility being on state agencies.
- 3 proposals are currently in front of the ICC:
  - PBR proposal to align with CEJA goals.
  - Beneficial Electrification Plan via CEJA
  - NEVI Plan and its alternative fuel corridors (AFCs)
- The ICC released a notice of inquiry separate from these proposals/CEJA to solicit feedback on IRA/IIJA funding from stakeholders. ICC can’t apply for the funds but can work with agencies, utilities, and stakeholders to streamline the use of federal dollars.

**Florida:**
- Florida is in a similar boat to Illinois regarding federal funds and are constantly in communication with state agencies about those funds. Communication is key for them.

**Indiana:**
- IOUs are having trouble finding suitable site developments for EV chargers funded by the Volkswagen Settlement funds.
- Federal right of way laws can sometimes get in the way of those site developments.
Next EV SWG meeting: Tues, March 28 at 3pm ET

WWW.NARUC.ORG/CPI-1/ENERGY-INFRASTRUCTURE-MODERNIZATION/ELECTRIC-VEHICLES/