NARUC Electric Vehicles State Working Group

AUGUST MEETING - MEDIUM AND HEAVY- DUTY VEHICLE CHARGING AUGUST 29, 2023, 3:00- 4:30PM



EV SWG Chair

Commissioner Katherine Peretick, Michigan Public Service Commission

New! EV SWG Vice Chair

Commissioner Milt Doumit Washington Utilities and Transportation Commission

NARUC Staff

Danielle Sass Byrnett, Robert Bennett

Feel free to enter questions into chat at any time

3:00 PM	Welcome and Announcements	
	Agenda review	
	 Announcements 	
3:10 PM	Kara Podkaminer, DOE (10 minutes)	
3:20 PM	Ray Minjares, International Council on Clean Transportation (ICCT) (15 minutes)	Aaenda
3:35pm	Jed Proctor, Daimler Truck North America (15 minutes)	
3:50pm	Adam Raphael, Amazon (15 minutes)	
4:05pm	Speaker Q&A	
4:20pm	Peer Sharing Discussion	
4:30 PM	Adjourn	

Announcements

The NARUC EV Getting Started Guide is now live!





NARUC National Association of Regulatory Utility Commissioners

Getting Started Guide for Electric Vehicles



Overview

NARUC members are increasingly seeking more information about electric vehicle (EV) infrastructure needs, impacts, and the role of Public Utility Commissions (PUCs). This Getting Started Guide connects commissioners and staff to essential EV resources that the NARUC Center for Partnerships and Innovation (CPI) has developed. All of these resources can be found on the <u>NARUC CPI EV webpage</u>.

NARUC CPI hosts an Electric Vehicles State Working Group (EV SWG), which is open to all NARUC members and holds monthly meetings on utility regulatory topics related to transportation electrification. For more information, or to join the working group, please contact Robert Bennett, <u>rbennett@naruc.org</u>, or Danielle Sass Byrnett, <u>dbyrnett@naruc.org</u>.

Foundational NARUC publications on EVs and the Role of PUCs

 Mini Guide on Transportation Electrification: State-Level Roles and Collaboration among Public. Utility Commissions, State Energy Offices, and Departments of Transportation, Summer 2022

This mini guide describes the unique and vital roles State Energy Offices, Public Utility Commissions (PUCs), and Departments of Transportation (DOTs), as well as State Environmental Agencies, Consumer Advocates, and other important state-level partners play in transportation electrification.

Announcements

- Registration is now open for the National Council on Electricity Policy (NCEP) Annual Meeting on Affordability in the Electricity System Transition in Indianapolis, IN from September 27-28.
 - The NCEP Annual Meeting will include a:
 - DC Fast Charger site visit in partnership with AES on September 26.
 - Workshop titled: Ensuring Affordability in the Transition to Transportation Electrification on September 27th
 - Travel stipends are available for NARUC members and more details and registration can be <u>found on NARUC's website</u>.
- September Meeting canceled for EV site visit in Indy. Next meeting will be October 24, 3:00-4:30pm ET



Moderator: Commissioner Katherine Peretick, Michigan Public Service Commission

Guest Speakers

- Kara Podkaminer, DOE
- Ray Minjares, International Council on Clean Transportation (ICCT)
- Jed Proctor, Daimler Truck North America
- Adam Raphael, Amazon

Powering zero-emission trucks: U.S. infrastructure needs through 2030

Ray Minjares Director, Heavy-Duty Vehicles Program Presentation to NARUC EV Working Group 29 August 2023



Inflation Reduction Act incentives will boost heavy-duty zero-emission vehicle sales

IRA incentives support HD ZEV sales share growth to ~44% (39-48) in 2030

Fuel cell market share limited by competition with lower cost batteries and would not exceed ~2% of truck sales





Slowik, P., Searle, S., Basma, H., Miller, J., Zhou, Y., Rodríguez, F., Buysse, C., Minjares, R., Kelly, S., & Pierce, L. (2023). *Analyzing the impact of the Inflation Reduction Act on electric vehicle uptake in the United States*. International Council on Clean Transportation. <u>https://theicct.org/publication/ira-impact-evs-us-jan23/</u>

Battery-electric long-haul trucks are expected to record the lowest TCO by 2030 in most states





Basma, H., Buysse, C., Zhou, Y., & Rodríguez, F. (2023). Total cost of ownership of alternative powertrain technologies for Class 8 long-haul trucks in the United States. *International Council on Clean Transportation*. <u>https://theicct.org/publication/tco-alt-powertrain-long-haul-trucks-us-apr23/</u>

A formula for successful zero-emission truck deployment nationwide

Vehicle product availability

Vehicle total cost of ownership

Charging infrastructure readiness







Three questions to determine national charging infrastructure readiness for heavy-duty vehicles

- 1. Where to locate charging infrastructure?
- 2. When does this charging infrastructure need to be ready?
- **3. How much** power to make available at each location?





2017 Annual Average Daily Traffic (top quartile)



Annual average daily traffic 76-100% (VKT) — 13337 - 461000



Source: ICCT map of 2017 FHWA Highway Performance Monitoring System data

At least 1.1M zero-emission trucks and buses expected by 2030

Projected stock of Class 4-8 zero-emission MHDVs based on market developments, 2023-2030



on CLEAN TRANSPORTATION

Ragon, P.L., Kelley, S., Egerstrom, N., Brito, J., Sharpe, B., Allcock, C., Minjares, R., and Rodriguez, F. (2023). Near-term infrastructure deployment to support zero-emission medium-and heavy-duty vehicles in the United States. Washington, D.C., 13 International Council on Clean Transportation. *https://theicct.org/publication/infrastructure-deployment-mhdv-may23*/

Growth in energy demand will be concentrated in freight zones, such as ports, industrial zones, and freight corridors



Ragon, P.L., Kelley, S., Egerstrom, N., Brito, J., Sharpe, B., Allcock, C., Minjares, R., and Rodriguez, F. (2023). Near-term infrastructure deployment to support zero-emission medium-and heavy-duty vehicles in the United States. Washington, D.C., 14 International Council on Clean Transportation. *https://theicct.org/publication/infrastructure-deployment-mhdv-may23/*

Top 1 percent of counties account for 15% of national charging needs in 2030

Rank	County	Daily energy consumption (MWh)	Estimated peak charigng load (MW)	Overnight chargers	Fast chargers	Ultrafast chargers	Nameplate capacity of chargers on local distribution grid (MW)
1	Los Angeles, CA	1,791	132	8,666	80	38	974
2	Maricopa, AZ	1,616	119	7,125	72	41	832
3	Harris, TX	1,613	119	7,036	72	41	826
4	Cook, IL	1,266	93	6,051	57	28	683
5	Dallas, TX	1,019	75	3,963	45	31	490
6	San Bernardino, CA	943	70	4,166	41	23	482
7	San Diego, CA	940	69	4,463	42	21	505
8	Salt Lake, UT	937	69	5,014	42	16	541
9	Riverside, CA	708	52	3,360	31	15	379
10	Bexar, TX	698	51	2,789	31	20	340
US total		139,893	10,317	580,054	7,869	5,639	69,157

Top ten counties by zero-emission truck charging demand in 2030

Projected 2030 national daily energy consumption is equal to **1%** of total electric retail sales in 2021*

Distribution capacity is far more urgent than generation capacity

Note: Counties are ranked in descending order of energy consumption. This table was updated on May 22, 2023 to accurately reflect modeling assumptions.

*2021 total electric retail sales taken from Energy Information Administration https://www.eia.gov/electricity/sales_revenue_price/pdf/table2.pdf



Ragon, P.L., Kelley, S., Egerstrom, N., Brito, J., Sharpe, B., Allcock, C., Minjares, R., and Rodriguez, F. (2023). Near-term infrastructure deployment to support zero-emission medium-and heavy-duty vehicles in the United States. Washington, D.C., 15 International Council on Clean Transportation. *https://theicct.org/publication/infrastructure-deployment-mhdv-may23/*

Setting targets for charging station deployment along key NHFN corridors can accommodate up to 85% of long-haul charging needs by 2030



0 - 3

- 3 - 6

- 6 - 10

- 10 - 15

- 15 - 20

- 20 - 30

-> 30

Minimum size of public charging stations every 50 miles along the NHFN to support long-haul trucks

Percentile of annual average daily traffic count on the NHFN	2025 minimum station size	2030 minimum station size
0 - 25%	350 kW/station	1,900 kW/station
25% - 50%	400 kW/station	4,300 kW/station
50% - 75%	700 kW/station	7,200 kW/station
>75%	1,400 kW/station	13,500 kW/station
NHFN national average	600 kW/station	6,200 kW/station

Note: This table was updated on May 23, 2023 to accurately reflect modeling assumptions.

NHFN = National Highway Freight Network



Ragon, P.L., Kelley, S., Egerstrom, N., Brito, J., Sharpe, B., Allcock, C., Minjares, R., and Rodriguez, F. (2023). Near-term infrastructure deployment to support zero-emission medium-and heavy-duty vehicles in the United States. Washington, D.C., 16 International Council on Clean Transportation. *https://theicct.org/publication/infrastructure-deployment-mhdv-may23*/

Opportunities for smart and timely charging infrastructure deployment



Maximize use of existing grid capacity today

- Short-term load rebalancing
- Use non-firm distribution capacity
- Dynamic line rating
- Smart charging

Increase flexibility to invest in load growth in the near-term

- · Provide maximum flexibility through balancing accounts
- Maximize use of public funding sources such as DOE loan programs
- Allow greater share of third-party finance

Plan for load growth in the long term

- Explicitly include transportation load forecasts into distribution system planning
- Authorize pre-construction of grid infrastructure in 'no-regret' freight zones
 and corridors

Discussion



Questions? ray@theicct.org



Actions to meet freight charging infrastructure needs

Federal

• **FERC Order 2023.** Adopts a 'first-ready, first served' cluster study approach, significantly speeding up grid planning and interconnection and serves as a likely model for distribution grid planning.

California

- **Senate Bill B410.** Requires the PUC to set maximum and target energization periods and to take remedial actions as necessary to achieve the targets
- Public Utilities Commission

- Freight Infrastructure Planning Framework. Addresses the need for proactive planning of long lead time utility side infrastructure to support acceleration of transport electrification.

- **High DER proceeding**. Assesses distribution grid impacts including from transport electrification, as well as the location, timing, and magnitude of distribution grid investments needed

New York Public Services Commission

• **Case 23-E-00700.** A proceeding to examine potential barriers to medium- and heavy-duty electric vehicle charging infrastructure and address proactive utility planning needs in New York State.

New Jersey

• **Docket QO21060946.** Medium- and Heavy-Duty Straw Proposal for the MHD EV Charging Ecosystem to define roles and responsibilities of interested parties, funding, technical standards, rate designs, and funding for technical and planning support.



Assessment of infrastructure needs based on freight activity



ICCT THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Ragon, P.L., Kelley, S., Egerstrom, N., Brito, J., Sharpe, B., Allcock, C., Minjares, R., and Rodriguez, F. (2023). Near-term infrastructure deployment to support zero-emission medium-and heavy-duty vehicles in the United States. Washington, D.C.,21 International Council on Clean Transportation. *https://theicct.org/publication/infrastructure-deployment-mhdv-may23/*

Top 10 states account for 49% of national charging needs in 2030

Energy demand is concentrated in states that have adopted the ACT rule and states with the largest industrial activity

Texas and California will account for a combined 19% of energy needs

ON CLEAN TRANSPORTATION

Energy needs from electric MHDVs in ACT states

Rank in U.S.	State	Total daily VKT, Class 4–8 MHDVs (km)	Total daily eVKT, Class 4-8 MDHVs (km)	Daily energy consumption from charging (MWh)	Share of national energy consumption
2	California	180,728,114	23,719,908	11,196	8%
10	New York	50,770,266	6,923,440	4,231	3%
22	Washington	60,919,508	5,450,202	2,398	2%
25	Oregon	49,076,476	5,367,451	2,229	2%
26	New Jersey	43,720,773	6,348,471	2,047	1%
31	Colorado	42,265,662	5,098,477	1,849	1%
32	Massachusetts	48,185,397	6,862,962	1,732	1%
48	Vermont	1,909,384	212,349	276	0%
U.S. total		3,523,436,176	399,077,768	139,865	100%

Ragon, P.L., Kelley, S., Egerstrom, N., Brito, J., Sharpe, B., Allcock, C., Minjares, R., and Rodriguez, F. (2023). Near-term infrastructure deployment to support zero-emission medium-and heavy-duty vehicles in the United States. Washington, D.C., 22 International Council on Clean Transportation. *https://theicct.org/publication/infrastructure-deployment-mhdv-may23/*

DAIMLER TRUCK

NARUC State Working Group Webinar

Jed Proctor – Daimler Truck North America

Manager – ZEV Infrastructure Strategy



Who We Are



Daimler Truck

What We Make



Daimler Truck

BUSINESS CONFIDENTIAL - NOT FOR DISTRIBUTION | NARUC Webinar | August 2023 25

GHG Phase 3 Rules are Coming and Require Depolyment of ZEV's



GHG Phase 3 can only be successful with significant planning, investment, and build out of the grid and charging infrastructure in all 50 states.

Daimler Truck



Daimler Truck

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Daimler Truck collaborates with utilities to support infrastructure development

Daimler Truck offer to utilities

- Daimler Truck can engage with utilities to share insights on Vehicle Telematics Data
- Utilities can leverage data to build the grid capacity necessary to support commercial EV charging
 - Critical in states that adopted ACT rule or areas that perceive distribution inadequacies
- Offer open to utilities to have reoccurring access to the data



Additional Examples



Daimler Truck

Temporary Power Solutions are needed. Rules that allow such installations are getting customers up and running.





These rules are much better than the alternative!

30

Thank You

Daimler Truck



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Guest Speakers

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Peer Sharing

- What M&HD charging issues are facing public utility commissions? For example, are M&HD charging issues wrapped separately or within transportation electrification plans, within overall distribution system investment plans, only in stakeholder discussions, general rate cases, etc.,?
- Where is assistance needed for PUCs to help plan for these M&HD charging issues?

All working group members are invited to share about their state September Meeting canceled for EV site visit in Indy. Next meeting will be October 24, 3:00-4:30pm FT

HTTPS://WWW.NARUC.ORG/CPI-1/ENERGY-CUSTOMERS/ELECTRIC-VEHICLES/

Appendix: Resources for Reference

- DOE's EV Grid Assist webinar series (June November) recordings are posted at: <u>www.energy.gov/eere/evgrid-assist-accelerating-transition</u>
- Presentations and recordings of past EVSWG events are available on the NARUC website: <u>www.naruc.org/cpi-1/energy-infrastructure-</u> <u>modernization/electric-vehicles/</u>
- EVSWG Listserv: <u>NARUC-EVSWG@lists.naruc.org</u>
- 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
 - <u>Transportation Electrification: State Level Roles and Collaboration among Public Utility Commissions,</u> <u>State Energy Offices, and Departments of Transportation</u>