Electric School Bus INITIATIVE

ELECTRIC SCHOOL BUS INITIATIVE UTILITY WORKING GROUP

UWG 7TH CONVENING | January 18th, 2024

IMAGE CREDIT: GILBERT ROSAS

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MEETING GOALS

- Launch a collaborative working group aimed at influencing, supporting and driving the equitable transition to ESBs
- Learn about various ESB-related activities, issues and ideas particularly as they pertain to electric utility interactions, requirements and programs.
- Collectively identify key ESB topics to explore in subsequent meetings and the related resources and support required

WE KINDLY ASK…

- Please rename your ZOOM title with your name and organization
- Please mute yourself during presentations and when not talking
- Please put your questions in the chat box
- Please participate in the surveys to help inform the topics and provide feedback on the value of the materials being presented
- Please be respectful of the meeting participants and the space allowed for input
- The meeting will be recorded and made available to all participants

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AGENDA

Welcome (Goals, Requests and Agenda)
Important News and Updates • Utility Updates • EPRI's eRoadMap • Equity Updates • CALSTART & Exelon Paper on Equity
Panel Discussion
Panel Q&A
Wrap-Up

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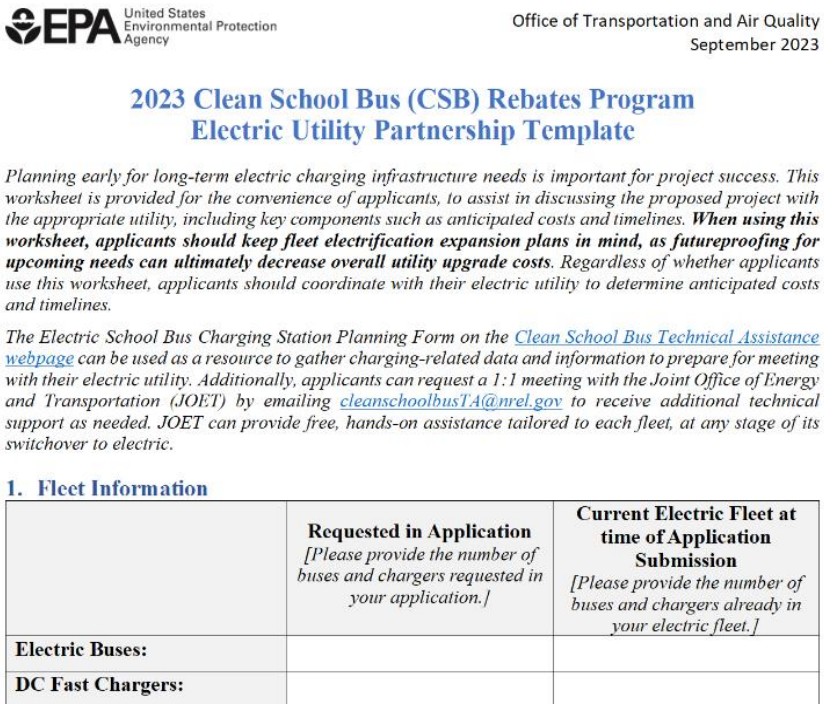
CLEAN SCHOOL BUS REBATES PROGRAM – APPLICATIONS ARE DUE SOON!

- Utility Partnership Template provides a guide to discuss infrastructure plans (i.e., scope, timelines, and deliverables).
- Utilities should expect to assess needed upgrades and provide estimated costs.
- Application deadline is **January 31, 2024**
- Electric School Bus Initiative offers Office Hours to support Clean School Bus Program applications.



EPA United States Environmental Protection Agency

Office of Transportation and Air Quality
September 2023

2023 Clean School Bus (CSB) Rebates Program
Electric Utility Partnership Template

Planning early for long-term electric charging infrastructure needs is important for project success. This worksheet is provided for the convenience of applicants, to assist in discussing the proposed project with the appropriate utility, including key components such as anticipated costs and timelines. ***When using this worksheet, applicants should keep fleet electrification expansion plans in mind, as futureproofing for upcoming needs can ultimately decrease overall utility upgrade costs****. Regardless of whether applicants use this worksheet, applicants should coordinate with their electric utility to determine anticipated costs and timelines.*

The Electric School Bus Charging Station Planning Form on the Clean School Bus Technical Assistance webpage can be used as a resource to gather charging-related data and information to prepare for meeting with their electric utility. Additionally, applicants can request a 1:1 meeting with the Joint Office of Energy and Transportation (JOET) by emailing cleanschoolbusTA@nrel.gov to receive additional technical support as needed. JOET can provide free, hands-on assistance tailored to each fleet, at any stage of its switchover to electric.

1. Fleet Information

	Requested in Application *[Please provide the number of buses and chargers requested in your application.]*	**Current Electric Fleet at time of Application Submission** *[Please provide the number of buses and chargers already in your electric fleet.]*
Electric Buses:		
DC Fast Chargers:		

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WRI'S ESB INDUSTRY DIGEST

Connect with us: electricschoolbusinitiative.org Twitter Facebook LinkedIn

December 2023

Happy New Year Electric School Bus Industry Stakeholders! Please see the latest news, policy, and funding updates below. The ESB Initiative published several new resources in December:

- EV Training Database | Find the right program to meet your needs.
- State Legislation | Summary of key 2023 state policy advancements.
- Equity Needs Assessment | Barriers and enablers for ESB adoption.
- Repowers & TCO | Learn about NYC's ESB repower deployment.

ESB Market Updates

- National League of Cities & National Governors Association launch partnership to support an inclusive EV workforce.
- Lion Electric earns final certification on its MD battery pack.
- Blue Bird forms joint venture with Generate Capital to offer electrification as a service, also announces secondary public stock offering.
- Workforce Development Institute launches ESB training course to support school bus workers in the transition to electric in New York.
- GreenPower manufactures first ESBs at West Virginia facility.
- Lightning eMotors enters receivership, assets to be sold.
- CALSTART & Excelon launch report on accelerating equitable ESB deployment.

- Sign up for WRI's ESB Industry Digest!
  - Will provide the latest market news, V2X, federal/state policy, and funding updates.

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EVs2Scale 2030™

Presentation for WRI ESB Utility Working Group

Katherine Stainken

January 18th, 2024

EPRI

Background and Objectives

- Government, Industry, and Fleets are **increasingly aligning on aggressive 2030 vehicle electrification goals**
- **The pace of needed year-over-year action and investment to prepare charging sites and the grid is not clear**
- Consumers and fleet operators must have confidence in charging availability, reliability, and affordability
- Consumers and fleets operators are increasingly looking to the utility industry to scale up efforts to support charging solutions, ensure the grid is capable of meeting vehicle loads

THIS TRANSITION IS UNPRECEDENTED AND COMPLEX. IT REQUIRES:

- **Extraordinary collaboration and partnering** across all the major EV stakeholder groups
- **Redesigned processes, useful tools, and increased standardization** to simplify the planning and complex interactions between major stakeholder groups
- **An evaluation of regulatory/board oversight** that may not be conducive to driving actions on the pace and scale required to meet 2030 targets

Addressing the Barriers to Achieving EVs at Scale

A Three-Pillar Strategy to Address the Key Industry Gaps

EVs2Scale 2030

1 COALITIONS & ROADMAPS

Bilateral Convening Series
- Utility-OEM Forum
- Utility-Fleet Forum

National EV Driver Research Board

50-state eRoadMAP™ to 2030
outlining EV loads, grid impacts, leadtimes, workforce, costs

2 STRUCTURAL SYSTEM REFORMS

Charging Infrastructure
- Reliability: Benchmarking, Standards
- Charging innovation & affordability

Grid Readiness
- Streamlined Grid Interconnect
  - Expedited Interim Charging Solutions
- Managed Charging at Scale
- Interconnect Standards for V2H/V2B/V2G

3 UNIFYING TOOLS & PILOTS

- Vetted Product List (VPL)
- NEVI/NEHC Coordination with EEI

- GridFAST™ Online Data Exchange
- OEM/Utility V2H/V2B Pilot
- EV Resilience/Evacuation Pilot

Enabling Regulatory and Oversight Framework

Equity Blueprint & Workforce Development

eRoadMAP™

EV load is coming – but where and when exactly?

- We need granular level data from the fleets themselves.
  - DMV data doesn't always work.
    - (Registrations are at a HQ, not where the vehicle is driven, and we don't know the vehicle behavior.)
  - Buying data sets aren't always complete.
    - (Only certain percentage of the market.)
  - County level, census tract level data isn't granular enough.
- Need a data set that shows where the vehicles are, and the vehicle behavior.

- **The eRoadMAP tool and data builds confidence** and **shows clear signals** for where and when EV load is coming.

eRoadMAP | Input Collaborators

EVs2Scale2030

ANALYTICS

EPRI

RMI
ENERGY. TRANSFORMED.

U.S. DEPARTMENT OF ENERGY

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

DATA

amazon

DAIMLER TRUCK

TESLA

NAVISTAR

WORLD RESOURCES INSTITUTE

PACCAR

REPUBLIC SERVICES

Enterprise Mobility™

NADA NATIONAL AUTOMOBILE DEALERS ASSOCIATION

PITT OHIO
SUPPLY CHAIN • LTL • TL

VOLVO

MANHATAN BEER DISTRIBUTORS.

Also:

Experian

GEOTAB ITS

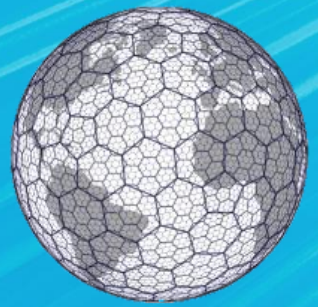
INRIX

REPLICA

1 Improved Data Resolution Techniques

Res	Average Hexagon Area (km^2)	Average Hexagon Area (mi2)
0	4,357,449.42	1,682,419.93
1	609,788.44	235,440.54
2	86,801.78	33,514.34
3	12,393.43	4,785.13
4	1,770.35	683.53
5	252.90	97.65
6	36.13	13.95
7	5.16	1.99
8	**0.74**	**0.28**
9	0.11	0.04
10	0.0150	0.0058
11	0.0021	0.0008
12	0.0003	0.0001

Where Hex8 ~ 1 or 2 feeders



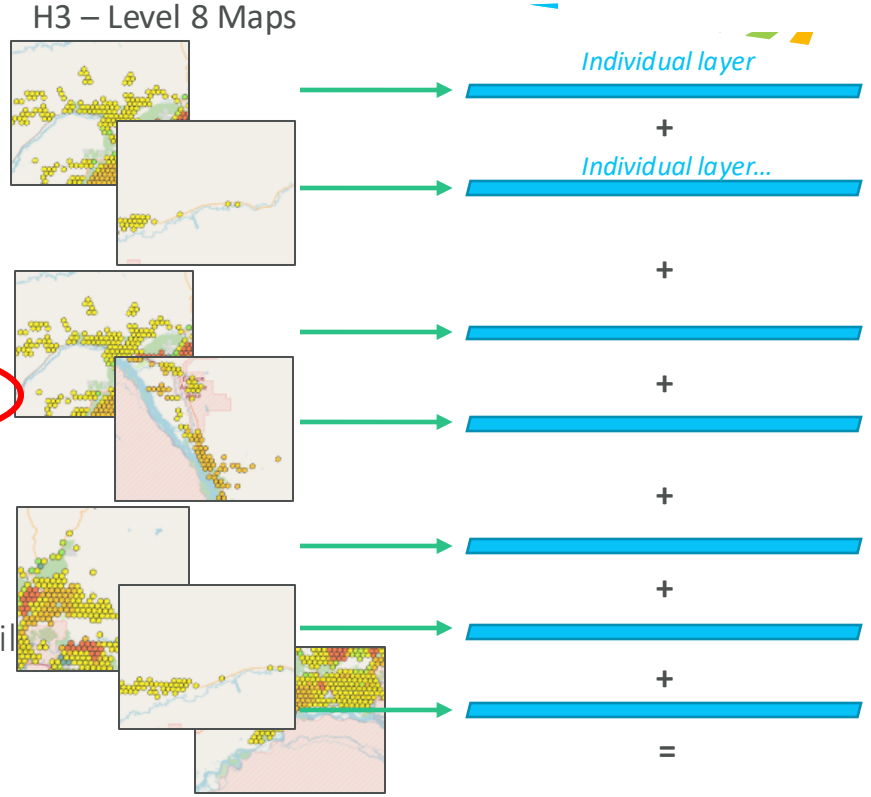
2 LAYERED DATA APPROACH

LD Vehicles
- Registrations
- Travel Models

MDHD Vehicles
- OEM data
- Fleet data
- Travel Data

Other Vehicle Sectors
- Transit/School Buses
- Government Fleets
- Ports/Airports
- Vocational Fleets

Other Load Data
- EVSPs/Fueling Retail



One map with energy + power needs

**EV Service Providers*

Interactive Energy Map to Hex 8 Resolution: eroadmap.epri.com

U.S. = Hex 5 (98 mi^2)

Interactive Energy Map to Hex 8 Resolution: eroadmap.epri.com

U.S. = Hex 5 (98 mi^2)

Additional Resources Overview

All available on **eroadmap.epri.com**

Fact Sheet:

One page outlining high level methodology and motivation

'If you can't measure it, you can't manage it'

User Guide:

How the eRoadMAP should be used, key assumptions, example energy calculations

FAQs:

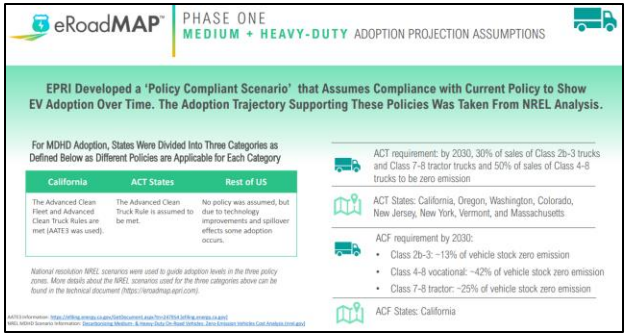
What are the costs? Will you include power? Who should I contact?

Technical Details:

Methodology, Data Sources, Ground Truthing, Version Documentation

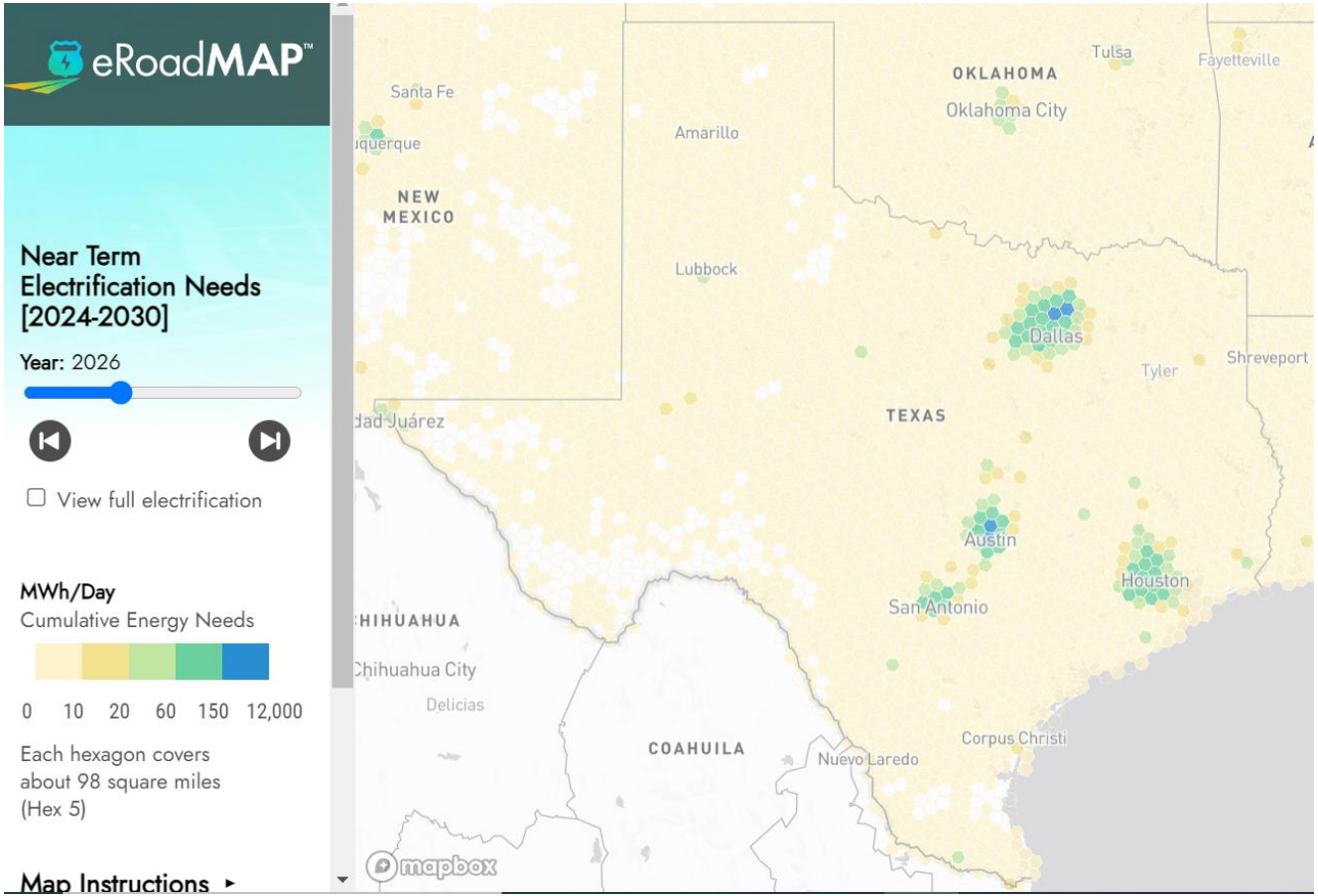
User Guide Example

Technical Document Example



Interactive Energy Map to Hex 8 Resolution: eroadmap.epri.com

2026- H5 close up



U.S. = Hex 5 (98 mi^2)

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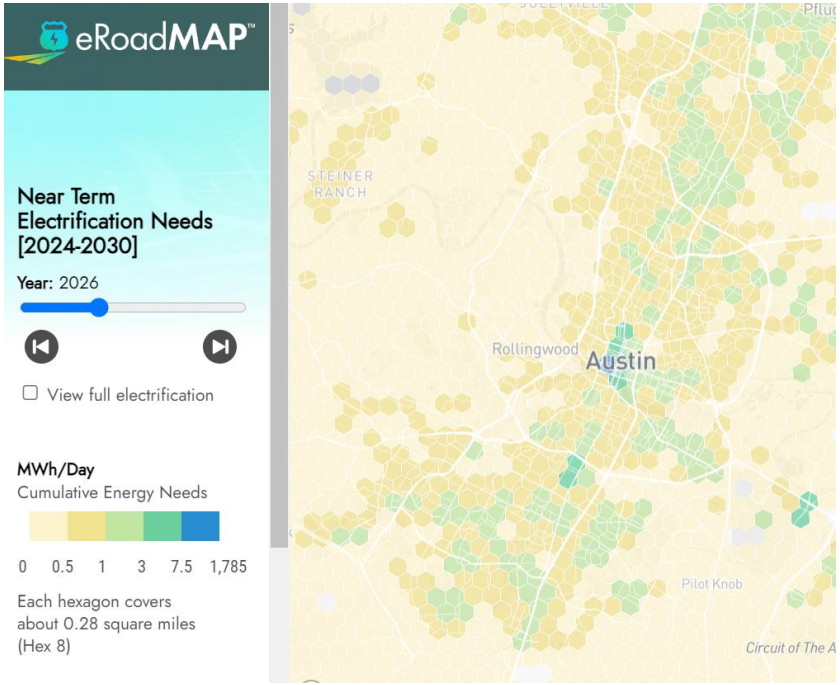
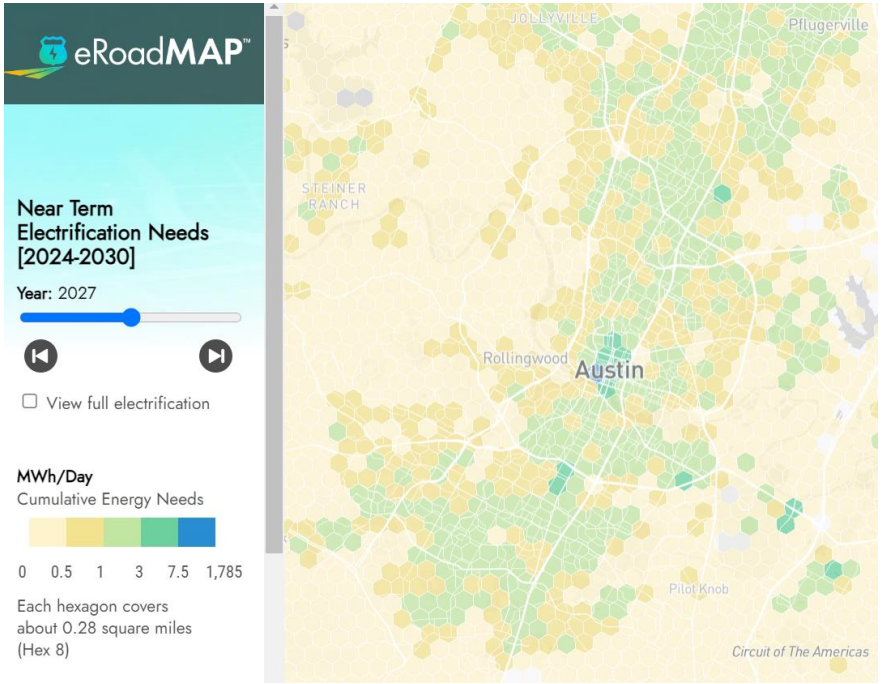
2026 to 2027 Comparison

EVs2Scale 2030



2026

2027

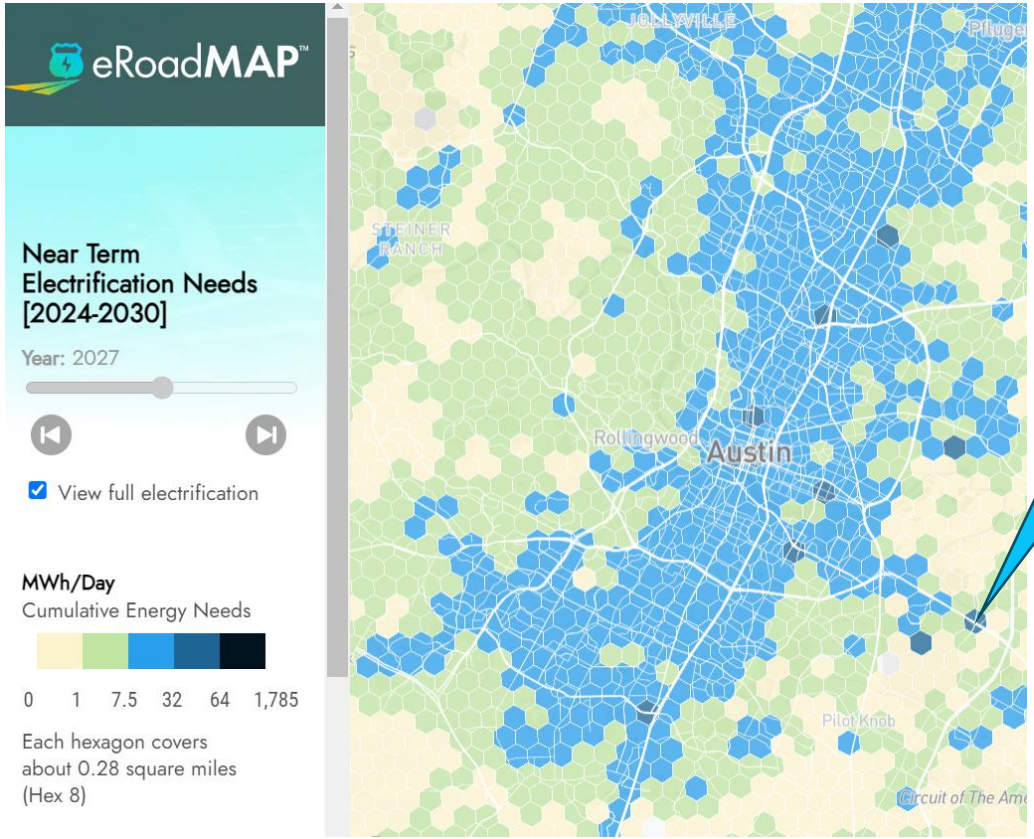


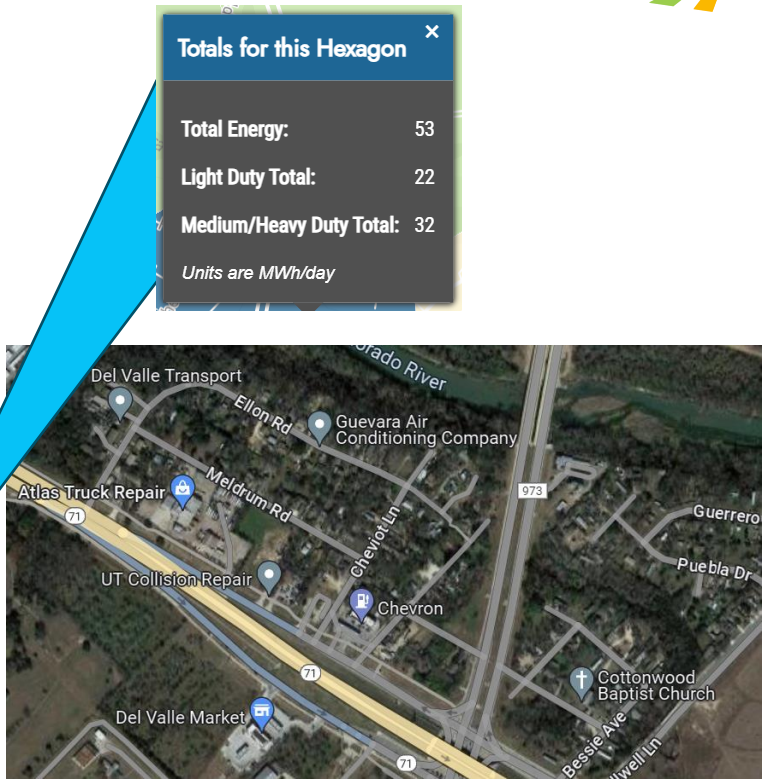
U.S. = Hex 8 (0.28 mi^2)

Interactive Energy Map to Hex 8 Resolution: eroadmap.epri.com

Full Electrification – H8 Granularity

EVs2Scale 2030





(Shows: Atlas Truck Repair, Condos, Del Valle Transport)

EVs2Scale 2030™

Thank You

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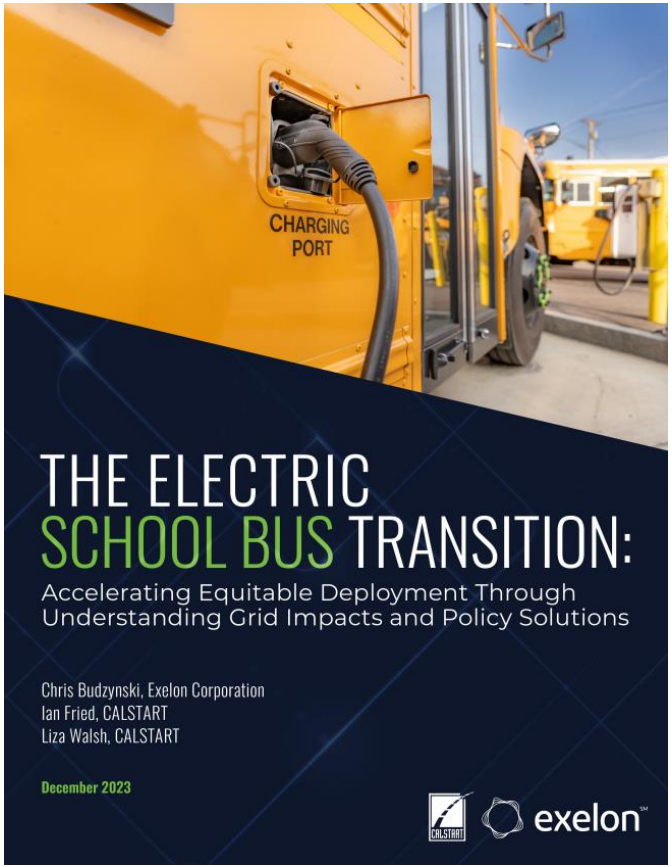
EQUITY UPDATES

NEW CALSTART AND EXELON WHITE PAPER



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OVERVIEW

- Exelon partnered with CALSTART, EPRI, WRI, EEI and Clean Energy Works

- Paper explores the role of equity, evaluates grid impacts at scale, describes the role of the utility and identifies potential policy enablers

- Designed to serve as a resource guide for utilities, PUCs, policymakers, school bus operators

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KEY LEARNINGS/INSIGHTS

Paper Observations	Considerations
IIJA and IRA have created a once-in-a-lifetime opportunity to electrify school buses	Federal funding alone is not enough to fully electrify all school bus fleets in the US creating the need for additional programs and support.
Electric school buses deliver a wide range of benefits to society at large	Resulting public health, environmental, economic and utility grid benefits must be distributed equitably with a priority focus on under resourced communities.
Electrification of the national school bus fleet can be used as an opportunity to leverage equity	Implementing a well-defined equity framework increases the likelihood of programs being responsive to community needs, empower communities and ensure benefits are equitably distributed.
Ability of utility grid to support school bus electrification will vary by location	Potential need for grid investments will need to be sequenced to keep pace with federal funding opportunities.
Transition to electrify school buses can often be complex and present challenges, particularly in under resourced communities	Utilities can play a central role to facilitate and accelerate the transition through a wide variety of programs and services.
Barriers to achieving school bus electrification at scale continue to exist	Complementary and supportive policies and regulatory programs are needed to reduce barriers and accelerate the transition at scale and deliver resulting benefits.

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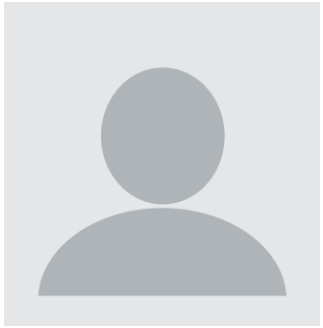
PANEL DISCUSSION

SUCCESSFUL ESB CASE STUDY: OPTIMIZING ELECTRIC SCHOOL BUS DEPLOYMENT

TODAY'S PANELISTS



Presenter not included due to permission not received

Tysen Brodwolf
Director of Transportation,
Cajon Valley Union School District

Chris Roberts
Senior Customer Solutions Advisor,
San Diego Gas & Electric

Rachel Zook
Senior Program Manager, Utility Partnerships,
Nuuve

Presenter not included due to permission not received

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THANK YOU

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