NARUC Electric Vehicles State Working Group

ENERGIZING CHARGERS FASTER

OCTOBER 1, 2024, 3:00 - 4:30 PM ET

Welcome

EV SWG Chair

Commissioner Katherine Peretick, Michigan Public Service Commission

EV SWG Vice Chair

Commissioner Milt Doumit, Washington Utilities and Transportation Commission

EV Commission Staff Leads

Ryan Cheney, North Carolina Utilities Commission

Steve Olea, Arizona Corporate Commission

NARUC Staff

Danielle Sass Byrnett and Robert Bennett

Agenda

Feel free to enter questions into chat at any time

3:00 PM	**Welcome and Announcements: Commissioner Peretick** • Agenda review • New EV Case Study Catalog
3:05 PM	**Dhananjay "DJ", Anand, Joint Office of Energy and Transportation (JOET)**
3:20 PM	**Britta Gross, Electric Power Research Institute (EPRI)**
3:35 PM	**Paul De Martini, Newport Consulting**
3:50 PM	**Speaker Q&A**
4:05 PM	**Peer Sharing Discussion**
4:30 PM	**Adjourn**

EV Fact of the Week:
A Typical EV is 87%–91% Efficient Compared to 30% for a Conventional Gasoline Vehicle. For more info and other facts, visit DOE FOTW webpage.

New EV Case Study Catalog

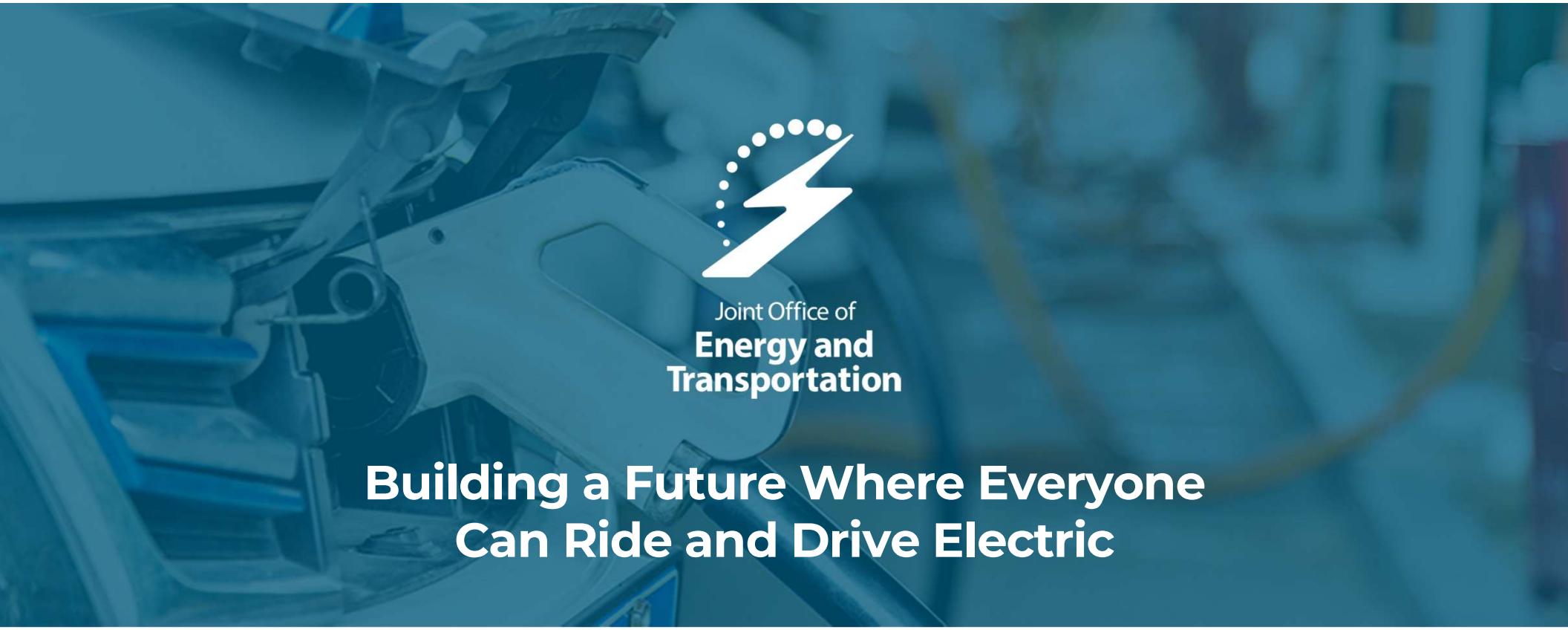
- NARUC CPI has developed a new EV Case Study Catalog to connect Commissioners and staff to existing reports on emerging utility regulatory approaches to EV questions.
- The Catalog features over 25 resources, including references to commission decisions, utility programs, pilots, and more from over 20 states. Some resources in the catalog cover several regulatory issues/topics, such as how to prepare the grid for medium and heavy-duty charging.
- https://www.naruc.org/core-sectors/energy-resources-and-the-environment/electric-vehicles/ev-catalog/

Presentations on Energizing Chargers Faster

Moderator: Commissioner Katherine Peretick, Michigan Public Service Commission

Guest Speaker

- **Dhananjay "DJ", Anand, Joint Office of Energy and Transportation (JOET)**
  - iQMS and federal perspective on energizing chargers faster
- **Britta Gross, Electric Power Research Institute (EPRI)**
  - GridFast tool
- **Paul De Martini, Newport Consulting**
  - Flexible Ev Interconnection



Building a Future Where Everyone Can Ride and Drive Electric

DJ Anand, Standards and Reliability for

Sejal Shah, Senior Advisor, Electric Utility Programs and Policies

October 1, 2024

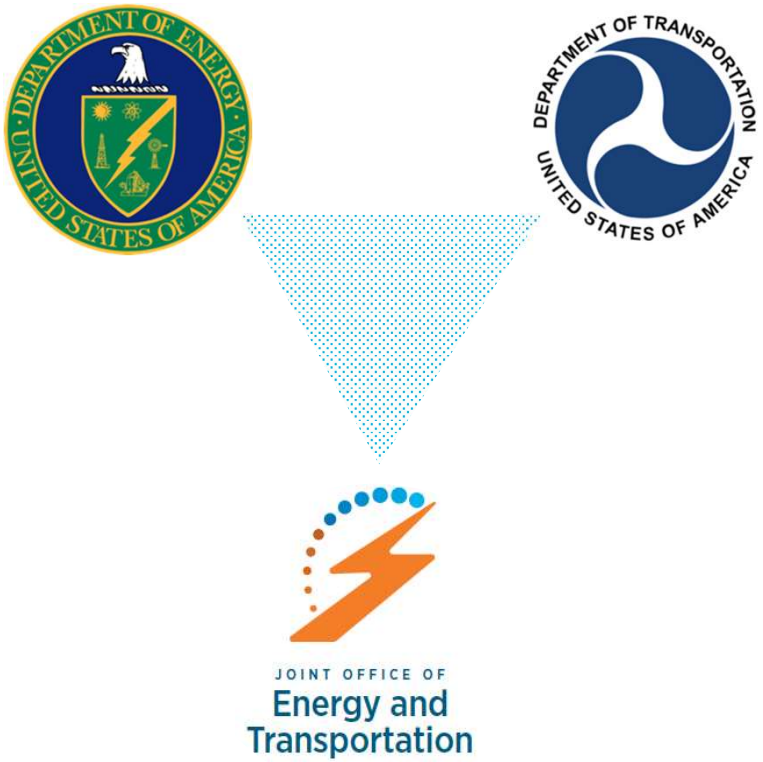
driveelectric.gov

AGENDA

- Joint Office Overview
- NEVI Update
- Energizing EV Chargers
- i2X: iQMS (Innovative Queue Management Solutions)

Joint Office Overview

Mission and Vision



Mission

To accelerate an electrified transportation system that is affordable, convenient, equitable, reliable, and safe.

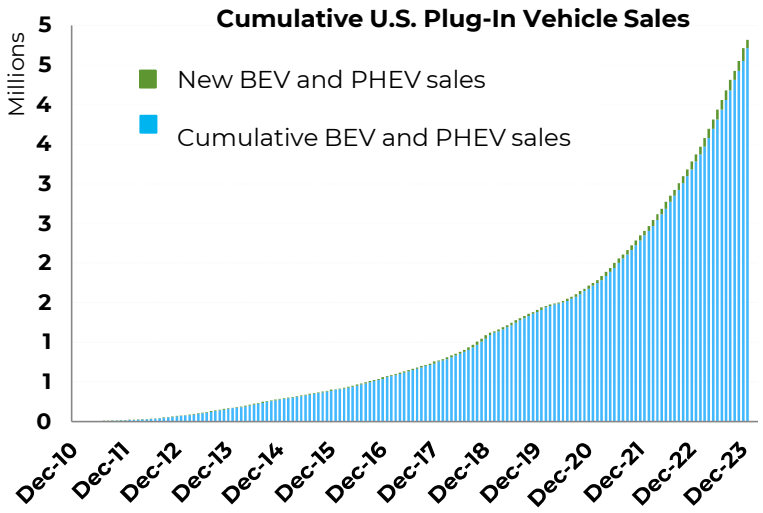
Vision

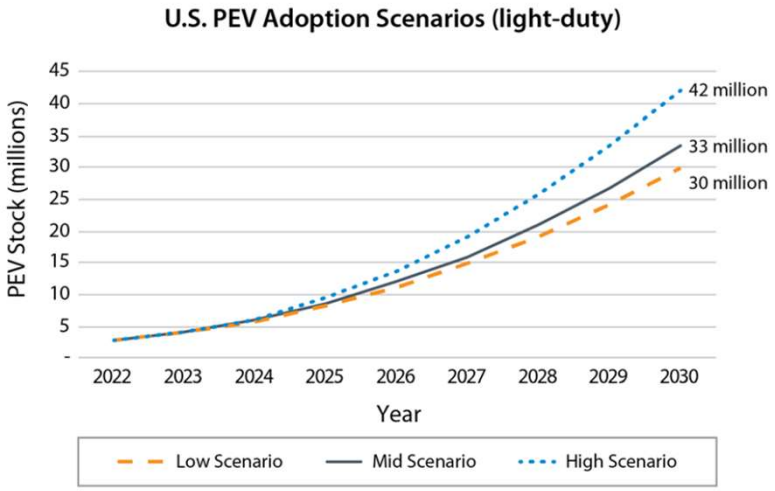
A future where everyone can ride and drive electric.

1 in every 10 vehicles sold is an **EV**

CAGR remains positive

Administration is prioritizing building a network of **500,000 public chargers by 2030**





https://www.nrel.gov/docs/fy23osti/85654.pdf

Programs Supported by the Joint Office

National Electric Vehicle Infrastructure (NEVI) Formula Program (U.S. DOT)
$5 billion for states to build a national EV charging network along corridors, including **$148** million awarded to repair and replace non-operational chargers.

Charging & Fueling Infrastructure Discretionary Grant Program (U.S. DOT)
$2.5 billion for communities to build EV charging, as well as hydrogen, natural gas, and propane fueling infrastructure

Low-No Emissions Grants Program for Transit (U.S. DOT)
$5.6 billion for transit agencies to deploy low- and no-emission transit buses

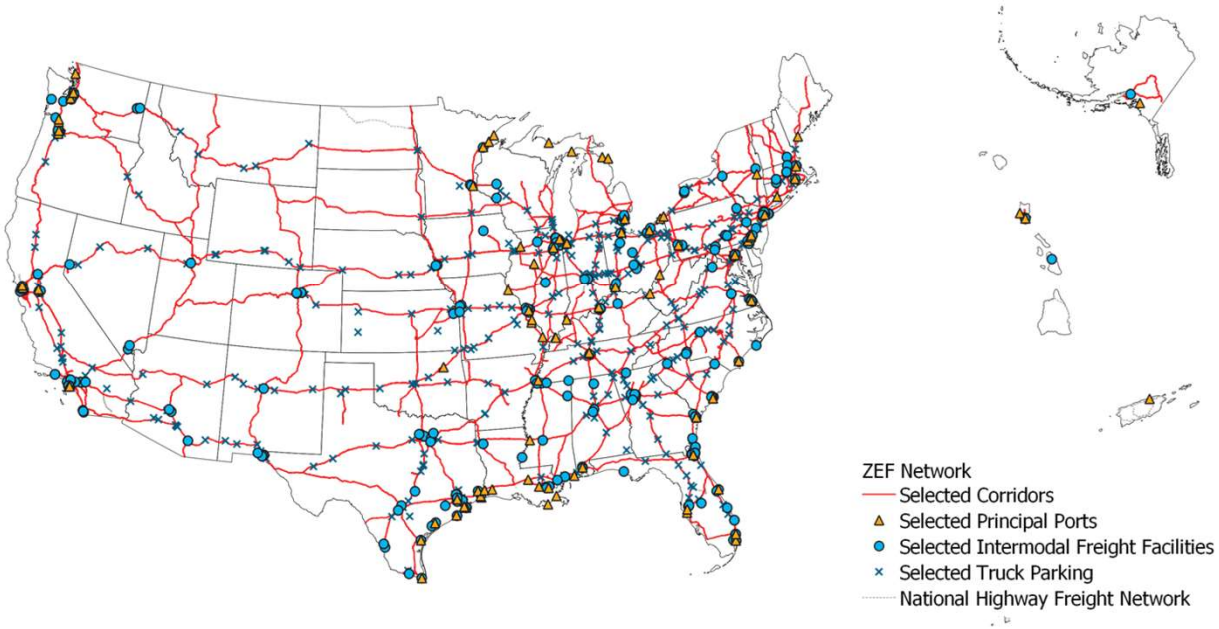
Clean School Bus Program (U.S. EPA)
$5 billion in support of electric school bus deployments

Ride & Drive Funding Opportunity (Joint Office)
$46.5 million to enhance charging resiliency and performance and enhance equitable access

Communities Taking Charge Funding Opportunity (Joint Office)
$54 million to expand community e-mobility access

National Zero-Emission Freight Corridor Strategy

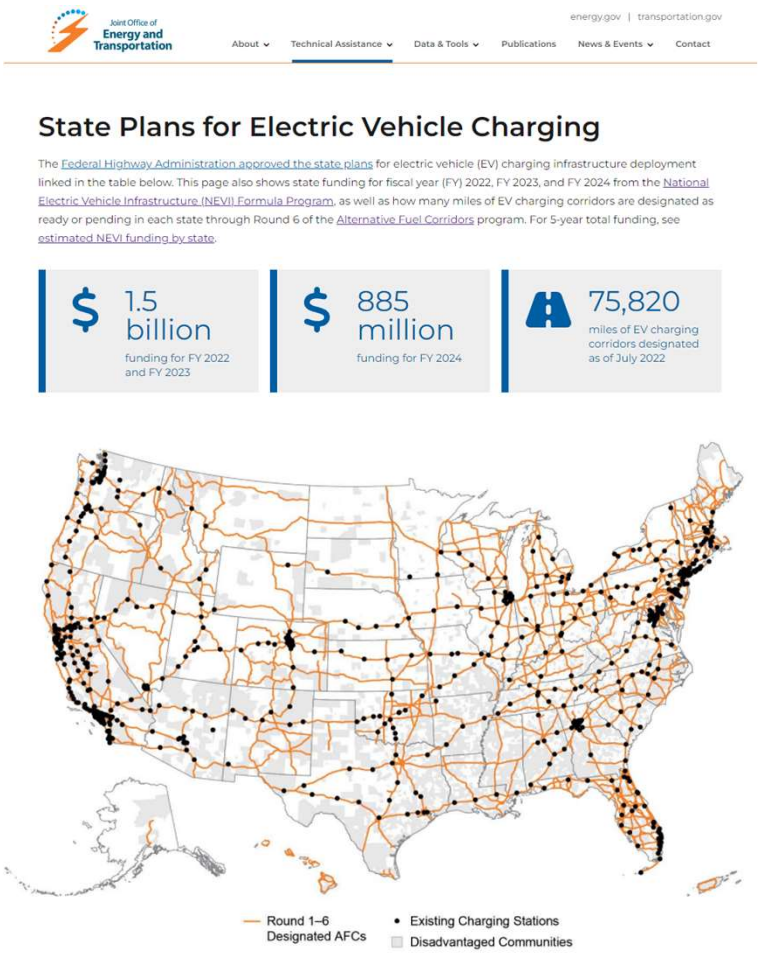
The *National Zero-Emission Freight Corridor Strategy* seeks to **align and accelerate cross-sector investments** in zero-emission medium- and heavy-duty vehicle (ZE-MHDV) infrastructure and **clearly signal the need to bolster electric grid and hydrogen planning** to achieve a zero-emission freight network by 2040.



NEVI Update

NEVI Formula Program Updates

- **All 50 state plans plus DC and Puerto Rico approved** by FHWA
- **Unlocking $2.4 billion** in FY22, FY23, and FY24 funding
- **States have released or are getting ready to release RFPs**

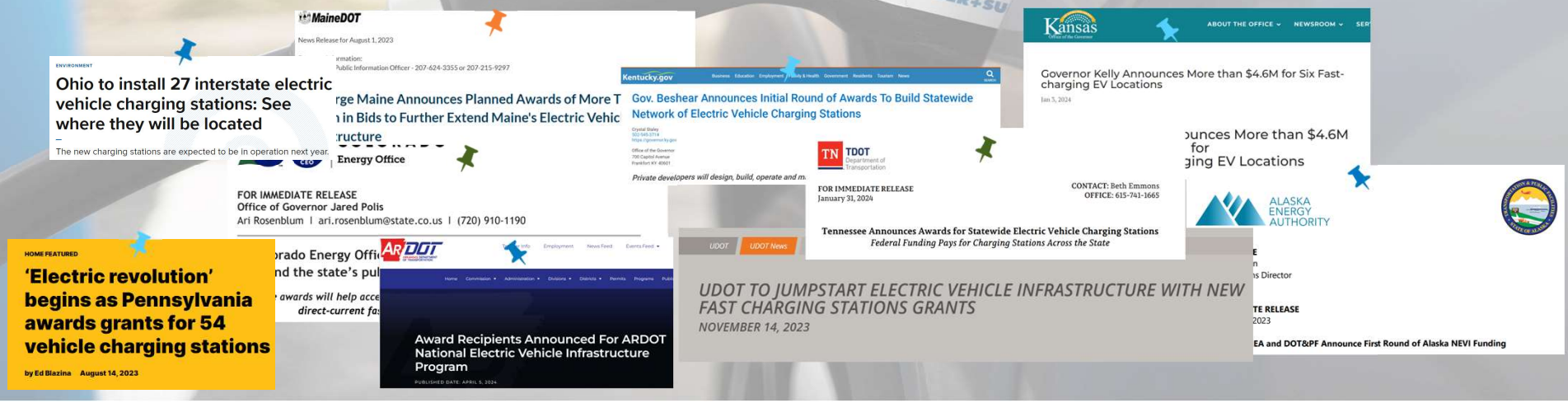


NEVI Program Bulletin Board

39 states/territories have released their solicitations

28 states/territories have issued awards or have agreements in place for ~**670** station locations (**at least 2,876 fast charging ports**)!

8 states have open NEVI stations (**15 stations and 61 funded ports** total)!



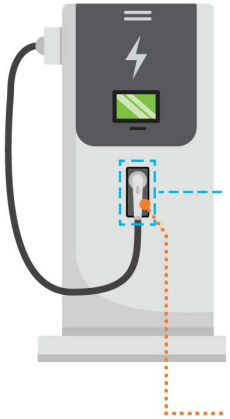

Energizing EV Chargers

Key Goals for Improving Charging Reliability

1. **Simplify the ecosystem, improve the reliability**
   - Innovate within standards
2. **Facilitate trust with standardization, security and data sharing**
   - Speak a common language
3. **Create game changers and technology speed ups**
   - Take advantage of unique capabilities of national labs and select contractors

CHARGEX consortium

EV Charging Minimum Standards



Charging is a predictable and reliable experience, by ensuring that there are consistent plug types (at least 4 CCS), power levels, and a minimum number of chargers capable of supporting drivers' fast charging needs;

Chargers are working when drivers need them to, by requiring a 97 percent uptime reliability requirement;

Drivers can easily find a charger when they need to, by providing publicly accessible data on locations, price, availability, and accessibility through mapping applications;

Drivers do not have to use multiple apps and accounts to charge, by facilitating several payment types

Chargers will support drivers' needs well into the future, by focusing on interoperability and ensuring that chargers and vehicles work seamlessly, similarly, and together

The Electric Vehicle Charging Ecosystem

CNO perspective

- EV charger networks have pressure to deploy quickly
- Given seasonality of funding (federal/state/utility), large number of service load request applications maybe submitted at a given time
- Electric utility tools/techniques/processes are NOT setup to handle this increased number of applications
- Feedback from EV charging infrastructure companies that queue timelines are essential for derisking, market balance and customer experience.

Utility perspective

- Utilities ask to be engaged early in the project cycle
- Can not ‘reserve’ capacity for future projects
- Not used to prospective or exploratory siting requests
- EV adoption models mismatched with load growth models

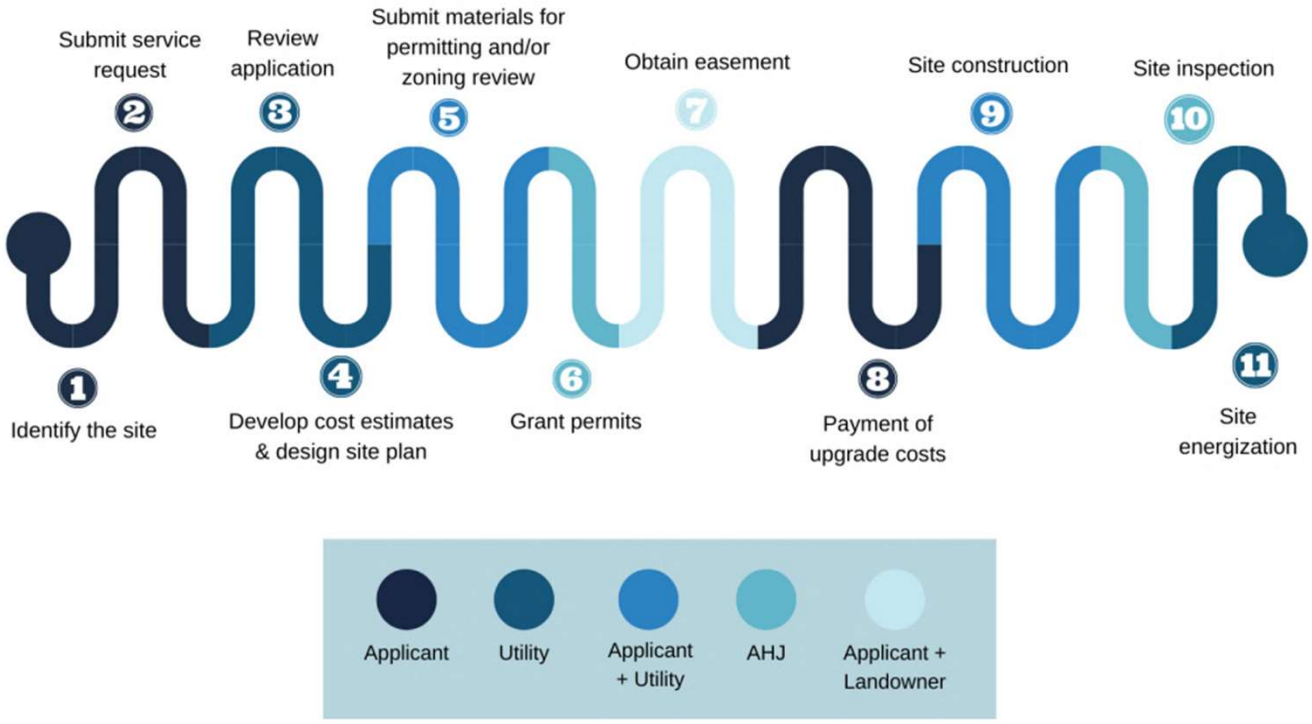
NEVI Utility Engagement

- Utility information form
- Pre-screened EV charging station sites
- Participation by state DOTs in utility commission working groups

Path to connecting EVSE to the electric grid

Issues to consider:

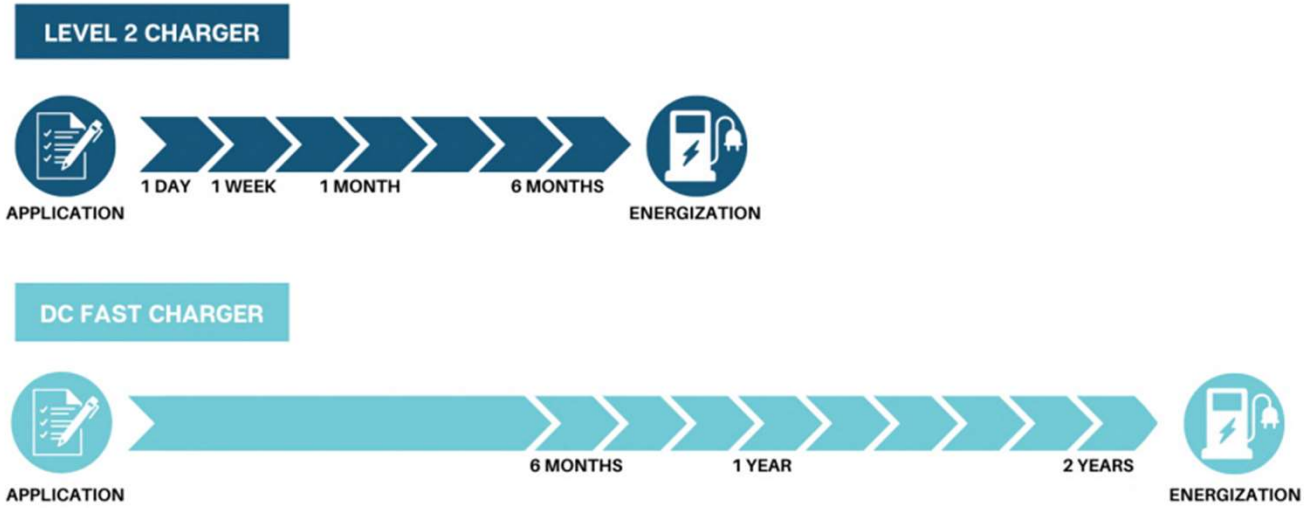
- utility engineer workload
- hosting capacity at the requested site
- obtaining permits
- satisfying connection requirements
- supply chain timelines



Paving the Way: Emerging Best Practices for Electric Vehicle Charger Interconnection. IREC. June 2022

EV Charger Energization timelines

- Surveys of 6 EV charging station developers note 180 days for L2 and 720 for DCFC.
- Timelines are longer if utility side upgrades are not planned or further delays due to supply chain issues



Paving the Way: Emerging Best Practices for Electric Vehicle Charger Interconnection. IREC. June 2022

Interconnection Innovation e-Xchange (i2X)

To enable a **simpler**, **faster**, and **fairer** interconnection of clean energy resources while enhancing the **reliability**, **resiliency**, and **security** of our **distribution and bulk-power electric grids**

Stakeholder Engagement

Nation-wide engagement platform and collaborative working groups

Data & Analytics

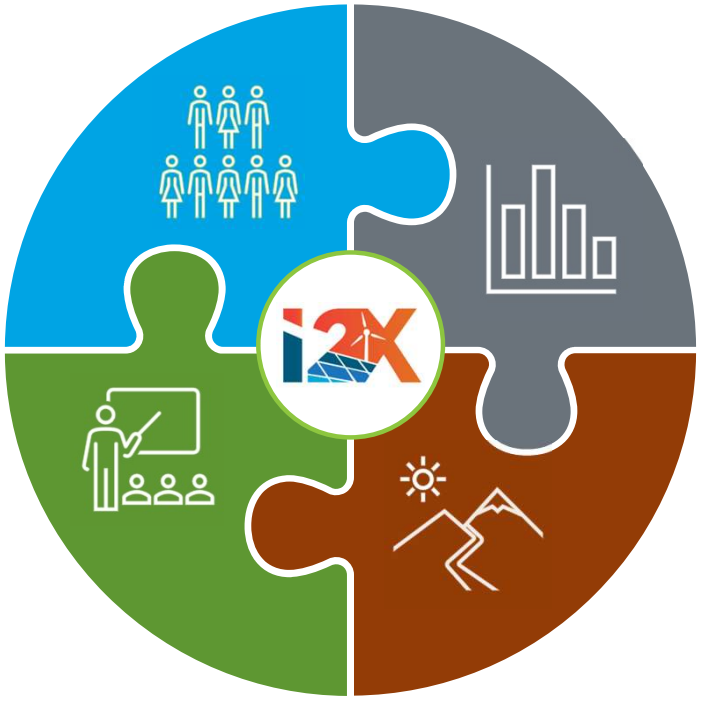
Collect and analyze interconnection data to inform solutions development

Strategic Roadmap

Create roadmap to inform interconnection process improvements

Technical Assistance

Leverage DOE laboratory expertise to support stakeholder roadmap implementation



Innovative Queue Management Solutions (iQMS)

Provide funding to **distribution utilities** to **rapidly prototype and pilot innovative solutions** to speed up interconnection queue processing for distributed generators or electric vehicle charging load requests (or both)

energywerx

Total amount: $11,200,000

BERKELEY LAB

Pacific Northwest NATIONAL LABORATORY

Joint Office of Energy and Transportation

OTT Office of Technology Transitions

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

VEHICLE TECHNOLOGIES OFFICE

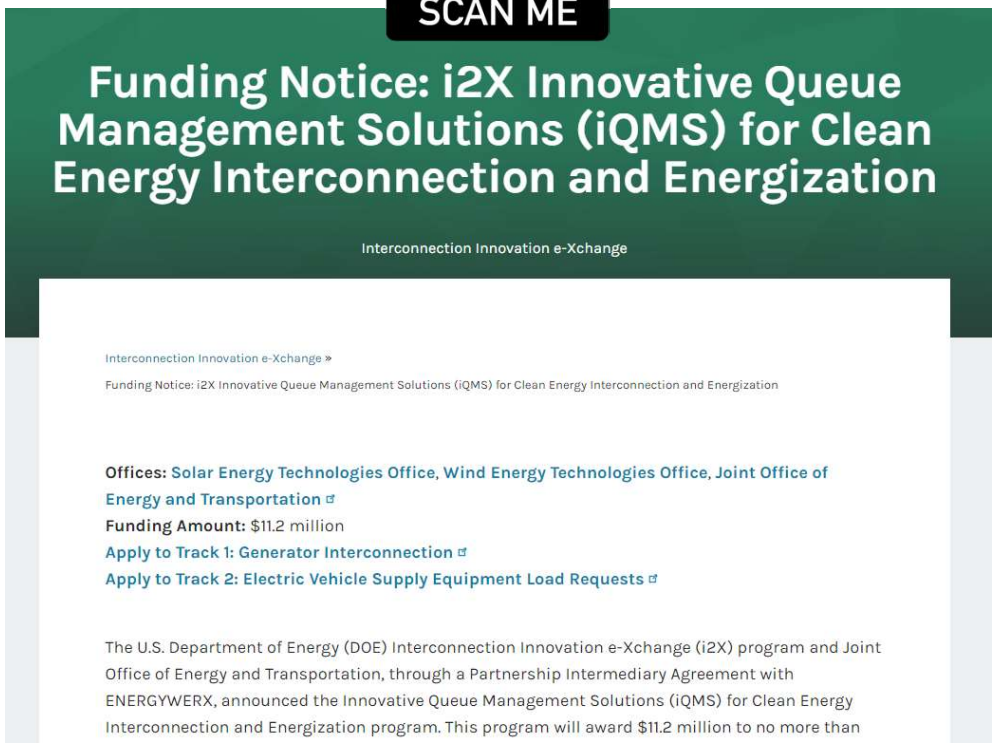
Sandia National Laboratories

NREL Transforming ENERGY

GDO GRID DEPLOYMENT OFFICE

U.S. DEPARTMENT OF ENERGY | OFFICE OF ELECTRICITY

SCAN ME



energy.gov/i2x

Joint Office of Energy and Transportation

INTERCONNECTION INNOVATION e-XCHANGE
U.S. DEPARTMENT OF ENERGY

Generator Track

Phase 1 – Prepare (8 months): Up to **20 utilities** will each be awarded **$200,000** to take tangible actions towards determining the feasibility and value proposition of implementing a queue management optimization solution, combined with a plan to demonstrate this solution under real-world conditions, in Phase 2.
Results of Phase 1 and lessons learned will be shared publicly.

Phase 2 – Demonstrate (16 months): Up to **8 utilities** from Phase 1 will each receive **$650,000** to complete their proposed implementation plan and demonstrate how the solution performs under real-world conditions and scenarios.
Results of these demonstrations and lessons learned will be shared publicly.

Electric Vehicle Supply Equipment (EVSE) Service Load Request Track

Phase 1 – Prepare (8 Months): Up to **10 utilities** will each be awarded **$100,000** to take tangible actions towards testing and validating a compelling value proposition of at least one new queue management optimization solution combined with a plan to demonstrate such solutions under real-world conditions in Phase 2 within the next 16 months.
The results of Phase 1 and lessons learned will be shared publicly.

Phase 2 - Demonstrate (16 Months): Up to **4 utilities** from Phase 1 will each receive **$250,000** to complete the proposed implementation plan and demonstrate how the new solution set delivers expected results under real-world conditions.
The results of these demonstrations and lessons learned will be shared publicly.

Examples

- Techniques to incorporate load control and energy management systems into capacity planning.
- Automated analysis and reliability assessment.
- Flexible interconnection strategies including phased/incremental capacity approvals.
- Methods to incorporate feeder and grid edge measurements into capacity planning.
- Locational clustering for engineering studies on generation, load request, and storage.
- Locational templates for point of coupling requirements such as grid codes.
- Advanced hosting capacity services and tools.
- And more ...

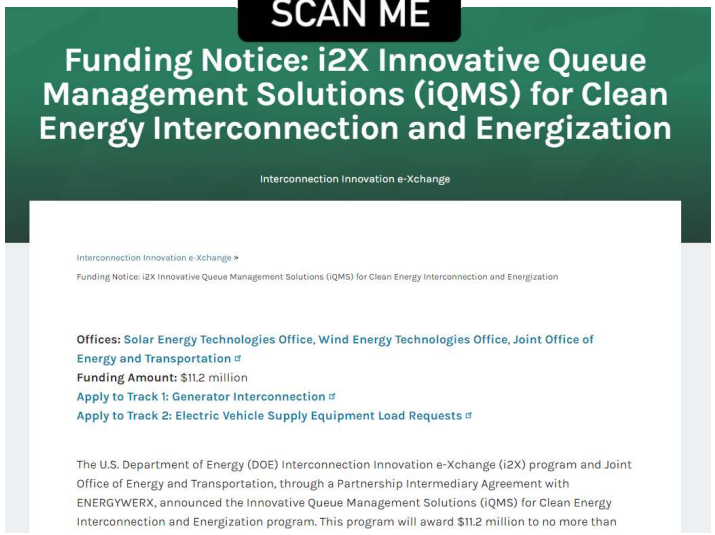
All dates are subject to change

energy.gov/i2x

Joint Office of Energy and Transportation

INTERCONNECTION INNOVATION e-XCHANGE
U.S. DEPARTMENT OF ENERGY

SCAN ME



Joint Office of
Energy and Transportation

Thank You

driveelectric.gov

EVs2Scale™ 2030

NARUC - EVs2Scale2030 | eRoadMAP and GridFAST Overviews

1 October 2024

Britta K. Gross
Director of Transportation

Addressing the Barriers to Achieving EVs at Scale

A Three-Pillar Strategy to Address the Key Industry Gaps

EVs2Scale2030

1 2 3

COALITIONS & ROADMAPS

Industry Forum Convenings
- Utility-OEM Forum
- Utility-Fleet Forum

National EV Driver Research Board

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

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

UNIFYING TOOLS & PILOTS

- Approved Product List (APL)
- 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

EVs2Scale2030 Advisory Board

Chair: **PG&E,** Patti Poppe

Ameren, Mark Fronmuller
ComEd, Gil Quiniones
GRE, Jeff Haase
LCRA, Khalil Shalabi
National Grid, Rudy Wynter
SMUD, Rachel Huang (LPPC)
Southern Company, Chris Cummiskey
Xcel Energy, Emmett Romine

APPA, Paul Zummo
EEI, Kellen Schefter
NRECA, Angela Strickland
NARUC, Katherine Peretick (Michigan PSC)
ATE, Phil Jones
AAI, John Bozzella
Amazon, Sujit Mandal
Caterpillar, Rob Schueffner
Daimler Truck, Diego Quevedo
JOET, Rachael Nealer

eRoadMAP | Input Collaborators

ANALYTICS

EPRI

RMI
ENERGY. TRANSFORMED.

U.S. DEPARTMENT OF ENERGY

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

DATA

amazon

DAIMLER TRUCK

TESLA

WORLD RESOURCES INSTITUTE

Also:

Experian

PACCAR

NAVISTAR

Enterprise Mobility™

GEOTAB ITS

INRIX

NADA NATIONAL AUTOMOBILE DEALERS ASSOCIATION

PITTOHIO
SUPPLY CHAIN • LTL • TL

VOLVO

MANHATAN
BEER DISTRIBUTORS

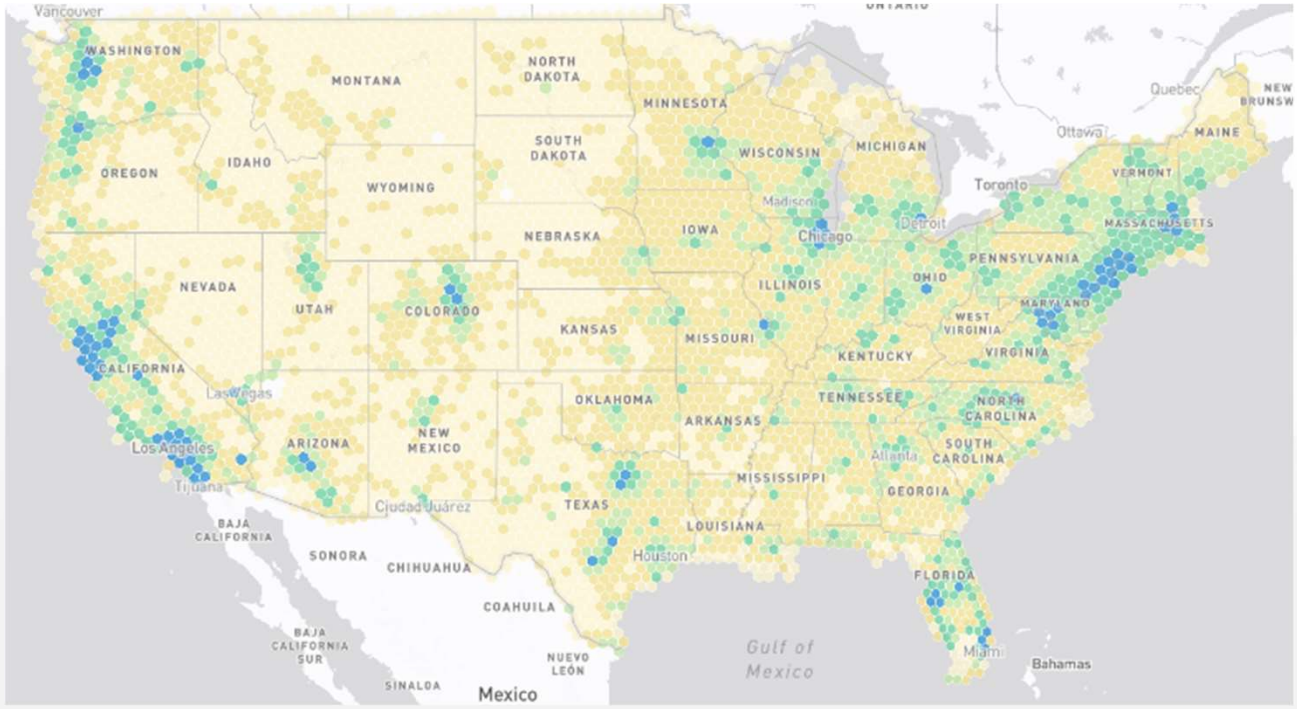
REPLICA

General Problem to be Addressed

Where and when will loads appear on the grid?

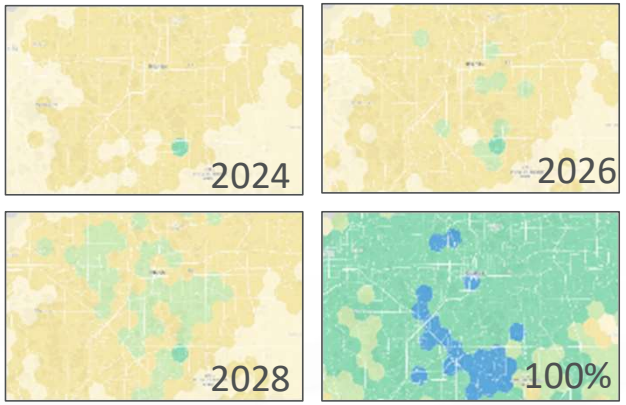
EVs2Scale 2030

https://eroadmap.epri.com/



eRoadMAP: Interactive Load Map to Hex8 Resolution (0.28 mi^2)

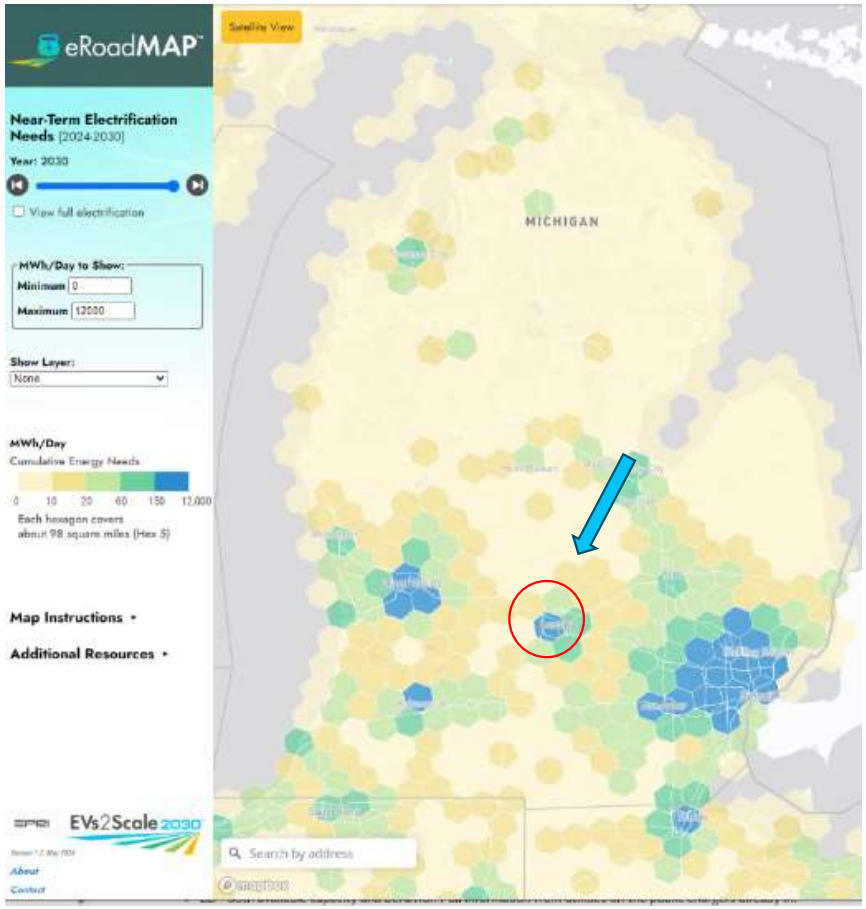
Fleet Electrification Over Time



Fleet activity aggregated to Hex8 Level
(protects proprietary fleet data)

EPRI

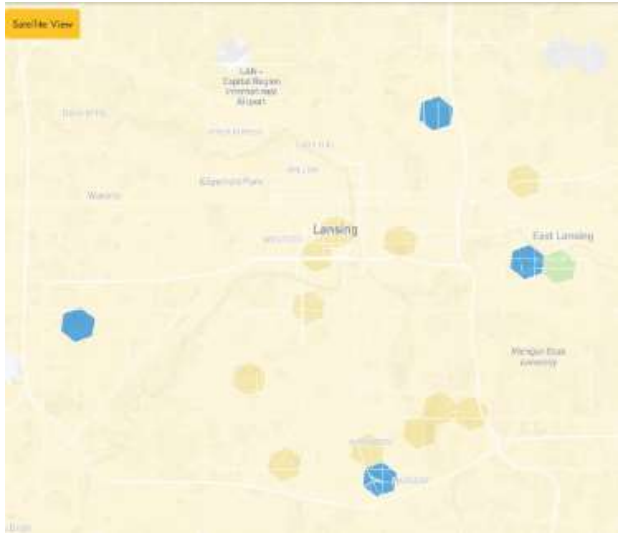
Interactive Energy Map: Michigan, 2030



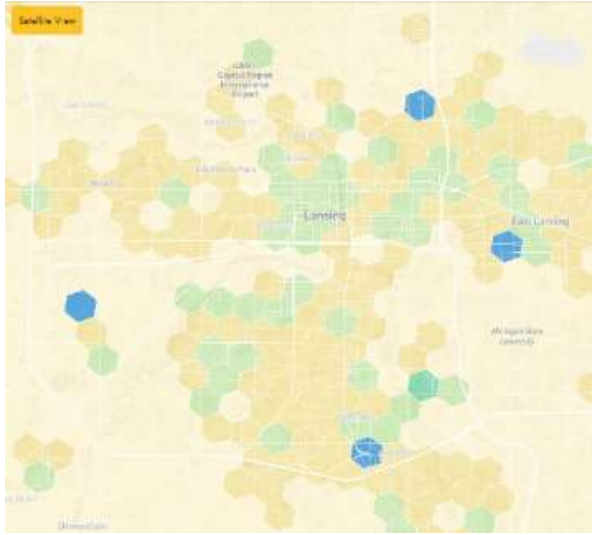
Interactive Energy Map: Lansing Area

2027 to 2030 to Full Electrification Comparison

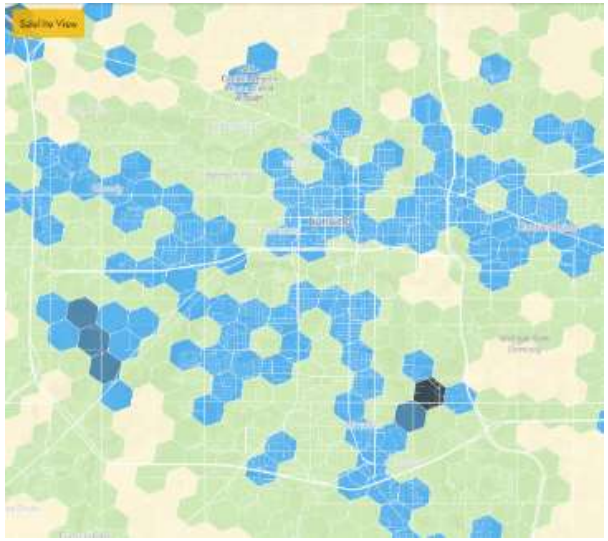
2027



2030



Full Electrification

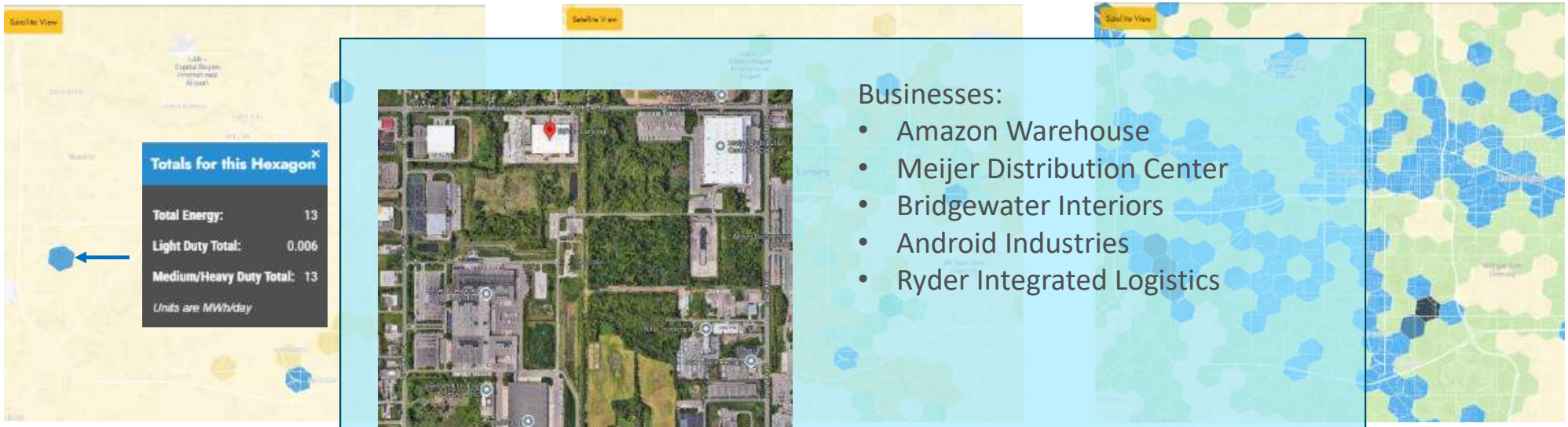


Hex 8 (0.28 mi^2)

Interactive Energy Map: Lansing Area

2027 to 2030 to Full Electrification Comparison

2026 **2030** **Full Electrification**

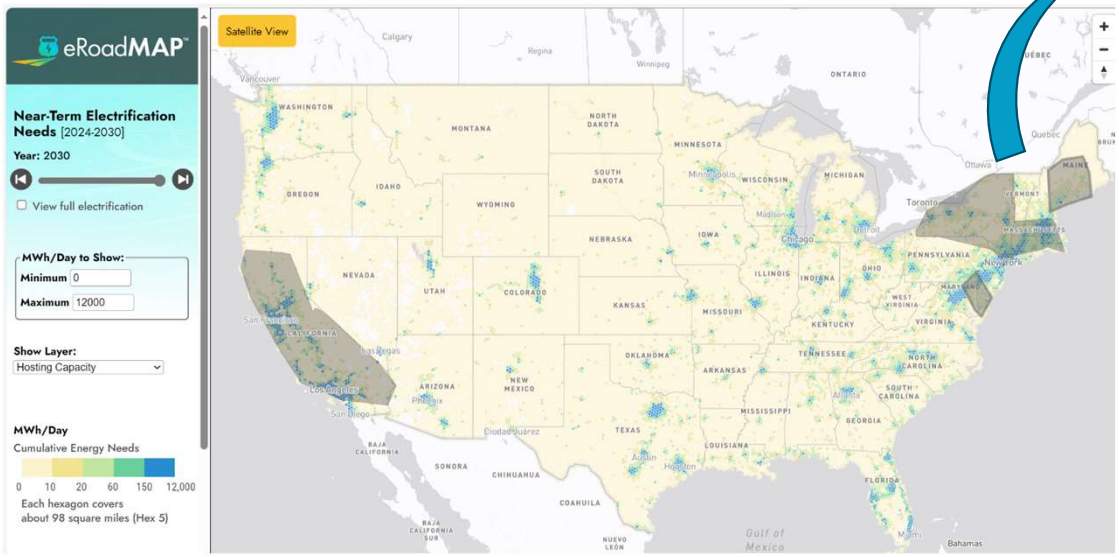


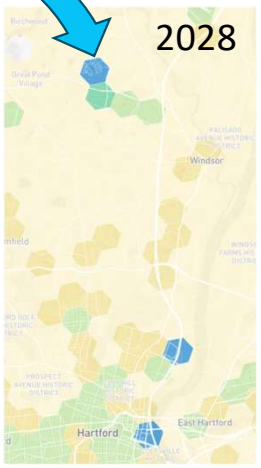
Businesses:

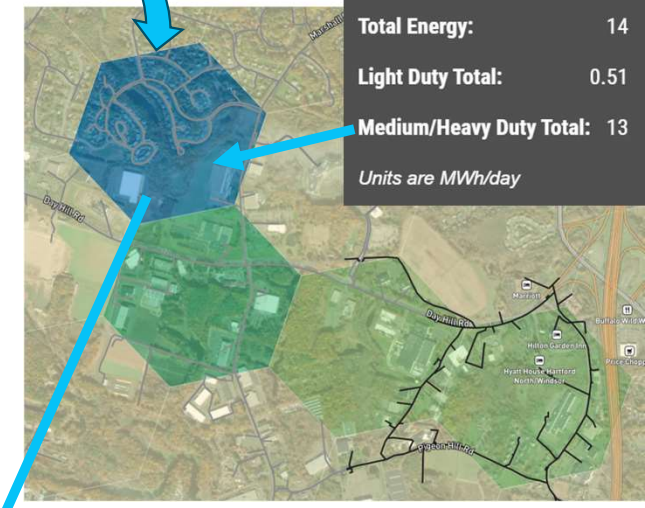
- Amazon Warehouse
- Meijer Distribution Center
- Bridgewater Interiors
- Android Industries
- Ryder Integrated Logistics

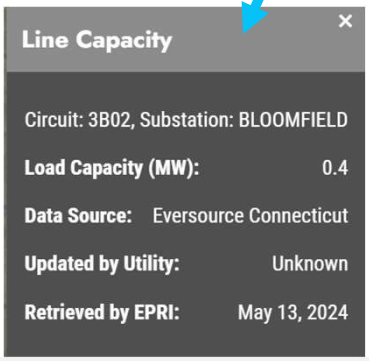
Hex 8 (0.28 mi^2)

eRoadMAP | Grid Hosting Capacity Maps



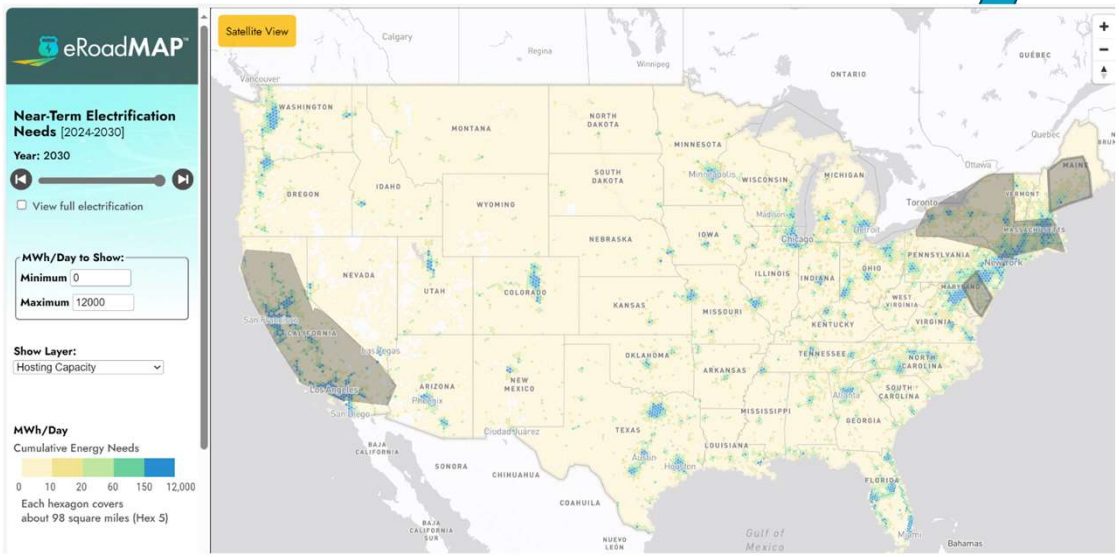






In 2028, 13 MWh (energy) forecast north of Hartford, CT; Eversource showing estimated 0.4MW (power) available. Note, major logistics provider in this area.

eRoadMAP | Grid Hosting Capacity Maps

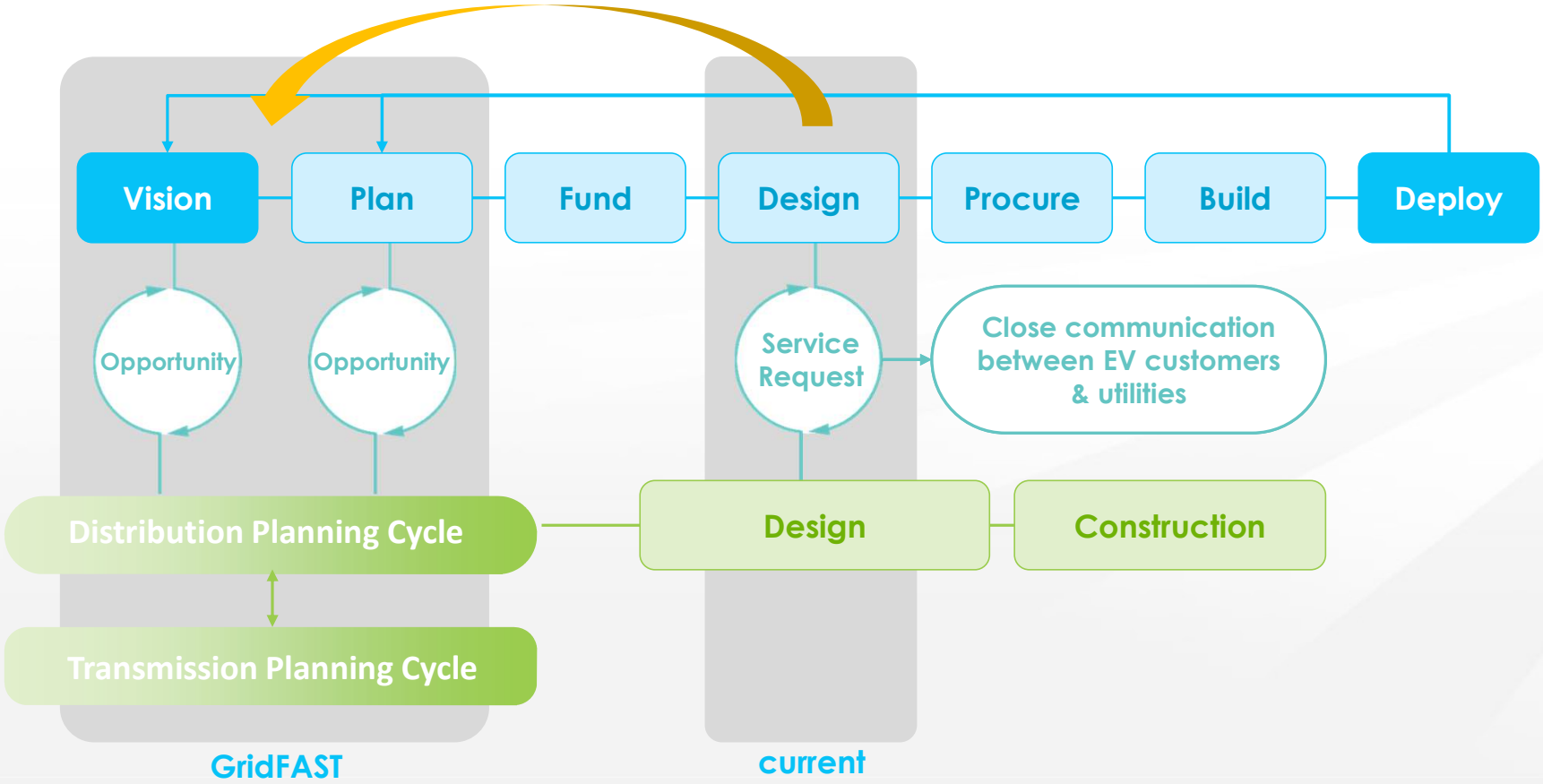


Load Capacity Maps from 14 Utilities include:

- **California**: PG&E, SCE, LADWP
- **Connecticut**: Eversource, United Illuminating
- **Delaware**: Pepco Holdings
- **Maine**: Central Maine Power
- **Massachusetts**: National Grid
- **Maryland:** Pepco Holdings
- **New York**: National Grid, ConEd, Orange & Rockland, Central Hudson, NYSEG, Rochester G&E
- **New Jersey**: Orange & Rockland
- **Rhode Island**: Rhode Island Energy

Grid Interconnection Problem Statement

How might we help EV customers and utilities get ***actionable*** information ***earlier***?



GridFAST | Addressing 15 Pain Points in Grid Interconnection

EVs2Scale 2030

Vision & Strategy

Provide tools to educate fleets and **make the case for electrification**

Help fleets forecast where/when to electrify (beyond 2 years) to **drive more certainty in fleet plans**

Create a standard practice (across utilities) to gather fleet plans early so **utilities can incorporate into D&T planning**

Validate fleet plans so utilities can confidently invest in costly grid upgrades

Help smaller utilities establish EV processes so they can better support EV projects

Plan & Forecast

Kickstart fleet communications with the right utility/POC to **eliminate nonvalue-added fleet efforts**

Educate fleets on electricity and utility processes and programs to **eliminate nonvalue-added utility efforts**

Help fleets gain more accurate insights into grid capacity, upgrade timelines and costs, so they can **select more viable locations**

Help utilities provide real-time, updated feeder capacity data so fleets can **select more viable sites before submitting a formal request**

Help fleets model and calculate charging and power scenarios to **minimize costly and potentially unnecessary grid upgrades**

Provide fleets with smart, interactive tools to alleviate utility bottlenecks (e.g., staff shortages) **without having to wait for a utility engineer**

Funding

Help fleets understand how to qualify/apply for grant and incentive programs so they have **full transparency into the process ahead of time**

Design & Engineering

Create a standardized process for service requests across the utility industry to minimize time-consuming and repetitive workload

Help utilities provide more timeline transparency to fleets (e.g. supply chain delays, resourcing, permits, easements) so **fleets can account for it in their project planning**

Approvals & Procurement

Set a standard for fleet x utility best practices to **minimize back and forth and timeline delays**

EPRI

GridFAST vision

Improve transparency in EV charging planning to inform grid investments and accelerate grid interconnects

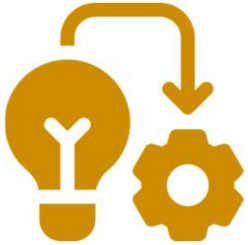
2024-2035 plans defining loads, locations, timing

GridFAST
Secure online data exchange platform

Utility hosting capacity indicating grid readiness, timing to support EV charging loads

How GridFAST works

EVs2Scale 2030

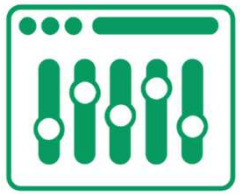


Project Input

EV customers enter their project concepts into GridFAST, and can view hosting capacity maps, if available

Utility Match

GridFAST matches EV projects to the relevant utility to start the exchange based on vetted information



Capacity Information Exchange

GridFAST is an easy and secure system for utilities to provide program and processes info to EV customers

Preparation of Service Request

EV customers finalize project details

Service Request

EV customer information in GridFAST submitted to utility when they're ready to move forward

EV Common Service Application Prototype

EVs2Scale 2030

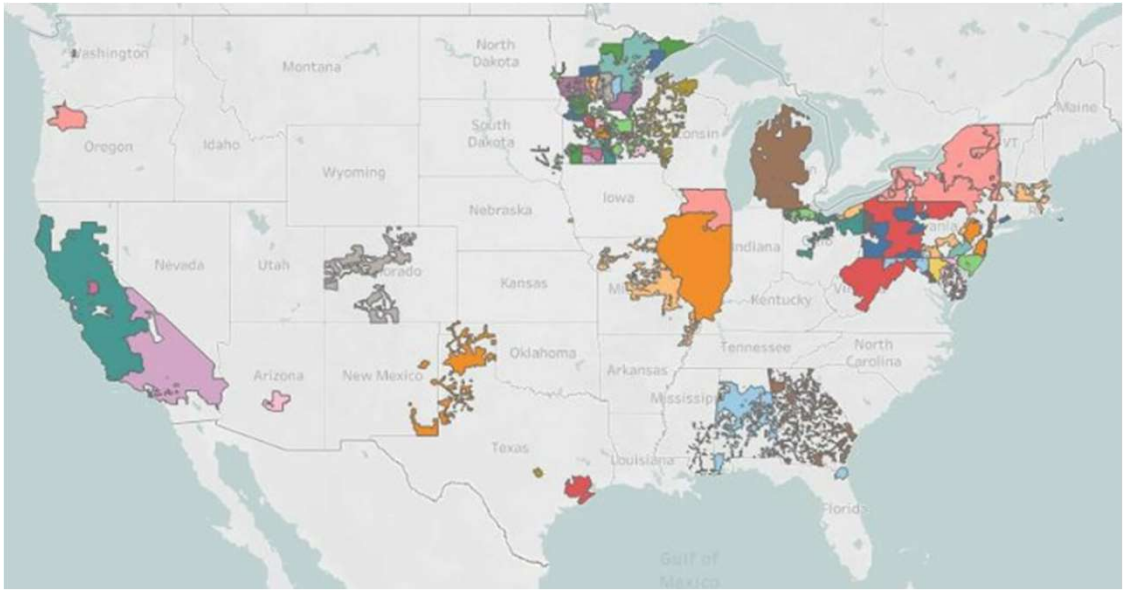
Common Utility Questions

- Customer Contact Info (primary, contractor, energy billing,…)
- Site Address
- Charging Characteristics (charger ownership,…)
- Service and EV Load Info (kW, voltage, panel size,…)
- Document Uploads (site plan,…)
- Project Delivery (ISD,…)

Custom Utility Questions

SCE	ConEd	SMUD	National Grid	PG&E	Exelon
• Meter access details • Total site square footage		• Overhead vs. underground service • Meter access details • On-site generation?		• Request due to natural disaster? • Desired electric rate • Pre-assessment needed? • Building Permit?	

Staged Rollout

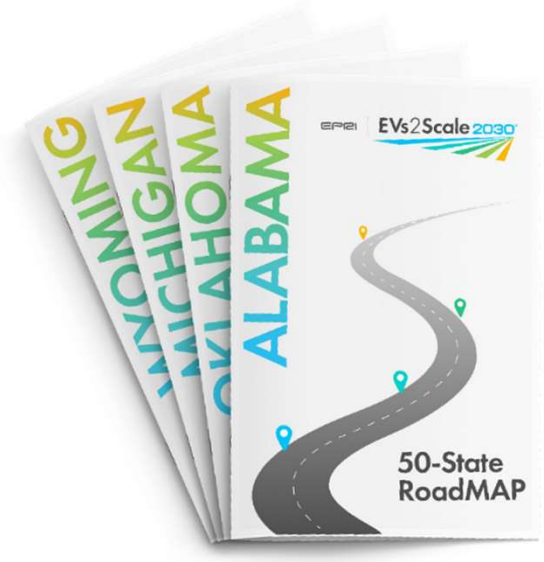


Deployment

- **Proactive campaign to utilities** (onboarding resources, utility training, …)
- **Staged campaign for EV customers**, starting with leading EV customers first
- Continue to refine GridFAST based on user feedback

- **Late 2024:** Early Internal Access for EVs2Scale Member Utilities
- **Early 2025:** Phase 1 Operational Launch for EVs2Scale Members and leading EV customers
- **General Rollout: TBD**

Regulatory/Policy Outreach



COMING In OCTOBER:

A **50-State/National Outreach Package** for regulators, legislators, consumer advocates, and federal agencies that leverages eRoadMAP™ and GridFAST™ to build a case for proactive grid investment that enables timely scale

- 13 states completed
  - AZ, CA, CO, FL, GA, IL, MA, MD, MI, NM, NY, PA, TX
- Previewing with the task force and EVs2Scale members on the best forums and key stakeholders to share with
- Summarizes key messaging
- Coordinating with the EPRI-ATE proactive grid build task force

Released Reports + Tools

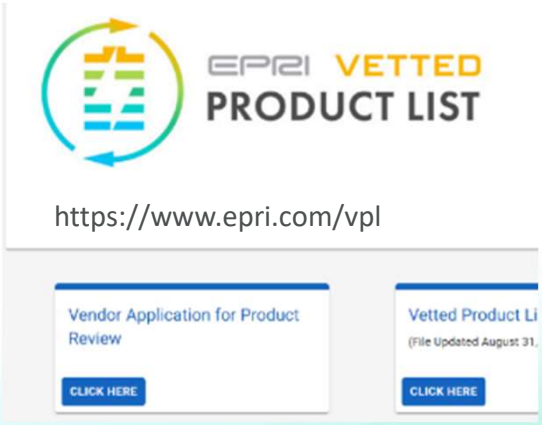
1

EVs2Scale Website

[EVs2Scale2030 | EPRI](https://msites.epri.com/evs2scale2030) --
https://msites.epri.com/evs2scale2030

2

VPL (Vetted Product List)

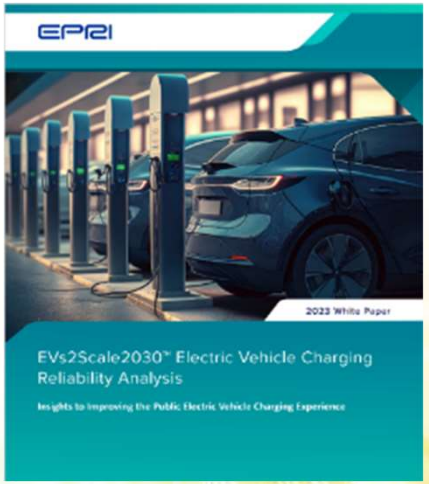


3

Grid Primer

4

EV Charging Reliability Analysis



5

eRoadMAP™

6

EVs2Scale 2030

Thank You

U.S. DEPARTMENT OF ENERGY
Office of Electricity

Flexible EV Charging Service Connections

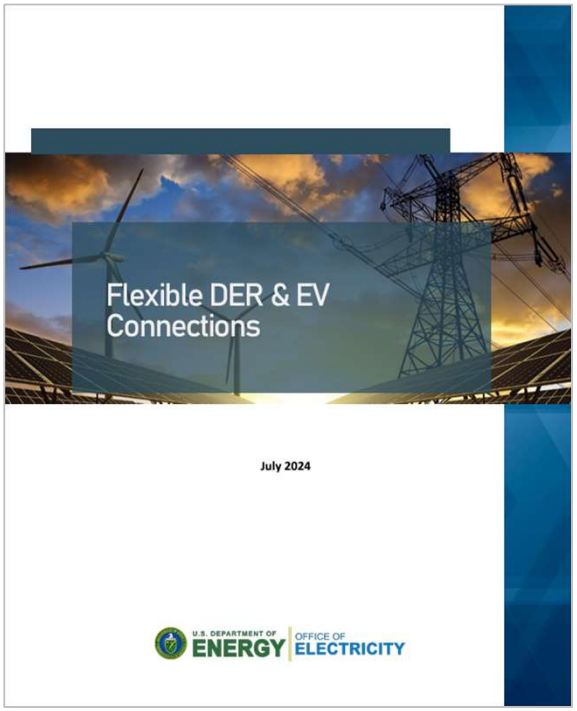
Paul De Martini
Newport Consulting

October 1, 2024

Flexible DER & EV Connections

Flexible connections are an intermediate solution to address constrained distribution feeders

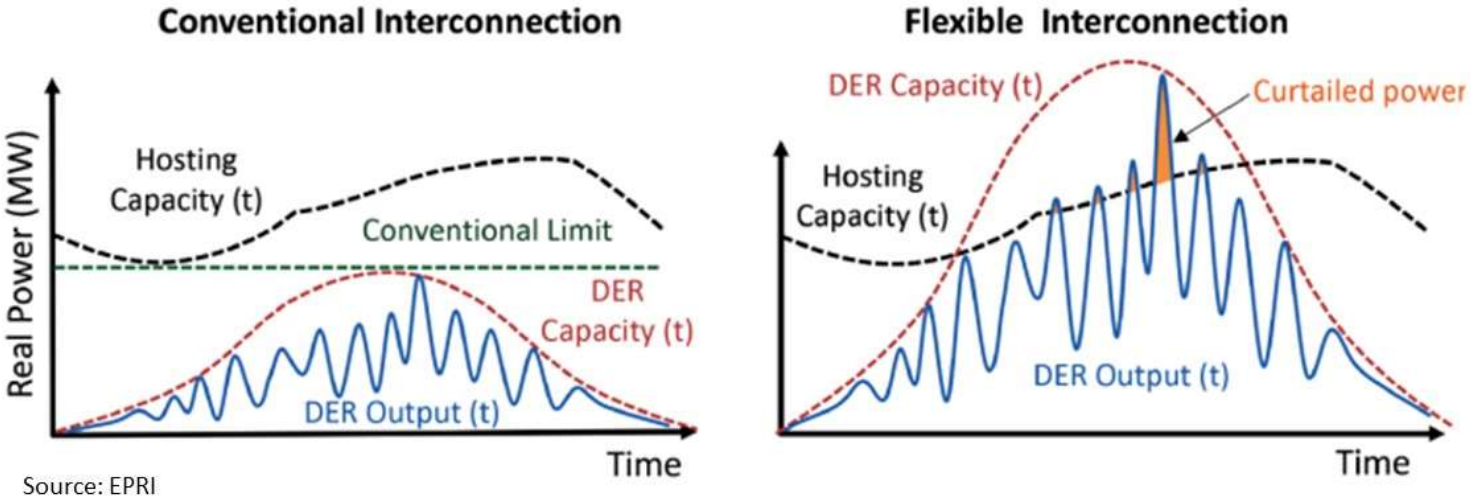
- Introduces and elaborates on three key concepts associated with interconnection strategies for DER and EV charging for constrained distribution:
  - **Dynamic operating envelope**
  - Flexible DER interconnections, and
  - **Flexible EV Charging service connections**.
- Informs regulatory decision processes by presenting emerging flexible connection strategies and case examples
- Provides a strategic framework for enhancing DER integration and electrification.



https://www.energy.gov/sites/default/files/2024-08/Flexible%20DER%20%20EV%20Connections%20July%202024.pdf

Flexible Connections

Flexible connections are methods to improve distribution system utilization allowing more DER interconnections and service connections for EV charging while lowering the cost of integration



Source: EPRI

Flexible connection strategies involve shaping DER and EV charging exports and imports to remain within distribution system operating parameters (e.g., capacity limits, voltage limits) during periods when distribution systems are constrained

Hosting Capacity Analysis vs. Dynamic Operating Envelope

Hosting Capacity Analysis

- Hosting capacity refers to the amount of DER/EV charging energy that can be integrated into a distribution system before requiring control adjustments of DERs or distribution infrastructure upgrades to maintain safety and reliability.
- Hosting capacity is based on three key operating parameters:
  - Thermal Capacity
  - Voltage Limits
  - Protection Coordination
- Hosting capacity analysis typically provides **a static assessment considering steady-state conditions such as peak load scenarios** for DER/EV Charging integration.

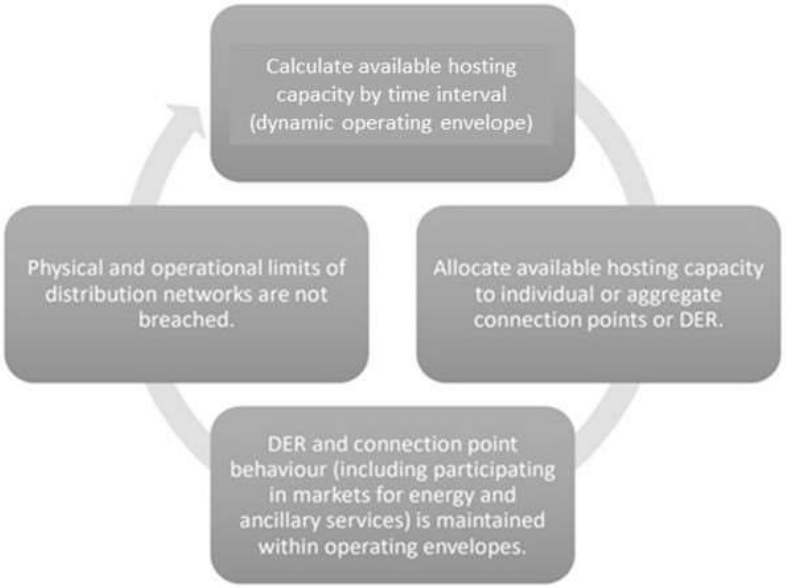
Dynamic Operating Envelope

- A dynamic operating envelope establishes the **upper and lower bounds for a given time interval for allowable import or export power** at a point of interconnection.
- These **upper and lower bounds can change from one time interval to the next**, based on system conditions and anticipated constraints.
- Dynamic operating envelopes introduce a more sophisticated method to determine available energy export/import limits to connect new distributed generation, storage, and larger EV charging loads based on forecast and real-time grid conditions.
- Forecasted power flows are typically used since real-time granular distribution grid data availability is limited.

Dynamic Operating Envelope

The variable operating limits for DER export/EV charging are the dynamic operating envelope

- Determining operating envelopes involves **identifying the specific locations of DER/EV Charging connection points** within the network to understand how **real and reactive power exports and/or imports** at these points will **affect the voltage, thermal, and protection constraints**.
- The operating envelope for each DER export/EV charging load is calculated for **each time interval, typically hourly over a year**.
- This results in seasonal, monthly, or daily **time-specific operating limits for DER/EV charging based on available distribution capacity at each time interval**.
- The initial use of dynamic operating envelopes today is done prospectively through **customer-controlled time-based import/export limits or via utility direct-controlled curtailment and derates** of DERs/EV Charging.



Source: Australian Renewable Energy Agency (ARENA)

Flexible Interconnections/Service Connection Approaches

Customer Controlled Solutions

- Customer-controlled solutions **empower end-users to actively manage their DER/EV Charger in response to dynamic operating envelopes provided by the distribution utility**.
- These solutions involve **customer control systems that automatically adjust** electricity consumption and energy exports to align with the dynamic operating envelope parameters.
- This can **enable faster and lower-cost service connections**, particularly for EV fleet operators and large public charging facilities.

Utility Direct Controlled Solutions

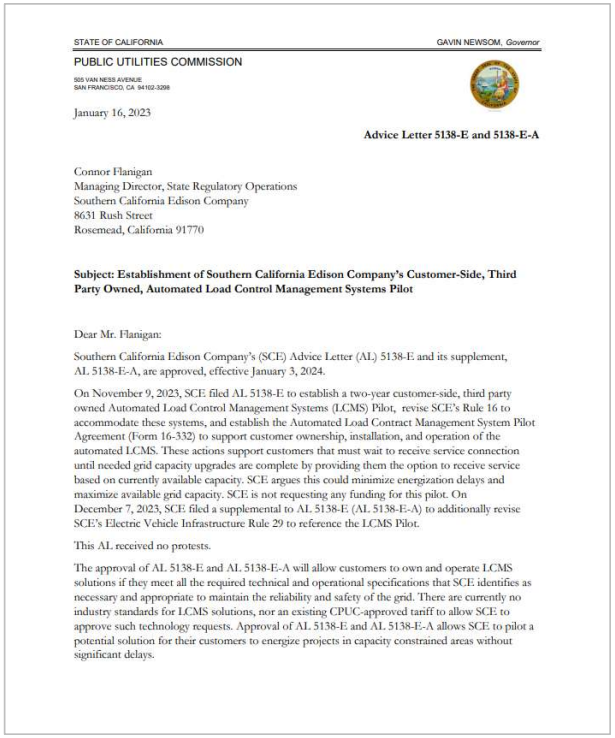
- Utility-controlled flexible interconnection and EV flexible service connections involve **utility curtailment of DER/EV Charging based on the grid's capacity**.
- Utility uses its operational system analytics and **control capability to interface with customers' smart inverters, PCS systems, EV telematics, and/or smart chargers**.
- A method is needed to determine **how much reduction (in charging or energy export) is required and from which DER/EV charger**.

Customer Controlled: SCE Load Control Management Systems (LCMS) Pilot

LCMS Pilot allows customers to manage their EV charging demand within limits set by SCE

- Southern California Edison (SCE) has implemented a two-year Automated LCMS Pilot, designed to allow customers to receive electrical service connection based on the currently available grid capacity instead of delaying the customer EV charging interconnection until required grid upgrades are completed to support full capacity charging.

- The customer's LCMS can reduce charging levels, disconnect specific devices, or stop charging at specific chargers to remain within distribution grid operating limits. Customers are responsible for purchasing, installing, and operating their LCMS.



STATE OF CALIFORNIA — GAVIN NEWSOM, *Governor*

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

January 16, 2023

Advice Letter 5138-E and 5138-E-A

Connor Flanigan
Managing Director, State Regulatory Operations
Southern California Edison Company
8631 Rush Street
Rosemead, California 91770

Subject: Establishment of Southern California Edison Company's Customer-Side, Third Party Owned, Automated Load Control Management Systems Pilot

Dear Mr. Flanigan:

Southern California Edison Company's (SCE) Advice Letter (AL) 5138-E and its supplement, AL 5138-E-A, are approved, effective January 3, 2024.

On November 9, 2023, SCE filed AL 5138-E to establish a two-year customer-side, third party owned Automated Load Control Management Systems (LCMS) Pilot, revise SCE's Rule 16 to accommodate these systems, and establish the Automated Load Contract Management System Pilot Agreement (Form 16-332) to support customer ownership, installation, and operation of the automated LCMS. These actions support customers that must wait to receive service connection until needed grid capacity upgrades are complete by providing them the option to receive service based on currently available capacity. SCE argues this could minimize energization delays and maximize available grid capacity. SCE is not requesting any funding for this pilot. On December 7, 2023, SCE filed a supplemental to AL 5138-E (AL 5138-E-A) to additionally revise SCE's Electric Vehicle Infrastructure Rule 29 to reference the LCMS Pilot.

This AL received no protests.

The approval of AL 5138-E and AL 5138-E-A will allow customers to own and operate LCMS solutions if they meet all the required technical and operational specifications that SCE identifies as necessary and appropriate to maintain the reliability and safety of the grid. There are currently no industry standards for LCMS solutions, nor an existing CPUC-approved tariff to allow SCE to approve such technology requests. Approval of AL 5138-E and AL 5138-E-A allows SCE to pilot a potential solution for their customers to energize projects in capacity constrained areas without significant delays.

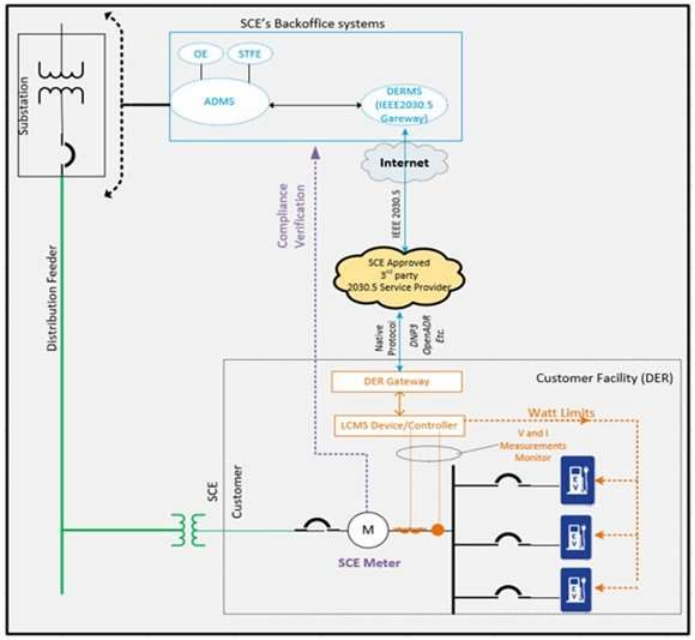
Establishment of Southern California Edison Company's Customer-Side, Third Party Owned, Automated Load Control Management Systems Pilot (Advice Letter 5138-E and 5138-E-A), January 2023. Available online: https://www.sce.com/regulatory/advice-letters

SCE Load Control Management Systems (LCMS) Pilot

LCMS Pilot allows 2 options for customers to receive operating limits from SCE

- The customer LCMS technology requires certification from Nationally Recognized Testing Laboratories (NRTLs) for performance validation.
- Customer has 2 options:
  - **Localized Autonomous LCMS**: Operates independently without real-time external communication, using pre-programmed limits to manage power usage. Under the localized autonomous option, authorized personnel can program the customer's LCMS locally to implement the SCE-provided limits, or it can be programmed remotely via approved communications.
  - **Utility Communication-Based LCMS**: Receives power limits in real-time or day-ahead from SCE through communication protocols, which informs a customer's LCMS. Under the utility communications-based option, the LCMS receives power limits From SCE through communication channels utilizing protocols such as IEEE 2030.5.

LCMS Pilot Conceptual Architecture

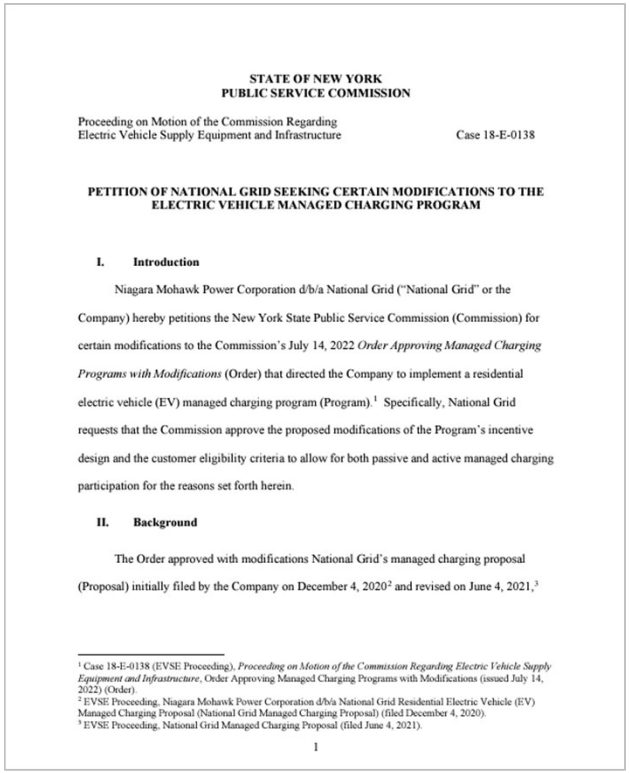


Source: SCE

Utility Controlled: National Grid EV Charge Smart Plan Demo

National Grid EV Charge Smart Plan program employs active and passive managed charging strategies

- National Grid aims to enhance the connection and management of EV charging on the grid. The demonstration is focused on **light-duty vehicles' smart charging on cars and at residences**.
- Active managed charging involves real-time utility control over charging activities, while passive managed charging relies on time-of-use rates and customer behavior to shift charging to off-peak periods.
- National Grid's EV Charge Smart Plan leverages advanced technology and a subscription-based model to manage and optimize EV charging. **The architecture integrates telematics from EV manufacturers and networked Electric Vehicle Supply Equipment (EVSE) to provide real-time data and control over EV charging activities.**



STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Proceeding on Motion of the Commission Regarding
Electric Vehicle Supply Equipment and Infrastructure — Case 18-E-0138

PETITION OF NATIONAL GRID SEEKING CERTAIN MODIFICATIONS TO THE ELECTRIC VEHICLE MANAGED CHARGING PROGRAM

I. Introduction

Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the Company) hereby petitions the New York State Public Service Commission (Commission) for certain modifications to the Commission's July 14, 2022 *Order Approving Managed Charging Programs with Modifications* (Order) that directed the Company to implement a residential electric vehicle (EV) managed charging program (Program).[1] Specifically, National Grid requests that the Commission approve the proposed modifications of the Program's incentive design and the customer eligibility criteria to allow for both passive and active managed charging participation for the reasons set forth herein.

II. Background

The Order approved with modifications National Grid's managed charging proposal (Proposal) initially filed by the Company on December 4, 2020[2] and revised on June 4, 2021,[3]

[1] Case 18-E-0138 (EVSE Proceeding), *Proceeding on Motion of the Commission Regarding Electric Vehicle Supply Equipment and Infrastructure*, Order Approving Managed Charging Programs with Modifications (issued July 14, 2022) (Order).
[2] EVSE Proceeding, Niagara Mohawk Power Corporation d/b/a National Grid Residential Electric Vehicle (EV) Managed Charging Proposal (National Grid Managed Charging Proposal) (filed December 4, 2020).
[3] EVSE Proceeding, National Grid Managed Charging Proposal (filed June 4, 2021).

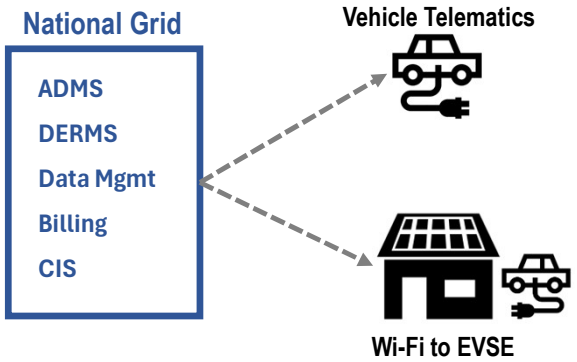
1

National Grid, National Grid Petition Seeking Certain Modifications to EV Managed Charging Program, New York Public Service Commission, Case 18-E-0138, 2024. https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BF0D6798D-0000-CC11-BE20-7BC34F9C0DB1%7D

Utility Controlled: National Grid EV Charge Smart Plan Demo

EV Charge Smart Plan program employs active and passive managed charging strategies for LDVs

- National Grid **utilizes EV manufacturers' telematics systems** (i.e., BMW & Tesla) to gather real-time data on EV charging sessions and **precise control over the charging process**, enabling smart scheduling to maximize off-peak charging and minimize grid constraints.
- Program **also controls networked EVSEs connected to home Wi-Fi**. National Grid sends commands to the charger to start or stop charging based on grid conditions and predefined schedules.
- National Grid's **data management system collects and analyzes charging data to optimize performance** for reliability and make necessary **adjustments to improve customer satisfaction**.
- The program has successfully demonstrated its technical capabilities and National Grid has proposed refinements to improve the program's effectiveness.



However, the program has faced and continues to address several technical challenges, including data loss from EV telematics and EVSE integrations, telecommunications failures, inconsistent smart charging performance, and interoperability issues following over-the-air software updates from EV or EVSE manufacturers.

Utility Curtailment Determination Methods

Utility-controlled solutions require the utility to determine how much reduction is needed from which DER/EV charger

Last-in-first-out (LIFO)

- EV Charger that applies for service connection first is curtailed last. This approach **prioritizes EV Chargers that have applied for service connection earlier**, affording them lower curtailment compared to those EV Chargers that connect later.
- By reducing the risk of curtailment for early applicants, this policy encourages early development of EV Charging facilities. However, **as more EV Chargers are added**, the LIFO mechanism could disadvantage **newer connections, potentially making them economically unfeasible** and limiting network utilization.

Pro Rata

- In this approach, **all EV Chargers in an area experience a proportionate reduction** in their energy consumption from the grid.
- This approach can **potentially enable more EV Chargers to function**, albeit at a reduced charging rate as compared to the LIFO approach.
- The **downside is that as EV Charger adoption rises, the frequency of distribution constraints and curtailments may grow**, and EV owners may have less confidence in the availability and capability of impacted chargers.

Both approaches are relatively immature for DER & EV charging curtailment with flexible connections

Thank you

Contacts:

Rosalie Yu, ICF rosalie.yu@icf.com

Paul De Martini, Newport Consulting paul@newportcg.com

More information is available on the DOE Distribution Grid Transformation website: https://www.energy.gov/distribution-grid

Questions and Answers

Moderator: Commissioner Katherine Peretick, Michigan Public Service Commission

Guest Speaker

- **Dhananjay "DJ", Anand, Joint Office of Energy and Transportation (JOET)**
- **Britta Gross, Electric Power Research Institute (EPRI)**
- **Paul De Martini, Newport Consulting**

Member EV Roundtable

Please share the situation from your perspective:

- How are or can utility regulators play a role in speeding up service load request timelines?
- Are regulators putting in any rules to help accelerate the timelines?
- How are you working with the state DOTs? Are they reaching out about NEVI and CFI award timeframes and needs?
- How are commissions considering possible EVSE public/fleet queue order priority rules?
- How are commissions handling EVSE/fleet requests for remaining distribution capacity from a cost perspective?

Upcoming 2024 EVSWG Topic

Date (Last Tues. of the month)	Future 2024 EV SWG Topics
October 29, 2024	Vehicle to Grid (V2G)
December 10, 2024	Innovative Charging Solutions

Next EV SWG Meeting: **October 29**, 3:00-4:30 pm ET via Zoom

WWW.NARUC.ORG/CORE-SECTORS/ENERGY-RESOURCES-AND-THE-ENVIRONMENT/ELECTRIC-VEHICLES/