

Electric Transportation



2024 Proposed Deliverables

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Abstract

This presentation provides a summary of key projects, supplementals, and proposed deliverables for the electric transportation program during 2024.

Keywords

Deliverables

Electrification

Electric Transportation

Project Plan

EPRI Electric Transportation

EPRI Commitment

EPRI Electric Transportation – EVs2Scale2030

Initiative Name	What you gain/why it matters	EPRI contact
EVs2Scale2030	<p>The “EVs2Scale2030” initiative is a three-year commitment focused on leveraging the scale of the utility industry to galvanize and align all market stakeholders as EV goals increasingly target 50% EV market share by 2030. The transition of 270 million cars, buses, and trucks to run on a new “fuel” is unprecedented and challenging. The issues are complex. Preparing for large-scale transportation electrification will require:</p> <ol style="list-style-type: none">1. Unprecedented collaboration, including heightened visibility into the electrification plans of all the major EV stakeholder groups2. Redesigned processes, useful tools, and as much standardization as possible to simplify the planning and complex interactions between major stakeholder groups3. An evaluation of the current regulatory environment that may affect the pace and scale of activities required to meet 2030 targets <p>Utilities will have a much-improved ability to plan for wide-scale electrification, validated data and best practices to inform grid readiness and regulatory processes, and will be able to provide improved support and seamless connection for EV drivers and fleet operators in their service territories.</p>	Britta Gross

EPRI Electric Transportation **2023 PROPOSED DELIVERABLES**

EPRI Electric Transportation – Proposed Deliverables

Project set details – Strategic Intelligence (18X), 1 of 4

EV markets/hot topics today, technology and future vision and trends tomorrow	What you gain/why it matters	EPRI contact
Quarterly EV market webcast	Current insights into EV and infrastructure market trends	Dan Bowermaster
Ad-hoc "one pager" summaries	Immediate perspective on important issues	Dan Bowermaster
Onsite Executive briefings	Provides in person executive level perspective	Dan Bowermaster
EV 101 webcast	Ability to quickly educate those new to EVs and EV charging	Dan Bowermaster
ET strategy paper	Offer vision, perspective, and insight on possible ET futures	Dan Bowermaster
Monthly newsletter	Whitty, easy to read perspective on recent ET subjects with links to research and more information	Salsabil Salah
Quick Take- Future Charging Infrastructure	Quick Take on what future charging infrastructure looks like	Jamie Dunckley
Quick Take - King County Metro Bus Project	Quick Take on what was learned for bus projects	Jamie Dunckley

EPRI Electric Transportation – Proposed Deliverables

Project set details – Strategic Intelligence (18X), 2 of 4

EV markets/hot topics today, technology and future vision and trends tomorrow	What you gain/why it matters	EPRI contact
Quick Take- Charlie Allcock Piece	Quick take on MDHD industry perspective	Jamie Dunckley
Five-year future EV outlook	Learn about specs of announced EVs, including battery size and charging power to plan and support your customers	Jamie Dunckley
EV energy consumption sankey chart	Understanding energy needs for 100% electrification	Salsabil Salah
OEM commitments	Understanding EV market trends & industry highlights	Salsabil Salah
Future Technology Executive one-page overview	Stage gate perspective on future ET tech (wireless, solid state batteries, autonomous vehicles, V2G, etc.)	Mariela Arceo
Used EVs (project with GW)	Engaging with GW to push out a deliverable for EVS/other conferences highlighting used EVs over time. Currently, deliverables timeline is unclear.	Allan Zhao / Erin Costigliolo / Jamie Dunckley

EPRI Electric Transportation – Proposed Deliverables

Project set details – Strategic Intelligence (18X), 3 of 4

Consumer guides: LDVs, C&I fleets and charging options	What you gain/why it matters	EPRI contact
Consumer’s guide to commercial and industrial ET	Easy-to-read technical overview of C&I vehicles including charging power (kW) and consumption (kWh)	Mark Kosowski
Consumer’s guide to plug-in EVs	Easy-to-read, glossy overview of available EVs for utility customers. Working on Web and phone version	Jamie Dunckley
Online Guide to Consumers guide to EVs	Filterable list of EVs that are available together with their performance characteristics	Salsabil Salah
Consumer Guide to Commercial and Industrial On-Road Electric Vehicles	Electricity can move materials, goods, and people through many means of transportation. Consumers can learn about the technology (with Spanish translation available) from the guide organized by commercial and industrial market segment and type of equipment.	Mariela Arceo and Kristen Bush

EPRI Electric Transportation – Proposed Deliverables

Project set details – Strategic Intelligence (18X), 4 of 4

Working councils for: infrastructure, bus & truck, and utility-only fleets	What you gain/why it matters	EPRI contact
Infrastructure Working Council (IWC)	Discuss and debate current issues with automakers and key stakeholders	John Halliwell
IWC summary newsletters (3)	Help understand the latest EV market trends and counterpoints at IWC	John Halliwell
Electric Bus and Truck Working Council	Discuss and debate current issues with automakers and key stakeholders	Mark Kosowski
Charging codes and standards	What you gain/why it matters	EPRI contact
Standards- J1772	Helps market scale	John Halliwell
Standards- Summary report	Help utility and other key stakeholders understand the latest in EV standards and how it may impact business	John Halliwell
Standards- J3105 and J2954-2 Bus and Truck charging	Helps market scale	Mark Kosowski

EPRI Electric Transportation – Proposed Deliverables

Project set details – Technical R&D (18Y), 1 of 3

Charging technology and trends	What you gain/why it matters	EPRI contact
Electric vehicle charging infrastructure technology update	Educates on state of the market and charging technology	John Halliwell
Generation of opensource green signal	One OEM is interested in testing this to enable use of renewables in charging algorithms. Opensource green signal will allow many small, medium companies to easily offer this technology which will help the load shapes on the grid and help to consume renewable power when available. Initially to be demonstrated for charging, but to be used later for other systems. Additional insights in follow-on projects to provide a more fine-tuned signal to support renewables that are generated locally.	Viswanath Ananth (Vis)
Future-proofing charging sites: Steps to take and prepare for public and workplace charging	Learn from previous installations to improve customer satisfaction	Mariela Arceo
EV Infrastructure Heat Maps	Understanding of current market dynamics and impacts and regional/policy differences	Kristen Bush
Charging Reliability (EVs@Scale 2030)	Tackling the problem of reliability for consumer charging via the larger EV initiative. Long term project.	Allan Zhao / Erin Costigliolo

EPRI Electric Transportation – Proposed Deliverables

Project set details – Technical R&D (18Y), 2 of 3

Pilots, demonstrations, and assessments	What you gain/why it matters	EPRI contact
Summary of key projects, supplementals, and one-offs	Summarizes learnings from last 24 months supplementals and one-offs	Dan Bowermaster
Summary of electric transit bus pilots	Learn from existing bus pilots to make your pilots smoother, implement quicker, and reduce costs	Allan Zhao
Charging for Hard to Reach Spaces	Learning from a pilot in Southern California to see how to creatively use existing infrastructure to add charging options	Sunil Chhaya
AC V2G demonstration at SCE with Stellantis Vehicle	SCE is updating standards for the AC Systems and setting/verifying interconnection requirements based on Open Standards (IEEE 2030.5) using Eaton EVSE and Stellantis PEV. Open standards will assist interoperability, scalability.	Viswanath Ananth (Vis)

EPRI Electric Transportation – Proposed Deliverables

Project set details – Technical R&D (18Y), 3 of 3

Grid integration technology research and development	What you gain/why it matters	EPRI contact
Advanced infrastructure development and testing	Lower cost and improved reliability helps scale	John Halliwell
Battery impact assessment for V2G services	Realistic assessment of EVs as resources. Will publish SPIN.	Sunil Chhaya
Other Commercial and Industrial ET research and support - R&D of premarket tech including marine, mining, rail, etc.	Helps develop the ET technology as well as quantify the potential benefits. One sample deliverable is the annual C&I ET report.	Mark Kosowski
Load shape analysis	What you gain/why it matters	EPRI contact
SCL 2 project : 1-115861-01-01	Python expertise, EV load shape expertise, request from Seattle City of Light	Nicolas Sockeel
Load shape tool development : 1-116288-01-01	Python expertise, EV load shape expertise, produce more realistic insight of real world EV charging. It is usefull for future DoE project and partners	Nicolas Sockeel

EPRI Electric Transportation – Proposed Deliverables

Project set details – Technical Deployment (18Z), 1 of 2

Localized EV sales today and future volume scenarios	What you gain/why it matters	EPRI contact
Localized current/ historic light-duty EV registrations	Learn how many light duty EVs are selling in which counties in your service territory	Marcus Alexander /Sachindra Dahal / Salsabil Salah
Utility specific dashboard (EV sales, charging infrastructure installed, EV available, etc.)	Quick overview of state of EV industry in your service territory	Salabil Salah
EV Infrastructure Heat Maps	Understanding of current market dynamics and impacts and regional/policy differences	Kristen Bush
Localized light-duty EV sales and related load projections: scenario analysis	Understand the high-level impacts of EV market expansion, specifically in your territory.	Rob Schurhoff / Sachindra Dahal

EPRI Electric Transportation – Proposed Deliverables

Project set details – Technical Deployment (18Z), 2 of 2

Charging infrastructure: Grid impacts	What you gain/why it matters	EPRI contact
Localized charging infrastructure maps and data analysis (Plugshare)	Understand charging infrastructure deployed over time in your service territory	Kristen, Mariela, Salsabil
Localized grid impact: Hotspotter tool and analysis	Understand grid impact of EV charging on circuit transformers in service territory	Sachindra Dahal
Charging infrastructure: Environmental benefits and costs	What you gain/why it matters	EPRI contact
Proposed: Localized environmental benefits	Understand environmental impact of EV charging in service territory	Marcus Alexander

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Key proposed shared deliverables, 1 of 2

Name	What you gain/why it matters	EPRI contact	EPRI partner program
DC fast charging and storage integration – demonstration, data collection, and analysis	Understand costs, benefits, and challenges of DC fast charging	Watson Collins	DC fast charging and storage integration – demonstration, data collection, and analysis
Battery pricing – Energy Storage Cost Analysis	Understanding current and potential future battery costs	Marcus Alexander	Battery pricing – Energy Storage Cost Analysis
Charging infrastructure on internet (COIN)	Address barrier to scale (high cost, low availability, cyber security, etc.). Funded by TI.	Sunil Chhaya	Charging infrastructure on internet (COIN)
Electrification of Construction Technologies	Insight into the emerging market of electrified construction equipment	Mark Kosowski	Electrification of Construction Technologies
Electrification of Agriculture Technologies	Insight into the emerging market of electrified agricultural equipment	Mark Kosowski	Electrification of Agriculture Technologies
Emerging Technology Overview: Electric Marine	Insight into the emerging market of electrified marine transportation	Mark Kosowski	Emerging Technology Overview: Electric Marine
Emerging Technology Overview: Electric Aviation	Insight into the emerging market of electrified aviation	Mark Kosowski	Emerging Technology Overview: Electric Aviation

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Key proposed shared deliverables, 2 of 2

Name	What you gain/why it matters	EPRI contact	EPRI partner program
Fleet Electrification Supplemental	Pairs potential medium and heavy duty vehicle charging load shapes with analysis on the readiness of the distribution system to support fleet electrification loads.	Jeremiah Deboever / Jennifer Kwong	Fleet Electrification Supplemental
Net Zero Strike Team	- Strategic planning for EPRI internal net-zero goals	Morgan Scott/ Sara Beaini	Net Zero Strike Team
Electrification Impacts and Benefits in Low-Income Communities	Identify how energy stakeholders are approaching and programmatizing electrification of transportation and buildings equitably - Future of electrification for low-income and priority communities	Ben Clarin	Electrification Impacts and Benefits in Low-Income Communities
Battery supply chain	US supply chain for EV battery critical minerals	Salsabil Salah	Battery supply chain
Sustainability Aspects of the Lithium Ion Battery Supply Chain	Lithium ion batteries (LIBs) are a key technology for decarbonizing the transport sector and for transitioning to a low-emissions power system. This work covers efforts by researchers, policy experts, manufacturers, and industry organizations to address key materials adequacy, environmental impacts, and human rights issues involved in producing lithium ion batteries.	Mariela Arceo/ Stephanie Shaw	Sustainability Aspects of the Lithium Ion Battery Supply Chain

EPRI Electric Transportation

Key supplemental projects, 1 of 3

Name	What you gain/why it matters	EPRI contact
DC-as-a-service, Phase 2	Do demonstration and understand costs, benefits, and challenges of DC-as-a-service	Watson Collins
eTRUC - Research Hub for Electric Technologies in Truck Applications (RHETTA)	The purpose of the project is to perform applied research and development (AR&D) and technology demonstration and deployment (TD&D) activities. The research hub will engage stakeholders to advance high power charging systems and to plan, design, and deploy innovative corridor charging strategies that extend the range and increase the operational flexibility of battery electric trucks.	Watson Collins
Model Design for Bus Depot	Technical assessment of the bus charging depot including structural infrastructure, power electronics, and grid interface. It will result in development of schematic designs for an initial charging, testing and commission station.	Watson Collins, John Halliwell, Mark Kosowski

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Key supplemental projects, 2 of 3

Name	What you gain/why it matters	EPRI contact
Commissioning Support for King County Metro Transit - South Base Test Charging Area	Project focuses on the development of specifications, commissioning methods, procedures and practices to enable the implementation and operation of interoperable charging infrastructure with the buses procured by KCM.	Watson Collins, Mark, John
EV charging infrastructure program services (ETIPS)	Strategize, establish, and implement utility specific EV charging programs	Dan Bowermaster / Andra Rogers
Smart charging – Open Vehicle-Grid Integration Platform (OVGIP) -- Completed 2 years ago. Talk about next generation.	Understand costs and consequences of smart charging, including grid integration directly with the automobile manufacturers	Sunil Chhaya
V2X integration requirement for backup power.	California IOUs and Ford are asking for this work.	Sunil Chhaya
V2X supplemental	Inform members how to provide backup power for residential service.	Sunil Chhaya

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Key supplemental projects, 3 of 3

Name	What you gain/why it matters	EPRI contact
Rockford Airport Change Over to Electric Transportation ComEd	Understand electrification change over	Mark Kosowski
Electric Maid of the Mist Data Analysis NYPA	Understand ship data and analysis	Mark Kosowski
USCAR, GITT, 21CT- DOE programs	Informed about the Government Programs	Mark Kosowski
Electric School Bus Demonstration, Dominion, Richmond Va	Understand costs and consequences of electrifying school buses	Mark Kosowski
EVs2Scale - 50 State National Outreach Package	The policy/reg workstream of the EVs2Scale 2030 Initiative will produce 50 individual state documents/ppt decks/interactive pdf (final deliverable form is still TBD) that will showcase the data that highlights the need for proactive grid build. By including data points on economic development opportunities, in-state revenue opportunities, takeaways from the eRoadMap and a framework for how states can approach the issue, states will have a comprehensive picture of what is at stake in meeting 2030 goals for transportation electrification and the risks of inaction.	Katherine Stainken

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Key government projects

Name	What you gain/why it matters	EPRI contact
DC Conversion Equipment Connected to the Medium-Voltage Grid for XFC	Provides foundational elements to supporting the widespread use of plug-in electric vehicles. The Project technologies will reduce the grid impacts from XFC in several ways.	Watson Collins
Virtual Wide Area Microgrid (VWAM)	Understanding of vulnerabilities and disaster readiness in DER virtual management.	Sunil Chhaya

EPRI Electric Transportation **WISH LIST DELIVERABLE SPECIFICS**

Wish List / Possible Projects

Name	What you gain/why it matters	EPRI Contact
Proposed: Evaluate DC fast charging infrastructure connectivity.	Understanding DCFC communication reliability and effectiveness for commercialization.	Watson Collins
Proposed: DCFC Integration in highway corridor.	Perspective of integration and effectiveness of public DCFC	Watson Collins
Proposed: high power DC fast charging technical and cost analysis, mapping, scaling, auto OEM integration	Improves utility grid planning	Watson Collins
Proposed: Infrastructure cost impact model (rates, demand charges, installation, technical mitigation costs and benefits)	Understand costs, benefits, and challenges of EV charging	Watson Collins
Proposed: Modeling of MD/HD Truck Technologies	Foundation for market integration and adaptation of MD/HD	Marcus Alexander
Proposed: HD Charging utility cost study	Budgetary estimations of depot/en-route HD charging	Marcus Alexander
Proposed: Evaluate MCS charging infrastructure integration and hardware.	Design and performance metrics for future MCS integration efforts	Andra Rogers
Proposed: transmission impact of EV charging	Learn revised impact of EV charging on transmission grid	Watson Collins/Shawn Tuyuri

Wish List / Possible Projects

Name	What you gain/why it matters	EPRI Contact
Affordable Public L2s at Scale	Best Practices and Innovations to Minimize \$/port of public L2s	Shaun Tuyuri/Jeff Lehman
Over the Road Charging Infrastructure Block Analysis	How will high power charging infrastructure long haul work	Shaun Tuyuri/Marcus Alexander
MDHD charging gap analysis	National Assessment of MDHD charging needs	Shaun Tuyuri/Marcus Alexander
What can EV Charging Industry learn from Solar?	EV charging sites use much of the same hardware as the solar industry. The solar industry is successfully navigating a huge scale up. What can we learn from their experience?	Shaun Tuyuri/Wayne Li
Hotspotter upgrade to include Loss of Life analysis	Hotspotter identifies overloads today. The size and duration of overloading can be used to identify loss of life impacts that will inform transformer fleet failure rates.	Sachindra Dahal/Jouni Peppanen
Hotspotter upgrade to include weather factors in loss of life	Once Hotspotter can calculate loss of life from thermal degradation, further analysis can estimate how temperature impacts EV charging and thermal aging of assets.	Sachindra Dahal/Jouni Peppanen
Tx Trucks - DOE funding application	Detailed analysis of H2 vs BEV for MDHD, projections of future technology performance, analysis of T&D impacts of 80% penetration	Shaun Tuyuri
Evolving DCFC load shapes of big packs and 800V batteries	DCFC load profiles have load diversity because of how battery packs charge. This diversity informs customer service equipment designs. How will the evolving EV fleet change these load profiles and equipment needs?	

Wish List / Possible Projects

Name	What you gain/why it matters	EPRI Contact
V2G Strategic Overview	Summarize V2G today and where it might be heading to inform next steps, identify gaps	Shaun Tuyuri/Sunil Chhaya/John Halliwell
V2G with Nikola Motors	Heavy duty EV V2G opportunity and technology assessment. APS and SRP both are intersted.	Sunil Chhaya
Proposed: Bus transit system load shape modeling - converting GTFS schedules into load shapes	See impacts of transit bus electrification and what routes are easy to electrify	Jennifer Kwong
EV driver behavior study	Learn how and where and how much EV drivers charge to better integrate grid planning	Jamie Dunckley

EPRI Electric Transportation **Other Projects**

Other Projects

Name	What you gain/why it matters	EPRI Contact
ET Wiki	Promotion of ET projects and deliverables	Kristen Bush
xFC cybersecurity tool deployment	It is important for the scaled infrastructure to be secure. This tool provides insights into important cybersecurity considerations for the Charging Infrastructure	Viswanath Ananth (Vis)
North American Utility Electric Transportation Charging Infrastructure	Documents utility EV infrastructure investments to track progress and serve as a model for other utilities to follow. These programs demonstrate of the numerous ways utilities may get involved in the EV charging space.	Erin Costigliolo
Systemic Challenges and Barriers to Consumer EV Adoption: Introduction to the Root Cause Analysis	The first step toward identifying ways to mitigate these barriers and accelerate the pace of new light-duty EV adoption in the United States. U.S. government's pledged goal of reducing CO ₂ emission to 50% of 2005 levels by 2030 and ensuring that EVs represent at least 50% of all new vehicle sales by 2030.	Mariela Arceo / Watson Collins
Policy analysis and other regulatory work	On demand, responding to policy and regulatory developments in the ET space. Documents generally get distributed internally but a handful eventually get pushed out as deliverables.	Allan Zhao
DoE AOI 10 proposal : Zero Emission Infrastructure Planning for Transforming Freight in the South Coast Air Bassin	Co-leading a proposal effort. Proposal to get funded for a project related to charging infrastructure plan for md/hd vehicle. Very hot topic	Nicolas Sockeel/ Watson Collins
Project with Gridscape Solutions	To advance and demonstrate innovative multi-vehicle DC platform vehicle-to building electric vehicle charger configuration to provide backup power during public safety power shutoff.	Andra Rogers/ Sunil Chhaya

Other Projects

Name	What you gain/why it matters	EPRI Contact
Possible: NYSERDA Electric Power Transmission and Distribution (EPTD) Future Grid Challenges	Mobile ES	Erin Minear
Resilient Infrastructure Vulnerability Evaluation Tool (RIVET) Tool development	Designed to produce a ranked list of options available to ET fleet owners and their utility that could be considered to improve site-specific resilience.	Erin Minear
Adding EV incidents to failure database	Occurrence of EV incidents	Erin Minear
Residential BESS Safety	Research on EV safety	Erin Minear
VR Fire training	VR Training for first responder to deal with EV fires	Erin Minear
2nd life technology (batteries, controls, cost) evaluation		Erin Minear
Flightline Electrification at air force bases with - Air Force Research Laboratory	Off-road electric vehicle implementation and grid impact mitigation projects.	Erin Minear / Baskar Vairamohan
Port of Los Angeles cargo handling equipment electrification	Off-road electric vehicle implementation and grid impact mitigation projects.	Erin Minear / Baskar Vairamohan

A blue-tinted photograph of four people, two men and two women, standing in a row. They are all wearing white lab coats with the EPRI logo on the left chest. The man on the far left has curly hair and glasses. The man next to him has short dark hair and glasses. The woman next to him is wearing a white hard hat and has short dark hair. The man on the far right has short brown hair, a beard, and glasses. They are all smiling and looking towards the camera. The background is a plain, light-colored wall.

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