

# ELECTRIC SCHOOL BUS NETWORK CALIFORNIA FORUM

## Utility Engagement and Infrastructure Solutions



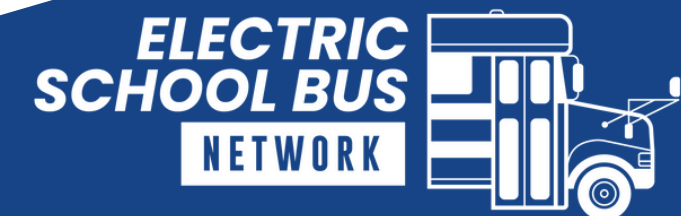
THE MOBILITY HOUSE



WORLD  
RESOURCES  
INSTITUTE

**Electric**  
School Bus  
INITIATIVE

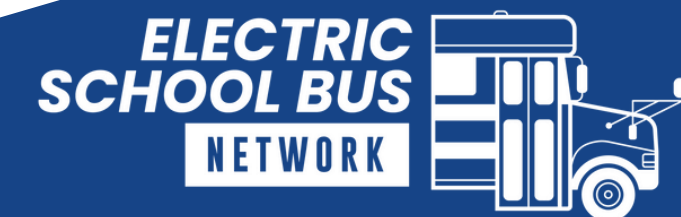
**SCALE**  
MICROGRIDS



**FEBRUARY 7, 2024**

# FORUM AGENDA

- 01.** Intro to the Electric School Bus Network
- 02.** Funding Updates
- 03.** Utility Engagement and Infrastructure Solutions
- 04.** Q&A
- 05.** Summary and Closing

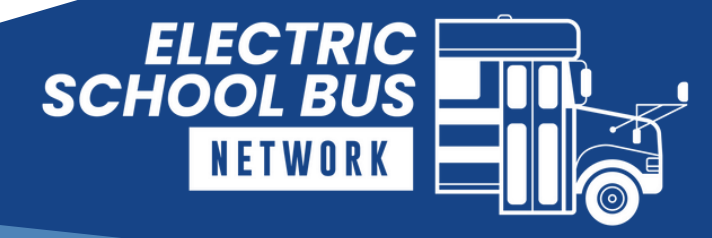




# ELECTRIC SCHOOL BUS NETWORK

The Electric School Bus Network accelerates nationwide school bus fleet electrification through peer-to-peer networking and dialogue-driven forum meetings for school districts, advocacy organizations, government organizations, and industry representatives. The ESB Network provides access to educational tools, resources, and subject matter experts to help support the electric school bus fleet transition.

In Partnership With:





# MEET THE ESB TEAM



**Rachel Chard**  
Deputy Director



**Michelle Hanson**  
Program Manager



**Ian Fried**  
Lead Project Manager



**Chrystal Ales**  
Project Manager



**Emily Gasca**  
Project Manager



**Juan Espinoza**  
Project Manager



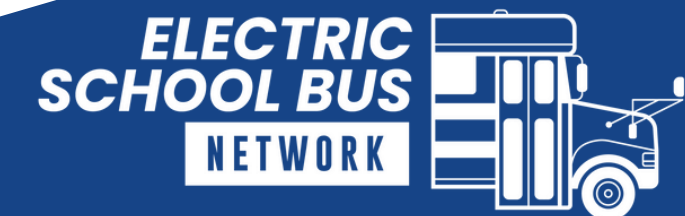
**Liza Walsh**  
Project Manager



**Skyler Potocek**  
Project Manager

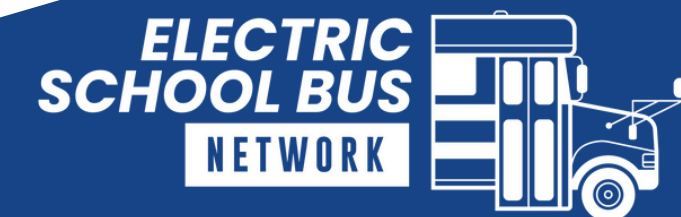


**Katelyn Tomaszewski**  
Project Manager

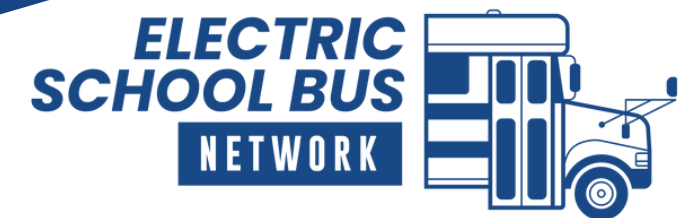


# MARK YOUR CALENDARS!

- **National Forum**
  - ESB Network National Forums occur every other month on the **second Wednesday at 11:00 a.m. PT.**
- **California Forum**
  - ESB Network California Forums occur every other month on the **first Wednesday at 11:00 a.m. PT.**
- **CASTO Annual Conference**
  - ESB Funding Feedback Session - **Saturday, Feb 24, 1:00-2:15 p.m. PT**
  - HVIP Booth Vendor Expo - **Saturday, Feb 24, 3:45 - 5:30 p.m. PT**
  - Ride and Drive Event - **Sunday, Feb 25, 10:00 a.m. - 2:00 p.m. PT**



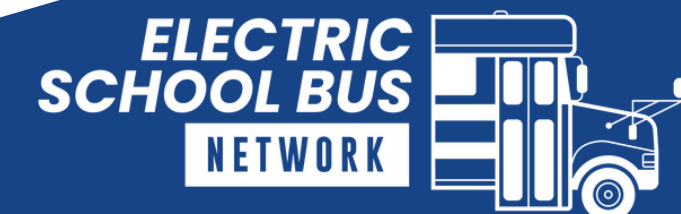
# FUNDING OPPORTUNITY UPDATES





# CALIFORNIA - EXISTING PROGRAMS

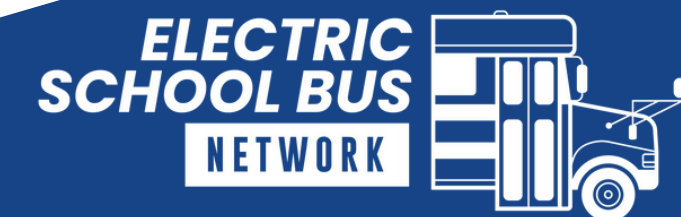
- Standard HVIP
  - [Policy Clarification: Small Fleet Voucher Amounts for School Buses](#)
- Public School Bus Set-Aside Round 2 & EnerglZE- Joint Application
  - Application Closed December 15, 2023
  - [Applicant Priority List available on HVIP website](#)
  - Currently accepting and reviewing Application Part B
  - Infrastructure deadline submission through [Incentive Processing Center](#) is **March 28, 2024, at 5:00 p.m. PT**





# CALIFORNIA - NEW PROGRAM

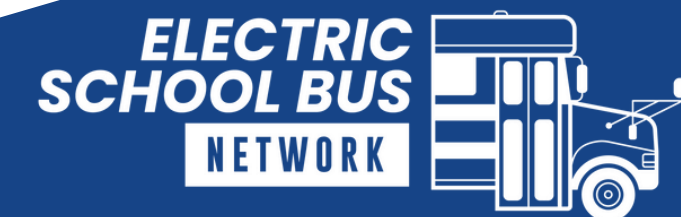
- Zero Emission School Bus and Infrastructure (ZESBI) Program
  - \$500 million in funding
  - Funding for buses and infrastructure
  - Coming May 2024



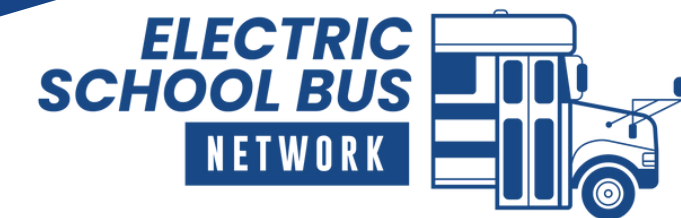


# FEDERAL UPDATES

- Qualified Commercial Clean Vehicle Credit
  - The Inflation Reduction Act (IRA) introduces tax credits for clean energy and climate investments, including provisions such as elective (direct) pay and credits up to \$40,000 per electric school bus and up to \$100,000 per charging station.
- EPA 2023 Clean School Bus Rebate Program Extension
  - The deadline for EPA Clean School Bus applications has been extended to February 14, 2024, at 4 p.m. ET.



# UTILITY ENGAGEMENT AND INFRASTRUCTURE SOLUTIONS



# **ELECTRIC SCHOOL BUS INITIATIVE BACKGROUND**

# ESTABLISHING PARTNER: BEZOS EARTH FUND



BEZOS  
EARTH  
FUND

WRI's Electric School Bus Initiative is supported by a grant from our **establishing partner, the Bezos Earth Fund.**

We're proud to partner with the Bezos Earth Fund to help foster an equitable transition to electric school buses nationwide.



# ESB INITIATIVE MISSION

In collaboration with partners and communities, **WRI's Electric School Bus Initiative** aims to build **unstoppable momentum toward an equitable transition of the U.S. school bus fleet** to electric by 2030, bringing health, climate and economic benefits to children and families across the country and normalizing electric mobility for an entire generation.



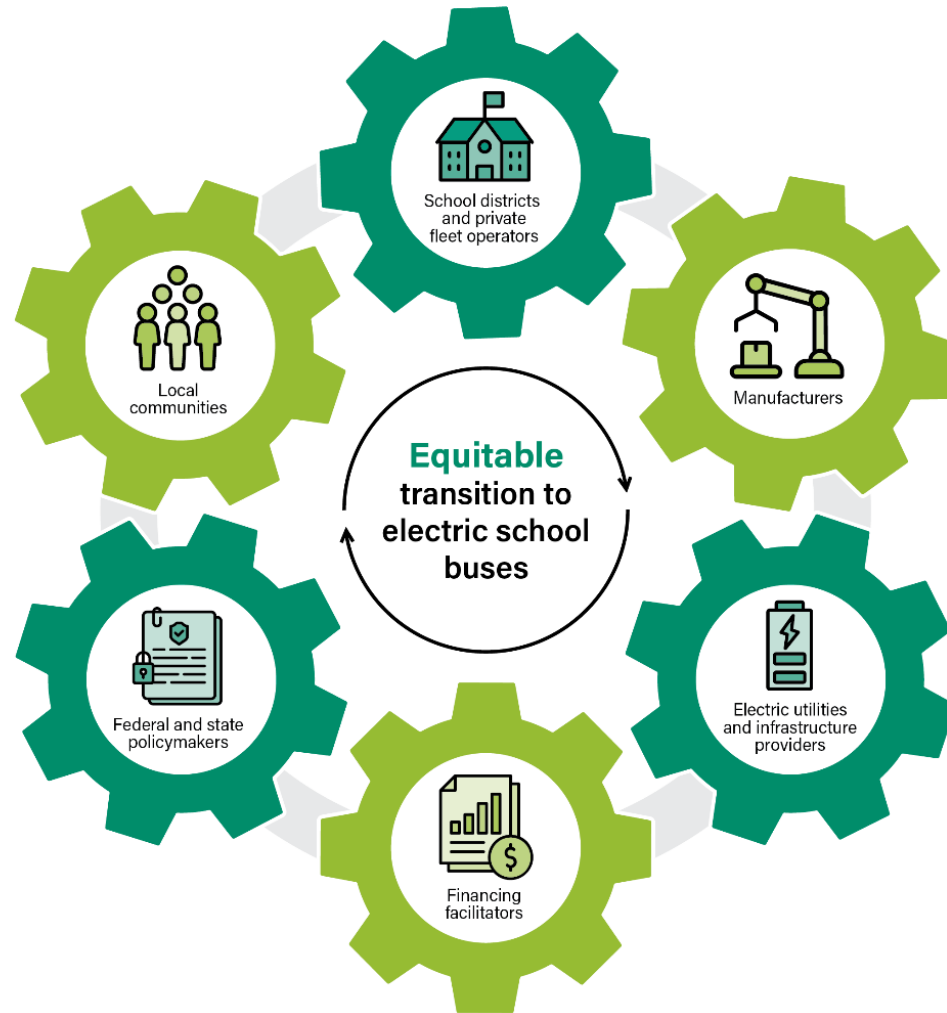
# ESB INITIATIVE WEBSITE



## [Electricschoolbusinitiative.org](https://www.electricschoolbusinitiative.org):

- One-stop-shop for tools, resources and information
- For school districts, manufacturers, electric utilities, policymakers, community members and more
- Free resources from across the electric school bus movement

# SYSTEMS CHANGE ACROSS MULTIPLE STAKEHOLDERS

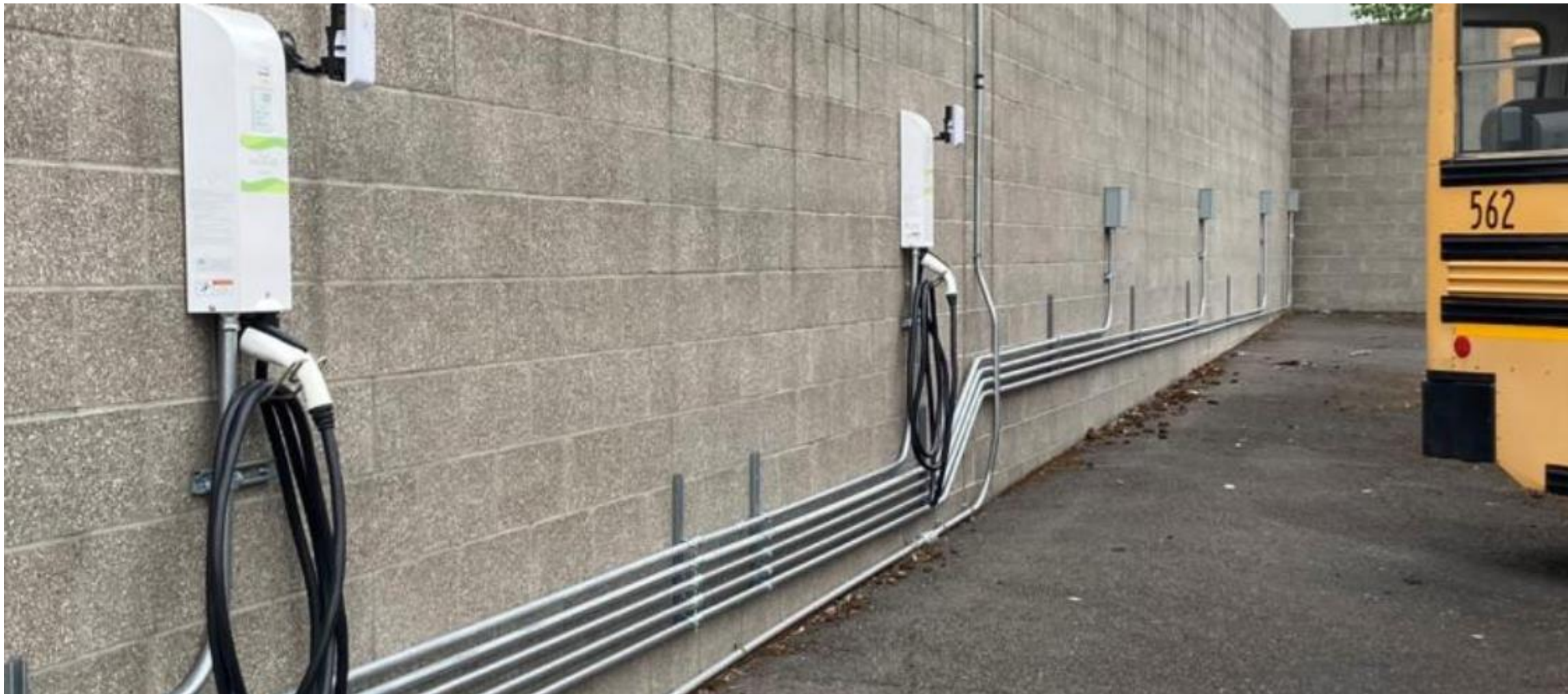


## Our Theory of Change

By partnering with school districts, manufacturers, utilities, policymakers, regulators and communities, we can increase knowledge and support for an equitable electric school bus transition.



# ALL ABOUT CHARGING INFRASTRUCTURE



NOTES AND SOURCE go here

**Electric**  
School Bus  
INITIATIVE



WORLD  
RESOURCES  
INSTITUTE



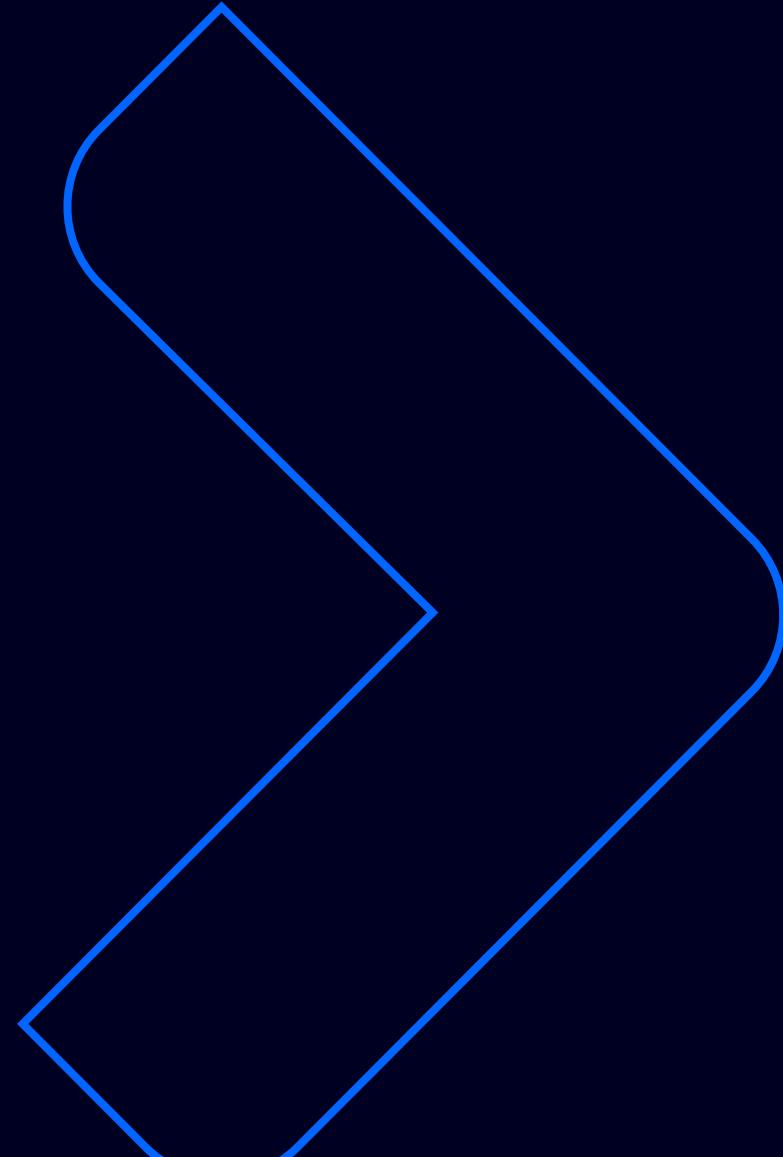
# POWER PLANNER FOR ESB DEPLOYMENT



NOTES AND SOURCE go here

# ChargePilot - Charging and Energy Management

Presentation on February 7, 2024

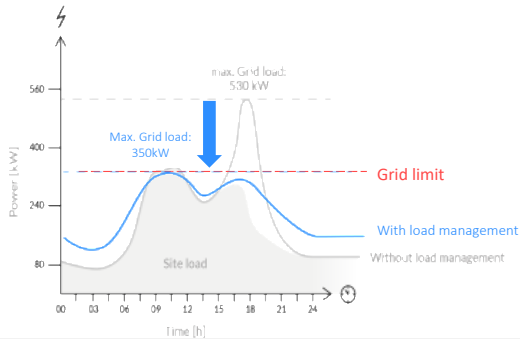




# The Most Experienced Fleet Charging Company Worldwide

## Smart Charging

ChargePilot - The world's leading EV charging and management platform designed just for fleets.



**Trusted by 1200+ EV Fleets**



## Vehicle-Grid Integration

EV Aggregation Platform for monetization of EV battery flexibility & energy markets.



**10+** Value generating energy & grid services enabled



## Stationary Storage

Largest developer of stationary storage solutions using EV batteries in the EU.



**100+ MW** Capacity installed or in construction

## Consulting & Solutions

Professional services from charging expert Consulting to complete Turnkey Solutions.



**180+ Fleets Helped**



Customers, Partners & Investors Include

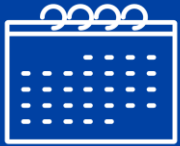
DAIMLER



AlphaStruxure



# For which fleets does ChargePilot provide the most value?



Fleet is on a schedule.



Site has limited power.



Site has time-of-use rate or high demand charges.



Fleet has multiple charging sites.



Fleet uses existing chargers from different manufacturers.



Fleet has high reliability requirements.



# Automated Load Management

“Automated Load Management (ALM) is the **use of software** or other behind-the-meter technologies to **strategically share charging capacity across multiple charging ports** at the same charging site, helping safely connect multiple charging ports **whose total nameplate load would otherwise exceed the rated capacity of the customer connection**. By using ALM, customers can avoid or defer the need to upgrade certain distribution system infrastructure to accommodate the new EV charging load.”

- Definition from the Vehicle-Grid Integration Council (VGIC)



# Appendix

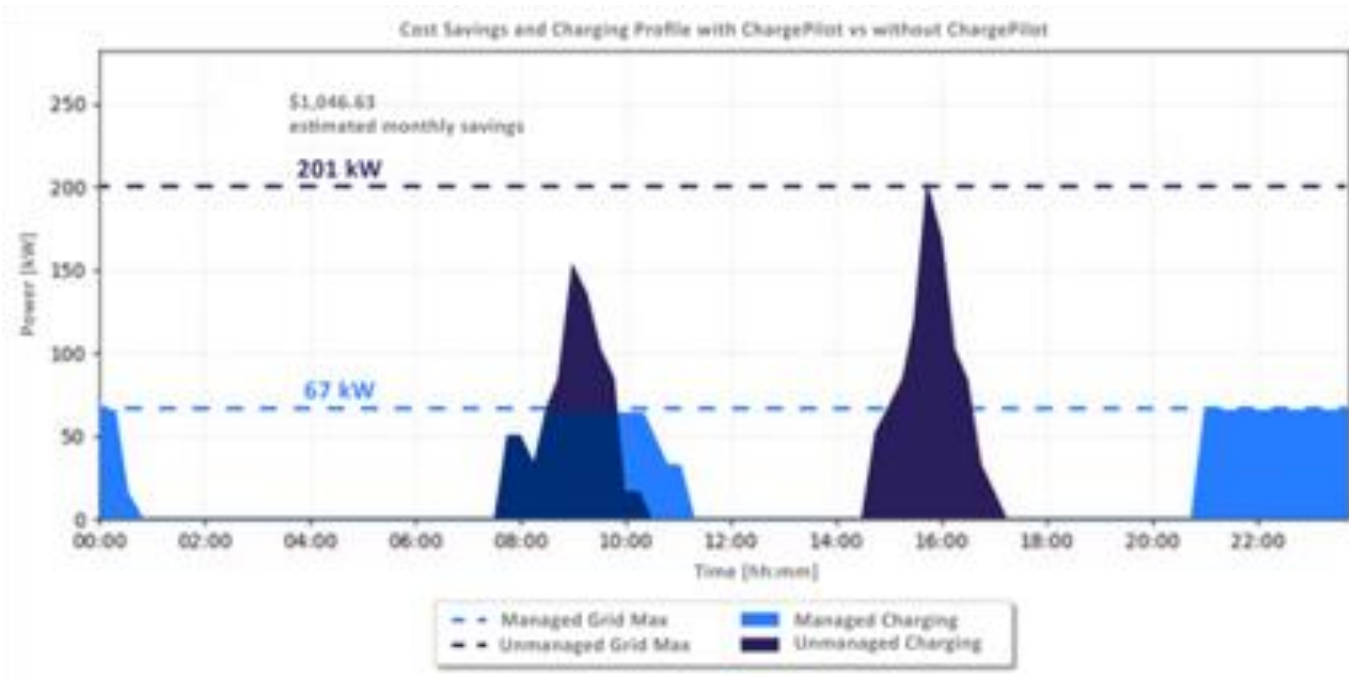
# Simulation of charging at a school bus depot with 24 charging points

201 kW

Load peak without load management

67 kW

Load peak with load management



## Parameters

- **Vehicles:** 11 x Blue Bird 150kWh School bus
- **Chargers:** 20 x 16.8 kW (AC), 4 x 50kW (DC)
- **Utility Rate Plan:** Pacific Gas and Electric Company (PG&E) BEV
- **TOU Peak hours:** 4 pm - 9 pm

## Results

Load peak reduction: -66.7%

Annual cost savings: \$12,157

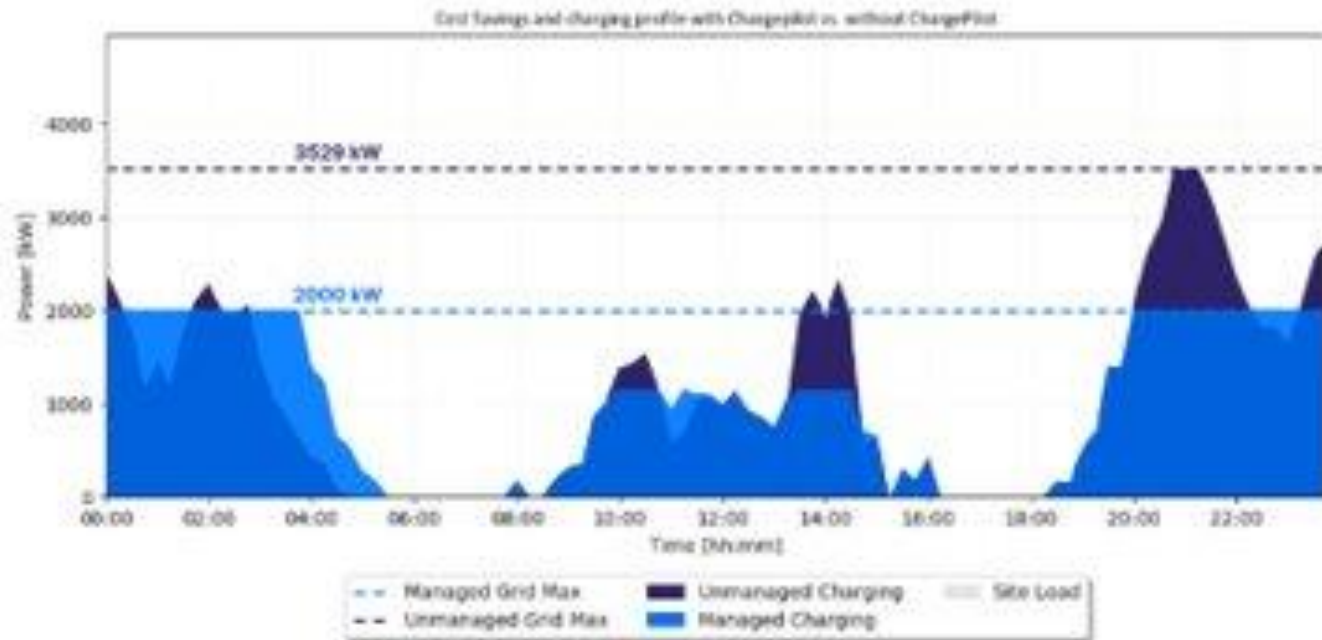
# Simulation of charging at a bus depot with 15 charging points

3,529 kW

Load peak without load management

2,000 kW

Load peak with load management



## Parameters

- **Vehicles:** 4 x E2 ProDrive 440kWh Proterra buses  
66 x E2 Max DuoPower 660kWh Proterra buses
- **Chargers:** 14 x 175 kW (DC)  
1 x 450 kW (Pantograph)
- **Utility Rate Plan:** Power Purchase Agreement
- **Other Information:** Microgrid with solar, battery storage, and gas generator

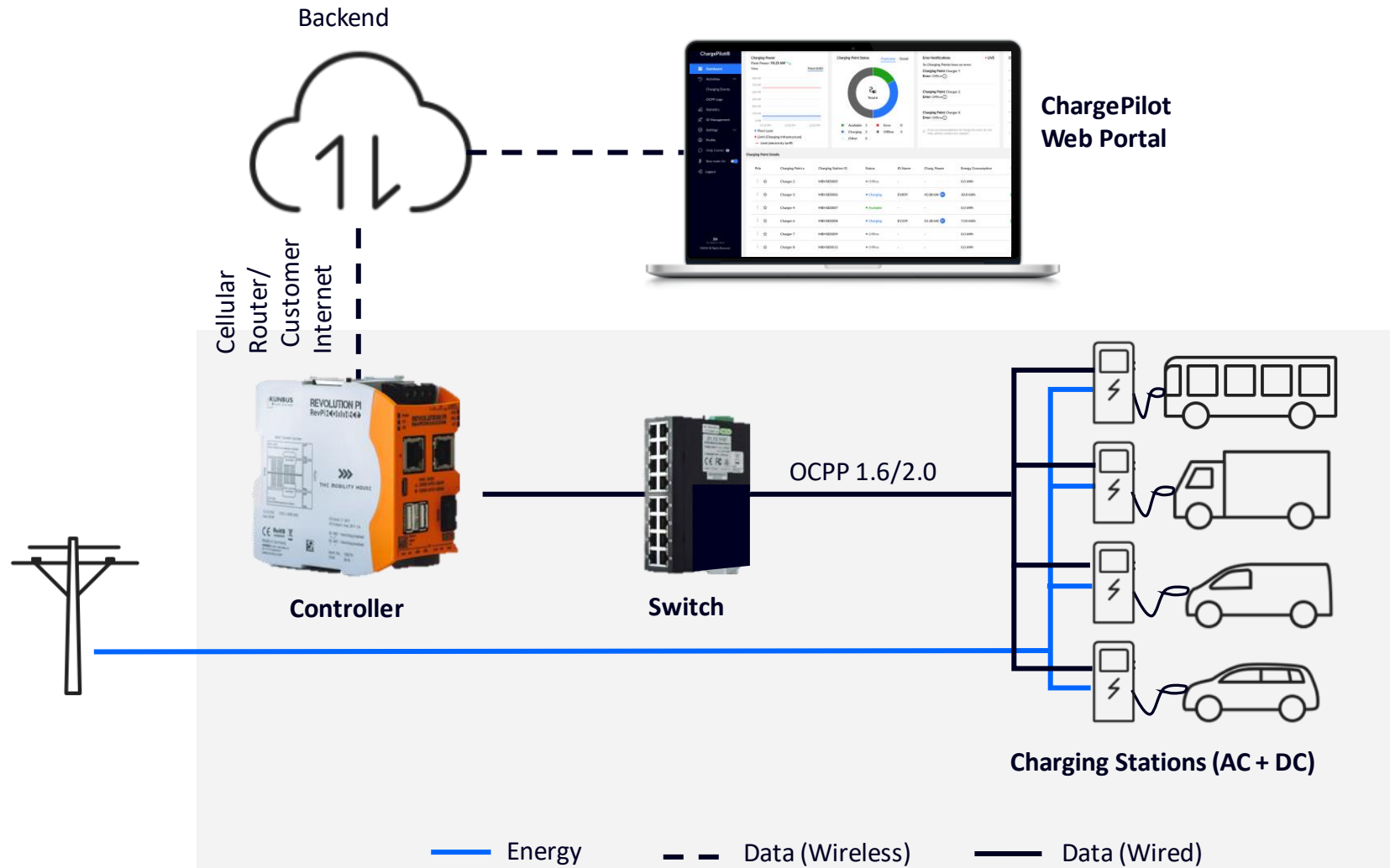
## Results

Load peak reduction: -43.3%

Microgrid: Optimize use of solar and generator

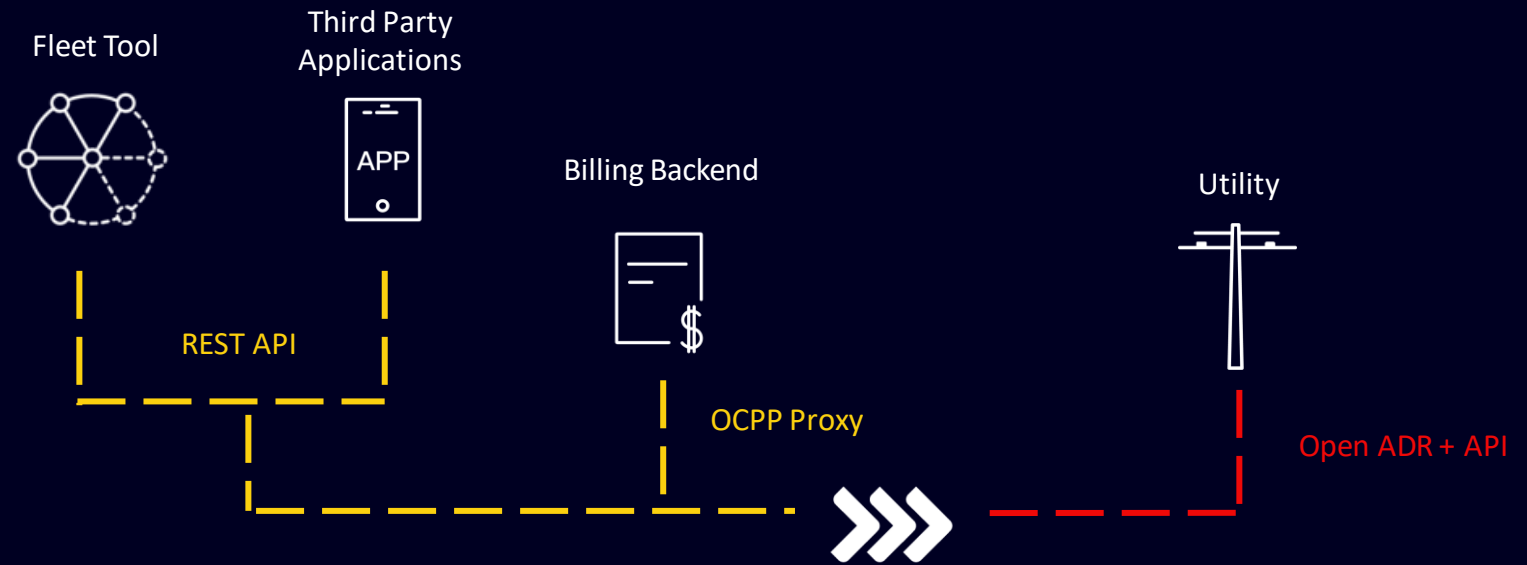


# ChargePilot System Architecture and Main Features



### Choose open standards and standardized interfaces

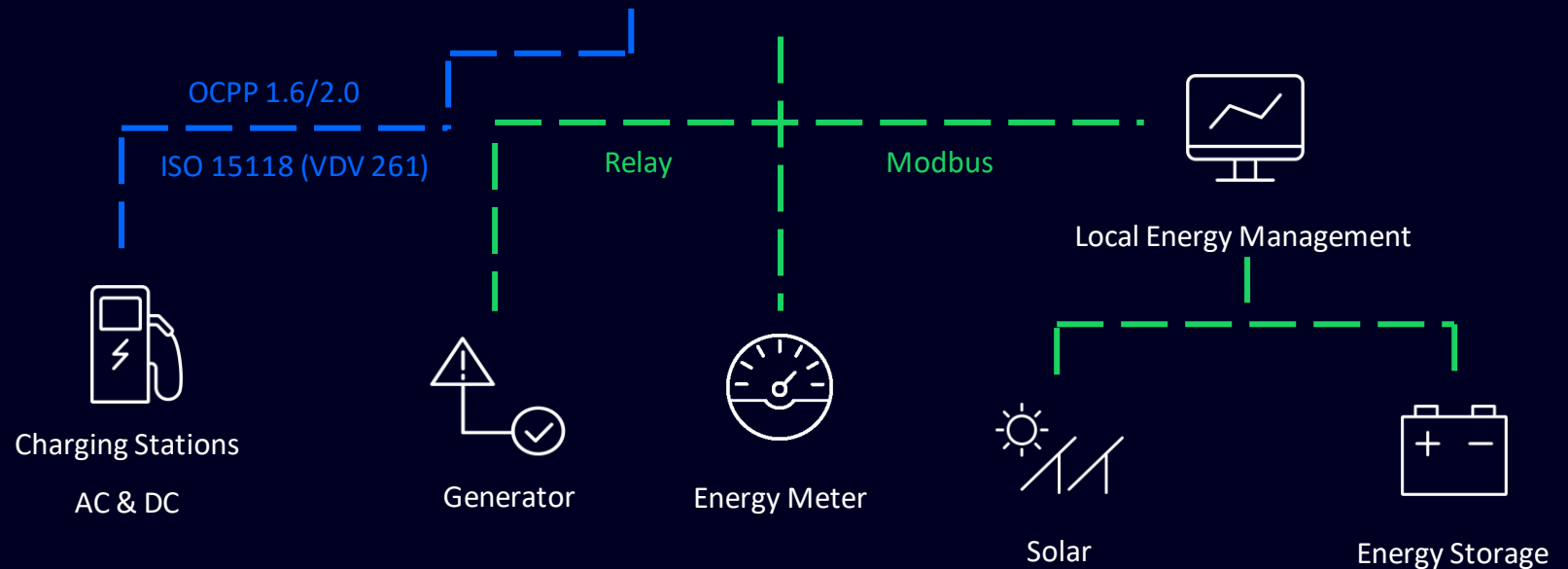
Plan for scale by choosing a system that can be combined with other systems from different manufacturers via standardized interfaces.



### Backend

### THE MOBILITY HOUSE

### Local



# Modesto City Schools



**\$6.3M**

Grant funding from HVIP

**Largest**

Order of electric buses in Blue Bird history

**\$250k/yr**

Annual savings by switching from diesel

**32**

AC and DC Chargers

*“The Mobility House was instrumental in building a holistic charging ecosystem that is intelligent, reliable, and cost-effective”*

- Gilbert Rosas, Director of Sustainability



# New York City Schools Bus Umbrella Services



**14 Buses**

Supported with Charging

**14 x 19.2 kW**

Chargers

**No Derating**

Individual Chargers

**80 kW**

Utility Transformer Limit

## Challenge

ChargePilot manages the cumulative load for this site without derating individual chargers, demonstrating true smart charging.



269 kW of chargers



80 kW of available capacity

### Location

New York, New York City, NY



### Charging Stations

14 additional single-port 19.2 kW Epic chargers serving 14 additional Microbird buses

### Energy Management

ChargePilot

### Modules

Plus

### Performance of TMH

Load Management (ALM) | Monitoring | Operation incl. Service



# Thank you!

North America Team

[us-sales@mobilityhouse.com](mailto:us-sales@mobilityhouse.com)

+1 (650) 232-4200

The Mobility House LLC

545 Harbor Blvd

Belmont, CA 94002



# SCALE

MICROGRIDS



**Tim Victor**  
Associate Director, eMobility

## Microgrid Solutions



Scale's microgrids simultaneously deliver cost savings, resiliency, and sustainability. Our platform drives efficient project development, minimizes soft costs, and maximizes dependability.

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**CUSTOM MICROGRIDS**

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**MODULAR MICROGRIDS**

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## Capital Solutions



Scale is investing millions of dollars into distributed energy assets, yet remains flexible and combines capital with technical expertise to step in and pull projects over the line.

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**DISTRIBUTED ENERGY**

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**ENERGY INFRASTRUCTURE**

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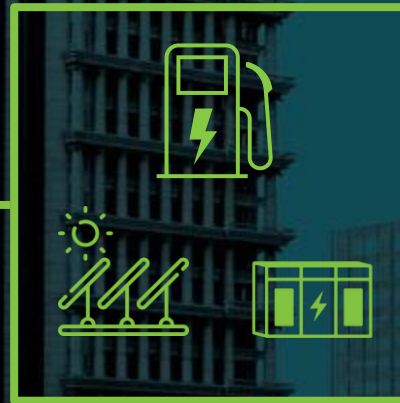
# Flexible & Distributed Energy Platform

## EV Infrastructure



EVSEs

## EV Infrastructure & DERs (BESS, Solar, etc)



SCALE

## Full Microgrid Ecosystem



SCALE

Resilience

Economics

Resilience

Economics

Increasing →

### Base Case

EV Infrastructure required to operate fleet

### Base + DERs

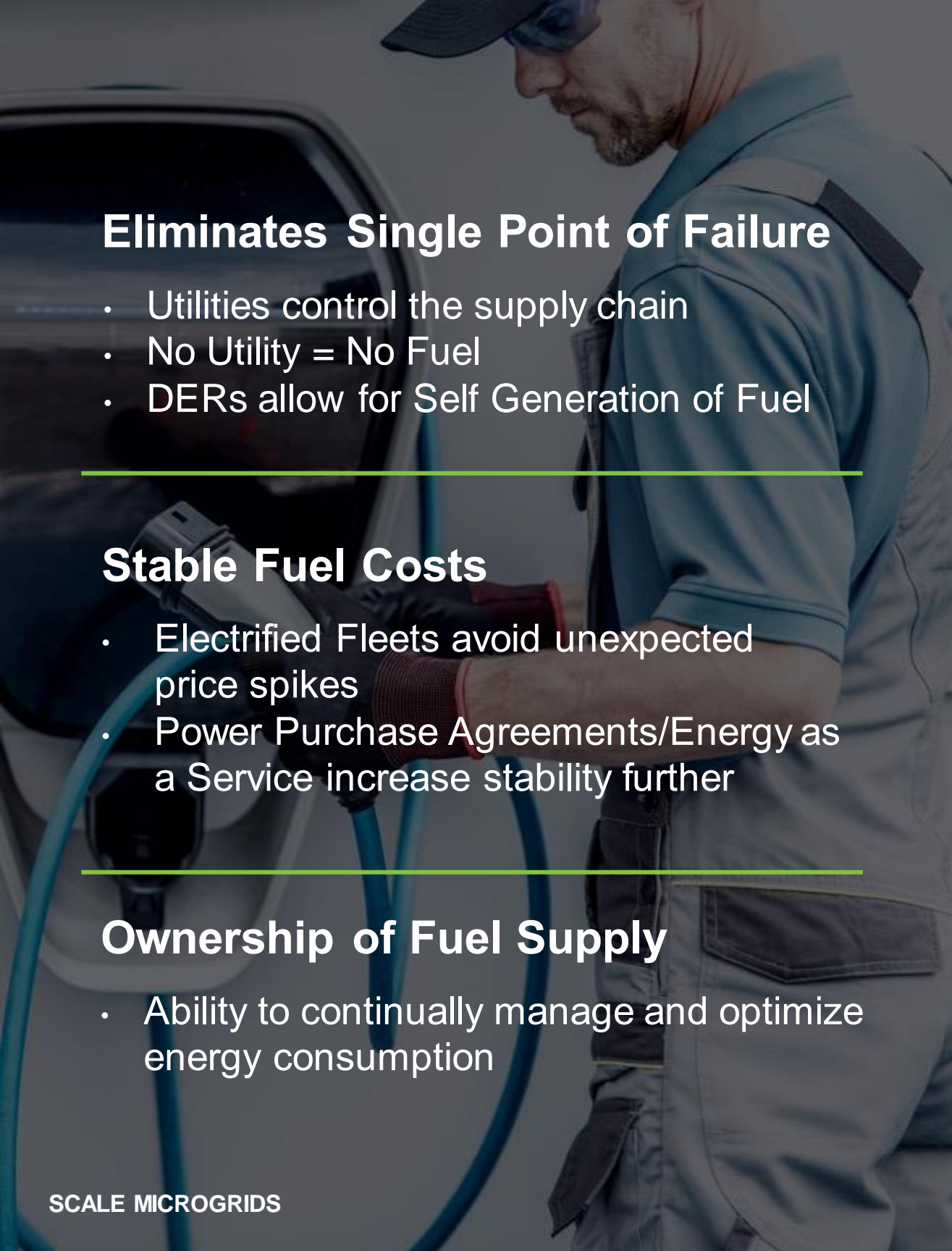
Addition of DERs to reduce total cost of \$/kWh

### Full Microgrid

Addition of microgrid controls and dispatchable generation for 100% resilience

The microgrid platform provides a modular approach to integrating DERs into fleet charging infrastructure.





## Eliminates Single Point of Failure

- Utilities control the supply chain
- No Utility = No Fuel
- DERs allow for Self Generation of Fuel

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## Stable Fuel Costs

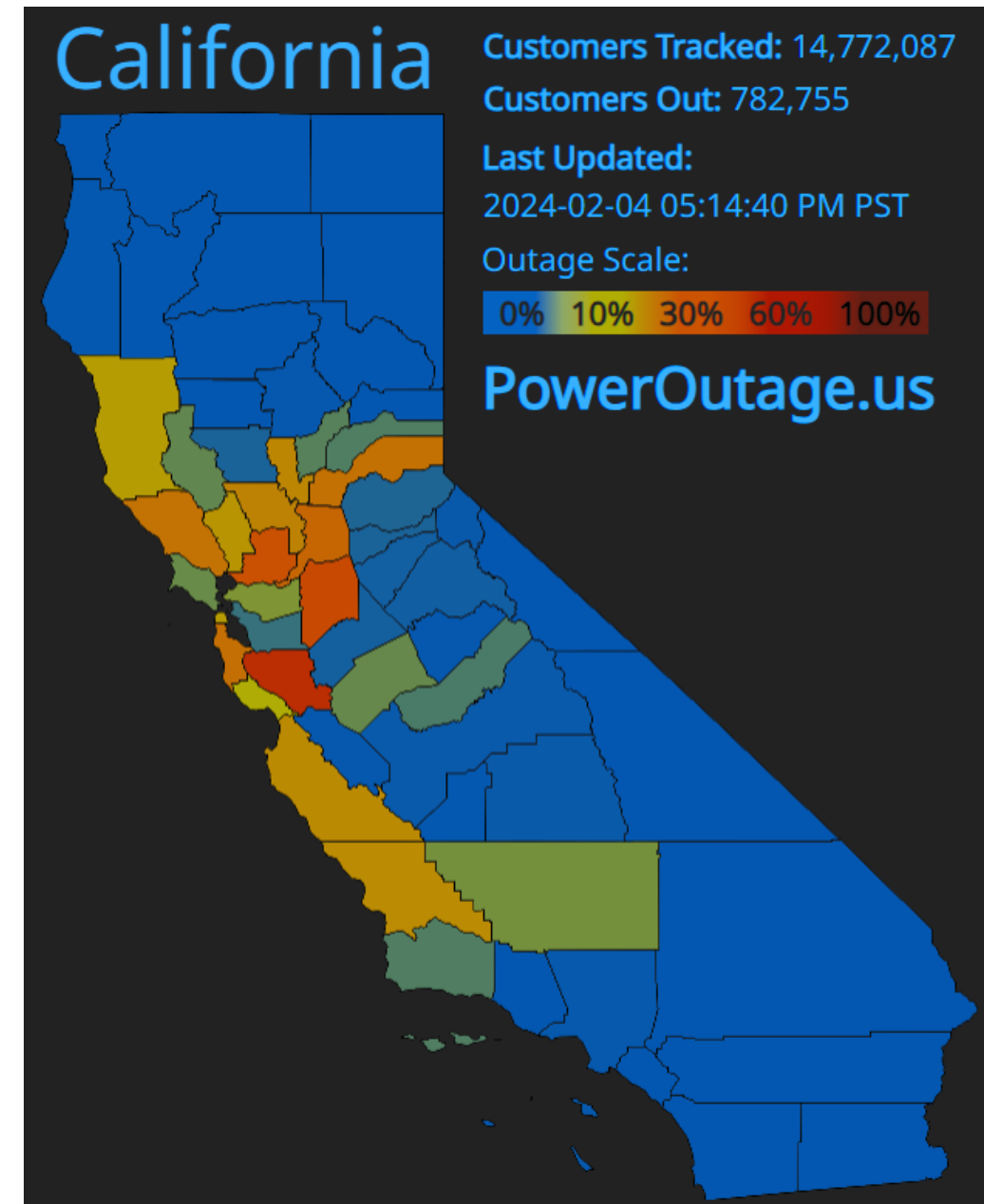
- Electrified Fleets avoid unexpected price spikes
- Power Purchase Agreements/Energy as a Service increase stability further

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## Ownership of Fuel Supply

- Ability to continually manage and optimize energy consumption

# The Need for Resilient Fuels





# UTILITY ENGAGEMENT AND INFRASTRUCTURE SOLUTIONS

**Sam Hill-Cristol**  
Business Development  
& Strategy

**Bobby Stafford**  
Research Associate,  
Transportation Electrification  
and Grid Resiliency

**Tim Victor**  
Associate Director,  
eMobility



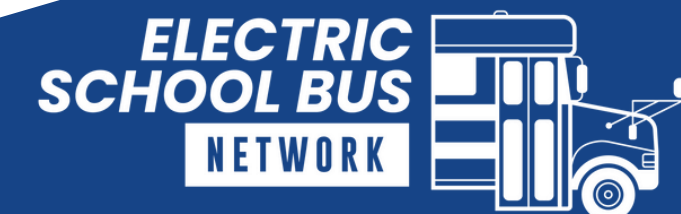
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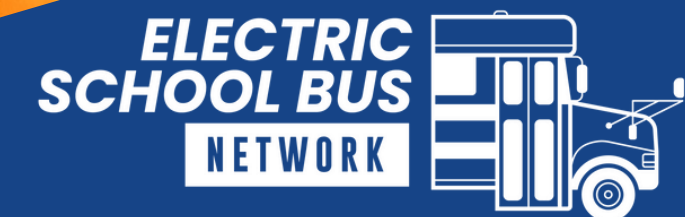
**SCALE**  
MICROGRIDS





# ANY QUESTIONS?

Please raise your hand or type your questions for our speakers in the chat!





# SAVE THE DATE!

- Forum follow-up email will be sent on **Friday, February 9**
  - Recording of the meeting
  - Copy of the slide deck
- ESB Network Newsletter will be sent on **Tuesday, February 13**
- Mark your calendars for the next California Forum:
  - **Wednesday, April 3, 2024, from 11:00 a.m.–12:00 p.m. PT**
- Please email [schoolbusteam@calstart.org](mailto:schoolbusteam@calstart.org) with questions

