



**C2C: Clean Energy
to Communities**

U.S. DEPARTMENT OF ENERGY

Accelerating the Deployment of Equitable, Grid-Friendly Electric Vehicle Charging Infrastructure

Cohort Recap
June 20, 2023



Accelerating the Deployment of Equitable, Grid-Friendly Electric Vehicle Charging Infrastructure



Defining the Role of Local Government in Equitable and Grid-Friendly EVSE Deployment

January



Grid Impacts and Utility Planning for EVSE

March



Engaging with Key Partners on Planning for Equitable and Grid-Friendly EVSE Deployment

May

February

EVSE Funding, Financing and Ownership Approaches



April

Strategies for Equitable EVSE Deployment in Underserved Communities



June

Peer Showcase with Consulting and Coaching



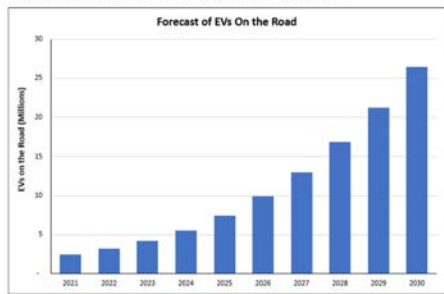
1:1 TA Session

Cohort Participants

- **Ann Arbor, Michigan**
- **Boston, Massachusetts**
- **Burbank, California**
- **Centralina Regional Council, North Carolina**
- **Chicago, Illinois**
- **Clark County, Nevada**
- **Columbia, South Carolina**
- **Columbus, Ohio**
- **Cook County, Illinois**
- **Dallas, Texas**
- **Fort Collins, Colorado**
- **Los Alamos County, New Mexico**
- **Missoula, Montana**
- **Salt Lake City, Utah**
- **Virginia Beach, Virginia**

In Workshop 1, we examined three main challenges related to local EV infrastructure deployment

Figure 1. EEI Forecast of EV Stock: 26.4 Million EVs on U.S. Roads in 2030



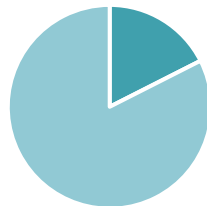
EV ownership will increase exponentially in coming years, and more charging infrastructure is required to support that shift.

Electric Vehicle Demand as Percentage of Total Global Electricity Demand

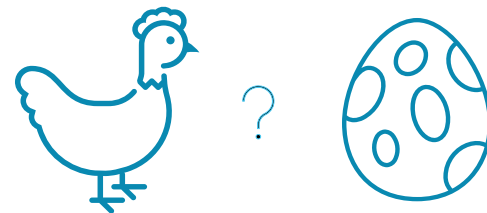
2022



2050



The projected addition of new EVs will result in significantly higher electricity demand and could intensify grid challenges.

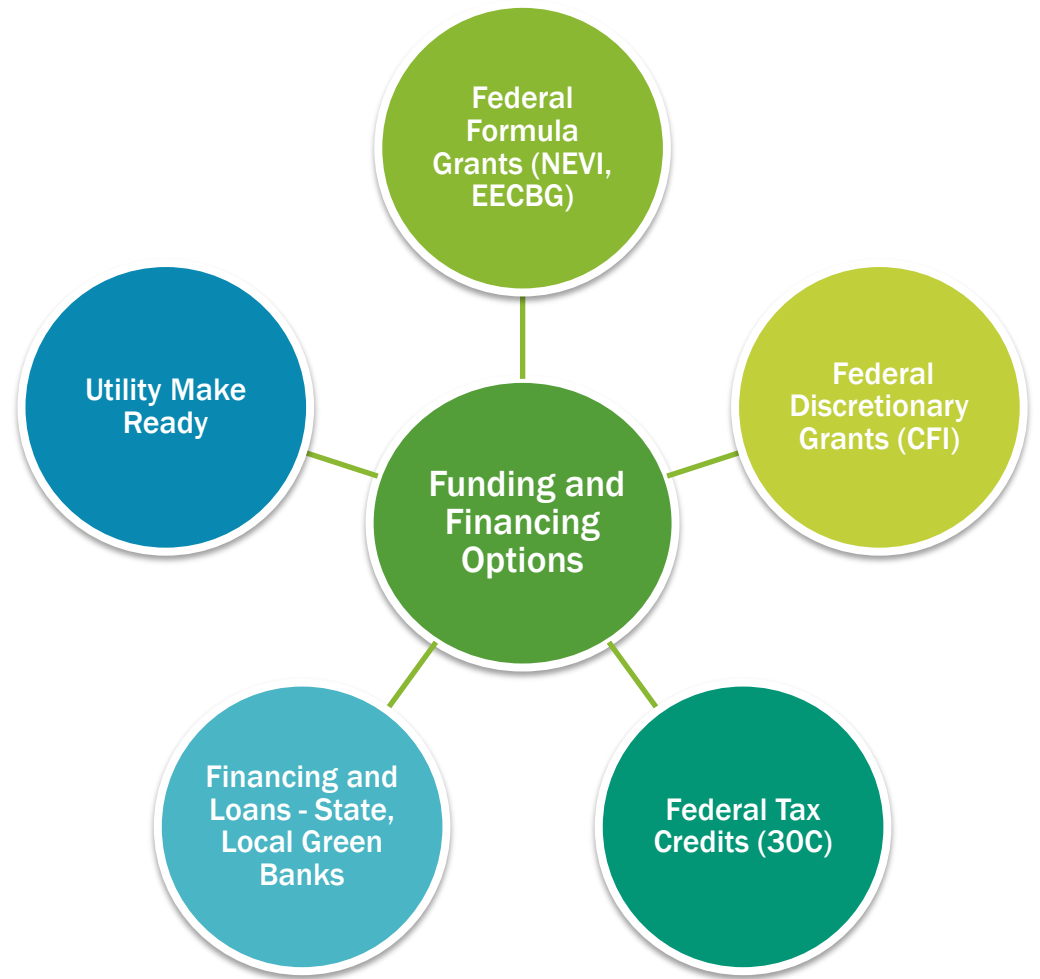


Private investment prioritizes areas with sufficient charging demand, which can leave underserved areas behind in terms of infrastructure.

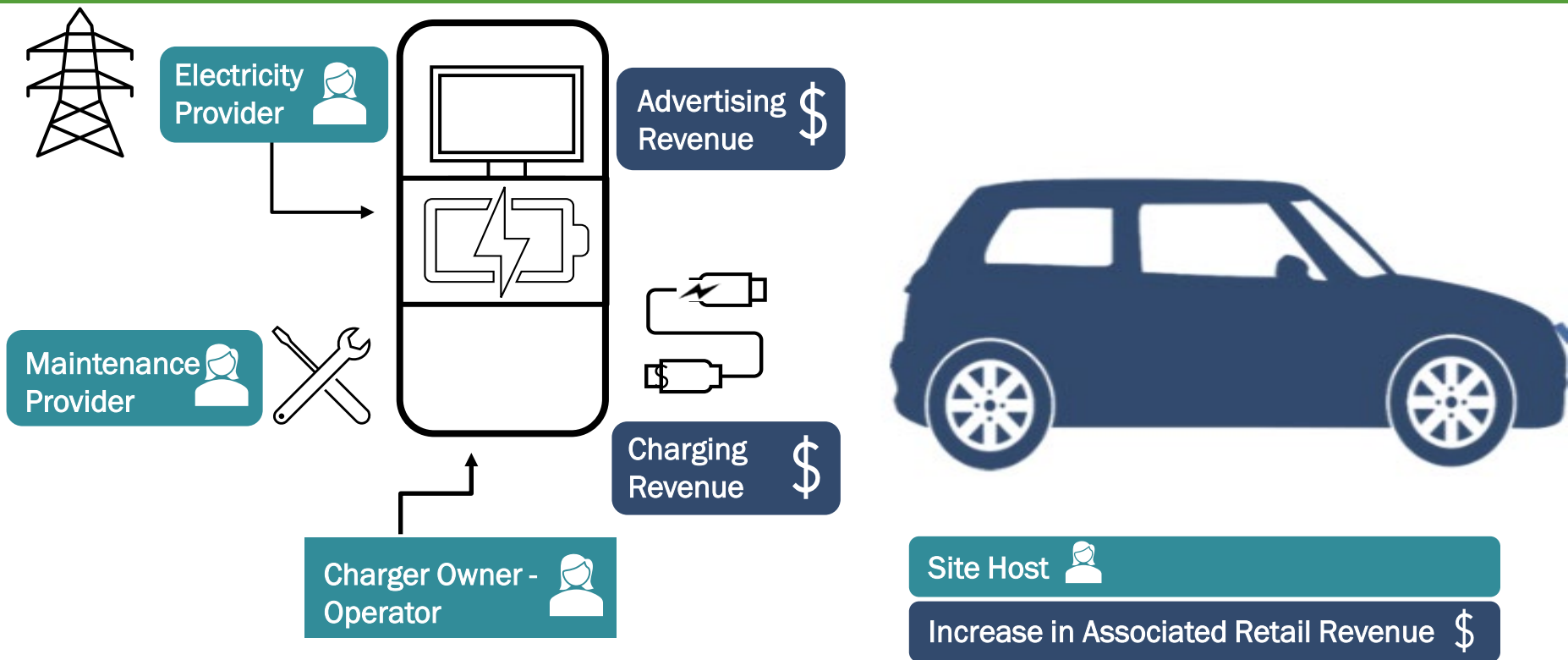
We defined and discussed some of the roles local governments can play in accelerating EV infrastructure



In Workshop 2, we learned about funding and financing opportunities and ownership structures



We also explored various roles and revenue streams related to charging infrastructure ownership



In Workshop 3, we focused on solutions to address grid impacts related to EV charging infrastructure

Workplace
charging

Managed/smart
charging

Time-of-use
rates

Vehicle-to-
Everything (V2X)

Holistic
transportation
strategies

On-site
generation

Potential grid impacts can be lessened by managed charging approaches and a shift to daytime charging to align with renewables production

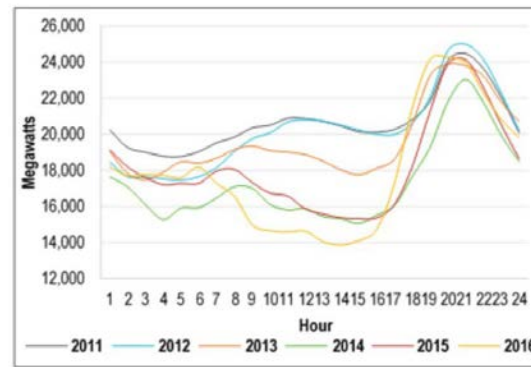
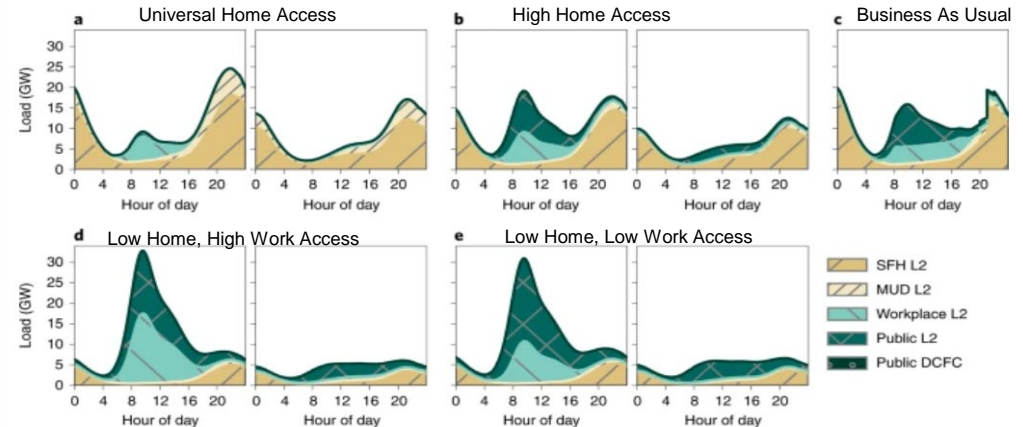


Figure 1. CAISO lowest March daytime net load—non-renewable generation needs.
Illustration from ScottMadden Management Consultants

Source: [Aligning PEV Charging with Electricity Supply and Demand](#), NREL 2017

Fig. 2: Profile of aggregate EV charging demand illustrated for each infrastructure and control scenario.



Source: [Charging infrastructure access and operation to reduce the grid impacts of deep electric vehicle adoption](#), Nature 2022

During a presentation from NREL researcher Jesse Bennett, the cohort learned that...

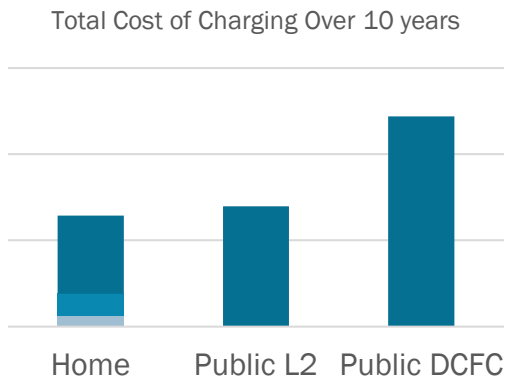
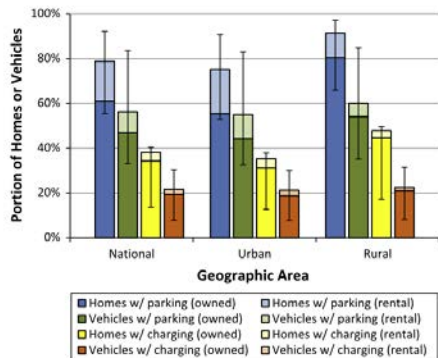
- The scale of vehicle electrification we're looking at will require significant distribution grid upgrades, but utilities have time to plan.
- Multiple customers are sometimes fed from a single distribution transformer.
 - When **multiple EVs charge simultaneously**, transformers, secondary wires, or voltage quality may be impacted.
- Vehicle charge flexibility can be leveraged to mitigate these impacts.
 - Uncontrolled charging and immediate responses to **TOU pricing** have the highest likelihood of creating demand peaks.
- The most common utility upgrade due to light-duty personal EV adoption could be **distribution transformers**, while usually only large installations for MHDV will require major utility upgrades such as distribution line or substation upgrades.

In Workshop 4, we explored a few of the causes of inequitable charging access

Access to dedicated parking that is charger capable is not universal, especially at multifamily housing

Charging at a public paid station is more costly and variable than charging at home

Grid constraints may limit the amount of new load that can be added to residential distribution circuits



There are multiple strategies municipalities can use to embed equity in EV charging and transportation electrification initiatives

Engage the public to create communitywide EV charging plans

Develop supportive policies and streamline permitting

Provide publicly accessible chargers and expand curbside charging

Incentivize charger deployment in specific areas

Engage with companies to offer workplace charging

Engage with utilities on equitable programming

Support charger deployment in multi-unit dwellings

Electrify other transportation modes – bikeshare, rideshare, transit

Track and communicate progress

In Workshop 5,
we explored key
stakeholders to
engage during
the process of
procuring and
installing EV
charging
stations

