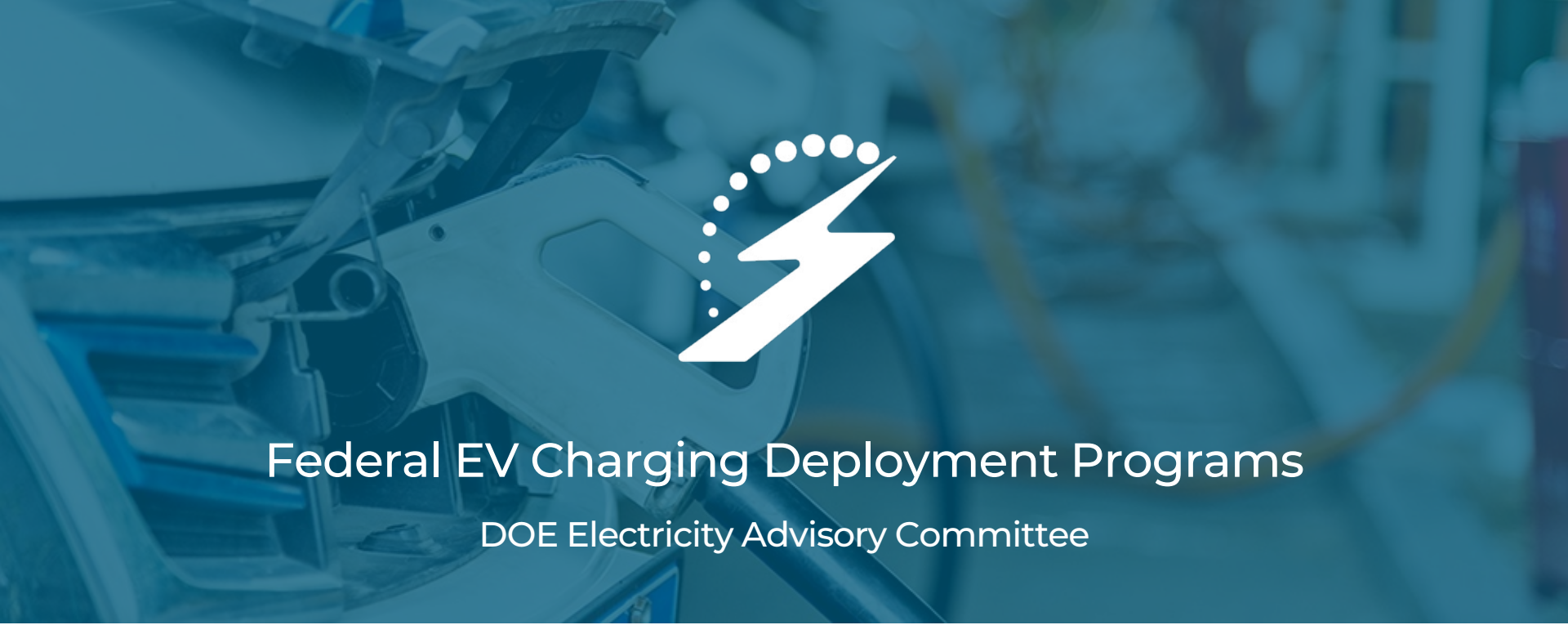

# Federal EV Charging Deployment Programs

## DOE Electricity Advisory Committee

October 27, 2022

Alex Schroeder, Chief Technology Officer
Joint Office of Energy and Transportation

JOINT OFFICE OF

# Energy and Transportation

**Kamala Harris**
@KamalaHarris
United States government official

The future of transportation in our nation and around the world is electric.

Our nation's ability to manufacture, charge, and repair electric vehicles will help determine the health of our communities, the strength of our economy, and the sustainability of our planet.

9:16 AM · Dec 17, 2021 · Sprout Social

JOINT OFFICE OF
Energy and
Transportation

# Innovation in Infrastructure



JOINT OFFICE OF
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Transportation

# Innovation in Government

# Joint Office of Energy and Transportation

Established in the Bipartisan Infrastructure Law to address areas of joint interest to the Departments of Energy and Transportation

**$300M**

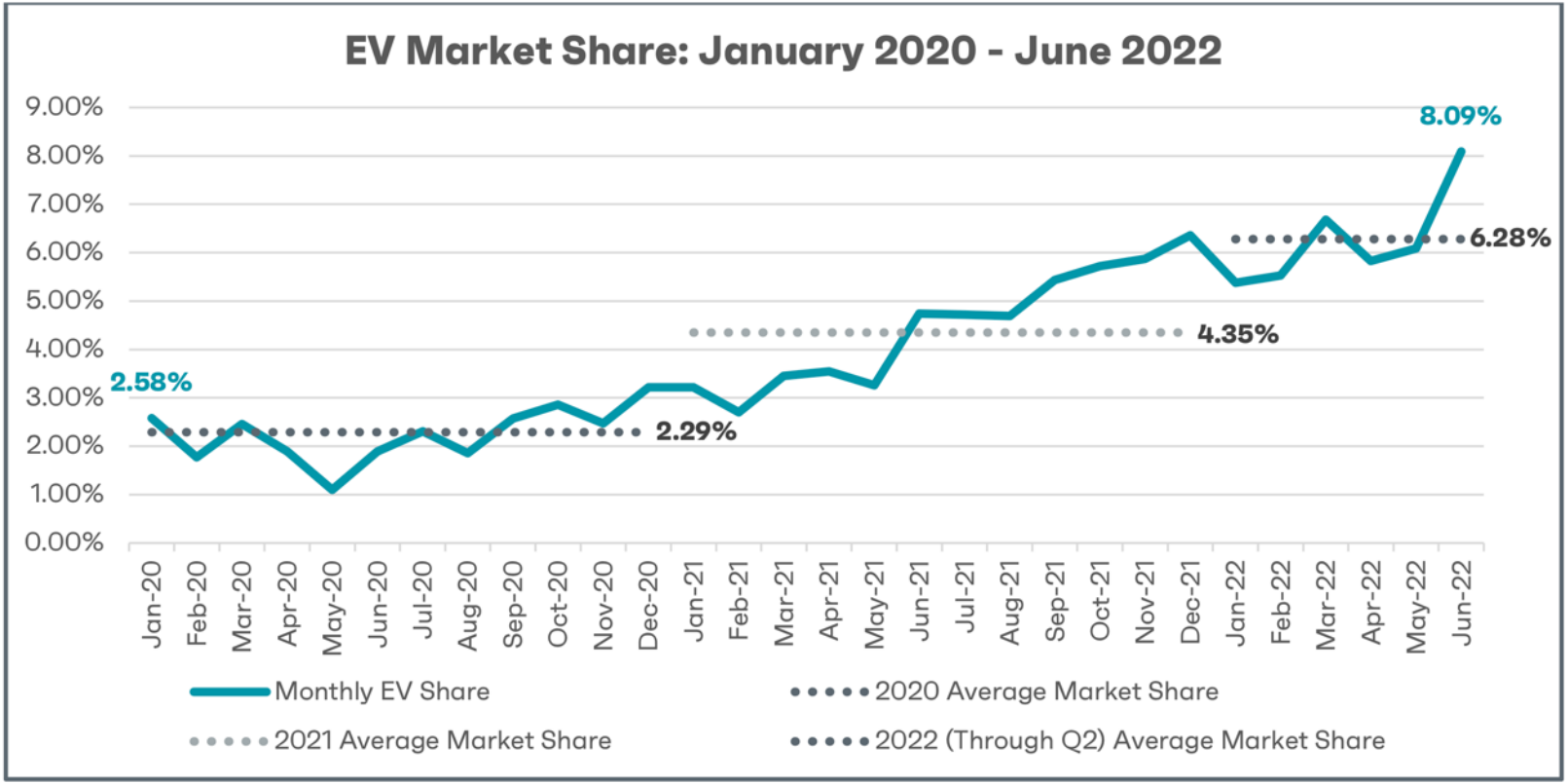
in FY22 funds to DOT with transfer authority to DOE

**9**

major areas of emphasis

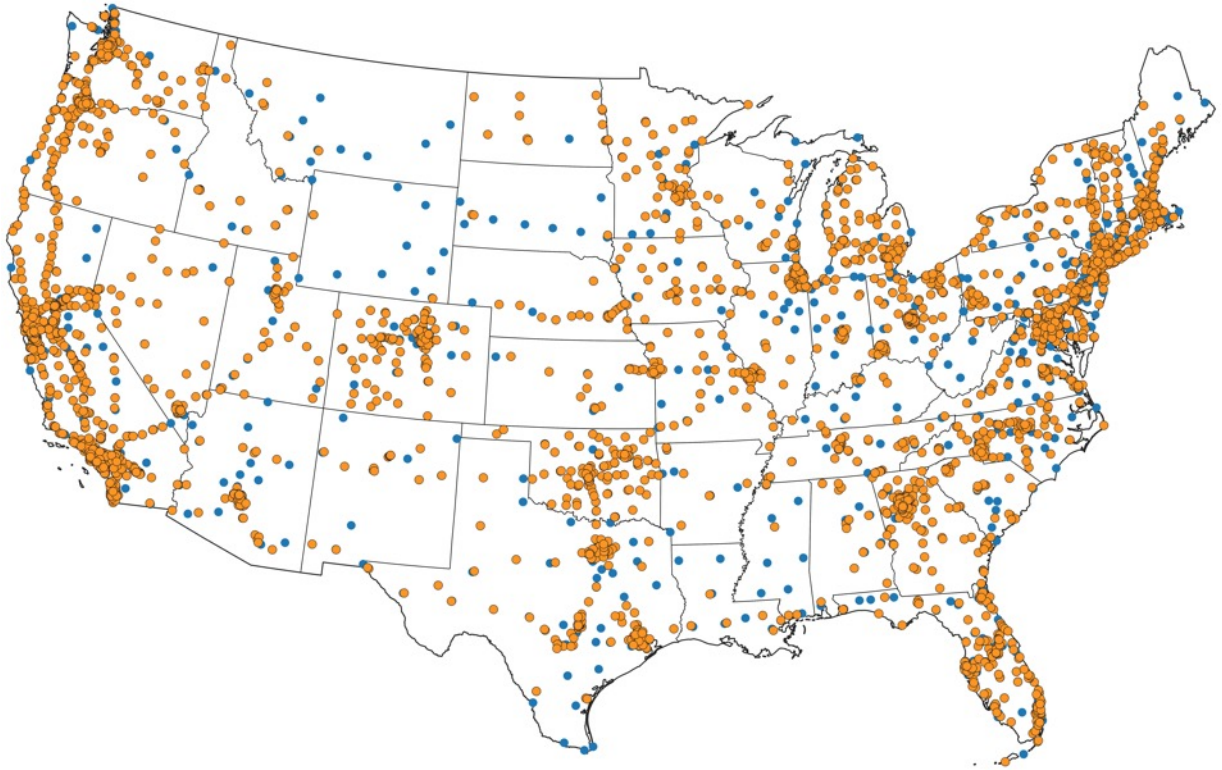
**(1) technical assistance** related to the deployment, operation, and maintenance **of zero emission vehicle charging and refueling infrastructure**, renewable energy generation, vehicle-to-grid integration, including microgrids, and related programs and policies; **(2) data sharing** of installation, maintenance, and utilization in order to continue to inform the network build out of zero emission vehicle charging and refueling infrastructure; **(3) performance of a national and regionalized study** of zero emission vehicle charging and refueling infrastructure needs and deployment factors, to support grants for community resilience and electric vehicle integration; **(4)** development and deployment of **training and certification programs**; **(5)** establishment and implementation of **a program to promote renewable energy generation, storage, and grid integration**, including microgrids, in transportation rights-of-way; **(6)** studying, planning, and funding for high-voltage distributed current infrastructure in the rights-of-way of the Interstate System and for constructing high-voltage and or medium-voltage transmission **pilots in the rights-of-way** of the Interstate System; **(7) research, strategies, and actions** under the Departments' statutory authorities to reduce transportation-related emissions and mitigate the effects of climate change; **(8) development of a streamlined utility accommodations policy** for high-voltage and medium-voltage transmission in the transportation right-of-way; and **(9) any other issues** that the Secretary of Transportation and the Secretary of Energy identify as issues of joint interest

# Where We Are Today




Source: Alliance of Automotive Innovation. Get Connected Electric Vehicle Quarterly Report, Q2 2022

# United States Public EV Charging Infrastructure
## May 2022

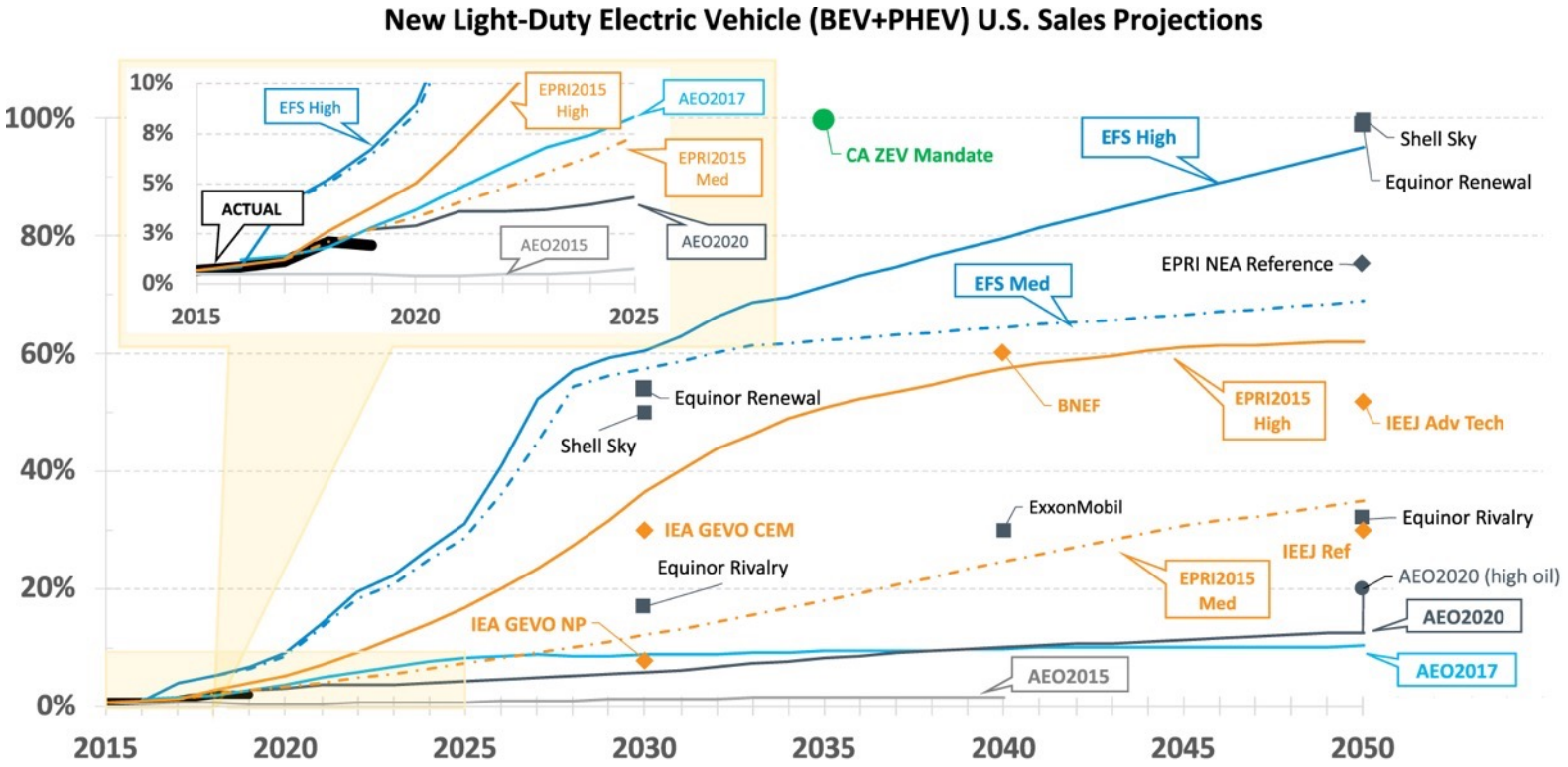


| Charger Type | Current Network* | | Network Growth (since Jan 2021) |
|---|---|---|---|
| | Stations | Plugs | Plugs |
| Public DCFC | 4,804 | 9,943 | +27% |
| Tesla DCFC | 1,334 | 13,485 | +43% |
| Total DCFC | 6,138 | 23,428 | +36% |
| Public L2 | 37,747 | 79,040 | +25% |
| Tesla L2 | 4,436 | 14,677 | +<1% |
| Total L2 | 42,183 | 93,717 | +20% |
| **Total Overall** | **47,304** | **117,145** | **+23%** |

- Public DCFC Stations
- Tesla Supercharger Stations**

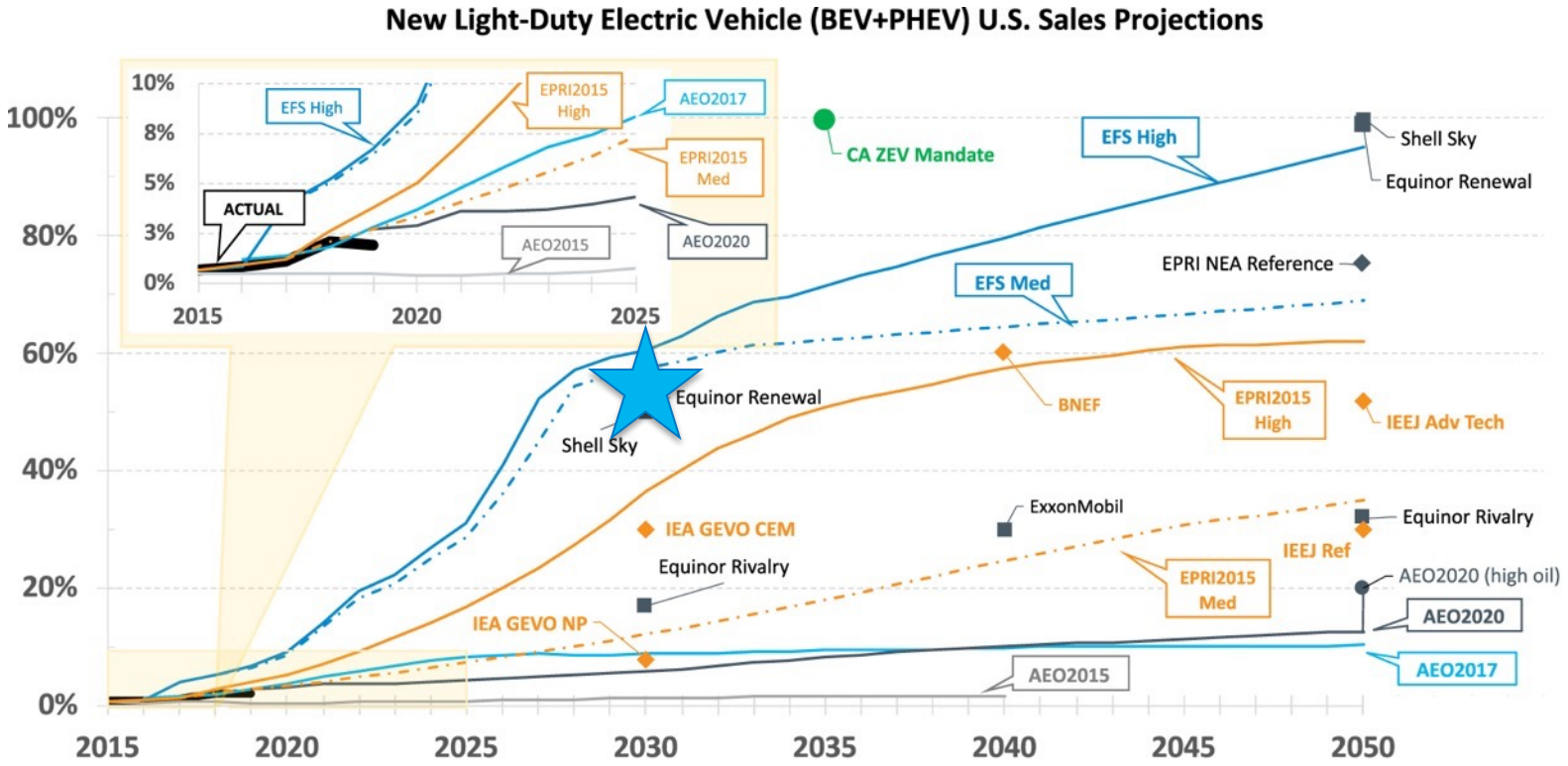
* Network data from the Alternative Fuels Data Center, 05/06/22 and 01/20/2021
** Superchargers typically support 150-250kW per port

# Where Are We Going?




Source: Matteo Muratori *et al* 2021 *Prog. Energy* **3** 022002

# Biden Administration has set a target of 50% of new light-duty sales being electric by 2030




Source: Matteo Muratori *et al* 2021 *Prog. Energy* **3** 022002

# Light-Duty Charging Infrastructure Needs

Key infrastructure needed along corridors to build confidence and in communities for convenience

## Multi-pronged approach to provide affordable charging for all

Fast intercity charging for ~10% of charging*

Curbside/overnight charging ~20% of charging*

Opportunity/destination charging ~10% of charging*


Home charging ~60% of charging*

*For illustrative purposes only

# High-power charging infrastructure considerations

Recharging a 500 mile truck

with a 1,200 kWh battery

in 20:00 minutes

will require 3+ MW power delivery

## Reference electrical loads

Office building[1]
200 kW

Tesla Supercharger
250 kW

Big box store
0.5-1 MW

Distribution substation
~20 MW

[1] 100,000 square foot

Source: J. Farrell, K. Kelly, A. Schroeder, National Renewable Energy Laboratory (2021)

# What We’re Doing About It

# Major BIL Programs Supported by the Joint Office

**National Electric Vehicle Infrastructure Formula Program (U.S. DOT)**

$5.0B

**Discretionary Grant Program for Charging and Fueling Infrastructure (U.S. DOT)**

$2.5B

**Low-No Emissions Grants Program for Transit (U.S. DOT)**

$5.6B

**Clean School Bus Program (U.S. EPA)**

$5.0B

# NEVI Formula Program Guidance

**> Four 150kW DC Fast Chargers** with Combined Charging System ports

EV charging **every 50 miles** along Interstate Highway System **within 1 travel mile**

Minimum station power capability at or above **600kW and supports at least 150kW per port** simultaneously

# Proposed Minimum Standards

-Sample provisions

Connectors, power levels, reliability

Accessibility

Interoperability


Signage

Payment, pricing

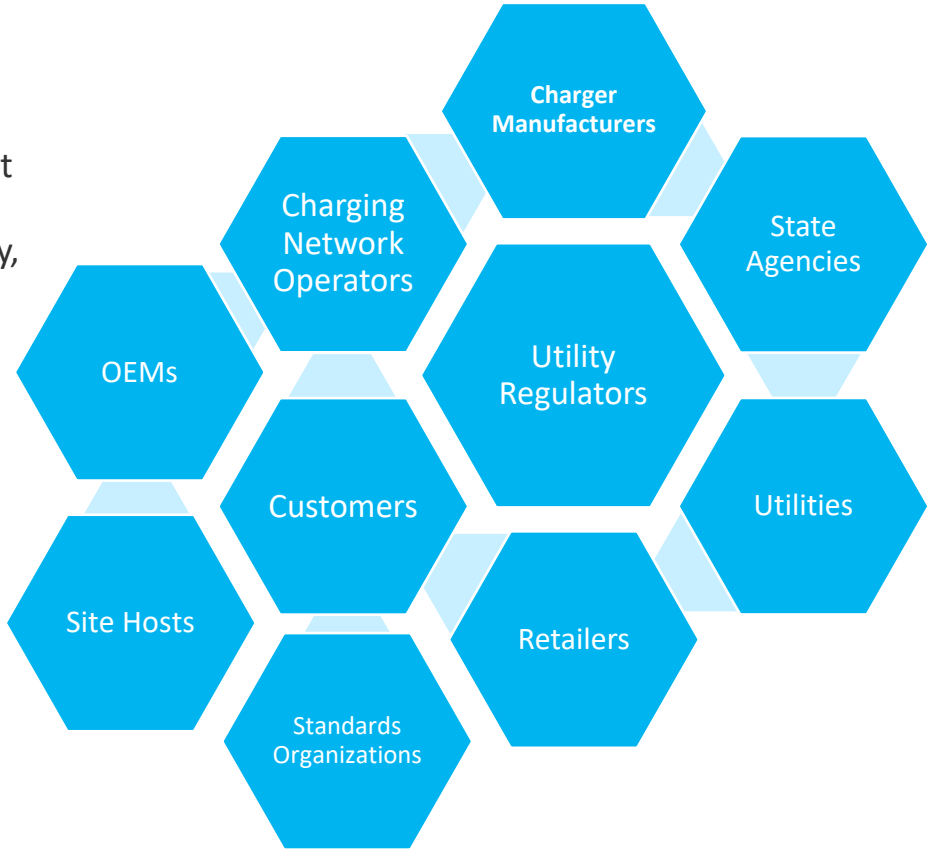
Program reporting, third-party data sharing

# EVGrid Assist: Accelerating the Transition

*Comprehensive VGI Technical Assistance Initiative*

A new cross-DOE coordination and technical assistance effort focused on the interface between vehicle charging and the electric grid considering the full spectrum of the R&D, deploy, use, learn cycle.

- **Purpose:**
- Increase stakeholder knowledge
- Drive actions to resolve VGI challenges and barriers
- Provide pathways for stronger VGI coordination
- **Objectives:** Activate the community to
- Prioritize challenges to solve
- Accelerate planning and decision making
- Enable proactive infrastructure investments and supporting markets, rates and regulations
- More quickly achieve decarbonization goals



# Looking Ahead

## Implementation

- Workforce development
- Community engagement
- Evolution of Joint Office technical assistance on NEVI, Low-No, and Clean School Bus Program
- AASHTO-NASEO Partnership
- DOE EV Grid Assist + continued engagement with APPA, EEI, NRECA, NARUC

## Programmatic

- Finalize NEVI Rulemaking
- Discretionary Fueling and Charging Grant Program
- EV Working Group
- IRA Provisions (30C, 30D, MD/HD)

# What More is Needed

# Thank You

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