



**Michelle Merchant**  
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**INCOG**

**Oklahoma Engineering Conference**  
**June 15, 2023 | 2pm**





## Agenda

- **Clean Cities & INCOG Intro**
- **Electric Vehicles & Projects**
- **Hydrogen & Projects**
- **EEMS Initiatives**







INCOG is a voluntary association of local and tribal governments in the Tulsa metropolitan area in northeast Oklahoma.

Established in 1967, INCOG is one of 11 Councils of Governments in the State of Oklahoma, and one of several hundred regional planning organizations across the country.

INCOG serves Creek, Osage, Rogers, Tulsa, and Wagoner counties, more than 50 cities and towns located in those counties, and the Cherokee, Muscogee, and Osage Nations.



# The Clean Cities Mission

*Clean Cities coalitions enhance the economic, environmental, and energy security of the United States by working locally to advance affordable, domestic transportation fuels, energy efficient mobility systems, and other fuel-saving technologies and practices.*



TULSA AREA  
CLEAN CITIES





# Clean Cities Coalitions



U.S. Department of Energy

Map Date: 04/16/19



# Clean Cities Portfolio



**Light, Medium, and Heavy-Duty Vehicles (on & off-road)**



**Alternative and Renewable Fuels and Infrastructure**



**Idle Reduction Measures and Fuel Economy Improvements**



**New Mobility Choices & Emerging Transportation Technologies**



## US DOE Technology Integration Program

Technology  
Integration  
Program

Provides objective/unbiased  
data and real world lessons  
learned that inform future  
research needs and  
support local decision-  
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# Basics: Electric-Drive Vehicles

## Electric Vehicles (EVs):

- All-Electric Vehicles
  - Powered by an electric motor
  - Uses charging infrastructure to charge the battery
- Plug-In Hybrid Electric Vehicle (PHEV)
  - Powered by an electric motor and engine
  - Uses charging infrastructure to charge the battery

## Hybrid Electric Vehicle (HEV):

- Powered by an engine and electric motor
- Does not use charging infrastructure to charge the battery



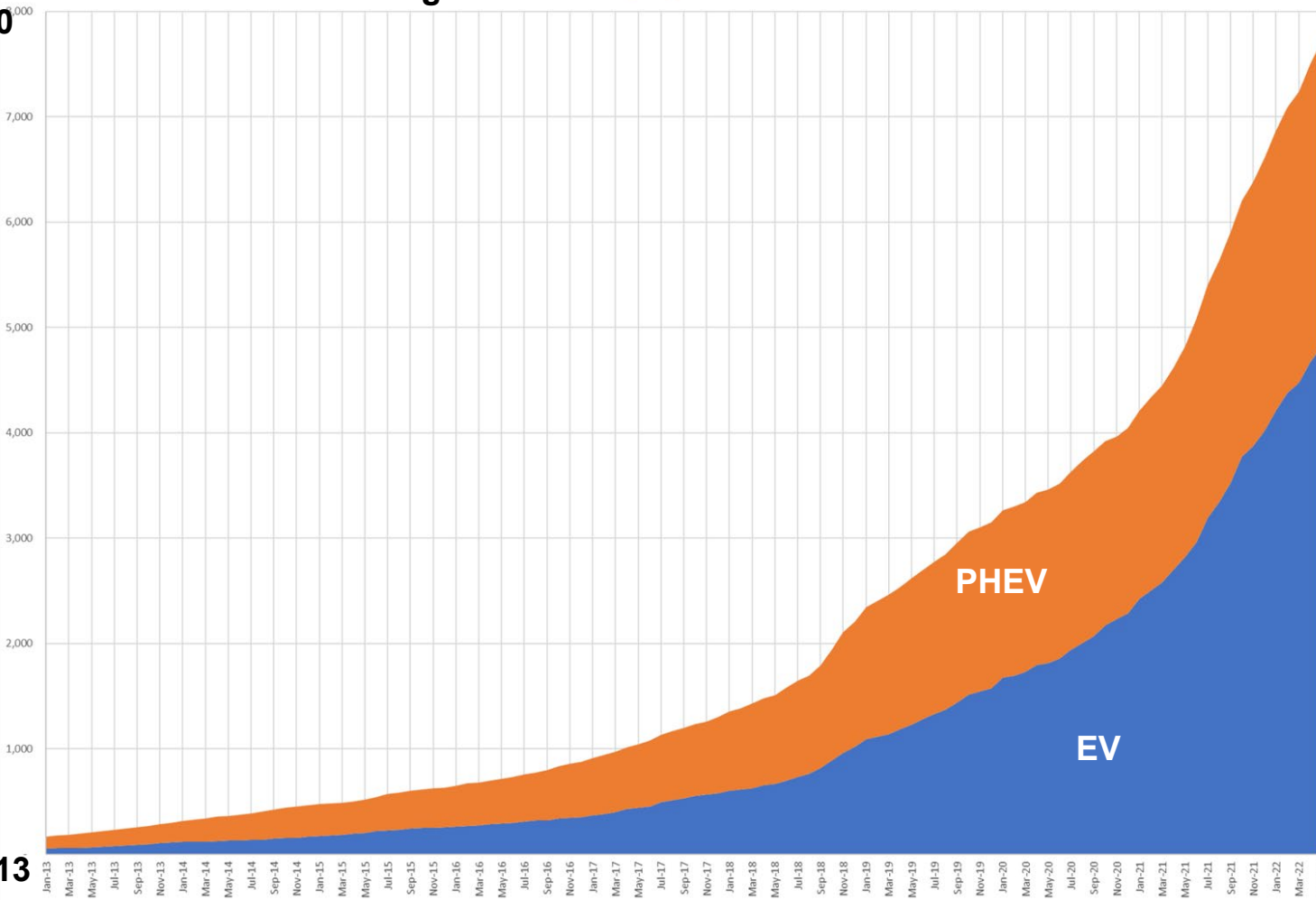


# Oklahoma EV Registrations

Oklahoma Vehicle Registrations

■ BEV ■ PHEV

8,000

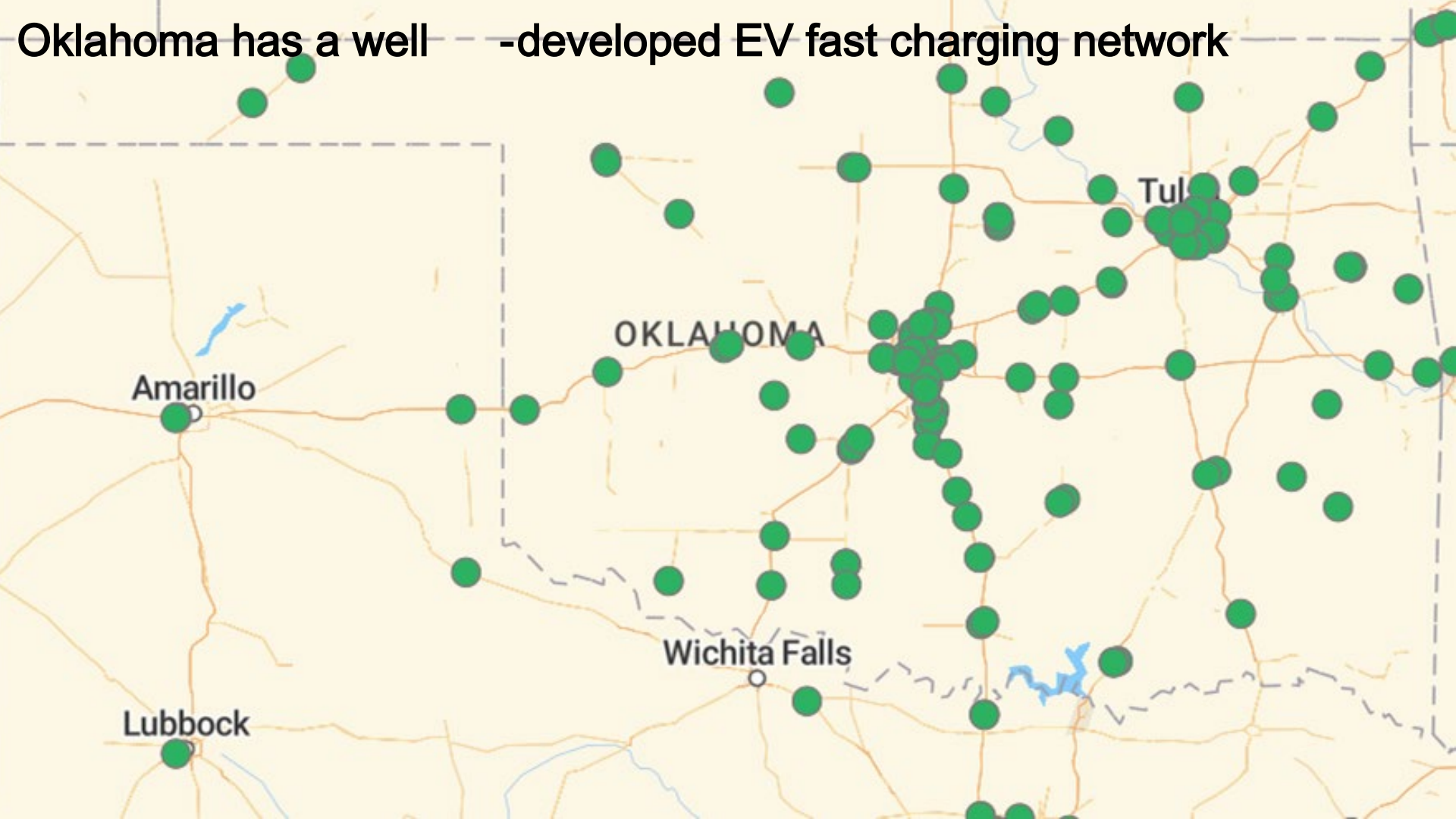


Jan 2013

May 2022



Oklahoma has a well -developed EV fast charging network





# Infrastructure: Electric Vehicle Charging Infrastructure

Type of Charger	Current Type	Input Voltage (V)	Typical Charging Time	Primary Use
Level 1	Alternating Current (AC)	120 V	Approximately 5 miles of range per hour of charging	Residential
Level 2	AC	208 V or 240 V	Approximately 25 miles of range per hour of charging	Residential Commercial
DC Fast	Direct Current (DC)	208 V or 480 V	100–200+ miles of range per 30 minutes of charging	Commercial
Wireless	AC	Varies	10–20 miles of range per hour of charging	Commercial





# Infrastructure: Connectors and Plugs

Type of Charger	Charging Standard
Level 1	SAE J1772 NEMA 5-15 NEMA 5-20
Level 2	SAE J1772
DC Fast	CHAdEMO CCS (SAE J1772 Combo) Tesla Supercharger
Wireless Charging	SAE J2954





# Infrastructure: Alternative Fuel Corridors

## Designated EV Corridors:



## FHWA AFC Designation Rounds 1-7

### Build Out:

- **ChargeOK**  
2019 & 2021  
\$4.2 mil
- **NEVI**  
2022-2026  
\$66 mil
- **CFI**  
2022-2026  
\$1.7 bil  
competitive





**4 electric buses  
deployed in 2021**

**7 electric buses  
coming soon**

**BRT**

**Microtransit**





# Local Industry



I I  
- C A N O O -  
I I







# EMPOWER

## WORKPLACE CHARGING

[mmerchant@incog.org](mailto:mmerchant@incog.org)

**Tulsa Area Clean Cities is helping workplaces explore EV charging as an amenity to employees.**

**We can help your team:**

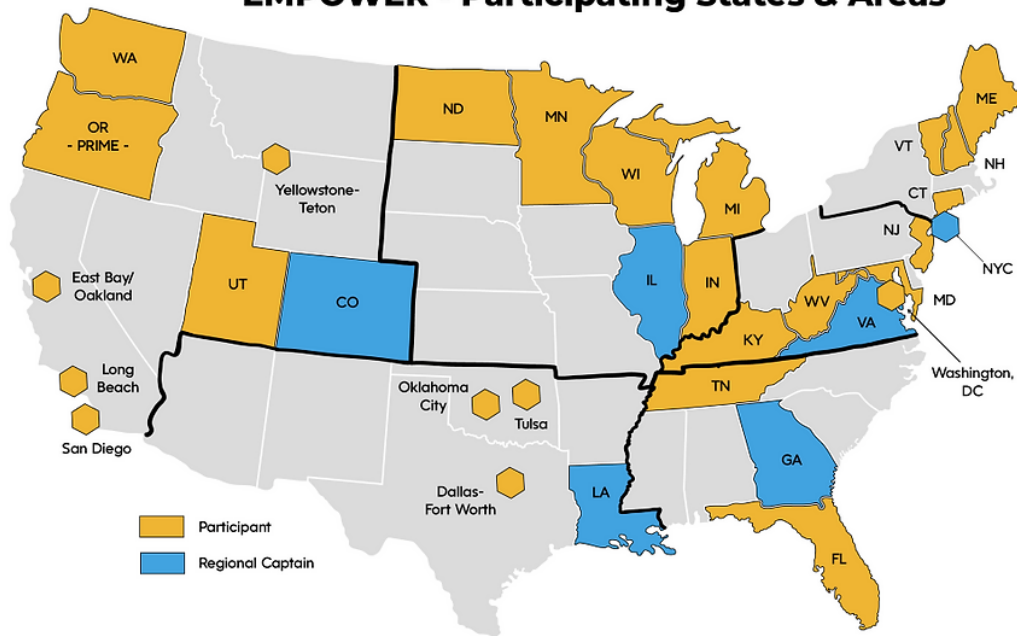
**kickoff the discussion and survey employee interest,**

**provide technical assistance,**

**suggest reputable contractors,**

**and more!**

### EMPOWER - Participating States & Areas



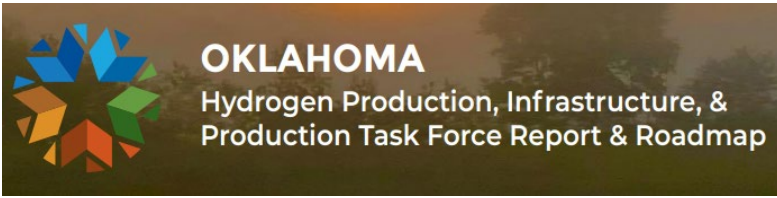


# Basics: Hydrogen in Vehicles

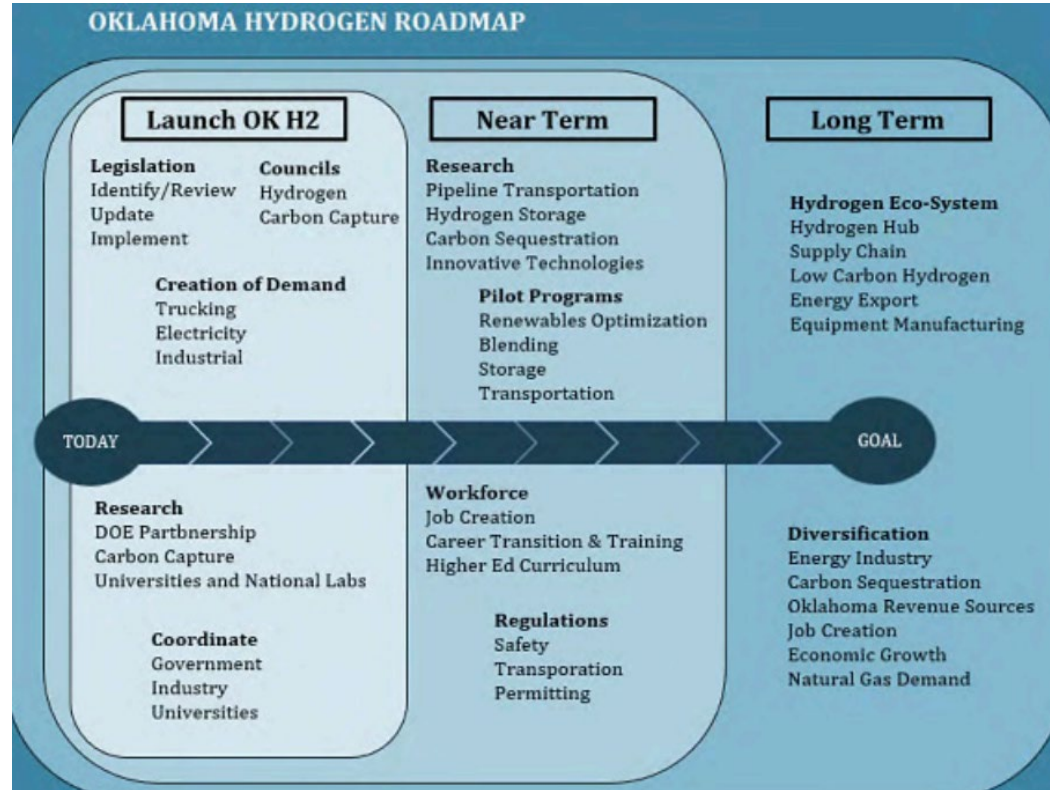
- Used in fuel cell electric vehicles (FCEVs)
- High energy content by weight
- Stored onboard vehicles in high-pressure tanks
- Challenges are cost-efficiently extracting hydrogen for use as a fuel and developing infrastructure for distribution







The Hydrogen Production, Transportation, and Infrastructure Task Force (OK H2 Task Force) was established by Senate Bill 1021 to research, collaborate, and submit this report on the viability of growing the production, use, supply chain, and infrastructure for a hydrogen economy within the state and for energy export.





# HALO<sup>2</sup>

## hydrogen hub

The HALO Hub's approach is to employ public-private partnerships that lead to deployment and development of an extensive hydrogen network in the three constituent states, ultimately to be integrated into the national hydrogen network. HALO goals support transformative technologies and investments that will drive lower costs and increase adoption of hydrogen to reduce carbon and other emissions.

### Scope

The scope of the HALO Hub is broad and inclusive, meant to catalyze widespread production and adoption of hydrogen for a variety of appropriate end-uses in the medium and long term. The participants comprise all parts of the value chain, from feedstock to production, transportation and delivery, storage, and end-use.



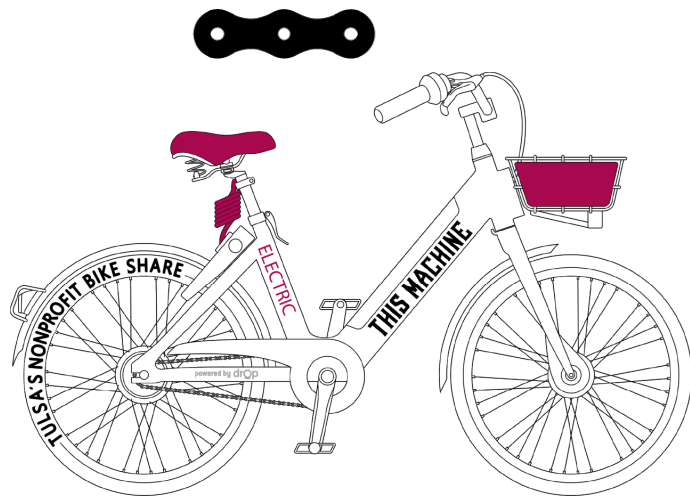
[h2alo.net](https://h2alo.net)



## EEMS Initiatives

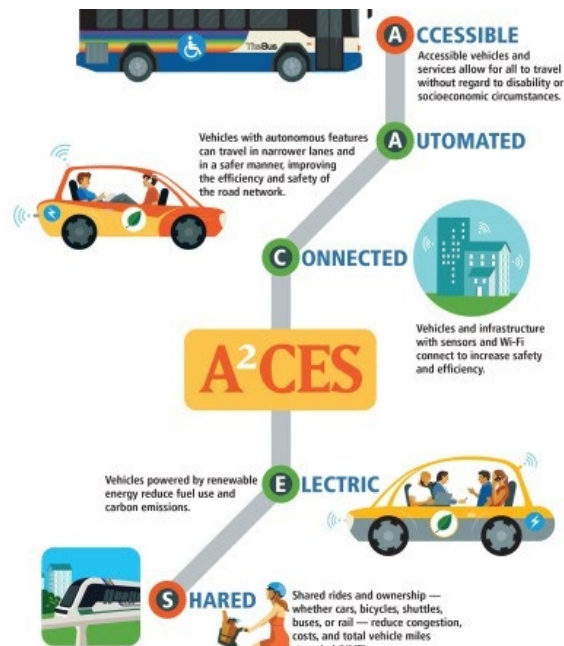
# THIS MACHINE

TULSA'S NONPROFIT BIKE SHARE



# Tulsa Mobility

## Innovation Strategy





# Thank you!

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