



# California-Mexico Medium- and Heavy-Duty Zero-Emission Vehicles (MHD ZEV) Transition

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**April 2023**

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**ALIANZAMX**

**UCR** CE-CERT

<http://www.cert.ucr.edu>



# UCRIVERSIDE | CE-CERT

CE-CERT is dedicated to addressing society's most pressing environmental challenges in air quality, climate change, energy and transportation through research, education and public service



**150 student employees**

**60 faculty & engineers**

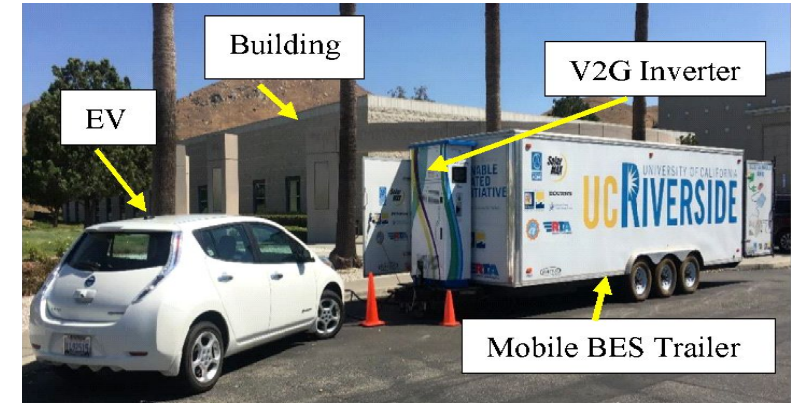
**\$ 30 million in ongoing research**

**30 laboratories and testbeds**

# Vehicle Electrification Projects at UCR CE-CERT

## Light-Duty EV Research Projects

- Carbon-Based EV Charging Strategies: developing pricing strategies to promote EV charging mid-day
- Vehicle-to-Building Energy Connectivity



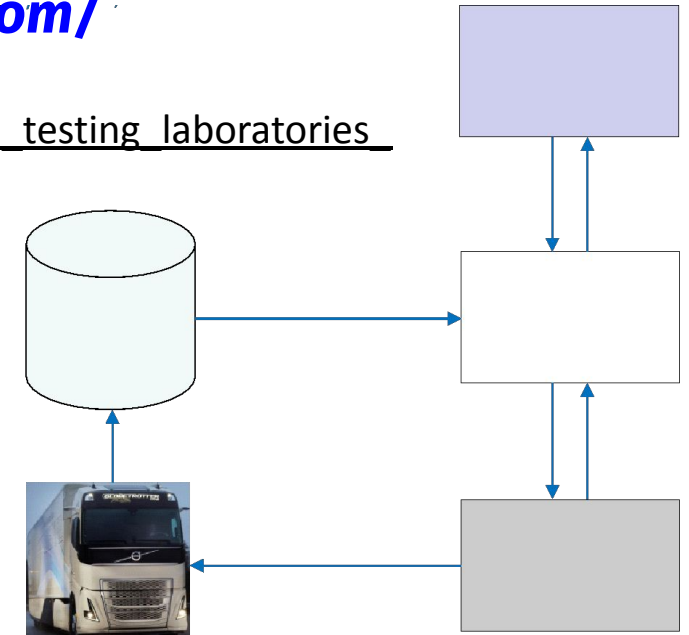
## Medium and Heavy-Duty Electrification

- Participation in several ZANZEFF (Zero- and Near Zero-Emission Freight Facilities) pilot projects; e.g., see VolvoLights: <https://www.lightsproject.com/>
- Vehicle Performance Testing: see [https://www.cert.ucr.edu/caltestbed#electric\\_drive\\_vehicle\\_testing\\_laboratories](https://www.cert.ucr.edu/caltestbed#electric_drive_vehicle_testing_laboratories)



## Battery Electric Truck (BET) Fleet Management

- Current limitations of BETs could significantly impact fleet operations, so we have developed BET-specific fleet management solutions
- New methods of scheduling, dispatching, SOC monitoring & forecasting, opportunity charge events





# Binational Workshop on ZEV Transition of MHD Vehicles



Focused on ZEV transition of CA-MX MHD vehicle cross border traffic

Organized by UC AlianzaMX and CE-CERT, UCR

Encourage dialog between stakeholders and identify challenges and opportunities

Topics included:

- Drayage and MHD ZEV regulations, current and proposed
- Trade and environmental implications
- Infrastructure and vehicle technologies

Participants included regulatory agencies, government, industry, utilities, and academia from both countries



# Workshop Participants

## MEXICO

## UNITED STATES

Asociación Nacional de Productores de Autobuses, Camiones y Tractocamiones, A.C. (ANPACT)	California Air Resources Board
Asociación Nacional de Transporte Privado (ANTP)	GHD
Cámara Nacional de Autotransporte de Carga (CANACAR)	Kenworth
CUMMINS	Nikola Corporation
Foton México	Riverside Public Utilities
Kenworth Mexicana	San Diego Gas & Electric Company (SDGE)
NAVISTAR (INTERNATIONAL)	San Diego Regional Chamber of Commerce
Secretaría de Economía e Innovación Gobierno del Estado de Baja California	South Coast Air Quality Management District
Secretaría de Medio Ambiente y Desarrollo Sustentable Baja California	UC Davis Institute of Transportation Studies Plug-in Hybrid & Electric Vehicle (PH&EV) Research Center
UC Alianza México	UC Riverside Center for Environmental Research and Technology (CE-CERT)
US Embassy in México	UC Riverside Office of Technology Partnerships





# Workshop Summary

## California is the first state to propose MHD ZEV mandates (Advanced Clean Fleets)

- Will improve air quality and GHG emissions
- Potential impacts on logistics companies, trade, border infrastructure, and vehicle manufacturing
- Offers an opportunity to develop strategies for a well planned transition that can be applied to other states and regions

## Discussion Topics

- Differences between CA and MX fleets; incentives; and regulatory requirements
- Small fleet companies will be unable to meet mandates under current circumstances; Age limit of 15 years will mean 50% of MX fleet will fall under 'out of service' category
- Support to install border charging and fueling infrastructure
- Supply chain and raw material issues, especially for Evs
- Hydrogen integrated microgrids and other novel approaches necessary to meet energy needs



# Workshop Summary

## Proposed strategies

- Explore coordinated regulatory approaches; advocate for policy mechanisms on both sides
- Address differences in regulatory requirements and technology/operational protocols
- Incorporate stakeholder input from both countries during the planning and deployment process
- Trade: implications of regional value content requirements on sourcing and supply chain
- Battery recycling, environmental issues associated with disposal
- Address differences in fleets between the two countries
- Workforce development
- Improve efficiency at border crossing stations
- Environmental justice



## Next Steps

Convene working groups to continue the discussion and identify specific issues and solution strategies

Encourage stakeholder participation in the planning process on both sides

Identify incentives, and opportunities to collaborate

UC AlianzaMX will sponsor a CE-CERT research project to develop a roadmap for the MHD ZEV transition of CA-MX border traffic

### Analysis will include

- Current and projected vehicle population mix; trip and route data
- Infrastructure needs; resource needs (renewable electricity and hydrogen)
- Charging and fueling station specifications and locations
- Cost analysis; air quality and GHG benefits estimates

Roadmap intended to be used by stakeholders to address challenges and help the transition process