California-Mexico Workshop on Medium- and Heavy-Duty Zero-Emission Vehicles (MHD ZEV) Transition and Related Topics

The transition to medium- and heavy-duty zero-emission vehicles (MHD ZEV) is a crucial topic of the US-Mexico agenda. California is the first and only state in the US to propose Advanced Clean Fleets (ACF) Regulation, which will have significant implications not only for goods carriers and logistics companies operating across the border region but could eventually impact trade, border infrastructure, and even vehicle manufacturing, particularly in Mexico.

At the North America Leaders' Summit (NALS) 2023, the three leaders committed to develop a plan for operating standards and the installation of EV chargers along international borders to ensure a seamless EV transition from country to country as part of a series of commitments to combat the climate crisis. California ACF and related regulations and their impact on various cross-border issues thus offer a learning experience for the other states that share a border between Mexico and the US. It also represents an excellent opportunity to develop a bi-national case study.

On February 28 and March 1, 2023, the College of Engineering - Center for Environmental Research and Technology (CE-CERT), at the University of California, Riverside, hosted a binational workshop on the ZEV transition of medium- and heavy-duty vehicles. The event provided a neutral space for dialogue between industry actors and policymakers on the challenges and opportunities of the transition concerning emissions regulations and trade, as well as a broad range of issues such as air quality, infrastructure, electric grid deployment, supply chain, renewable sources, and technology development, among others.

More than 40 U.S. and Mexican stakeholders attended the workshop, strengthening the dialogue with diverse perspectives. Participants also toured CE-CERT facilities (at left) and the Southern California headquarters of the California Air Resources Board in Riverside (at right).

UC Riverside Chancellor Dr. Kim A. Wilcox and CE-CERT Director Dr. Don Collins provided welcoming remarks, noting the crucial challenges and opportunities for collaboration between Mexico and the US, given their geographic proximity and history of cooperation. They also highlighted the strategic importance of UC research on the transition, not only for the US and Mexico but specifically for Riverside and the Inland Empire, a key logistics industry hub and transit point for goods movement.

During the workshop, participants identified the issues most relevant to achieving a managed industry transition to zero-emission vehicles that would ensure prosperity, competitiveness, and inclusion for the binational goods transportation industry and border communities. Using these insights, UCR CE-CERT plans to carry out a new research effort with support from UC AlianzaMX that will provide science-based recommendations for policymakers, communities, and the private sector.

Research & Policy Dialogue

After an overview of the impacts of goods movement in Inland Southern California and other links between **air quality, transportation, and energy** given by CE-CERT, the **Advanced Clean Fleets** (ACF) and related current and proposed regulations were presented by California Air Resources Board (CARB). Measures, costs, regulation components, schedules, and milestones proposed for Drayage Truck Regulation led to a dialogue about the **differences** in fleets and infrastructure between Mexico and California. The implementation should consider those differences because any regulation on one side of the border will affect the whole **trade** in the region. **Incentives** such as the Energy Infrastructure Incentives for Zero-Emission (EnergIIZE) funds that focus on infrastructure and the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) are expected to help fleet owners to comply in time.

Mexico's National Chamber of Cargo Transportation and National Association of Private Transport representatives provided perspectives on cargo transport impacts of California's fleet regulations, pointing out that environment preservation, mobility, productivity, and competitiveness are part of their core values but regulatory requirements in CA will affect trade between US and Mexico because there is no Infrastructure or electrical capacity in Mexico, nor incentives from the Government and the costs of ZEV transition are still very high.

Besides the governments on both sides of the border, the private sector and communities also want cleaner energy and air, but the challenges associated with the transition to ZEVs should be addressed proactively with careful planning. Otherwise, more than 1,000 trucks from small fleet companies will not be able to comply with new mandates under present circumstances; the COVID-19 pandemic created a challenge that is still affecting cargo transport companies, and further regulatory requirements could put them under increased stress. There is a lack of robust financial strategies in Mexico to support the transition, and from the stakeholders' perspectives, additional time is needed for implementation.

San Diego Regional Chamber's speaker talked about trade and commerce opportunities for transport in the California-Mexico border region, emphasizing that both economies depend on each other; Mexico is not only California's largest export market but a production and manufacturing partner. Efficient cross-border connectivity and the complementary nature of both economies make California and Baja California globally competitive. During the dialogue, it was pointed out that this is why transition mandates should incorporate strategies to fund **border charging and hydrogen fueling infrastructure**. There are ongoing conversations on the expansion of border infrastructure, development of ports of entry, and funding that state and federal governments are involved in.

One question to be addressed is how the charging required for the EV trucks will impact the **supply chain** processes and operational procedures because it could negatively impact productivity.

Finally, challenges and opportunities for the Medium and Heavy-Duty industry in the ZEV transition were presented by the Mexican National Association of Buses, Trucks, and Tractors Producers. Mexico´s producers (16 associated brands) actively participate in different initiatives, from working groups, the national strategy for electromobility, and circular economy regulation discussions, to white papers and research endeavors. The main challenges are **road safety, the environment, and the supply chain**.

The US-Mexico-Canada Free Trade Agreement (USMCA), regional value content requirement of 60% by 2023, 64% by 2024, and 70% by 2027 for the automotive sector is threatened by the fact that 80% of EV **batteries** are manufactured in China; if a strategy to relocate battery producers to North America is not developed, the entire supply chain could be strained, and bus and truck manufacturers could face significant risk. But this is also a great opportunity for **supply chain** companies and OEMs if the battery manufacturing develops as a robust industry in Mexico and the US. This also could lead to **research** on new **raw materials** and critical components for EV batteries.

Another issue to be considered is that the limit age of 15 years for fleet vehicles proposed by CARB implies that approximately 50% of Mexican fleets are in the "out of service" criteria, and there are no **incentives** from the federal government to renew old fleet systems in Mexico. There should also be policy mechanisms in place to avoid the likelihood of replaced high emissions and inefficient vehicles from California being sold to Mexican entities and continued in service.

A major challenge of ZEV transition is the production, storage, and delivery of the electricity and hydrogen required to replace fossil fuels. Utilities, local, state, and federal governments, OEMs, and charging and fueling technology providers must work closely to ensure adequate production and distribution of these resources. Given that this is an enormous requirement for utilities, it is important to engage them closely from the beginning and ensure adequate policy and funding support for the transition. New approaches to energy generation, storage, and distribution are needed to meet the anticipated demand. Microgrids, including hydrogen integrated microgrids that have long term energy storage capabilities, can complement the traditional electric grid and also provide grid services. This is an important area of research that will be addressed as part of the next steps.

Breakout Discussions

The proposed Advanced Clean Fleets Regulation (ACF) by CARB is expected to have implications for improving air quality and mitigating Greenhouse Gas (GHG) emissions and trade and commerce between California and Mexico. The main topics that emerged during breakout discussions with the goal of ensuring a well-managed transition that minimizes risks and negative impacts for all stakeholders are summarized below.

Drayage and MHD ZEV Transition Regulations

- Border infrastructure: What roles do federal governments play in managing critical infrastructure components, including coordinating with state government actors?
- Costs: What are the "real" costs of the ZEV transition on both sides of the border? How are they similar and different?
- Incentives: What types of policy incentives could potentially help the industry address transition challenges?

- Harmonization: What is the potential for coordinated regulatory approaches? Can international pressure help the Mexican industry advocate for fundamental domestic policy changes?

Trade and Environmental Implications

- USMCA: How do regional value content rules create sourcing and/or supply chain obstacles?
- China: Could restricting access to low-cost battery imports from China create a bottleneck for Mexican manufacturers shortly? If so, how can this be addressed?
- Batteries: How can stakeholders gain additional information on incentives for recycling? How can Mexican stakeholders put controls on local disposal and/or remediate environmental issues?

Infrastructure and Vehicle Technologies

- Full-service model: Can OEMs build a shared network of vehicles, infrastructure, and energy that allows all firms to profit from links?
- Funding: What mechanisms are available to Mexico carriers to facilitate the ZEV transition?
- Electromobility: Can pilot projects help develop strategies to support ZEV deployment in public transportation (e.g., buses) and last-mile operations?
- Cross-border operations: What can be done to improve efficiency at the border?
- Operations: How will stakeholders adjust to different technological requirements in California and Mexico? Are regulatory exemptions or adjustments required for the technology transition?
- Workforce development: What type of training programs are currently available? Which are still needed?
- Communities: How can regulations address environmental justice, particularly for low-income communities in high-traffic areas?
- Batteries: What technology and/or programs can support recycling and/or disposal options, including as part of the circular economy?

Conclusions

The binational effort between the US and Mexico with the High-Level Task Force for the EV transition, which was created in February 2021, by UC AlianzaMX and the Mexican Ministry of Foreign Affairs (SRE) will help to coordinate engagement activities of this group, and AlianzaMX will continue to support stakeholder participation on both sides of the border.

The workshop identified a number of challenges and issues on both sides of the border and there was robust discussion on how these can be addressed. The consensus was that while the challenges are significant, there is a significant desire on both sides to work together to address these challenges and achieve shared goals and enhance the existing strong trade and cultural relationships. As initial steps, CE-CERT and AlianzaMX will develop working groups to develop strategies to address critical issues, provide input in the regulatory and policy-making process on both sides, enhance collaboration, and help accelerate the transition in a well-planned manner. The team will also help address key scientific, technological, and policy challenges through continuing research and development projects that will leverage ongoing work and resources on both sides.

Next Steps

Based on the initial input from stakeholders during the workshop, CE-CERT researchers will develop a new research project on the transition funded by UC AlianzaMX as part of the Strategic Initiative of Zero Emission Vehicles. Please click this link to register as a member of the MHD-ZEV working group and indicate your principal topic(s) of interest for more information.

CE-CERT from UC Riverside and UC AlianzaMX will also be presenting this Policy Brief during the California-Mexico 2030 Summit on April 19th; and sharing more information on the research progress at the binational forum within the framework of ANPACT's Expo Transport, scheduled for November 2023 in Guadalajara, Mexico.

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

Presentations

- *Background and context on MHD-EV Transition* - Matt Barth, Associate Dean, UCR Bourns College of Engineering
- *MHD ZEV Regulatory environment overview* - Bruce Tuter, Manager, Compliance Assistance & Outreach Section, California Air Resources Board
- *Perspectives on cargo transport impact of California regulations on Electric Vehicles* - Israel Delgado, Vice President, Northwest Region, CANACAR; and Alex Theissen, President, ANTP
- *Utility perspectives* - Todd Corbin, General Manager, Riverside Public Utilities
- *Infrastructure and vehicle technologies* - Omar Gonzales, Senior Manager, State & Local Government Affairs, Nikola Corporation
- *Trade and commerce opportunities for transport in the California-Mexico Border Region* - Kenia Zamarripa, San Diego Regional Chamber of Commerce
- *Challenges and opportunities for the Medium and Heavy-Duty industry on the EV transition* - Miguel Elizalde, President, ANPACT

Contact

- Isabel Studer N., Ph.D., Director, University of California – AlianzaMX, Professor, School of Public Policy at the University of California, Riverside (UCR) isabel.studer@ucr.edu
- Arun S.K. Raju, Ph.D.- Associate Director – Operations, Center for Environmental Research and Technology (CE-CERT), University of California, Riverside (UCR) arun@engr.ucr.edu
- Jail Ixel Cruz – Zero-Emission Project Coordinator, UC AlianzaMX (jail.cruzgarcia@ucr.edu)