Title

Policy Brief: Implications of Global Electric Vehicle Adoption Targets for Mexico Light Duty Auto Industry

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Publication Date

2023-04-01

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Implications of Global Electric Vehicle Adoption Targets for Mexico Light Duty Auto Industry

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POLICY BRIEF **April 2023**

Issue/Research Description

Roadmaps to meet greenhouse gas (GHG) emissions reduction targets in industrialized nations increasingly include extensive vehicle electrification as an efficient, clean, and comfortable transportation decarbonization solution, particularly for the light-duty sector. For vehicle producers around the world, this shift represents both a challenge to adapt their operations to meet consumer demands, and an extraordinary opportunity to rethink business as usual and restructure production and supply chains to become leaders in the development and sales of clean transportation technology. The Mexican auto industry is the fifth largest light duty vehicle (LDV) exporter in the world, the single largest foreign supplier to the US with close to 15% of the market, and a significant contributor to the Canadian, European, and South American markets.

The Mexican auto industry is currently grappling with a significant paradigm shift, as the world moves from traditional internal combustion engine vehicles to electric vehicles. This global transition has the potential to impact the industry in ways that are both promising and challenging. On one hand, there is a growing demand for light duty electric vehicles in the global market, which presents a unique opportunity for Mexico's auto industry to expand and thrive. On the other hand, the shift towards electric vehicles is an inevitability, and companies that fail to keep up may lose market share.

This brief explores the impact of different electric vehicle demand scenarios combined with global trade trends on the light duty vehicle industry in Mexico.

Key Findings

Mexico produces about 3.8 million light duty vehicles (LDVs) per year; most of them are exported to the US and the small remaining portion is exported to Canada, sold on the local market, or exported to other markets (Figure 1). The EV share today is just over 100 thousand vehicles per year, mostly produced by Ford.

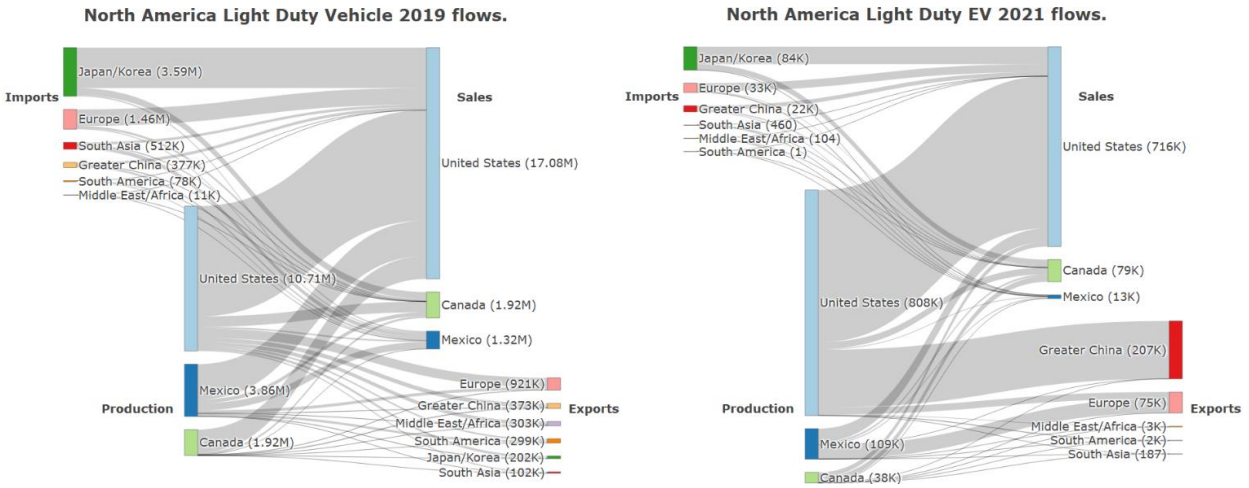

Figure 1: *2019 LDV Supply Dynamic in North America (left) and 2021 Light-duty EV Supply Dynamic in North America (right).*

Current light duty vehicle production in Mexico is led by major international Automakers (Original Equipment Manufacturers or OEMs). Mexican production constitutes a large share of the North America production but only minor share of the global capacity (Figure 2).

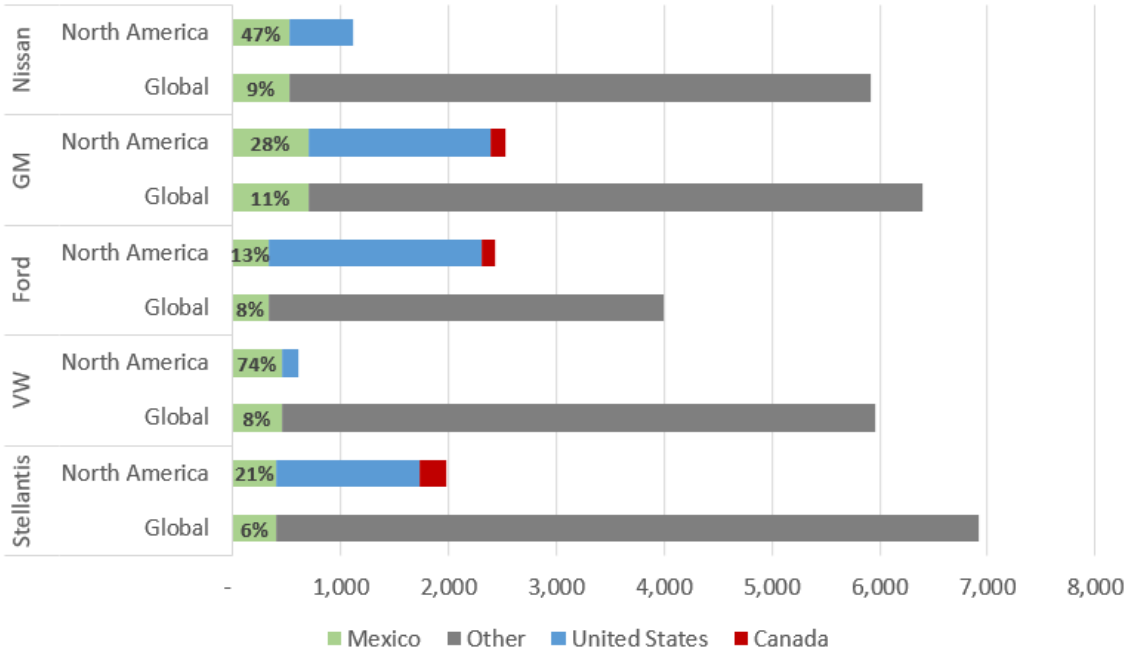

Figure 2: *Mexico's 2022 total LDV production by major OEM operating in the country (in thousands), and the share of global and regional production it represents*.

The current domestic market for light-duty vehicles in Mexico is about 1.32 million vehicles per year most of which is exported to the US. The US light-duty vehicle market is saturated, with vehicle ownership at approximately 80%, and sales have remained relatively stable, with annual unit sales oscillating between 15-17 million. In contrast, UC Davis modeling shows that Mexico is expected to witness a 62% growth in its light-duty vehicle market by 2035, driven by its higher population growth rate and currently low vehicle ownership. Other lower- and middle-income countries and regions are also poised to experience significant expansions in their light-duty vehicle markets. The expected growth in local demand together with the growth in other developing markets will help the Mexican industry grow the total LDV production in most scenarios other than scenario 3 “free trade” where the local market will be shared with higher level of imports. Scenario 2b which reflects high global reliance on domestic supply with combined United States-Mexico-Canada Agreement (USMCA) market shows the maximum growth for the total LDV Mexican supply, mostly by growing the domestic demand (Figure 3).

The most significant advantage that the Mexican automotive industry could have in the global shift to EVs under current policies is by incentivizing North American-made parts, combined with provisions established by the Biden administration in the 2022 Inflation Reduction Act (IRA) that expand tax credits to purchase EVs assembled in North America. This cements Mexico as the most strategic investment location for foreign automakers to access the massive North American Market. Scenario 2, reflecting higher domestic supply for the US, Canada, and Mexico, and scenario 3, reflecting global free trade, yield similarly low EV production for Mexico of 1.3-1.4 million a year. While scenario 2B, reflecting higher domestic supply under the USMCA region, yields the highest EV supply of 2.2 million a year out of 5.2 million light-duty vehicles.

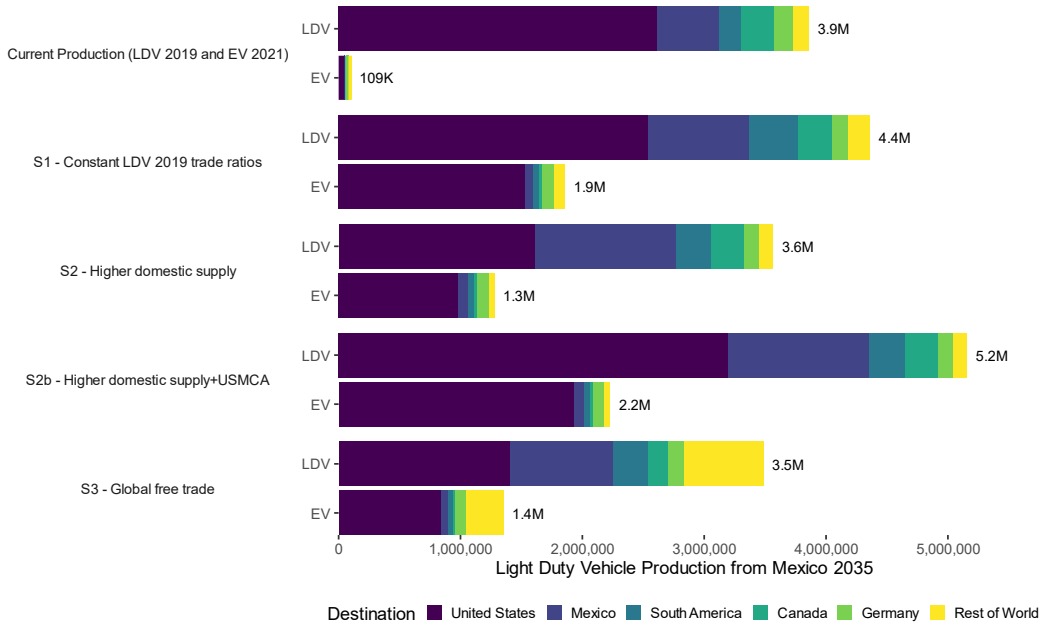

Figure 3: *Mexico’s Light duty vehicle production in 2035 under all different scenarios. Only the major export partners are presented in detail. LDV: Light Duty Vehicle total. EV: Light Duty Electric Vehicle.*

Mexico's heavy dependence on the US market could hinder its ability to compete globally in an open market scenario, as indicated in scenario 3. Therefore, Mexico must maintain a strong relationship with the US market while exploring opportunities to expand its market reach. Mexico could leverage its position by being a pioneer in supplying EVs not only for North America but also for Central and South America, offering a diverse range of EVs from large and expensive ones to more affordable options with smaller batteries. In doing so, Mexico could position itself as a leading supplier to the rapidly expanding markets of lower- and middle-income countries.

Historically highly motorized countries will experience a large uptake of electric vehicles (EVs) by 2035, taking up a considerable proportion of their total light-duty vehicle sales. For Mexico's export-oriented automakers, this shift presents a unique opportunity and risk with the need to secure a competitive advantage by capitalizing on the rising EV market. All four scenarios in our model suggest that in order to keep the light-duty vehicle market share, one third to 45% of the production in 2035 will have to be EVs. Thus, when planning for the EV transition, it's essential to add capacity rather than only replacing it, by investing in new production facilities and equipment.

The Mexican auto industry's reliance on the US market is a significant factor affecting its transition to electric vehicles, as the US market demands larger battery sizes per vehicle than the global average. Current investment does not cover the new demand, thus the Mexican automotive industry will have to work to secure a proportionally high battery supply to meet this demand, most likely through imports (Figure 4).

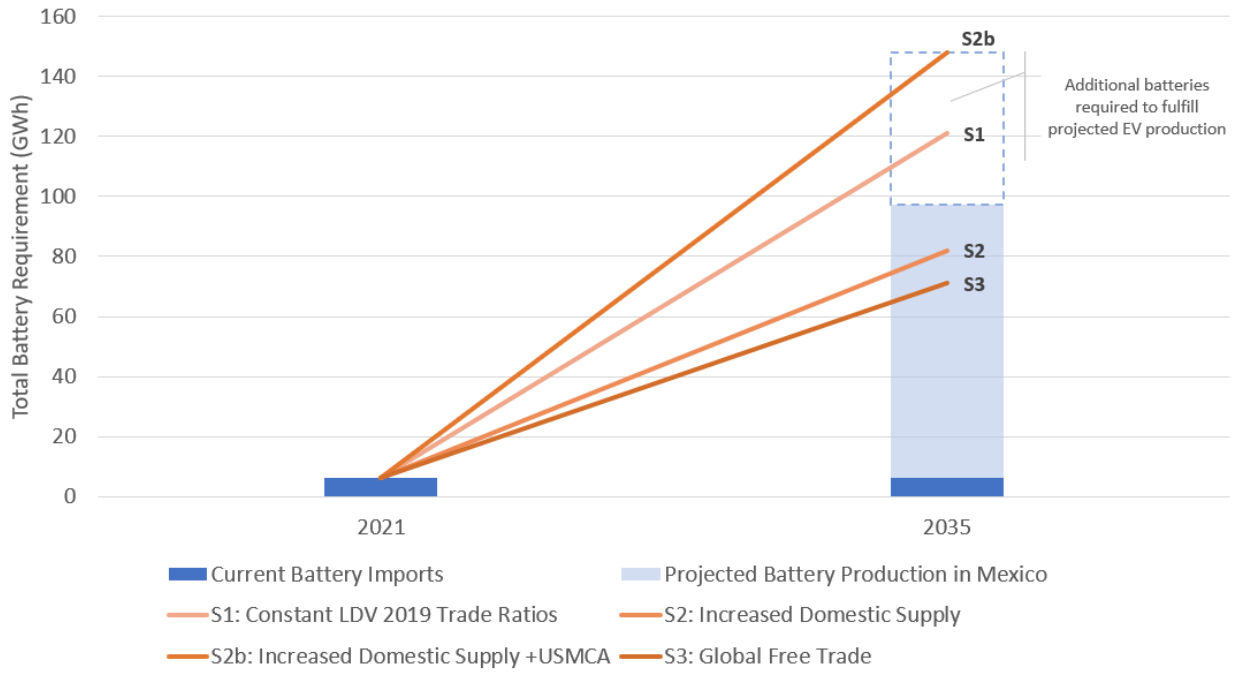

Figure 4: *Current EV battery supply for production in Mexico and the requirement in 2035 under the four production scenarios. Battery production in Mexico by 2035 is estimated from current production announcements by CATL, BMW, and Cenntro Automotive Mexico.*

Our analysis suggests that the Mexican EV industry is heavily dependent on regional trade agreements and the decision of large international OEMs that can shift production within North America and globally. Diversifying the OEM's represented in Mexico and especially promoting new EV-only OEMs may help reduce that dependency and create a more stable industry. Furthermore, developing new markets for LDV's in general and EV's specifically in markets that are expected to grow in the mid- and long-term such as Latin America may also help diversifying the demand, reduce the battery capacity per vehicle demand, and create a long-term change.

Additional Considerations

This report presents an analysis of current production and sales trends and provides scenarios for international trade. To gain a better understanding of the barriers and opportunities in the transition to the electric vehicle industry, further modeling of the demand for batteries and minerals is critical. We aim to develop our modeling tool to include additional vehicle categories and technologies that better reflect the global market and current and future supply. In future work, we plan to refine these scenarios by interviewing industry experts to explore changes in production and the decision-making processes of international OEMs. We also would like to add additional considerations such as labor, transportation, and others into the tool decision process.

Furthermore, we recognize the importance of considering the entire supply chain, including tier 1-3 suppliers, and suggest a focus on the labor implications of the industry change. While the current analysis focuses only on light duty vehicles and ends in 2035, we acknowledge the need to expand our analysis to include the demand for medium and heavy-duty vehicles, as well as electric transit, to fully understand the demand for batteries and the industry transition.

This policy brief is drawn from a longer report entitled "Implications of Global Electric Vehicle Adoption Targets for MExico Light Duty Auto Industry" available at https://escholarship.org/uc/item/1pt8q0zc.