NEW ZEALAND
FOREIGN AFFAIRS & TRADE
Manatū Aorere

Report on California's Zero Emission Vehicle Market

Market Report

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Summary

- California has stepped up its commitments and ambitions for zero emission vehicles by allocating US$3.9 billion over the next three years and requiring all new passenger vehicle sales to be zero emissions by 2035.
- There is a sense of optimism that a tipping point is being met for electric vehicle adoption, and with manufacturers providing consumers with a wide variety of vehicle options, the pressure is now on for California's infrastructure to meet demand.
- For New Zealand, California's sizable consumer market and incentives aimed at supporting in-state electric vehicle manufacturing and infrastructure could present opportunities for New Zealand businesses to support low emissions projects and goals. California can also offer insights to New Zealand in communicating and raising awareness to support behavioural change toward low emission vehicle options.
- While electric battery-based technologies remain the underpinning technology in California, hydrogen continues to hold a portion of focus and is receiving significant investment across the state.

Report

Leading the US's low emission vehicle sector

California leads the US in zero emission passenger and goods movement. Its policies to promote zero emission vehicles (ZEV)are a key component of the state's ambitious clean energy and emissions goals. California has made significant progress in developing its passenger vehicle market, with ZEVs (including plug-in hybrids) making up 11.5 percent of new vehicle sales in 2021 to date. California already accounts for approximately half of the total US ZEV sales with almost one million ZEVs sold to date, and would be the sixth largest ZEV market in the world if counted separately. The state is working to cement its placing as the top ZEV market in the US, not just on the consumer side, but on the supply-side as it is also home to 34 ZEV manufacturers. In 2020 ZEVs were the largest source of California's exports.

Governor Gavin Newsom has been a vocal proponent of the state's climate policies and stepped up the state's ambitions in September 2020 by setting more aggressive ZEV goals. By 2030, all drayage trucks and sales of new passenger cars and light-duty trucks (e.g. utes) are to be zero emission. All operating off-road vehicles and equipment are also to be zero emission where feasible. By 2045 all medium and heavy-duty trucks and buses are to be zero emission where feasible.

Underpinning these goals is a commitment of US$3.9 billion for ZEV-related investments as part of the 2021 state budget. Some of the major investments by California over the next three years include:

- US$1.3 billion to deploy over 1,000 drayage trucks, 1,000 school buses and 1,000 transit buses with zero emission alternatives and associated refuelling infrastructure.
- $700 million for zero emission clean trucks, buses, and off-road equipment and investment in medium and heavy-duty ZEV fuelling and charging infrastructure.

- US$1.2 billion to invest in consumer adoption of ZEVs and in clean mobility for disadvantaged and low-income communities.
- US$407 million in zero emission rail and transit equipment purchases and infrastructure.
- US$250 million over two years for manufacturing and supply chain grants to expand California's ZEV manufacturing footprint.

California's investments may present opportunities for New Zealand businesses involved in low emission technologies and the ZEV supply chain to enter the market or increase their US footprint. In addition to a growing consumer market, the California Energy Commission (the lead agency on ZEV fuelling infrastructure and vehicle-grid integration) is currently working through the guidelines for applying grant funding incentives to companies that support the in-state manufacturing of ZEV components, infrastructure and batteries.

Efforts to develop the consumer market

A fundamental factor in developing the ZEV market is creating behavioural change in consumers. In California, the non-profit organisation Veloz plays a key consumer advocacy role in building awareness and education. Veloz is supported by many of the key decision makers in the ZEV world in California: car manufacturers, utilities and regulators – whom all share the common goal of increasing ZEV adoption.

Veloz runs high profile advertising campaigns utilising celebrities and influencers to create awareness of the ZEV experience and address common consumer concerns. Its Electric for All website, aggregates information for consumers on incentives, vehicle models, and charging options. Experts believe public messaging campaigns are most effective when coordinated across public, private and non-profit sectors – and most importantly delivered through the lens of the driver/consumer. Messaging on the functionality of electric vehicles offering the same (if not enhanced) reliable features as a traditional ICE-vehicle, has appeared to be more motivating to the wider consumer market than relying solely on messages around sustainability and climate friendliness.

In discussions with a number of stakeholders in California's ZEV market, there was a general sense of optimism that a tipping point on ZEV uptake is being reached. This is largely due to the commitment of some of the larger vehicle manufacturers in the US and a growing number of vehicle categories becoming available to consumers. Commentators made specific note of Ford's fully electric version of the F150, a large ute that will be available in 2022, describing it as a 'game-changer'. To give a sense of the impact it could have, the model Ford F150 has consistently been the number one selling vehicle of any style in the US over the last 40 years. Ford's wider commitment is that it expects 40-50% of its global vehicle volume to be fully electric by 2030. Similarly, General Motors plans to release 30 new electric vehicles globally by 2025 and shift its entire product offering to ZEV by 2035.

Driving down the cost

California has been offering incentives to address the higher upfront costs of purchasing ZEVs for over a decade. The Clean Air Vehicle Rebate scheme offers cash back for purchases of new ZEVs of up to NZ$6,300 based on battery size with a further NZ$3,500 available for lower income applicants. This is in addition to the potential NZ$10,500 of tax credits that are also available from the federal government (which could increase further to US$17,500 under Biden's Build Back Better legislation). In addition to providing cost incentives, California stakeholders stated that informing consumers about the availability of subsidies and the overall ZEV ownership experience is vital to change behaviour and drive market participation.

Infrastructure challenges

In our engagement there was agreement that infrastructure remains the most significant challenge to the promotion and viability of ZEV goals. California currently boasts the most EV chargers in the nation with around 75,000 (including 6,000 DC fast chargers) across the state. However, a recent assessment of the state's future infrastructure needs has estimated that California will need 1.2 million public and shared chargers by 2030 to meet the demands of the 7.5 million passenger plug-in vehicles expected to be on California roads at that time.

The California Energy Commission has invested approximately US$100 million annually since 2009 through the 'Clean Transportation Program' that supports projects for the ZEV infrastructure buildout. Governor Newsom has extended this programme and the allocation of significant new funding in this year's budget is a reflection that public investment remains necessary in building the charging infrastructure. Utility companies play a key role in the infrastructure rollout and under current state law, are required to invest in infrastructure to support the electrification of transportation. To date these efforts have mainly targeted multi-unit dwellings and workplace chargers.

Some experts believe that charging accessibility is top concern for consumers looking to purchase a ZEV and that it is important to build a strong narrative of the benefits and ability to charge at home. More than 80% of current electric vehicle owners rely primarily on home charging, and more than half exclusively charge at home. Utility companies have been playing a role in incentivising ZEV uptake in California by offering subsidies of up to NZ$3,500 towards home charging systems as well discounted electricity rates for ZEV consumers to encourage vehicle charging at off peak times. California regulators also noted that electricity rates are significant considerations for developing the market, and that transparency in pricing is required for consumers to understand the costs of vehicle charging.

California regulators are also faced with rethinking the grid in the wake of transitioning to electrifying transportation. The state is currently working on a framework to better integrate electric vehicles as grid resources, including being used as resiliency reserves. An example of this vehicle-to-grid integration is a California pilot programme involving electric school buses acting as battery storage, which is charged at off peak times and can then feed power back into the grid when needed. The school buses present a unique opportunity as they often finish their routes before peak energy times (in California these fall between 4pm and 9pm).

Beyond the battery – the role of hydrogen

California leads the US in uptake of hydrogen fuel cell vehicles (FCEV) and hydrogen fuelling infrastructure, however hydrogen lags well behind battery electric vehicles – FCEVs make up just over 1 percent of all ZEV sales. The general consensus from our engagement was that hydrogen will likely have some role to play in California's zero emission transport future, with most agreeing that hydrogen has more potential for use in medium and heavy duty transportation and could be effective in the movement of goods.

The use of heavy duty FCEVs is an option currently being piloted at the Ports of Los Angeles and Long Beach (Ports). The Ports' Clean Air Action Plan aims to transition drayage trucks to ZEVs by 2035. The Ports have approximately 20 pilot projects under way testing zero emission drayage trucks including five hydrogen-powered fuel cell electric trucks along with two hydrogen fuelling stations. The Ports are currently completing a feasibility report, expected to be published later this year, which will assess the different zero emission technology platforms currently piloted.

While the Ports have been successful to date in making significant emissions reductions, some commentators believe the strict environmental standards have made the ports less competitive and that the costs of transitioning to near zero and zero emission trucks will only add to the truck driver shortage currently adding to the supply chain congestions. The current cost of near zero emission drayage trucks is four times that of diesel equivalents and some experts believe billions of dollars of subsidies will be required to transition the fleet by the current target date.

In addition to the hydrogen projects at the Ports, there are a number of investments taking place that aim to make California a significant figure in the hydrogen arena. There are extensive investments taking place across California in hydrogen production projects, including the Los Angeles Department of Water & Power converting gas-fired power plants to run on hydrogen, and the City of Lancaster (50 miles north of Los Angeles) developing a plant that will gasify recycled mixed paper waste and will be capable of producing up to 11,000 kilograms of green hydrogen per day.

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