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Electric Vehicle Outlook - North America

Stratas Advisors

This excerpt is from a report that is available to subscribers of Stratas Advisors' Global Automotive Service and Stratas Automotive Interactive Model (AIM).

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North America has created momentum for vehicle fleet electrification through innovation and policy. Led by the United States, Canada has had sub-national policies for nearly the last decade and is now implementing a national policy to reduce carbon emissions in an effort to head off climate change. Increased public awareness, investment in infrastructure, and efforts to reduce costs to consumers – from both government incentives and technology improvements – are necessary for sustained adoption of electrified vehicles.

CANADA

In Canada, the government has begun to take substantive actions on a national level to promote zero-emissions vehicles (ZEVs). Several provinces in Canada, including British Columbia and Quebec, have implemented provincial level ZEV incentive programs to battle climate change; however, the recently implemented national program is the first unified program of its kind in Canada.

With its incentive schemes, the Canadian government projects that nearly half of its light-duty vehicle (LDV) fleet will be ZEV by 2040. Stratas Advisors forecasts a considerably more bearish view of Canada's fleet. Stratas Advisors projects that in 2040, 75% of the Canadian LDV fleet will be traditional gasoline powertrains. There will be substantial growth in both the PHEV-Gasoline and EV categories, but these two classes combined will account for nearly 16% of the fleet; Stratas forecasts small amounts of hybrid gasoline, LPG, and natural gas vehicles through 2040. In total, Stratas forecasts 1.98 million EVs and 2.55 million PHEVs in Canada's 28.66 million LDV fleet by 2040.



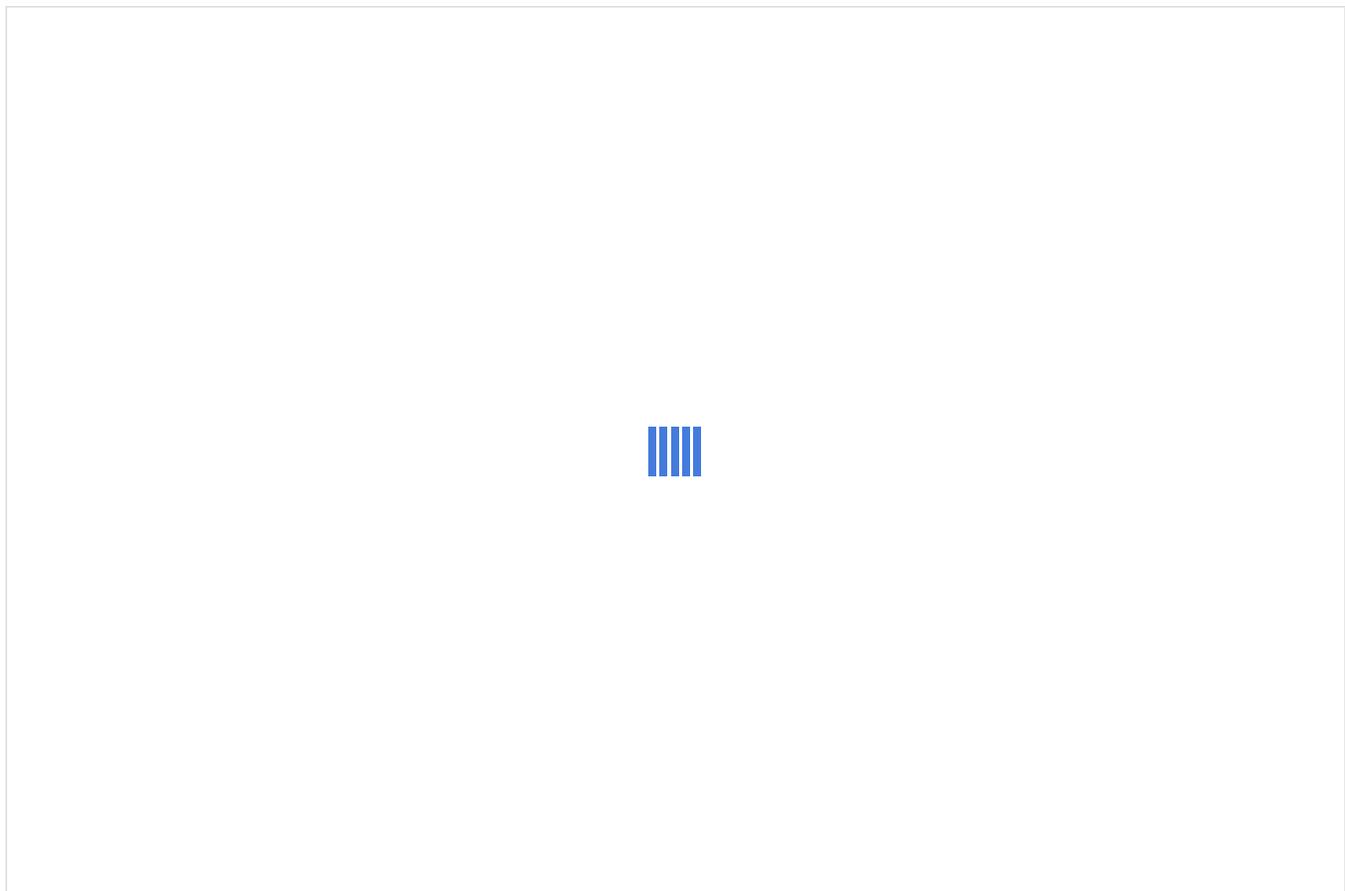
Source: Stratas AIM

Using Stratas Automotive Interactive Model (AIM), Stratas analysts have incorporated historical data, fuel and vehicle prices, and tax and incentive policy to create a data-driven outlook. Stratas AIM builds powertrain splits based on historical fleet composition and forward-looking total cost of ownership (TCO) forecasts. These TCO forecasts are comprised of model-year purchase price forecasts for the powertrain and the cost of the fuel required to drive that vehicle 100,000 miles, factoring in incentives. Stratas views the vehicle price holistically to account for all of the technology evolution that will occur throughout the forecast period. With that in mind, the price of EVs and PHEVs are forecast to grow dramatically cheaper, based on improvements in battery technology to reduce the kilowatt-hour cost. Gasoline-vehicle purchase prices are forecast to continue slowly increasing to add new technology to improve fuel economy. By 2030, EV TCO is forecast to be \$9,762 higher than gasoline, while PHEV TCO is forecast to be \$3,857 higher than gasoline. By 2040, these TCO deltas will fall to \$7,952 and \$3,303 for EVs and PHEVs, respectively. These final TCO differences are the narrowest of all LDV powertrains, explaining the strong growth of EVs and PHEVs in Canada. Further, this helps to explain the importance of sustained government intervention, an area that Canada lags behind the US and many other countries in the world that are adopting EVs and PHEVs in large numbers.

UNITED STATES

The United States has a varied incentive climate, as well. There are national and assorted state-level incentive programs. Sixteen states have some form of financial incentive, either by a tax rebate or from a fee or requirement exemption. Four states – Illinois, Nevada, North Carolina, and Washington – exempt EVs, hybrid vehicles, or other alternative fueled vehicles from state inspection requirements. An additional nine states offer rebate programs for purchases or leases.

Stratas Advisors forecasts that gasoline vehicles will remain the dominant fuel in the United States, but, as with Canada, Stratas remains bearish on extensive LDV fleet electrification. As there is no longer a compliance compulsion to produce ethanol flex-fuel vehicles after 2014, these vehicles will follow fleet dynamics to filter out of the fleet. These vehicles are largely light-duty trucks or SUVs, which accounted for 69% of new registrations in the US in 2018. This consumer preference for bigger, heavier vehicles makes EVs and PHEVs less favorable to American driving habits. There is also a limited number of truck and SUV models offering electric powertrain options. These factors, combined with lack of infrastructure in many parts of the country, limit EV and PHEV penetration into the US market. Stratas Advisors forecasts that in 2040, the US fleet will contain 12.5 million EVs (4% of the fleet) and 5.4 million PHEVs (2% of the fleet). In total, the US fleet will contain 290.9 million LDVs in 2040.



Source: Stratas AIM

Conducting a TCO analysis in the US, both EV and PHEV ownership costs breakeven with gasoline to make these powertrains cost-efficient when factoring in incentives, fuel costs, and vehicle purchase cost. PHEVs become more cost-efficient than gasoline vehicles in 2026, while EVs gain cost parity in 2035. By 2040, a PHEV purchase will save a consumer \$2,038, and an EV will keep \$666 in a consumer's pocket. Given that charging occurs 80% of the time or more at home, publicly available charging infrastructure is of greater importance between urban centers (rather than work

commutes or school runs), which comprises much of the US geography. Without adequate between-city infrastructure, EV uptake will be limited in situations where an EV is the primary vehicle for a consumer.

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