

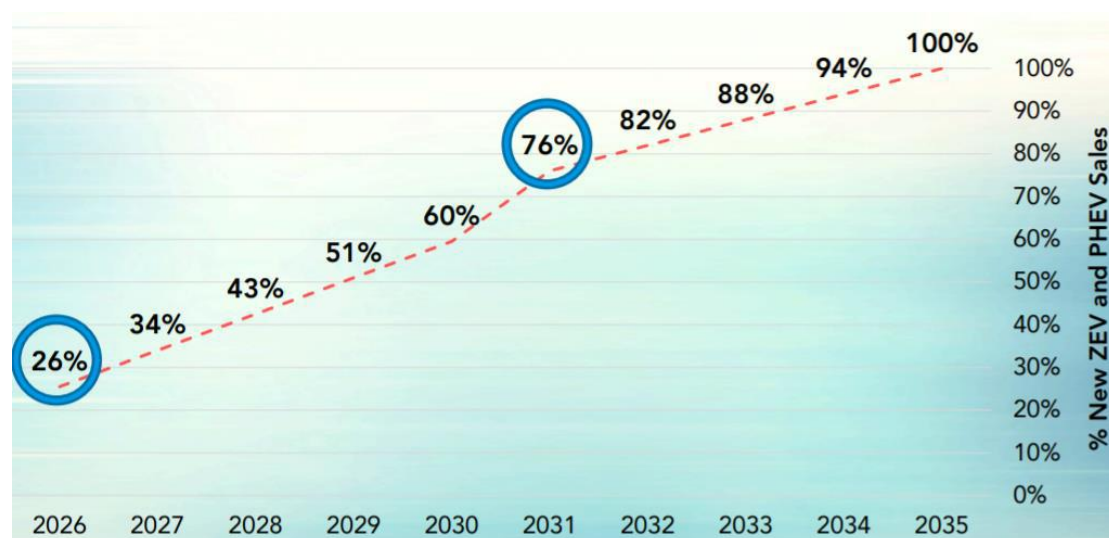
# TOTAL COST OF OWNERSHIP AS A POLICY TOOL- ANALYZING THE HETEROGENEITY IN THE COST TO TRANSITION TO 100% PLUG-IN VEHICLE SALES BY 2035

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California in the US has the most aggressive targets for electrification of the transportation sector; proposed Advanced Clean Cars II rule being the primary mechanism.



**Figure 1: Targets for the share of ZEV sales in total light-duty vehicle sales in California**

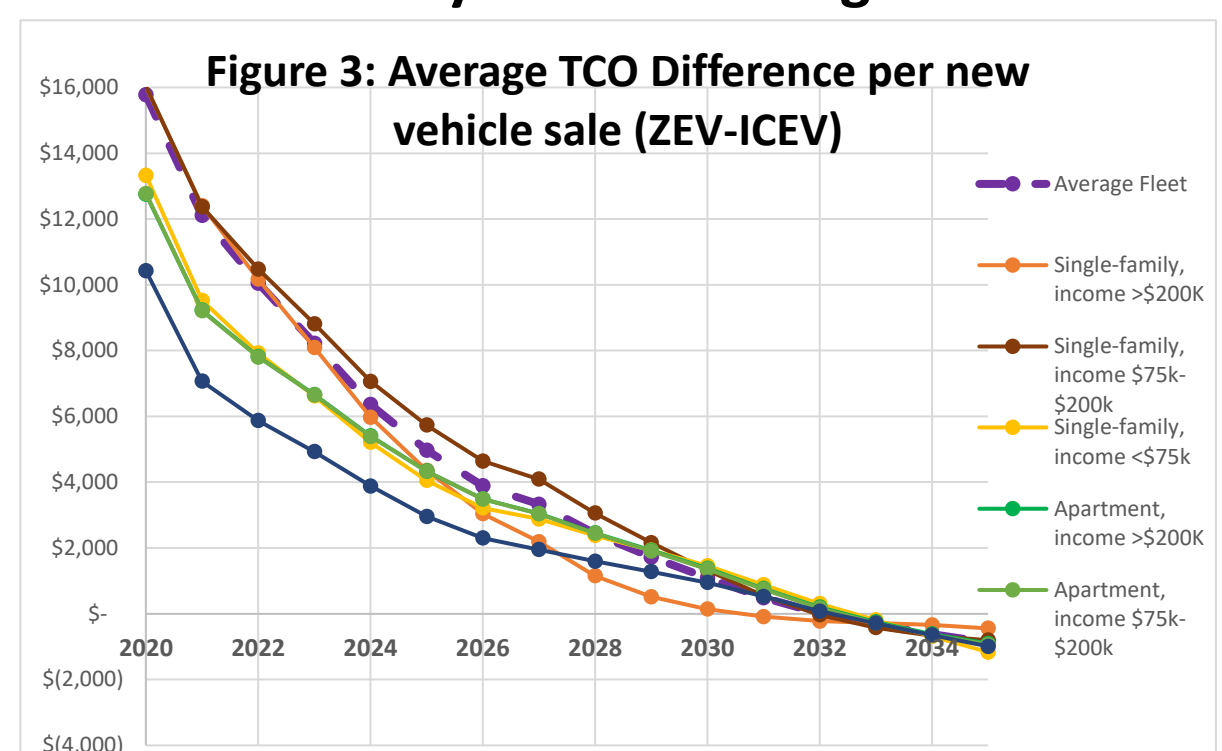
Like many other energy and climate policies, rapid electrification of the LDV sector can produce winners and losers in the transition process, highlighting the role of policy support to address the equity concerns of the transition.

Focusing on the LDV sector electrification goal of California, we determine the cost of achieving the target of 100% new EV sales by 2035, using **total cost of ownership (TCO)** as the tool for analysis.

<b>Capital Cost</b> <ul style="list-style-type: none"> <li>Vehicle purchase</li> <li>Charger installation (only for BEVs, and PHEVs) based on dwelling type</li> </ul>	
<b>Fuel/ Energy Costs</b> <ul style="list-style-type: none"> <li>Depends on miles traveled by each socioeconomic group &amp; their access to home vs non-home charging.</li> </ul>	
<b>Other costs</b> <ul style="list-style-type: none"> <li>Insurance</li> <li>Maintenance (depends on miles traveled)</li> <li>Registration</li> </ul>	
<b>Resale Value</b> <ul style="list-style-type: none"> <li>Depends on depreciation of vehicles</li> </ul>	
<b>Household Categories</b>	
Annual Household Income	<ul style="list-style-type: none"> <li>Low-income (&lt;\$75,000),</li> <li>Middle-income (\$75,000-\$200,000)</li> <li>High-income (&gt;\$200,000)</li> </ul>
Dwelling Type	Single-family Apartment
Fleet size	1, 2, 3, 4,, 5 or more vehicles 1,2,3,4, 5 or more PEVs

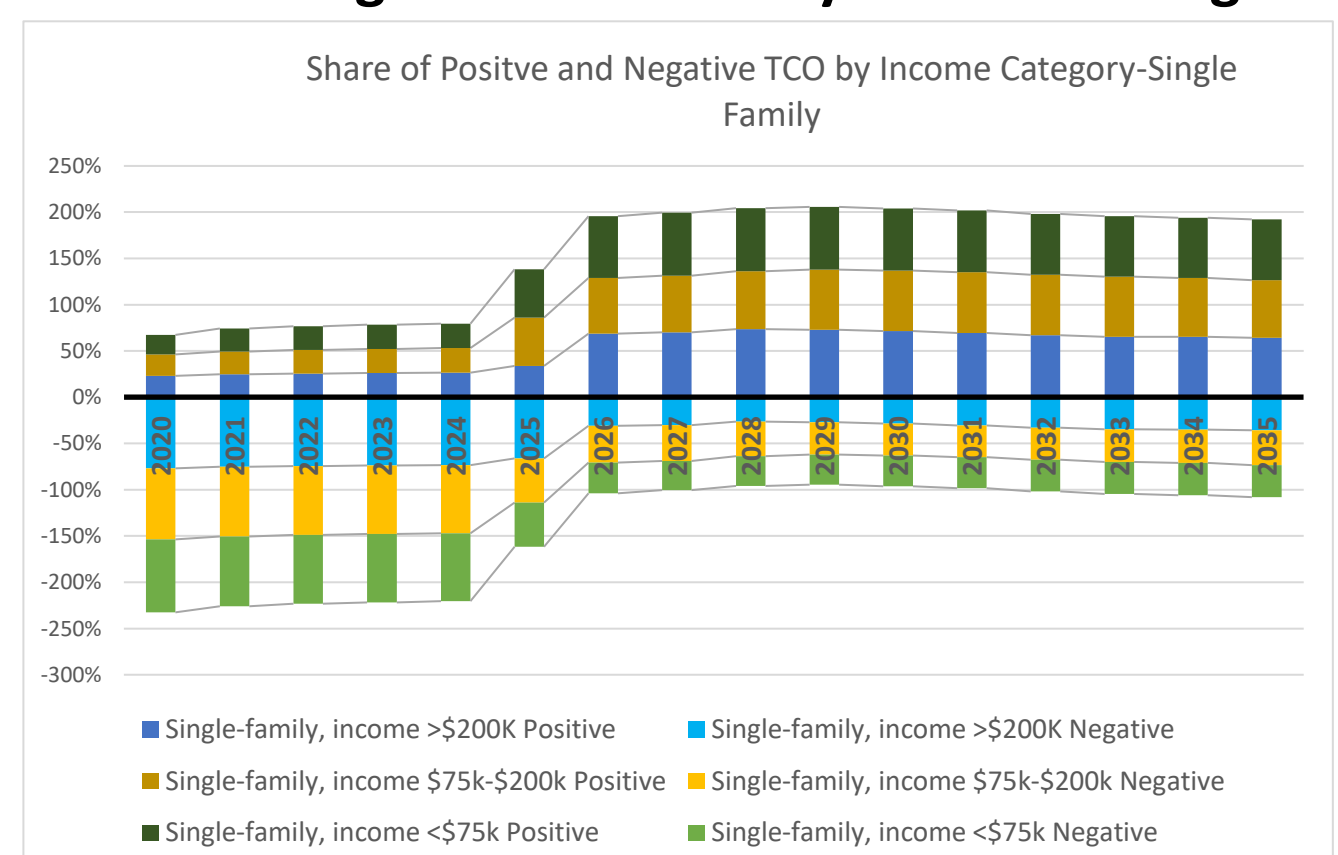
**Figure: 2: TCO by household segments**

## Cost of Transition to ZEVs by 2035 – differences by household segments



For the average LDV fleet, TCO parity is achieved by 2032. Beyond 2032, as ZEV prices continue to drop and at-home charging infrastructure expands, TCO parity is achievable for all the household groups as well, without policy intervention.

## Share of TCO gains and Loses by household segments



Distribution of TCO gains/ loses is heterogenous; share of households with positive TCO increases from 23% to 79% over time but does not reach 100% even by 2035.

Until 2030, high- and middle-income households in single-family homes bear on average 44% of the estimated transition costs of \$2.8 billion; between 2030 -2035, low-income households bear on average 21% of the transition cost of \$1.9 billion.