

UC Davis

Policy Briefs

Title

A Self-financing Zero Emission Truck Incentive Program

Permalink

<https://escholarship.org/uc/item/5wc7028m>

Authors

Ramji, Aditya

Dhole, Anuj

Sperling, Daniel

et al.

Publication Date

2025-07-01

A Self-financing Zero Emission Truck Incentive Program

Aditya Ramji, Anuj Dhole, Daniel Sperling, Lewis Fulton, Roland Hwang
Institute of Transportation Studies, University of California Davis

Abstract

ITS-Davis has analyzed the design of self-financing zero emission truck (ZET) incentive programs that could help the current underfunded Clean Truck and Bus Voucher Program (HVIP) and continue to provide certainty for fleet buyers to transition, given the recently withdrawn Advanced Clean Fleet (ACF) regulation for trucks. The revenues are generated by either imposing a one-time pollution charge on the price of new diesel truck sales or a recurring annual surcharge to annual registration fees, with the revenues used to incentivize ZET sales. For instance, if a one-time charge of 6.8% is imposed on new diesel truck sales, or an annual polluter charge was imposed on diesel trucks ranging from \$290 to \$820 per truck, depending on the type of truck, about \$3.4 billion would be generated over 10 years. On an annual basis, this would roughly be equivalent to the average funding level of \$340 million per year from 2021 to 2024 of the current HVIP incentive program. Such a program would harness market forces by sending a clear signal to truck buyers and manufacturers, and would generate revenue for incentive funds for ZETs, with no cost to government or taxpayers. The charges would be administratively straightforward to collect. As a one-time charge, it could be collected at the time of vehicle purchase. Alternatively, as an annual charge, it could be assessed as part of the annual registration and renewal fee, known as the Commercial Vehicle Registration (CVRA) fee.

Issue

Although diesel trucks account for only 6% of vehicles on the road in California, they contribute a disproportionate amount to air pollution (31% of nitrogen oxide, 55% of particulate matter pollution and 8.3% of GHG emissions). Meeting the state's air quality and climate goals will require a suite of policies to accelerate the adoption of zero emission trucks (ZETs), including strong regulations and incentives. California's Advanced Clean Trucks (ACT) regulation requires 75% of medium- and heavy-duty truck sales and 40% of heavy-duty tractor sales to be zero-emission by 2035. Since ZETs are currently significantly more expensive to purchase than diesel equivalents, purchase incentives are critical to ensure the program's success, especially given the withdrawal of the ACF regulation and the uncertain funding of the

current ZET rebate program, called HVIP. Applications for most categories of ZETs are now paused due to lack of funds, creating uncertainty in the market as both fleets and manufacturers work toward meeting the regulatory requirements of the ACT.

Proposal for a Self-Financing ZET Incentive Program

To replace the HVIP program, ITS researchers have analyzed a new rebate program that would be revenue neutral over the life of the program, where the rebates would be funded through either an upfront pollution charge on new truck sales or through an annual pollution charge on all registered trucks. Incentives are important for improving the affordability of ZETs. An electric class 8 long-haul tractor costs about \$500,000 and is currently about three

times the cost of a comparable diesel vehicle. The HVIP and federal IRA incentives when combined, had reduced the upfront cost by 30-40% for eligible fleets.

We analyzed a ten-year program from model year 2026 to 2035. We capped the rebate level at 80% of the price differential between a ZET and its diesel counterpart. Rebates per truck would decline over time as the cost differential decreases. We assumed the program will support 31% of the new ZET sales over the next decade, roughly following the pattern with similar voucher programs including the Clean

Vehicle Rebate Project for light duty vehicles and the HVIP program.

Two program designs were analyzed, as indicated above: an upfront pollution charge on new trucks sold and annual pollution charge on all registered diesel trucks. **Table 1** shows the estimated pollution charge for our two options. The new vehicle charge was set at 6.8% of the truck price for Class 4-8 trucks and Class 8 tractors. The average annual charge by truck class ranges from \$290 for medium-duty (MD) delivery or vocational trucks to \$820 for Class 8 tractors.

Table 1. Proposed Average New Sales and Annual Pollution Charges by Truck Segment

Segment	Option 1: Polluter Charge on New Diesel Trucks (6.8% of price)	Option 2: Average Annual Pollution Charge for In-Use Diesel Trucks	Current CVRA Fees
Long Haul	\$12,200	\$820	\$1,270
Short Haul	\$10,900	\$820	\$1,270
MD Delivery	\$5,100	\$290	\$447
MD Vocational	\$10,000	\$290	\$447
HD Vocational	\$20,400	\$615	\$937

To address equity concerns, in Option 2 we suggest reducing the annual charges paid by smaller fleets, keeping the weighted average annual charge by segment constant. For instance, the owners of the smallest fleets (<50 trucks) would pay 80% less than the average for the annual pollution charge, while fleets of 500 or more would pay slightly more, 17% extra.

The levels of pollution charges analyzed here are intended to be illustrative of potential program designs that could replace the historical funding levels of the HVIP program while ensuring revenue neutrality over the life of the program. Depending on policy maker objectives, ITS researchers have the capability to model alternatives that have

higher or lower charges and rebates, and/or different distributions of annual charges across fleet sizes. The charges presented here are also broadly consistent with the social cost of the pollution emitted, with heavier, more polluting vehicles being assessed higher charges.¹

More Information

This policy brief is drawn from “Market-Based Policies for Zero-Emission Trucks in California” a report from the Institute of Transportation Studies, University of California Davis. For more information about the findings presented in this brief, contact Anuj Dhole at aadhole@ucdavis.edu.

¹ For instance, see Dennis-Bauer, S., & Jaller, M. (2023). Truck transportation in California: Disaggregating public health costs from criteria pollutants. *Transportation Research Part D: Transport and Environment*, 122, 103850. <https://doi.org/10.1016/j.trd.2023.103850>