#1: REGULATING TRUCKS: WHY & HOW

Policy design options and potential benefits

Berkeley Law | Center for Law, Energy, & the Environment

Zero-Emission Trucks: A Factsheet Series

CONTEXT AND MOTIVATION

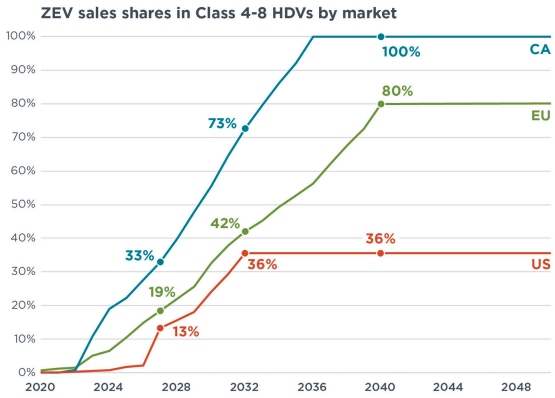
Although fewer than 8% of vehicles globally, trucks and buses are responsible for more than 35% of direct CO_2 emissions from global road transport. Emissions from trucks have grown rapidly since the early 2000s and are a major source of air pollution with significant health burdens that can disproportionately affect low-income communities. Transitioning to zero emission trucks (ZETs) is critical to combating climate and improving public health. While ZET technology and cost competitiveness are present for multiple market segments, deployment is insufficient to meet climate goals and demand is still outpacing supply. Analyses of commercial fleets highlight frustration with limited ZET models and demonstrate strong demand–for example, just 20 US fleets plan to purchase 60,000 ZETs by 2027.

ZET SALES		BUS	ALL HDVS
ACTUAL	2022	4.5%	1.2%
REQUIRED TO MEET PARIS GOALS	2025	7-30%	3-12%
	2030	75-90%	40-56%
	2035	90-100%	69-83%
	2040	100%	94-100%
	2045	100%	100%

Sources: IEA Global EV Outlook (2023) & ICCT Heavy-duty zero-emission vehicles: Pace and opportunities for a rapid global transition (2022)

REGULATORY OPTIONS

Binding regulations on manufacturers and/or importers can address the gap in supply and have a lower administrative and compliance burden than demand side regulation. Analysis has shown that supply-side regulations are the most effective policy levers for accelerating ZET deployment and capturing associated benefits. Options include: manufacturer sales requirements (like California's Advanced Clean Truck Rule), tailpipe emission standards (like the EU CO_2 HDV Standards and US Phase 3 HDV GHG Standards) and fuel economy standards (like Chile's fuel economy standards currently in development). While all require manufacturers and importers to ensure new truck sales meet gradually increasing requirements, their varied designs create different pathways for ZET deployment.



Source: ICCT Analysis (2023), note that the CA line includes 100% target from the Advanced Clean Fleets Rule

	FUEL ECONOMY AND GHG TAILPIPE EMISSION STANDARDS	SALES REQUIREMENTS FOR MANUFACTURERS
MANUFACTURER REQUIREMENT	Improve fuel efficiency and reduce GHGs in an increasing percentage of total annual truck sales.	Increase ZET sales as an increasing percentage of total annual truck sales.
COMPLIANCE TECHNOLOGY	Allows investment in any ZE technology and more efficient fossil fuel or internal combustion engines.	Allows investment in any ZE technology, can include partial credit for hybrids. Does not give credit for fossil fuel or internal combustion engines.
CREDIT TRADING SYSTEM STRUCTURE	A manufacturer accrues deficits if the fuel efficiency or the GHG emissions of all vehicles sold do not meet the established threshold. Deficits must be offset with previously banked surplus credits or credits purchased from manufacturers that performed in excess of the required threshold. Any deficits not offset by credits result in fines.	A manufacturer accrues deficits if the percentage of ZETs it sold in a year is below the established threshold. Deficits must be offset with previously banked surplus credits or credits purchased from manufacturers that sold a higher percentage of vehicles than those required by the regulation.
ZET SUPPLY & MARKET CERTAINTY	New ZET sales can be accelerated through sufficient stringency of the standard. However, the total deployment is more uncertain as fossil fuel engines can also become more efficient and the exact % of ZE technology is harder to predict.	New ZET sales are accelerated by a specific schedule set in the regulation and by the financial incentive of selling or banking surplus credits. This allows economic certainty around the expected increase in supply and scaling of production.

VALUE OF ECONOMIC CERTAINTY

Regulations drive manufacturer investment and innovation in technology. By setting gradually increasing requirements for the sale of new trucks, regulations create economic certainty allowing the market to plan around a predictable ZET deployment timeline. This unlocks financing through increased investor confidence, and encourages further cost reductions by accelerating economies of scale as well as increasing diversity and competition in zero emission truck products, services, and supply chains. It also provides certainty around future electricity demand, which is critical for utilities to plan and develop grid infrastructure expansions, which can take many years to complete. For example, when the revision of EU CO_2 regulations for new cars was completed in 2020, the market share of EVs in Europe jumped from 3% in 2019, to 11% in 2020, and to 19% in 2021, with a similar jump in infrastructure investment (public chargers more than doubled between 2018 and 2021), with much of these outcomes potentially attributable to the certainty provided by the new regulations.

POTENTIAL BENEFITS OF ACCELERATING ZERO EMISSION TRUCKS

BINDING REGULATIONS THAT ACCELERATE WIDESPREAD ZET DEPLOYMENT ARE A KEY MECHANISM FOR CAPTURING THE FOLLOWING BENEFITS

CLIMATE BENEFITS: Reduce global road transport CO_2 emissions ~ **64% by 2050** (from 2020 levels).

TOTAL COST OF OWNERSHIP SAVINGS: While costs vary by country, median estimates of **58 analyses** show that significantly lower maintenance and fuel costs will generate savings now or or within the decade: urban delivery vehicles (now-2027); short-haul freight trucks (now-2030); and long-haul tractor trailers (2027-2030).

AIR QUALITY AND HEALTH SAVINGS: US truck pollution reductions generate **$735 billion in health** benefits and avoid 66,800 premature deaths.

GREEN JOBS: **Significant job gains** predicted in zero emission transport industry and manufacturing job losses can **likely transition to green job alternatives**.

ELECTRIC GRID BENEFITS: **Significant potential value from managed EV charging** for improving energy system economics and reliability, including complementing large-scale solar and wind. **EVs have increased utility revenues** in the US, putting downward pressure on electric rates for everyone.

AUTO MANUFACTURE (OEM) MARKET SHARE AND LONG-TERM VIABILITY: Modeling predicts that manufacturers can achieve the **most future profitability** and **retain the most market share** by rapidly transitioning to electrification and risk loss of profits and market standing if they move slowly.

MEET PRIVATE SECTOR DEMAND: The US (see **support here**) and EU (see **support here**) received letters requesting adoption of binding zero emission truck regulations from over 120 major businesses, fleets, and investors.

DECREASE FUEL DEPENDENCY AND IMPORTS: Switching to zero emissions can **reduce dependence** on **volatile and expensive imported fossil fuels**.