

Final Standards to Reduce Greenhouse Gas Emissions from Heavy-Duty Vehicles for Model Year 2027 and Beyond

The U.S. Environmental Protection Agency (EPA) is finalizing a new and more protective set of greenhouse gas standards for heavy-duty vehicles for model years (MYs) 2027 through 2032, building on the “Phase 2” greenhouse gas standards established in 2016. These “Phase 3” greenhouse gas standards will result in significant benefits for public health and welfare through substantial reductions in carbon dioxide emissions from heavy-duty vehicles.

EPA last revised the greenhouse gas standards for on-highway heavy-duty trucks and engines in 2016 under the “Phase 2” greenhouse gas program. Those standards achieve important greenhouse gas reductions from medium- and heavy-duty vehicles beginning in model year MY 2021.

Types of Vehicles Covered

The final Phase 3 standards apply to heavy-duty vocational vehicles (such as delivery trucks, refuse haulers, public utility trucks, transit, shuttle, and school buses) and tractors (such as day cabs and sleeper cabs on tractor-trailer trucks).

Overview of the Final Standards

EPA’s final rule includes new, stronger greenhouse gas standards that phase in over MYs 2027 through 2032. The standards are technology-neutral and performance-based, allowing each manufacturer to choose what set of emissions control technologies is best suited to meet the standards and the needs of their customers. This means that the standards can be met with a diverse range of heavy-duty vehicle technologies, including advanced internal combustion engine vehicles, hybrid vehicles, plug-in hybrid electric vehicles, battery electric vehicles, and hydrogen fuel cell vehicles.

For heavy-duty vocational vehicles such as delivery trucks, refuse haulers, and public utility trucks, the Phase 3 standards vary according to vehicle type and range up to 60% stronger than the previous Phase 2 standards for MY 2032. For tractors such as day cabs and sleeper cabs on tractor-trailer trucks, the Phase 3 standards vary according to vehicle type and range up to 40% stronger than the previous Phase 2 standards for MY 2032.

Percent Reduction from the Phase 2 CO ₂ Emission Standards						
Model Year:	2027	2028	2029	2030	2031	2032
Light-Heavy Vocational	17%	22%	27%	32%	46%	60%
Medium-Heavy Vocational	13%	16%	19%	22%	31%	40%
Heavy-Heavy Vocational	--	--	13%	15%	23%	30%
Day Cab Tractors	--	8%	12%	16%	28%	40%
Sleeper Cab Tractor	--	--	--	6%	12%	25%

Advancements in Clean Vehicle Technologies

The final standards align with and support the commitments and billions of dollars' worth of investments from trucking fleets, vehicle manufacturers, and U.S. states as they plan to increase the use of clean vehicle technologies in heavy-duty fleets. The increased use of these technologies – which include, but are not limited to, advanced internal combustion vehicle engine technologies, hybrid technologies, battery-electric vehicles and fuel cell electric vehicles – have the potential to significantly reduce greenhouse gas emissions from the heavy-duty vehicles sector. These ongoing technological innovations – which are already being adopted by the heavy-duty industry – allow for significant strengthening of the greenhouse gas emission standards considering cost, lead time, and other factors.

Climate and Air Quality Urgency

Greenhouse gas emissions have significant impacts on public health and welfare. Transportation is the single largest U.S. source of greenhouse gas emissions, making up 29 percent of total greenhouse gas emissions. Within the transportation sector, heavy-duty vehicles are the second largest contributor, at 25 percent of all transportation sources.

The final standards for heavy-duty vehicles will avoid approximately 1 billion metric tons of greenhouse gas emissions from 2027 through 2055, making an important contribution to efforts to limit climate change and its impacts such as heat waves, drought, sea level rise, extreme climate and weather events, coastal flooding, and wildfires. These greenhouse gas reductions will benefit all U.S. residents, including populations such as people of color, low-income populations, indigenous peoples, and/or children that may be especially vulnerable to various forms of damages associated with climate change.

Air pollution continues to be a public health problem in many communities across the U.S., with exposure to ozone, particulate matter, and other pollutants leading to premature death, asthma, and other negative health and environmental effects. The final standards will reduce air pollution for the 72 million people who live near major truck freight routes, who bear the burden of higher levels of pollution and are more likely to be people of color or low-income. Reducing these emissions also provides cleaner air for communities across the country, preventing health issues like asthma, and ultimately saving money, lives, and trips to the hospital.

Benefits, Costs and Consumer Savings

This final rule will produce \$13 billion in annualized net benefits through the year 2055. We estimate approximately \$10 billion in annualized climate benefits and up to \$300 million in annualized benefits from reduced emissions of fine particulate matter (PM_{2.5}). PM_{2.5} is associated with premature death and serious health effects such as hospital admissions due to respiratory and cardiovascular illnesses. Under the Phase 3 program, the heavy-duty industry will see annualized savings of \$3.5 billion compared to annualized costs of about \$1.1 billion. After accounting for the vehicle purchase tax credits provided under the Inflation Reduction Act, the typical buyer of new clean technology heavy-duty vehicles will recoup any costs in two to five years.

Related Actions and The Clean Trucks Plan

These heavy-duty greenhouse gas standards complete the EPA's Clean Trucks Plan for reducing greenhouse gas emissions and other harmful air pollutants from heavy-duty trucks through a series of rulemakings. These rules include 1) the EPA's recently finalized light- and medium-duty vehicles final rule for MY 2027-2032 (which covers Class 2b and 3 trucks), 2) the 2023 heavy-duty NO_x final rule, and 3) the greenhouse gas standards set by today's rulemaking. The Clean Trucks Plan represents the most protective set of EPA regulations ever for the on-road sector while considering the significant emission reductions and cost savings that clean vehicle technology can provide.

Public Participation

EPA appreciates the significant public input received through the rulemaking process. This rule was informed by input from the public, including stakeholders such as community groups, labor groups, environmental justice groups, heavy-duty manufacturers, suppliers, environmental and public health organizations, and state, local, and tribal governments.