



Delivering the Green

Reducing Trucks' Climate Impacts While Saving at the Pump

Clean Vehicles California

A Fact Sheet of the Union of Concerned Scientists

Nearly all modern heavy-duty trucks run on petroleum-based diesel fuel. The resulting tailpipe emissions contribute to poor local air quality and rising global temperatures, and high fuel costs are busting truckers' budgets. A win-win solution is possible, however: technologies that reduce global warming pollution from trucks can also reduce fuel use, smog-forming pollution, and truckers' operating costs.

The Union of Concerned Scientists (UCS) recently completed an analysis of available pollution-control technologies, evaluating the savings available to truck operators and the pollution reductions that could be achieved both in California and across the nation. We found that retrofitting both new and in-use trucks and trailers could reduce global warming pollution nationally by 17 million metric tons (MMT) of CO₂eq (carbon dioxide equivalent) by 2020—the same effect as taking 2.5 million cars off the road.ⁱ

Technologies

The efficiency of today's tractors and trailers can be improved more than 12 percent by using the most fuel-efficient tires on the market, equipping trailers with available aerodynamic technologies, and choosing the most efficient tractors when buying new. The photos on the right depict examples of these fuel-saving and pollution-reducing technologies.

Fuel Savings

For a typical new long-range truck traveling 130,000 miles per year, these improvements would save 2,000 gallons of diesel fuel annually. The initial cost of the upgrades could be offset by fuel savings in as short a time as one year, and more than \$30,000 in net savings could be realized over the life of the truck.ⁱⁱ

Retrofitting existing tractor-trailers offers significant fuel and cost savings for all but the oldest and lowest-mileage trucks, while choosing the most efficient new tractor-trailers offers the greatest savings overall.

Pollution Reductions

Compared with other regulatory strategies that California is considering in order to meet its global warming emissions reduction targets, retrofitting trucks is one of the most effective. Only three other proposed strategies promise greater reductions according to our analysis.ⁱⁱⁱ Moreover:



Aerodynamic Tractor



Photo courtesy of ATDynamics, Inc.

Rear Tail Fairing



Photo courtesy of Nose Cone Mfg. Co., Inc.

Front Fairing



Photo courtesy of Laydon Composites Ltd.

Trailer Side Skirts

- An additional 470 tons of smog-forming nitrogen oxides (NO_x) could be reduced nationwide by 2020. Reductions of NO_x in California would help the state meet federal air quality standards in the San Joaquin Valley and Los Angeles area—two of the country’s most polluted regions.
- Implementing these basic truck-efficiency improvements could reduce diesel consumption in California 5 percent by 2020 (or 200 million gallons annually).
- National fuel savings could total more than 1.4 billion gallons of diesel by 2020.

The table below shows the benefits for both California and the United States as a whole.

Some truck fleet owners have already invested in these technologies, but the vast majority have not, as there continue to be barriers to widespread adoption even in the face of rising fuel prices. One reason is that a truck typically goes through many owners during its lifetime; the current owner may choose not to invest in efficiency improvements if the truck will be sold in a couple of years. Split ownership of tractors and trailers presents similar challenges. And the absence of standardized fuel-economy testing data for new trucks and retrofit components has slowed adoption as well.

California air pollution regulators have proposed a measure that would establish efficiency standards for both new and in-use trucks and trailers. This is a win-win strategy that can reduce truck pollution and petroleum use while saving money at the pump.

Benefits of Implementing Cost-Effective Retrofits on Trucks Operating in California

	2020 Diesel Fuel Savings (million gallons/year)	2020 Global Warming Pollution (MMT CO ₂ eq/year)	2020 NO _x Reductions (tons/year)	2010–2020 Fuel Savings (billion gallons)	2010–2020 Cumulative Global Warming Pollution Reductions (MMT CO ₂ eq)
In-State California Benefits	211	2.6	61	1.7	20.6
Out-of-State National Benefits	1,210	14.7	412	10.7	123
Total Benefits	1,421	17.3	473	11.8	144

Note: Global warming pollution estimates include tailpipe and upstream emissions from diesel fuel production.
Source: TIAX LLC, September 2008, *Heavy-duty truck retrofit technology: Assessment and regulatory approach*, final report.

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ⁱ Based on UCS estimates of average passenger car emissions in 2020.

ⁱⁱ Based on a diesel fuel price of \$3.24 per gallon.

ⁱⁱⁱ Only light-duty vehicle standards (31.7 MMT CO₂eq), “green” buildings (26 MMT CO₂eq), and a federal renewable electricity standard (21.3 MMT CO₂eq) would eliminate more pollution nationwide.

