FACT SHEET: EUROPE

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THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

COST-EFFECTIVENESS OF FUEL-EFFICIENCY TECHNOLOGIES FOR LONG-HAUL TRACTOR-TRAILERS IN THE 2025–2030 TIMEFRAME

BACKGROUND

In the European Union between 1990 and 2014, CO_2 emissions from commercial vehicles increased by 25%, while passenger car emissions rose only 12%. Trucks and buses now produce about one-quarter of all CO_2 emissions from road transport in the EU, and that share is growing as cars and vans rapidly become more fuel-efficient to meet increasingly tight CO_2 standards.

The United States, Canada, China, Japan, and most recently India have all adopted heavy-duty vehicle CO_2 standards, a significant step toward improving efficiency. The EU is contemplating similar action. This study evaluates the cost-effectiveness of efficiency technology packages for long-haul tractor-trailers that could be deployed by 2020–2030, as a contribution to the EU policy dialogue on heavy-duty vehicle efficiency standards.

METHODOLOGY

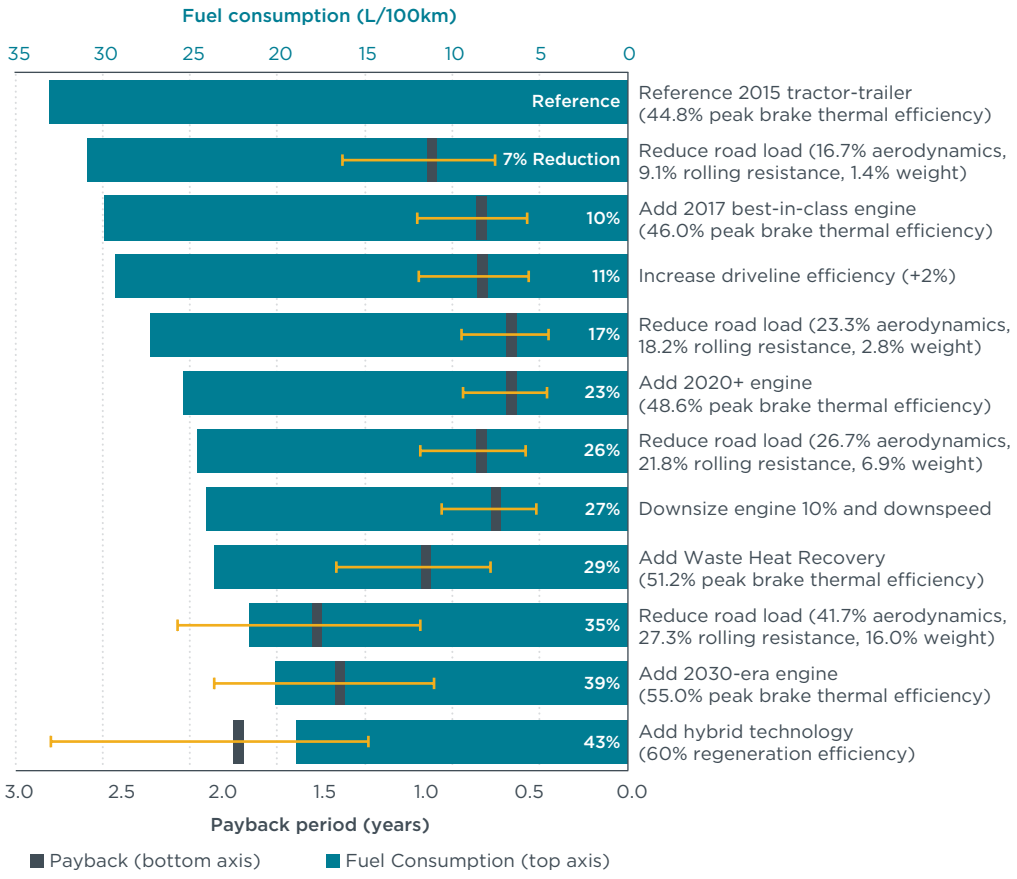
The study estimated costs in 2025 and 2030 of the heavy-duty vehicle and engine technologies in the technology packages evaluated by a 2017 companion study, *Fuel Efficiency Technology in European Heavy-Duty Vehicles: Baseline and Potential for the 2020-2030 Time Frame*. Economic impact metrics include investment payback period, first-owner and full lifetime fuel savings, and marginal costs under a range of economic assumptions, including different technology cost estimates, discount rates (4%, 7%, and 10%) and diesel fuel prices (€0.70, €1.10, and €1.40 per litre).

KEY FINDINGS

Efficiency technologies ready to be widely deployed by 2020–2025 would deliver fuel savings greatly exceeding up-front costs. Available tractor-trailer efficiency technology can reduce distance-based fuel consumption by 27% from baseline 2015 technology at payback periods of 1.1 years or less. Projected costs would be €7,700 in 2025. Lifetime fuel savings would be €41,800 to €106,500 per tractor-trailer. For a typical first owner of a tractor, reducing fuel consumption by 27% would mean €28,400 to €62,150 in discounted fuel savings over the first five years of ownership and result in benefits four to nine times greater than the upfront technology costs and maintenance impacts.

Emerging advanced efficiency technologies promise even greater fuel savings over the longer term and a compelling payback picture. The most advanced road-load and engine technologies package evaluated offers a 43% fuel-consumption reduction (2015 baseline) at an estimated cost of €30,900 in 2030, delivering lifetime fuel savings of €65,800 to €166,500 per tractor-trailer and a payback period of 1.3 to 3.3 years, depending on economic factors. A 43% reduction in fuel consumption of new 2030 tractor-trailers would mean €44,650 to €97,750 in fuel-cost savings over five years for a typical first owner, exceeding upfront technology costs and maintenance by 1.5 to 3.3 times. Europe would need to enact technology-forcing regulatory standards to promote development and deployment of these advanced technologies.

Payback periods are short even when technology costs are high and fuel prices low. The most advanced technology packages, delivering a 35% to 43% reduction in fuel consumption, have payback periods of 1.0 to 3.3 years, even assuming high technology costs, a high discount rate, and an average fuel price as low as €0.70 per liter. When adjusting vehicle-kilometers-traveled per year specifically for long-haul tractor-trailers, payback periods drop to 0.7–2.2 years. The slow rate of adoption of efficiency technologies in the face of such a cost-benefit picture signals the presence of market barriers, a further argument in favor of regulation to mandate ambitious efficiency standards.



Cumulative fuel-consumption benefits and payback periods for tractor-trailer efficiency technologies in 2030. The "whiskers" show payback period range between varying economic assumptions, including technology cost, fuel price, and discount rate.

FURTHER READING

- Fuel efficiency technology in European heavy-duty vehicles: Baseline and potential for the 2020–2030 timeframe. www.theicct.org/publications/fuel-efficiency-technology-european-heavy-duty-vehicles-baseline-and-potential-2020
- Heavy-duty vehicles technology potential and cost study. www.theicct.org/publications/heavy-duty-vehicles-technology-potential-and-cost-study
- Market penetration of fuel efficiency technologies for heavy-duty vehicles in the European Union, the United States, and China. www.theicct.org/publications/market-penetration-fuel-efficiency-technologies-heavy-duty-vehicles-european-union

PUBLICATION DETAILS

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