Ongoing technology developments are pointing to the viability of tractor-trailers with fuel economy of 10 mpg or better. These developments raise questions about how quickly the technologies can be deployed and how cost-effective they might be. With U.S. federal regulatory agencies now working on the second phase of heavy-duty vehicle greenhouse gas (GHG) emission and fuel efficiency standards, such questions take on added importance.

This paper analyzes the costs and fuel savings of tractor-trailer efficiency technologies examined in a companion paper, *Advanced tractor-trailer efficiency technology potential in the 2020-2030 timeframe*. The evaluation includes a synthesis of best-available data on technology costs and their associated fuel savings under a variety of fuel price and discount rate assumptions to bound low and high payback periods for average long-haul tractor-trailer conditions. The figure below summarizes the payback period results, ranging from reference 2010 technology, to compliance with 2017 standards, to further advancements in technology.

**Payback periods for tractor-trailer efficiency technologies in the 2020-2030 time frame**

![Graph showing payback periods for tractor-trailer efficiency technologies](https://example.com/graph.png)
FACT SHEET COST EFFECTIVENESS OF EFFICIENCY TECHNOLOGIES FOR LONG-HAUL TRACTOR-TRAILERS

KEY FINDINGS:

(1) Already available tractor-trailer technologies can achieve 9 mpg, deliver payback periods of less than a year, and be widely deployed in the 2020–2025 time frame.

(2) Advanced efficiency technologies, now emerging in the marketplace, can double fuel economy to 11–12 mpg, with payback periods of 18 months or less in the 2025–2030 time frame.

(3) Even under very conservative assumptions — fuel prices remaining as low as $3.10 per gallon diesel, higher technology costs, and a high discount rate of 10% — the most advanced technology packages have payback periods of only 1.4–2.2 years.

(4) Typical first owners of tractor-trailers with efficiency technology packages up to 9 mpg would see fuel savings 3–9 times greater than the upfront technology cost over the period of ownership.

PUBLICATION INFORMATION
Cost effectiveness of advanced efficiency technologies for long-haul tractor-trailers in the 2020–2030 time frame
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