

# Transportation study reveals potential for deep cuts to petroleum use and carbon emissions

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The U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) and Argonne National Laboratory (ANL) today announced the release of the Transportation Energy Futures (TEF) study, an assessment of avenues to reach deep cuts in petroleum use and greenhouse gas (GHG) emissions in the transportation sector.

"Transportation is an engine of our economic strength, but it also represents a key challenge for the future of U.S. energy use," NREL Senior Analyst Austin Brown said. "Transportation accounts for 71 percent of total U.S. petroleum consumption and 33 percent of our nation's total carbon emissions. It presents significant opportunities to cut oil dependence while taking a bite out of [greenhouse gas emissions](#)."

The study revealed strategies to potentially reduce petroleum use and GHG emissions in the transportation sector by more than 80 percent by 2050. However, each of these opportunities faces significant challenges.

The TEF study also confirmed that there is no "silver bullet" for decreasing [carbon emissions](#) and petroleum use in transportation. Instead, deep reductions would involve an inclusive approach, combining strategies to:

- Increase [fuel economy](#) for all types of vehicles

- Reduce use of transportation while providing comparable service
- Expand use of low-carbon fuels, including biofuels, as well as electricity and hydrogen

"The finding that there are many options increases our confidence that a clean transportation solution is possible in the long term," Brown said.

The purpose of the TEF study was to address critical questions and inform domestic decisions about transportation energy strategies by identifying possible paths to a low-carbon, low-petroleum future for transportation, as well as the barriers that may block those paths. It can help inform decisions about investments in transportation energy research, and can also help policymakers if they choose to expand the role of advanced transportation technologies and systems. The study focuses on identifying opportunities related to energy efficiency and renewable energy in transportation.

Three major strategies were explored in the study: reduction of energy use through efficiency and demand management; increased use of electricity and hydrogen from renewable energy; and expanded use of biofuels.

It was found that energy efficiency improvements and measures to reduce transportation demand, without compromising service, have the potential to stop – or reverse – the growth in national [transportation energy](#) use, making it possible for competitive [renewable energy](#) supplies to provide an increasing share of [energy](#).

Focus areas of the nine reports that are part of the TEF study include:

### **Light Duty Vehicles (personal cars and light trucks)**

- Deployment pathways issues including the development of, transition to, and challenges to advanced technology.
- Non-cost barriers such as range anxiety, refueling availability, technology reliability, and lack of consumer familiarity.

### **Non-Light-Duty Vehicles (trucks, rail, aircraft, and other modes)**

- Opportunities to improve non-light-duty vehicle efficiency, including that of medium- and heavy-duty trucks, off-road vehicles and equipment, aircraft, marine vessels, and railways.
- Opportunities for switching modes of transporting freight, such as moving freight from trucks to rail and ships.

### **Fuels**

- Infrastructure expansion required for deployment of low-GHG fuels, including electricity, biofuels, hydrogen, and natural gas.
- Balance of biomass resource demand and supply, including allocations for various transportation fuels, electric generation, and other applications.

### **Transportation Demand**

Provided by National Renewable Energy Laboratory

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