Alternative Fuels Insights

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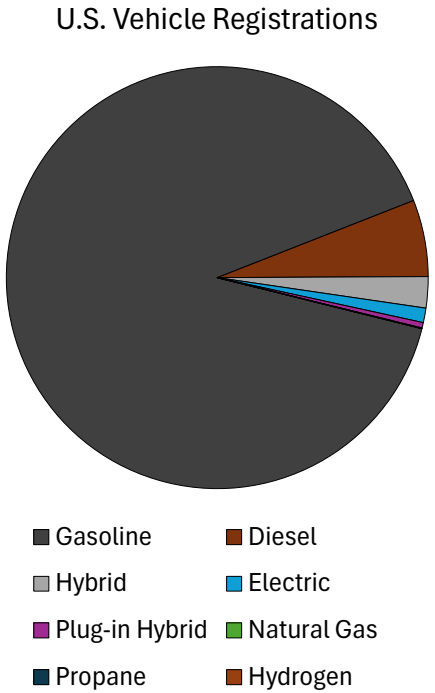
Vehicle registration data

Nearly 300 million vehicles are registered in the United States, ranging from light-duty passenger vehicles to heavy-duty freight and work trucks.

The majority of these vehicles are gasoline-fueled internal combustion engine vehicles (ICEV), followed by diesel-fueled ICEV.

Sales of plug-in electric vehicles and hybrid vehicles have grown in the last few years, particularly for light-duty vehicles.

Over 10 million are registered in Illinois; these show similar registration mix.



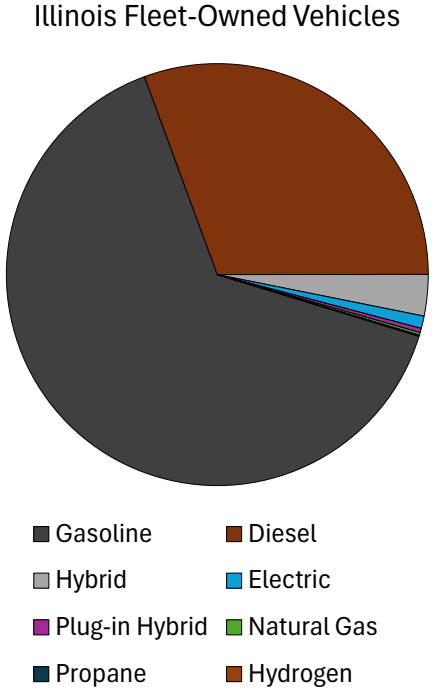
Source: Argonne analysis of Experian Automotive vehicles in operation data, December 2023

Illinois fleet vehicles

Of the 10.4 million vehicles registered in Illinois, over one million are owned by organizations (e.g., companies, governments).

Many of these are heavy-duty trucks, seen in the relative increase in diesel powertrains in the pie chart.

Hybrids, electric vehicles, and alternative fuels make up about 3.9% of all Illinois registrations, and about 4.7% of fleet-owned vehicles registrations.



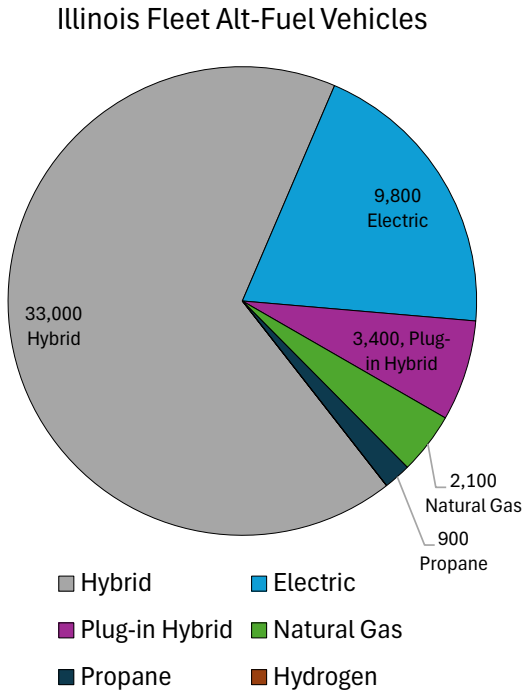
Source: Argonne analysis of Experian Automotive vehicles in operation data, December 2023

Illinois alt fuel fleet vehicles

For light-duty vehicles, hybrid vehicles and plug-in vehicles are the most common fuel-saving technology pathways in use now, with over 46,000 vehicles on the road today.

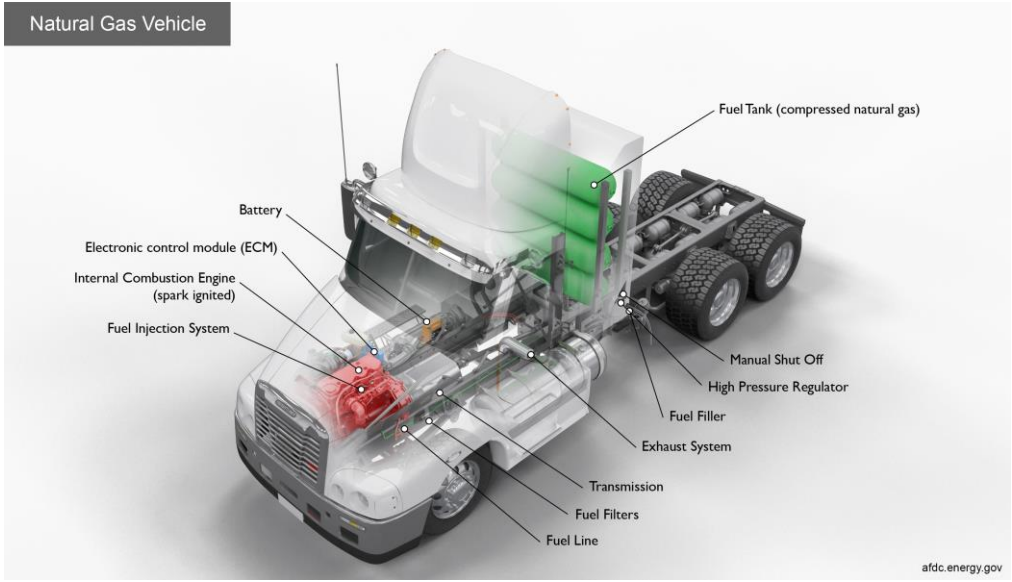
Alt fuels for trucks in use in Illinois include natural gas (over 2,000 registered today) and propane/LPG/Autogas (nearly 1,000 registered).

Almost all hydrogen fuel cell vehicles in use are registered in California.



Source: Argonne analysis of Experian Automotive vehicles in operation data, December 2023

Operation of alt fuel vehicles



Natural gas and propane operate similar to gasoline- and diesel-fueled ICEV.

Propane is stored in liquid low-pressure tanks; natural gas can be either pressurized (compressed natural gas, CNG), or cryogenically stored (liquefied natural gas, LNG).

Bi-fuel vehicles can switch between use of alternative fuel and conventional fuel.

Source: DOE Alternative Fuel Data Center,
https://afdc.energy.gov/vehicles/how-do-natural-gas-class-8-trucks-work
https://afdc.energy.gov/vehicles/how-do-bifuel-propane-cars-work

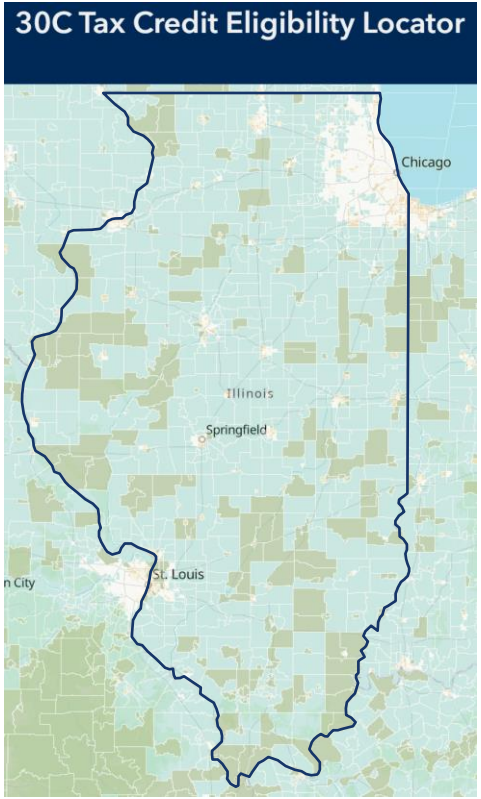
Fueling infrastructure credits

Tax credits exist for installation of “clean-burning fuels”

Alternative fuels that qualify as clean-burning fuels for the purposes of the 30C tax credit:
(i) Any fuel at least 85 percent of the volume of which consists of one or more of the following: ethanol, natural gas, compressed natural gas, liquified natural gas, liquefied petroleum gas, or hydrogen.
(ii) Any mixture-

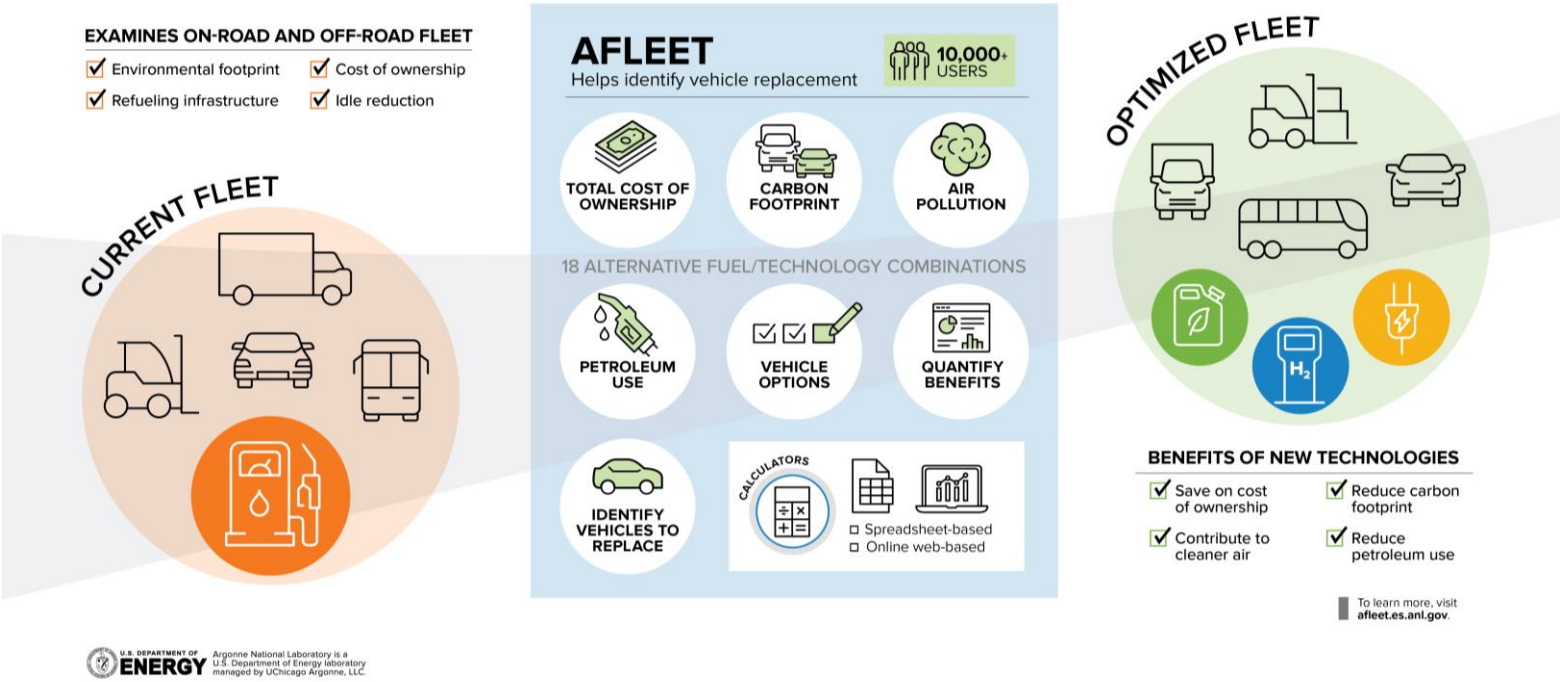
(I) which consists of two or more of the following: biodiesel (as defined in section 40A(d)(1)), diesel fuel (as defined in section 4083(a)(3)), or kerosene, and
(II) at least 20 percent of the volume of which consists of biodiesel (as so defined) determined without regard to any kerosene in such mixture.

(iii) Electricity



https://www.anl.gov/esia/refueling-infrastructure-tax-credit

AFLEET model



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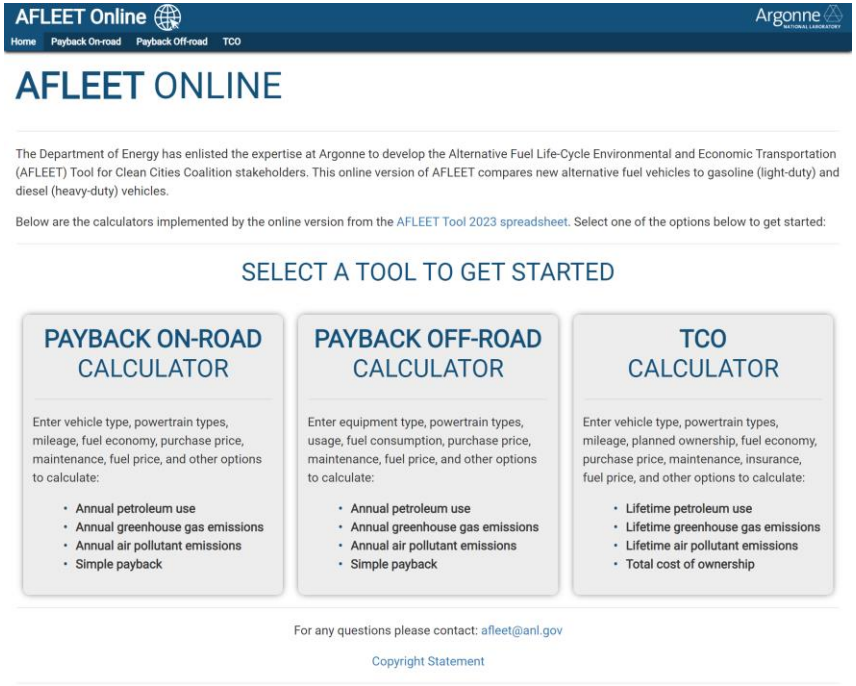
AFLEET model

The AFLEET model developed at Argonne examines light-duty, heavy-duty, and off-road vehicles to estimate:

- Fuel consumption
- Greenhouse gas emissions
- Air pollutants
- Cost of ownership

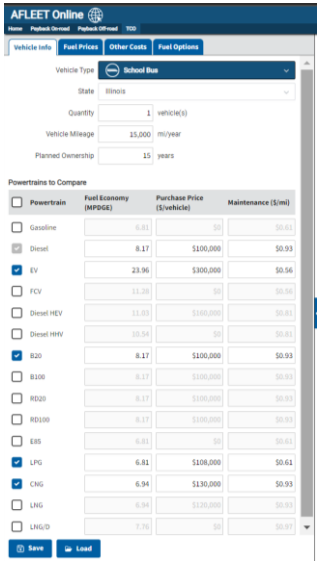
AFLEET contains 18 fuel/vehicle technologies, including conventional, hybrids, plug-in vehicles, and alt fuels

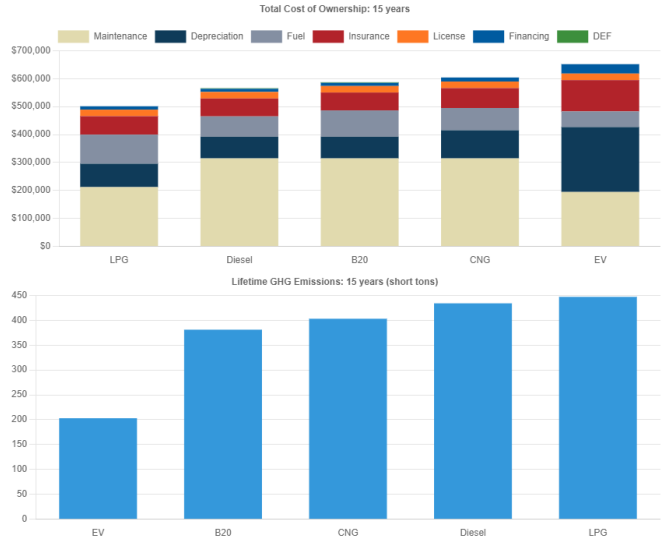


https://afleet.es.anl.gov/afleet/

AFLEET model

Using AFLEET, a user can input fleet-specific assumptions to compare operational costs and environmental impacts of different vehicle technologies.





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GREEN DRIVES