Automotive Deployment Option Projection Tool (ADOPT) Model
(National Renewable Energy Laboratory)

Objectives

Estimate the petroleum use impacts of alternative technologies and policies. Estimate future vehicle market share based on infrastructure constraints, consumer preferences, and vehicle attributes. Analyze policy options by considering factors such as vehicle incentives and energy prices.

Key Attributes & Strengths

The model validates in many relevant dimensions with historical vehicle sales data and captures market penetration more realistically by competing advanced technologies with all current makes and models. The model also captures key aspects to light duty fuel use including changes to vehicle travel with age and scrap rates with age.

Platform, Requirements & Availability

Easy to use interface in Microsoft Excel environment (provides access to assumptions, inputs, and outputs). Planned to be made freely available to the public.

INPUTS

- Vehicle characteristics (price, acceleration, usable volume, range).
- Fuel prices.
- H_2 or CNG infrastructure availability.
- GHG emissions by fuel by year.
- PHEV utility factor.
- Median vehicle miles traveled.
- Survival rates.
- Refueling infrastructure availability (user-defined).
- Consumer income distribution.

ASSUMPTIONS & DATA

- LDV market share results are primarily based on vehicle attributes (price, fuel cost, acceleration, usable volume, and range), as well as household income level.
- Consumer choice coefficients are calibrated to historical vehicle sales at national and zip code levels.
- Captures a distribution of consumer tastes.
- Fuel prices from the U.S. EIA.
- Advanced vehicle characteristics are generated from drivetrain simulation models such as FASTSim and PSAT.

OUTPUTS

- Vehicle sales.
- Fleet count.
- Petroleum consumption.
- GHG emissions.
- All outputs are broken down by powertrain.