



Highlights of [GAO-09-493](#), a report to congressional requesters

## Why GAO Did This Study

The U.S. transportation sector relies almost exclusively on oil; as a result, it causes about a third of the nation's greenhouse gas emissions. Advanced technology vehicles powered by alternative fuels, such as electricity and ethanol, are one way to reduce oil consumption. The federal government set a goal for federal agencies to use plug-in hybrid electric vehicles—vehicles that run on both gasoline and batteries charged by connecting a plug into an electric power source—as they become available at a reasonable cost. This goal is on top of other requirements agencies must meet for conserving energy. In response to a request, GAO examined the (1) potential benefits of plug-ins, (2) factors affecting the availability of plug-ins, and (3) challenges to incorporating plug-ins into the federal fleet. GAO reviewed literature on plug-ins, federal legislation, and agency policies and interviewed federal officials, experts, and industry stakeholders, including auto and battery manufacturers.

## What GAO Recommends

GAO recommends the Department of Energy (DOE)—in consultation with other agencies—propose legislative changes to resolve conflicts among energy and vehicle acquisition requirements. GAO also recommends DOE and the General Services Administration (GSA) provide guidance to help agencies make decisions about acquiring plug-ins. GSA agreed with our recommendations, and DOE did not comment.

View [GAO-09-493](#) or [key components](#). For more information, contact Susan Fleming at (202) 512-2834 or [flemings@gao.gov](mailto:flemings@gao.gov) or Mark Gaffigan at (202) 512-3841 or [gaffiganm@gao.gov](mailto:gaffiganm@gao.gov).

# FEDERAL ENERGY AND FLEET MANAGEMENT

## Plug-in Vehicles Offer Potential Benefits, but High Costs and Limited Information Could Hinder Integration into the Federal Fleet

### What GAO Found

Increasing the use of plug-ins could result in environmental and other benefits, but realizing these benefits depends on several factors. Because plug-ins are powered at least in part by electricity, they could significantly reduce oil consumption and associated greenhouse gas emissions. For plug-ins to realize their full potential, electricity would need to be generated from lower-emission fuels such as nuclear and renewable energy rather than the fossil fuels—coal and natural gas—used most often to generate electricity today. However, new nuclear plants and renewable energy sources can be controversial and expensive. In addition, research suggests that for plug-ins to be cost-effective relative to gasoline vehicles the price of batteries must come down significantly and gasoline prices must be high relative to electricity.

Auto manufacturers plan to introduce a range of plug-in models over the next 6 years, but several factors could delay widespread availability and affect the extent to which consumers are willing to purchase plug-ins. For example, limited battery manufacturing, relatively low gasoline prices, and declining vehicle sales could delay availability and discourage consumers. Other factors may emerge over the longer term if the use of plug-ins increases, including managing the impact on the electrical grid (the network linking the generation, transmission, and distribution of electricity) and increasing consumer access to public charging infrastructure needed to charge the vehicles. The federal government has supported plug-in-related research and initiated new programs to encourage manufacturing. Experts also identified options for providing additional federal support.

To incorporate plug-ins into the federal fleet, agencies will face challenges related to cost, availability, planning, and federal requirements. Plug-ins are expected to have high upfront costs when they are first introduced. However, they could become comparable to gasoline vehicles over the life of ownership if certain factors change, such as a decrease in the cost of batteries and an increase in gasoline prices. Agencies vary in the extent to which they use life-cycle costing when evaluating which vehicle to purchase. Agencies also may find that plug-ins are not available to them, especially when the vehicles are initially introduced because the number available to the government may be limited. In addition, agencies have not made plans to incorporate plug-ins due to uncertainties about vehicle cost, performance, and infrastructure needs. Finally, agencies must meet a number of requirements covering energy use and vehicle acquisition—such as acquiring alternative fuel vehicles and reducing facility energy and petroleum consumption—but these sometimes conflict with one another. For example, plugging vehicles into federal facilities could reduce petroleum consumption but increase facility energy use. The federal government has not yet provided information to agencies on how to set priorities for these requirements or leverage different types of vehicles to do so. Without such information, agencies face challenges in making decisions about acquiring plug-ins that will meet the requirements, as well as maximize plug-ins' potential benefits and minimize costs.