

The Energy Policy Act of 1992 and Executive Order 13149: Proposed compliance strategies and process improvements for federal agencies

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Abstract

Under the Energy Policy Act of 1992 (EPAAct), 75 percent of Light Duty Vehicle acquisitions by federal agencies must be Alternative Fuel Vehicles (AFVs). EPAAct's intent was to reduce United States reliance on oil imports, with federal agencies assuming a leadership role in acquiring AFVs and using alternative fuel in those AFVs. Executive Order (E.O.) 13149, issued in 2000, required federal agencies to reduce petroleum consumption 20 percent relative to a 1999 baseline and use alternative fuels the majority of the time in their AFVs by 2005. Most federal agencies met the EPAAct 75 percent acquisition requirement in 2004, however, most will not achieve the petroleum reduction and alternative fuel use requirements. Frequently, federal agencies acquire the relatively expensive AFVs and then fuel those vehicles with gasoline. Besides wasting taxpayer dollars, this approach does not meet the intent of EPAAct. It was surmised that federal agencies lack an objective, quantitative methodology for AFV acquisitions and Executive Order 13149 compliance. Several types of optimization models were constructed, using the United States Navy as a test case, for models focusing on EPAAct and/or E.O. 13149 compliance. Results of a tiered set of models indicate there are efficiencies that federal agencies could take advantage of when developing EPAAct and E.O. 13149 compliance strategies that are not currently being exploited.

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1. Introduction

The Energy Policy Act of 1992 (EPAAct) requires that 75 percent of Light Duty Vehicle (less than 8500 pounds or 3856 kg) acquisitions by federal agencies in 1999 and beyond must be alternative fuel vehicles (AFVs). EPAAct requirements apply to centrally fueled federal fleets consisting of 20 or more light duty vehicles (LDVs) operating primarily in a Metropolitan Statistical Area (MSA) with a population of more than 250,000 based on the 1980 census, and that are owned or operated by an entity controlling at least 50 vehicles nationwide. The intent of EPAAct was to reduce United States dependence on petroleum imports and to improve air quality. Nearly 20 federal agencies are subject to EPAAct. Federal agencies were to assume a leadership in petroleum displacement by

acquiring AFVs and then using alternative fuel in those AFVs.

A fundamental flaw in EPAAct with respect to reduction of petroleum imports was the fact that the Act mandated acquisition of AFVs but did not mandate the use of alternative fuels. Therefore, President Clinton signed Executive Order (E.O.) 13149 on April 21, 2000 directing agencies with 20 or more vehicles in the United States to reduce their fleet's petroleum consumption by 20 percent by the end of fiscal year 2005 compared to a 1999 baseline. Significant requirements of E.O. 13149 (entitled "Greening the Government Through Federal Fleet and Transportation Efficiency") include the development of a compliance strategy for agencies to meet the 20 percent reduction goal, the inclusion of medium and heavy-duty vehicles in the 20 percent reduction requirement, and mandatory vehicle acquisition, vehicle inventory and fuel consumption reporting to the Department of Energy (DOE). Unlike EPAAct, which mandated AFV acquisitions, E.O. 13149 requires agencies to use alternative fuel in AFVs the

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majority of the time the vehicles are in operation by the year 2005, and also requires agencies to increase the fuel efficiency of new LDVs by 1 mile per gallon (mpg) by 2002 and 3 mpg by 2005 compared to a 1999 baseline (or equivalently, 0.425 km/l by 2002, and 1.275 km/l by 2005). E.O. 13149 forces agencies to achieve fuel use reduction by acquisition and use of AFVs and alternative fuels, and by acquisition of higher fuel economy vehicles (say a hybrid vehicle, for example, which won't help an agency meet EPAAct goals but could assist in meeting E.O. 13149 goals).

This paper describes our work to capture EPAAct and E.O. 13149 compliance data from federal agency annual reports, examine current compliance strategies, and analyze the results of a series of tiered integer optimization models that were created to improve federal agency EPAAct and E.O. 13149 compliance. The United States Navy is used as a test case to compare its current compliance strategy with those developed by the series of tiered optimization models.

2. EPAAct and E.O. 13149 compliance

In the year 2000, only seven of the 18 covered federal agencies met the 75 percent EPAAct acquisition requirement, and at least nine federal fleets actually increased petroleum consumption from 1999 to 2000, resulting in an overall two percent increase in federal fleet petroleum consumption from 1999 to 2000. DOE reports that some data may be inaccurate, including year 2000 petroleum consumption and the 1999 baseline consumption data. This is not surprising, given that year 2000 was first year that agencies were required to collect and submit petroleum consumption data, and some 1999 baseline data has since been adjusted. Subsequent data submissions were expected to be more accurate, and improvements in AFV acquisition percentages and reductions in petroleum consumption were expected, as fleet managers focused on EPAAct and E.O. 13149 requirements.

In 2002, at least nine agencies failed to meet the 75 percent acquisition requirement, and in 2003, at least five agencies failed to meet EPAAct acquisition requirements. Federal agency compliance with EPAAct for 2004 by agency is illustrated in Table 1, as is the number of EPAAct-covered LDV acquisitions for each agency for the year 2004. Seven agencies failed to comply with EPAAct's statutory 75 percent requirement in 2004. Table 1 also illustrates federal agency compliance in 2004 with two requirements of E.O. 13149: the requirement to use alternative fuel in AFVs at least half the time by 2005 and the requirement to reduce overall petroleum consumption by 20 percent relative to 1999, also by 2005. Note that the Army, Navy, Air Force and Marines are broken out separately, although technically they belong to one federal agency—the Department of Defense (DoD). In practice, however, these four departments report EPAAct and E.O. 13149 compliance separately. DOE (2006b) provides an EPAAct Annual Reports web site that links to federal agency annual reports where most of

Table 1 data was accessed, and whenever possible, data were used from these annual agency reports.

Federal agencies are even more challenged in meeting E.O. 13149 requirements than they are in meeting EPAAct requirements. Table 1 illustrates that almost all agencies have not attained E.O. 13149 alternative fuel use and petroleum reduction goals. Since agencies were to use alternative fuel in their AFVs at least 50 percent of the time by 2005, and agencies were charged with reducing petroleum consumption by 20 percent relative to a 1999 baseline, it is apparent that E.O. 13149 goals will not be reached by 2005. It is possible that there are some errors in reported alternative fuel consumption, however, the fact remains that almost every federal agency will not approach E.O. 13149 goals in 2005.

There are several negative side effects for federal agencies in not meeting EPAAct and E.O. 13149 requirements. The first is that it can be embarrassing for an agency not to meet the statutory EPAAct requirement, and it opens up the door for criticism of the agency and other negative consequences like law suits, which have occurred. Another side effect is that, while most federal agencies are meeting EPAAct requirements (acquiring 75 percent AFVs), they are not meeting the intent of EPAAct, which was to reduce United States dependence on foreign oil, because many agencies acquire AFVs and then use only conventional fuel in them. This is clear from Table 1, which illustrates the relatively low percentage of time that AFVs actually use alternative fuel. What is happening, then, is that in many cases, federal agencies are spending taxpayer money on more expensive AFVs that will never use alternative fuel and will therefore never provide any of the intended benefits of using alternative fuel, such as less pollution and reduced dependence on petroleum. Federal agencies often offer the lack of alternative fuel infrastructure, higher incremental cost of some AFVs, and difficulties in tracking alternative fuel use as excuses for not meeting EPAAct and/or E.O. 13149 requirements, although nothing precludes agencies from tracking their own alternative fuel use, and estimates of alternative fuel use do not necessarily appear unreasonable. Improving the process of acquiring AFVs and complying with E.O. 13149 is the focus of the research described in this paper.

The General Services Administration (GSA) has purchased thousands of AFVs that are available for leasing for federal agency customers, and there are thousands of AFVs in federal fleets today. Nevertheless, compliance with EPAAct and E.O. 13149 will remain a challenge for federal fleet managers. Compliance strategies can change on short notice as inventory requirements change, and alternative fuel availability can change as well. Increased incremental costs of the relatively more expensive AFVs often cause fleet managers to make compromises. The General Accounting Office reported that the fleet manager's primary responsibility "is to acquire the number of vehicles that will satisfy their agency's mission. Buying alternative fuel vehicles has a lower priority. Thus, when budget

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