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# General Accounting Office

## Transportation Energy Conservation In The Federal Government

This report discusses the Department of Energy's efforts through the Federal Energy Management Program to develop and promote a transportation energy conservation program in the Federal Government.

While significant reductions have been reported in the Federal Government's use of energy since fiscal year 1973, DOE has not provided the leadership necessary for a strong, structured transportation energy conservation program. The reported reductions, to a great extent, are the result of operational changes and not the result of conservation activities. This report recommends, and provides some suggestions for a stronger, more structured transportation energy conservation program.



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JANUARY 25, 1979

*Report*





UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

ENERGY AND MINERALS  
DIVISION

B-178205

The Honorable James R. Schlesinger  
The Secretary of Energy *AGC 00912*

Dear Mr. Secretary:

As part of our continuing work to evaluate what the Federal Government is doing to manage its use of energy, we reviewed the Department of Energy's (DOE's) efforts under the Federal Energy Management Program (FEMP) to develop and promote a transportation energy conservation program. Based on our evaluation, we have concluded that a transportation energy conservation program, as envisioned and authorized and which we believe is needed, has not been developed and implemented. Moreover, we believe several known practices, methods, and techniques which are not being promoted across-the-board offer potential for transportation energy conservation. We are recommending, therefore, that DOE, through the FEMP, take a more active leadership role in the transportation area by (1) issuing guidance to agencies, (2) investigating and promoting known transportation energy conservation opportunities, and (3) developing a better means of monitoring and evaluating agency energy conservation activities.

BACKGROUND

The Federal Government is the largest single user of energy in the Nation. Energy is used within the Federal sector by almost six million people, in more than 400,000 buildings, and in operating more than 650,000 vehicles of all types.

Presidential Memoranda, Executive Orders, and Public Laws dealing with energy envision and authorize a strong, structured energy conservation program with the Federal sector. DOE is responsible for energy conservation in the Federal establishment. As stated in the DOE Organization Act, it was established, among other purposes:

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" \* \* \* to achieve, through the Department, effective management of energy functions of the Federal Government, including consultation with the heads of other Federal departments and agencies in order to encourage them to establish and observe policies consistent with a coordinated energy policy, and to promote maximum possible energy conservation measures in connection with the activities within their respective jurisdictions. \* \* \*"

Responsibility for energy conservation programs in the Federal Government rests with the FEMP, which is managed by DOE's Office of the Assistant Secretary for Conservation and Solar Applications. FEMP is concerned with the total energy used in the Federal sector, which is divided into two major categories--energy used in buildings and facilities and energy for vehicles and equipment (transportation). The transportation category includes energy used in aircraft, ships, and ground vehicles.

In fiscal year 1977, Federal agencies consumed 1,641 trillion British thermal units (Btus) of energy, of which 896 trillion Btus (or 55 percent) were used for transportation. DOE has reported that between fiscal years 1975 and 1976, the Federal Government reduced its use of transportation energy by 8.6 percent, but that between fiscal years 1976 and 1977, transportation energy consumption increased by 3.9 percent.

LACK OF DOE MANAGEMENT AND LEADERSHIP IN  
ADMINISTERING A TRANSPORTATION ENERGY  
CONSERVATION PROGRAM

DOE has not provided guidance to Federal agencies for use in developing transportation energy conservation plans and has not assisted them in establishing specific goals for reducing transportation energy consumption. While individual agencies have implemented certain conservation measures which have known potential, DOE has not monitored and promoted these on a Government-wide basis. Thus, the Federal Government has only a piecemeal approach to conserving transportation energy.

A November 4, 1976 Presidential Memorandum concerning FEMP directs Federal agencies to establish specific plans for energy savings and directs DOE to work with these agencies to establish individual goals for energy conservation. Subsequently, Executive Order 12003, dated July 20, 1977,

reiterated these requirements by directing each executive agency to submit to DOE an overall plan for conserving energy in all operations of the agency. Each agency is also required to annually report to DOE the progress made toward achieving the goals established in its overall plan. These requirements provide DOE the authority and the means to direct energy conservation efforts and evaluate results.

We found, however, that DOE has not provided the leadership necessary for a strong, structured transportation energy conservation program in the Federal Government. In this respect, DOE has not issued any guidance for Federal agencies to use in developing their overall energy conservation plans. Further, DOE has not assisted Federal agencies in establishing individual agency conservation goals. As a result, no Federal agency has submitted a conservation plan to DOE even though it is required by the Executive Order and, therefore, DOE cannot measure the progress being made.

We believe one reason for DOE's ineffectiveness in managing a transportation energy conservation program is the lack of organizational emphasis. No person in the FEMP office is responsible for promoting transportation energy conservation, and no staff has been assigned to work with the agencies to develop the required conservation plans. The primary effort relating to the transportation area has been to collect and compile energy consumption data reported by Federal agencies.

Despite DOE's lack of leadership, Federal agencies have implemented some transportation energy conservation measures. For example, the Department of Defense has increased its use of aircraft, ship, and vehicle simulators. Also, the U.S. Postal Service has evaluated and is using electric vehicles, and the Department of the Interior has successfully demonstrated the use of compact pickup trucks for most routine operations. Individual agencies, however, are operating in a piecemeal fashion--their efforts have not been brought together in any type of structured program.

#### Opportunities to reduce Federal transportation energy consumption

During our review, we noted that the only thing being done on a Governmentwide basis to conserve transportation energy is the acquisition of fuel-efficient vehicles. The General Services Administration is responsible for ensuring

that all new passenger automobiles acquired by the Federal Government meet certain fuel economy standards. While this represents a necessary first step toward reducing Federal consumption of transportation energy, we believe additional opportunities exist and should be promoted by DOE through FEMP.

Driver training programs and the use of electric vehicles both offer known conservation potential. Tests have shown that by practicing fuel-efficient driving techniques, drivers can improve their vehicles' fuel economy by up to 20 percent. The Douglas Aircraft Company, for example, improved its truck fleet fuel economy by an overall average of 22.1 percent through a driver training and evaluation program.

DOE's Division of Transportation Energy Conservation also sponsored a driver training demonstration project and concluded that measurable and statistically significant increases in fuel economy can be achieved through driver training. The Division is continuing research in fuel-efficient driving techniques, but its work has not been integrated with the FEMP. Although training methods and materials have been developed, DOE has not issued guidance to Federal agencies on how driver training programs should be implemented.

Replacing conventional vehicles with electric vehicles could also result in less energy consumption by the Federal Government. In March 1976, GAO reported <sup>1/</sup> that many vehicles on Federal installations are overpowered for the tasks they are assigned to do and could be replaced by electric vehicles. U.S. Postal Service officials estimate that the use of an electric vehicle in their operations saves about 20 percent of the total energy used by an equivalent gasoline vehicle.

As directed by the Electric and Hybrid Vehicle Research, Development, and Demonstration Act (Public Law 94-413) <sup>2/</sup> of September 17, 1976, DOE is required to demonstrate the

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1/Potential for Using Electric Vehicles on Federal Installations, (Mar. 3, 1976, LCD-76-206).

2/GAO plans to issue a report within the next month on DOE's implementation of the act.

feasibility of using electric vehicles, and its Division of Transportation Energy Conservation is responsible for the program. While it includes demonstrations within the Federal Government as well as the private sector, the program has again not been integrated with the FEMP. Further, while DOE is emphasizing the use of electric vehicles in the commercial sector, we believe more emphasis should be given to the demonstration and testing of electric vehicles in Federal agencies.

Opportunity to reduce Federal employees' transportation energy consumption

In addition to those activities which directly reduce Federal Government energy use, DOE should be promoting, through the FEMP, ride-sharing programs involving Federal employees. Carpooling and vanpooling programs have significant potential for conserving energy, reducing traffic congestion and air pollution, and decreasing parking requirements. While the Federal Government is prohibited from providing vehicles for employees to use in commuting to and from work, some Federal agencies could be doing more to encourage their employees to rideshare.

The Tennessee Valley Authority (TVA) has demonstrated the potential for vanpooling. In cooperation with the TVA Employees Credit Union, TVA sponsors the largest vanpool program in the Nation. The program began in 1974 with six vans and has since been expanded to a total of 226 vanpools at 10 sites in two States. Based on estimated savings of 5,000 gallons of gasoline each year per van, TVA employees are saving more than one million gallons of gasoline per year.

In contrast to the TVA example, we noted that the Wright-Patterson Air Force Base in Dayton, Ohio, does not have an ongoing ridesharing program. During the 1973-74 energy crisis, the Air Force sponsored a carpool program which included a computer matching service. Even though the number of carpools grew from 1,965 in December 1973 to 2,792 in July 1974, the carpool program was discontinued in 1975 when personnel reductions and changes in the computer system operations were made. At that time, computer matching for carpooling was assigned a low priority, since interest in the energy crisis had declined.

The responsibilities for promoting carpooling and vanpooling arrangements under the Energy Policy and Conservation Act were transferred to the Department of Transportation when

DOE was organized. DOE, however, is still responsible for promoting ridesharing through State energy conservation plans. We believe that DOE, as part of its FEMP activities and in cooperation with the Department of Transportation, should also be more actively promoting ridesharing for Federal employees. This could be accomplished by requiring Federal agencies to include ridesharing activities in their overall energy conservation plans, which must be submitted to DOE.

DATA DOES NOT MEASURE THE  
EFFECTIVENESS OF CONSERVATION  
ACTIONS

DOE's primary activity under FEMP has been to compile data on the energy used by Federal agencies to determine whether the Federal Government is achieving its overall energy conservation goals. The data being compiled, however, shows changes in energy consumption levels and does not necessarily reflect the results of energy conservation actions.

Federal agencies involved in FEMP submit data to DOE on how much energy they use. This data is used to show changes which take place in energy consumption from year to year. In the August 11, 1978, letter transmitting the fiscal year 1977 Annual Report on "Energy Management in the Federal Government" to the President, DOE states that energy use within the Federal Government has been reduced by an average of 4.7 percent annually since fiscal year 1975. DOE also states that this energy use reduction has resulted from ongoing energy conservation activities. We found, however, that the reported reduction is incorrect and, to a great extent, is the result of operational changes and not the result of conservation activities.

Using fiscal year 1975 as the base year, DOE reported that energy use was reduced 5.7 percent in fiscal year 1976 and 3.7 percent in fiscal year 1977, and combined these results to show an average annual saving of 4.7 percent since fiscal year 1975. Our analysis of the energy use data in the report shows, however, that the correct average annual savings is about 1.8 percent as computed on the following schedule.

<u>Fiscal year</u>	<u>Total energy use</u>	<u>Annual change</u>	<u>Average annual change</u>
	------(trillions of Btus)-----		
1975	1,704.57	-	-
1976	1,606.68	-97.89	-
1977	1,641.54	+34.86	<u>a/-31.52</u>

Average annual savings as a percentage of fiscal year 1975 total usage is  $-31.52 \div 1,704.57$  which equals 1.8 percent.

a/Represents mid-point between -97.89 and +34.86.

We also found that both increases and decreases in transportation energy use can be attributed more directly to changes in agencies' missions and levels of operations than to concerted agencies' efforts to conserve energy. The following table shows increases and decreases in transportation energy use. The table on the following page shows that most Federal agencies have actually increased their use of transportation energy since fiscal year 1975. It also indicates that the Department of Defense (DOD), because it uses such a large portion of Federal transportation energy, determines whether the total Federal Government consumption increases or decreases.

Federal Government Transportation Energy Consumption,  
Fiscal Year 1975 to Fiscal Year 1977  
(in trillions of Btus)

Agency	Fiscal year 1975 base year	Fiscal year 1976	Change from Fiscal		Fiscal year 1977	Change from			
			year 1975	year 1975		Fiscal year 1976	Fiscal year 1975	Fiscal year 1976	Fiscal year 1975
			(plus)	(minus)		(plus)	(minus)	(plus)	(minus)
DOD	899.78	816.32	-	9.3%	849.55	4.1%	-	-	5.6%
DOT	10.98	12.21	11.2%	-	12.43	1.8	-	13.2%	-
USPS	11.24	11.32	0.7	-	11.74	3.7	-	4.4	-
Agriculture	5.17	5.55	7.4	-	5.29	-	4.7%	2.3	-
Interior	3.55	3.85	8.5	-	3.66	-	4.9	3.1	-
Treasury	2.22	2.22	-	-	2.23	0.5	-	0.5	-
Justice	1.86	2.20	18.3	-	2.09	-	5.0	12.4	-
DOE	1.63	1.78	9.2	-	1.85	3.9	-	13.5	-
NASA	1.72	1.62	-	5.8	1.73	6.8	-	0.6	-
Commerce	1.13	1.42	25.7	-	1.39	-	2.1	23.0	-
All others	4.40	4.31	-	2.0	4.32	0.2	-	-	1.8
Total	<u>943.68</u>	<u>862.80</u>		<u>8.6%</u>	<u>896.28</u>	<u>3.9%</u>			<u>5.0%</u>

Source: Fiscal year 1977 Annual Report--Energy Management  
in the Federal Government.

DOD officials informed us that both internal and external actions were responsible for reducing energy consumption levels in DOE since 1973. Internally, DOD was promoting conservation through the use of flight simulators, driver training programs, etc., but DOD officials told us these internal actions were not the primary reason for reduced energy use. We were told that major factors affecting DOD's energy consumption were the cessation of operations in Viet Nam and increases in the costs of energy in conjunction with a shrinking budget.

This was substantiated by information provided to us. For example, the Navy's "Energy Plan and Program--1978" states:

"The Navy has been successful in cutting energy consumption thus far, largely by reducing its ship and aircraft strength and its general operational activity. However, according to on-site energy conservation inspection reports, some Navy shore activities could achieve as much as an additional 15 percent savings by implementing more aggressive conservation programs without affecting the Navy's mission or lowering morale. Implementing these programs is a question of available manhours and the degree of command attention that is provided. While aggressive energy conservation investment programs, facilities engineering programs, and energy R&D are underway, payback from these programs will accrue gradually and will not yield significant results until the 1980-1982 period."

More specifically, the plan, in discussing ship and aircraft operations, contains the following statements:

"Since 1973 ship fuel consumption has decreased 46 percent, primarily due to decreased OPTEMPO (operating tempo), while the cost of fuel for ship operation has increased by 140 percent from \$158 million in 1973 to \$379 million in 1977."

"Since 1973, aircraft fuel consumption has decreased by 17 percent, primarily due to decreased OPTEMPO, while the cost of aircraft fuels has increased by 156 percent from \$158 million to \$404 million."

Further, data provided by the Air Force shows that flying hours (on the decline since 1969) decreased 33 percent from 1973 through 1977, while fuel costs increased 167 percent for the same period. In other words, the \$0.61 billion authorized for fuel in 1973 provided 4.9 million flying hours, while the \$1.63 billion in 1977 allowed only 3.3 million flying hours.

We also found other instances where changes in a department's mission and level of operations probably would explain an increased energy consumption level. For example, extension of the U.S. offshore territory limits to 200 miles would have an impact on the Coast Guard, the Department of Transportation, and the Department of Commerce. The Coast Guard, responsible for patrolling these waters, and Commerce, responsible for fish surveys, would both have had to increase their levels of operation. The FEMP report does in fact show large increases in transportation energy for both Transportation and Commerce for fiscal year 1976.

FEMP reports are inconsistent in dealing with decreases and increases in Federal energy consumption. On the one hand, DOE takes credit for reductions as being attributable to conservation actions, yet, on the other hand, it attributes increases in energy use to mission or operational changes. The upward trend in total Federal energy use between 1976 and 1977, for example, was said to be the result of factors such as

--the conduct of major training exercises by the Armed Forces and

--expanded mission requirements and responsibilities in a number of agencies.

In discussing the overall reduction between 1975 and 1977, however, the FEMP annual report attributes the savings to energy awareness; the use of simulators, compact cars, and electric vehicles; driver and operator training programs; and the procurement of energy-efficient equipment. While these actions probably did save some transportation energy, FEMP data is indicative only of total consumption and the results of conservation actions are, in fact, unknown.

We believe that before DOE can determine and report the results of agency conservation activities, it must have a conservation plan (with specific goals) from each agency as required first by Presidential Memorandum and later by Executive Order. With these plans, DOE would be better able to identify changes in consumption resulting from specific energy conservation actions.

#### CONCLUSIONS AND RECOMMENDATIONS

In our opinion, DOE has not developed, implemented, or promoted a transportation energy conservation program within the Federal Government as authorized and envisioned by Presidential Memoranda, Executive Orders, and Public Laws. DOE has not provided program guidance, specific goals have not been established, and department and agency plans have not been developed. Moreover, DOE is not actively monitoring, evaluating, or promoting conservation activities within the Federal sector, such as driver training, electric vehicles, and ridesharing for Federal employees which, in our opinion, are potential conservation techniques warranting wider application.

Further, we believe DOE's contention that energy use reductions in the Federal Government are due to agency conservation programs is misleading. While agencies individually have implemented conservation programs, our review disclosed that energy use reductions are more directly due to mission changes, reduced levels of operation, and rising costs of energy. This was especially true in DOD, which, because of its relative size, determines whether the Federal Government's use of energy increases or decreases each year.

We recommend, therefore, that DOE, through the FEMP, take a more active leadership role in the transportation area by

- issuing guidance,
- requiring agency plans and goals,
- investigating and promoting known transportation energy conservation opportunities,
- providing technical assistance, and
- developing a better means of monitoring and evaluating agency conservation activities.

Department of Energy comments

In commenting on this report, DOE stated:

"Our review (of the GAO draft report) indicates no substantive disagreement with the major findings but we do feel that the implication that the Secretary had distorted the Federal savings figures is inappropriate. \* \* \* A technical error may exist but there was no intent to mislead or distort the figures."

We reported the incorrect computation of the average annual energy savings figure because of the wide variance that existed between DOE's computation of a 4.7-percent average annual savings and the correct figure of 1.8 percent. Our primary concern, however, was that the statistics were not presented in a manner which most accurately described the Federal energy situation and the effectiveness of conservation actions. In this regard, we concluded that FEMP reports were inconsistent in dealing with decreases and increases in Federal energy consumption, and that they were misleading in contending that energy-use reductions were due to agency conservation programs.

With respect to the need for more organizational emphasis on transportation energy conservation within the Federal Government, DOE stated:

"\* \* \* the current CS (Conservation and Solar Applications) organization is an interim one, approved on June 16, 1978. The Assistant Secretary for Conservation and Solar Applications now has underway, as a top priority, a meticulous examination of the CS programs and activities and the development of a related permanent organization structure. It is expected that this review would result in the proper organizational emphasis and the requisite manning levels for accomplishment of assigned responsibilities."

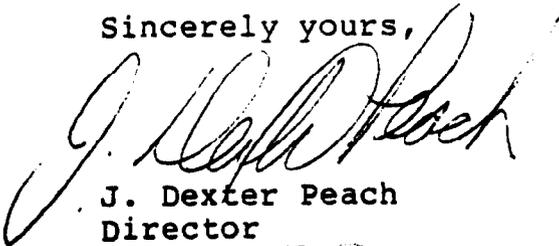
We appreciate the fact that the Office of the Assistant Secretary for Conservation and Solar Applications, as an organization, is in its formative stages. We believe, however, that our recommendation for strengthening DOE's leadership role in the transportation area needs to be implemented regardless of the organizational structure.

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As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the four Committees mentioned above and to the chairman of energy-related congressional committees. We are also sending copies to the Director, Office of Management and Budget.

Sincerely yours,



J. Dexter Peach  
Director

EMD

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