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Report to the Chairman, Subcommittee on Public Buildings and Grounds, Committee on Public Works and Transportation, House of Representatives

January 1992

GENERAL SERVICES ADMINISTRATION

A Status Report on Energy Conservation Efforts

GAO/GGD-92-22

GAO

United States
General Accounting Office
Washington, D.C. 20548

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General Government Division

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January 13, 1992

The Honorable Gus Savage
Chairman, Subcommittee on
Public Buildings and Grounds
Committee on Public Works and
Transportation
House of Representatives

Dear Mr. Chairman:

This report responds to your predecessor's request that we review the General Services Administration's (GSA) efforts to achieve the building energy reductions required by the Federal Energy Management Improvement Act of 1988. The act requires that by 1995 all federal agencies, including GSA, reduce their building energy usage by 10 percent from 1985 levels. Specifically, we were asked to assess GSA's efforts to reduce energy usage and meet the 10-percent energy reduction requirement in the buildings it owns and leases.

Results in Brief

While it is too early to forecast whether GSA will achieve the required 10-percent reduction by 1995, GSA is making a concerted effort in the energy conservation area. In response to the 1988 act, GSA began taking a more proactive approach to energy conservation and in 1990 developed a comprehensive energy reduction plan. Under this plan, GSA has taken a number of steps to reduce energy consumption. For example, GSA is funding specific projects to reduce energy consumption and educating tenant agencies about energy conservation. GSA is also pursuing other energy-saving opportunities, such as shared energy-saving contracts—in which contractors install energy-saving equipment in federal buildings in return for a percentage of the resulting cost savings—and energy rebates—in which public utilities help finance energy conservation investments that reduce the demand for energy and thus the need for the utilities to increase their energy-generating capacity.

In spite of these initiatives, GSA faces a formidable challenge in achieving the required 10-percent building energy reduction by 1995. GSA cited two major reasons the 10-percent reduction will be difficult to achieve. First, because many of the most obvious and cost-effective energy-saving measures were completed before 1985, the potential energy-saving opportunities that remain generally are more expensive and will produce fewer energy savings. Second, changes in building and

At GSA's Energy Usage Analysis Center, we interviewed officials and analyzed GSA's nationwide energy usage statistics to develop an understanding of how GSA compiles, measures, and assesses energy usage. At the 3 GSA regional and 10 GSA field offices, we interviewed officials, reviewed documentation, and analyzed data to assess how GSA's energy reduction plan is being implemented at the field office level, how specific energy reduction projects are identified and selected, and what progress is being made to reduce energy consumption. We did not verify this data nor did we test the reliability of the energy usage analysis system.

Additionally, we interviewed officials at four public utility companies to obtain information on available energy rebate programs. To assess GSA's implementation of shared energy-saving contracts, we interviewed officials at GSA's National Capital and Atlanta regional offices. We did our work between August 1990 and July 1991 in accordance with generally accepted government auditing standards.

Too Early to Forecast Whether GSA Will Meet the 10-Percent Requirement

The data needed to forecast whether or not GSA will be able to achieve the mandated 10-percent energy reduction by 1995 are not yet available. GSA is currently attempting to develop the necessary data to accurately make such forecasts, assess its progress to date, and identify what additional actions and initiatives will be required between now and 1995 to meet the requirement.

GSA recently revised its automated system for tracking energy consumption to track and measure changes in total energy usage since 1985. These data indicated that GSA used about 1 percent less energy in 1990 than in 1985. This energy reduction did not include the energy savings that should result from GSA's recently completed, ongoing, and planned energy-saving initiatives. For example, it did not include the expected cumulative energy savings that will result by 1995 from (1) the $71 million the agency has committed to spend on energy conservation projects in fiscal years 1990, 1991, and 1992; (2) the agency's planned initiatives for fiscal years 1993 through 1995; or (3) the agency's ongoing and planned repair and alteration projects that are energy related.

In commenting on our draft report and in subsequent discussions, GSA said that it has further refined its energy usage data for 1990. GSA's revised data—developed after our field work was completed—indicated a 2-percent decrease in fiscal year 1990 energy usage compared to the 1985 level. In addition, GSA said that preliminary energy usage data

Energy Project Funding

Because government-owned buildings make up roughly 60 percent of GSA-managed space, reducing energy consumption in these buildings will be critical to GSA's success in achieving the 10-percent reduction. Accordingly, GSA has concentrated on identifying and funding a variety of energy conservation projects in federally owned buildings. In fiscal years 1990 through 1992, GSA set aside $71 million of its available building repair and alteration funds to finance energy conservation projects. According to GSA, Department of Energy project selection criteria indicated that these projects would yield the highest ratio of savings to investment over the estimated life of the project.

These projects included basic energy-saving approaches, such as installing motion detectors to control lights in offices and in occasionally used rooms. More costly projects included installing building systems to monitor and control energy consumption and replacing outdated and inefficient heating, ventilating, and air conditioning systems. Energy projects that GSA funded during fiscal years 1990 through 1992 are summarized in appendix II.

Building Operations

One of the key objectives of GSA's energy reduction strategy is to make building operations more energy efficient. We noted that the field offices we visited had emphasized this objective.

The actions that GSA field offices have taken to conserve energy through improved building operations and systems maintenance include (1) doing regular preventive maintenance on building heating, ventilating, and air conditioning systems and equipment; (2) turning off building equipment when not needed or not in use; (3) using new log forms that were created to maintain more detailed daily records on heating and ventilation system operations and that allow operators to identify equipment needing maintenance; (4) inspecting buildings to ensure efficient operation and regular preventive maintenance of these systems; and (5) periodically revising building operation and maintenance plans to implement the most energy-efficient methods. However, GSA does not have estimates of the dollar or energy savings that will result from these efforts.

Educating Tenant Agencies About Energy Conservation

The GSA field offices we visited had taken steps to educate tenant agencies about energy conservation. Some field offices sent letters to tenants stressing conservation practices, such as turning off lights and equipment when they are not being used. Field offices that emphasized these

too early to tell how useful these contracts will be in reducing energy consumption.

Even though GSA is pursuing the use of shared energy-saving contracts, the GSA officials we interviewed were concerned that the contracts' complicated structures will require extensive contract administration efforts. They pointed out that GSA must first prepare detailed contract specifications and evaluation factors and develop baseline energy use data. After the contract is awarded, GSA must (1) calculate energy cost savings directly attributable to the contract to determine the contractor's share and (2) monitor the contractor's maintenance of the energy-saving equipment.

GSA officials also noted that these contracts may be more appealing to other federal agencies, which unlike GSA depend on direct congressional appropriations to finance their mandated 10-percent energy reduction. Shared energy-saving contracts are attractive to these agencies because they do not require up-front government financing; the contractor finances the initial investment. GSA's energy conservation projects are financed by the Federal Buildings Fund. This fund, established by law in 1972, is intended to finance costs associated with providing space to federal agencies, including utilities. Because the Federal Buildings Fund provides GSA with an available source of funding for energy-saving initiatives, shared energy-saving contracts are not a critical funding source for its energy conservation efforts. Simply stated, federal agencies may be willing to put up with the extensive contract administrative effort because of limited funding. GSA, on the other hand, has more of an option in using these complex contracts because of the Federal Buildings Fund.

Energy Rebates

Rebates provided by public utility companies in return for specific energy-saving investments can be another important source of funding to help pay for energy projects. As with shared energy-saving contracts, GSA tasked each of its regional offices with identifying rebate opportunities. As of May 1991, GSA's regional and field offices had identified about $6.5 million in potential rebates. Additionally, in commenting on a draft of this report, GSA said that it had established a national policy to participate in energy conservation rebates when they are economically practical.

biggest energy savings. However, these savings are already reflected in GSA's 1985 baseline energy level and do not count toward the required 10-percent reduction. For example, GSA said that it reduced building energy consumption by 25 percent between 1973 and 1975 by turning off lights and building operating equipment during nonwork hours and that it achieved an additional 25-percent savings between 1975 and 1985 by installing solar film—which reduces the heat transmitted by sunlight—on windows, replacing incandescent light bulbs with energy-efficient fluorescent lights, and disconnecting unneeded lights and lighting ballasts. Such low-cost initiatives usually have large energy savings and short payback or cost recovery periods. GSA officials said that the remaining available energy-saving opportunities generally are more capital-intensive, have longer payback periods, and most importantly will result in smaller energy savings.

GSA also cited a number of changes in building and tenant agency operations over the last several years that have increased the demand for energy and that will make the 10-percent energy reduction more difficult to achieve. These changes include (1) the increased use of personal computers, (2) the proliferation of large-scale automated data processing centers, and (3) flexible employee work schedules that increase the daily hours that buildings remain open.

Conclusions

In response to the 1988 act, GSA has begun to take a proactive approach to energy conservation. However, it faces a formidable challenge in achieving the required 10-percent building energy reduction by 1995, and it is too early to forecast whether GSA's efforts will be successful. Because GSA has developed a comprehensive strategy to reduce building energy usage, has begun funding a variety of specific energy conservation initiatives, and is proactively exploring other energy-saving opportunities, we are making no recommendations to GSA in this report.

Agency Comments and Our Evaluation

In a November 26, 1991, letter, the Administrator of GSA commented on a draft of this report. GSA agreed with our basic message and acknowledged that it faces a formidable challenge in meeting the 10-percent energy reduction requirement by 1995. GSA also provided some clarifications and updated information that we incorporated in the report. (See app. III.)

Funding for GSA Energy Projects: Fiscal Years 1990-92

Project description	Number	Cost
Install motion sensors	39	$2,555,103
Install or upgrade energy management systems	54	4,127,728
Upgrade heating, ventilating, and air conditioning systems	105	17,035,556
Install or upgrade insulation	11	395,000
Upgrade lighting	194	22,896,502
Improve electrical metering devices	4	214,500
Upgrade lighting reflectors	51	9,317,028
Improve windows	36	2,643,968
Miscellaneous	36	1,986,569
Total	**530**	**$61,171,954[a]**

[a]Does not include the $7.5 million set aside in fiscal year 1992 for delegated agency energy projects, which had not been selected at the time of our review. Nor does it include the $1.9 million committed to fiscal year 1991 projects, which were not finalized until after the completion of our work.

PUBLIC BUILDINGS SERVICE
RESPONSE ON GAO DRAFT REPORT

A Status Report on Energy Conservation Efforts

Item 1

Page 3, paragraph 2: "...GSA manages and oversees about 245 million square feet of space in 6,600 buildings. About 1,600 of them that are federally owned contain 60 percent of this space; the rest is in 5,000 buildings that are leased from private owners. For fiscal year 1992, GSA expects to spend about $300 million on utilities and fuel for these buildings."

See p. 2.

Response: For fiscal year 1992 we expect to obligate about $264 million, not $300 million as cited in the draft report on utilities and fuel. These monies will pay for utilities and fuels for our federally owned and operated buildings, leased buildings where we pay the utilities, and the central heating plants.

Item 2

Page 5, paragraph 3: "The data needed to forecast whether or not GSA will be able to achieve the mandated 10 percent energy reduction by 1995 is not yet available."

See pp. 3 and 4.

Response: Although data needed to forecast may not be fully available yet, the energy performance to date reveals significant reductions. For example, the performance trend over the past 3 years shows, 1989 at plus 8 percent, 1990 at minus 2 percent, and 1991 at minus 4 percent (through August 1991). This trend indicates that we are well on our way to meeting the goals.

Item 3

Page 6, paragraph 2: "This data indicates that GSA used about 1 percent less energy in 1990 than in 1985."

See pp. 3 and 4.

Response: The current data, completed after the presentation of the draft audit, indicates that we used about 2 percent less in 1990 than in 1985.

Major Contributors to This Report

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PUBLIC BUILDINGS SERVICE
RESPONSE ON GAO DRAFT REPORT

A Status Report on Energy Conservation Efforts

Item 4

Page 6, paragraph 2: "...it does not include the expected cumulative energy savings that will result by 1995 from (1) the more than $61 million the agency invested in energy projects in fiscal years 1990, 1991, and 1992."

See pp. 3, 5, and 13.

Response: The dollar amount is actually $71 million. GSA has committed $11 million in 1990; $30 million in 1991, and $30 million in 1992.

Item 5

Page 14, paragraph 2: "...GSA tasked each of its 10 regions with identifying rebate opportunities."

See p. 7.

Response: Our national configuration is eight regions. Additionally, we have established a national policy to participate in "Demand-Side Management" programs for energy conservation whenever economically practical.

Comments From the General Services Administration

Administrator
General Services Administration
Washington, DC 20405

November 26, 1991

The Honorable Charles A. Bowsher
Comptroller General
of the United States
General Accounting Office
Washington, DC 20548

Dear Mr. Bowsher:

Thank you for the opportunity to comment on the General Accounting Office (GAO) draft audit report entitled "A Status Report on Energy Conservation Efforts," GAO/GGD-92-XX.

See p. 9.

The General Services Administration (GSA) appreciates your positive remarks concerning our energy conservation efforts. We agree that achieving the required 10 percent buildings energy reduction by 1995 is a formidable challenge. However, we accept the challenge to achieve the buildings energy reductions required by the Federal Energy Management Improvement Act of 1988. Even with our rebate and shared energy saving contract plans in place, GSA will still aggressively seek new and cost-efficient, energy-related opportunities.

See p. 9.

Enclosed are additional specific comments on issues discussed in the draft report that we respectfully request be considered in the drafting of the final report. We appreciate the time and effort your staff has expended in developing this report. We look forward to working with GAO in continuing to improve GSA's energy conservation efforts.

Sincerely,

Richard G. Austin
Administrator

Enclosure

GSA Field Offices Visited or Contacted

Region 9	Golden Gate Field Office, San Francisco
	Sansome Street Field Office, San Francisco
	East Bay Field Office, Oakland
	Sacramento Field Office
	West Los Angeles Field Office
Region 5	Loop Field Office, Chicago
	Central Field Office, Chicago
	Milwaukee Field Office
	Midwest Field Office, Chicago
	Cincinnati Field Office

As agreed with the Subcommittee, we are sending copies of this report to the Administrator of the General Services Administration, the Director of the Office of Management and Budget, and other interested parties. Copies of this report will also be made available to others on request.

Major contributors to this report are listed in appendix IV. If you have any questions regarding this report, please contact me on (202) 275-8676.

Sincerely yours,

L. Nye Stevens
Director, Government Business
Operations Issues

To enable rebates to be a viable source of funding for energy conservation projects, GSA successfully obtained language in its 1991 congressional appropriation allowing it to use the rebates it obtained in fiscal year 1991 to finance additional energy projects.[1] GSA did this because, by law, all such rebates obtained by federal agencies, including GSA, are to be turned over to the Department of the Treasury. According to GSA officials, the fact that federal agencies are not permitted to keep the utility rebates has proven to be a disincentive for federal agencies to pursue them. Consequently, GSA has proposed legislation to provide itself, as well as other agencies, with the permanent authority to retain future rebates to fund additional energy conservation projects. Congress has not yet provided this permanent authority.

Although GSA has taken some positive steps to pursue available rebates, we noted some confusion at the regional level as to who should be pursuing them. This confusion existed primarily because GSA has not assigned the responsibility for identifying and obtaining rebates. Specifically, GSA headquarters officials told us that regional Public Buildings Service (PBS) staff are solely responsible for obtaining rebates. However, regional PBS staff said that project designers in their design and construction divisions, field office personnel, or architect/engineer firms under contract to GSA were in fact responsible.

If the responsibility for obtaining rebates is not clearly assigned and communicated, GSA will have little assurance that it is taking full advantage of all available rebate opportunities. GSA agreed and said that it was drafting an instructional letter to all of its regions requiring them to clearly establish who has responsibility for obtaining rebates.

Obstacles to Achieving the 10-Percent Reduction

Even though GSA has a comprehensive approach for energy conservation, officials cited two major reasons why achieving the 10-percent building energy reduction by 1995 will be difficult. First, because GSA took some of the most obvious and most cost-effective conservation measures in response to the energy shortages of the 1970s, the remaining available energy-saving opportunities are less attractive. Second, recent changes in building and tenant operations have increased the demands for energy.

According to agency officials, the energy conservation initiatives that GSA took between 1973 and 1985 were the ones with the lowest costs and

[1] Congress subsequently extended this authority through fiscal year 1992.

conservation practices promoted additional energy use awareness activities, such as (1) holding meetings with tenants to stress the importance of energy conservation, (2) initiating energy conservation poster campaigns, and (3) encouraging energy-saving suggestions from tenants.

Although it is difficult to quantify any resulting energy savings, field offices that raised energy use awareness cited positive results. For example, GSA's Springfield Field Office—which won the Department of Energy's energy conservation award for fiscal year 1991—credited its proactive energy use awareness program with helping to reduce energy consumption in its buildings by 8 percent.

Energy Conservation in Leased Space

Although GSA's energy-saving efforts to date have focused primarily on federally owned buildings, it has also encouraged energy conservation in leased space. For example, its new leases require building owners to adhere to specified heating and cooling temperature ranges and to install programmable thermostats that reduce energy usage during nonoffice hours. In addition, according to GSA officials, GSA now considers building energy costs in awarding leases, and lessors with the most energy-efficient buildings have an advantage in competing for new leases. However, existing lease contracts usually do not allow GSA to either mandate building operation improvements or require lessors to invest in energy conservation equipment. Consequently, significant energy savings in leased space will be difficult to achieve until these old leases expire.

Two Additional Approaches to Energy Savings

In addition to its energy reduction plan, GSA has also begun exploring the use of two joint-venture approaches to energy savings. One approach is shared energy-saving contracts—in which private contractors install energy-saving equipment in federal buildings in return for a percentage of the resulting cost savings. The second is energy rebates—in which public utilities help finance energy conservation investments that reduce the demand for energy and thus the need for the utilities to increase their energy-generating capacity.

Shared Energy-Saving Contracts

GSA has tasked each of its regions with investigating the feasibility of using shared energy-saving contracts. The GSA regions we contacted have begun to do so, and the National Capital and Atlanta regions are each preparing to award a shared energy-saving contract. However, it is

through August 1991 indicated a 4-percent decrease in fiscal year 1991 energy usage compared to 1985. We did not verify the accuracy of GSA's revised energy usage data.

GSA's Efforts to Date

Even though it is too early to forecast whether GSA will achieve the required 10-percent reduction, GSA recognizes the importance of energy conservation and seems committed to reducing energy consumption in federal buildings. In response to the 1988 act, GSA has taken a more proactive approach to energy conservation and in 1990 developed a comprehensive building energy conservation plan. Although this plan is not yet fully implemented, it appears to be a well-designed strategy for achieving energy savings. Under this plan, GSA (1) has revised its automated system for tracking energy consumption, (2) has funded a variety of energy conservation projects, (3) is implementing a strategy for making building operations more energy efficient, (4) is educating tenant agencies about energy conservation, and (5) is encouraging energy conservation in leased buildings.

Automated System to Measure Energy Use

GSA revised its automated system for measuring energy use to track and measure total energy consumption and energy savings since 1985. This system, the Energy Usage Analysis System (EUAS), was fully redesigned as of June 1991. Using information from utility bills, the system now (1) tracks energy consumption in federally owned buildings and leased space in which GSA pays the utilities and (2) enables GSA field offices to measure energy consumption in individual buildings to target high-consumption buildings for energy-saving projects. The revised system provides more complete and accurate energy consumption data than the earlier version, which only tracked energy usage in a sample of GSA buildings. Under the earlier version, GSA used the energy usage data for the sampled buildings to estimate its total energy usage.

In addition to revising EUAS to track its current total energy usage, GSA had to reconstruct its total energy usage for the 1985 base year for comparative purposes. To do this GSA (1) reconstructed its total building inventory and the number of square feet of space it managed and controlled as of 1985, (2) analyzed energy usage data for buildings tracked under the old version of EUAS, and (3) had GSA regional energy coordinators nationwide reconstruct and provide data on 1985 utility bills for the buildings that were not tracked initially. GSA's efforts to reconstruct its 1985 energy usage and redesign and test its revised system began in July 1989 and were completed in June 1991.

tenant agency operations, such as the increased use of personal computers, have increased the demands for energy.

Background

Congress has long recognized the importance and the benefits of reducing national energy consumption. To promote energy conservation and the efficient use of energy by the federal government, Congress passed the Federal Energy Management Improvement Act of 1988 (P.L. 100-615). The act requires a 10-percent reduction in energy consumption in federal buildings by 1995. The President further challenged federal agencies by issuing Executive Order 12759 on April 17, 1991, which required the agencies to reduce their energy usage by 20 percent by the year 2000.

Because GSA provides most of the office space for federal agencies, it is directly affected by both the act and the executive order. Nationwide, GSA manages and oversees about 245 million square feet of space in 6,600 buildings. Roughly 60 percent of this space is located in 1,600 federally owned buildings; the rest is located in 5,000 buildings that are leased from private owners. During fiscal year 1992, GSA expects to obligate about $264 million on utilities and fuel for federally owned and operated buildings, for leased buildings in which it pays the utilities, and for central heating plants.

Objective, Scope, and Methodology

Our objective was to assess GSA's efforts to reduce energy usage and meet the 10-percent energy reduction requirement. To meet this objective, we did work at GSA's headquarters in Washington, D.C.; its Energy Use Analysis Center in Fort Worth, Texas; 3 of its regional offices (New York City, Chicago, and San Francisco); and at 10 GSA field offices (see app. I). We judgmentally selected these regions and field offices to achieve geographic diversity in assessing GSA's energy reduction efforts.

At GSA headquarters, we reviewed and analyzed the agency's energy reduction plan for achieving the 10-percent reduction, and interviewed senior GSA officials responsible for designing and implementing the plan. We analyzed various documents related to energy reduction initiatives. We also interviewed GSA officials who were responsible for approving energy reduction projects and for monitoring efforts to reduce energy consumption. Finally, we analyzed GSA's processes for identifying, approving, and monitoring energy reduction projects.