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RESTRICTED

Part VII

**Department of
Energy**

**Guidelines for Energy Management in
General Operations of the Federal
Government; Final Rule**

DEPARTMENT OF ENERGY

10 CFR Part 436

Federal Energy Management and Planning Programs; Guidelines for Energy Management in General Operations of the Federal Government

AGENCY: Department of Energy.

ACTION: Final rule.

SUMMARY: The Department of Energy is issuing final guidelines for Federal agencies to use as they develop an overall 10-year energy management plan to reduce the rate of energy consumption and increase energy efficiencies in their general operations. These guidelines pertain to all Federal general operations, including energy used for general transportation, services, industrial or production type activities, and for operational training and readiness functions. Guidelines for the related "buildings" plan aspects of the Federal Energy Management and Planning Programs such as heating, lighting, air conditioning and hot water systems were published as a final rule in the Federal Register on November 14, 1979. The integration of agency General Operations and Buildings Plans will constitute the planning base for all Federal energy use.

The purposes of the general operations guidelines for Federal agencies are: To reduce the rate of energy consumption, to increase energy efficiency, to provide a methodology for reporting agency progress in meeting energy conservation goals, and to promote emergency energy conservation planning.

Using agency inputs prescribed by the guidelines, the Department of Energy will have a factual basis to disseminate energy-saving information to both the public and private sectors, to initiate actions within the Federal Government that may be necessary to avoid occurrence of energy supply crises, and to promote the establishment and attainment of energy conservation goals on an agency by agency basis.

EFFECTIVE DATE: July 31, 1980.

FOR FURTHER INFORMATION CONTACT:

Paul G. Brumby, (202) 252-9467, Office of Conservation and Solar Energy, Department of Energy, 1000 Independence Ave., SW., Washington, D.C. 20585.

Karen Griffin, (202) 252-4440, Office of Policy and Evaluation, Department of Energy, 1000 Independence Ave., SW., Washington, D.C. 20585.

Christopher T. Smith, (202) 252-9510, Office of the General Counsel,

Department of Energy, 1000 Independence Ave., SW., Washington, D.C. 20585.

SUPPLEMENTARY INFORMATION:

I. Introduction

Today, and for the foreseeable future, Federal agencies are faced with rising energy costs and the possibility of a sudden, and possibly severe, reduction of oil-based energy resources, natural gas or electricity. To assist in avoiding or managing such problems, the Department of Energy (DOE) today establishes Subpart F, Part 436 of Title 10 of the Code of Federal Regulations, for Federal agencies to follow as they develop 10-year conservation plans for their general operations and emergency conservation plans for an emergency energy shortage. Besides facilitating conservation planning in agencies' general operations and promoting emergency planning, these guidelines will enable DOE to initiate necessary actions within the Federal Government to avoid or mitigate energy supply crises and to promote the establishment and the attainment of energy conservation goals on an agency by agency basis.

These guidelines are published pursuant to and in accordance with Section 381 of the Energy Policy and Conservation Act, as amended (EPCA) 42 U.S.C. 6361; Executive Order 11912, as amended by Executive Order 12003 (the Executive Order), 42 FR 37523 (July 20, 1977); Title V, Part 3, of the National Energy Conservation Policy Act (NECPA), Pub. L. 95-619, 92 Stat. 3275 (1978); Section 644 of the Department of Energy Organization Act, 42 U.S.C. 7254; Presidential Memorandum, (Reduction of Energy Use by the Federal Government, February 2, 1979); Presidential Memorandum, (Required 5% Reduction in Agency Energy Use, April 10, 1979); and Section 211(c) of the Emergency Energy Conservation Act of 1979, Pub. L. 96-102, 93 Stat 758 (1979), 42 U.S.C. 8511(c).

Under the Executive Order and by operation of Section 301 of the Department of Energy Organization Act, 42 U.S.C. 7151, the Secretary of DOE is responsible for developing a Federal 10-year energy management plan. The Executive Order requires each Executive agency to submit to DOE an overall Federal 10-year energy management plan for conserving fuel and energy in all of its operations. Each agency plan is to include a Buildings Plan and a General Operations Plan. Guidelines for establishing the Buildings Plans were published as final rule for inclusion in 10 CFR Part 436, Subpart C (44 FR 65714, November 14, 1979), and

this final rule establishes guidelines for the General Operations Plan.

The guidelines published today establish a series of actions to be taken by Federal agencies to reduce energy use. Such actions will include establishing specific energy reduction goals; identifying appropriate baselines for charting and evaluating progress toward agency goals; formulating long-term plans for achievement of goals; adopting appropriate conservation measures; developing emergency conservation plans; and establishing specific evaluation and reporting procedures. All such actions shall be undertaken in accordance with a time-phased program coordinated with DOE, a committee of Federal agency representatives, and the Office of Management and Budget (OMB). The guidelines are designed to assure the earliest possible implementation of all known cost-effective energy conservation measures. It is anticipated that any such action should not jeopardize attainment of fundamental agency functions or missions.

DOE considered assigning annual general operations energy consumption targets (energy Btu budgets) for each Federal agency during the 1980-1995 period. This approach was avoided because information on individual agency missions and budgets was inadequate and because it could adversely affect the agency's mission. Therefore, the general operations guidelines allow goals in general operations to be set by each agency. This approach is taken to ensure that energy conservation is balanced against agency primary missions and to avoid degradation of services which might result from improperly planned and implemented conservation measures. However, these guidelines do prescribe management methodologies for planning, control, and selected operational measures for obtaining energy efficiencies or reductions. Furthermore, DOE intends to supplement these guidelines, as needed, with management controls, additional energy conservation measures for agency consideration, and if necessary, energy-related standards of operations.

Since the missions and operating responsibilities of Federal agencies vary widely, general operations planning consists of heterogeneous sets of agency-specific programs, projects and activities. Agency reports indicate that all major and most lesser energy-using agencies have ongoing programs to train, motivate, and educate employees, to review and revise administrative practices to make them more energy

efficient; to eliminate unnecessary travel; to purchase fuel-efficient automobiles and other equipment; to curtail unnecessary activities; and to improve operational scheduling and maintenance. While most Federal agencies have already made progress toward reducing energy use, these guidelines are expected to reinforce ongoing energy conservation efforts and to provide a more comprehensive and coordinated planning process for achieving greater reductions and efficiencies in energy use.

DOE's Office of Federal Energy Management and Planning Programs (FEMP) is responsible for coordinating the development of the Federal 10-year general operations and buildings plans. Today's final rule was developed in consultation with OMB, the "656" Committee (the Interagency Federal Energy Policy Committee, established under section 656 of the DOE Organization Act and which consists of designated Assistant Secretaries or Assistant Administrators of various agencies), and other Federal agencies who provided advice, participated in interagency meetings, and reviewed drafts of the guidelines. The Director of OMB has concurred in today's final rule.

Section 381 of the EPCA makes many of the Executive Order provisions regarding the Federal 10-year energy management plan applicable to the United States Postal Service and Executive agencies as defined by 5 U.S.C. 105. These agencies are referred to in this rule as "Federal agencies." In addition, because of the significant role of the Department of Defense (DOD) in energy management, DOD will submit separate plans and reports for the Departments of Army, Navy, and Air Force, as well as a collective plan and reports for all DOD organizations including the military departments. However, data from the military departments will be published under the heading of the Department of Defense, and all formal contact from DOE will be with DOD.

II. Technical Assistance From DOE

The development of 10-year plans and the establishment of reporting mechanisms to meet the provisions of these guidelines may require resources in excess of those currently available to some agencies. To the extent requested and possible, DOE will provide technical assistance to agencies.

III. Summary of Comments on the Proposed Rule and DOE Responses

On February 1, 1980 (45 FR 7498), DOE published proposed guidelines for agencies to follow in developing their

10-year plans for conserving energy in their general operations. DOE received nine written comments, some of which were received after the end of the comment period, and considered all of them in the development of this final rule. In addition, other minor technical revisions have been made as a result of continuing DOE analysis and dialogue with agency energy coordinators.

1. Level of Detail in Planning and Reporting.

Two commenters suggested that the guidelines are too prescriptive, require an unneeded and unjustified level of reporting and detail, and fail to give adequate consideration to existing long-term functioning energy management conservation plans and programs.

The President has repeatedly emphasized the need for wise use of energy resources, particularly by the Federal Government. Consistent with this need, the public is entitled to an accounting of energy use planning and performance by the Federal Government. To be effective, the accounting mechanism must conform to principles generally acceptable to Federal agencies, the President, the Congress, and the general public. These guidelines are intended to establish such an accounting mechanism, and if the mechanism is to be effective, it is important that all Federal agencies follow the methodology contained in the guidelines.

DOE recognizes that a burden is imposed on Federal agencies, and that some agencies may be required to modify existing methods and procedures. DOE has attempted to minimize the reporting burden while providing enough detail to support energy policy decisions. Should an agency encounter difficulty in preparing initial plans or revising them, technical assistance may be available through DOE. DOE will review the reporting requirements after agency submissions of the initial plan and subsequent annual reports to determine whether format changes may be appropriate. Should an agency be unable to comply with provisions of this rule, the agency concerned may seek a waiver.

2. Fuel Use Conversion to Btu

Two commenters disagreed about using a total cycle (source) conversion factor of 11,600 Btu/kwh for electricity and 1,380 Btu/lb for steam while on-site factors are used for other fuel types. One commentator suggested that all fuel use be calculated with an on-site factor (3412 Btu/kwh for electricity) while the other commentator suggested that all fuel use be converted using a total cycle

analysis. Since conversion to Btu's is not essential for reporting agency progress toward improved conservation and efficiency goals, and in view of the comments, DOE has changed the guidelines to require reporting in physical units of the particular fuel type; e.g., kilowatt hours, gallons, and cubic feet. This also simplifies the reporting calculations agencies must perform.

3. Different Treatment of Smaller Agencies

One commentator suggested that there ought to be different treatment for smaller agencies which might find the paperwork and administrative requirements burdensome.

DOE considered exempting smaller agencies from some provisions of the rule. DOE believes that the scope of supporting detail developed by a smaller agency will be substantially less than that developed by a larger agency. Accordingly, while the added burden of these guidelines is recognized, DOE believes that the requirements should not be unduly burdensome for smaller agencies. Moreover, the planning elements identified in these guidelines are essential for all agencies.

As stated above, DOE intends to provide additional guidance and continuing technical assistance to help agencies achieve the objectives of the guidelines. Furthermore, after the initial plans and subsequent annual reports are submitted, DOE will review the reporting requirements faced by smaller agencies to determine whether they should be changed.

4. 436.101, Definitions

One commenter expressed a preference for the words "objectives and measures" over use of the word "goals." DOE has revised the definition of "goal" to simplify and clarify its intended meaning.

One commenter suggested that the base year be changed from FY 1975 to the previous fiscal year for each report or plan because some agency programs have significantly increased since FY 1975, making it unrealistic to use FY 1975 data to compare and project energy use through FY 1990.

Although significant program increases (or decreases) could make comparisons of energy use with 1975 data misleading, DOE believes that other provisions of these guidelines will allow agencies to accurately demonstrate energy conservation planning and progress. For example, agencies are required to relate energy conservation goals to primary mission goals in the text of 10 year plans and annual reports including data on energy

use avoidance as well as energy use. In addition, information on energy efficiency is included in planning and reporting. It is anticipated that progress in improving energy efficiency should not be hampered by program increases.

Furthermore, it is necessary to establish a common starting point or anchor so that comparisons may be made among agencies and between points in time. DOE believes that FY 1975 is the appropriate base year because that is the base year established by the Executive Order and historically it has been used for comparisons in energy use.

One commenter also proposed that the definition for general operations not include the word "world-wide" since some agencies are not collecting world-wide data and to do so would impose a tremendous burden. The commenter recommended that the elements of general operations be consistent with those presently reported on the quarterly energy conservation report.

Section 436.106, Reporting Requirements, has been amended to make reporting of foreign energy consumption optional if such consumption is *estimated* to be less than 10% of the total energy consumption in the United States of that agency. Since energy consumption in foreign countries is a significant part of general operations for some agencies and is currently being reported, DOE considers it proper to retain "world-wide" in the definition for general operations.

5. 436.102, General Operations Plan Format and Content

Two commenters suggested that the requirement to provide costs and benefits for all conservation measures is unworkable since costs and budget expenditures cross several budget line items. Although DOE recognizes the difficulty and will attempt to assist agencies in this regard, estimation of cost and benefits of conservation measures is considered to be a prerequisite to adequate planning and to insure that only cost-effective measures are adopted.

One commenter noted that personnel ceilings may result in the acquisition of new energy intensive equipment to replace people, and suggested that specific budget guidelines should be provided discussing these trade off considerations. DOE believes that there is enough flexibility in the rule to allow agencies to accommodate personnel ceilings without increasing energy consumption. If an agency has particular difficulty, this fact should be noted in the issues section of the plan.

One commenter recommended striking from the rule the paragraph requiring agency internal procedures and schedules to be a part of the plan since such internal information is considered to be of little value to DOE. The paragraph has been amended to make such reporting permissive as to detail. However, DOE considers inclusion of implementing instructions to be necessary for adequate planning and plan evaluation.

Another commenter suggested that more time be given (at least nine months) for the development of the general operations plan and three commenters suggested that the due date for revisions be made July 1 rather than January 1, annually. The commenter was concerned about the administrative load caused by preparing both building and operations plans. DOE agrees that revisions to both plans should be due on the same date and has thus changed the annual revision due date to July 1. DOE does not consider it appropriate, however, to delay initial submission of the operations plan. Buildings plans should be nearing completion at this time, and the critical nature of the energy situation makes it advisable to complete operations plans as rapidly as possible.

In a comment letter, the Environmental Protection Agency (EPA) expressed concern about the environmental aspects of agencies' plans. Since each agency is responsible for complying with the National Environmental Policy Act in carrying out its responsibilities under these guidelines, DOE has concluded that no change is required in the rule. However, Appendix D has been amended to include environmental considerations as a key element in the development of energy conservation plans.

6. 436.103, Program Goal Setting

At the suggestion of two commenters, Appendix B to this subpart has been clarified to be consistent with § 436.103 by allowing agencies to use their own methods of establishing goals, so long as the agency method provides a method which can be used to measure progress in reducing energy consumption and in improving energy efficiency. This change is consistent with the Executive Order, which does not establish specific goals for the operations plan submitted to DOE by Federal agencies.

One commenter suggested that the ratio, Btu/\$ R&D budget, is not a good measure of energy efficiency, and that his agency has not yet been able to find a good measure of R&D energy efficiency. The ratios in Appendix V are only examples. The ratio, Btu/\$ R&D

budget, has been deleted. Agencies are free to choose any energy efficiency measures. DOE can assist agencies, upon request, with specific problems.

One commenter suggested that the base year be the previous fiscal year rather than FY 1975. For the reasons stated in paragraph 4, above, DOE has decided to retain FY 1975 as the base year.

EPA suggested that "unmitigated negative environmental impacts" be considered as agencies establish their general operations consumption goals. In response to this comment, DOE has added the phrase to § 436.103(c).

7. 436.104, Energy Conservation Measures and Standards

One commenter recommended elimination of this section because the level of detail is too great and an excessive accounting burden is imposed. As an integral part of effective planning, DOE considers it essential that all agencies consider proven energy saving measures. The list of questions in § 436.104 is a checklist of factors that must be considered in determining whether to include any given measure in the plan. There is no accounting requirement.

8. 436.105, Emergency Conservation Plan

In this section, the term "emergency conservation plan" has replaced "contingency plan" which was used in the proposed rule. DOE has made this change to describe better the activity involved.

One commenter expressed concern that this section was too limited. In response, § 436.105(b) has been amended to clarify that agencies can formulate additional planning scenarios as needed.

One commenter suggested that the substitution of coal-fired generation of electricity in priority over on-site natural gas should not apply because of the low total cycle efficiency of electricity.

In an energy emergency, the availability of the fuel source outweighs considerations of efficiency. DOE thus considers it appropriate to look to fuels in more plentiful supply, to include coal fired generation of electricity. For example, for the Department of Defense, a guaranteed source of supply is necessary for assured operational readiness. In the case of coal, a 120-day supply is normally stockpiled on site. On the other hand, most natural gas supply contracts with Federal agencies are interruptible. This reflects the priority for natural gas to go first to residential users. From a practical standpoint, fuel conversions are limited to those which

can be completed in a three-month period. This limitation favors the substitution of natural gas, which is more easily installed. However, when oil supplies are interrupted, it is anticipated that the natural gas production capability will be absorbed quickly by the private residential and industrial sectors.

9. 436.106, Reporting Requirements

One commentor suggested that agencies be allowed to add their own unique functional categories. Section 436.106(a)(2) has been clarified to accommodate agency-unique categories.

A comment was also made that the quarterly report required by § 436.106(c) appears to be a duplication of the current Quarterly Energy Consumption Report. DOE does not require duplicate quarterly reports. The Quarterly Energy Consumption Report format is being revised to be consistent with the information required by § 436.106(c).

One commentor suggested that an unnecessary level of detail is introduced and that the additional shred-outs requested for the plan would require an expensive and lengthy reconstruction of historical information.

Concern over the level of detail to be reported is understandable. Providing increased visibility to the President, Congress, DOE, OMB, and agency conservation managers places an increased reporting burden on all Federal agencies. DOE believes this burden is justified because:

- When energy reductions were relatively easy to achieve, reduction targets could be met with little impact on agency missions or budgets. Additional energy reductions are now more difficult to achieve, hence examination in greater detail is required for setting Federal energy policy and managing energy conservation programs.
- The level of detail established by the reporting requirements of the buildings guidelines and the general operations guidelines will provide needed information about the links between energy reduction and mission performance and resource allocation. The link between energy consumption and mission performance is shown in greater detail by the 12 functional categories for buildings and 5 functional categories for operations. (However, each agency may report as few as two categories for operations). Goal-setting and reporting for general transportation have been made mandatory because of the importance of transportation-related fuel consumption in the conservation program and because of the attention

focused on government transportation activities. Reporting energy efficiency provides information about the link between energy consumption and the magnitude of mission activity.

—Reporting energy investment programs, and more importantly, graphically displaying the relationship between investment and energy consumption and between investment and energy efficiency, gives a view of the impact of investment on energy savings.

- Total energy consumption is already being reported. For prior years, estimates using available information are permissible. For future years, agencies may allocate fuel use to the predominate function for multi-function activities, however, agencies should also establish a procedure for collecting data by functional category and fuel type.

In response to two other comments, DOE revised § 436.106(a) to indicate that annual reports will be based on fiscal year data.

10. 436.107, Review of Plan

One commentor recommended that the review process for general operations plans follow the same process as the buildings plans, and that it is not necessary to involve the "656" Committee to review major problem areas of plans not in compliance with guidelines.

DOE intends that both buildings and operations plans follow the same review process. In both cases, it is considered appropriate to involve the "656" Committee when major problem areas arise that require significant interagency actions for solution. The purpose of the "656" Committee involvement is to find solutions to major problem areas and to advise the Secretary and the President.

11. Fuel Switching

One commentor expressed concern that the goal setting methodology and reporting requirements did not provide a method for measuring shifting from the use of oil-based fuel and natural gas to fuels in more plentiful supply from domestic resources. Accordingly, the rule has been changed to require agencies to establish goals and to report progress in fuel switching.

12. Miscellaneous

Additional minor changes of a technical nature have been made as a result of continuing DOE analysis and dialogue with the "656" Committee and agency energy coordinators. Any further substantial changes in or modifications to these guidelines will be coordinated through the "656" Committee and OMB

and published, as appropriate, for review and comment.

IV. National Environmental Policy Act Review

After reviewing the proposed guidelines pursuant to DOE's responsibilities under the National Environmental Policy Act of 1969, (NEPA), as amended, 42 U.S.C. 4321 *et seq.*, DOE has determined that because these guidelines only establish procedures which agencies are to follow in developing their plans, the proposed administrative action does not constitute a major Federal action significantly affecting the quality of human environment. Therefore, no environmental impact statement (EIS) or environmental assessment is necessary to support this action.

V. Regulatory Analysis

In accordance with the provisions of Executive Order 12044, 43 FR 12601 (March 24, 1978), implementing DOE directives, and OMB circular A-116, it has been determined that neither a regulatory analysis nor an urban and community impact analysis is necessary or appropriate in connection with this rulemaking. Although today's final rule is deemed to be "significant" because of the widespread impact on Federal agencies of the Executive Branch, this rule is not considered to be "major" because it will not have the kind or degree of effect which, under Executive Order 12044, necessitates a regulatory analysis.

In consideration of the foregoing, the DOE hereby amends Chapter II Title 10, Code of Federal Regulations, by establishing Subpart F and Appendices A, B, C, and D to Part 436 as set forth below.

Issued in Washington, D.C. June 13, 1980.

Worth Bateman,
Acting Under Secretary.

PART 436—FEDERAL ENERGY MANAGEMENT AND PLANNING PROGRAMS

Subpart F—Guidelines for General Operations Plans

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- Appendix A—Energy Conservation Standards for General Operations [Reserved].
Appendix B—Goal Setting Methodology.
Appendix C—General Operations Energy Conservation Measures.
Appendix D—Energy Conservation Program Elements.

Authority: Sec. 381, Energy Policy and Conservation Act, as amended, (42 U.S.C. 6361); Executive Order 11912, as amended by Executive Order 12003, 42 FR 37523 (July 20, 1977); National Energy Conservation Policy Act, Title V, Part 3, Pub. L. 95-619, 92 Stat. 3275 (1978); sec. 644, Department of Energy Organization Act, (42 U.S.C. 7254).

Subpart F—Guidelines for General Operations Plans

§ 436.100 Purpose and scope.

(a) *Purpose.*—The purpose of this subpart is to provide guidelines for use by Federal agencies in their development of overall 10-year energy management plans to establish energy conservation goals, to reduce the rate of energy consumption, to promote the efficient use of energy, to promote switching for petroleum-based fuels and natural gas to coal and other energy sources, to provide a methodology for reporting their progress in meeting the goals of those plans, and to promote emergency energy conservation planning to assuage the impact of a sudden disruption in the supply of oil-based fuels, natural gas or electricity. The plan is intended to provide the cornerstone for a program to conserve energy in the general operations of an agency. A description of the elements necessary for a successful energy conservation program appears in Appendix D of this subpart. These elements must be reflected in the 10-year plan prescribed in § 436.102.

(b) *Scope.*—This subpart applies to all general operations of Federal agencies and is applicable to the management of all energy used by Federal agencies that is not included under the regulations in Subpart C of this part. Energy use and energy-saving actions for Federal buildings excluded from the buildings plans under Subpart C of this part, are to be included in the general operations plans under this subpart.

§ 436.101 Definitions.

As used in this subpart—

- "Automotive gasoline" means all grades of gasoline for use in internal combustion engines except aviation gasoline. Does not include diesel fuel.
"Aviation gasoline (AVGAS)" means all special grades of gasoline for use in aviation reciprocating engines.
"Btu" means British thermal unit; the quantity of heat required to raise the

temperature of one pound of water one degree Fahrenheit.

"Cogeneration" means the utilization of surplus energy, e.g., steam, heat or hot water produced as a by-product of the manufacture of some other form of energy, such as electricity. Thus, diesel generators are converted to cogeneration sets when they are equipped with boilers that make steam and hot water (usable as energy) from the heat of the exhaust and the water that cools the generator.

"Diesel and petroleum distillate fuels" means the lighter fuel oils distilled-off during the refining process. Included are heating oils, fuels, and fuel oil. The major uses of distillate fuel oils include heating, fuel for on- and off-highway diesel engines, marine diesel engines and railroad diesel fuel.

"DOE" means the Department of Energy.

"Emergency conservation plan" means a set of instructions designed to specify actions to be taken in response to a serious interruption of energy supply.

"Energy efficiency goal" means the ratio of production achieved to energy used.

"Energy use avoidance" means the amount of energy resources, e.g., gasoline, not used because of initiatives related to conservation. It is the difference between the baseline without a plan and actual consumption.

"Facility" means any structure or group of closely located structures, comprising a manufacturing plant, laboratory, office or service center, plus equipment.

"Federal agency" means any Executive agency under 5 U.S.C. 105 and the United States Postal Service, each entity specified in 5 U.S.C. 5721(1)(B) through (H) and, except that for purposes of this subpart, the Department of Defense shall be separated into four reporting organizations: the Departments of the Army, Navy and Air Force and the collective DOD agencies, with each responsible for complying with the requirements of this subpart.

"Fiscal year or FY" means, for a given year, October 1 of the prior year through September 30 of the given year.

"Fuel types" means purchased electricity, fuel oil, natural gas, liquefied petroleum gas, coal, purchased steam, automotive gasoline, diesel and petroleum distillate fuels, aviation gasoline, jet fuel, Navy special, and other identified fuels.

"General operations" means worldwide Federal agency operations, other than building operations, and includes services; production and industrial activities; operation of aircraft, ships,

and land vehicles; and operation of Government-owned, contractor-operated plants.

"General transportation" means the use of vehicles for over-the-road driving as opposed to vehicles designed for off-road conditions, and the use of aircraft and vessels. This category does not include special purpose vehicles such as combat aircraft, construction equipment or mail delivery vehicles.

"Goal" means a specific statement of an intended energy conservation result which will occur within a prescribed time period. The intended result must be time-phased and must reflect expected energy use assuming planned conservation programs are implemented.

"Guidelines" means a set of instructions designed to prescribe, direct and regulate a course of action.

"Industrial or production" means the operation of facilities including buildings and plants which normally use large amounts of capital equipment, e.g., COCO plants, to produce goods (hardware).

"Jet fuel" means fuels for use, generally in aircraft turbine engines.

"Life cycle cost" means the total cost of acquiring, operating and maintaining equipment over its economic life, including its fuel costs, determined on the basis of a systematic evaluation and comparison of alternative investments in programs, as defined in Subpart A of this part.

"Liquefied petroleum gas" means propane, propylene-butanes, butylene, propane-butane mixtures, and isobutane that are produced at a refinery, a natural gas processing plant, or a field facility.

"Maintenance" means activities undertaken to assure that equipment and energy-using systems operate effectively and efficiently.

"Measures" means actions, procedures, devices or other means for effecting energy efficient changes in general operations which can be applied by Federal agencies.

"Measure of performance" means a scale against which the fulfillment of a requirement can be measured.

"Navy special" means a heavy fuel oil that is similar to ASTM grade No. 6 oil or Bunker C oil. It is used to power U.S. Navy ships.

"Non-renewable energy source" means fuel oil, natural gas, liquefied petroleum gas, synthetic fuels, and purchased steam or electricity, or other such energy sources.

"Operational training and readiness" means those activities which are necessary to establish or maintain an agency's capability to perform its primary mission. Included are major activities to provide essential personnel

strengths, skills, equipment/supply inventory and equipment condition. General administrative and housekeeping activities are not included.

"Overall plan" means the comprehensive agency plan for conserving fuel and energy in all operations, to include both the Buildings Plan developed pursuant to Subpart C of this part and the General Operations Plan.

"Plan" means those actions which an agency envisions it must undertake to assure attainment of energy consumption and efficiency goals without an unacceptably adverse impact on primary missions.

"Program" means the organized set of activities and allocation of resources directed toward a common purpose, objective, or goal undertaken or proposed by an agency in order to carry out the responsibilities assigned to it.

"Renewable energy sources" means sunlight, wind, geothermal, biomass, solid wastes, or other such sources of energy.

"Secretary" means the Secretary of the Department of Energy.

"Services" means the provision of administrative assistance or something of benefit to the public.

"Specific Functional Category" means those Federal agency activities which consume energy, or which are directly linked to energy consuming activities and which fall into one of the following groups: Services, General Transportation, Industrial or Production, Operational Training and Readiness, and Others.

"Standard" means an energy conservation measure determined by DOE to be applicable to a particular agency or agencies. Once established as a standard, any variance or decision not to adopt the measure requires a waiver.

"Under Secretary" means the Under Secretary of the Department of Energy.

"Variance" means the difference between actual consumption and goal.

"656 Committee" means the Interagency Federal Energy Policy Committee, the group designated in Section 656 of the DOE Organization Act to provide general oversight for interdepartmental FEMP matters. It is chaired by the Under Secretary of DOE and includes the designated Assistant Secretaries or Assistant Administrators of the Department of Defense,

Commerce, Housing and Urban Development, Transportation, Agriculture, Interior and the U.S. Postal Service and General Services Administration, along with similar level representatives of the National Aeronautics and Space Administration and the Veterans Administration.

§ 436.102 General operations plan format and content.

(a) Each Federal agency shall prepare and submit to the Under Secretary, DOE, within six months from the effective date of these guidelines, a general operations 10-year plan which shall consist of two parts, an executive summary and a text. Subsequent agency revisions to plans shall be included in each agency's annual report on progress which shall be forwarded to DOE by July 1 annually.

(b) The following information shall be included in each Federal agency general operations 10-year plan for the period of fiscal years 1980-1990:

- ✓ (1) An Executive Summary which includes--
 - ✓ (i) A brief description of agency missions, and applicable functional categories pursuant to § 436.106(a)(2);
 - ✓ (ii) A Goals and Objectives Section which summarizes what energy savings or avoidance will be achieved during the plan period, and what actions will be taken to achieve those savings, and the costs and benefits of measures planned for reducing energy consumption, increasing energy efficiencies, and shifting to a more favorable fuel mix. Assumptions of environmental, safety and health effects of the goals should be included;
 - (iii) A chart depicting the agency organizational structure for energy management, showing energy management program organization for headquarters and for major subordinate elements of the agency;
 - (iv) A schedule for completion of requirements directed in this subpart, including phase-out of any procedures made obsolete by these guidelines; and
 - (v) Identification of any significant problem which may impede the agency from meeting its energy management goals.
- ✓ (2) A Text which includes--
 - (i) A Goals and Objectives Section developed pursuant to § 436.103 describing agency conservation goals; these goals will be related to primary mission goals;
 - (ii) An Investment Section describing the agency planned investment program by fiscal year, pursuant to Appendix B of this subpart, all measures selected pursuant to § 436.104, and the estimated costs and benefits of the measures planned for reducing energy consumption and increasing energy efficiencies;
 - (iii) An Organization Section which includes: (A) Designation of the principal energy conservation officer, such as an Assistant Secretary or Assistant Administrator, who is responsible for supervising the

preparation, updating and execution of the Plan, for planning and implementation of agency energy conservation programs, and for coordination with DOE with respect to energy matters; (B) designation of a middle-level staff member as a point of contact to interface with the DOE Federal Programs Office at the staff level; and (C) designation of key staff members within the agency who are responsible for technical inputs to the plan or monitoring progress toward meeting the goals of the plan;

(iv) An Issues Section addressing problems, alternative courses of action for resolution, and agency recommendations that justify any decisions not to plan for or implement measures contained in Appendix C of this subpart, and identifying any special projects, programs, or administrative procedures which may be beneficial to other Federal agency energy management programs;

(v) An implementing instructions Section which includes a summary of implementing instructions issued by agency headquarters, and attachments of appropriate documents such as:

- (A) Specific tasking resulting from development of the Plan;
- (B) Guidance for the development of emergency conservation plans;
- (C) Task milestones;
- (D) Listing of responsible sub-agencies and individuals at both agency headquarters and subordinate units;
- (E) Reporting and administrative procedures for headquarters and subordinate organizations;
- (F) Report schedules pursuant to § 436.106(c);
- (G) Schedules for feedback in order to facilitate plan updating, to include reviews of emergency conservation plans developed pursuant to § 436.105;
- (H) Schedules for preparing and submitting the annual report on energy management pursuant to § 436.106(a);
- (I) Schedules of plan preparation and publication;
- (J) Communication, implementation, and control measures such as inspections, audits, and others; and
- (K) An Emergency Conservation Plan Summary Section pursuant to the requirements of § 436.105(c).

(3) Appendices which are needed to discuss and evaluate any innovative energy conserving technologies or methods, not included in this Part, which the agency has identified for inclusion in its plan.

(c) Each plan must be approved and signed by the principal energy conservation officer designated pursuant to paragraph (b)(2) of this section.

§ 436.103 Program goal setting.

(a) In developing and revising plans for a projected 10-year plan each agency shall establish and maintain energy conservation goals in accordance with the requirements of this section.

(b) Agencies shall establish three types of conservation goals:

(1) Energy consumption goals, by fuel type by functional category (see Appendix B).

(2) Energy efficiency goals by fuel type by functional category (see Appendix B).

(3) Fuel switching goals for shifting energy use from oil and natural gas to other fuels in more plentiful supply from domestic sources (see Appendix B).

(c) General operations energy conservation goals shall be established by each Federal agency with the broad purpose of achieving reductions in total energy consumption and increased efficiency without serious mission degradation or unmitigated negative environmental impacts. Within the broad framework, each agency should seek first to reduce energy consumption per unit of output in each applicable functional category. In evaluating energy efficiency, each agency should select and use standards of measurement which are consistent throughout the planning period. Particular attention should be given to increased energy use efficiency in nonrenewable fuel consumption. The second focus of attention should be on initiatives which shift energy use from oil and natural gas to other fuels in more plentiful supply from domestic sources.

§ 436.104 Energy conservation measures and standards.

(a) Each agency shall consider for inclusion in its plan the measures identified in appendix C of this subpart.

(b) The following questions should be considered in the evaluation of each measure:

(1) Does this measure provide an incentive or disincentive?

(2) What is the estimate of savings by fuel type?

(3) What are the direct and indirect impacts of this measure?

(4) Is this measure to be mandatory throughout the agency?

(5) If not mandatory, under what circumstances will it be implemented, and who will be responsible for determining specific applicability?

(6) Who will be the direct participants in the implementation of this measure?

(7) What incentives (if any) are to be provided for the participants?

(8) When will this measure be implemented?

(9) Will this measure be implemented in a single step or will it be phased in? If it will be phased in, over what period of time?

(10) Will performance of the measure be evaluated and reported?

(11) By what criterion will performance be determined?

(12) Who will prepare performance reports?

(13) What is the reporting chain?

(14) What is the reporting period?

(c) Each agency will take all necessary steps to implement the energy conservation standards for general operations listed in appendix A (reserved).

§ 436.105 Emergency conservation plan.

(a) Each agency shall establish an emergency conservation plan, a summary of which shall be included in the general operations plan, for assuaging the impact of a sudden disruption in the supply of oil-based fuels, natural gas or electricity. Priorities for temporarily reducing missions, production, services, and other programmatic or functional activities shall be developed in accordance with paragraph (b) of this section. Planning for emergencies is to address both buildings and general operations. Provisions shall be made for testing emergency actions to ascertain that they are effective.

(b) Federal agencies shall prepare emergency conservation plans for 10 percent, fifteen percent, and 20 percent reduction compared to the previous fiscal year in gasoline, other oil-based fuels, natural gas, or electricity for periods of up to 12 months. In developing these plans, agencies shall consider the potential for emergency reductions in energy use in buildings and facilities which the agency owns, leases, or has under contract and by employees through increased use of car and van pooling, preferential parking for multipassenger vehicles, and greater use of mass transit. Agencies may formulate whatever additional scenarios they consider necessary to plan for various energy emergencies.

(c) In general, Federal agencies' priorities shall go to those activities which directly support the agencies' primary missions. Secondary mission activities which must be curtailed or deferred will be reported to DOE as mission impacts. The description of mission impacts shall include estimates of the associated resources and time required to mitigate the effects of the reduction in energy. Other factors or assumptions to be used in energy conservation emergency planning are as follows:

(1) Agencies will be given 15-30 days notice to implement any given plan.

(2) Substitution of fuels in plentiful supply for fuels in short supply is authorized, if the substitution can be completed within a 3-month period and the cost is within the approval authority of the executive branch.

(3) All costs and increases in manpower or other resources associated with activities or projects to assuage mission impacts will be clearly defined in respective agency plans. One-time costs will be identified separately.

(4) Confronting the emergency situation will be considered a priority effort and all projects and increases in operating budgets within the approval authority of the executive branch will be expeditiously considered and approved if justified.

(d) Summary plans for agency-wide emergency conservation management shall be provided to DOE pursuant to § 436.102(b)(2)(vi). Such summaries shall include:

(1) Agency-wide impacts of energy reductions as determined in accordance with paragraph (b) of this section.

(2) Actions to be taken agency-wide to alleviate the energy shortfalls as they occur.

(3) An assessment of agency services or production that may need to be curtailed or limited after corrective actions have been taken.

(4) A summation of control and feedback mechanisms for managing an energy emergency situation.

§ 436.106 Reporting requirements.

(a) By July 1 of each year each Federal agency shall submit an "Annual Report on Energy Management" based on fiscal year data to the Secretary of DOE. The general operations portion of this report will encompass all agency energy use not reported in the buildings portion and shall include:

(1) A summary evaluation of progress toward the achievement of energy consumption, energy efficiency, and fuel switching goals established by the agency in its plans;

(2) Energy consumption reported by functional categories. Reports must include General Transportation and one or more of the following functional categories: industrial or production, services, operational training and readiness, and other. Agencies may report in subcategories of their own choosing. The following information is to be reported for the usage of each fuel type in physical units for each selected functional category:

- (i) Total energy consumption goal,
- (ii) Total energy consumed,
- (iii) Total energy use avoidance;

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(iv) Variance between actual consumption and consumption goal;
(v) Cost saved;
(vi) Status of planned investments, and if different from the investment program upon which existing goals are based, the expected impact on meeting goals; and
(vii) Summary of any other benefits realized.

(3) The energy efficiencies as calculated in accordance with appendix B of this subpart, or by an equivalent method, for the appropriate functional categories identified in paragraph (a)(2) of this section. The following information is to be reported for the energy efficiency for each fuel type by functional category:

(i) Energy efficiency goal;
(ii) Efficiency for the reporting period;
(iii) Summary of any other benefits realized.

(4) A summary of fuel switching progress including:

(i) Description and cost of investments in fuel switching;
(ii) Avoidance in use of oil-based fuels and natural gas;
(iii) Increased use of solar, wood, gasoline and other renewable energy sources;
(iv) Increased use of coal and coal derivatives, and
(v) Use of all other alternative fuels.

(b) Each agency's annual report shall be developed in accordance with a format to be provided by DOE and will include agency revisions to 10-year plans.

(c) Agencies whose annual total energy consumption exceeds one hundred billion Btu's, shall, in addition to the annual report required under paragraph (a) of this section, submit quarterly reports of the energy usage information specified in paragraph (a)(2) of this section.

(d) Agencies who consume energy in operations in foreign countries will include data on foreign operations if foreign consumption is greater than 10% of that consumed by the agency in the United States, its territories and possessions. If an agency's estimated foreign consumption is less than 10% of its total domestic energy use, reporting of foreign consumption is optional. Reports should be annotated if foreign consumption is not included.

§ 436.107 Review of plan.

(a) Each plan or revision of a plan shall be submitted to DOE and DOE will evaluate the sufficiency of the plan in accordance with the requirements of this subpart. Written notification of the adequacy of the plan including a

critique, will be made by DOE and sent to the agency submitting the plan or revision within 60 days of submission. Agencies shall be afforded an opportunity to modify and return the plan within an appropriate period of time for review by DOE.

(b) A general operations plan under the guidelines will be evaluated with respect to:

(1) Adequacy of information or plan content required to be included by § 436.103;

(2) Adequacy of goal setting methodology or baseline justification as stated in § 436.103;

(3) Adequacy of a well justified investment program which considers all measures included in Appendix C of this subpart; and

(4) Other factors as appropriate.

(c) After reviewing agency plans or revisions of plans, the Under Secretary of DOE, may submit to the "656" Committee for its recommendation, major problem areas or common deficiencies.

(d) Status of the plan review, the Under Secretary's decisions, and "656" Committee recommendations, will be published as appropriate in the DOE annual report to the President, titled "Energy Management in the Federal Government."

§ 436.108 Waivers.

(a) Any Federal agency may submit a written request to the Under Secretary for a waiver from the procedures and requirements of this subpart. The request for a waiver must identify the specific requirements and procedures of this subpart from which a waiver is sought and provide a detailed explanation, including appropriate information or documentation, as to why a waiver should be granted.

(b) A request for a waiver under this section must be submitted at least 60 days prior to the due date for the required submission.

(c) A written response to a request for a waiver will be issued by the Under Secretary no later than 30 days from receipt of the request. Such a response will either (1) grant the request with any conditions determined to be necessary to further the purposes of this subpart, (2) deny the request based on a determination that the reasons given in the request for a waiver do not establish a need that takes precedence over the furtherance of the purposes of this subpart, or (3) deny the request based on the failure to submit adequate information upon which to grant a waiver.

(d) A requested waiver may be

submitted by the Under Secretary to the "656" Committee for its review and recommendation. The agency official that submitted the request may attend any scheduled meeting of the "656" Committee at which the request is planned to be discussed. The determination to approve or disapprove a request for a waiver shall be made by the Under Secretary.

(e) Status of the requests for a waiver, the Under Secretary's decisions, and "656" Committee recommendations, will be published, as appropriate, in the DOE annual report to the President, entitled "Energy Management in the Federal Government."

Appendix A—Energy Conservation Standards for General Operations [Reserved]

Appendix B—Goal Setting Methodology

In establishing and updating agency goals for energy conservation, the following methodology or an equivalent method should be utilized:

(a) For overall energy consumption—

(1) An analysis shall be made to determine what factors have the most significant impact upon the amount of each fuel type used by the agency in performing functions in support of its overall mission. Consideration is to be given, but not limited to, the following factors: Number of people using energy; number of vehicles using gasoline; amounts of other equipment using energy; tempo of operations (one, two, or three shifts); the type of operations (degree of equipment or labor intensity); equipment fuel limitations; environmental conditions (tropical versus arctic, etc.); budget levels for fuel, operations, maintenance, and equipment acquisition; and phase-out schedule (of older equipment or plants which may be inefficient). After identifying these factors, a further analysis shall be made to identify any projected workload changes in the quality or quantity of these factors on a yearly basis up to 1990.

(2) Based upon the analysis in (a)(1) and an evaluation of available information on past energy usage, a baseline of energy use by fuel type by functional category shall be established beginning with FY 1975. In addition to "General Transportation," other functional categories should be selected to enhance energy management. Total fuel use for a particular activity may be allocated to the functional category for which the preponderance of fuel is used. Figure B-1 is an example of one such baseline.

GENERAL OPERATIONS - TRANSPORTATION,
 DIESEL FUEL CONSUMED

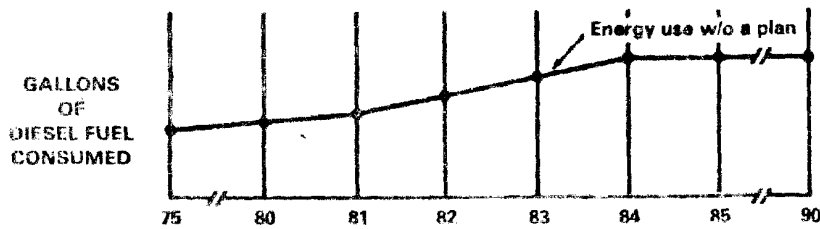


FIGURE B-1: GENERAL OPERATIONS - TRANSPORTATION,
 DIESEL FUEL CONSUMED

This example shows an increase in energy use, for a specific fuel type, during the period 1975-1981, with a further increase from 1981 to 1984 and a leveling off and no growth from 1984-1990. A justification, based on factors as discussed above, shall accompany each baseline.

(3) Thereafter, analyses should be made of the measures available for reducing the energy consumption profiles without adverse impact on mission accomplishment. Finding viable opportunities for reducing energy use, increasing energy efficiency and switching energy sources, will require consultation with specialists in the fields of operations, maintenance, engineering, design, and economics, and consideration of the measures identified in Appendix C. The DOE Federal Energy Management Programs Office can, upon

request, provide information on where such resources can be located. Once these measures are identified, they are to be incorporated into a time-phased investment program, (using where appropriate, the life cycle costing factors and methodology in subpart A of this part). If investment and other costs for implementing a measure are insignificant, a Federal agency may presume that a measure is cost-effective without further analysis. An estimate must then be made as to the lead time required to implement the program and realize energy reductions.

Figure B-2 shows a summarized investment program, which should be accompanied by a detailed description of the measures, projects, and programs making up the total planned investments for each year. This summary need not be by function or fuel type.

ENERGY INVESTMENT PROGRAM

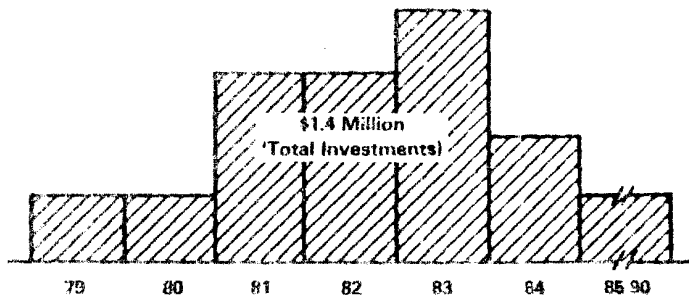


FIGURE B-2: ENERGY INVESTMENT PROGRAM

These analyses should enable the agency to project an energy consumption goal, with the assumption that funds for executing the planned projects will be approved. Figure B-3 shows a new energy use profile, with planned initiatives and related

investments taken into consideration, and the resulting goal entitled "Energy Use With A Plan" superimposed on Figure B-1. Included are the anticipated effects on consumption cause by improvements in energy efficiency and fuel switching.

GENERAL OPERATIONS - TRANSPORTATION,
 DIESEL FUEL CONSUMED

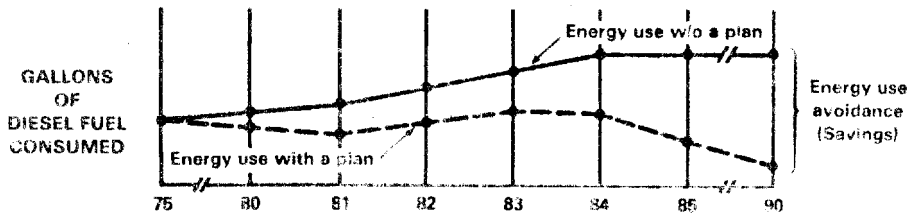


FIGURE B-3: GENERAL OPERATIONS - TRANSPORTATION,
 DIESEL FUEL CONSUMED

A comparison of these projections will show the energy use avoidance resulting from the investment program as depicted in Figure B-2. Using the prices of fuel contained in Appendix C to subpart A, the dollars saved can be projected against the dollars invested. Life cycle costing methodology pursuant to subpart A, will be used to determine priorities for submitting individual initiatives into the appropriate budget year.

(b) For energy efficiencies—Energy efficiency baselines and goals for each fuel type shall be calculated using the same consumption factors and similar methodology to that outlined in paragraph (a). Energy consumption by fuel type shall be linked to mission through the functional categories listed in § 436.106(a)(2). This will identify a rate which will indicate energy efficiency trends. This linkage may be accomplished through the following algorithm:

Step 1: Determine functional categories from section 436.106(a)(2) which best describe the Agency overall mission.

Step 2: Determine types of fuels used to support the functions selected in Step 1.

Step 3: Determine quantities of fuel consumed or planned for consumption over a specific period of time.

Step 4: Determine quantity of output of function for same period of time used in Step 3. Quantify output in a standard measure which best describes functional category.

Step 5: Determine the energy efficiency ratio by dividing quantity from Step 4 by quantity from Step 3

This ratio of fuel consumed to a unit measure of output will be used to develop a projection of a baseline and goals through 1990, and used in reporting variance. Examples of ratios that should be considered are:

- Production or industrial process type operations

$$\frac{\text{Ton of product}}{\text{Cu. ft. of natural gas}}$$

- Services, such as postal delivery

$$\frac{\text{Customers served or pounds delivered}}{\text{Gallons of automotive gasoline}}$$

- General Transportation

$$\frac{\text{Passenger Miles}}{\text{Gallons of automotive gasoline}}$$

- Training

$$\frac{\text{Persons trained or in training}}{\text{Gallons of navy special}}$$

Agencies shall select one or more of these ratios, which shall be used throughout the planning period, or use more appropriate energy efficiency ratios, to describe their overall functions. Figure B-4 illustrates the planning baseline and goal resulting from this type of analysis.

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GENERAL OPERATIONS
(Energy Efficiency Trend)

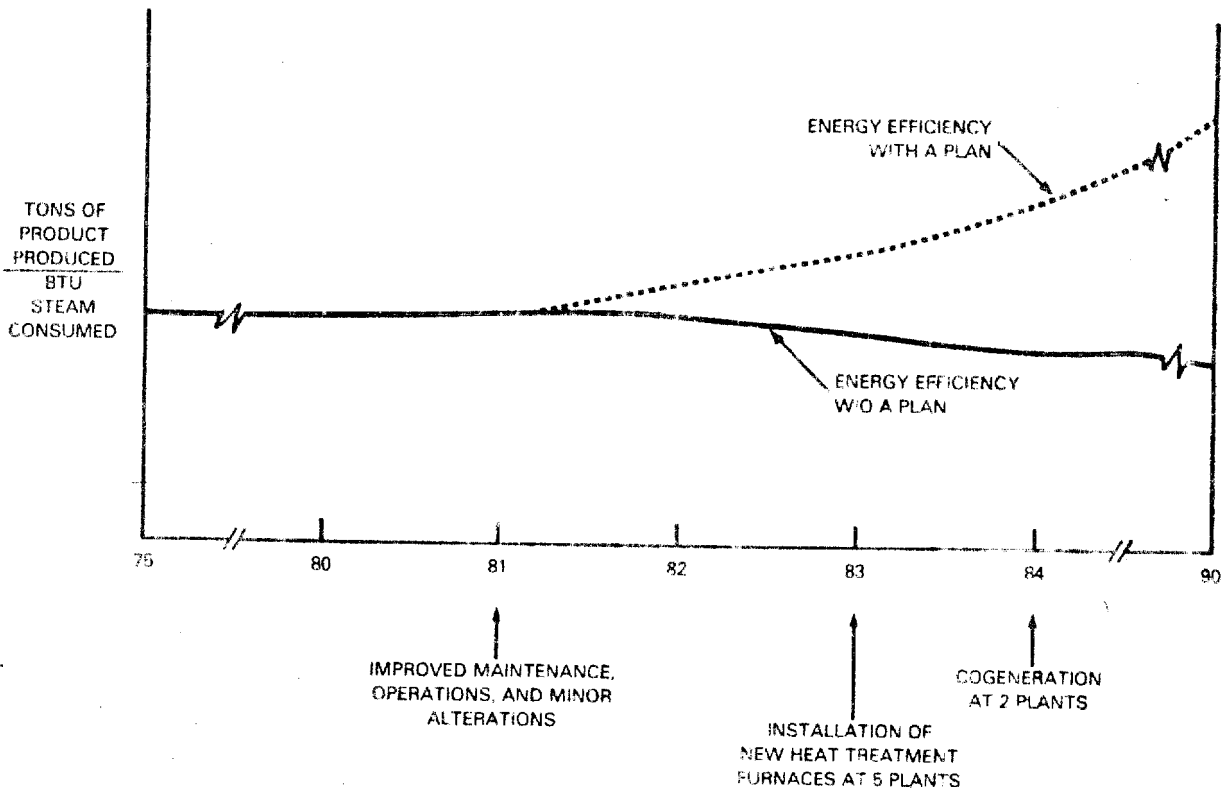
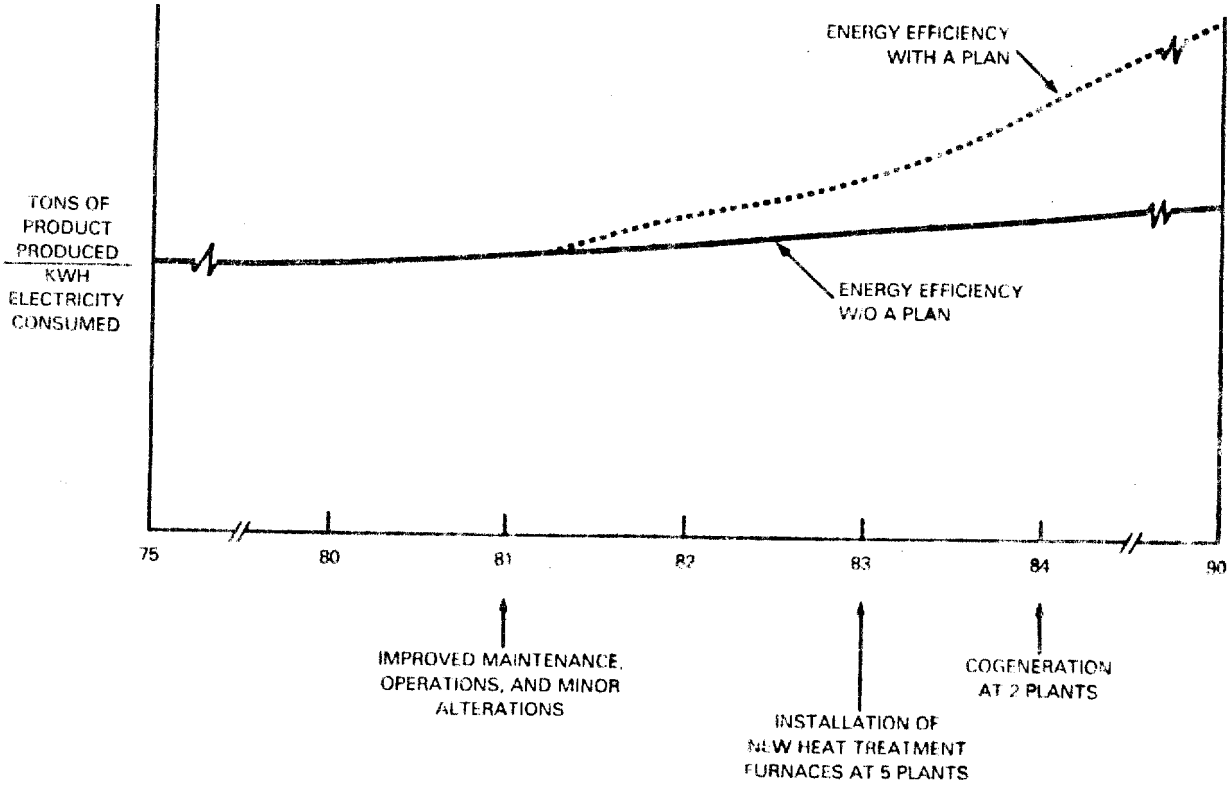


FIGURE B-4: GENERAL OPERATIONS, ELECTRICITY, STEAM CONSUMED.

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(c) For fuel switching—Fuel switching goals for gasoline other oil-based fuel and natural gas may be calculated as follows:

Step 1: For each fiscal year, identify investments, where appropriate, in fuel switching from gasoline, other oil-based fuel and natural gas to alternate renewable or nonrenewable fuel

sources.

Step 2: Project for each fiscal year, the avoidance in the use of gasoline, other oil-based fuel and natural gas resulting from previous fuel switching investments.

Completion of these steps will permit the formulation of charts such as that shown in Figure B-5.

OTHER OIL-BASED FUELS
(Thousands of barrels)

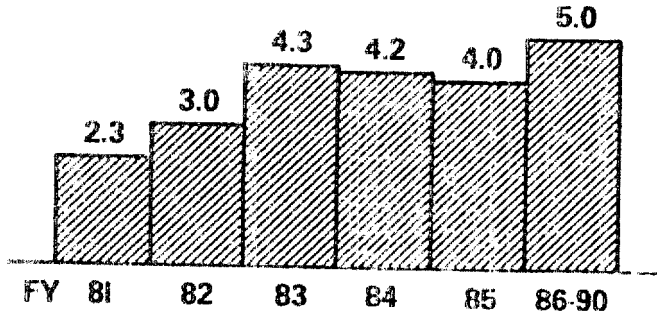


FIGURE B-5
FUEL SWITCHING GOALS

Appendix C—General Operations
Energy Conservation Measures

(a) The following individual measures or set of measures must be considered for inclusion in each agency 10-year energy management plan:

(1) **Federal Employee Ridesharing Programs**—Includes the use of vanpooling and carpooling and complies with existing orders and regulations governing parking for vanpools and carpools.

(2) **Fleet Profile Change**—Includes energy considerations in equipment selection and assignment.

(3) **Fleet Mileage Efficiency**—Includes agency plans to implement existing orders, goals, and laws related to vehicle fuel economy.

(4) **Driver Training**—Includes development of appropriate programs for training operators of U.S. Government vehicles in energy conservation.

(5) **Maintenance Procedures Improvement**—Includes activities to insure proper vehicle maintenance to optimize energy conservation.

(6) **Operating Procedures Improvement**—Includes use of cooperative passenger shuttle and courier services on an interagency or other basis within each metropolitan area.

(7) **Mass Transit**—Includes employee use of existing services for business-related activities and commuting.

(8) **Public Education to Promote Vanpooling and Carpooling**—Includes

activities to support the EPCA requirement to establish "responsible public education programs to promote vanpooling and carpooling arrangements" through their employee awareness programs.

(9) **Elimination of Free or Subsidized Employee Parking**—Includes elimination of free or subsidized employee parking on Federal installations in accordance with OMB Cir. A-118, August 13, 1979.

(10) **Two-Wheeled Vehicle Programs**—Includes activities to encourage the substitution of bicycles, mopeds, etc. for automobiles for commuting and operational purposes. These may include the establishment of weather-protected secure storage facilities, shower and locker facilities, and restricted routes for these vehicles on Federal property. Cooperative programs with local civil authorities may also be included.

(11) **Consolidation of Facilities and Process Activities**—Includes such measures as physical consolidation of operations to minimize intra-operational travel and may include facility closure or conversion. Alternative work patterns, availability of transportation, energy source availability, and technical and financial feasibility are among the considerations that should be evaluated.

(12) **Agency Procurement Programs**—Includes activities to ensure that energy conservation opportunities are fully exploited with respect to the agency's procurement programs including procurements relating to operations and maintenance activities; e.g., (a) giving

preference to fuel-efficient products whenever practicable, and (b) ensuring that agency's contractors having a preponderance of cost-type contracts pursue a comprehensive energy conservation program.

(13) **Energy Conservation Awareness Programs**—Includes programs aimed toward gaining and perpetuating employee awareness and participation in energy conservation measures on the job and in their personal activities.

(14) **Communication**—Includes substitution of communications for physical travel.

(15) **Dress Code**—Includes measures to allow employees greater freedom in their choice of wearing apparel to promote greater participation in conservation.

(16) **Land Use**—Includes energy considerations to be employed in new site selection, such as colocation.

(17) **Automatic Data Processing (ADP)**—Includes all energy aspects of ADP operation and equipment selection.

(18) **Aircraft Operations**—Includes energy-conserving measures developed for both military and Federal administrative and research and development aircraft operations.

(19) **GOCO Facilities and Industrial Plants Operated by Federal Employees**—Includes development of energy conservation plans at these facilities and plants which contain measures such as energy efficient periodic maintenance.

(20) **Energy Conserving Capital Plant and Equipment Modification**—Includes development of energy conservation and life cycle cost parameter measures for replacement of capital plant and equipment.

(21) **Process Improvements**—Includes measures to improve energy conservation in industrial process operations. These may include consideration of equipment replacement or modification, as well as scheduling and other operational changes.

(22) **Improved Steam Maintenance and Management**—Includes measures to improve energy efficiency of steam systems. These may include improved maintenance, installation of energy-conserving devices, and the operational use of substitutes for live steam where feasible.

(23) **Improvements in Waste Heat Recovery**—Includes measures utilizing waste heat for other purposes.

(24) **Improvement in Boiler Operations**—Includes energy-conserving retrofit measures for boiler operations.

(25) **Improved Insulation**—Includes measures addressing the addition or replacement of insulation on pipes, storage tanks, and in other appropriate areas.

(26) Scheduling by Major Electric Power Users—Includes measures to shift major electrical power demands to non-peak hours, to the maximum extent possible.

(27) Alternative Fuels—Includes measures to alter equipment such as generators to use lower quality fuels and to fill new requirements with those that use alternative fuels. The use of gasohol in stationary gasoline-powered equipment should be considered, in particular.

(28) Cogeneration—Includes measures to make full use of cogeneration in preference to single-power generation.

(29) Mobility Training and Operational Readiness—Includes measures which can reduce energy demands through the use of simulators, communications, computers for planning, etc.

(30) Energy Conservation Inspection or Instruction Teams—Includes measures which formulate and perpetuate the review of energy conservation through inspections to determine where specific improvements can be made and then followed by an instruction and training program.

(31) Intra-agency and Interagency Information Exchange Program—Includes measures providing a free exchange of energy conservation ideas and experiences between elements of an agency and between other agencies in the same geographic area.

(32) Recycled Waste—Includes measures to recycle waste materials such as paper products, glass, aluminum, concrete and brick, garbage, asphalt road materials or any material which requires a petroleum base.

(33) Fuel Conversion—Includes measures to accomplish conversion from petroleum based fuels and natural gas to coal and other alternative fuels for appropriate equipment.

(34) Operational Lighting—Includes measures to reduce energy consumption for lighting in operational areas and GOCO plants by: switching off by means of automatic controls; maximizing the use of daylight by floor planning; keeping window and light fixtures clean and replacing fixtures when they begin to deteriorate, rather than when they fail altogether; providing automatic dimmer controls to reduce lighting when daylight increases; and cleaning the work area during daylight, if possible, rather than at night.

(35) Lighting Fixtures—Includes measures to increase energy efficiency of lighting. The following reveals the

relative efficiencies of common lamp types.

Lamp type	Lumens/ watt	Improvement over tungsten
Tungsten lamp	12	X1
Modern fluorescent lamp	85	X7
Mercury halide lamp	100	X8
High pressure sodium lamp	110	X9
Low pressure sodium lamp	180	X15

(36) Industrial Buildings Heating—Includes measures to improve the energy conservation of industrial buildings such as: fixing holes in roofs, walls and windows; fitting flexible doors, fitting controls to heating systems; use of "economizer units" which circulate hot air back down from roof level to ground level; use of controlled ventilation; insulation of walls and roof; use of "optimisers" or optimum start controls in heating systems, so that the heating switch-on is dictated by actual temperature conditions rather than simply by time.

(37) Hull Cleaning and Antifouling Coating—Includes measures to reduce energy consumption through periodic cleaning of hulls and propellers or through the use of antifouling coatings.

(39) Building Temperature Restrictions on Thermostat Setting for Heating, Cooling and Hot Water—Includes enforcement of suggested restriction levels: 65 degrees for heating, 78 degrees for cooling, and 105 degrees or ban for hot water.

(40) Such other measures as DOE may from time-to-time add to this appendix, or as the Federal agency concerned may find to be energy-saving or efficient.

Appendix D—Energy Program Conservation Elements

(a) In all successful energy conservation programs, certain key elements need to be present. The elements listed below must be incorporated into each agency conservation program and must be reflected in the 10-year plan prescribed in § 436.102. Those organizations that have already developed programs should review them to determine whether the present management systems incorporate these elements.

(1) *Top Management Control.* Top management must have a personal and sustained commitment to the program, provide active direction and motivation, and require regular review of overall energy usage at senior staff meetings.

(2) *Line Management Accountability.* Line managers must be accountable for the energy conservation performance of their organizations and should participate in establishing realistic goals

and developing strategies and budgets to meet these goals.

(3) *Formal Planning.* An overall 10-year plan for the period 1980-1990 must be developed and formalized which sets forth performance-oriented conservation goals, including the categorized reduction in rates of energy consumption that the program is expected to realize. The plan will be supplemented by guidelines enumerating specific conservation procedures that will be followed. These procedures and initiatives must be life cycle cost-effective as well as energy efficient.

(4) *Goals.* Goals must be established in a measurable manner to answer questions of "Where are we?" "Where do we want to go?" "Are we getting there?" and "Are our initiatives for getting there life cycle cost-effective?"

(5) *Monitoring.* Progress must be reviewed periodically both at the agency headquarters and at local facility levels to identify program weakness or additional areas for conservation actions. Progress toward achievement of goals should be assessed, and explanations should be required for non-achievement or unusual variations in energy use. Monitoring should include personal inspections and staff visits, management information reporting and audits.

(6) *Using Technical Expertise.* Personnel with adequate technical background and knowledge of programmatic objectives should be used to help management set technical goals and parameters for efficient planning and implementation of energy conservation programs. These technicians should work in conjunction with the line managers who are accountable for both mission accomplishment and energy conservation.

(7) *Employee Awareness.* Employees must gain an awareness of energy conservation through formal training and employee information programs. They should be invited to participate in the process of developing an energy conservation program, and to submit definitive suggestions for conservation of energy.

(8) *Energy Emergency Planning.* Every energy management plan must provide for programs to respond to contingencies that may occur at the local, state or National level. Programs must be developed for potential energy emergency situations calling for reductions of 10 percent, 15 percent and 20 percent for up to 12 months. Emergency plans must be tested to ascertain their effectiveness.

(9) *Budgetary and Fiscal Support.* Resources necessary for the energy

conservation program must be planned and provided for, and the fiscal systems adjusted to support energy management investments and information reporting.

(10) *Environmental Considerations.*

Each agency shall fulfill its obligations under the National Environmental Policy Act in developing its plan.

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