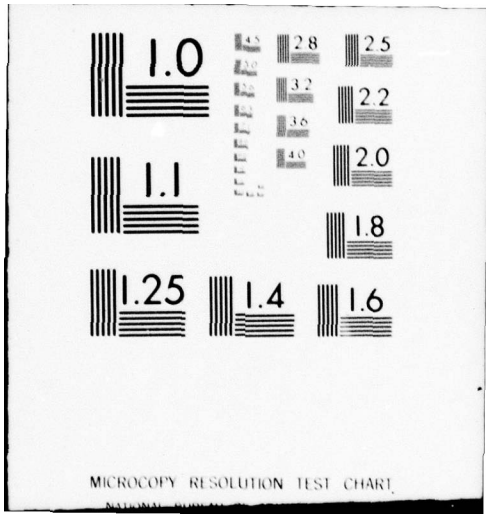
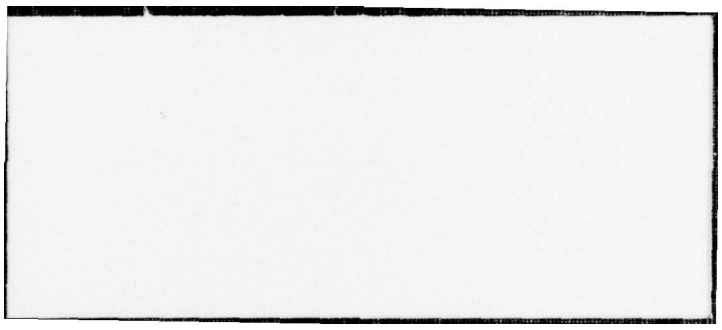
AD-A057 986 UNIFIED INDUSTRIES INC ALEXANDRIA VA F/G 5/1
ARMY ENERGY MANAGEMENT STUDY.(U)
MAY 77 MDA903-76-C-0392
UNCLASSIFIED NL

1 OF 2
AD
A057 986


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
MICROCOPY RESOLUTION TEST CHART



AD A057986
AD No.
DDC FILE COPY

LEVEL II

ARMY ENERGY MANAGEMENT STUDY

Contract Number: MDA903-76-C-0392
Contract Expiration Date: 31 May 1977
Project Director: Mr. Mitchell J. Hazam
Telephone Number: (703) 751-2200

DDC
RECEIVED
AUG 22 1978
A

Prepared for

Army Energy Office
Directorate of Transportation, Energy, and Troop Support
Room 1D570, The Pentagon

134p.

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

Letter on file

Prepared by

Unified Industries, Incorporated
205 South Whiting Street, Suite 201
Alexandria, Virginia 22304

409 808

31 May 1977

ORIGINAL CONTAINS COLOR PLATES: ALL DDC REPRODUCTIONS WILL BE IN BLACK AND WHITE.

LB

MANAGEMENT BRIEF

This report reflects a management study designed to develop the optimum energy management organization for the Department of the Army (DA).

The study was performed by Unified Industries Incorporated (UII), 205 South Whiting Street, Alexandria, Virginia 22304, under Defense Supply Service contract number MDA 903-76-C-0392 for the Army Energy Office. Additional guidance was provided by the Study Advisory Group.

This brief provides an abstract of the results of this study broken out by its four subordinate tasks.

ROLES AND FUNCTIONS FOR THE ENERGY ORGANIZATION

The roles and functions assigned to the Army Energy Office and Army Staff were analyzed. This analysis was accomplished through the review of current directives and regulations, discussions, interviews, and responses to questionnaires. It was determined that the role of the Army Energy Office needed to be strengthened. Further, that the roles of the Army Energy Office and several Army Staff agencies needed to be expanded and clarified. The need for a comprehensive, integrated Army Energy Plan was identified.

ORGANIZATION AT HEADQUARTERS, DEPARTMENT OF THE ARMY

After identifying the appropriate roles and functions for the Army Energy Office and the Army Staff agencies, an analysis was made of the organizational structure of the Army Energy Office. Five alternatives were evaluated. Three alternatives called for the Army energy organization to be located within the Office of the Deputy Chief of Staff for Logistics (ODCSLOG): one alternative was to retain the office under the Directorate of Transportation, Energy, and Troop Support (DTRETS); a second, to create a separate Army

Energy Office reporting directly to the DCSLOG; and the third involved the creation of a separate Directorate for Energy. The fourth alternative involved establishment of the Army Energy Office within the Office of the Chief of Engineers (OCE), and the fifth advocated creation of a separate energy office within the Office of the Chief of Staff of the Army (OCSA).

With the modification in the roles and functions of the Army Energy Office previously identified and the establishment of a general officer level Advisory Group on Energy, it was determined that retention of the Army Energy Office in its present location would satisfy the requirements with the least expenditure of resources.

ORGANIZATION AND FUNCTIONS OF MAJOR COMMANDS

Eight of the Army's major commands were surveyed through visits, discussions, or questionnaires. The results showed that all had implemented the requirements contained in AR 11-27 in varying degrees. All lacked a comprehensive energy plan and management information system. Energy management in the commands surveyed was accomplished by the use of four different organizational concepts. These varied from the use of command energy committees or councils, through having either the petroleum or facilities engineering activity manage the program, to having an energy management office staffed with full-time personnel. Due to different missions, sizes, and locations, a standard energy organization for major commands was deemed impractical.

It was concluded that command energy plans and management information systems were required. The use of full-time personnel and command energy councils or committees was considered to be advisable.

REQUIRED CHANGES TO REGULATIONS

Based upon the conclusions resulting from the examination of the roles and functions of Army Energy Office, the Army Staff, and the major commands, certain changes to AR 10-5, Organization and Functions, Headquarters, DA; AR 11-27, Army Energy Program; and AR 703-1, Coal and Petroleum Products Supply and Management Activities were identified. The recommended changes to these regulations are contained in the study. The key recommendations concern the vital and immediate need for a comprehensive, integrated energy plan to be developed at both DA and major command levels and the need for additional manpower in the Army Energy Office.

From an organization standpoint, it is recommended that the Army Energy Office be retained in the present location, with its mission and functional responsibilities strengthened and clarified. The restructuring of the Advisory Group on Energy as a general officer level council to be chaired by the Director of Transportation, Energy, and Troop Support (DTRETS) of DCSLOG is recommended. This general officer level group would be supported by a working level group to be chaired by the Chief of the Army Energy Office.

A standard organization for the major commands is not recommended. However, the use of full-time personnel and command energy councils is encouraged.

EXECUTIVE SUMMARY

INTRODUCTION

This report reflects the results of a management study to develop the optimum energy management organization for the Department of the Army (DA). Four specific tasks were addressed in the study. They were:

(a.) To determined what should be the roles and functions of the Army Energy Office,

(b.) To determine what organizational structure for energy management should be adopted at Headquarters, Department of the Army,

(c.) To determine what organization and functions should be required in major Army commands to best interface with the Department of the Army organization; and

(d.) To recommend which changes to Department of the Army regulations and publications should be made.

The study was performed by Unified Industries Incorporated (UII) of 205 South Whiting Street, Alexandria, Virginia 22304 for the Army Energy Office under Defense Supply Service, Washington, D.C. contract number MDA 903-76-C-0392.

BACKGROUND

The serious national security implications of energy shortages, possible oil embargoes, and rising costs make energy management a matter of concern to the Department of Defense and the Army. Although the Department of Defense consumes approximately two percent of the nations total energy consumption, this represents 78 percent of the energy consumed by the Federal Government.

The projected annual cost of Army energy requirements of $600 million, made in September 1976, is both significant and low, based upon later estimates.

STUDY METHODOLOGY

The study methodology consisted of a literature survey to identify the nature and extent of the energy problem and the roles, functions, and organizational structure for energy management at the Department of Defense, Army, Navy, and Air Force levels. Emphasis was placed upon the roles, functions, and structures of the Army Energy Office. The literature survey was followed by extensive interviews within and outside the Department of the Army. Interviews were supplemented with written questionnaires and telephone conversations. The energy program and organization of eight of the major Army commands were surveyed.

The results of the literature survey, interviews, conversations, and questionnaires were analyzed, the alternatives evaluated, and the recommendations formulated. These recommendations were then translated into proposed changes to Army regulations and publications.

ROLES AND FUNCTIONS OF THE ARMY ENERGY OFFICE

AR 11-27, dated 20 July 1976, defines the Army Energy Program objectives and outlines the roles and function of the Army Staff agencies and the major commanders. The Deputy Chief of Staff for Logistics (DCSLOG) is assigned the overall responsibility for supervising and coordinating the Army Energy Program and has the major responsibility in the mobility area. The Army Energy Office, located within the Directorate for Transportation, Energy, and Troop Support (DTRETS) exercises this responsibility for the DCSLOG. The Chief of Engineers (COE) has responsibility for the facilities portion of the Army Energy Program. An Advisory Group on Energy, consisting of action

officer representatives, exists to serve as a forum for the discussion of energy problems and the development of recommended solutions.

Based upon an analysis of the discussions, interviews, and the responses to questionnaires, it was concluded that the following areas need improvement.

a. A comprehensive, integrated Army Energy Plan is not available and is vitally needed.

b. The visibility of the Army Energy Office and the Army Energy Program need to be enhanced.

c. The existing management information system was completely dependent on the Defense Energy Information System reports. These reports are totally oriented toward consumption data, and there appears to be some lack of confidence in their reliability. A true management information system is needed to provide essential information for managing a total Army Energy Program.

d. The dissemination of information, application of incentives, and training on conservation and other energy matters needs to be improved.

e. Low visibility, low priority, and limited funding and manpower all serve to constrain implementation of an Army Energy Program.

f. A systems-oriented approach to energy related programs within DA is needed if significant improvements are to be made in the Army Energy Program.

ORGANIZATION FOR ENERGY MANAGEMENT

The conclusions stemming from the review and analysis of the roles and functions of the DA Staff were analyzed to determine what part the organization structure should play in affecting improvements in energy management within Headquarters, Department of the Army.

The following five alternatives were examined for the Army Energy Management organization.

Alternative 1: Retain the existing Army Energy Office in DTRETS within DCSLOG.

Alternative 2: Establish a Directorate of Energy within DCSLOG.

Alternative 3: Establish a separate Energy Office reporting directly to the DCSLOG.

Alternative 4: Establish an Army Energy Office within the Office of the Chief of Engineers, retaining the petroleum management function within DCSLOG.

Alternative 5: Establish the Army Energy Office within the Office of the Chief of Staff of the Army.

These alternatives were examined using the criteria of visibility, coordination, available expertise, continuity of current operations, required resources, and authority.

From the standpoint of visibility, alternative 5 offered the highest visibility with alternative 4 offering the least. Alternatives 2 and 3 offer a slight increase in visibility over alternative 1, the status quo.

Organizational placement within DCSLOG does not appear to have a significant effect on the ability to coordinate the energy program. It is considered that alternative 4 would encounter the most difficulty in coordination and alternative 5 the least.

The availability of the required technical expertise in energy management is highest in alternative 1, closely followed by alternatives 2 and 3, and lowest in alternative 5. Alternative 4, while providing the strongest expertise in facilities/utilities, lacks both expertise and authority in petroleum mobility and operations matters.

Continuity of current operations would be highest in alternative 1. Disruption of current operations would occur to the greatest degree in alternatives 4 and 5 and to a lesser extent in alternatives 2 and 3. More effort would be involved in establishing a directorate type organization than a separate office. Alternative 4 would require major adjustment and changes both in channels of coordination and in procedures while alternative 5 would involve a lesser degree of adjustment and change.

The creation of a newly established, separate energy office or directorate organization would involve partial duplication of existing technical expertise and complete duplication of administrative and overhead personnel. The increased resource requirements of alternatives 2 through 5 preclude their adoption unless their individual or collective advantages cannot be achieved by other means. The Advisory Group on Energy/Study Advisory Group advised UII that there is a very real probability that additional personnel resources would not be forthcoming.

Alternative 5 offers the most authority, followed by alternatives 3, 2, and 1. Alternative 4, a special staff element, provides for the least authority.

This analysis effectively eliminated alternatives 2 through 5, primarily due to resource considerations. Consideration was then given to determining what modifications might be made to alternative 1 to alleviate the current problems associated with its somewhat low visibility and authority. It was determined that the establishment of a general officer level Advisory Group on Energy chaired by the Director of Transportation, Energy, and Troop Support would improve the visibility of the Army Energy Program and serve to reinforce and increase the authority of the Chief, Army Energy Office. This

action, when considered in conjunction with the necessary changes in the Army Energy Office roles and functions previously identified, would provide the required visibility, authority, and emphasis to the Army Energy Office and the Army Energy Program.

ORGANIZATIONAL STRUCTURES AT MAJOR COMMANDS

The assigned responsibilities for energy resource management at major Army commands are established in AR 11-27. From information obtained from the eight major commands surveyed, it was apparent that these commands have, with some variation in the degree of program formality, initiated command energy programs. In accordance with DA direction, all programs are being accomplished utilizing existing command resources. The organizational structure and the resources applied were found to vary among the commands. The lack of comprehensive energy plans was evident at the major command level. The functional area concerning validity and timeliness of energy data appeared to be weak in that some data furnished to UII differed with comparable data contained in Defense Energy Information System reports. From a functional standpoint, it was concluded that the following additional responsibilities should be assigned to the major commands:

a. Develop and maintain, on a current basis, an overall comprehensive energy plan.

b. Develop and monitor an active command energy program.

c. Develop and maintain a viable management information program.

In the commands surveyed, four organizational concepts were being used. In two commands, energy programs were coordinated by energy management control groups or councils. In two other commands, energy coordinators who function on a part-time basis were found in the facilities engineering

area. Another two commands placed the coordinator in the petroleum management area. Overall responsibility for energy management in the remaining two commands was assigned to full-time personnel.

In the majority of the commands surveyed, overall responsibility for the energy program resided with the person responsible for supply, installation, and services. Since energy is a key resource, it appeared most appropriate that the senior materiel resource manager be charged with energy management.

The decision as to whether the petroleum or the facilities engineering functional area should have primary responsibility varied with the commands. In the Military District of Washington and U.S. Army Intelligence and Security commands, 96 percent of the energy consumed was in the facilities area, thereby supporting assignment of overall responsibility for energy management to that area.

In order to provide the maximum emphasis to the energy management program, it was concluded that full-time personnel were necessary in order to permit a greater degree of specialization in energy conservation matters and eliminate the disadvantages of competing priorities for time. It is recognized that the availability of personnel resources may constrain this approach.

The use of senior-level command energy councils or committees, down to the installation level, is needed to provide the necessary command emphasis and authority to the energy program, as well as to facilitate the coordination and dissemination of information. These senior-level councils would be in addition to conservation groups currently required by AR 11-27 at all levels, down to the battalion level.

It was concluded that, due to the differences in mission, size, and location of the various commands and their resulting energy requirements, a standard organization for the energy activity at the major command level is not feasible. Major commanders are traditionally permitted great latitude in organizing their commands to accomplish their assigned missions. In view of this and the fact that DA is not providing any added personnel resources, it was considered inappropriate for DA to dictate the energy organization at the major command level.

REQUIRED CHANGES TO REGULATIONS AND PUBLICATIONS

In order to implement recommendations stemming from the conclusions of the study, it was determined that changes to the following Army regulations would be required:

a. AR 10-5, Organization and Functions, Headquarters, DA.

b. AR 11-27, Army Energy Program.

c. AR 703-1, Coal and Petroleum Products Supply and Management Activities.

It was concluded that the responsibilities of Army Staff agencies should be improved by better defining their respective roles in directing the Army Energy Program, by promoting energy conservation in the development, acquisition, and operation of any materiel, and by encouraging research, development, and demonstration of new equipment and techniques in support of the energy and energy conservation programs.

In AR 11-27, further delineation of the responsibilities for DCSLOG in overall management of the energy program to include development of a comprehensive integrated energy plan was determined to be necessary. Clarification

and delineation of the responsibilities were required of the following Army agencies:

a. Deputy Chief of Staff for Logistics (DCSLOG).

b. Deputy Chief of Staff for Research, Development, and Acquisition (DCSRDA).

c. Deputy Chief of Staff for Personnel (DCSPER).

d. Chief of Public Affairs (CPA).

e. Chief of Engineers (COE).

It was concluded that the responsibilities of the major commanders should be broadened to include development of a comprehensive energy plan, maintenance of an active energy program, and a management information system.

Several specific petroleum-related responsibiliites currently assigned to DCSLOG in AR 11-27 were considered to be more appropriate for inclusion in AR 703-1. A reference to these responsibilities in AR 703-1 should be placed in AR 11-27.

SUMMARY OF RECOMMENDATIONS

The study recommendations are summarized as follows:

a. Retain the Army Energy Office within the Directorate of Transportation, Energy, and Troop Support (DTRETS).

b. Establish a general officer level Advisory Group on Energy, chaired by the Director, DTRETS and supported by an action officer level working group.

c. Notwithstanding present constraints on manpower, allocate sufficient additional manpower resources, particularly to the Army Energy Office, to accomplish the recommendations of this study.

d. Revise the DCSLOG responsibilities contained in AR 11-27 as follows:

(1) Exercise overall Army General Staff responsibility for planning, directing, and coordinating the Army Energy Program. (To be contained in AR 10-5 as well.)

(2) Develop, with the assistance of and in coordination with the Army Staff, a comprehensive Army Energy Plan.

(3) Exercise primary Army Staff responsibility over the supply and management of coal and petroleum products as prescribed in AR 703-1. (Transfer six individual petroleum-oriented functions now contained in AR 11-27 to AR 703-1.)

(4) Develop and supervise an effective management information and evaluation element for the Army Energy Program and Plan.

(5) Monitor the consumption of energy in the testing, adoption, and life cycle management of new items of Army materiel.

(6) Insure compatibility between the Army Energy Program and the Army Environmental Program.

e. Revise the Deputy Chief of Staff for Operations and Plans (DCSOPS) responsibilities contained in AR 11-27 as follows: Develop and provide policy guidance which will emphasize that major commanders plan and schedule unit training and exercises within the guidelines of the Army Energy Program, and that major commanders assure that individual soldiers are trained in and practice energy conservation.

f. Revise the DCSRDA responsibilities contained in AR 11-27 as follows:

(1) Promote energy conservation in the development of Army materiel and include energy consumption as a criterion for evaluating alternative concepts for satisfying Army materiel requirements.

(2) Insure that thorough consideration is given to conservation of energy in the development, acquisition, operation, use, or disposal of any materiel and the management of production base support programs. (To be contained in AR 10-5 as well.)

g. Revise the DCSPER responsibilities contained in AR 11-27 as follows:

(1) Insure that an appreciation of the energy problem and training in energy conservation techniques is incorporated in the curriculum and training programs of all schools and training centers.

(2) Incorporate energy conservation considerations and objectives in all personnel-related actions such as carpooling, clothing standards, and morale activities.

h. Revise the COE responsibilities contained in AR 11-27 as follows:

(1) Conduct a vigorous energy research and development (R&D) program to develop and/or demonstrate new construction techniques, materiels, and criteria that will further reduce energy requirements and more effectively utilize energy at Army fixed installations. (To be reflected in AR 10-5 as well.)

(2) Formulate and recommend coordinated DA policy on procurement, supply, and utilization of utility energy resources for fixed installations.

(3) Assure that all construction projects are considered for their energy requirements and impact on energy resources.

i. Revise the Chief of Public Affairs responsibilities contained in AR 11-27 as follows:

(1) Develop and execute the command and public information support for the Army Energy Plan and Program.

(2) Provide information on the Army Energy Program for use by the news media and the public.

j. Revise the responsibilities of commanders contained in AR 11-27 as follows:

(1) Encourage commanders at all levels, down to and including the installation level, to establish and use command energy councils or committees to serve as forums for formulating, coordinating, and disseminating energy policy and actions. The use of full-time personnel in the energy program is encouraged where a cost benefit analysis justifies their use.

(2) Develop and maintain an active command energy program.

(3) Develop and maintain, on a current basis, an overall comprehensive energy plan. Major commanders will forward a copy of their plans to the Army Energy Office.

(4) Develop and maintain a viable management information program. Submit a quarterly narrative management report 1 month after the end of each fiscal quarter outlining significant accomplishments and shortfalls.

(5) Evaluate candidates and recommend projects for the Energy Conservation Investment Program (ECIP).

k. Develop a systems-oriented approach to the Army's energy challenge.

TABLE OF CONTENTS

Page

SECTION I. INTRODUCTION

GENERAL I-1

BACKGROUND I-1

World Energy Perspective I-2

National Energy Perspective I-3

Department of Defense (DOD) Energy Perspective I-7

Department of the Army Energy Perspective I-9

APPROACH I-12

SECTION II. ROLES AND FUNCTIONS IN ENERGY MANAGEMENT

CURRENT ARMY ENERGY OFFICE AND ARMY STAFF ROLES AND FUNCTIONS II-1

OBSERVATIONS AND FINDINGS II-4

Energy Program Visibility/Awareness II-4

Training, Motivation, and Incentives II-5

Program Orientation/Approach II-6

Coordination II-7

Energy Program Accountability/Information Requirements II-8

Information Dissemination II-8

ANALYSIS II-9

Summary Analysis II-11

CONCLUSIONS II-12

Army Energy Office Roles and Functions II-12

Program Planning and Policy II-12

Coordination II-13

Page

Standards Criteria II-13

Monitoring and Evaluation. II-13

Training, Motivations, Incentives. II-14

DA Staff Roles and Functions II-14

Overall DA Staff Role. II-14

DA Staff Planning Functions. II-15

Training, Motivation, and Incentives Functions II-16

Information Requirements and Dissemination Functions II-16

Other DA Staff Functions II-17

SECTION III. ORGANIZATION FOR ENERGY MANAGEMENT, HQDA

PRESENT ORGANIZATION III-1

ALTERNATIVE ORGANIZATIONAL STRUCTURES. III-2

Alternative 1: Energy Office Retained in DTETS under DCSLOG III-2

Alternative 2: Create DCSLOG Directorate for Energy III-4

Alternative 3: Create Energy Office as a Special Assistant to the DCSLOG III-6

Alternative 4: Create Army Energy Office Under COE. III-8

Alternative 5: Create Energy Office at the Chief of Staff Level . . III-10

ANALYSIS OF ALTERNATIVES III-12

Visibility III-12

Coordination III-12

Available Expertise. III-12

Continuity of Operations III-12

Required Resources III-12

Page

Authority. III-13

Conclusions. III-14

SECTION IV. FUNCTIONS AND ORGANIZATION OF MAJOR COMMANDS

FUNCTIONS OF MAJOR COMMANDS. IV-1

Regulatory Functions IV-1

Command Implementation IV-1

Conclusions. IV-3

SUMMARY OF MAJOR COMMAND FINDINGS. IV-3

General. IV-3

Organization of the Energy Conservation Activity IV-4

Programs IV-5

Results Achieved IV-6

Program Constraints. IV-6

Coordination IV-7

Assistance Desired from the Army Energy Office IV-8

ANALYSIS OF ENERGY ORGANIZATION WITHIN MAJOR COMMANDS. IV-9

Energy Organization Standardization. IV-9

Councils or Committees IV-10

Petroleum-Oriented Activity. IV-10

Facilities-Oriented Activity IV-11

Separate Full-Time Activity. IV-11

Functional Area. IV-12

CONCLUSIONS. IV-13

Page

SECTION V. REQUIRED CHANGES TO REGULATIONS

OVERALL ARMY ENERGY OFFICE ROLE V-1

ORGANIZATION V-2

PLANNING V-5

POLICY V-6

MANANGEMENT INFORMATION-EVALUATION V-8

INFORMATION DISSEMINATION. V-9

COORDINATION V-10

TRAINING, MOTIVATION, AND INCENTIVES V-11

SECTION VI. RECOMMENDATIONS

APPENDIXES

APPENDIX A: CONTRACT SCOPE OF WORK. A-1

APPENDIX B: LIST OF INTERVIEWS. B-1

APPENDIX C: SAMPLE ARMY STAFF QUESTIONNAIRE C-1

APPENDIX D: BIBLIOGRAPHY. D-1

APPENDIX E: SUMMARY OF MAJOR COMMAND RESPONSES. E-1

APPENDIX F: RECOMMENDED CHANGES TO AR 11-27 . . . . . F-1

APPENDIX G: RECOMMENDED CHANGES TO AR 10-5. . . . . G-1

APPENDIX H: RECOMMENDED CHANGES TO AR 703-1 . . . . . H-1

APPENDIX I: ARMY ENERGY PLAN OUTLINE. I-1

APPENDIX J: GLOSSARY. J-1

SECTION I. INTRODUCTION

GENERAL

The Army Energy Office, through the Defense Supply Service, Washington, D.C., contracted Unified Industries Incorporated (UII) to conduct a study of energy management in the Department of the Army (DA). This study, completed in May 1977, provides DA with a better understanding of the roles, functions, and organizations that will effect an immediate optimization of energy management within DA.

The study was conducted in four phases. The following specific tasks were required by the contract (extract at appendix A):

Task 1: Determine what should be the role and functions of the Army Energy Office.

Task 2: Determine what organizational structure for energy management should be adopted at Headquarters, Department of the Army (HQDA).

Task 3: Determine what organizations and functions should be required in major Army commands to best interface with the HQDA organization.

Task 4: Recommend what changes to DA regulations and publications should be made.

This report provides a summation of the UII findings, conclusions, and recommendations developed in the execution of the above four tasks.

BACKGROUND

The following is a delineation of world, national, Department of Defense, and Army energy perspectives.

World Energy Perspective

International economic development in the 20th Century has been primarily driven by the unrestricted availability and inexpensive cost of energy in the form of fossil fuels. In October 1973, the world was subjected to a selective political denial of petroleum during the Arab oil embargo. These events precipitated spiraling oil prices. The world's economic balance faltered soon after the Arab oil embargo, which gave rise to widespread unemployment and a general slowdown in the tempo of international business and industrial production.

It has become apparent that an energy crisis exists which is all pervasive and not restricted, permanent rather than transitory. The crisis is a direct result of the nature of the geological distribution of the world's energy resources. The problem of the maldistribution of energy resources is further aggravated by the fact that approximately 25 percent of the world's population consumes over 80 percent of the world's annual petroleum production. The developed industrial nations presently cannot supply all of their own energy needs, whereas underdeveloped countries are producing far more petroleum and natural gas than they currently require. More nations are expected to come to rely on imported oil in the near future. It is estimated that the Soviet Union, for instance, will no longer be energy self-sufficient by 1985; which may precipitate serious international financial and political ramifications. Almost half of the world's energy comes from oil, with coal and natural gas comprising the major portion of remaining energy sources. (See figure I-1.) That the world oil supplies are nearly exhausted makes the situation critical.

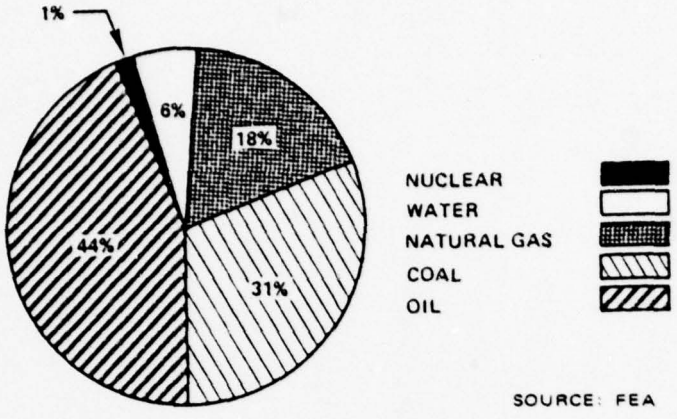


Figure I-1. World Energy Sources

Consumer nations reacted to higher prices by reducing oil demand through energy conservation. In 1976, the Organization of Petroleum Exporting Countries (OPEC) actually had an excess in productive capacity due to the decline in world demand. Regardless of any conservation measures however, conservative theoretical estimates of world oil depletion, based on a 2.5 percent per annum growth rate, place exhaustion of world petroleum resources at approximately the year 2015.

National Energy Perspective

The energy problem in the United States stems from the Nation's dependence upon its least abundant energy resource to provide for most of its energy needs. Since the year 1900, the United States has switched from using coal for over 90 percent of its energy needs to depending on oil and gas for 75 percent of its energy needs. However, oil and gas account for only 7 percent of U.S. proven recoverable reserves, as shown in figure I-2.

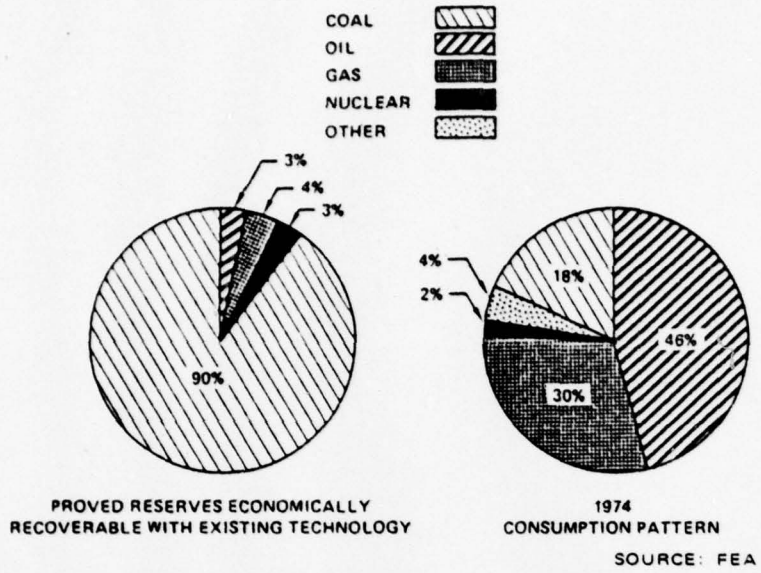


Figure I-2. Roots of the U.S. Energy Problem

The United States makes up only 6 percent of the world's population. Yet Americans currently consume 32 percent of the world's petroleum energy while producing only 15 percent of the world's crude oil. As a result, the United States imports more than 40 percent of its liquid petroleum needs at a daily cost of $93 million. Two-thirds of these imports come from OPEC; one-third of that comes from the Arab nations that imposed the 1973-74 oil embargo. Moreover, the United States is currently importing twice as much crude oil from Arab nations as it did just prior to the embargo. Post-embargo studies project higher imports for at least 8 more years or longer. Findings from the American Petroleum Institute (API) (see figure I-3) depict import projections to 1990 as being up to 70 percent higher than today's level. Total exhaustion of U.S. oil reserves is estimated to occur between 1987 and 2004, using annual consumption growth rates ranging from zero to four percent, assuming no new discoveries.

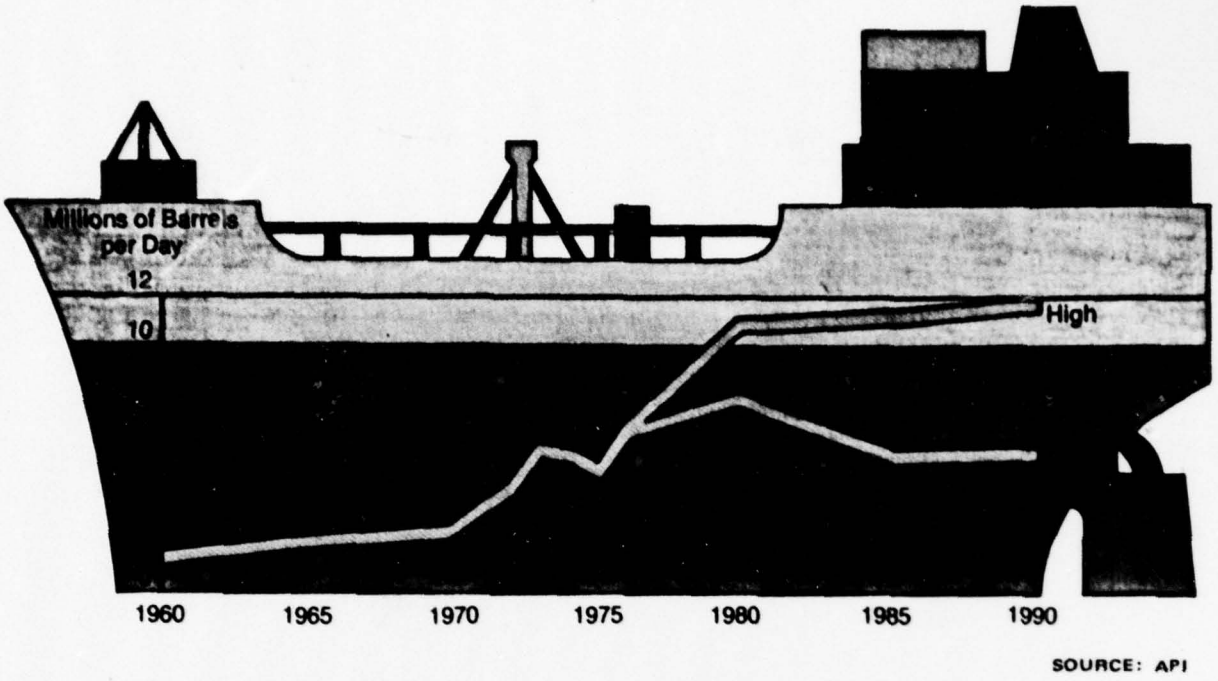


Figure I-3. U.S. Energy Imports (Post-1974 Forecasts)

Studies by the Federal Energy Administration (FEA) do not show a significant contribution by solar, geothermal, synthetic fuels, or other sources for at least 10 to 15 years.

The largest portion of U.S. energy is consumed by the industrial sector, as shown in figure I-4. It is noteworthy however, that while 26.7 percent of total U.S. energy is used in transportation, this accounts for almost half of the United States consumption of petroleum.

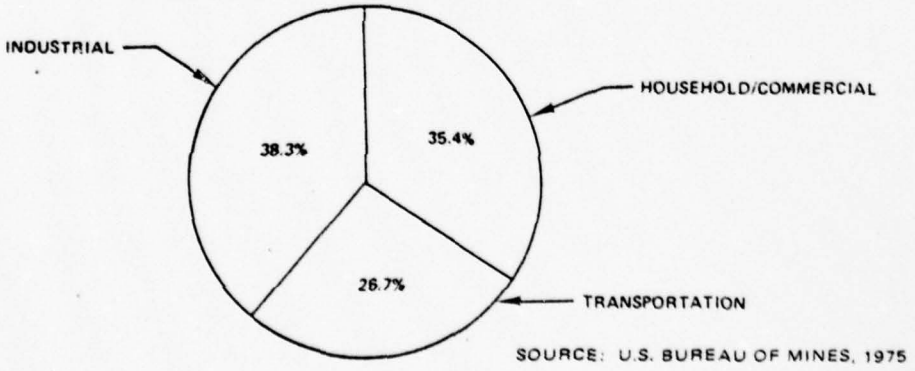
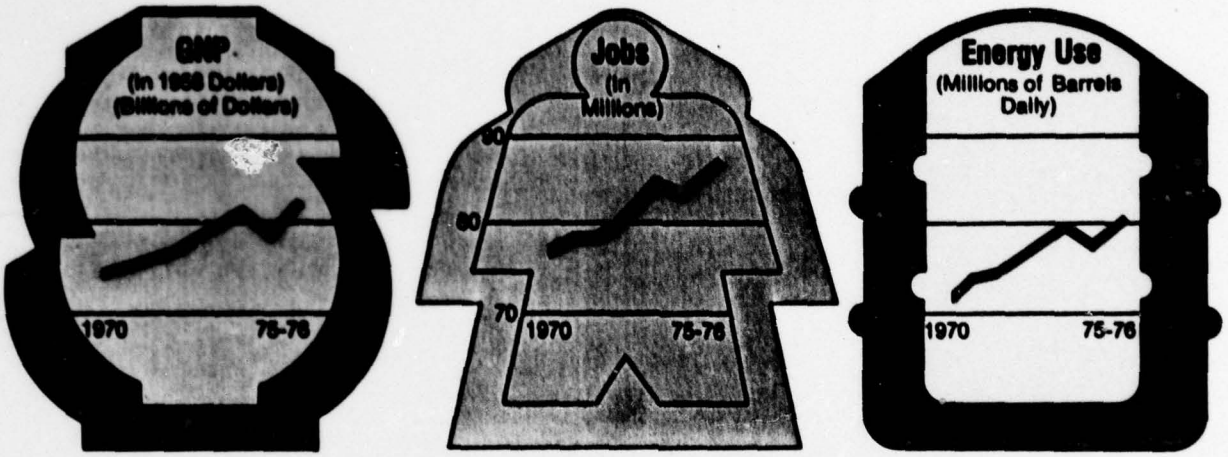


Figure I-4. Total U.S. Energy Use by End-Use Sectors

Petrochemical products, from plastics to road surfaces, make up a substantial portion of the U.S. gross national product (GNP). Indeed, the rate of increases in the GNP and jobs bears a relationship to the rate of energy use, as reflected in figure I-5.



SOURCE: U.S. DEPARTMENTS OF COMMERCE, LABOR, INTERIOR

Figure I-5. Economic Growth, Jobs, and Energy

It is clear that the era of cheap, abundant, domestic supplies of energy is over. Indeed, in light of U.S. and world oil exhaustion predictions, new energy sources must ultimately be developed if we are to survive as an industrial and technological society.

The situation dictates that serious efforts must be made both to conserve present energy supplies and to increase present energy production. President Carter's recently proposed National Energy Plan has as its foundation, provisions for the implementation of a vigorous energy conservation program driven by both financial incentives and legal requirements. Insulation of buildings, both commercial and residential, along with stringent measures to reduce gasoline consumption by automobiles are at the heart of

this aspect of the energy plan. Conversion from the use of petroleum as the nation's primary source of fuel to coal, the nation's most abundant energy resource, is another key aspect of President Carter's proposed plan.

Department of Defense (DOD) Energy Perspective

The increasingly inadequate and uncertain supply of energy resources, from both foreign and domestic sources, makes energy an extreme concern to DOD. National security depends on the ability to meet the nation's military and industrial energy requirements. Key to attaining these requirements is the uninterrupted supply of energy.

After the 1973 Arab oil embargo, a Directorate for Energy was established in DOD under the Assistant Secretary of Defense (see figure I-6).

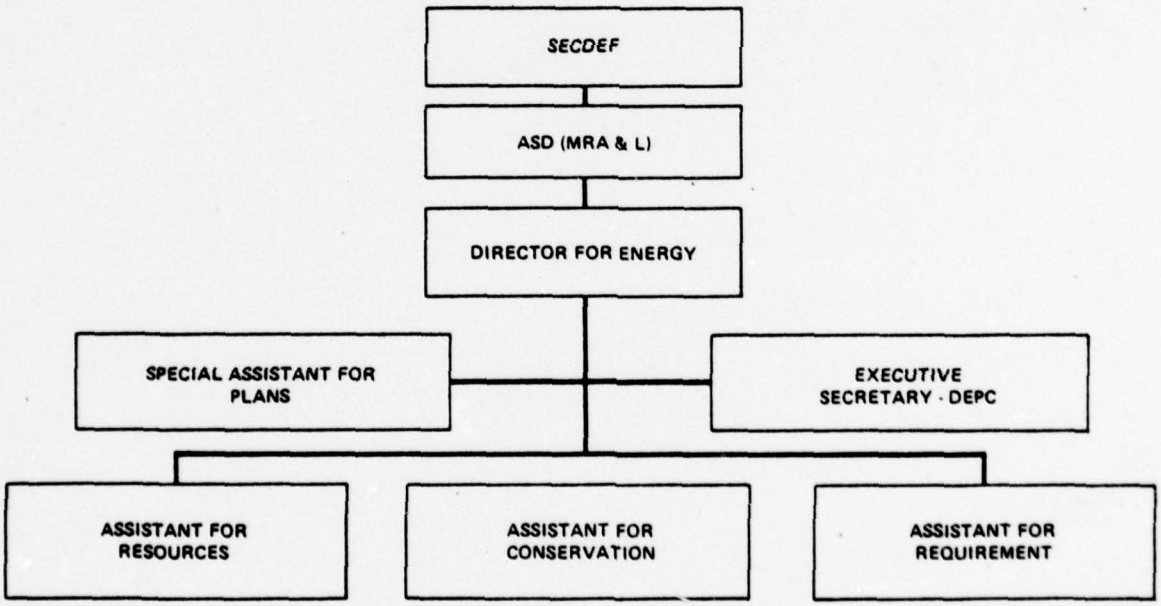


Figure I-6. Secretary of Defense Energy Structure

Further energy conservation emphasis was provided through establishment of the Energy Conservation Investment Program (ECIP). The ECIP goal was to

reduce energy consumption through self-amortizing retrofit projects to existing facilities. The funding for ECIP, however, was largely eliminated from the FY 78 budget. In addition, the Defense Energy Information System (DEIS) was established as an energy management tool, but it provides only statistical consumption data.

In compliance with the Federal Energy Management Program, DOD set specific goals for energy conservation for FY 74 (7 percent savings over FY 73), FY 75 (15 percent savings over FY 73), and FY 76 (no growth over FY 75). DOD has exceeded all of these goals, achieving savings of 25 percent in FY 74, 26 percent in FY 75, and 7 percent in FY 76. A no-growth goal compared to FY 75 consumption was established for FY 77.

Reduction of petroleum consumption has been achieved since FY 73, but the FY 76 daily DOD petroleum requirement is nearly one-half million barrels. Petroleum products comprise 67 percent of the total energy used by DOD (see figure I-7). DOD is the largest energy consumer in the government; it consumes nearly 2 percent of the national demand and 78 percent of the energy consumed by the Federal Government.

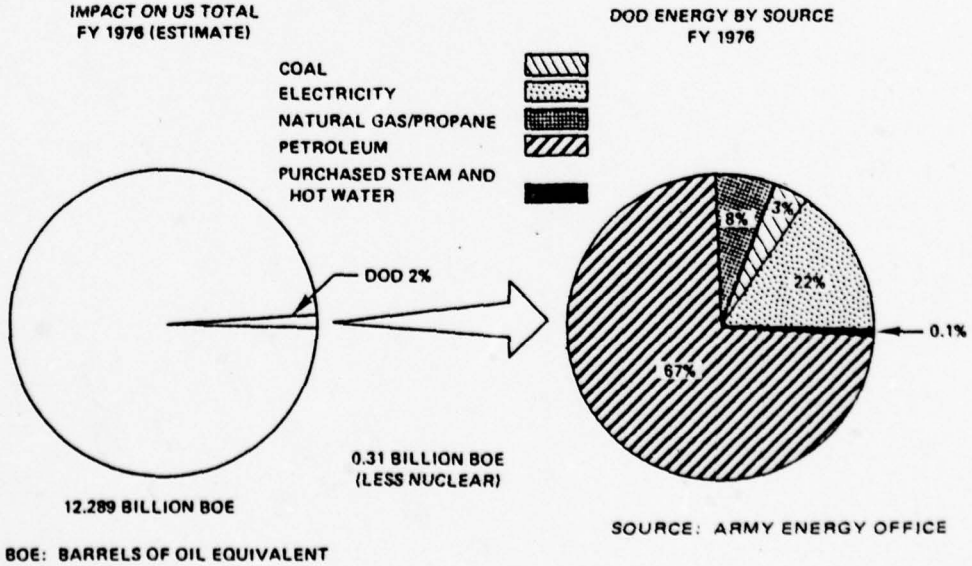


Figure I-7. Energy Used by DOD

Department of the Army Energy Perspective

Pursuant to DOD directives, the Department of the Army established an Army Energy Office. This office is located in the recently designated Directorate for Transportation, Energy, and Troop Support (DTRETS) under the Deputy Chief of Staff for Logistics (DCSLOG). In addition, a Special Assistant for Energy has been established at the Deputy Under Secretary of the Army level.

Currently, Army energy management objectives are to conserve energy while maintaining readiness, to maintain zero growth based on the FY 75 total energy consumption, and to maintain a supportive and cooperative role with the designated national energy authorities in the development of new energy sources.

The Army portion of defense energy consumption for FY 76 is 19 percent of total energy and 10.4 percent of defense petroleum consumption. (See figure I-8.) The Army utilizes 84 percent of its total energy in its facilities; the remaining 16 percent is used in its mobility operations.

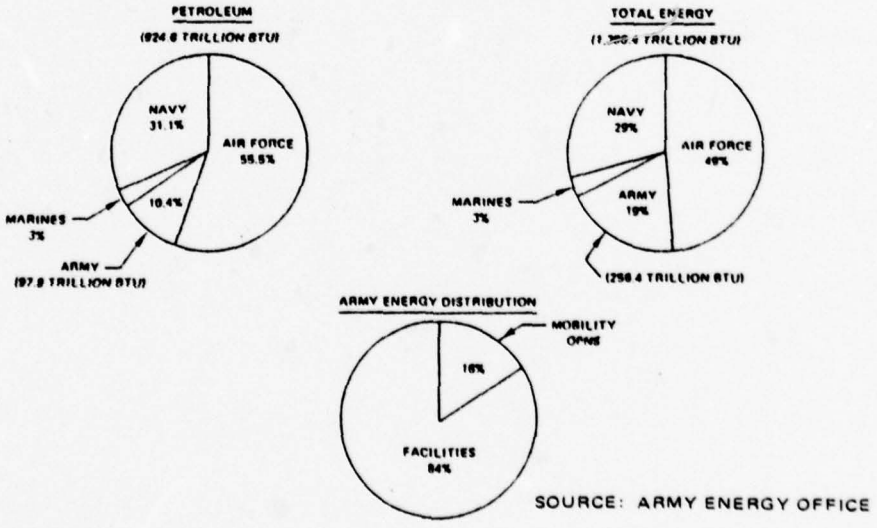


Figure I-8. Army Portion of Defense Energy

Energy consumption has steadily declined from FY 73 (pre-embargo), when the Army used 354.6 trillion Btu's, to FY 76 where energy consumption was 256.4 trillion Btu's. (See figure I-9.)

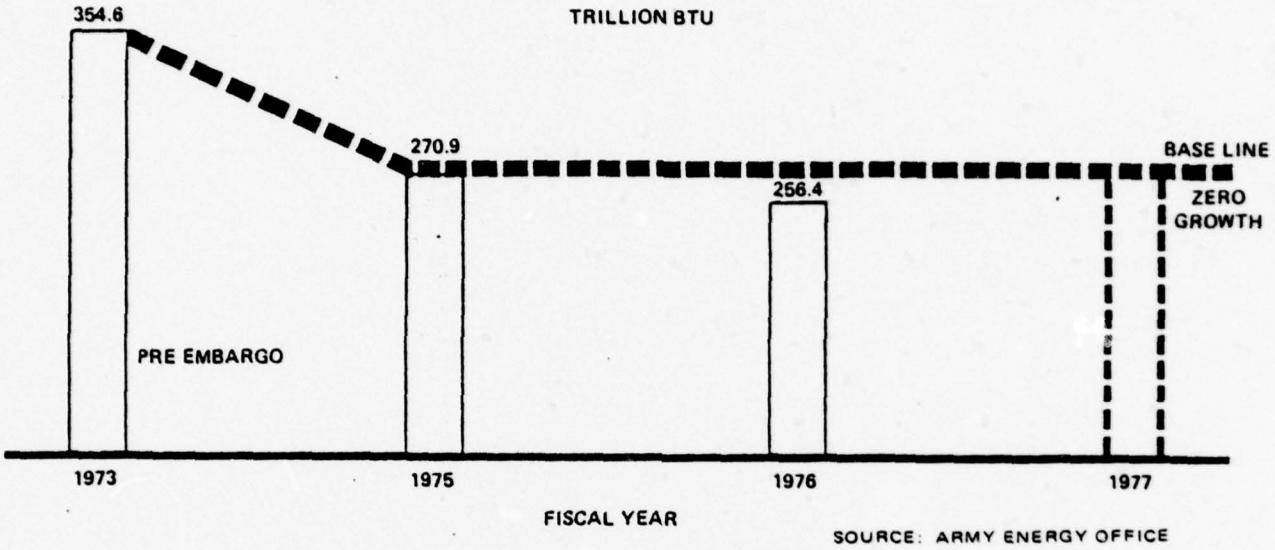


Figure I-9. Army Energy Consumption

However, costs during the same period have risen sharply from less than $400 million in FY 73 to more than $600 million in FY 76. (See figure I-10.)

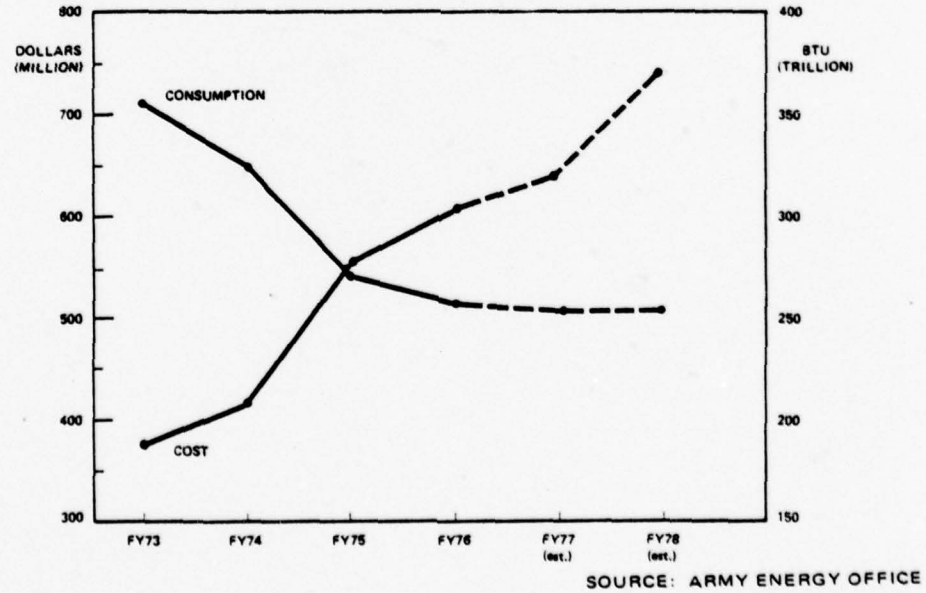


Figure I-10. Army Energy Costs Versus Consumption

The change in the tempo of operations that included consolidation of facilities, canceled training, and a general winding down of activity after Vietnam contributed in part to the Army's declining consumption.

The cold weather during the winter of 1976-77 served to underscore the severity of the national energy crisis. Impact on the Army was readily apparent: military installations were forced to curtail operations and, in some cases, had to halt entirely. (See figure I-11.)

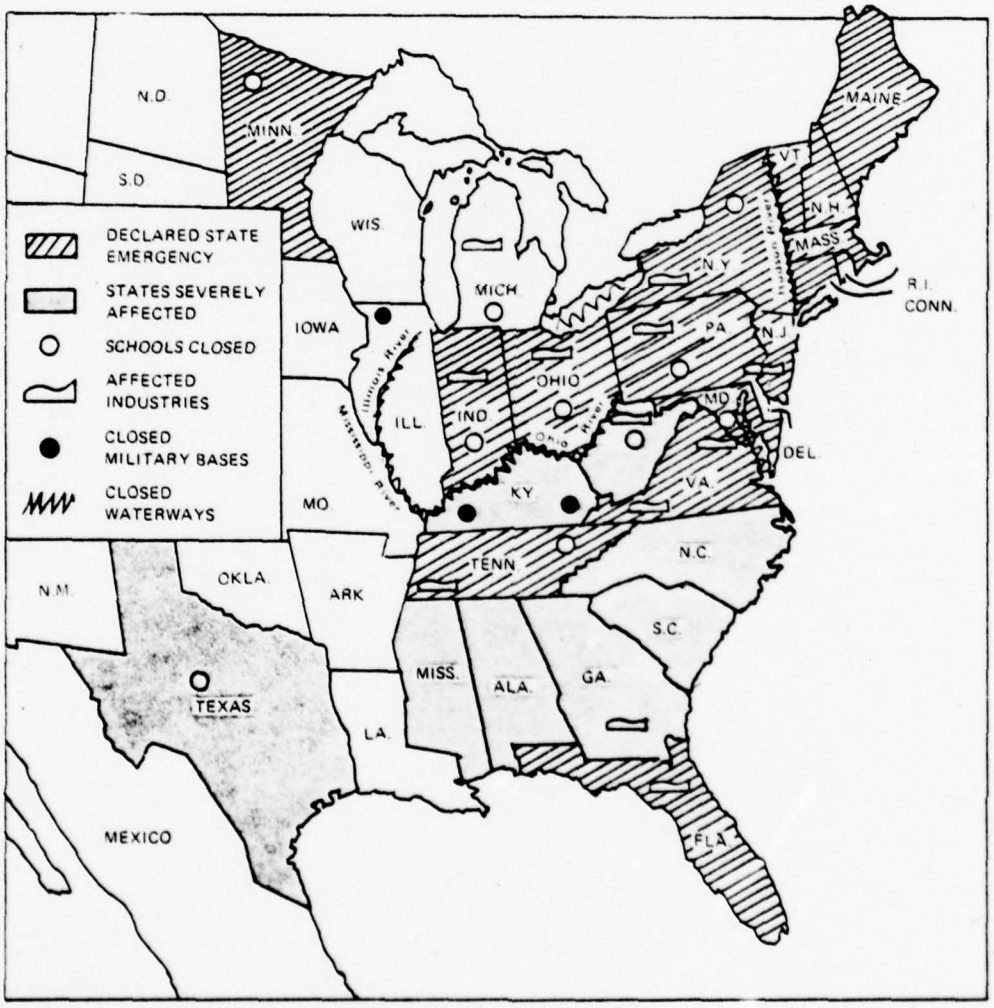


Figure I-11. Energy Crisis, Winter 1977

APPROACH

In order to develop conclusions and recommendations concerning optimization of energy management within DA, the following efforts were undertaken in accomplishing each of the previously identified tasks:

a. Task 1: Determine what should be the roles and functions of the Army Energy Office (and DA Staff). This was accomplished by:

(1) An investigation to determine the present roles, functions, objectives, procedures, and constraints of the Army Energy Office and the DA Staff.

(2) A review of energy conservation studies, performed both in-house and by outside research centers, to relate the state-of-the-art of energy management techniques and concepts to the specific problems and requirements of DA.

(3) A survey of energy management organizations, both internal and external to DA, with energy-related activities. This was accomplished through verbal and written interviews with representatives of the various offices listed in appendix B.

(4) The collection and structuring of data to gain an understanding of inherent problems. This was done to draw conclusions and to develop solutions from which recommended Army Energy Office and DA Staff roles and functions were determined.

b. Task 2: Determine what organizational structure for energy management should be adopted at HQDA. This was accomplished by:

(1) A comparison of recommended DA Staff roles and functions against existing regulations found in both AR 11-27, Army Energy Program, and AR 10-5, Organization and Functions, DA.

(2) Further analysis of recommended DA Staff roles and functions in light of DA Staff responses to UII questionnaires concerning current energy-related actions and functions. (See the sample questionnaire in appendix C.)

(3) The development of alternative energy program organizational and structural relationships based on the recommended DA Staff roles and functions taken together with existing Army regulations that were considered necessary and appropriate.

(4) The formulation of conclusions concerning the efficacy of each of the alternative organizations.

(5) The development of recommendations concerning organizational structure for energy management at HQDA, based on conclusions.

c. Task 3: Determine what organization and functions should be required in major Army commands to best interface with the DA organization. This was accomplished by:

(1) A review conducted of current regulations pertaining to organization and functions for energy management at major Army commands.

(2) A UII questionnaire prepared to determine current provisions and programs for energy management at major commands. Copies were mailed to those commands which UII was unable to visit due to time and money constraints. (A sample questionnaire coupled with summary findings can be found in appendix E.) These commands were: U.S. Army, Europe (USAREUR); U.S. Army, Japan (USARJ); U.S. Armed Forces, Korea (US Korea); U.S. Army Forces Command (FORSCOM). Other major commands contracted, either by phone or through personal interviews, included Military District of Washington

(MDW), U.S. Army Intelligence and Security Command (INSCOM), U.S. Army Training and Doctrine Command (TRADOC), and U.S. Army Materiel Development and Readiness Command (DARCOM).

(3) A comparison analysis conducted on the collected data to identify and evaluate alternative organizational concepts.

(4) Conclusions drawn from this analysis.

d. Task 4: Recommend what changes to DA regulations and publications should be made. Regulation changes necessary to implement recommendations to optimize energy management within DA were developed.

SECTION II. ROLES AND FUNCTIONS IN ENERGY MANAGEMENT

CURRENT ARMY ENERGY OFFICE AND ARMY STAFF ROLES AND FUNCTIONS

The current Army Staff roles and functions for the Army Energy Program are defined in AR 11-27. The following is a summary of the key aspects concerning Army Energy Program responsibilities.

The Army Energy Office has overall DA Staff responsibility for the supervision and coordination of the Army Energy Program. Its primary functions include the following:

a. Assuring development and execution of a balanced energy conservation program.

b. Initiating energy seminars to maintain field-level interest.

c. Providing guidance and advice on energy contingency plans and on overall energy matters for DA.

d. Formulating DA policy for the allocation, supply, use, and statistical reporting of consumption through the Defense Energy Information System (DEIS) of energy within DA.

e. Providing policy and technical guidance on petroleum-related matters for DA.

f. Justifying Army Energy Program budgetary actions.

The overall responsibilities of Army Staff agencies include the following:

a. Insuring that energy considerations are included in agency functional responsibilities.

b. Coordinating plans and actions which impact on energy matters with the Army Energy Office.

c. Insuring that all policy documents for which they are the proponent have been evaluated for impact on energy.

d. Advising the Army Energy Office of the status of energy-related actions.

e. Establishing a point of contact for energy matters and actions.

Specific responsibilities of DA Staff elements that are key to the effective functioning of the Army Energy Program are as follows:

a. The Deputy Chief of Staff for Operations and Plans (DCSOPS) is responsible for:

(1) Establishing operational priorities for distribution and use of energy.

(2) Insuring energy is considered in development of strategies and mission and materiel requirements for DA.

b. The Deputy Chief of Staff for Research, Development, and Acquisition (DCSRDA) is responsible for:

(1) Developing research and development (R&D) programs to resolve energy utilization problems.

(2) Initiating or supporting R&D to conserve energy.

(3) Evaluating studies and tests of materiel during development for impact on energy.

(4) Assuring energy is considered in materiel acquisition, life cycle management of materiel, and in management of production base support programs.

c. The Deputy Chief of Staff for Personnel (DCSPER) is responsible for:

(1) Promoting energy problem and conservation awareness at Army training schools and center.

(2) Emphasizing energy conservation in the incentive awards program.

(3) Providing details for personnel-related actions (e.g., carpooling, clothing, and morale during energy shortages).

d. The Chief of Engineers (COE) is responsible for developing and managing the installations and utilities element of the Army Energy Program. This includes:

(1) Assuring energy conservation through active installation programs.

(2) Assuring development of new energy-efficient construction standards and emphasizing energy conservation in all construction programs.

(3) Conducting a vigorous energy R&D program to reduce energy requirements at fixed Army installations.

(4) Assuring that all construction projects except minor Military Construction Army (MCA) projects are considered for energy requirements and energy resource impacts.

(5) Formulating DA policy on procurement, supply, and use of utility energy resources, except coal, fuel oil, and liquid petroleum gas.

e. The Chief of Public Affairs (CPA) is responsible for:

(1) Developing and distributing command information materials to promote support for the Army Energy Program goals and objectives.

(2) Providing Army Energy Program information for use by news media and the public.

An Advisory Group on Energy (established by AR 11-27), which is chaired by the Chief, Army Energy Office, has representatives from the offices of DCSOPS, DCSPER, DCSRDA, CPA, Surgeon General, COE, and the Army National Guard. The group's purpose is to function as a forum for the exchange of

information and ideas on energy matters, to determine actions required to attain Presidential and DOD energy goals, and to review policies, programs, procedures, and urgent energy matters to determine recommended courses of action.

OBSERVATIONS AND FINDINGS

Based on interviews with DA elements and other agencies (listed in appendix B), a review of relative publications (appendix D), and analyses of responses to the UII-prepared DA Staff questionnaire (appendix C), the following observations and findings were collected.

Energy Program Visibility/Awareness

The following are findings concerning the visibility and level of awareness of the Army Energy Program.

a. The Army does not have an overall energy plan.

b. The Army Energy Office and the Army Energy Program do not have adequate visibility. The Army Energy Office is sometimes overlooked or ignored within the Army in matters concerning energy policies and programs.

c. While having a small percentage of the total national energy consumption, DA nevertheless has a high profile nationally in the consumption of energy. The Army needs to do more in energy conservation and resource management, but the present lack of authority, funds, and manpower have constrained its effectiveness in energy resource management.

d. Energy conservation and impact on energy is not being adequately considered in DA budgetary actions. Consequently, actions that might conserve energy are likely to be subordinated to mission and readiness-related activities.

e. DA involvement in energy R&D appears to be secondary to other mission-related R&D. Apparently no new R&D directly related to energy has been initiated since FY 74.

f. The Army Energy Office and DA Staff elements could play a stronger role in the Army Energy Program through an integrated energy plan.

Training, Motivation, and Incentives

The following are findings related to training, motivation, and incentives related to the Army Energy Program.

a. Implementation of the Army Energy Program depends largely on the desires, motivations, and priorities of the installation commanders.

b. Currently, installation commanders have limited economic incentive to reduce energy consumption because the monies saved can only be captured and used in the year the savings occur. The budget for subsequent years will usually be determined on the basis of the previous year's expenditure by category, thus, providing an energy conservation disincentive that is counter-productive to conservation goals.

c. In industry, International Business Machines (IBM) has instituted an energy incentive plan by which plant managers are given a bonus if they surpass their conservation requirements based on a previous energy audit.

d. The Energy Research and Development Administration (ERDA) Twin Rivers Study of multi-family housing has shown that the differing habits and lifestyles of individual occupants can result in a range of energy consumption which may vary as much as 250 percent. Moreover, additional ERDA studies have shown that separate metering and individual billing for energy has reduced energy consumption in multi-family dwellings by 30 percent.

e. In order to maintain high morale in the new all-volunteer Army, installation housing is being constructed that will afford additional space and amenities to the volunteer soldier, which may result in increased energy consumption. Once again, motivation and incentive for energy conservation become particularly important in this setting.

f. Development of stronger career paths in energy fields and training in energy management are necessary to attract junior officers and civil service employees to form a cadre for conservation activities which are both technical and managerial in nature.

g. Intensive training and indoctrination, along with both positive and negative incentives, are presently considered to be effective methods for reducing energy consumption, particularly over the short term. Long-term conservation goals and achievements need to be supported and maintained by such an approach.

Program Orientation/Approach

The following pertains to findings concerning the Army Energy Program orientation and approach.

a. The Army Energy Office and DA Staff actions concerning energy matters are sometimes oriented towards a "fire fighting" rather than a "fire prevention" approach to management. Inadequate manpower appears to be a major contributing factor in this situation.

b. Management information concerning energy program implementation and effectiveness is only available in piecemeal form on an irregular basis resulting primarily in management by exception.

Coordination

The following pertains to findings concerning coordination of the Army Energy Program.

a. AR 11-27, dated 20 July 1976, defines areas of energy program responsibility; nevertheless, there are instances where some confusion exists concerning exactly "who does what" at the DA Staff level. The following are some related examples:

(1) CPA is responsible for development of information concerning the energy program. However, CPA has interpreted its mission to be solely that of the publisher of such information as is provided to CPA.

(2) The majority of Army Staff agencies, when queried via a questionnaire, indicated little apparent activity in their assigned area concerning energy conservation. Whereas AR 11-27 requires persistent and widespread consideration of energy impact on policies, strategies, programs, etc., it would appear that a disparity exists either in interpretation or in fact.

(3) DCSRDA is given responsibility in AR 11-27 for developing R&D programs in support of the energy program. However, no new programs have been developed since 1974. In fact, it is understood that the new XM1 tank currently being developed will consume approximately 22 percent more energy than the current M60 series tank.

b. Formalized procedures providing for coordination among DA Staff elements are sometimes not utilized.

c. Proper coordination and future program synchronization will be increasingly difficult due to the limited personnel staffing within the Army Energy Office.

d. Program coordination would be bolstered by an overall, definitive energy plan.

Energy Program Accountability/Information Requirements

The following are findings concerning energy program accountability and information requirements.

a. Current requirements for energy planning, policy, program development, and accountability demand not only higher confidence levels in energy consumption data, but also further information on energy program activities throughout DA. Spot surveys, energy audits, and baseline studies are some of the frequently suggested methods for increasing data confidence levels.

b. The Defense Energy Information System (DEIS) or an equivalent reporting mechanism/information system could be expanded to include information required on a periodic basis and to target energy saving opportunities at the major Army command level.

c. To measure the effectiveness of energy programs against standards and criteria, feedback concerning the status of energy saving activities such as research and development, Energy Conservation Investment Program (ECIP), equipment/ECIP programs, carpooling incentive awards, and the like, should be initiated on a regular rather than an exceptional basis throughout the operating levels of the DA. In the future energy environment, energy accountability (i.e., the ability to account for the effectiveness of energy programs) will become of paramount importance.

Information Dissemination

The following are findings concerning energy program information dissemination.

a. Information concerning energy conservation mechanisms, programs, and practices that is collected from both DA and other Federal agencies needs to be made available, especially at the major command and unit levels. The cross-feeding of such information among all DA elements would eliminate much duplication of effort, and would bring to light both successes and failures in conservation efforts. While a plethora of such information is available from many sources, it has not been sufficiently tailored to Army applications, thus detering its usefulness.

b. At present, both technical and programmatic information regarding energy conservation developments, practices, and legislation are frequently communicated in an informal manner. Inclusion of such information in quarterly or monthly publications, training curricula (at all levels), films, television, and radio spots are some of the suggested means for communicating this knowledge to the individuals who can, by their actions, influence energy consumption.

ANALYSIS

Since the previously mentioned observations and findings were expressed by many respondents, it has been concluded that they are of importance, and thus have been seriously considered in the subsequent analysis and conclusions.

a. Various individual Army Staff and command elements are actively promoting energy programs and dealing with energy concerns within their own spheres. However, they are without the benefit of clear central direction in that there is no comprehensive Army Energy Plan.

b. Implementation of energy-related programs has been impeded by low priority and visibility, limited funding, and manpower constraints at all Army levels. Limited staffing results in missed opportunities for enhancing the

Army Energy Program. Energy-related programs are also sometimes overlooked or ignored. Increased program visibility and greater awareness of energy problems and solutions can serve to alleviate these constraints.

c. New and innovative incentive mechanisms for the encouragement of energy conservation need to be developed and implemented.

d. Both awareness of energy conservation goals and a motivating influence to accomplish these goals are required from the individual soldier to the highest levels of authority. However, there does not appear to be either sufficient emphasis or the structured doctrine required to provide the necessary awareness or motivation to accomplish conservation goals required from Army personnel at all levels.

e. Energy management on anything less than a total program basis and the piecemeal reporting of program effectiveness are inappropriate in an environment of rapidly increasing requirements for energy accountability nationally and in DOD.

f. The cornerstone of a viable energy resource management program is the ability to measure the effectiveness of individual energy conservation efforts as a means of evaluating overall program effectiveness. While there is general enthusiasm and awareness of energy programs, further accomplishments in energy conservation could be attained through improvements in accountability.

g. A well-defined requirement for the proponents of various energy program activities of the DA Staff, to account for their efforts on a periodic basis for program review and evaluation, would result in a more effective and vigorous program. Moreover, such information would permit more effective planning and would increase the visibility and awareness of conservation opportunities.

h. Supervision and coordination of the Army Energy Program are based on the quality and periodicity of the data collected. At present, the Army Energy Office relies heavily on DEIS I and II, informal communications, Inspector General reports, Army Audit Agency reports, etc. for the formulation and evaluation of policies and programs. The problems inherent in the coordinating and interrelating of this data mixture hinder the Army Energy Office in its policy formulation, monitoring, and evaluation roles.

i. The heart of any well-run management program is the effective collection and dissemination of information to the proper management levels. A need exists to continuously collect information and analyze it to insure that ideas and projects, initiated by various elements of the DA that result in energy savings, are brought to the attention of the other DA elements. This would reduce duplication of effort and bring successful and unsuccessful conservation efforts to light. An effective information collection and dissemination program would provide:

(1) Greater awareness and visibility.

(2) Reduced duplication of effort.

(3) Increased motivation.

(4) DA-wide accountability for energy actions.

Summary Analysis

The above findings, when taken individually, reflect only the need for programmatic improvements. When taken collectively, the analysis reflects the need for an integrated, systems-oriented approach to the energy-related programs/actions within DA. Such a role should enable the Army Energy Office and DA Staff to effect a significant improvement in the achievement of energy program objectives.

The Army Energy Office, in its present role as the supervisor/coordinator of the Army Energy Program, along with the DA Staff in its supportive role, has achieved, and in many cases exceeded, its original energy program objectives. However, the increasing future importance of energy conservation, the requirements for energy planning and accountability, and the fact that more intensive efforts will be needed to achieve further energy conservation goals point to a need for redirection of the Army Energy Office and DA Staff roles and functions.

CONCLUSIONS

Army Energy Office Roles and Functions

The Army Energy Office, as the principal responsible DA Staff element, should play an active "management directive role" in the planning, direction, and integration of energy-related activities that will insure the optimal use of energy resources within the Department of the Army.

Key to the management of these actions is the necessity for an action plan that will: Provide a framework through which energy goals can be translated to operating procedures, and assure that energy-related activities and concepts are communicated, understood, and coordinated in order to improve the effectiveness of Army energy resource management programs.

a. Program planning and policy

Support of the Army Energy Office in its management role will necessitate the immediate development of an initial program plan that should establish a pattern of energy goals, strategies, and objectives from which policy, program, and budget initiatives will flow. Moreover, the planning function should be continuous; i.e., the plans should be periodically reviewed and updated to reflect changes in the energy resource environment, in top-level policy changes, and in the evaluation of program performance.

b. Coordination

In its management role, the Army Energy Office should function as the overall coordinator of widely dispersed Army energy programs. A synchronization of these programs can be attained through the institution of a structured dialogue with other DA elements based upon the overall energy plan that would:

(1) Integrate other concepts and perspectives into the planning process.

(2) Allow other DA elements to recognize their role in achieving the overall energy program goals.

(3) Facilitate resolution of conflicts and integration of such activities.

c. Standards and criteria

The Army Energy Office should function in the development of energy program standards that establish criteria against which program results can be measured. These standards and criteria should present the energy program planning goals and objectives in such terms that accomplishment of assigned or delegated responsibilities can be established either quantitatively or qualitatively.

d. Monitoring and evaluation

Mechanisms for evaluation and subsequent incremental correction of energy plans and policies require both the measurement of performance (monitoring) and the comparison of measurement with established criteria (evaluation of performance). If the Army Energy Office is to achieve its future objectives, it is imperative that DA, through the Army Energy Office:

(1) Formalize and promulgate energy monitoring and evaluation procedures.

(2) Insure that such procedures are understood and followed at all levels of DA.

(3) Direct the monitoring and evaluation process to achieve maximum energy savings.

e. Training, motivation, and incentives

A key part in the achievement of conservation goals over the long term will be the continuous motivation of all elements within DA down to the small unit level. Such motivation should be achieved primarily through training and information dissemination. Therefore, the Army Energy Office should function as the prime motivator for all DA elements in promulgating training and information dissemination programs on a timely, useful, and regular basis.

As a necessary corollary to functional motivation, further emphasis must be placed on both positive and negative incentives that recognize the importance of the individual soldier and his leaders in achieving energy goals.

DA Staff Roles and Functions

The following are conclusions concerning DA Staff roles and functions.

a. Overall DA Staff role

The primary role of the DA Staff elements should be to develop, promulgate, and manage those elements of the Army Energy Program that are within their respective areas under the guidance, direction, and supervision of the Army Energy Office. An Army "action plan" is central to achieving a more viable energy management program. The following defines the required DA Staff functional involvement in the energy program planning process.

b. DA Staff planning functions

To develop and periodically update an energy plan, it is necessary that all actions, activities, and programs related to energy management and conservation be clearly delineated. In order to accomplish this, each DA Staff element must closely examine its area of responsibility and its on-going programs to identify its relationship to energy matters. This examination would clearly indicate the energy-related actions that have been accomplished within the currently available resources for all DA Staff elements.

It is recognized that resource constraints limit each Staff element's ability to provide in-depth participation in the Army Energy Program. It is for this reason that it is necessary to develop realistic short- and long-range objectives as well as to develop a clear picture of how energy-related actions are integrated both laterally and vertically throughout DA. This information should be used in the planning process, both to avoid unnecessary overlap in the development of energy programs and to minimize the cost of overall program integration and implementation.

In the planning process, the energy-related measures undertaken must be compared against existing objectives and requirements. The resulting variations must be analyzed and appropriate adjustments or corrective actions undertaken. An objective of this process is to avoid the necessity for major program overhauls now or in the future. Further, the plan should reduce the number of separate actions and activities that must be developed or maintained.

While no mention is made at this time of the major Army commands' involvement in this planning process, their input is obviously vital and will be required. Major commands will be addressed in section IV of this report.

c. Training, motivation, and incentives functions

All elements of the DA Staff should function in the development of incentives that motivate Army personnel either to conserve energy directly, or to participate actively in the pursuit of further energy resource conservation goals. The accumulation of many small successes produced by incentives can result in making a large measure of progress toward more effective energy resource use. For example, inclusion of energy conservation as a rated area on personnel efficiency reports might be ineffective over a period of time. However, guidance for raters, which suggests recognizing noteworthy energy conservation contributions by rated personnel in the narrative section of the report, would, almost certainly, motivate recipients of such praise to further their efforts. Conducting training seminars on energy is another example that can be used to solicit good ideas for incentives and the means for conserving energy. These examples pertain to personnel management and training policy. However, all DA Staff elements have broad influence on the people, activities, and materiel in their areas of expertise, and they should be able to develop positive tools that promulgate energy conservation programs.

d. Information requirements and dissemination function

Each DA Staff element should function in measuring the effectiveness of its energy conservation programs and in transmitting pertinent data to the Army Energy Office which has the responsibility for overall management of the Energy Program. While it is recognized that such information is periodically required in the overall planning process, this continuous evaluation enables each DA Staff element to make its contributions to the overall program a matter of record.

When properly implemented, program effectiveness feedback will enhance energy program management. It will also enable DA, as a whole, to be accountable for the responsiveness and effectiveness of its energy program, and to spread an awareness of the Army Energy Program and its accomplishments internally and externally.

e. Other DA Staff functions

The functions of the DA Staff, as delineated in AR 11-27, generally include most of the required areas of energy concern. In many cases, however, these functions are neither sufficiently defined nor specific enough to allow for clear identification of the responsibilities necessary for a more integrated energy program.

Section V of this study recommends changes to regulations and publications in order to clarify or make additions to those responsibilities.

SECTION III. ORGANIZATION FOR ENERGY MANAGEMENT, HQDA

PRESENT ORGANIZATION

Currently, the Army Energy Office is located in the Directorate for Transportation, Energy, and Troop Support (DTRETS) under the Deputy Chief of Staff for Logistics (DCSLOG). All Army Staff elements are required to have a designated point of contact within each agency to provide for coordination with the Army Energy Office and to expedite energy actions. An Advisory Group on Energy exists to provide a forum for and develop recommendations on energy matters. Membership consists of a principal and alternate from the following Department of the Army (DA) Staff elements.

a. Army Energy Office, DTRETS, Office of DCSLOG (Chairman and Secretariat).

b. Office, Deputy Chief of Staff for Operations and Plans (ODCSOPS).

c. Office, Deputy Chief of Staff for Personnel (ODCSPER).

d. Office, Deputy Chief of Staff for Research, Development, and Acquisition (ODCSRDA).

e. Office, Chief of Engineers (OCE).

f. Office of The Surgeon General (OTSG).

g. Office, Comptroller of the Army (OCA).

h. Office, Chief of Public Affairs (OCPA).

i. Office of the Chief, National Guard Bureau (OCNGB).

The minimum specified rank is lieutenant colonel or civilian equivalent. A special assistant to the Secretary of the Army is located in the Office of the Deputy Under Secretary of the Army for Operations Research.

ALTERNATIVE ORGANIZATIONAL STRUCTURES

After consideration of the conclusions in section II, which concern areas requiring improvement in the energy program and the necessary roles and functions for the Army Energy Office and DA Staff elements, a number of alternative organizational structures were developed. From these, a total of five were selected for analysis and are listed below. The advantages and disadvantages of these organizational structures were determined according to the following criteria: visibility, coordination, available expertise, continuity of current operations, required resources, and authority. It is considered that, for each alternative, the Advisory Group on Energy should be retained as a necessary forum for discussion, and to facilitate decisions and coordination.

a. Alternative 1: Energy Office retained in DTRETS under DCSLOG (Figure III-1.)

The Army Energy Office would remain in DTRETS under DCSLOG. Its roles and functions would serve to provide increased focus, emphasis, and thrust to the Army Energy Office and DA Staff responsibilities and capabilities as previously described.

(1) Advantages.

(a) Facilitates continuation of existing programed efforts.

(b) Facilitates full utilization of established procedures and coordination channels.

(c) Not necessary to rejustify program emphasis and priorities.

(d) Benefits of existing learning curve are totally retained.

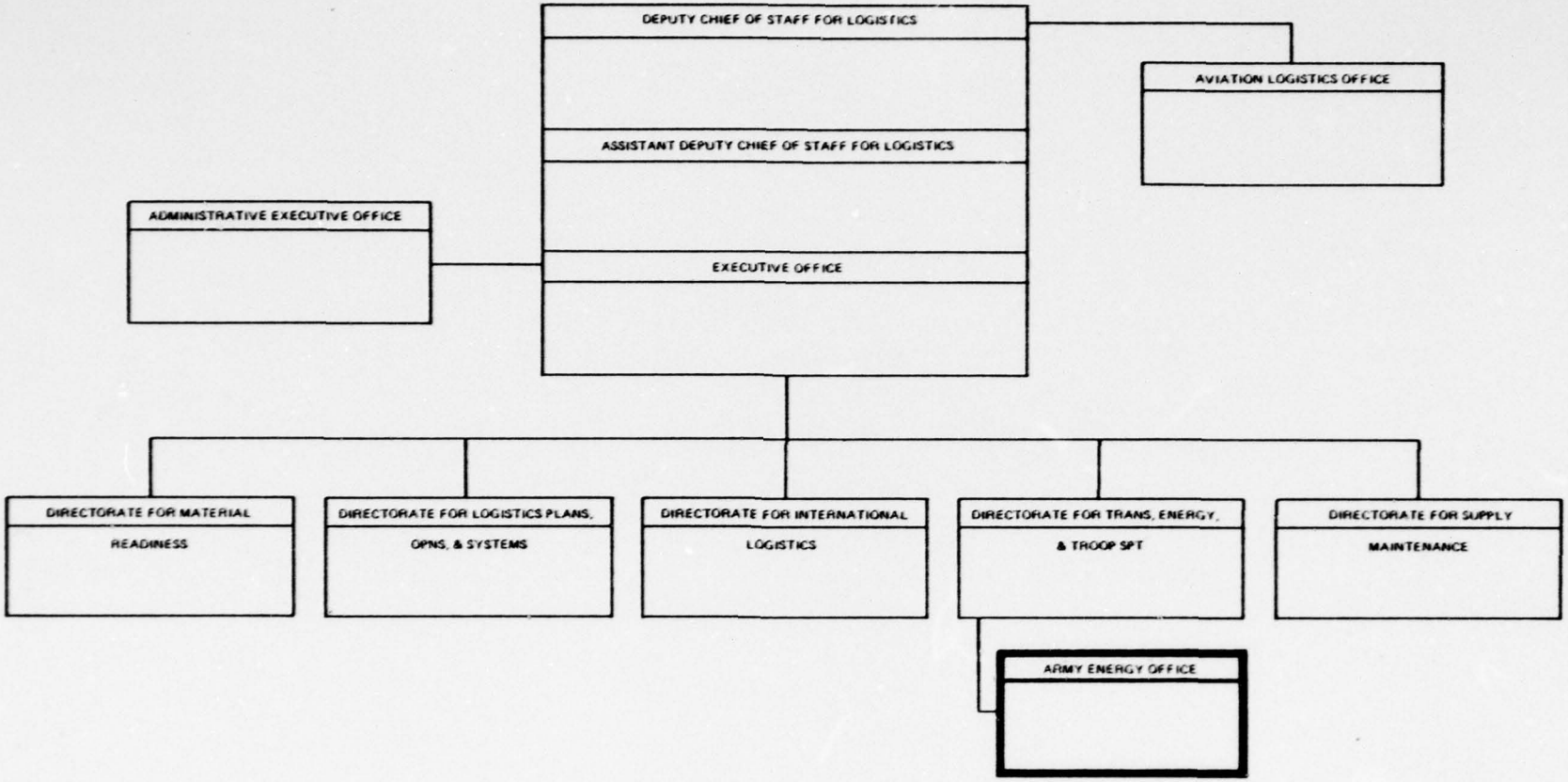


Figure III-1. Alternative Organizaiton 1

(e) Requires minimal increase in resources.

(f) Retains existing energy expertise.

(2) Disadvantages.

(a) Does not provide for increased program visibility or authority.

(b) Requires some duplication of effort in the facilities portion of the energy program.

b. Alternative 2: Create DCSLOG Directorate for Energy (Figure III-2.)

This alternative would place overall responsibility for the management of the Army Energy Program with a newly formed Directorate for Energy in DCSLOG. Other DA Staff elements would retain functions previously identified. All current DCSLOG energy-related responsibilities would be assumed by the Energy Directorate.

(1) Advantages.

(a) Provides some increase in program visibility.

(b) Reflects an increased emphasis on energy programs in DA.

(c) Provides for direct access to the DCSLOG.

(d) Enables total concentration of energy expertise on energy programs.

(2) Disadvantages.

(a) Creates a temporary disruption to the present energy program during reorganization.

(b) Requires some duplication of effort in the facilities portion of the energy program.

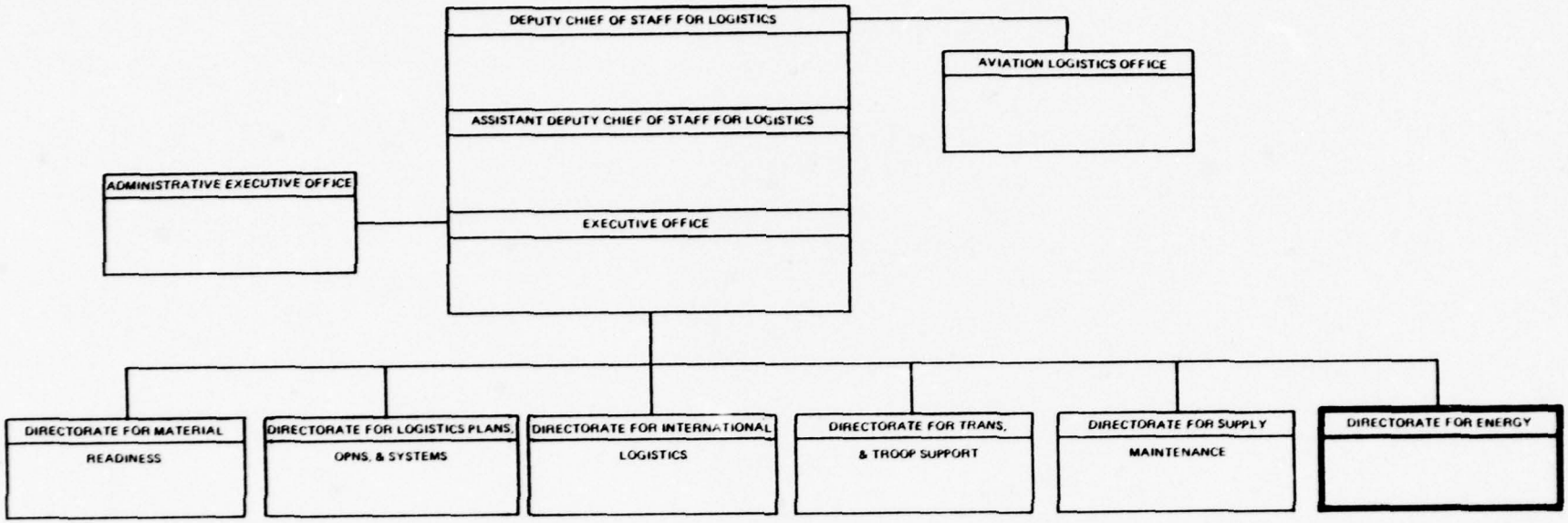


Figure III-2. Alternative Organization 2

(c) Requires substantial increase in resources, particularly in administrative support.

(d) Would not conform to DA Staff management guidance for size and composition of a directorate organization.

(e) Increases span of control for DCSLOG.

c. Alternative 3: Create Energy Office as a Special Assistant to the DCSLOG (Figure III-3.)

The Energy Office would be directly responsible to the DCSLOG. Its current staff and functions would be retained. Other DA Staff agencies would retain previously identified functions.

(1) Advantages.

(a) Provides some increase in visibility of the energy program.

(b) Provides for direct access to the DCSLOG.

(c) Reflects increased emphasis on energy in DA.

(2) Disadvantages.

(a) Requires additional resources primarily for administrative support.

(b) Requires establishment of some new regulations and procedures.

(c) Requires some duplication of effort in the facilities portion of the energy program.

(d) Separates petroleum mobility activities from the directorate responsible for transportation and troop support.

(e) Increases span of control for DCSLOG.

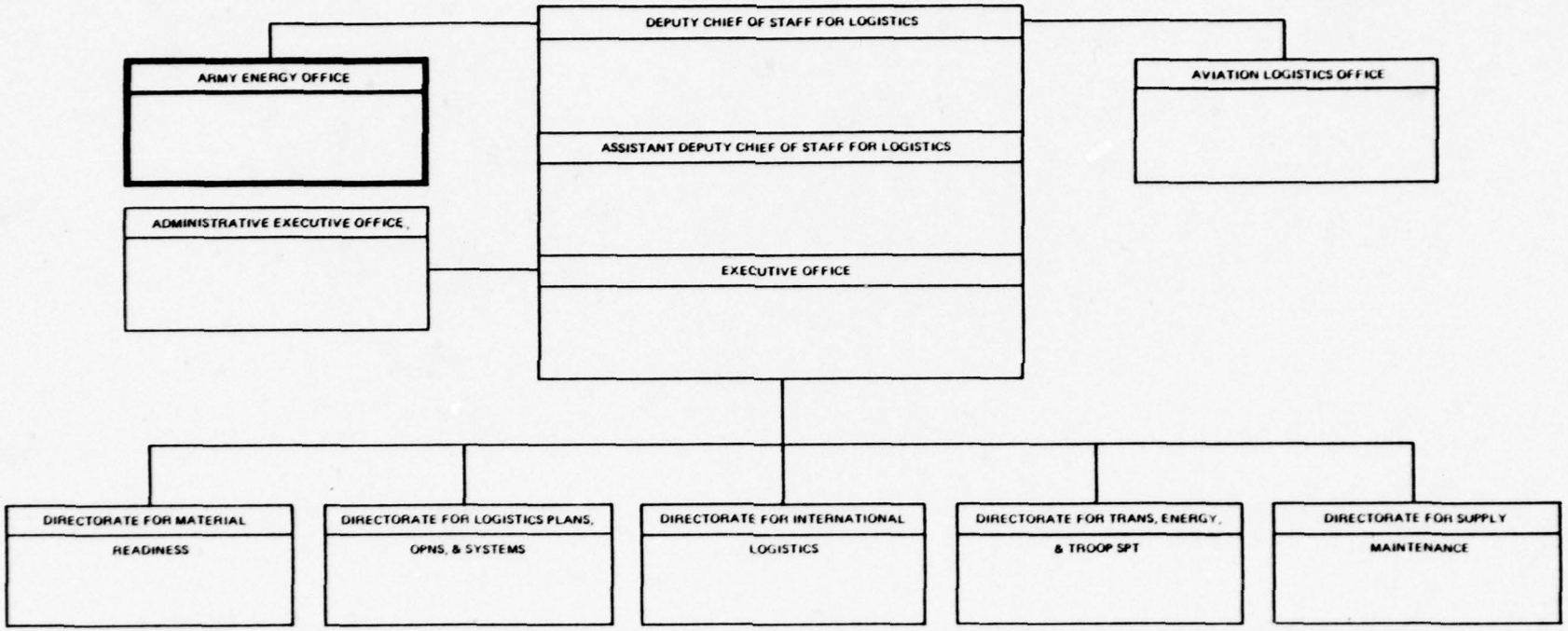


Figure III-3. Alternative Organization 3

d. Alternative 4: Create Army Energy Office under OCE (Figure III-4.)

This alternative would place overall responsibility for the management of the Army Energy Program with OCE. Other DA Staff responsibilities would follow the functional requirements previously identified in this report. DCSLOG would retain responsibility for mobility petroleum resources and would respond to OCE as would all other DA Staff elements.

(1) Advantages.

(a) Places organization under COE who already has responsibility for the management of the installations and utilities elements of the energy program which consume 84 percent of Army energy.

(b) Takes maximum advantage of OCE staff of facilities engineers with technical expertise in energy and related matters; emphasizes the facilities element of the energy program.

(2) Disadvantages.

(a) Defies tradition and HQDA policy of not assigning broad ranging programs that affect all general Staff agencies to a special Staff agency.

(b) Tends to reduce visibility and awareness of the energy program.

(c) Requires duplication of effort in petroleum-related mobility areas.

(d) Disrupts current programs temporarily.

(e) Requires establishment of new procedures and coordination channels.

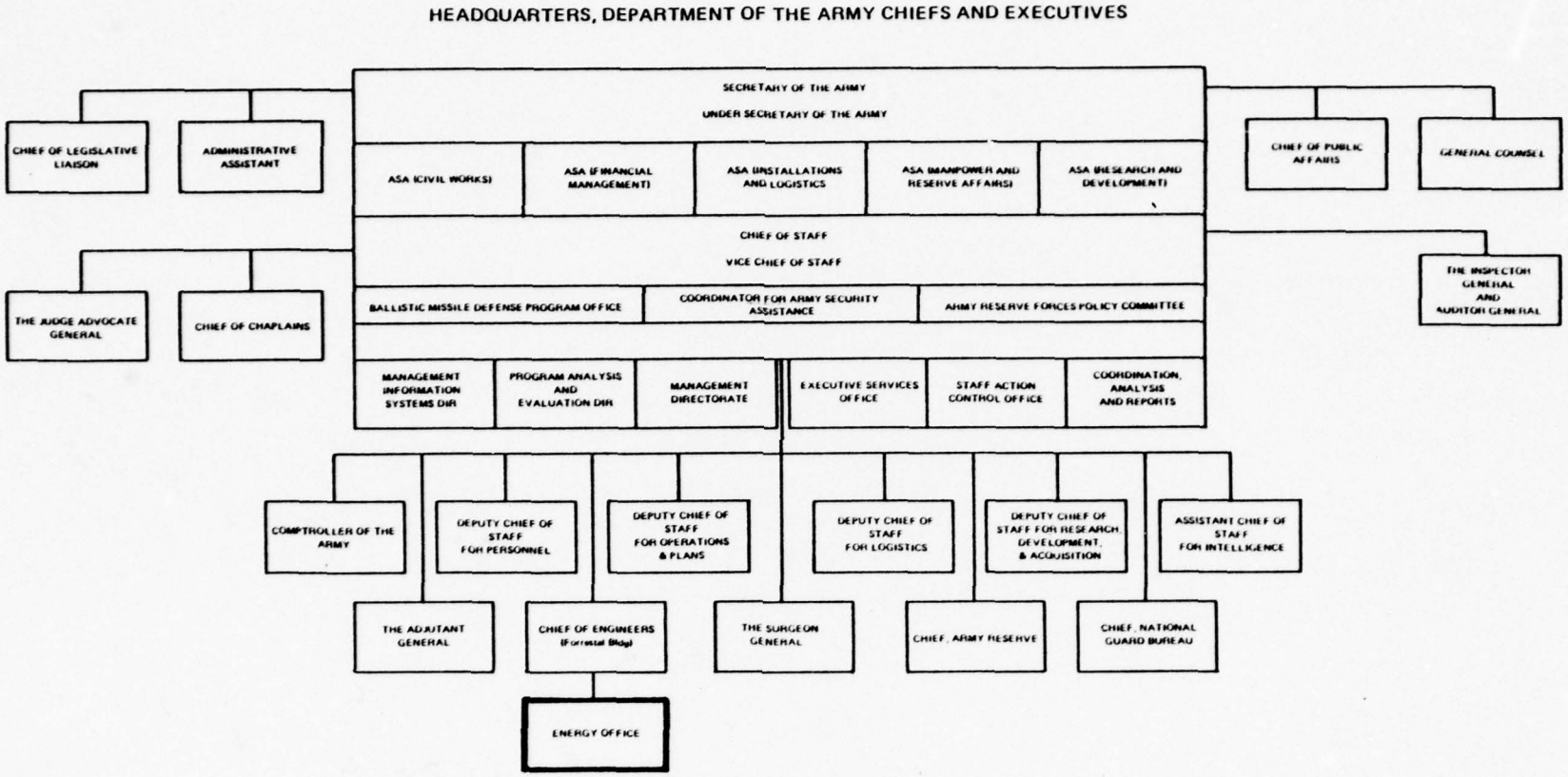


Figure III-4. Alternative Organization 4

(f) Increases coordination problems due to location outside of the Pentagon.

e. Alternative 5: Create Energy Office at the Chief of Staff Level (Figure III-5.)

Under this alternative, the Energy Office would be located within the Office of the Chief of Staff. In this case, DCSLOG would retain the petroleum management functions and COE would retain the facilities engineering functions.

(1) Advantages.

(a) Provides increase in visibility of the energy program.

(b) Provides direct authority of the Chief of Staff.

(c) Reflects increased emphasis on energy within DA.

(d) Offers potential improvement in priorities of energy-related actions.

(2) Disadvantages.

(a) Creates an operational element within the Office of the Chief of Staff not considered appropriate to that staff level.

(b) Creates an additional office under the Chief of Staff.

(c) Temporarily disrupts the continuity of the existing energy program.

(d) Requires substantial increases in resources, particularly in administrative support.

(e) Requires duplication of effort and resources in both the petroleum and facilities portion of the energy program.

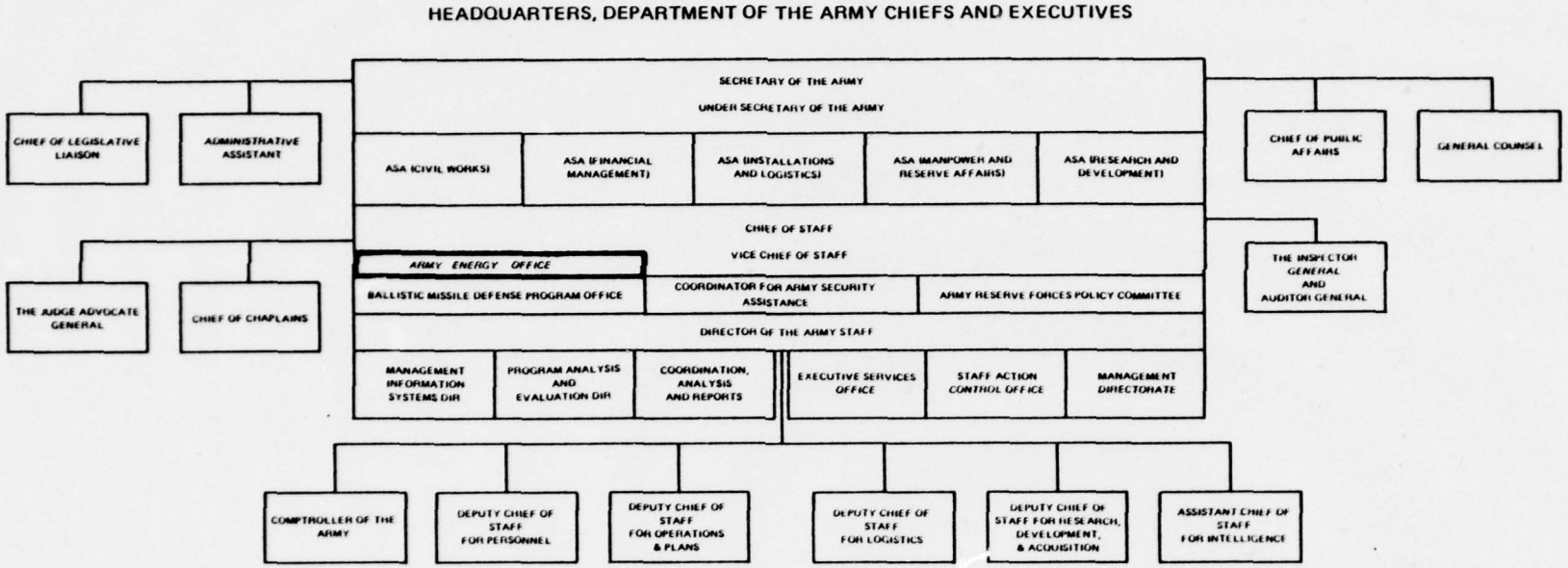


Figure III-5. Alternative Organization 5

ANALYSIS OF ALTERNATIVES

The following is an analysis of the alternative organizational structures for energy management.

a. Visibility.

Generally speaking, the higher the level of organization, the higher the visibility. Accordingly, alternative 5 would result in the highest visibility and alternative 4, in a special staff section, the least. Alternatives 2 and 3 offer only a slight increase in visibility over alternative 1, the status quo.

b. Coordination

Organizational placement within DCSLOG does not appear to have a significant effect on ability to coordinate the energy program. It is considered that alternative 4 would encounter the greatest problems in coordination and alternative 5 the least.

c. Available Expertise

The availability of required technical expertise in energy management is highest in alternative 1, closely followed by alternatives 2 and 3, and lowest in alternative 5. Alternative 4 (COE), while having facilities/utilities expertise, lacks both expertise and authority in petroleum mobility and operations matters.

d. Continuity of Operations

Continuity of current operations would be highest with alternative 1. Disruptions of current operations would occur to the greatest extent in alternatives 4 and 5 and to a lesser extent in alternatives 2 and 3. Considerably more effort would be necessary to establish an entire directorate as opposed to a separate office. Alternative 4 would require

major adjustment and changes both in channels of coordination and in procedures while alternative 5 would require a lesser degree of adjustment and change.

e. Required Resources

The establishment of a separate office or directorate organization would involve some duplication of technical expertise and substantial duplication of administrative and overhead personnel. Under alternatives 2, 3, and 4, the existing petroleum or facilities engineering expertise would be retained under DCSLOG and COE. This minimizes the requirement for additional technical resources. Alternative 5 would require the greatest duplication of technical expertise. In light of the current restrictions on personnel staffing and hiring and the current trend toward reducing the DA Staff, the increased resources required by alternatives 2 through 5 mitigate against their adoption at this time unless their individual or collective advantages cannot be achieved by other means. Moreover, the Advisory Group on Energy/ Study Advisory Group for this study has provided guidance indicating that there is a real probability that additional personnel resources would not be forthcoming.

f. Authority

A key factor in considering the alternatives is whether the energy program will obtain the benefits of increased authority. Alternative 5 offers the most authority. Little differentiation in authority would exist among alternatives 1, 2, and 3 since the basic authority would stem from the DCSLOG. Alternative 4, as a special Staff element, provides the least authority. In addition, alternative 4 would involve assigning general Staff responsibilities and authority to a special Staff element.

g. Conclusions

Under current resource restrictions, the above analyses effectively eliminate all alternatives except for alternative 1, which is the status quo. The question arises: What options are available to alleviate the problems associated with somewhat lower visibility and authority at that level?

The Advisory Group on Energy could serve to alleviate low visibility if it were reconstituted as a general officer level group. It is considered that the logical choice for the chairmanship of the general officer level Advisory Group on Energy would be the Director of Transportation, Energy, and Troop Support. This would tend to reinforce and increase the authority of the Chief of the Army Energy Office since the Director, DTRETS is his immediate supervior in the chain of command.

Increased authority will also result from the changes to the Army Energy Office functions previously concluded to be necessary. Alternative 1, as revised, when considered in conjunction with the general officer level Advisory Group on Energy, would serve to provide a sharper focus, higher visibility, and more authority to the energy program. Through these means, the objectives of the Army Energy Program can be accomplished with the least requirement for additional resources.

SECTION IV. FUNCTIONS AND ORGANIZATION OF MAJOR COMMANDS

FUNCTIONS OF MAJOR COMMANDS

Regulatory Functions

In order to identify and evaluate the major commands' organizations, functions, and interfaces with the Headquarters, Department of the Army, it was necessary to establish their currently assigned responsibilities. AR 11-27 states that commanders are responsible for:

a. Optimizing efficiency in utilization of command resources.

b. Initiating command energy programs in support of the objectives stated in this regulation.

c. Assuring the validity and timeliness of energy data required or requested by higher authority.

d. Designating an activity responsible for coordinating all energy matters (to battalion level). This will be accomplished within presently approved personnel ceilings.

e. Maintaining liaison and cooperation with local representatives of Federal, state, and other local energy offices.

f. Developing and maintaining plans for dealing with potential energy shortages at individual installations.

Command Implementation

Based upon the limited information available from the eight commands surveyed, it was apparent that all commands had initiated command energy programs in support of AR 11-27 (function b). There appeared to be some variations in the degree of program formality among the various commands. All programs appeared to have as their objectives, the optimizing of effi-

ciency in the utilization of command resources (function a). All had designated an activity to coordinate energy matters (function d). These varied from assignment of responsibility to an energy council in United States Army, Europe (USAREUR), chaired by the Chief of Staff, to assignment of officers in other commands, and finally, in DARCOM and FORSCOM, to one or more full-time individuals.

With respect to function c, concerning the validity and timeliness of energy data required by DA or DOD, there appeared to be some problems. While data was provided through the Defense Energy Information Systems (DEIS) I and II reports, there was considerable evidence that the data could not be relied upon for complete accuracy. In some instances, the data provided to UII was at variance with that provided in the DEIS reports. Also, there was insufficient available information to assess either the existence or effectiveness of other management information. An effective evaluation program is dependent upon valid management information. This functional area appeared to be weak.

Inadequate information was available to UII on the implementation of functions e and f with respect to liaison and cooperation with other energy offices and to the developing and maintaining of plans for dealing with potential energy problems at subordinate installations.

Another key observation in the functions area concerned the lack of overall energy plans. It may be recalled that one of the deficiencies identified at the DA level (section II) was the lack of an overall Army Energy Plan. While an overall major command energy plan is implied in order to implement the six functions of AR 11-27, it is not specifically required by the AR. No command advised UII of the existence of a comprehensive energy

plan. A related observation was made that the requirement in function b to "initiate" a command energy program is a somewhat weaker requirement than that of "developing and maintaining an active command energy program."

Conclusions

From data available from the major commands survey, it was the overall assessment of UII that the functions currently assigned by DA were generally being performed.

The lack of overall Army and command energy plans, as road maps for command efforts and direction, appeared to be a significant impediment to further progress. The absence of such plans, coupled with the lack of adequate management information and reporting systems to pinpoint problem areas and enable concentration on solutions, serves to perpetuate existing conditions. Both command energy plans and management information and reporting systems are definitely required.

SUMMARY OF MAJOR COMMAND FINDINGS

General

Eight of the major Army commands, including the three principal overseas commands, were contacted through correspondence, personal visits, or telephone to obtain information concerning their energy conservation programs. The following information was sought: the organization of the energy conservation activity, its programs, results achieved, constraints placed on achieving desired results, coordination affected, and what additional assistance they were seeking from the Army Energy Office. Each of these areas will be addressed in turn. A synopsis of the major command responses can be found in appendix E.

Organization of the Energy Conservation Activity

Two of the commands contacted, USAREUR and U.S. Army, Korea (US Korea), indicated that their programs were coordinated principally by energy conservation control groups or management councils. In USAREUR, the council is chaired by the Chief of Staff. In US Eighth Army Korea, the G-4 exercises the primary responsibility. US Army, Japan (USARJ) and US Army Training and Doctrine Command (TRADOC) have assigned a petroleum officer in the respective G-4 and DCSLOG offices to serve part-time as an energy conservation coordinator. In the case of Military District of Washington (MDW) and US Army Intelligence and Security Command (INSCOM), a civilian in the facilities engineering area has been assigned part-time duty as an energy conservation coordinator. In INSCOM, the facilities engineer is under the DCSLOG (figure IV-1); in MDW the coordinator is under the engineer (figure IV-2). In addition, MDW has an executive-level energy council that meets informally once each month. In these two commands, the amount of energy consumed in facilities may be as

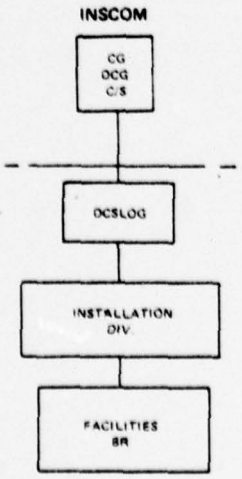


Figure IV-1

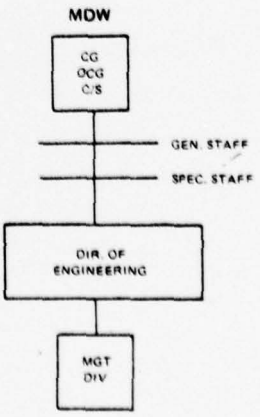


Figure IV-2

much as 96 percent of their total consumption. DARCOM has assigned one military officer in the Engineer Division of the Installation and Services Directorate to serve full-time as the energy conservation coordinator (figure IV-3). On the other hand, FORSCOM has an energy office consisting of four, full-time civilian personnel: three professionals and one clerical. It is located in the Services and Energy Division under the DCSLOG (figure IV-4).

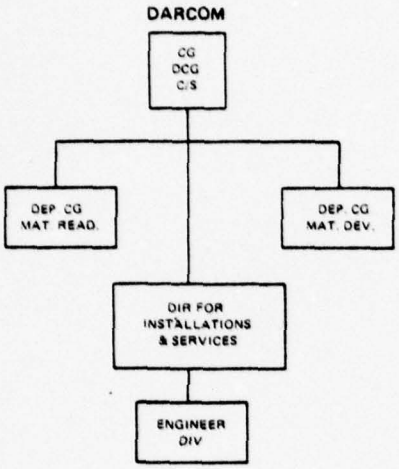


Figure IV-3

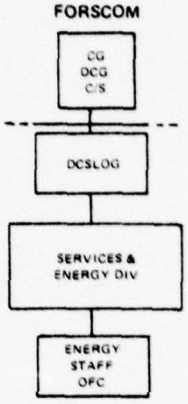


Figure IV-4

In the majority of the commands, the overall responsibility rests with the individual responsible for supply, installations, and services. Variations occurred in the commands depending upon how each command saw fit to discharge its responsibilities.

Programs

All commands indicated that the policies and measures outlined in AR 11-27 and other DA and DOD directives had been implemented in their commands. Of particular interest were the "Voluntary Energyless Wednesdays" of USAREUR, the objective of a 15 percent reduction of FY 73 energy consumption in MDW, and the program of providing thermograph surveys of all facilities in INSCOM

in order to identify and pinpoint energy losses. USAREUR appeared to have a very active public information/consumer education program. MDW is particularly active in publishing energy conservation articles in local newspapers. In addition, special cover plates for light switches with a small thermometer attached are being installed at MDW installations. At Fort Belvoir, a FORSCOM installation, a children's energy poster contest is planned to increase awareness from the "bottom up."

Results Achieved

The majority of the commands stated that they had an effective program. In some instances, savings in Btu's consumed were cited. In other instances, percentages savings achieved during FY 76 versus FY 75 were provided. In the case of two commands which provided consumption figures in Btu's (USAREUR and INSCOM), the percentage savings provided to UII bore little correlation with figures available in the Army Energy Office compiled from the DEIS reports submitted by those commands. In only one instance were actual dollar savings or cost avoidance figures cited ($14 million for USAREUR). From this evidence and other comments, it was apparent that the Army's data base for achieved results is suspect. It is understood that efforts are underway to obtain precise quarterly consumption data from all commands in order to purify the data base.

Program Constraints

The most frequently cited constraint to achieving greater conservation was the lack of funds, particularly Military Construction Army (MCA) funds. It was repititious of the old adage that it takes money to make money. For example, on one installation in MDW, opening the commissary and post exchange on Saturday requires heating the entire installation because of an old central

heating system. In order to save the energy required to heat the rest of the installation, it would be necessary to replace or substantially modify the existing heating system. This would require additional funds which are not currently programed or available. A corresponding complaint concerned the tedious and lengthy procedures required to process MCA and Energy Conservation Investment Program projects.

Another constraint cited was the lack of manpower to develop programs, publicize them, and check on compliance with announced policies and directives. The lack of energy consumption standards for construction was cited as impacting on overall conservation efforts; e.g., efforts to lower construction costs may have an adverse impact on energy consumption.

Although not cited, it is believed that the fact that environmental protection issues have had priority over energy conservation issues may have been an additional constraint.

Coordination

All of the commands contacted stated that close coordination was effected among the staff elements responsible for various portions of the energy conservation program. In several commands, the location of facilities and petroleum activities in close proximity was cited as facilitating closer coordination.

The fact that the DCSLOG, or G-4, in addition to being responsible for both facilities and petroleum, has the overall responsibility for the energy conservation program in seven of the eight commands surveyed also tends to encourage and insure coordination. The use of energy councils, committees, or advisory groups in four of the eight commands, is believed to offer additional encouragement to necessary coordination of energy matters.

Assistance Desired From the Army Energy Office

Several commands expressed the desire for the Army Energy Office's assistance in stablizing policies and procedures. A need for amortizing energy conserving construction projects over 10 or 15 years rather than 6 years was stated by both FORSCOM and MDW. A requirement for more specific policy guidance was indicated. Several commands identified a requirement for long-range energy conservation goals as contrasted to a single-year, zero-growth objective.

The need for more specific short- and long-range objectives or, in brief, a comprehensive energy plan was cited by several commands. This need was coupled with requirements for a statement or ranking of priorities for those objectives.

Most of the commands indicated that a more effective information dissemination program was needed. Several commands expanded this to include requirements for training program information, career programs, and more effective incentive programs. A desire was stated for more information on what other commands and other services are doing to conserve energy.

Several commands suggested a more active role for the Army Energy Office in working with DOD in the following areas:

a. Sponsoring legislation to permit a 10-hour-per-day, 4-day work week.

b. Incorporating energy consumption criteria in construction standards.

c. Reinstating the Energy Conservation Investment Program to an amortization period of 15 years rather than the current amortization requirement of 6 years.

ANALYSIS OF ENERGY ORGANIZATION WITHIN MAJOR COMMANDS

Energy Organization Standardization

It does not appear appropriate to the role of the major commander for DA to specify the precise organization for energy within that command. The differences in mission, size, and location of the commands all mitigate against the requirement for a standard energy organization. The additional fact that DA has decreed that the major command energy program will be accomplished within existing resources further restricts DA from requiring a standard energy organization for all major commands, or specifying an organization for individual commands. For the above reasons, a standard organization for energy at the major command level is not considered to be appropriate, or feasible. On the other hand, a discussion of some of the organizational alternatives and their advantages and disadvantages will be offered for consideration.

Energy in its various forms is considered to be a significant materiel resource. Accordingly, it is considered entirely appropriate that overall direction of the energy program be placed under the staff officer primarily responsible for materiel resource management. That officer is normally the G-4 or DCSLOG of the major command. For this reason, and the fact that other options were not encountered in the major commands surveyed, alternatives for placing the energy entity under other organizational activities were not considered.

The four organizational alternatives for energy found in the major commands surveyed offer a wide choice. These alternatives were considered to be the most appropriate alternatives and will be discussed accordingly.

a. Councils or committees.

b. Petroleum-oriented activity has primary responsibility.

c. Facilities-oriented activity has primary responsibility.

d. Separate full-time activity.

Councils or Committees

The principal advantages of a committee or council are that it normally includes representation from all activities, it facilitates coordination, and it requires the least in terms of resources. In addition, visibility of the energy program would be high, especially if it were an executive committee or council. Executive participation would also indicate close proximity to the point of decisionmaking and would facilitate response to crisis. The committee or council would be a decentralized approach. In order to gain the benefits inherent in decentralization, however, executive committee/council members would have to task energy matters to operating levels within their respective activities. If such were the case, targeting of energy saving opportunities would be facilitated throughout the command.

On the other hand, its disadvantages include: difficulty in fixing responsibility, more difficulty in development of an overall plan, and permitting all members to be subjected to higher priorities due to their primary mission. A strong chairman with adequate authority, command emphasis, and necessary staff and clerical assistance would be able to minimize many of the disadvantages.

Petroleum-Oriented Activity

The petroleum-oriented activity offers the inherent advantage of technical expertise in petroleum products. It also provides for fixing responsibility

and is economical in terms of personnel resources. Its disadvantages are that: it does not facilitate coordination, it may not provide adequate technical expertise in the solid fuel, electrical, and steam energy fields, and the petroleum operational mission will normally receive priority. Also, program visibility and emphasis are not enhanced. If the petroleum-oriented energy officer chairs a command energy council or committee and has available to him the necessary authority and staff, many of the disadvantages are minimized.

Facilities-Oriented Activity

A facilities-oriented activity offers the obvious advantage of technical expertise in the energy fields, which may represent up to 96 percent of the energy consumed in some commands. Additionally, it fixes responsibility and makes economical use of resources. Similar to the petroleum-oriented activity, it suffers related disadvantages. Namely, it does not facilitate coordination, it may not provide adequate technical expertise in the petroleum energy field, program visibility and emphasis are not enhanced, and the facilities mission will normally take priority. As in the petroleum-oriented activity, if the facilities-oriented energy officer chairs a command energy council or committee and has available the necessary authority and staff, many of the disadvantages are minimized.

Separate Full-Time Activity

A separate activity staffed with full-time personnel offers the advantages of giving energy the highest priority, devoting full time to energy matters, fixing responsibility, and facilitating development and monitorship of an overall energy program. On the other hand, it may require some dupli-

cation of skills in staffing, it may require more dedicated resources, and it may involve more coordination.

The placement of this office organizationally, whether in the petroleum facilities, or a separate area, would be dictated by the circumstances within the individual command. This alternative would appear to provide the best overall management vehicle, particularly in conjunction with chairing a command energy council or committee, when a cost benefit analysis justifies the resource expenditure. DARCOM's and FORSCOM's energy offices, although minimally staffed, were the only major commands surveyed with this type of organization.

Functional Area

In the functional area, major deficiencies were identified in the energy planning and energy data areas. Accordingly, it was concluded that AR 11-27 should be amended to require the following of major commands:

a. Develop and maintain, on a current basis, an overall comprehensive energy plan. This plan should establish the objectives, functions, and responsibilities for the overall energy program. A copy of the plan should be provided to the Army Energy Office for information, review, and extraction of any unique or innovative ideas which could be of benefit within the Army or DOD.

b. Develop and maintain an active command energy program. This requirement would be in lieu of the present requirement to initiate a command energy program.

c. Develop and maintain a viable management information program. This requirement would be in lieu of the present requirement of merely assuring the validity and timeliness of energy data for higher authority.

It is not believed possible to manage an energy conservation program without adequate data on present, past, and forecasted consumption.

CONCLUSIONS

With respect to major command energy organization, it is concluded that:

a. In view of the differences in mission, size, and location of the various commands and their resulting energy requirement, a standard organization for the energy activity at the major command level is not feasible. DA directs that energy programs be accommodated within existing resources, and major commanders are traditionally permitted great latitude in organizing their commands to accomplish the assigned mission. These two conditions make it inappropriate for DA to dictate the organization for energy at the major command level.

b. While a standard organization is not recommended, there are certain organization-related characteristics that appear more viable and effective than others.

(1) Since energy is a key resource, the assignment of the energy program to the individual primarily responsible for materiel resources management in the major command is considered desirable. In most instances, this would be the DCSLOG or G-4. Since he most often supervises both mobility petroleum and facilities areas, this facilitates overall coordination and direction.

(2) The use of a command energy council or committee facilitates coordination, dissemination of information, and cross-fertilization of ideas. When that council is chaired by the senior member of the functional activity, the DCSLOG or G-4, or as in the case of USAREUR, the Chief of Staff, it lends more command emphasis, visibility, and authority to the council and the program.

(3) The decision as to whether the facilities or the petroleum functional area should carry the lead in the energy program depends upon the circumstances within the individual command. In commands such as MDW and INSCOM, where facilities represent 96 percent of the energy consumption, there is a clearcut advantage to having the activity responsible for the facilities functional area carry the lead. In other commands, where the consumption breakout is different, other considerations may dictate the decision. The workload and degree of energy management/conservation expertise available within a particular command must be considered.

(4) The choice of whether the energy program activity is manned by full-time or part-time personnel is dictated by some of the same considerations as the decision to organize around the facilities or petroleum activity. Full-time personnel are needed in order to eliminate the disadvantage of priorities competing for time. Part-time personnel tend to become fire fighters and fire prevention specialists, not program managers. If the energy program is to prosper, it needs to be monitored on a continuous basis. Full-time personnel would permit a greater degree of specialization in energy conservation matters.

SECTION V. REQUIRED CHANGES TO REGULATIONS

OVERALL ARMY ENERGY OFFICE ROLE

In conclusions concerning the Army Energy Office role, section II indicates that the Army Energy Office, as the principal responsible Department of the Army (DA) Staff element, should play an active "management directive role" in the Army Energy Program. It is further concluded that DA staff elements should work under the guidance and direction of the Army Energy Office. In addition to its current role as supervisor and coordinator of the Army Energy Program, it is concluded that a requirement exists for the Army Energy Office to play a stronger role by giving DA Staff direction to the energy program. Accordingly, it is recommended that the Army Energy Office functions contained in paragraph 1-6 of AR 11-27 be revised to satisfy this requirement. The proposed wording for the change is reflected in appendix F, paragraph 1-6(1). It is considered that this increased role for the Army Energy Office should be reflected in the Deputy Chief of Staff for Logistics (DCSLOG) responsibilities enumerated in AR 10-5, Organization and Functions, Department of the Army. Therefore, it is proposed that DCSLOG be charged with the responsibilities for planning, directing, and coordinating the Army Energy Program. The proposed wording for this change to AR 10-5 can be found in appendix G, paragraph 2-28a(20). It was recognized in section II that inadequate funding and manpower constrain the effectiveness of the Army Energy Program. Consequently, it was concluded that a more vigorous Army Energy Office management program, together with increased visibility and awareness of the energy program, should improve program effectiveness.

It was concluded in section II that while various individual Army staff and command elements are actively promoting energy conservation programs within their own sphere, they are without the benefit of clear central direction. Because of this, it is concluded that the Army Energy Office must develop and execute an energy conservation program for both operations and installations support. Therefore, it is recommended that Army Energy Office functions delineated in paragraph 1-6 of AR 11-27 be amended to reflect the proposed wording found in appendix F, paragraph 1-6a(5).

ORGANIZATION

Section II determined that implementation of energy-related programs has been somewhat impeded at all DA levels by the low visibility and priority, the limited funding, and the manpower constraints imposed upon those programs. It was further indicated that energy programs have been, in some cases, overlooked or ignored.

The DCSLOG Directorate for Transportation and Services has been redesignated the Directorate for Transportation, Energy, and Troop Support (DTRETS) to more accurately reflect its responsibilities and to give added recognition to its energy mission. While it is too early to assess the impact of this redesignation, it is hoped that the increased visibility, together with more centralized authority, will bring greater awareness of the Army Energy Program, and will lead to improved effectiveness of the Army Energy Office.

Additional means for alleviating problems of limited program visibility, authority, and manpower funding were identified in section IV discussions concerning councils or committees. When participation in such groups is at the general officer level, visibility and thrust of its actions is high. The Advisory Group on Energy is currently at an action officer level; as such, it

carries less weight and affords less visibility to the Army Energy Office and the Army Energy Program than would an executive level council. It is recommended that the Advisory Group on Energy should be constituted as an executive level council. In addition to an executive level, policymaking body, a working group consisting of action officers would be necessary to assist in performing the functions of the policy group. Were the Advisory Group on Energy so constituted, it would, in effect, create greater visibility, awareness, and authority concerning energy programs. Paragraph 7 of AR 11-27 needs to be revised to reflect the above requirements. The recommended wording for these changes to the makeup of the Advisory Group on Energy are found in appendix F, paragraphs 7-1 through 7-4. It is considered that the responsibility for providing the chairman and secretariat of the general officer level Advisory Group on Energy should be added to the responsibilities of DCSLOG in AR 10-5. The recommended changes can be found in appendix G, paragraph 2-28b(6).

While it was recognized in section IV that it would be inappropriate for DA to specify the organization for energy management at major commands, it is concluded that use of executive level energy councils should be encouraged. It is further concluded that major commanders should be encouraged to provide for full-time personnel whenever possible in their respective energy programs. Accordingly, the above requirements should be added to AR 11-27, paragraph 1-6. The recommended wording of this addition is reflected in appendix F, paragraph 1-6j.

Both the redesignation of the DTRETS and the establishment of an executive level Advisory Group on Energy should serve to minimize and alleviate some of the existing problems concerning the visibility and authority of the

Army Energy Office. It is apparent that while organizational solutions do bear relation to these problems, it is primarily incremental adjustments to management practices and procedures that will best serve to further Army Energy Office effectiveness. Additional planning and management information tools are two key elements to that effect and are topics treated later in this section. There appears to be a significant manpower shortage in the Army Energy Office. The duties and responsibilities of that office have expanded significantly since it was established. Current shortages of various sources of energy and the emphasis now being placed on the availability of energy will assuredly result in increased demands being placed upon the Army Energy Office by the Administration, the Department of Defense, and the Army. While a manpower survey was not a part of this study, it was concluded that the personnel staffing of the Army Energy Office would need to be augmented in order to implement the recommendations of this study.

It is envisioned that additional effort and staffing would be required in the following areas:

a. Energy planning, programing, and budgeting.

b. Monitoring energy research and development efforts to include combat development and engineering.

c. Development and operation of an effective management information system to include provisions for evaluation of reports, inspections, and audits.

d. Public affairs to include both command and public information aspects.

In light of the above, it is not considered necessary to alter the current location of the Army Energy Office in the DTRETS. It is considered

essential that the Army Energy Office exercise its authority to the fullest extent to provide the needed thrust for increased program effectiveness.

PLANNING

The findings of this study have indicated that a comprehensive Army Energy Plan does not currently exist either at DA Staff or major Army command (MACOM) levels. It was concluded that there is an immediate need for such a plan since it is considered that the key to the management of the Army Energy Program is an action plan. Section II indicates that an energy plan should be developed so as to better allow all DA elements to recognize their role in achieving present and future goals and objectives in energy resource management and conservation. Conclusions concerning DA Staff roles and functions found that in order to accomplish the development of an energy plan, each DA Staff element must closely examine its area of responsibility and ongoing programs to identify its relationship to energy matters. Responsibility for the development of an energy plan, with the assistance of and in coordination with the Army Staff, is proposed for assignment to the Army Energy Office in AR 11-27. The recommended addition to AR 11-27 is contained in appendix F, paragraph 1-6a(2).

Conclusions in section IV concerning functional responsibilities at major Army commands call for development of energy plans at the MACOM level. In addition, the Army Energy Office should be provided copies of such plans and their periodic updates for information, review, and extraction of unique or innovative ideas that could be of benefit elsewhere within the Army or DOD. It is recommended that these requirements be added to AR 11-27, paragraph 1-6. The proposed wording for this addition is found in appendix F, paragraph 1-6j(2).

POLICY

A section II finding indicated that energy aspects are not being adequately considered in the development and acquisition of Army materiel. While it was recognized that energy considerations are secondary to mission-related considerations, it was concluded that sufficient emphasis is not being placed on energy in research and development (R&D) and acquisition actions. Therefore, it is felt that additional emphasis is required of the Deputy Chief of Staff for Research, Development, and Acquisition (DCSRDA). It was also concluded that energy consumption should be made a specific criterion in the evaluation of concepts for satisfying Army materiel requirements and in all R&D actions including those by DA contractors. It is recommended that DCSRDA functions delineated in AR 11-27, paragraph 1-6, be changed to reflect the above requirements. Exact wording suggested can be found in appendix F, paragraph 1-6d(3). The delineation of the DCSRDA responsibilities contained in AR 10-5 has also been strengthened to reflect this view, which is found in appendix G, paragraph 2-29. As a necessary check, it is recommended that DCSLOC insure that energy considerations in the life cycle management of new items of Army materiel are indeed adequate. This recommendation is reflected in appendix F, paragraph 1-6a(11).

It is recognized that the Army does not have a primary role to play in the R&D of new energy sources and in energy conservation. Nevertheless it can, and indeed does, actively participate in the demonstration of new energy developments in conjunction with other Federal and civilian researchers. Such demonstrations are conducted primarily at installations, and are under the aegis of the Chief of Engineers (COE). Accordingly, it is recommended that this responsibility be assigned to COE. The proposed revision in

appendix F, paragraph 1-6(4), reflects the requirement for such energy research demonstrations. This responsibility should also appear in the appropriate portion of AR 10-5, as recommended in appendix G, paragraph 2-34b(4).

It was concluded that energy considerations must be further woven into the fabric of DA policy so as to provide more visibility for, and a more pervasive application of, energy management principles. The increasing national emphasis on energy accountability dictates that energy conservation and resource management efforts be increased in as many of the areas of DA as reasonably possible. It is therefore recommended that the COE assure that all construction projects are evaluated for their energy requirements and their effects on energy resources; these should include minor military construction Army (MCA) projects which are presently excluded. This recommendation is reflected in the proposed revision to paragraph 1-6f(5), found in appendix F.

To establish a clear delineation of the responsibility for the use of all utility energy resources, it is recommended that this be assigned to COE for fixed installations. It is proposed that DCSLOG retain primary Army staff responsibility for the supply and management of coals and petroleum products as prescribed in paragraph 1-6a(9) of appendix F and AR 703-1, Coal and Petroleum Products Supply and Management Activities. Selected specific management responsibilities in the petroleum area currently assigned to DCSLOG in AR 11-27 are considered to be more appropriate for inclusion in AR 703-1 (appendix H). It is therefore recommended that these responsibilities be consolidated and summarized for incorporation in a revised AR 11-27 as reflected in appendix F, paragraph 1-6a(9).

Additional emphasis in terms of the consistent application of energy management principles that encourage energy conservation down to the small unit level was identified in the section IV conclusions as a necessary energy program policy. It is therefore recommended that the Deputy Chief of Staff for Personnel (DCSPER) incorporate energy conservation considerations and objectives in all personnel-related actions. Examples are individual training, carpooling, clothing standards, and morale activities. These responsibilities are reflected in appendix F, paragraph 1-6e(3).

Requirements for added energy program emphasis, visibility, and exercise of existing authority were identified in section IV as being needed at the MACOM level. Accordingly, it is recommended that the major commands be tasked in AR 11-27 to "develop and maintain" an active energy program as opposed to merely "initiating a command energy program." This is reflected in appendix F, paragraph 1-6j(1).

MANAGEMENT INFORMATION-EVALUATION

Section II conclusions, concerning the monitoring and evaluation of energy programs, indicated it is imperative that the Army Energy Office formalize and promulgate such procedures. Section II conclusions also emphasized the increasing importance of accountability in energy matters. Those conclusions indicate that at present, for management information, the Army Energy Office relies primarily on Defense Energy Information System (DEIS) I and II reports, which are concerned solely with energy consumption data.

In addition, section II conclusions prescribe that each DA Staff element should evaluate their energy programs and provide the Army Energy Office with management information. When properly implemented, a management information and evaluation process will better enable DA to be accountable for the

responsiveness and effectiveness of its energy program. Therefore, it is recommended that, as the principally responsible DA Staff element, the Army Energy Office develop and supervise an effective management information and evaluation element of the Army Energy Program. This recommendation is reflected in a proposed revision to AR 11-27 contained in appendix F, paragraph 1-6i(10).

The cross-feeding of information was identified in section IV as being inadequate at MACOM level. A section IV conclusion indicates the need for development of a command management information program. This requirement would be in lieu of the present requirement of merely assuring the validity and timeliness of energy data for higher authority. It is recommended, therefore, that command level energy program information systems be developed, and that appropriate information be periodically forwarded to the Army Energy Office as part of an overall energy management information program. The proposed addition to the MACOM responsibilities is contained in appendix F, paragraph 1-6j(3).

By instituting recommendations for a formalized management information element of the energy program, as found in appendix F, paragraphs 1-6a(10) and 1-6j(3), reduced duplication of effort, greater program awareness and visibility, and DA-wide accountability for energy actions would result.

INFORMATION DISSEMINATION

Information dissemination was identified as a key element of the energy program in section II in that awareness of energy concerns, conservation techniques, and challenges, now and for the future, are of paramount importance to program implementation and effectiveness. Section IV identified that additional information concerning energy conservation is required by

MACOM's. While a considerable quantity of information concerning energy is available from many sources, it has not been evaluated for its applicability to Army programs. The sheer volume of such information deters its usefulness. A requirement exists for a selection of the most appropriate materials tailored for Army use. Therefore, it is recommended that AR 11-27 assign the responsibility for the development and execution of the command and public information support for the Army Energy Program to the Chief of Public Affairs. The proposed change is contained in appendix F, paragraph 1-6h(1-3). This program should not only distribute, but also should develop information packages that provide for its effective use DA-wide.

COORDINATION

Coordination was repeatedly identified in sections II, III, and IV as essential to the crossfeeding of ideas, synchronization of program efforts, and understanding by all DA elements of their roles and functions in achieving energy goals.

Initiation of a general officer level Advisory Group on Energy serves to provide a consolidated and coordinated approach to energy problems. The immediate development of an overall Army Energy Plan will allow for a greater understanding of what the widely dispersed activities in the Army must do to promote an effective energy program. Formalized energy management information and information dissemination programs are tools that provide the necessary communication for effective coordination. Finally, increased Army-wide motivation in areas that concern energy challenges will be manifested by heightened interest in, and coordination with, those responsible for energy management. All of the above steps should serve to improve overall coordination of, and within, the Army Energy Program.

TRAINING, MOTIVATION, AND INCENTIVES

Section II identified that long-term achievement of the energy program's conservation goals depends on the continuous motivation of all elements within the Army down to the small unit level. Such motivation can be encouraged through appropriate training and information dissemination. Therefore, it is recommended that the Deputy Chief of Staff for Operations and Plans (DCSOPS) insure that unit training serves to indoctrinate personnel in erergy conservation concepts, and that conservation is indeed practiced during training exercises. The recommended revision to the responsibilities assigned to DCSOPS in AR 11-27 are contained in appendix F, paragraph 1-6c(3).

The appreciation of energy problems, challenges, and the training of Army personnel in energy conservation and resource management techniques are other key areas requiring further emphasis. Section IV findings specifically call for additional training and information in order to implement more effective command level energy programs. AR 11-27 should require DCSPER to incorporate energy-related training into the curriculum and training programs of Army schools and training centers. This requirement is reflected in the proposed change contained in appendix F, paragraph 1-6c(1).

Incentives were repeatedly stressed in the execution of the study as an important element for an effective energy program. While DCSPER retains the primary responsibility for emphasizing energy conservation in the incentive awards program, it is recommended that DCSRDA encourage conservation by all research, development, and acquisition contractors. This proposed change is contained in appendix F, paragraph 1-6d(5).

SECTION VI. SUMMARY OF RECOMMENDATIONS

The study recommendations are summarized below.

a. Retain the Army Energy Office within the Directorate of Transportation, Energy, and Troop Support (DTRETS).

b. Establish a general officer level Advisory Group on Energy, chaired by the Director, DTRETS and supported by an action officer level working group.

c. Notwithstanding present constraints on manpower allocate sufficient additional manpower resources, particularly to the Army Energy Office to accomplish the recommendations of this study.

d. Revise the DCSLOG responsibilities contained in AR 11-27 as follows:

(1) Exercise overall Army general staff responsibility for planning, directing, and coordinating the Army Energy Program. (To be contained in AR 10-5 as well.)

(2) Develop, with the assistance of and in coordination with the Army staff, a comprehensive Army Energy Plan. A suggested outline is included in appendix I.

(3) Exercise primary Army staff responsibility over the supply and management of coal and petroleum products as prescribed in AR 703-1. (Transfer six individual petroleum-oriented functions now contained in AR 11-27 to AR 703-1.)

(4) Develop and supervise an effective management information and evaluation element for the Army Energy Program and Plan.

(5) Monitor the consumption of energy in the testing, adoption, and life cycle management of new items of Army materiel.

(6) Insure compatibility between the Army Energy Program and the Army Environmental Program.

e. Revise the DCSOPS responsibilities contained in AR 11-27 as follows: Develop and provide policy guidance which will emphasize that major commanders plan and schedule unit training and exercises within guidelines of the Army Energy Program and that major commanders assure that individual soldiers are trained in, and practice, energy conservation.

f. Revise the DCSRDA responsibilities contained in AR 11-27 as follows:

(1) Promote energy conservation in the development of Army materiel and include energy consumption as a criterion for evaluating alternative concepts for satisfying Army materiel requirements.

(2) Insure that thorough consideration is given to conservation of energy in the development, acquisition, operation, use or disposal of any materiel, and the management of production base support programs. (To be contained in AR 10-5 as well.)

g. Revise the DCSPER responsibilities contained in AR 11-27 as follows:

(1) Insure that an appreciation of the energy problem and training in energy conservation techniques is incorporated in the curriculum and training programs of all schools and training centers.

(2) Incorporate energy conservation considerations and objectives in all personnel-related actions such as individual training, carpooling, clothing standards, and morale activities.

h. Revise the COE responsibilities contained in AR 11-27 as follows:

(1) Conduct a vigorous energy R&D program to develop and/or demonstrate new construction techniques, materiels, and criteria that will further reduce energy requirements and more effectively utilize energy at Army fixed installations. (To also be reflected in AR 10-5.)

(2) Formulate and recommend coordinated DA policy on procurement, supply, and utilization of utility energy resources for fixed installations.

(3) Assure that all construction projects are considered for their energy requirements and impact on energy resources.

(4) Review and recommend approval of major command ECIP projects.

i. Revise the Chief of Public Affairs responsibilities contained in AR 11-27 as follows:

(1) Develop and execute the command and public information support for the Army Energy Plan and Program.

(2) Provide information on the Army Energy Program for use by the news media and the public.

j. Revise the responsibilities of commanders contained in AR 11-27 as follows:

(1) Commanders at all levels down to and including installations are encouraged to establish and use command energy councils or committees to serve as forums for formulating, coordinating, and disseminating energy policy and actions. The use of full-time personnel in the energy program is encouraged where a cost benefit analysis justifies their use.

(2) Develop and maintain an active command energy program.

(3) Develop and maintain, on a current basis, an overall comprehensive energy plan. Major commanders will forward a copy to the Army Energy Office.

(4) Develop and maintain a viable management information program. Submit a quarterly narrative report by the last day of the month following each fiscal quarter outlining significant accomplishments and shortfalls.

(5) Evaluate candidates and recommend projects for ECIP.

k. Develop a systems-oriented approach to the Army's energy challenge.

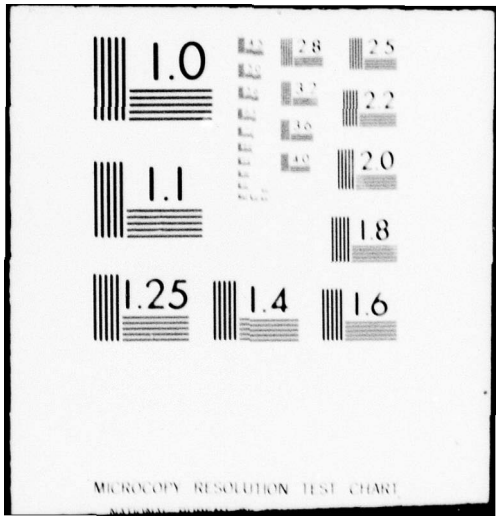
APPENDIX A

CONTRACT SCOPE OF WORK

AD-A057 986 UNIFIED INDUSTRIES INC ALEXANDRIA VA F/G 5/1
ARMY ENERGY MANAGEMENT STUDY.(U)
MAY 77 MDA903-76-C-0392
UNCLASSIFIED NL

2 OF 2
AD
A057 986

END
DATE
FILMED
10-78
DDC


1.0
1.1
1.25
1.4
1.6
2.8
2.5
2.2
2.0
1.8
MICROCOPY RESOLUTION TEST CHART

APPENDIX A

CONTRACT SCOPE OF WORK

Extracts from Defense Supply Service - Washington

Contract MDA 903-76-C-0392, September 27, 1976

F-1. Background.

The purpose of the study is to develop the optimum energy management organization for the Department of the Army. The Defense Planning and Programing Guidance Memorandum (PPGM) of 18 February 1976 requires services to program for continued conservation measures. It also requires programing research and development projects for improving the efficiency of energy consumption. The PPGM requires service program objective memos (POMs) to include a brief description of any changes in peacetime operational concepts or other innovations proposed in an attempt to reduce energy consumption. The Army Planning and Programing Guidance Memorandum of 13 February 1976 also requires the description of changes in peacetime operational concepts or other innovations proposed in an attempt to reduce energy consumption. Army Regulation 11-27 requires Army energy resources to be intensively managed to insure their efficient and effective utilization in support of mission requirements. A special study is required to determine any changes necessary to optimize the Army's organization. The projected Army energy requirements cost about $600 million a year. The present organization has effectively administered the energy conservation program for Fiscal Years 1974 and 1975, and achieved a savings of over $200 million by avoiding increased costs. Additional savings appear possible through skillful investments. Recommendations to increase the effectiveness of energy management in the Army is required to increase the savings of the program. The exact role and influence that the Army Energy Office should have in this program should be better defined by this study.

F-2. Scope of Work.

The Contractor shall accomplish the following tasks:

a. Determine what should be the role and functions of the organization.

b. Determine what organizational structure for energy management should be adopted at Headquarters, Department of the Army.

c. Determine what organization and functions should be required in major Army commands to best interface with the Department of Army organizations.

d. Recommend what changes to Department of Army regulations and publications should be made.

APPENDIX B

INTERVIEWS

APPENDIX B

INTERVIEWS

Interviews were conducted with officials of the following offices/agencies:

a. Department of the Army

(1) Office of the Under Secretary (Energy)

(2) Office of the Assistant Secretary, Installation and Logistics

(3) Energy Conservation Office, United States Army Training and Doctrine Command

(4) Energy Conservation Office, United States Army Development and Readiness Command

(5) Military District of Washington

(6) United States Army Intelligence and Security Command

(7) Army Audit Agency

(8) Office of the Deputy Chief of Staff for Research, Development, and Acquisition

(9) Office of the Chief of Engineers

(10) Office of the Director for Transportation, Energy, and Troop Support

(11) Army Energy Office

b. Department of the Navy, Energy Management Office

c. Department of the Air Force, Energy Conservation Office

d. Energy Research and Development Administration, Office of the Administrator for Energy Conservation

APPENDIX C

ARMY STAFF QUESTIONNAIRE

APPENDIX C

ARMY STAFF QUESTIONNAIRE

Army Energy Management Study

1. What program initiatives has your staff element undertaken (or plan to undertake) to reduce energy consumption in DA?

2. What constraints have hindered you in the accomplishment of your energy program and conservation goals?

a. Manpower/funding?

b. Lack of direction, goals, or procedures?

c. Lack of authority or effectiveness?

d. Inadequate useful information?

3. How is your energy conservation activity organized and staffed?

4. How can the Army Energy Office further assist you in the accomplishment of your energy conservation goals?

a. Additional procedures and guidelines.

b. Further training or organizational assistance.

c. Additional or more useful information.

d. Further clarification of DOD/DA Staff policy and objectives.

5. What further actions should be undertaken in your area of expertise to help promulgate the following:

a. An Energy Resourse Management Action Plan.

b. Motivation and incentives for energy conservation that are innovative.

c. Qualitative and quantitative measurement of energy program effectiveness.

d. Information dissemination that is useful.

6. What organizational structure would best accomplish the abcve mentioned actions in conjunction with centralized program direction.

APPENDIX D

BIBLIOGRAPHY

APPENDIX D

BIBLIOGRAPHY

Army Regulations

AR 10-5, "Organization and Functions, Department of the Army," 1 April 1975.

AR 11-27, "Army Energy Program," 20 July 1976.

AR 20-3, "Inspections and Investigations: Department of the Army Special Subjects for Inspection," 4 August 1975.

AR 200-10, "Army Environmental Program," 28 December 1976.

AR 210-4, "Installations: Carpooling and Parking Controls," 20 May 1974.

AR 420-10, "Facilities Engineering: General Provisions, Organizations, Functions, and Personnel," 30 May 1975.

AR 420-49, "Facilities Engineering: Heating Energy Selection and Fuel Storage, Distribution, and Dispensing Systems," 18 November 1976.

AR 703-1, "Coal and Petroleum Products Management: Coal and Petroleum Products Supply and Management Activities," 8 January 1976.

Miscellaneous Publications

"A Time to Choose: America's Energy and the Future," Ford Foundation, Ballinger Publishing, 1974.

"Buildings and Community Systems Program Approval Document," Energy Research and Development Administration, 30 September 1976.

"Conservation of Natural Gas," Secretary of Defense, Memorandum, February 1977.

"Consistent Security of Defense (I&L)," Secretary of Defense, Memorandum, 6 February 1977.

"Defense Energy Initiatives Plan," (draft) Office of the Secretary of Defense, 12 October 1976.

"Energy," The Futurist, vol. viii, no. 1, Feburary 1974, pp. 4 - 22.

"Energy and the Future," A. L. Hammond, W. D. Metz, and T. H. Maugh; Washington: AAAS, 1973.

"Energy Audit Procedures," Energy Research and Development Administration, 1976.

"Energy Conservation," TRADOC Circular 700-1, 15 April 1976.

"Energy Conservation at Government Field Installations," LCD-76-229, General Accounting Office, 19 August 1976.

"Energy Conservation Performance, Vector Report," Department of the Air Force, Fourth Quarter, FY76.

"Energy Fact Book," Tetra Tech, Incorporated, for the Direct, Fleet Analysis, and Support Division, Office of Naval Research, February 1976.

"Energy Information Brochures," Energy Research and Development Administration, 1976.

"Energy Officer Responsibilities," DARCOM memorandum, 22 July 1976.

"Energy Program Fact Sheet, DARCOM, September 1976.

"Fuel Conservation," Secretary of Defense memorandum, 31 January 1977.

"FY76 Army Energy Conservation Status," DALO-TSE, 1976.

"Life Cycle Costing," Energy Research and Development Administration, 76-130, 1976.

"MIS Description," DARCOM memorandum, 10 September 1976.

"National Energy Outlook, 1976," Federal Energy Adminisration, FEA-N-75/713, 1975.

"Navy Energy Office Mission Statement," Office of the Chief of Naval Operations, 25 September 1976.

"Updated Natural Gas Supplement to the DEIS," Department of the Army memorandum, 10 September 1976.

"Utilities Management Analysis," Military District of Washington Supplement to AR 420-44, 6 February 1976.

APPENDIX E

MAJOR COMMAND RESPONSES

APPENDIX E

MAJOR COMMAND RESPONSES

SAMPLE UII QUESTIONNAIRE	USAREUR	KOREA	
1. What program initiatives has your command undertaken (or plan to undertake) to reduce energy consumption? a. Facilities b. Operations	1. Insulation, lighting, temperature controls, thermal modernization, speed limit, traffic reduction, wheel vehicles, flight sim., public information/posters/TV radio bulletins, energyless Wednesday, pamphlets.	1. Meters, more efficient heating, temperature control, insulation, speed limits, POL allocation.	1. Consum reduce voltag 0600 h vehicl reduce consol insula
2. What have been the results of these programs? a. Dollars saved b. Energy saved	2. $14 million saved. electric - 1.6% savings heating - 6.5% savings Anthracite coal - 2.9% savings Bituminous coal - 2.5% savings 1400 X 10^9 BTU saved Mobility POL - 1.2% increase.	2. Saved 9% FY 75. Lost 1% FY 76. Dollar savings?	2. (Not a
3. What constraints have hindered you in the accomplishment of your energy conservation goals? a. Manpower/funding b. Lack of direction, goals, or procedures	3. Guidance needed on facilities design.	3. Funding limitations.	3. Fundi conser
4. How is your energy conservation activity organized? What percentage of those involved are on a full-time basis?	4. USAREUR - Energy Conservation Management Council V Corps - full-time energy coordinators (30-35) VII Corps - no full-time personnel.	4. Energy Conservation Control Groups.	4. POL of office
5. Do your command's facilities engineering and petroleum logistics activities coordinate on their energy conservation efforts? If so, how?	5. Yes.	5. Yes. J-4 coordinates both POL and engineers.	5. Yes.
6. How can the AEO further assist you in the accomplishment of your energy conservation goals? a. Additional procedures and guidelines b. Further training or organizational assistance c. Incentives programs d. Additional information dissemination e. Further clarification of DOD/DA staff policy and objectives	6. Stablize policies and procedures.	6. Guidance limited; information dissemination less than adequate.	6. Earlie goals. Need c and tr conser energy tives focus matio

ENDIX E

MAND RESPONSES

EA	JAPAN	FORSCOM
e efficient heating, control, insulation, s, POL allocation.	1. Consumer education program, reduced flight time, reduced voltage between 2400 and 0600 hours, consolidation of vehicles, reduced mass transit, reduced H_2O and room temp., consolidated space, plastic insulation, burning waste oil.	1. Established master planning energy use study, convert energy from noneuseable to reuseable in 20 years, instituted many standard conservation measures in accordance with DA guidance.
75. 76. ngs?	2. (Not available.)	2. Savings 3,369,783 MBTU's saved.
itations.	3. Funding limitation; lack of conservation personnel.	3. Funding methodology poor. Need conservation funding standards. Procedures (ECIP, MCA) are inefficient. Manpower constraints.
ervation Control	4. POL officer as conservation officer.	4. FORSCOM Energy Office - 4 full-time, part of DCSLOG. Also has facilities energy office 15 part-time, need 3 full-time.
ordinates both POL es.	5. Yes. Close proximity of offices.	5. Yes. See #4 above.
ited; information n less than adequate.	6. Earlier dissemination of annual goals. Need long-range goals. Need conservation information and training program insuring conservation office gets all energy information and directives (internal coordination); focus needed for energy information from DA too.	6. AEO has little engineering expertise. DEIS reports combine certain mobile fuels and heating fuels -- not a clear energy picture. New requirements but no new resources. Further clarification short- and long-range priorities and objectives needed.

2

APPENDIX E

MAJOR COMMAND RESPONSES (CON.)

SAMPLE UII QUESTIONNAIRE	DARCOM	TRADOC	
1. What program initiatives has your command undertaken (or plan to undertake) to reduce energy consumption? a. Facilities b. Operations	1. Car pooling, energy MIS, instituted many standard conservation measures in accordance with DA guidance.	1. Limit: weapons demo, speed limit, reduce use of aircraft/vehicles., car pooling, temperature lowering, consolidation, closing of buildings, retain coal equipment, reduce lighting, automatic doors, time clocks.	1.
2. What have been the results of these programs? a. Dollars saved b. Energy saved	2. (Not available.)	2. (Not available.)	2.
3. What constraints have hindered you in the accomplishment of your energy conservation goals? a. Manpower/funding b. Lack of direction, goals, or procedures	3. Funding limitations; lack of conservation personnel.	3. Lack of information/timeliness, lack of standards in statistical reporting, more consolidations.	3.
4. How is your energy conservation activity organized? What percentage of those involved are on a full-time basis?	4. Energy conservation officer and coordinator (1 full-time). Separated from POL. Energy Advisory Group made up of directorate representatives.	4. Conservation officer (DCSLOG/POL) 1/2 time, facilities engineers part time POL.	4.
5. Do your command's facilities engineering and petroleum logistics activities coordinate on their energy conservation efforts? If so, how?	5. Yes. Close proximity of offices.	5. Yes. Informally/proximity of offices.	5.
6. How can the AEO further assist you in the accomplishment of your energy conservation goals? a. Additional procedures and guidelines b. Further training or organizational assistance c. Incentives programs d. Additional information dissemination e. Further clarification of DOD/DA staff policy and objectives	6. AEO should rank priorities. AEO should expand training and information dissemination program. AEO should take more active role in DOD.	6. More specific policy guidance, long-range goals needed, Information would be helpful concerning ways to initiate improvements.	6.

APPENDIX E

MMAND RESPONSES (CON.)

TRADOC	MDW	INSCOM
t: weapons demo, speed t, reduce use of aircraft/ cles., car pooling, temper- e lowering, consolidation, ing of buildings, retain equipment, reduce lighting, matic doors, time clocks.	1. Established goal of 85% of FY 73 for utilities, 95% for water, lighting surveys, temperature contols, unique light switch coverplates for conservation awareness.	1. Infrared photograph of facilities unit and individual conservation award, mass meetings of housing occupants, detailed review of DEIS reports.
available.)	2. (Not available.)	2. Overall savings do not agree with AEO data FY 75 - 535,183 MBTU FY 76 - 472,738 MBTU Savings 11.7%
of information/timeliness, of standards in statistical rting, more consolidations.	3. Money payback policy.	3. Funding - MCA procedures tenure.
rvation officer (DCSLOG/POL) time, facilities engineers time POL.	4. Energy officer in facility Engineering Management Division. Energy conservation councils at each installation.	4. 1/2 civilian manyear in facilities Branch Installation Division of DCSLOG (95% facilities 5% mobility) trying to hire heating and A/C specialist.
Informally/proximity of es.	5. Informal coordination only.	5. Facilities Branch has total responsibility.
specific policy guidance, -range goals needed, Infor- n would be helpful concern- ays to initiate improvements.	6. 3 year payback should be 10-15 years. Need long-range guidance. Could use packaged conservation program.	6. Most information and guidance from OCE not AEO, legislation for four 10-hour days, no cross fertilization of what is being done in other services and commands. No penalty for not achieving DOD goal.

2

APPENDIX F

RECOMMENDED CHANGES TO AR 11-27

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (*reverse*) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (*Forward to proponent of publication or form*) (*Include ZIP Code*)	FROM: (*Activity and location*) (*Include ZIP Code*)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 11-27	20 July 1976	Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (*Exact wording of recommended change must be given*)
1	1-2	1-6				Delete and substitute the following: "1.6 Responsibilities "a. The Deputy Chief of Staff for Logistics (DCSLOG) will establish an Army Energy Office which will: "(1) Exercise overall Army general staff responsibility for planning, directing, and coordinating the Army Energy Program. "(2) Develop with the assistance of and in coordination with the Army staff a comprehensive Army Energy Plan. The Army Energy Plan will identify the who, what, when, where, and how for the accomplishment of the Army Energy Program. It will provide specific objectives for the immediate 5-year period and general objectives for the longer range period. "(3) Conduct, with the assistance of the Army Staff, a continuing review of DA statutory and regulatory authority, policies, procedures, and programs to eliminate inconsistencies or deficiencies which could constrain the Army Energy Program. "(4) Formulate and recommend coordinated DA policy for the allocation, supply, and use of energy resources with the Army. "(5) Develop and execute a comprehensive energy conservation program for both operations and installation support within the overall framework of the Army Energy Program.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1 - Continued						"(6) Will advise the Secretary of the Army on energy matters through the Director of Transportation, Energy, and Troop Support. "(7) Provide principal Army Staff advisors on energy to include the provision of backup expertise to principal DA witnesses appearing before OSD, Office of Management and Budget, or the Congress on energy-related matters. The Chief of Engineers, as DA Power Procurement Officer, will continue to be the principal Army Staff advisor on utilities services (electricity, natural gas, purchased steam, hot water, and liquid petroleum gas). "(8) Function as primary Army Staff contact with OSD, the Army Secretariat, Defense Supply Agency, other government and military departments, and the civilian sector on energy matters. "(9) Exercise primary Army Staff responsibility over the supply and management of coal and petroleum products as prescribed in AR 703-1. "(10) Develop and supervise an effective management information and evaluation element for the Army Energy Program and Plan, to include Army participation in the Defense Energy Information System (DEIS). "(11) Monitor, as the Army's logistician, the consumption of energy in the testing, adoption, and life cycle management of new items of Army materiel.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1 - Continued						"(12) Participate in the budgetary process for Army Energy Program within overall guidance and policies developed by the Director of the Army Staff and the Comptroller of the Army to include preparation of appropriate justification. "(13) Develop and coordinate the DA position on energy-related actions generated by audit and inspection activities of the General Accounting Office (GAO), Department of Defense, and the Inspector General and Auditor General of the Army. "(14) Review joint and DA strategic plans to insure consideration and incorporation of appropriate energy input. "(15) Insure compatiblity between the Army's Energy Program and the Army Environmental Program (AR 200-10). "b. The Comptroller of the Army (COA) will assist ODCSLOG and other Army Staff agencies in the development of budgetary actions and cost and effectiveness measures, including projected increases in the price of energy, to insure that the programing of energy is consistent with the provisions of this regulation. "c. The Deputy Chief of Staff for Operations and Plans (DCSOPS) will: "(1) Establish overall operational priorities for distribution and use of fuels and other sources of energy. "(2) Insure recognition of the provisions of this regulation during the development of Army

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1 - Continued						aspects of national strategy, Army force requirements, strategic mobility requirements, and overall roles and mission of the Army. "(3) Develop and provide policy guidance which will emphasize that major commanders plan and schedule unit training and exercises within guidelines of the Army Energy Program and that major commanders insure that individual soldiers are trained in and practice energy conservation during unit training and exercises. "(4) Review current procedures for establishment of materiel requirements to assure recognition of the Army Energy Program. "(5) Exercise decision authority for petroleum equipment basis of issue plans (BOIP). "(6) Insure that statements of materiel requirements consider and are consistent with Army Energy Program conservation objectives. "d. The Deputy Chief of Staff for Research, Development, and Acquisition (DCSRDA) will: "(1) Develop research and development programs to resolve technological programs impacting on Army energy utilization. "(2) Initiate or support R&D actions to conserve energy, including conservation and development of methods for the broader utilization of fuel.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE, AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1 - Continued						"(3) Promote energy conservation in the development of Army materiel and include energy consumption as a criterion for evaluating alternative concepts for satisfying Army materiel requirements. "(4) Insure that thorough consideration is given to the conservation of energy in the development, acquisition, operation, manufacture, use or disposal of Army materiel, and the management of production base support programs. "(5) Emphasize and encourage energy conservation by all R&D acquisition contractors. "e. The Deputy Chief of Staff for Personnel (DCSPER) will: "(1) Insure that an appreciation of the energy problem and training in energy conservation techniques is incorporated in the curriculum and training programs of all schools and training centers. "(2) Emphasize energy conservation in the incentive awards program. "(3) Incorporate energy conservation considerations and objectives in all personnel-related actions such as individual training, carpooling, clothing standards, and morale activities. "f. The Chief of Engineers (COE) will develop and manage the installations and utilities element of the Army Energy Program. He will:

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS *For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.*	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	FROM: *(Activity and location) (Include ZIP Code)*	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Exact wording of recommended change must be given)*
1 - Continued						"(1) Assure conservation of utility energy resources through active installation conservation programs. "(2) Assure the development of new construction standards for efficient use of energy. "(3) Emphasize energy conservation and life cycle costing considerations in all construction programs. "(4) Conduct a vigorous energy R&D program to develop and/or demonstrate new construction techniques, materials, and criteria that will further reduce energy requirements and more effectively utilize energy at Army fixed installations. "(5) Assure that all construction projects are considered for their energy requirements and impact on energy resources. Review and when appropriate recommend approval of energy conservation investment program projects. "(6) Formulate and recommend coordinated DA policy on procurement, supply, and utilization of utility energy resources for fixed installation. "g. The Surgeon General will insure that the health and preventive medicine aspects of the Army Energy Program and Plan are adequate. "h. The Chief of Public Affairs will: "(1) Develop and execute the command and public information support for the Army Energy Plan and Program.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1 - Continued						"(2) Develop and distribute command information materials to obtain troop understanding, support, and initiation of energy conservation measures. "(3) Provide information on the Army Energy Program for use by news media and the public. "i. All Army Staff agencies including the Chief, National Guard Bureau and Chief of Army Reserve will: "(1) Insure that energy considerations are included in agency functional responsibilities. "(2) Coordinate plans and actions which impact on energy matters with the Army Energy Office, ODCSLOG. "(3) Insure that all policy documents for which they are the proponent have been evaluated for impact on energy. "(4) Advise the Army Energy Office (DALO-TSE) of the status of energy-related actions, proposed or taken, within assigned responsibilities and objectives of this regulation. "(5) Establish a single POC to expedite staff actions on energy matters and to disseminate essential information within each agency. (The name, rank, agency, room, and telephone number of the agency POC will be provided to HQDA (DALO-TSE), WASHINGTON, D.C. 20310.)

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC SM) AND BLANK FORMS

PUBLICATION FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1 - Continued						"j. Commanders at all levels down to and including installation commanders are encouraged to establish and use command energy councils or committees to serve as a forum for formulating, coordinating, and disseminating energy policy and actions. The use of full-time personnel is encouraged where a cost benefit analysis justifies resource expenditures. Commanders will: "(1) Develop and maintain an active command energy program. "(2) Develop and maintain on a current basis an overall comprehensive energy plan. Major commanders will forward a copy to the Army Energy Office (DALO-TSE). Updates will be provided at least annually. "(3) Develop and maintain a viable management information program. Submit a quarterly narrative report by the last day of the month following each fiscal quarter outlining significant accomplishments, to include explanations of any shortfalls, together with major plans and objectives for the remainder of the fiscal year. "(4) Designate an activity responsible for coordinating all energy matters. This will be accomplished within presently approved personnel ceilings. "(5) Maintain liaison and cooperation with local representatives of Federal, state, and other local energy offices.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	*Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs Supply Manuals (SC/SM).*	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	FROM: *(Activity and location) (Include ZIP Code)*	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Exact wording of recommended change must be given)*
1 - Continued						"(6) Develop and maintain plans for dealing with potential energy shortages at individual installations. "(7) Evaluate and recommend ECIP candidate projects." Reason: This paragraph was restructured and rewritten to emphasize and incorporate program elements considered necessary for more effective program functioning and results. The major areas needed to be developed include: an overall Army Energy Plan, an energy management information program, an executive level Advisory Group on Energy, and further DA Staff emphasis on energy conservation and related matters (e.g., motivation, incentives, and awareness).
2	7-1	7-1				Delete and substitute the following: "7.1 General. "a. The DA Advisory Group on Energy will consist of two bodies: a policy group and a working group. The policy group will function as the senior level forum for the review, evaluation, and preparation of policy guidance pertaining to the Army Energy Program. The working group will assist the policy group in performing the functions listed below and by identifying those issues and policies which require the attention of the policy group. The working group will prepare such studies reports or information as required by the policy group.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE, AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
2		7-1 -	Continued			"b. The purpose of these groups will be to: "(1) Continually review Army policies, programs, procedures, and implementing instructions for their impact on energy and recommend new energy policies or corrective actions as necessary. "(2) Evaluate the Army's short- and long-range energy plans to determine the adequacy of those plans and recommend appropriate revisions. "(3) Provide a forum for coordination and the exchange of information and ideas and to determine actions required to attain Presidential and DOD-established goals for energy conservation and energy self-sufficiency. "(4) Develop and provide recommendations on urgent energy matters." Reason: An executive level Advisory Group on Energy (AGE) would provide added emphasis, visibility, and awareness to the Army Energy Program. This paragraph outlines specific responsibilities concerning the AGE.
3		7-2				Delete and substitute the following: "7.2 Membership. "a. The AGE Policy Group will be a general officer level council. It will be chaired by the Director of Transportation, Energy, and Troop Support, ODCSLOG. The Army Energy Office will provide the secretariat.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
3		7-2 -	Continued			"b. Membership will consist of a principal in grade of general officer or civilian equivalent and an alternate who may be in the grade of colonel or civilian equivalent designated from each of the following DA Staff agencies. "(1) Office of the Deputy Chief of Staff for Operations and Plans. "(2) Office of the Deputy Chief of Staff for Research, Development, and Acquisition. "(3) Office of the Deputy Chief of Staff for Personnel. "(4) Office of the Chief of Engineers. "(5) Office of The Surgeon General. "(6) Office of the Chief of Public Affairs. "(7) Office of the Comptroller of the Army. "(8) Office of the Chief, National Guard Bureau. "(9) Office of the Chief, Army Reserve. "(10) Office of the Director of Army Automation. "(11) Office of the Director of Program Analysis and Evaluation. "c. The working group will consist of one primary and one alternate action officer representative designated from each of the above Staff agencies.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
3		7-2 -	Continued			The chairman and secretariat will be provided by the Army Energy Office. "d. Names, locations, office designations, and telephone numbers of designated members will be provided to the Army Energy Office (DALO-TSE) WASHINGTON, D.C. 20310 within 30 days of date of publication of this regulation. Changes in any of these items will be reported promptly."
4		7-3				Delete and substitute the following: "7.3 Other Participation. "a. The Army Special Assistant for Energy will be invited to attend all meetings. "b. Attendance at meetings or participation in the activities of the AGE by Army commands, agencies, and activities; other military services; DOD and nonmilitary Government agencies; educational institutions; commercial manufacturers and distributors; and private consultants will be on an as-required basis. Such attendance and participation will require prior approval of the chairman."
5		7-4				Delete and substitute the following: "7.4 Meetings. "The AGE Policy and Working Groups will be convened at the discretion of the respective chairmen. Members may propose agenda items as desired."

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 11-27		Army Energy Program

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
5		7-4 -	Continued			Reason for 7-2, 7-3, and 7-4: An executive level Advisory Group on Energy (AGE) would provide added emphasis, visibility, and authority to the Army Energy Program. This paragraph outlines specific responsibilities concerning the AGE.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

APPENDIX G

RECOMMENDED CHANGES TO AR 10-5

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 10-5	1 April 1975	Organization and Functions Department of the Army.

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1	2-20	2-28a (20)				Revise to read, "Planning, directing, and coordinating the Army Energy Program." Reason: Current wording does not include provision for an energy planning process. Having DA Staff responsibility for planning, directing, and coordinating is more emphatic than stipulation of supervisory responsibility.
2	2-20	2-28b				Add: "(6) Provides chairman and secretariat to the Advisory Group on Energy." Reason: Establishes responsibility for the chairman and secretariat of the executive level Advisory Group on Energy.
3	2-22	2-29				Add: "j. He is responsible for: "(1) Promoting energy conservation in the development of Army materiel and including energy consumption as a criterion for evaluating alternative concepts for satisfying Army materiel requirements; "(2) Insuring that thorough consideration is given to the conservation of energy in the development, acquisition, operation, use, or disposal of Army materiel and the management of production base support programs." Reason: To provide emphasis to energy and energy conservation in research, development, and acquisition actions.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 10-5		Organization and Functions, Department of the Army

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
4	2-29	2-34b (4)				Revise to read, "Technical engineering, research, development, and demonstration of new equipment or techniques in support of the Energy and Energy Conservation Programs. Managing the programs associated with energy production and conservation techniques, facilities, and materiel as may be assigned, to include management of the Army Nuclear Power program and related training." Reason: To clarify COE responsibilities for demonstration and monitoring of energy conservation and energy resource applications in consort with other federal and civilian agencies.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

APPENDIX H

RECOMMENDED CHANGES TO AR 703-1

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (Forward to proponent of publication or form) (Include ZIP Code)	FROM: (Activity and location) (Include ZIP Code)	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
AR 703-1	8 January 1976	Coal and Petroleum Products Supply and Management Activities

ITEM NO.	PAGE NO.	PARAGRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
1	1-2	17				Add the following:
					add	"f. Participate in force development actions for petroleum-related units.
					add	"g. Review petroleum equipment required operational capability (ROC) and basis of issue plans (BOIP) for adequacy, and, providing recommendations to DCSOPS, monitoring the testing, disposition, and status of equipment used in petroleum units worldwide, including operational projects.
					inherent in 1-7a.	"h. Provide technical guidance on petroleum fuels.
					"	"i. Develop policy for the operation and control of bulk petroleum terminals.
					replace 1-7e	"j. Evaluate requirements for existing or new petroleum facilities. Will act as backup witness for congressional testimony related to MCA programs for petroleum systems and related facilities.
					inherent in 1-7a	"k. Establish policy for the DA quality surveillance programs for petroleum fuels and lubricants and associated testing equipment and laboratories."
						Reason: The above DCSLOG responsibilities for petroleum management functions contained in paragraph 1-6a of AR 11-27 are considered more appropriate for inclusion in AR 703-1.

*Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 2028 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

APPENDIX I

ARMY ENERGY PLAN OUTLINE

APPENDIX I

ARMY ENERGY PLAN OUTLINE

I. BACKGROUND

A. World Energy Perspective

1. Current

2. Past

3. Future

B. National Energy Perspective

1. Current

2. Past

3. Future

C. Defense Energy Perspective

1. Current

2. Past

3. Future

D. Army Energy Perspective

1. Current

2. Past

3. Future

II. CURRENT ENERGY POLICIES, GOALS, AND OBJECTIVES

A. National

B. Defense

C. Army

III. ARMY PROJECTIONS*

- A. Assumptions
- B. Requirements
- C. Availability
- D. Costs

IV. ARMY ENERGY ALTERNATIVES UNDER DIFFERENT SCENARIOS*

V. EXAMINATION OF ALTERNATIVES AND SELECTION OF ARMY COURSE(S) OF ACTION

VI. REVISED ARMY POLICIES, GOALS, AND OBJECTIVES

VII. ARMY ENERGY MANAGEMENT PLAN

- A. Organization
- B. Responsibilities
- C. Procedures

ANNEXES

- A. Conservation Plan
- B. Facilities Plan
- C. Management Information Plan
- D. Research and Development Plan
- E. Command and Public Information Plan

* Short, mid, and long range

APPENDIX J

GLOSSARY

APPENDIX J

GLOSSARY

AGE - Advisory Group on Energy

API - American Petroleum Institute

AR - Army regulation

Btu - British thermal unit

CNGB - Chief, National Guard Bureau

COA - Comptroller of the Army

COE - Chief of Engineers

CPA - Chief of Public Affairs

DA - Department of the Army

DARCOM - United States Army Materiel Development and Readiness Command

DCSLOG - Deputy Chief of Staff for Logistics

DCSOPS - Deputy Chief of Staff for Operations and Plans

DCSPER - Deputy Chief of Staff for Personnel

DCSRDA - Deputy Chief of Staff for Research, Development, and Acquisition

DEIS - Defense Energy Information System

DOD - Department of Defense

DTRETS - Directorate for Transportation, Energy, and Troop Support

ECIP - Energy Conservation Investment Program

ERDA - Energy Research and Development Administration

EQ/ECIP - Equipment Energy Conservation Investment Program

FEA - Federal Energy Administration

FORSCOM - United States Army Forces Command

FY - fiscal year

GNP - gross national product

HQDA - Headquarters, Department of the Army

IBM - International Business Machines

INSCOM - United States Army Intelligence and Security Command

MACOM - major Army command

MCA - Military Construction Army

MDW - Military District of Washington

OCA - Office, Comptroller of the Army

OCE - Office, Chief of Engineers

OCNGB - Office of the Chief, National Guard Bureau

OCPA - Office of the Chief of Public Affairs

ODCSOPS - Office, Deputy Chief of Staff for Operations and Plans

ODCSPER - Office, Deputy Chief of Staff for Personnel

ODCSRDA - Office, Deputy Chief of Staff for Research, Development, and Acquisition

OPEC - Organization of Petroleum Exporting Countries

OTSG - Office of the Surgeon General

R&D - research and development

SAG - Study Advisory Group

TRADOC - United States Army Training and Doctrine Command

TSG - The Surgeon General

UII - Unified Industries, Incorporated

USAREUR - United States Army, Europe

USARJ - United States Army, Japan

US KOREA - United States Army, Korea