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ABSTRACT

This directory lists energy education programs directed at increasing the energy conservation awareness of scientists, engineers, managers, and technicians working in fields where they are responsible for managing energy consumption. The resource is prepared to help with the process of identifying, selecting, and obtaining materials for promoting energy-conservation skills. Section II includes comprehensive descriptions of such items as operations and maintenance manuals, life-cycle costing handbooks, films on fuel-saving driving techniques, and courses devoted to weatherization. Section III describes supplementary resources such as technical studies of energy conservation options, pamphlets containing simple tips, and supportive documents. (Author/RE)

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DOE/CS-0034/1

PRACTICAL METERIALS FOR TEACHING RESOURCE FILE: EDITION I ENERGY MANAGEMENT

U.S. Department of Energy

November 1977

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DOE/CS-0034/1

PRACTICAL MATERIALS FOR TEACHING ENERGY MANAGEMENT

A Resource File: Edition I

U.S. Department of Energy
Assistant Secretary for Conservation and Solar Applications

November

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DOE/CS-0034/1

PRACTICAL MATERIALS FOR TEACHING ENERGY MANAGEMENT

A Resource File: Edition I

U.S. Department of Energy
Assistant Secretary for Conservation
and Solar Applications
Washington, D.C. 20461

November 1977

Editor's note: This document was prepared prior to the activation of the U.S. Department of Energy on October 1, 1977. Therefore, wherever mention is made of the Federal Energy Administration (FEA) or the Energy Research and Development Administration (ERDA), it should be noted that the functions of these organizations have been transfered to the U.S. Department of Energy as of the above date.

TABLE OF CONTENTS

Edition I of this Resource File has been reviewed by the Federal Programs Office, Office of Conservation and Solar Applications, Department of Energy (DOE) and approved for publication. Approval does not signify that the mention of trade names or commercial products constitute endorsement or recommendation for use.

DOE has attempted to include every known publication under each subject heading. Any omission of a publication is unintentional. To have your publication included in the next edition, send one copy to:

Federal Programs Office
Office of Conservation and Solar Applications
Department of Energy
Washington, D.C. 20461

SECTION I

INTRODUCTION

WHY A RESOURCE FILE?

Edition I of this resource file was prepared by the Federal Energy Management Program (FEMP) to help with the complex and time consuming process of identifying, selecting and obtaining materials for promoting energy conservation skills.

As one energy conservation specialist puts it, "Energy policy is just so much paper unless the people with their hands on the switch know what to do." The materials described in this resource file were selected for inclusion because they can be used to teach people with their hands on the switch how to conserve energy.

Additional materials are being assembled (as Edition II) which will include energy conservation materials appropriate for use within Federal agencies and the private sector in the following areas:

- o Manufacturing and industrial processes
- o Retail and business
- o Heavy mobile equipment, and
- o Other appropriate categories

WHAT DOES THIS RESOURCE FILE CONTAIN?

Section II of this book includes comprehensive descriptions of such items as operations and maintenance manuals, life-cycle costing

handbooks, films on fuel-saving driving techniques, and courses devoted entirely to weatherization. These publications will be referred to as 'primary resources' because they can be used alone as practical guides to energy conservation.

Each primary resource description consists of:

- o title
- o corporate author
- o year of publication
- o a brief description of its intended audience and use
- o a chapter-by-chapter annotated table of contents, highlighting each topic covered
- o comments about the resource
- o where to obtain the resource

Section III describes supplementary resources such as technical studies of energy conservation options, pamphlets containing simple tips, and supportive documents such as the ASHRAE Standard 90-75. These publications can be used to add technical and theoretical depth to a presentation or a class. Some of them, such as studies of attitudes toward energy conservation, may be of use in planning an educational program that will overcome many of the misperceptions that exist.

It should be noted, however, that inclusion of a particular item does not constitute its recommendation by DOE, nor does exclusion mean that it is disapproved. Rather, this resource file is: (1) a comprehensive

selection of how-to energy conservation materials that have been described in detail to help potential users with their own evaluating and selecting, and (2) an annotated listing of other publications that may be used in support of the primary resources.

WHO SHOULD USE THE RESOURCE FILE?

Although Edition I has been developed primarily for the Federal sector, it may be useful to anyone with responsibility for reducing energy use. Managers and staff development coordinators, educators, and extension agents who are concerned with improving energy conservation skills should find the file to be of value. Librarians, technical information spetialists and others who are called upon for referral to practical energy conservation can use this resource file to identify relevant publications. It is important to remember that many of us are in a position to influence other people's energy use, and that occasionally we may be sought out as sources of practical energy conservation information. Thus, this Resource File is designed to be used by anyone who may need, or who may wish to provide others, information on how to use energy efficiently. For this reason, some items such as manuals on industrial energy conservation have been included even though these processes may not be directly under the management of the Federal Government.

Section 7	Plumbing suggests ways to conserve energy by more efficiently regulating the heating and cooling of the building's water.
Section 8	Vertical Transportation lists the major considerations in planning the renovation of escalator and elevator systems.
Section 9	Solid Waste suggests alternatives to off-site waste disposal that may result in energy savings.
Section 10	Operation and Maintenance presents ideas for energy conservation through efficient operation of equipment and preventive maintenance. Important to these concepts is the training of personnel in this area.
Appendix A	Life Cycle Cost Analysis describes the techniques used in determining the least overall cost alternative.
Appendix B	Summary of Energy Conservation Opportunities, in checklist form reviews all the energy conservation opportunities mentioned throughout the manual.
Appendix C	Bibliography.
Appendix D	Project Team.
Comments:	With this document, a building administrator can easily survey his building and determine where energy savings can be fully realized. The layout of the manual, with a column on each page designated for notes, lends itself to this type of use.
Price:	$2.00
Available From:	Business Service Center General Services Administration 7th & D Streets, S. W. Washington, D. C. 20407

HOW CAN THE APPROPRIATE RESOURCE DESCRIPTION BE FOUND?

Basically, the Resource File is a catalog. It consists of Primary Resources (Section II), Supplementary Resources (Section III), Appendices listing the materials according to their source, and an Index. The index can be used to find descriptions of resources according to the topics they cover. Following each topic in the index is one or more numbers preceded by the capital letters P or S to indicate the item number, and whether it is a primary or supplementary resource. Descriptions in Sections II and III are arranged alphabetically by title, and divided into: (1) Buildings and Fixed Facilities, (2) Transportation, and, in the case of Section III, (3) Others. Thus, the user who already knows the title of a particular primary resource may simply look it up alphabetically in the Table of Contents.

WHERE ELSE CAN ENERGY CONSERVATION INFORMATION BE FOUND?

Every effort has been made to include a comprehensive listing of buildings and fixed facility and transportation materials in Edition I of the resource file. Nevertheless, it is possible some materials may have been overlooked or new materials published before the second edition of this Resource File is available. Moreover, *ad hoc* seminars, workshops, and special courses are continually being announced, so the reader may wish to contact the following sources of information and assistance:

- o Federal regional energy offices
- o State energy offices
- o Colleges and universities, especially schools of engineering and departments of continuing education
- o Vocational and technical schools
- o Local utility companies
- o U.S. Department of Energy, Technical Information Center, P.O. Box 62, Oak Ridge, Tennessee 37830 (FTS-850-4352)
- o Center for Energy Policy and Research, New York Institute of Technology, Old Westbury, New York 11568 (New York Tech. Energy HOTLINE 516-686-7744).
- o Equipment manufacturers (detailed information and training regarding the selection, operation, maintenance, and retrofit of specific equipment should be obtained from manufacturers)
- o Commercial energy management firms (a growing number of companies are offering seminars in various aspects of energy management)
- o Professional and trade associations
- o National Referral Center, Science and Technology Division, Library of Congress, 10 First Street, S.E., Washington, D.C. 20540
- o Local and architecture and engineering firms
- o State and local building code administrators
- o Libraries.

HOW CAN THE MATERIALS DESCRIBED IN THIS RESOURCE FILE BE OBTAINED?

Every description in this Resource File includes the agency or source to contact and the price, if any, for government produced materials. For government-produced items, it is advisable to check with the originating agency (if time permits) before contacting either the

Government Printing Office or the National Technical Information Service (remember to contact regional offices also). In some instances, the agency may have a supply of free copies on hand, or may be able to provide information about a later edition or a new item. Other resources, both government and non-government, may have become available in conjunction with a course. For other than government-produced materials, the price of the publications, courses and kits, films, or teaching aids are not given. Prices for government materials are subject to change without notification.

The address and phone numbers for the Government Printing Office and the National Technical Information Service are:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20420

(202) 783-3238

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
(203) 557-4650

SECTION II

PRIMARY RESOURCES

PART 1

BUILDINGS AND FIXED FACILITIES

1. A COMMUNITY PLANNING GUIDE TO WEATHERIZATION

COMMUNITY SERVICES ADMINISTRATION
1975

A guide to aid Community Action Agencies and other nonprofit organizations serving the poor in planning weatherization of low-income dwellings. (37 pp.)

CONTENTS

Appendix C	For More Information About Materials lists associations which may be helpful in providing unbiased information about insulating materials.
Appendix D	Building Weatherization Plan consists of a form that aids in project planning.
Bibliography	Lists other sources of materials in home winterization.
Comments:	This booklet is good introductory material for agencies involved in or wishing to become involved in winterization of low-income dwellings. The bibliography lists supplementary materials which help in implementing the programs.
Price:	None.
Available From:	Community Services Administration 1200 19th St., N. W. Washington, D. C. 20506

2. EFFICIENT ELECTRICITY USE: A PRACTICAL HANDBOOK FOR AN ENERGY CONSTRAINED WORLD

ELECTRIC POWER RESEARCH INSTITUTE
CRAIG B. SMITH, EDITOR
1976

This book addresses a wide variety of audiences from design professionals to the lay consumer. Because chapters range from the highly technical to the popular, the book lends itself to selective use in a number of settings. More than 50 energy conservation case studies are included, along with extensive bibliographies. (996 pp.)

CONTENTS

Chapter 1 — An Energy Constrained Society introduces the energy problem by examining the earth's energy cycle, U. S. energy use, and the benefits of improved efficiency.

Chapter 2 — Industrial Energy Use reviews energy use patterns, energy management programs and representative case studies.

Chapter 3 — Commercial Energy Use looks at the economic advantages of energy efficiency in commercial facilities. Case studies examine small building programs and an application of solar energy.

Chapter 4 — Residential Energy Use points out the impact of appliances, options for the homeowner, more efficient heating and cooling. Case studies cover air conditioner selection methods, a review of microwave oven economics, and solar heating of homes.

Chapter 5 — Transportation and Communication Use describes electric vehicles and related future technology, electric railways, and communications and information processing applications. Case studies concern prototype electric vehicles and electric trains.

Chapter 6 — Agricultural Energy Use depicts the growth of energy technology in agriculture and livestock and reviews conservation options. Case studies describe agricultural heat recovery and feed lot energy reductions.

Chapter 7 — Heat Sources shows more efficient ways of using electric heat, using new designs, modification of systems, control of environmental sources and heat sinks, points of wastage and opportunities for savings. Case studies concern the use of heat pipes, efficient refrigeration and the use of process heat in buildings.

Chapter 8 — Light Energy Sources points out ways to modify facilities and retrofit existing and/or properly designed new lighting systems to attain immediate savings. Lighting standards are reviewed and case studies show potential ways to save energy through industrial high pressure sodium lamping and relamping.

Chapter 9 — Motion (Mechanical Energy Sources) explains the transfer of mechanical energy, the shaping and forming of materials for creating electricity and the prime movers of electric generators. Case studies include efficiency improvements in mechanical energy transfer and reductions in peak demands for electric motors.

Chapter 10 — Electrolytic and Electronic Processes gives some alternative process which will improve energy efficiency and discusses the efficiency of the production of primary metals. In addition, it suggests the best ways to use and maintain storage batteries and gives ideas of how to reduce and/or prevent corrosion in these processes. The proper utilization of fuel cells and the leveling of power demand are also explained.

Chapter 11 — Energy Use in Urban and Suburban Dwellings explains energy efficiency in residential building energy systems. A discussion of home conditioning from an environmental point of view including the use of heat pumps, is also contained in the chapter.

Chapter 12 — Energy Use in the Non-Residential Buildings points out the role of the architect-engineer in designing buildings which are more energy efficient and whose conditioning is environmentally sound. Some tips on selecting building equipment are given. Case studies include the reconditioning of air economizer equipment for better energy efficiency.

Chapter 13 — Energy Use in Cities depicts the historical trends in efficient energy use by cities. New technological developments are discussed, including solid waste energy recovery, urban transportation and underground urban systems. Case studies include an analysis of the impact which urban growth has had on the economy, environment and energy use. The necessity of closely monitoring temperatures in underground buildings is also pointed out in the case studies.

Chapter 14 — Benefits of Improved Efficiency looks at the total savings in energy use which will be realized through improved energy efficiency. The electrical energy savings that will result from improved electrical use are highlighted. The merits of and barriers to a shift to electrical use are presented

Appendices — Conversion Factors gives energy and power equivalents and conversion factors for energy and power.

Engineering Data presents contents of energy in fuels and manufactured and stockpiled materials. Also points out power plant energy investments.

Energy Efficiency - The Concept of Available Work is a technical discussion of the laws of efficiency and energy utilization and available work efficiencies.

Energy Management Regulations reviews the U. S. energy legislation; the Federal agencies and Congressional committees involved in energy legislation and policy and presents a profile of energy management programs and policies.

Comments: A bibliography is included at the end of each chapter which provides additional sources of information for the reader on the topics discussed in that chapter.

Some parts of the book are technical and geared toward those with an engineering background but others can be easily understood by the layman. Many of the suggested projects could be implemented immediately with little capital expense. Diagrams, tables and case studies are included for ease in understanding.

To receive information on price and publication availability, contact:

Pergamon Press, Inc.
Fairview Park
Elmsford, N.Y. 10523

3. ENERGY CONSERVATION DESIGN GUIDELINES FOR NEW OFFICE BUILDINGS. 2ND EDITION

GENERAL SERVICES ADMINISTRATION
PUBLIC BUILDINGS SERVICE
1975

This manual presents an approach to the design of an energy efficient office building based upon the experience of the GSA in design of the Manchester, New Hampshire project. The level of technical detail is only moderate and should be useful to building owners or managers contemplating the construction of an office building. (275 pp.)

CONTENTS

Section 1 — Energy Goal presents the rationale for the GSA energy goal of 55,000 Btu/sq ft and explains how to develop a goal which considers the pertinent factors.

Section 2 — Design Criteria presents design criteria which should provide a reasonable, yet reduced, standard of performance. Factors considered include user needs, climate (both internal and external), illumination and domestic hot water

Section 3 — Climate explains the impact of climate on energy use and building design considerations such as the building envelope, configuration, orientation, fenestration and wall materials, color and mass. Discusses the effect of site, energy load demands, diurnal variations of temperature, heat storage, solar radiation, wind and snow.

Section 4 — Site presents some of the more desirable features to strive for in site selection and site development

Section 5 — Building discusses some of the more important design considerations of the architectural and structural features of a building; including configuration and orientation; interior planning; structure; roof; opaque walls; glass walls, windows and doors; and floors.

Section 6 — Lighting provides a discussion of energy efficient lighting design, including such important consideration as daylighting, interior design, total lighting systems selective task lighting, switching, lamps and luminaires, and security lighting.

Section 7 — Power discusses the basic factor to consider in designing a buildings power system, including system sizing, load leveling, power factor, and large motor selection.

Section 8 — Heating, Ventilating, and Air Conditioning presents the major factors of HVAC design for energy efficiency, including system selection, ventilation humidity, air distribution systems, hot and chilled water distribution systems, free cooling cycle, adiabatic cooling, heat recovery and waste heat systems, total energy systems, heat pumps, reheat systems, heat of light systems, variable air volume systems, and roof top systems.

Section 9 — Domestic Water gives important concepts for designing domestic water systems, including quality and temperature control, system design, heating with waste heat, and solar heat source.

Section 10 — Vertical Transportation gives some general considerations for vertical transportation as well as discussing elevators and escalation.

Section 11 — Solid Waste briefly discusses concepts of solid waste systems, including off-site facilities and alternative solutions.

Section 12 — Operation and Maintenance presents some ideas and consideration for building maintenance on energy use for the following areas: building envelope electrical systems and heating, ventilating, and air conditioning systems.

Appendix A — Energy Conservation Computer Software provides information on existing software networks, minimum program requirements, existing software deficiencies, potential software network, program contacts.

Appendix B — Alternative Energy Sources includes solar energy, wind energy, total energy systems and other alternatives.

Appendix C — Solar Energy Utilization provide an introduction, general theory, collection characteristics, materials, system integration and a bibliography.

Appendix D — Life Cycle Cost Analysis discuss the major concepts and considerations of this important technique for determining the least overall cost alternative.

Appendix E — Summary of Energy Conservation Opportunities provides prioritized check lists of energy conservation opportunities for general factors, siting, building, lighting, power, HVAC, domestic hot water, vertical transportation, solid waste and operation and maintenance.

Appendix F — Project Team includes those who contributed to the preparation of the guidelines.

Appendix G — Bibliography.

Price: $2.00

Available From: Business Service Center
General Services Administration
7th & D Streets, S. W.
Washington, D. C. 20407

4. ENERGY CONSERVATION GUIDELINES FOR EXISTING OFFICE BUILDINGS

GENERAL SERVICES ADMINISTRATION
PUBLIC BUILDINGS SERVICE
1975

Guidelines for use primarily by GSA in the remodeling, maintenance, and operation of buildings in its inventory. This document has been made available to other Federal agencies, the construction industry, and other interested groups. (175 pp.)

CONTENTS

Section 1 — Program Analysis discusses the steps involved in reducing energy consumption in buildings. Specifically, these are: 1) a programmatic evaluation of existing buildings for reducing energy usage, 2) establishing an energy goal, and 3) determining a methodology for obtaining the maximum energy reduction in existing buildings.

Section 2 — Site recommends possible modifications to the existing landscape setting and pavement areas that may stabilize the interior building conditions and reduce energy consumed by the building's HVAC equipment.

Section 3 — Building suggests several ways to take advantage of the positive effects of climate, site and geographic location on the interior conditions of the building and offers precautions against the negative effects, as well as several trade-off alternatives. After the general discussion of these factors, it then details the considerations involved in the modification of the building envelope to further reduce energy consumption.

Section 4 — Lighting examines this major consumer of electrical energy in office buildings and explains the steps involved in determining the power goal for the building and achieving this goal.

Section 5 — Power briefly describes an electrical power system and the efficiency of the power distribution system. It offers a few rules to follow in order to minimize power loss through the power generating and distribution systems.

Section 6 — Heating, Ventilating and Air Conditioning evaluates the design criteria and the energy relationships which must be considered in retrofitting and revising systems to reduce energy consumption. It also lists energy conservation opportunities which should be investigated in the planning stages.

Section 7	Plumbing suggests ways to conserve energy by more efficiently regulating the heating and cooling of the building's water.
Section 8	Vertical Transportation lists the major considerations in planning the renovation of escalator and elevator systems.
Section 9	Solid Waste suggests alternatives to off-site waste disposal that may result in energy savings.
Section 10	Operation and Maintenance presents ideas for energy conservation through efficient operation of equipment and preventive maintenance. Important to these concepts is the training of personnel in this area.
Appendix A	Life Cycle Cost Analysis describes the techniques used in determining the least overall cost alternative.
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Appendix C	Bibliography.
Appendix D	Project Team.
Comments:	With this document, a building administrator can easily survey his building and determine where energy savings can be fully realized. The layout of the manual, with a column on each page designated for notes, lends itself to this type of use.
Price:	$2.00
Available From:	Business Service Center General Services Administration 7th & D Streets, S. W. Washington, D. C. 20407

5. ENERGY CONSERVATION IN BUILDINGS: TECHNIQUES FOR ECONOMICAL DESIGN

C. W. GRIFFIN

THE CONSTRUCTION SPECIFICATIONS INSTITUTE, INC.

1974

Aimed primarily at architects and engineers, a survey of energy saving techniques is also useful for owners, contractors, mortgage lenders. (183 pp.)

CONTENTS

Chapter 1 — The Energy Crisis: A Problem in Economics briefly reviews the energy use picture in the United States, sets goals for energy conservation, and describes the major obstacles to achieving these goals.

Chapter 2 — Strategy for Energy Conservation describes both administrative and technical approaches and points out that energy conserving technology will only be effective if it is supported by consistent administrative policy. A number of cases in point are given. Much of the rationale behind ASHRAE Standard 90-75 is then put forth.

Chapter 3 — Financial Obstacles to Energy Conservation stresses the importance of life-cycle costing and points out those aspects of zoning and tax laws that favor energy waste. Recommendations are made for specific revisions in policy and law that would stimulate rather than deter energy-efficient practices.

Chapter 4 — Energy-Conscious Architectural Design begins with a short review of the escalation of energy-wasting practices in buildings. In a review of energy-conserving architectural techniques, siting and orientation, building shape, multi-use occupancy, envelope design, wall shading, exterior and interior finishes, and entrance ways are all reviewed in terms of their relative impact on energy use.

Chapter 5 — Thermal Insulation discusses such benefits as improved thermal comfort, prevention of condensation on interior surfaces, reduced HVAC capacity, reduced HVAC operating costs. The principles and standards of insulation are covered in detail, while a checklist is provided for determining the adequacy of existing insulation.

Chapter 6 — Glass Wall Design contrasts the potentially conflicting goals of increased use of glass for reducing lighting requirements and decreased use of glass for improving thermal efficiency. Methods are suggested for reaching a compromise between the two goals, including the use of shade, the use of double plate glass, and the value of heat-absorbing and heat-reflecting glass. A number of designs are shown for achieving energy-efficient fenestration. The tradeoffs between air leakage around windows that can be opened and the loss of natural ventilation with fixed windows are discussed.

Chapter 7 HVAC Systems points out that these systems account for more than 20 percent of total U.S. energy consumption and over 60 percent of building energy consumption. Many of the pros and cons of particular system choices are considered. Such innovations as thermal energy storage and personal HVAC units are described. A checklist is provided for reducing energy use in existing HVAC systems.

Chapter 8 Waste Heat Recovery begins by demonstrating the double impact of use of excess lighting. It points out the efficiencies that can be gained by recycling the heat produced by lighting systems. Several methods for reclaiming heat from exhaust air are described and diagrammed, and a description of total energy systems is provided. The chapter concludes with a checklist of steps for determining the applicability of waste heat recovery to existing systems.

Chapter 9 Improved Mechanical Design discusses the relative difficulty of estimating heating loads versus cooling loads. General concept is provided for energy conserving designs for new HVAC systems and the role of the computer in modeling building energy use for the purpose of appropriate HVAC system design is discussed.

Chapter 10 Operating and Maintenance Economies reviews the ways that lack of proper training can lead operations and maintenance personnel to waste energy through misuse of HVAC systems. Guidelines for operating an effective operations and maintenance program are given. In general, a maintenance contract with the equipment supplier is recommended as preferable to the use of in-house custodial personnel. An O&M checklist is provided for review.

Chapter 11 HVAC System Controls reviews the savings possible from automated HVAC controls and the application of these controls to three sources of waste, i.e., excessive labor costs, inefficient use of systems and expensive repairs, and the potential application of automated sensing and control systems to operations and maintenance tasks. Comparisons are made among types of equipment and the conditions that require them.

Chapter 12 Lighting and Electrical Desigh reviews sources of lighting and gives guidelines for economizing on lighting, including case histories. The chapter shows also those electrical designs other than lighting that have energy conservation possibilities. A brief checklist of specific techniques is given.

Chapter 13 Solar Energy is concerned with fairly detailed explanation of solar energy technology utilizing the flatplate solar collector. Photo-voltaic systems are not considered.

Chapter 14 GSA Demonstration Building is a case study of the analytic and design activities that went into the demonstration building constructed by the General Services Administration in Manchester, New Hampshire.

Appendix Life-Cycle Costing cites several case histories in which life-cycle costing proved accurate, and specifies applicable modes of life-cycle costing.

Comments: In general, this textbook is suited to a general introductory course. It could be supplemented by operations and maintenance manuals or other training aids.

To receive information on price and publication availability, contact:

The Construction Specifications Institute, Inc.
1150 17th Street, N. W.
Washington, D.C. 20036

6. ENERGY CONSERVATION SEMINARS

HONEYWELL, INC.

A series of seminars is offered on subjects of interest to those involved in building energy conservation. The workshops provide opportunities for the exchange of information between participants and for the practical solution of energy management problems. Instructors are drawn from the Honeywell professional staff and supplemented as necessary by consultants. Complete sets of study materials are provided. The seminars are held at Bloomington, Minnesota, on a varying schedule, from six to ten times a year.

CONTENTS

Seminar 1 — Energy Conservation Management Workshop — three-day workshop providing participants with a practical knowledge of energy conservation management methods and applications. Course content is designed to train the attendee to apply a proven program of energy conservation management to his own facility.

Seminar 2 — Energy Conservation in Buildings for Delta Systems Owners — designed for those who supervise Delta System operation, this seminar provides practical knowledge of the Delta System operation, its applications and capabilities. Information is provided that can be put to immediate use in more efficient use of the system to conserve energy.

Seminar 3 — Air Conditioning Control Fundamentals — provides participants with a fundamental knowledge of air conditioning processes and then expands these concepts into areas of control technology, operational procedures, and control system operation.

To receive information on price and seminar schedules, contact;

Honeywell Commercial Training Center
8200 Normandie Boulevard
Bloomington, Minnesota 55437

7. ENERGY CONSERVATION PROGRAM GUIDE FOR INDUSTRY AND COMMERCE (EPIC)

NBS HANDBOOK 115
(INCLUDING SUPPLEMENT 1)

U. S. DEPARTMENT OF COMMERCE
(NATIONAL BUREAU OF STANDARDS)

AND

FEDERAL ENERGY ADMINISTRATION
1974/1975

This book was first issued in 1974. Widespread distribution and use resulted in the receipt of useful comments and suggestions that were incorporated into Supplement 1 in December 1975.

Well written, and with a large number of fully worked examples, the book is intended to assist industry officials to develop their own energy conservation programs. However, the information is also applicable to other classes of users, including hospitals, schools and government agencies. The book also serves as an excellent introductory text to energy conservation practices and principles and can be used as either a reference or as seminar material.

A special feature of this publication is the heavy involvement of industrial energy specialists and executives in its development. It is eminently practical in its approach, and contains much material that was developed and proven through actual industrial experience. (250 pp.)

CONTENTS

Chapter 1 Introduction provides a clear description of the need for energy conservation, explains the orientation of the publication, and suggests plans of action for the plant manager that will result in a successful energy conservation program.

Chapter 2 Energy Conservation Program Implementation is a section that describes in some detail the actions necessary to implement a successful energy conservation program in a typical plant. The process commences with the establishment of top management committees and the assignments for program responsibility. Examples are provided of forms for summarizing past and present energy usage. Appropriate letters, forms, posters, and "kits"

are shown in detail, and the process is continued through initial energy conservation committee meetings, energy surveys, findings, supervisor training, contingency plan development, and ends on a note of continuing concern for continued conservation efforts.

Chapter 3 — Energy Conservation contains a detailed but clear discussion of energy conservation opportunities with descriptions of specific applications. These reports include charts, graphs, tables and sample calculations, as well as a brief description of the initial circumstances and subsequent actions. The calculations illustrate the key steps in estimating energy savings potential and the associated costs, but are not intended to substitute for detailed engineering analyses. Complete references are given for each suggested energy conservation example.

Chapter 4 — Engineering Data and Factors contains selection of tables, graphs and conversion factors useful in calculations needed to determine energy losses, savings and conservation opportunities. Metric equivalents are provided by reference only.

Chapter 5 — Financial Evaluation Procedures states that conservation opportunities require initial capital outlays that must be amortized by the energy savings generated over their lifetime. This section illustrates methods for calculating payback periods and performing benefit/cost analysis, and also discusses return on investment and marginal analysis for those investments whose rates of return decrease as the level of investment increases.

Chapter 6 — Sources of Assistance is a section providing a list, complete with telephone numbers, of the major trade associations, technical societies, and Department of Commerce and Federal Energy Administration Field Offices.

Chapter 7 — Safety, Health and Pollution Considerations shows how conservation actions can result in improvement or degradation of pollution measures at a plant. This section discusses those energy conservation actions that can result in improvements, those that can potentially produce unfavorable effects, and those where precaution is necessary. Reduction of ventilation levels below those considered satisfactory for worker safety and health and lighting levels are also discussed.

Chapter 8 — Employee Participation discusses the importance of employee participation in any plant energy conservation program and shows how to develop this feature through competitions, awards, posters and newletters. Also discusses the extension of energy conservation into the areas of transportation and the home environment. Communication and education must be a firm management commitment.

Chapter 9 — Energy Flow Measurements provides a brief and non-technical discussion of the instrumentation and methods that should be utilized in the measurement of temperatures, fluid flows, pressures, liquid levels, electrical power and flue gas analysis. Subjects covered include the range of operations, principle of operation, costs, accuracies and precautions. No diagrams are provided.

Chapter 10 — Bibliography is a detailed listing of handbooks, journal articles and technical papers on all aspects of energy conservation that are covered in this publication.

Comments: An ambitious and well written handbook that should find a wide audience in industry and elsewhere. The handbook should be exceptionally useful in its intended audience — the plant manager. It would not be suitable for operating engineers, nor for an engineering survey, and it is not intended to be.

The handbook lacks a comprehensive index. Tables of contents are fairly complete, but are scattered throughout the handbook, making reference to any particular item unnecessarily difficult.

Supplement No. 1 was issued in December 1975 and contains additional energy conservation ideas and suggestions, some additional case studies, and minor revisions to other sections of the handbook. Supplements are provided at extra cost.

Price: $2.25 (Catalog No. C13.11:115); Supplements priced separately.

Available From: Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

8. ENERGY CONSERVATION THROUGH UTILITIES OPERATION

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
1976

Correspondence course designed to instruct operating and maintenance personnel in efficient operation and maintenance of the utilities function. (140 pp.)

CONTENTS

Chapter 1 Transforming Energy Into Work explains the basic principles and concepts that govern each step of the energy conversion process. It identifies the forms of energy and the energy transformations that occur in a steam plant. This chapter also describes fuel formation, fuel combustion, the effects of heat on water, and the fundamentals of steam generation.*

Chapter 2 Boiler Operation describes the types and characteristics of boilers, and the devices that improve their efficiency. The chapter explains boiler water treatment methods, blowdown, and waste water disposal. Guides to conserving energy are also given to suggest methods of reducing the amounts of fuel and water consumed in individual plants.*

Chapter 3 Boiler Maintenance describes how soot, scale, and corrosion form on boiler surfaces and how to prevent or remove them. Guidelines that will help to keep control systems, compressed air systems and auxiliary equipment operating efficiently are provided. In addition, the chapter describes typical maintenance schedules and tables.*

Chapter 4 Combustion and How It Works identifies the properties of coal, oil, and natural gas that affect their ability to burn. It also describes the characteristics of an efficient fire, and the factors that affect the combustion process. In addition, the instruments used to measure the stack draft and the flue gas temperature and content, as indicators of efficiency, are also described.*

Chapter 5 Steam Generation describes the steam generating process, and traces the flow of water and steam through the system. The chapter also explains how to maintain steam plant auxiliaries to keep them operating properly and thereby reduce energy losses.*

*From the manual.

Chapter 6 Turbines describes the main types of steam turbines, how they operate, and how they compare with gas turbines. It explains how a condenser operates, and the condenser's effect on efficiency. It also describes good maintenance practices that will help to keep the turbine-generator unit in each plant in good operating condition, and thus conserve energy.*

Chapter 7 Boiler Instrumentation, Controls, and Safety describes and illustrates the major types of boiler instruments and how to use and maintain them. It also explains how the combustion and feedwater control systems operate. In addition, it describes the types of safety devices needed in the power plant.*

Chapter 8 Electrical Power Fundamentals explains and illustrates the basic principles of electricity. The chapter then describes the types of metering equipment used to measure electrical quantities in the plant. In addition, it explains the systems and equipment used to distribute electricity from the power plant generator to the user.*

Chapter 9 Electrical Systems Analysis describes and illustrates the line diagram and explains its function. The chapter then describes electrical billing procedures, and how demand control and power factor correction can decrease power costs. Transformer losses and system voltage variation are also explained. In addition, it introduces maintenance procedures that will help to keep each plant's electrical system equipment in good condition.*

Chapter 10 Air Conditioning Systems describes the basic air-conditioning cycle and how each component operates. It also describes accessories and controls that contribute to efficient operation. In addition, recommended maintenance practices for improving efficiency and saving energy are suggested.*

Comments: The manual is designed as a text for a course in energy conservation through utilities operation. Figures, tables, and graphs are used widely to clarify the text. There are series of programmed exercises at critical points in the text. At the end of the manual, there are two tests which together covers the entire course. Upon satisfactory completion of the course, the student receives a final grade and a certificate of completion.

Price: To receive information on price and publication availability, contact:

Technical Publishing Company
1301 South Grove Avenue
Barrington, Illinois 60010

Attn: Ms. Carolyn Nylen, Training Counselor

*From the manual.

9. ENERGY CONSERVATION WORKSHOPS: MANAGING THE ENERGY DILEMMA IN OFFICE BUILDINGS

FEDERAL ENERGY ADMINISTRATION
1976

A program of executive conferences and workshops designed to aid business leaders in improving their capabilities for resolving energy problems.

CONTENTS

Energy Overview discusses the energy problem, and the relation of office buildings to this problem. A list of fifty readily available ways to save energy is included here with a simplified outline of the five basic steps in an energy management program.

Step 1 — Select an Energy Management Team emphasizes the importance of selecting people who have technical expertise in the areas to be managed. The organizational structure of the team, in order to function most efficiently, must also be formally determined.

Step 2 — Survey Your Building covers the purposes of an energy survey including familiarization with sources of information as well as familiarization with the building and energy data. Sample forms and instructions are included here.

Step 3 — Find Energy Conservation Opportunities and Determine Potential Savings describes how to apply the data obtained in the building survey to determine which areas offer the greatest potential cost savings. The analysis service offered by utility companies is mentioned as an important part of this process. A checklist which suggests ways to obtain the most significant savings is found here.

Step 4 — Set Up a Complete Energy Management Action Plan provides the criteria for the development of a plan. Important in this plan is accurate accounting and recording of all energy-related information on forms similar to the ones provided in the section.

Step 5 — Implement Your Plan covers communications and incentives as highly important factors in the implementation of the plan.

Supplementary Material contains excerpts from the sources used to prepare the manual. These sections include a glossary, techniques for measuring energy, energy units and conversion, building equipment (HVAC and lighting systems), energy guidelines, and the ASHRAE 90-75 standard.

Comments: This segment of the FEA Energy Conservation Workshops deals strictly with office buildings. Other workshops cover energy conservation in industrial buildings and vanpooling.

Each section of the workshop is briefly documented leaving it open to members input and discussion.

10. ENERGY MANAGEMENT: A MANUAL FOR USE IN WORKSHOPS

THE ENERGY TASK FORCE OF THE
AMERICAN COUNCIL ON EDUCATION
ASSOCIATION OF PHYSICAL PLANT ADMINISTRATORS
NATIONAL ASSOCIATION OF COLLEGE AND UNIVERSITY BUSINESS OFFICES
1976

A comprehensive and detailed practical approach to energy efficiency in all energy-using systems typical of college campuses. Designed to be used jointly by facilities managers and business officers. (247 pp.)

CONTENTS

Chapter I — Outlook and Overview reviews energy consumption in higher education; its use; and current status, patterns, and trends.

Chapter II — How Energy Is Used and Wasted begins with a case in point, a before-and-after example of energy reduction at an Ohio State University clinical/administrative facility. Primary forms of energy, i.e., fuel, steam, electricity, are reviewed and systems studied such as terminal reheat system, dual duct system, induction system, steam and boiler system. The necessity of having an efficient data base is shown utilizing a sample of universities' use/cost of energy.

Chapter III — Evolutionary Approach to Energy Management considers the methods of conservation based on the experiences of several colleges and universities. The three basic systems comprising any functioning building are discussed in terms of energized systems, non-energized systems, and human systems, all of which can be modified, in evolutionary stages, e.g., quick fix, refit, and systems convert. Energy management techniques range from elementary to highly complex.

Chapter IV — Energy Finance and Investment discusses the necessity for an economic plan including knowledge of funding/capital sources, knowledge and use of economic analysis tools (life-cycle costing, payback and return on investment, present value, etc.), and preparation of proposals to include all accompanying data (e.g., budgetary mechanisms, historical data, etc.).

Chapter V — Analysis of Purchased Utilities is devoted to the need for analysis of utilities, including water, gas, fuel oil, coal, steam, and electricity. The section is devoted mostly to the electricity since it comprises so great a portion of the total utility bill. Taken into account in the analysis should be rate structures services, schedules, riders which can be sought from the utility companies. Knowledge and consideration of the Federal Power Commission and the State's Public Utility Commission's roles are discussed briefly. Considered also are bill computation, power factor problems, data accumulation measures, controls, etc.

Chapter VI Energy Management and Organization Incentives discusses the human system of energy management as the most essential in terms of a successful program. The team of physical plant director and Chief Business Officer devised the program plan, which has goals translated into action mechanisms with supportive/cooperative commitment of the entire institutional hierarchal structure.

Taken into account in the plan are organizational structure, delineating activities, such as monitoring, internal and external communications and educational mechanisms, selecting of projects, etc.

Chapter VII Appendices - This section includes the following:

- I-1 • Energy Flow Pattern in the United States 1950-1990 (5 pps)
- II-1 • Testing Boilers for Efficiency (9 pps)
- II-2 • Energy Survey Form (5 pps)
- II-3 • Operation of a Municipal Housing Project Boiler Plant, A Case History (3 pps)
- II-4 • Graphing the Data (Weather Effects), A Case History (2 pps)
- III-1 • Lighting, Ventilation, Infiltration, Reduction of Heat Transmission, Modification of Central Plant Operating Practices, Modification of Distribution Systems, Electric Power Adjustment and Modification of Automatic Controls Domestic Hot Water, Elevators, Improvement of Maintenance Procedures, Water, Space Utilization, Transportation, Modification of Operating Practices of Kitchen and Cafeteria Areas, Energy Conservation in New Building Design (43 pps).

  Topics are discussed in terms of categories "Quick Fix," "Refit," and "Systems Convert."
- III-2 • Bibliography (annotated).
- IV-1 • Report to Implement Energy Conservation Measures at Hitchcock Hall, Ohio State University.
- V-1 • Typical Contract.
- VI-1 • Memorandum to Yale University Community Re: Energy Conservation, 11/28/73.
- VI-2 • Memorandum to Deans, Directors, Department Chairmen, May 6, 1974 (Re.: Air Conditioning Policy).
- VI-3 • Purdue University "To All Employees" Bulletin (Re.: Coop-Effort to Help Save Dollars).
- VI-4 • Proposal for Student Participation in University Energy Management.

Comments: Because the course is designed for both facilities managers and business officers, it covers the basics of energy systems finance and of energy systems design. There is much of substance for equipment operators and maintenance personnel as well. Because university physical plants encompass so broad a range of end-use systems and building types, much of the course is applicable to many other types of facilities. The most university-specific material is devoted to budget presentation and funding sources, but even this information can be translated to other nonprofit or state-supported institutions.

To receive information on price and publication availability, contact:

The Association of Physical Plant Administrators
of Universities and Colleges (APPA)
Suite 525
1 Dupont Cicle
Washington, D.C. 20036

11. ENERGY MANAGEMENT AT SHORE ACTIVITIES

NAVAL SCHOOL
CIVIL ENGINEER CORPS OFFICERS
POINT HUENEME, CALIFORNIA

1976

This publication is the basis of a week long course in energy management that is given at the Naval School at Point Hueneme in California. The course is intended primarily for Naval Officers, but students are accepted from both government and industry. Further information on the course can be obtained from the Energy Program Office at Point Hueneme, Autovon 360-5562; commercial (805) 982-5562.

The materials are discussed in this precis in the order in which they are presented to course students, lecture by lecture. Each individual set of lecture notes is preceded by a summary sheet that details: 1) the objectives of the lecture, 2) reference materials required, 3) texts required, 4) supplementary material required (provided with course materials), and 5) previous assignments that should be completed.

Course materials are supplemented throughout with worked examples, clear diagrams, brochures, magazine articles, movies, copies of applicable regulations and class notes. The majority of the lecture periods are followed by workshops and student participation exercises.

CONTENTS

Chapter 1 — Introduction is an introductory lecture which discusses the objectives for the entire course and recommends that the student prepare a "Personal Action Plan" for energy management at his home facility. The U. S. energy situation is discussed in detail and supplemented by a motion picture, "Energy: The Critical Choices Ahead." A panel of instructors is convened to discuss energy problems with students. Each student is required to present information on an energy conservation technique that has been successfully employed at his home facility, this is later critiqued.

Chapter 2 — FEA/DOD Programs discusses the energy policies of the U. S. Government, how they are promulgated by the FEA, and how they affect both users and managers. The lecture also covers the DoD policies on energy conservation and on coal/oil boiler fuels, the organization and responsibilities of the DoD Defense Energy Directorate, and the purpose and use of the Defense Energy Information System.

Chapter 3 — DoD Energy Conservation Criteria covers the DoD policy on electrical heating and heat pumps, on the conversion from natural gas and fuel oil to coal burning facilities, and on solar and total energy system applications.

Chapter 4 — Navy Energy Programs discusses the overall economic and operational impact of energy conservation programs on the Navy fleet and shore installations and interprets current D D and Navy Energy Programs as they impact Navy activities. Cost trends, fuel policies, conservation targets and operational standards are covered. The student is recommended to apply these programs at his facility.

Chapter 5 — Navy Family Housing Conservation discusses the problem of energy conservation when the housing occupant is entitled to free utility services and suggests methods of improving utility conservation. Materials provided to the student include sections from the NAVFAC Family Housing Energy Conservation Handbook. Solar energy applications and the future administrative trends regarding energy conservation in family housing are also discussed. Family housing consumed 10 percent of the total Navy energy budget.

Chapter 6 — ERDA Programs describes the national energy policies and discusses the role of ERDA in implementing this policy.

Chapter 7 — Utilities Procurement discusses in detail the Navy policies and procedures that apply to the procurement of utility services from the General Services Administration, from public utilities and from other Navy sources. Subjects discussed include contractural arrangements, invoicing, utility rate structuring, and the procedures used by various regulatory agencies. The student prepares a rate comparison and checks typical utility invoices.

Chapter 8 — Energy Audits contains a detailed discussion of the methods used to prepare energy audits. The information is presented from the point of view of a large industry with many plants in different parts of the country, and it is then shown how these methods can be applied to Naval facilities. Examples are provided to show how the program could be organized, the importance of good "public relations," and how to summarize and present the results.

Chapter 9 — Energy Conservation Investment Program deals with energy conservation from an economic viewpoint and covers priority ranking by payback period, amortization rates, escalated energy rates, and the effects of inflation. Several fully worked examples are included. The Navy Energy Conservation Investment Program (ECIP) criteria are presented, together with the normal process for funding energy projects from identification through Congressional funding action.

Chapter 10 Electrical Energy Conservation is a detailed discussion of electrical power system components, functions, maintenance, and energy conservation opportunities in Naval installations. Special attention is given to lighting energy conservation, power factor correction and the advantages of a 34.5 KV distribution system.

Chapter 11 Mechanical Energy Conservation is a thorough review of the basic principles of various types of boilers and heating systems. Covers potential for energy losses in the boiler plant and in the distribution system, including condensate return, and stresses equipment inspection and maintenance.

Chapter 12 Heating, Ventilating and Air Conditioning Systems uses a large number of clear diagrams, graphs and tables to discuss the features of the more common type of HVAC systems, the equipment used in those systems, and the energy conservation opportunities and techniques that can be applied. Basic information is provided on the properties of air as related to heating and air conditioning, human comfort considerations, and methods for calculating heating and cooling loads. Special attention is given to the proper use and maintenance of controls.

Chapter 13 Supervisory and Other Control Systems this lecture is essentially an introduction to automated energy management systems and covers the function of simple on-off controls, time clocks, thermostats, demand and ripple control systems. The influence of utility billing procedures that include demand interval billing, fuel adjustments and power factor adjustments is discussed. Demand curves, with and without ratchet clauses, are included. Problems that are frequently introduced by existing control systems on HVAC systems are discussed, and the function of demand controlling systems in saving energy and maintenance and providing security, alarms, and maintenance monitoring are covered.

Chapter 14 Building Improvements and Rehabilitation covers a number of subjects including building architecture, HVAC systems, and domestic hot water systems. Basic equations are provided for understanding some aspects of heat transfer, infiltration and ventilation, energy consumption for heating and cooling, and for calculating the associated energy consumed. Several suggestions are provided for saving energy in existing buildings together with sample calculations for determining both energy and cost savings.

Chapter 15 Lighting Applications discusses present day considerations for the design of lighting systems and introduces the various types of energy saving lamps that are now available. An example is given of an economic analysis of a lighting system. The use of natural daylight is also covered.

Chapter 16 — Facilities Research and Development contains a detailed discussion of the energy research and development program conducted by the Civil Engineering Laboratory of NAVFAC Engineering Command at Point Hueneme. The CEL acts as a clearinghouse for Naval energy problems and also performs research and development on a wide range of energy problems.

Chapter 17 — Total Energy Applications discusses the principles, advantages and constraints of total energy systems, presents typical equipment configurations, and presents the calculations required for total system evaluation. Also discusses economic analysis and the design and installation considerations.

Chapter 18 — Solid Waste Fuel Developments is a discussion of the methods and variables involved in converting solid wastes into energy, presents details of ongoing research, and related Navy policy implications. Tables are provided giving the heating values of various solid wastes and, solid waste production figures from various military facilities. Pollution considerations are discussed, together with details of boiler test programs. Clear diagrams of various installations are given.

Additional Materials: This section of the student manual contains selected Naval directives dealing with aspects of energy conservation.

Comments: This course appears to cover every aspect of facilities energy conservation as practiced within the U. S. Navy. The course materials are complete, detailed and accurate. The materials contained within the manual itself represent a thorough and workable approach to energy conservation. Upon completing this course, the student should be well equipped to initiate energy conservation programs at his own facility.

The sole omission is a thorough discussion of advanced mini-computer-controlled energy management systems.

Available From: Further information on the course can be obtained from the Energy Program Office at Point Hueneme, Autovon 360-5562; commercial (805) 982-5562.

12. ENERGY MANAGEMENT COURSE

THE ELECTRIFICATION COUNCIL

A course for facilities managers, designers, and engineers in the efficient use of electrical energy.

CONTENTS

Session 1 - Energy Management in Perspective

Chapter 1 Energy Consumption in the United States begins with a discussion of the amounts, sources, and uses of energy, and then focuses on the role of various fuels in the generation of electrical energy.

Chapter 2 The Role of Government briefly surveys government actions to alleviate the potential severity of fuel embargoes and shortages.

Chapter 3 The Need for Energy Management introduces basic concepts of energy management, and suggests sources of assistance.

Chapter 4 Economic and Financial Analysis of Energy Management reviews the basic methods for performing economic studies of the feasibility of particular options. Discussed are: life cycle costing, payback period, and return on investment. AXCESS, the Edison Electric Institute's Computerized Energy Analysis Program, is described. Energy survey forms are provided, along with a number of selected citations for further reference.

Session 2 - Energy Management in Lighting Design

Chapter 1 The Need for Energy Management reviews the general energy picture and concentrates on the energy used in lighting and its implications for improved design.

Chapter 2 The New Direction makes the point that the basic criterion for lighting design must be the seeing needs of building occupants.

Chapter 3 Design Criteria develops the concept of suiting lighting to visual tasks, and explains such subjects as the quantity and quality of light, including visual comfort probability and equivalent spherical illumination. Design approaches for uniform and non-uniform illumination are presented, along with step-by-step methods for solving typical lighting problems. The chapter provides criteria for maximizing the efficiency of light sources and luminaires, and illustrates methods for integrating luminaires into the heating system. Other topics

Chapter 3 (Cont.) are outdoor lighting, controls, delamping, effective maintenance and operation, and life-cycle costing. The nine steps in planning a lighting system are dealt with, and a complete set of lighting calculation worksheets and sample calculations is provided.

Session 3 - Energy Management in Electric Space Conditioning

Chapter 1 Building Site, Plan, and Envelope points out the importance of such factors as solar orientation options, outdoor air ventilation requirements, aspect ratio, thermal resistance and mass, and penetration and entrances.

Chapter 2 HVAC Energy Conservation Systems focuses first on heat reclaiming systems such as the double bundle condenser, water storage, hot gas reclaim from air-cooled equipment, heat recovery from lighting fixtures, the closed loop water-to-air heat pump system, variable air volume distribution, the economizer cycle, the rotary air-to-air heat exchanger, plate-type exchangers, run-around systems, evaporative cooling, and the heat pump. Each system description includes a hypothetical problem and the rationale for applying a particular system to the solution. Methods for calculating savings using each system are provided.

Chapter 3 Maintaining and Modifying Your HVAC to Conserve Energy lists steps that can be taken to maximize the efficiency of existing systems and systems in specially-designed energy-saving buildings. Those steps requiring additional investment are specified.

Session 4 - Energy Management in Electric Process Heating

Chapter 1 Process Heating Controls is an overview of step-type controls, stepless controls, and temperature-sensing controls.

Chapter 2 Process Heating Applications considers heat-loss reductions in liquid heating, steam generation, pipeline heating, surface heating, radiant process, and various types of electric furnace.

Chapter 3 Heat Recovery gives brief descriptions of various methods, including heat exchangers and heat pipes.

Chapter 4 Industrial Space Heating points out that waste heat should be used for space heating whenever possible, and suggests localized infrared heaters for isolated invividuals.

Session 5 - Energy Management in Service Hot Water Systems

Chapter 1 — Types of Service Hot Water Systems lists and explains the criteria by which service hot water (SHW) systems can be classified. The criteria include the type of energy source, the system design (central or individual), storage, pipe arrangement, control type and temperatures, multiple temperatures, and summer-winter hookups.

Chapter 2 — Energy Use in SHW Systems discusses heat losses in conversion and generation, in pipes and tanks, and as a consequence of hot water use. Methods for reducing loss are suggested, along with techniques for estimation.

Chapter 3 — System Energy Considerations explains the energy-use impact of system elements, and recommends approaches to minimizing inefficiencies. Considered among the elements are hot water flow, fixture type, temperatures, pressures, usage patterns, energy source, heater sizing, circulating pumps, and heat traps.

Chapter 4 — ASHRAE Standard 75 is a brief description of the standard as it applies to hot water systems.

Chapter 5 — Demand Control makes the point that load limiting systems may reduce the ability of small SHW systems to maintain required heat levels, making larger equipment or more rapid recovery necessary.

Chapter 6 — Heat Recovery and Heat Pump Water Heating demonstrates a method for integrating air conditioners into the water heating system.

Chapter 7 — Energy and Cost Tradeoffs operation and maintenance and energy labeling are covered briefly.

Session 6 - Power Management

Chapter 1 — Motors and Motor Controls looks at motors as elements of a system, and discusses the value of matching the motor to the load and to the operation. A broad conceptual framework is provided for analyzing applications, selecting the most efficient processes and machinery, and evaluating drive systems. Operating and maintenance procedures are prescribed for enhancing system efficiency.

Chapter 2 — Power Distribution suggests approaches to voltage selection and choosing the appropriate conductors and busways for a particular application. The importance of matching transformer size to load is stressed. Methods for correcting power factor to comply with ASHRAE Standard 90-75 are presented, including the use of synchronous motors and synchronous condensers. The chapter concludes with a checklist for system maintenance and suggestions for system operation.

Chapter 3 — Demand Management and Control explains the concept of demand and the utility billing procedures and metering methods associated with it. The impact of maximum instantaneous demand on the operating level of electrical utilities is demonstrated. The student is shown a method for analyzing the demand characteristics of his facility, and for developing operational procedures and control systems for limiting demand.

Comments: "Energy Management" is presented in six 2½-hour sessions, each divided into a home study assignment and a classroom review meeting. The student, on his own time, goes over the material to be covered, using his course text as a guide. The material is then discussed in class, questions answered, and new material for the next home assignment introduced. Visual aids are used to depict energy management principles and applications; actual equipment may be employed for demonstration purposes. (From a descriptive brochure.)

Materials are furnished either as a master kit or mini-kit. The larger set contains two leader's guides, 50 student texts and diplomas, 105 2x2 classroom slides, supplementary material lists, homework assignments, and classroom problems. The mini-kit contains the same materials, but in smaller quantity—one leader's guide and 10 student texts and diplomas.

To receive information on price and kit availability, contact:

The Electrification Council
90 Park Avenue
New York, New York 10016

13. ENERGY MANAGEMENT FOR COMMERCIAL BUILDINGS

MINNESOTA ENERGY AGENCY

1976

An energy management tool for use by those responsible for energy use in commercial business. (17 pp.)

CONTENTS

Introduction	Conducting an Energy Audit provides the guidelines for this first step in an energy management program.
Section A	Basic Operation, Maintenance and Scheduling for Energy Conservation lists energy saving steps that don't involve the purchase or replacement of equipment.
Section B	Remodeling and Modification Design Changes for Energy Conservation lists energy savers to consider when designing a new building or remodeling.
Comments:	The list of energy savers does not go into the technical reasoning behind each suggestion. Therefore, supplementary materials are advisable.
Price:	None.
Available From:	Minnesota Energy Agency Energy Conservation Division 740 American Center Building 150 East Kellogg Blvd. St. Paul, Minnesota 55101

14. ENERGY MANAGEMENT FOR INDUSTRIAL OPERATIONS

MINNESOTA ENERGY AGENCY

1976

This energy conservation handbook is designed for use by managers and operators of industrial processing plants. Each area of energy use is divided into a series of checklists — Systems, Operating Procedures, and Controls. The user is asked to check each of the booklet's recommendations for its potential applicability, and to consult with relevant staff to determine whether recommendations would be economical. A telephone number is provided for requests for follow-up technical assistance (42 pp).

AREAS COVERED

- Air Conditioning Systems
- Boiler Operations
- Compressed Air Systems
- Domestic Hot Water
- Electrical and Lighting
- Gas Turbines
- Material Handling Operations
- Paint Line Operations
- Process and Manufacturing Operations
- Space Heating and Building Operations
- Welding Operations

GRAPHS AND TABLES

- Fuel Direct Heat Values
- Tool Air Requirements
- Uninsulated Pipe Heat Loss
- Steam Leak Losses
- Seasonal Steam Leak Loss
- Annual Steam Leak Loss
- Boiler Scale Transfer Reduction
- Compressor Air Leak Losses

Comments: The manual can be used alone (with technical assistance) or as the beginning of a sequential energy management course. It is a readable and readily applicable survey guide that includes an important dissemination feature: a tear-out postcard for the reader to return with comments and the names of other people who should receive the manual.

Price: None.

Available From: Minnesota Energy Agency
Energy Conservation Division
740 American Center Building
150 E. Kellogg Boulevard
St. Paul, Minnesota 55101

15. ENERGY MANAGEMENT GUIDE FOR LIGHT INDUSTRY AND COMMERCE

W.J. Kelnhofer and L.A. Wood

U. S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS

1976

A training tool to assist small industrial and commercial organizations in making the most efficient use of energy. (28 pp.)

CONTENTS

Introduction presents the problems of uncontrolled energy use in industry that have evolved with the energy crisis and the necessity of an effective energy management program.

Energy Management Program discusses the four main points of consideration in an energy management program: 1) organization of the program, 2) conducting an energy audit, 3) taking action on energy saving, and 4) promoting the program.

Checklist for Reducing Energy Usage lists simple procedures for employees to follow to reduce energy use in buildings and grounds, in electricity and in vehicles.

Cost Analysis Procedures discusses two procedures for making a financial analysis of the industry's cost savings opportunities. One approach is to determine the benefit/cost relationship, another is to determine the time to recoup the investment.

Assistance suggests where to find outside help in solving energy usage problems. Suggestions include private consultants, utility companies, trade associations, and government organizations.

Interaction with OSHA and EPA Requirements discusses the coordination of energy saving practices with health requirements established by OSHA and EPA.

Appendix I Cost Savings Opportunities lists case studies where substantial energy savings were realized.

Appendix II U. S. Department of Commerce District Office Directory

Appendix III References includes documents on energy management and conservation.

Appendix IV Conversion Table to International System of Units.

Comments: This document is an edited and rewritten version of portions of NBS-HB-115, the EPIC manual. It is intended to be used by small organizations with a limited supply of technical manpower.

Price: $.70 (Catalog No. C13.11:.20)

Available From: Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

16. GUIDELINES FOR ENERGY CONSERVATION IN EXISTING BUILDINGS

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.
1974

A guide to familiarize sheet metal and air conditioning contractors with the potential for conserving energy in existing structures. (12 pp.)

CONTENTS

Chapter I	Introduction states the purpose of the guidelines in providing the contractor with the knowledge necessary to plan the building systems evaluation.
Chapter II	Existing Building Evaluation explains the procedure for conducting an evaluation and provides a sample checklist.
Chapter III	Human Comfort Needs recommends desirable temperature, humidity, and ventilation standards to maintain human comfort.
Chapter IV	Energy Conservation Basics points to operational modifications such as temperature setback, structural modifications such as insulation, and good preventive maintenance as basic considerations in an energy management program for existing buildings.
Chapter V	Energy Conservation Systems suggests elimination of systems which are inherently large energy wasters, and recommends those which are more efficient as replacements.
Chapter VI	Sample Building Evaluation outlines the steps to be taken in determining the baseline state of a building.
Comments:	The document is brief; no details are included. It serves as an introductory guide to building owners and contractors in the energy-conservation evaluation process.

To receive information on price and publication availability, contact:

SMACNA, Inc.
8224 Old Courthouse Road
Tysons Corner
Vienna, Va. 22180

17. GUIDELINES FOR ENERGY CONSERVATION SYSTEMS IN NEW BUILDINGS

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.

1975

A condensation of conservation information combined with good industry practices as it relates to the design of building environment systems. These guidelines are for use by designers of building systems and equipment. (50 pp.)

CONTENTS

Chapter I — Introduction provides a statement of purpose and emphasizes the role of the totally integrated project design approach in the reduction of the energy requirements of a building.

Chapter II — Energy Conservation Management discusses controlling energy flow and distribution, maximizing performance efficiency of equipment and processes, and design analysis of energy sources and costs. Diagnostic checklists are included in this section.

Chapter III — All-Air Systems describes the operation of all-air systems as efficient energy users in primary treatment of the occupant media-air, maximum flexibility requiring minimal energy consumption for changes in temperature, humidity, and ventilation requirements, and easy adaptation to heat recovery and economizer cycles.

Chapter IV — All-Water Systems explains the energy-conserving features of all-water systems including economical uses of sources of wasted heat and minimal occupancy of space to energy conveyed ratio.

Chapter V — Control Systems concentrates on the long term energy cost savings and increased system efficiency offered by the control systems described.

Chapter VI — Heat Recovery and Conservation Systems discusses the availability of recoverable waste heat, the economic possibility of enthalpy exchange, and the transfer of unneeded heat to spaces requiring heat.

Chapter VII — Heat Pumps covers the theory behind heat pump operation, different varieties of heat pumps and their applications.

Chapter VIII — Primary Energy Sources is concerned primarily with basic energy reserve supplies and uses, and the necessary future considerations.

Chapter IX — Total Energy Systems discusses the efficiency and pollution aspects of total energy systems.

Chapter X — Life Cycle Costing explains the increased life expectancy and decreased long-term costs (i.e., life cycle costing) in more efficient systems.

Chapter XI — Building Operation and Maintenance stresses the importance of good maintenance practices in efficient energy use.

Comments: Concise manual, good as a primary source in building design.

To receive information on price and publication availability, contact:

Sheet Metal and Air Conditioning
Contractors' National Association, Inc.
8224 Old Courthouse Road
Tysons Corner
Vienna, Va. 22180

Attention: Mrs. Hunt

18. GUIDELINES FOR SAVING ENERGY IN EXISTING BUILDINGS
BUILDING OWNERS AND OPERATORS' MANUAL ECM 1
JUNE 16, 1975
CONSERVATION PAPER NO. 20

FEDERAL ENERGY ADMINISTRATION
OFFICE OF ENERGY CONSERVATION AND ENVIRONMENT
1975

This manual is designed to be used by building owners, managers, operators and occupants. It presents a set of guidelines to reduce energy waste in existing buildings through changes in the operation of mechanical and electrical equipment. While much of the emphasis is on those buildings that are in use relatively few hours per week, such as offices, schools and religious buildings, the principles of energy conservation discussed are applicable for other types of buildings as well. (300 pp.)

CONTENTS

Section 1 — The Principles of Energy Conservation explains the basis of energy use in buildings and provides a summary of the principles of energy conservation programs.

Section 2 — Major Energy Conservation Opportunities - priorities, Examples hows the relative order of magnitude of energy use of the various building systems so that priorities for an energy conservation program can be developed. Case histories of buildings in which energy conservation programs have been instituted and the savings that have been achieved are presented. Major building energy conservation opportunities are identified.

Section 3 — Use and Implementation of the Manual this Section is essentially an introduction to the rest of the Manual and explains in detail how to use the various charts and tables to determine conservation potential. Emphasis is on development of accurate building energy load data, climate zone profiles, building type, construction and use profiles and complete details of the mechanical and electrical equipment. Instructions for preparing a detailed energy use audit are followed by some basic considerations that should be considered before attempting to determine conservation potential.

While the charts and forms in this section are very detailed, it will be only very rarely that they will all need completing. The charts and tables are designed to anticipate all building types from single-family residences to large office buildings.

Section 4 — Detailed Energy Conservation Opportunities this section, some 180 pages of the manual, addresses in detail specific methods of saving energy in building systems. The areas addressed are:

- Heating and Ventilation
- Domestic Hot Water
- Cooling and Ventilation
- Distribution and HVAC Systems
- Commercial Refrigeration
- Lighting
- Power

For each of the 41 conservation opportunities discussed complete information is provided in the form of charts, tables and graphs. Fully worked examples are given in most cases. Energy savings are presented in the form of BTU saved per year. These savings are converted to dollars using rates extant in 1974.

Appendix A — Cost Indices provides relative cost data for nine cities including consideration of labor rates and materials costs. The Manual user is recommended to obtain updated local costs from professional construction cost indices and other sources.

Appendix B — Energy Conservation Example provides a fully worked example of energy savings for an office building in Chicago.

Bibliography — Lists a total of 55 sources for further reading.

Glossary/ Abbreviations — Defines all terms used in the manual and all abbreviations.

Comments: At first glance this manual would appear to be too technical for the average building owner, operator or occupant. Experience in reading and using tables, graphs and charts is definitely required, but a study of any portion of the Manual will show that the explanations and examples are fully explained and simply presented. An important feature of the Manual is that it is usable anywhere in the United States, furthermore, the data tables permit consideration of most variables that are likely to be encountered. The index is inadequate for a Manual of this complexity.

Price: $5.05 (Catalog Number GPO-041-018-000-79-8)

Available From: Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

19. GUIDELINES FOR SAVING ENERGY IN EXISTING BUILDINGS

ENGINEERS, ARCHITECTS, AND OPERATORS' MANUAL — ECM 2

FEDERAL ENERGY ADMINISTRATION

OFFICE OF ENERGY CONSERVATION AND ENVIRONMENT

1975

This manual continues ECM 1 at a greater level of technical detail. It should be noted that the intended audience differs from the first volume in its inclusion of engineers and architects who will be involved in the more complex analyses and program design activities to which this volume is geared. ECM 2 cannot be used independently of ECM 1, since the first volume contains many of the charts, tables, and graphs necessary to quantify the savings suggested by ECM 2 (448 pp.)

CONTENTS

Section 5 — Establish an Energy Management Program gives a step-by-step plan for organizing the people and resources necessary to make an energy management plan work. The composition and roles of the energy management team are described, including the owner, the professional engineer and architect, the utility companies, service and maintenance organizations, operating personnel, tenants and professional cost engineers. The team then participates, as their roles require, in conducting energy audits, establishing a data base, determining actual energy use, selecting potential conservation measures, analyzing options and conducting pre- and post-construction activities, such as monitoring the performance of new or modified equipment and training operations and maintenance personnel with regard to the changes.

Section 6 — Detailed Energy Conservation Opportunities examines the options for energy reduction in heating and ventilation, domestic hot water, cooling and ventilation, commercial refrigeration, distribution and HVAC systems, heat reclamation, lighting and power systems. Illustrative of the level of detail of this section is the consideration given to the relative cost of moving furniture and people to install storm windows indoors compared to that of scaffolding for installing windows on the outside of the building. Section 6 constitutes more than half of the 450-page manual.

Section 7 — Central Control Systems begins with an overview of the purpose and types of such systems. Tables are provided to show the number of type of interface points for each system function. Criteria for the selection of systems are not included; the commercially available systems are not listed by name.

Section 8 — Alternative Energy Sources is limited to a fairly specific treatment of solar energy for heating and cooling, and to a brief consideration of total energy systems.

Section 9 — Cost Estimates and Economic Analysis introduces a workbook provided as an appendix for calculating the costs of the various energy saving options described throughout the manual. Cost indices are provided for each of 9 characteristic cities. (See notes on appendices.)

Section 10 — Computer Programs for Energy Analysis discusses more than twenty specialized programs for performing analyses of such functions as duct design, use of daylight and elevator design. In addition, eleven commercial and sixteen research programs are listed for analyzing total building energy use. Guidelines are given for selecting computer programs.

Appendix A — Selected Codes and Standards examines the implications of retrofit and operations changes in terms of building codes and standards, but does not consider specific codes or standards. Because the manual was published in mid-1975, it could only make brief mention of ASHRAE's new energy conservation standard, 90-75. Presumably, this section will be updated in subsequent editions.

Appendix B — Cost Data gives cost estimates for many (approximately 30) of the options listed in ECM 1 and 2. Costs are keyed to cost indices for different geographic locations throughout the United States, and each set of cost estimates comes with a set of assumptions on which it was based.

Appendix C — Economic Model and Example consists of five tables: Summary tables for 1) displaying and comparing discounted rates of return and other measures, 2) computing after-tax cash flow from an option, 3) converting cash flow to discounted rate of return, and two tables for computing inputs necessary to compute cash flow. A sample set of data for input to the model is given.

Appendix D — Sources for Computer Programs to Calculate Loads and Energy Use

Appendix E — Energy Conservation Example: Energy Savings for Typical Office Building takes a sample office building's data and processes them completely through the economic model.

Bibliography: Complete citations for all references in ECM 1 and 2 are given.

Glossary: Defines key energy terms.

Comments: This manual is one of the most complete and readable technical guides to energy conservation available. As such, it is necessarily geared to the engineering professionals, but would be of real value to the informed building manager.

Price: $5.25 (GPO-041-018-000-80-1)

Available From: Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

20. GUIDE TO ENERGY CONSERVATION FOR FOOD SERVICE

FEDERAL ENERGY ADMINISTRATION, ENERGY CONSERVATION AND ENVIRONMENT, OFFICE OF INDUSTRIAL PROGRAMS

1975 - 1977

This report offers "how to" procedures for saving energy that a food service operator can perform himself. (74 pp.)

CONTENTS

Section 1 — Introduction and How to Begin presents the need for an energy management program in food service instititutions and outlines a plan for program implementation.

Section 2 — Food Preparation and Storage focuses on efficient operation and maintenance of cooking equipment. The major pieces of energy-consuming equipment considered are rangetops, griddles, broilers, ovens, fryers, steamers, refrigerators, and freezers. Efficient operation of equipment is attainable through the energy conservation principles listed.

Section 3 — Lighting contains directions on how to conduct a lighting survey that will accurately determine where energy savings can be made. Then offers suggestions on how to maintain the most efficient lighting systems.

Section 4 — HVAC first describes the operation of heating, ventilating, and air conditioning (HVAC) systems. It then provides tips on operation and maintenance that will reduce energy use.

Section 5 — Sanitation explains how to save energy in dishwashing and water heating processes. Operational procedures and simple maintenance tasks are included.

Appendix: — Tracking Your Energy Use provides worksheets which can be used to determine energy savings.

Comments: — The format of each section emphasizes operation, maintenance and planning. The guide is non-technical and present only guidelines to follow in managing energy use. More technical publications are listed in the bibliography.

Price: — $2.25 (Stock No. 041-018-00127-1)

Available From: — Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

21. HEAT RECOVERY ENGINEERING SEMINAR

THE TRANE COMPANY
1977

An engineering manual which analyzes the vital considerations associated with the application of heat recovery systems and equipment. (58 pp.)

CONTENTS

Part 1 — Practicality of Heat Recovery studies the interdependent nature of the factors to be considered, including weather, fuels, building characteristics, systems/equipment, and building utilization. The two overriding factors which determine the suitability of heat recovery systems, available heat and a use for recovered heat, are also examined in this part.

Part 2 — Systems/Equipment presents various heat recovery systems and equipment combinations and provides the logic for determining the best arrangement to serve the need. Systems covered are coil loop, terminal reheat, double duct, single zone (fan coil), and variable volume. Equipment covered includes domestic water preheating, separate water circuits, air cooled reciprocating chillers, computer room air conditioners, de-superheaters, storage, and control.

Part 3 — Evaluation provides the techniques that permit the evaluator to analyze the various systems in terms that relate to his goals. A sample building is used to illustrate each example system/equipment combination.

Comments: These seminars are conducted for engineers, negotiating contractors and consultants. Further schedule information may be obtained from the regional company offices who sponsor the seminars.

To receive information on price and publication availability, contact:

Main Office
The Trane Company
3600 Pammel Creek Road
La Crosse, Wisconsin 54601
Attention: Neil Patterson

22. IDENTIFYING RETROFIT PROJECTS FOR FEDERAL BUILDINGS

FEDERAL ENERGY ADMINISTRATION
OFFICE OF CONSERVATION AND ENVIRONMENT
1976

This unique handbook is designed to be used by building owners, managers, operators and occupants to identify quick payback retrofit projects in existing buildings. It provides a methodology for non-technical people to survey existing buildings while focusing on proven high-payback options by climate zone and building type, while reducing the technical requirements of the surveyor. The tools are provided to calculate the energy savings, cost savings, capital costs and simple payback periods for the options identified. The handbook suggests a format for writing up the options, energy calculations and reporting the overall retrofit surveys for one or several buildings. (100 pp.)

CONTENTS

Section 1 — Introduction explains the need for emphasizing energy conservation efforts in existing buildings and states that the handbook can be used as a short-cut to the more costly services available from an architect and engineering firm.

Section 2 — Overview of Method for Identifying Retrofits lays out the four basic steps contained in the handbook methodology for identifying retrofits. The method employed parallels that used in a full-scale engineering survey. However, checklists, reference tables, and simple calculations based on the experience of others are substituted for the more complex analysis and measurements entailed in a full-scale engineering effort. The four tasks contained in the methodology are simplified into the following general steps.

- Step 1 - Collecting Energy Use Data This step provides fuel cost data necessary to calculate cost savings in a later step, and also provides an overall sense of priority for retrofit projects. Fuel forms that account for the largest part of the total fuel bill should receive greatest emphasis in planning retrofit projects.
- Step 2 - Categorizing Buildings In this step, all of the buildings at a facility are ranked in terms of size, and thus by their probable proportion of energy use; buildings are categorized into types; and the climate zone that corresponds to a facility's location is identified.

- Step 3 - Identifying Retrofit Options In this step, reference tables link appropriate candidate retrofit options with specific energy systems as a function of building type and the climate zone in which the building is located. In addition, retrofit projects already planned can be easily incorporated.

- Step 4 - Evaluating and Ranking Retrofit Projects In this step the energy and cost savings of individual retrofit projects are calculated, along with their associated investment costs. The options are then ranked in terms of the time it would take for them to pay back their investment cost.

Section 3 — Method for Identifying Retrofit Projects gives an explanation, in sequence, of the tasks in each of the previously mentioned steps. For each task, either a simple table, reference table, or worksheet is provided. When completed, these materials can be combined to provide reports on retrofit options for individual buildings and for the entire group of buildings that make up a facility. This section gives detailed procedural instruction for the surveyor to follow in accomplishing the survey.

Section 4 — Evaluating and Ranking Retrofit Options gives instructions for prioritizing retrofit projects once they are identified in the preliminary part of the survey. Such an exercise provides a picture of which projects identified should be considered first for funding.

Section 5 — Reporting gives the surveyor a format for writing a concise report on each facility surveyed. This is particularly useful in standardizing reports from diversified sites, especially when the surveys are being done by personnel previously unexperienced in building retrofit surveys and cost-benefit assessments.

System-oriented Sections — The tabbed sections of the handbook provide the bulk of the text (all but the first 21 pages). Thirty-six retrofit options are presented under the headings of: heating, ventilating, lighting, cooling, water heating and miscellaneous. Each option has specific instructions for the surveyor to accomplish: preliminary data collection; calculations of energy savings, energy cost savings, capital costs and simple payback period.

Additional tabbed sections are provided for a section on Energy Management Systems and the Appendices containing worksheets and technical reference materials.

Comments: This handbook is useful in expanding an organization's ability to identify quick payback retrofit projects. It is compatible with any existing program and can be useful to experienced engineers. However, its most important contribution to energy conservation effort is in its ability to be used by non-technical personnel. This allows the field of people involved in building retrofit analysis to be greatly expanded and results in a corresponding increase in an organization level of effort in energy conservation and energy cost avoidance.

Price: $2.20 (Stock # 041-018-00129-8)

Available From: Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

23. INDUSTRIAL BOILER USERS' MANUAL

METHODS AND EQUIPMENT FOR EFFICIENCY IMPROVEMENT

FEDERAL ENERGY ADMINISTRATION
1976

This manual's scope includes boilers in the range of 10,000 - 50,000 lb/hr steam flow, utilizing natural gas, oil or coal. Its intended audience includes purchasers and operators of boilers, who want to achieve the most economically feasible degree of energy efficiency in boiler operations. (104 pp.)

CONTENTS

Chapter 1 — Introduction states the manual's objectives, points out the importance of fuel conservation, and gives an overview of the manual's design.

Chapter 2 — Boiler Efficiency and Controlling Factors reviews the major constraints on boiler efficiency, and suggests operational and equipment modifications.

Chapter 3 — Boiler Maintenance Practices and Operational Modifications recommends, as a first step, simply returning the boiler to its original level of operating efficiency and maintaining that level. Boiler tune-up steps are enumerated, and a method is given for developing a maintenance program. Special attention is given to coal-fired boilers. General recommendations include reduced steam pressure, water quality control through various flow down options, and methods of load management. Fuel conversion is treated briefly.

Chapter 4 — Boiler Efficiency Improvement Equipment gives a detailed analysis of air preheaters, economizers, firetube turbulators, combustion control systems and instrumentation, low excess air burners, wall and soot blowers and insulation. For each of these modifications, the following characteristics are described, as appropriate: 1) principle of operation, 2) performance, 3) costs, 4) physical description and application, 5) instrumentation, and 6) air pollution emissions. Brief consideration is given to the costs and benefits of purchasing a new boiler rather than refurbishing an old one.

Chapter 5 — Financial Evaluation Procedures This section is reprinted directly from *Energy Conservation Program Guide for Industry and Commerce* (NBS Handbook 115). Its purpose is to acquaint the user with the various methods of measuring the value of an energy conservation investment, including payback period, return on investment and benefit-cost ratio.

Appendix — Auxilliary Equipment Manufacturers Survey lists the names, type of equipment offered, efficiency data and costs for the maufacturers, as well as partial information for 22 others. The Appendix strongly urges that the manufacturer of the original boiler be contacted before any equipment is purchased.

Comments: The manual is a companion volume to *The Potential for Energy Conservation Through Improved Boiler Efficiency* (See Section III). It is recommended that the two be used together for a comprehensive study of energy conservation in boilers. This volume may be used alone if the users are boiler owners and operators whose objective is to understand boiler efficiency options well enough to begin looking for manufacturers.

Price: $5.50 (Document # 262-577/AS)

Available From: National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

24. INTERIM DESIGN CRITERIA: TECHNICAL GUIDELINES FOR ENERGY CONSERVATION IN EXISTING BUILDINGS

NAVAL FACILITIES ENGINEERING COMMAND
1975

This manual sets specifications for upgrading existing buildings to conform to new building standards. Its primary audience is engineers, and secondarily, facilities managers in DoD facilities. (175 pp.)

CONTENTS

Chapter 1 — Updating of Design Parameters — ventilation, infiltration and building envelope are discussed in terms of specific retrofit and operations changes that may be employed to bring these building characteristics up to current standards. Guidelines are set forth for measuring thermal characteristics for input to computerized building analysis programs.

Chapter 2 — Energy Conservation Checklist — provides a fairly exhaustive series of steps for surveying a building for energy conservation opportunities.

Chapter 3 — Systems and Recovery Techniques — 1) Conversion, additions or modifications to existing HVAC systems to improve energy efficiency. Areas discussed include radiation, elimination of reheat, reheat of secondary energy, conversion of low pressure ductwork, and conversion of refrigeration equipment. 2) Heat balance. The method for conducting a heat balance analysis is set forth, along with procedures for creating a heat balance diagram, and calculating breakeven temperature. 3) Energy reclamation components are examined, including exhaust air heat recovery, refrigeration heat recovery and storage tanks. Each heat recovery system is shown in diagram form in a typical installation. 4) Other technical guidelines and mandatory requirements for energy conservation are dealt with, including economizer/enthalpy cycle, mechanical drive systems, control valves, pumping, cascade refrigeration system, series flow through chillers, heat recovery boilers, split system air conditioning, window units, insulation, low resistance filters and others. 5) Energy sources, solid waste heat recovery and total energy systems are described and explained, but no guidelines or requirements are set forth.

Chapter 4 — Modification of Existing Controls for Energy Conservation this section provides for the tabulation of information about the building and its operation, and the analysis of those tabulations for the purpose of determining what changes to make to existing control systems.

Chapter 5 — Computer Programs examines several of the available software packages for performing building energy analyses. They include the Energy Systems Analysis Series, AXCESS, ECUBE, MACE, TRACE, and the Westinghouse energy study. Following a general description of the programs, the types of input data are reviewed. An example computer analysis of a building is provided.

Chapter 6 — Electrical Systems looks at lighting design requirements and stipulates lighting intensities for different work areas in facilities, as well as outdoor areas.

Chapter 7 — Operation, Maintenance and Balancing in Existing Buildings an extremely brief review of many of the recommended operation and maintenance suggestions provided throughout the manual.

Chapter 8 — Domestic and Sanitary Water Systems stipulates the use of specific equipment for insulation, temperature control, pump operation and conservation of hot water.

Comments: The section on computer systems is particularly strong, and should be reviewed for possible use along with energy management courses at the professional level.

For current information on price and availability, write:

Department of the Navy
Naval Facilities Engineering Command
200 Stovall Street
Alexandria, Va. 22332

25. IN THE BANK...OR UP THE CHIMNEY

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
1975

A manual of safe and cost-saving energy conservation techniques for the homeowner. (73 pp.)

CONTENTS

Part 1 — A Quick Look at Your Home gives several easy-to-follow tips that will reduce fuel consumption and waste without major investments.

Part 2 — A Closer Look at Your Home gives a more individualized approach to home energy savings. The best and least expensive methods of retrofitting a house are suggested by first determining exactly what each house needs.

Part 3 — How To Do It gives step by step directions for installing energy saving materials. In addition, it gives general information on how to find a good contractor to do the work.

Part 4 — More... on how to save heating and cooling energy and... coming soon for your home gives more simple energy-saving tips and briefly describes sun and wind energy and waste heat recovery.

Comments: This is a very useful guide for home owners. The simple language and step-by-step installation instructions make it a document that anyone could use. HUD gives permission to anyone to reprint the manual in its exact present form as long as proper credit is given to HUD. Therefore, it has become available from not only HUD, but from several state energy offices and industries, as well.

Price: $1.70 (Stock No. 023-000-00297-3)

Available From: Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

26. LIFE CYCLE COSTING EMPHASIZING ENERGY CONSERVATION

GUIDELINES FOR INVESTMENT ANALYSIS

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

SEPTEMBER 1976 (REISSUED MAY 1977)

REFERENCE: ERDA - 76/130 UC-13 MODIFIED

This handbook was prepared specifically for use by ERDA and its contractors as a guide to using life-cycle costing as a tool to justify and analyze investment decisions relating to ERDA energy conservation projects. The methodologies presented are generally applicable to a wide range of industrial-type projects whether retrofits or new construction/installation. In some 70 pages, it provides a detailed review of the use of life-cycle costing as an evaluation technique and as an investment decision tool.

CONTENTS

Chapter I — Introduction emphasizes the importance of thorough analyses of all energy-related capital investments and introduces the concept of life-cycle costing as a method of expenditure evaluation that recognizes the sum total of all costs associated with the expenditure during the time it is in use.

As stated, the purpose of this publication is to provide the applicable study parameters and methodologies for capital expenditures for energy conservation, including such features as discount rates, energy cost escalation, salvage value, BTU measurement and analytical techniques.

Chapter II — Economic Concepts and Guidelines discusses, in the form of narrative and illustrative examples, the following economic concepts that are used in life-cycle costing analyses:

- Time Value of Money and the Present Value
- Economic Life
- Residual Value
- Incremental Costing
- Differential Cost Escalation.

Economic measurement concepts are also discussed and include:

- Savings/Investment Ratio (SIR)
- Discounted Payback Period
- BTU Savings/Investment Dollar.

Chapter III — Life-Cycle Investment and Energy Analysis summarizes the procedures for gathering life-cycle costing data and provides a flow chart to illustrate their interrelationships. Discusses the various types of baselines that are used in evaluating the effectiveness of energy conservation measures.

Text, diagrams, tables, and formulas are used to illustrate the application of the life-cycle costing method in a typical situation involving energy production/generation, distribution, and the facility customer. Examples are provided to show the method of analyzing energy use and cost including consideration of fuel adjustments; demand; load factor; and non-energy costs such as maintenance, repairs, and replacements.

Chapter IV — Economic Analysis Methodology this final chapter in the handbook presents complete details of two economic analysis techniques—the Nomogram Analysis Technique and the Primary Project Analysis Technique. Each technique is followed through in logical sequence with detailed examples of both blank and completed forms.

Appendices — Four appendices are provided to supplement the text. The information presented covers the following:

- Definition of Economic Terms
- Average Useful Life of Energy Machinery and Equipment
- Annual and Accumulative Present Value Tables
- Differential Escalation Rate Tables
- Payback to SIR Conversion Table

Comments: The Desk Guide goes beyond a general introduction to economic analysis of energy conservation projects, although a short refresher course of fundamental concepts is provided in the second chapter. As a working document, it addresses practical solutions to problems of order bias in selecting conservation alternatives, electrical demand charges, unequal cash flows, etc. A computer program written in Fortran IV and Basic is available to facilitate the computational process. No bibliography is provided. The use of standard typewriter typeface throughout detracts from readability.

Price: $6.00 (printed copy)
$3.00 (micriofiche)

Available From: National Technical Information Service (NTIS)
U. S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161

27. MANUAL FOR SELECTION, APPLICATION AND COST ANALYSIS OF CENTRAL BUILDING AUTOMATION SYSTEMS

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
1975

This manual was designed to present data and establish procedures to assist Navy personnel and architects and engineers in developing requirements for central building automation systems. The intended audience is engineers experienced in the planning, design and/or construction of mechanical or electrical building systems. It assumes their familiarity with the application of the conventional pneumatic-electrical-electronic control systems. (113 pp.)

CONTENTS

Section 1 Introduction provides a statement of purpose and a glossary of terms.

Section 2 Guidelines and Prerequisites states criteria for pneumatic-electronic control centers (PECCs). Provisions for interconnecting parts of the system are stipulated.

Section 3 Description of Central Building Automation Systems (CBAS) explains the two levels of CBAs, categorized by operation, capability and cost. The review of five types of CBAS is given along with a detailed explanation of the precise nomenclature which is applied to such systems. Descriptions include manufacturer's designation, address capacity, analog value format, format display, trouble display, alarm display, power, address methods, specific function methods, specific method of initiating displays, intercom projector peripherals, computer transmission and whether or not the system has obtained Underwriters' Laboratory approval.

Section 4 CBAS Point Determination, Systems Selection and Development of Installed Costs shows all the components and capabilities which can be managed by a CBAS. Shows how to determine the economic justifiability of a particular CBAS in terms of the control needs of a particular situation. Examples are given for developing CBAS costs.

Section 5 Economic Justification refers specifically to preparation of Department of the Navy economic analyses to justify equipment procurement. However, all components, which are taken into account in setting up the economic justification, are generalizable to other circumstances. The reader is taken, step-by-step, through the calculation of all economic analyses. Several examples are given.

Display 1 Pneumatic Electric Control Centers (PECC) provides drawings and stem diagrams for ECC hardware.

Display 2 Schematic Drawings of Commercially Central Building Automation Systems illustrates the configuration of eleven different CBASs.

Display 3 Central Building Automation System Costs provides cost curves according to costs per control point and number of points in a system.

Display 4 Estimated CBAS Points for Definitive Drawings is based on Naval regulations for illustrating the number of discrete, analog, start/stop and reset points within typical buildings and facilities.

Comments: While this manual is primarily designed for use by Naval engineers, it nevertheless provides a broad overview of a number of actual commercially available system designs and should have more general applicability as a guide to determining the cost and appropriateness of specific systems to particular needs. No supplementary aids or other materials are furnished.

Price: No cost specified.

Available from: Department of the Navy
Naval Facilities Engineering Command
200 Stovall Street
Alexandria, Virginia 22332

28. MEASURING AND IMPROVING THE EFFICIENCY OF BOILERS:
A MANUAL FOR DETERMINING ENERGY CONSERVATION
IN STEAM GENERATING POWER PLANTS

ENGINEERING EXTENSION SERVICE
AUBURN UNIVERSITY
1977

Fuel saving techniques for plant managers, owners, engineers, and boiler operators. (170 pp.)

CONTENTS

Chapter 1 Introduction discusses the text's purpose, scope, contents, and use.

Chapter 2 The Energy Situation reviews U.S. and world energy use patterns, its end uses, and available and potential energy resources.

Chapter 3 Description of Boilers provides a liberally illustrated discussion of the three types of boilers—fire-tube, water-tube, and electric. The energy-using characteristics and the advantages and disadvantages of each type of boiler are enumerated.

Chapter 4 Effect of Important Parameters on Boiler Performance includes consideration of the economic consequences of poor boiler performance. The effect of combustion air, inlet water, fuel gas temperature, and fuel composition on efficiency are dealt with in detail.

Chapter 5 Performance of Boilers describes two methods of measuring boiler performance—the direct, which measures steam generator efficiency, and the indirect, which measures combustion efficiency. Also discussed are the accuracy of instrumentation and the impact of errors in measuring mass flow rates, and change in enthalpy. Instruments are recommended for both methods, along with the relative advantages of each technique.

Chapter 6 Economics Associated with Energy Conservation gives an introduction to basic methods of figuring the costs of conservation measures. Methods include the calculation of payback period and benefit/cost ratio analysis. The reader is then led through both types of calculation to determine the appropriateness of buying a heat exchanger.

Chapter 7 Combustion Control Systems begins with an input-output analysis of the boiler system, followed by a description of the basic variations of the model, e.g., two-position systems and modulating systems. Combustion management systems are then described.

Chapter 8 — Boiler Feedwater Treatment demonstrates the impact of scale, corrosion, and foaming caused by improperly treated feedwater. Water quality terminology is defined, as are a wide variety of treatment methods. A water quality troubleshooting chart is provided.

Chapter 9 — Waste Heat Recovery From Boilers covers the potential sources of recoverable heat, including exhaust gases, process steam pressure drops, and steam condensate and blowdown. Potential uses of the recovered heat are indicated along with the mechanisms for implementing waste heat recovery, including finned tube heat exchangers, flash tank systems, and hybrid flash tank heat exchangers. Throttling turbines are also discussed as a source of electricity where a sufficient pressure gradient is available.

Chapter 10 — Operation and Maintenance of Boilers is divided into sections on general, daily, weekly, monthly, and annual requirements. Using a problem-solution approach, the correct maintenance responses to various situations are delineated. In addition, the chapter contains a number of charts that identify specific energy-conserving operation and maintenance steps and the schedules that must be followed.

Appendices - Are devoted to the more highly technical aspects of energy use analysis, including the properties of fuels, boiler analysis, use of the Orsat analyzer, and the throttling calorimeter. Necessary tables and equations are provided.

Comments: The manual is thoroughly documented with references and illustrations. Chapters are so arranged that they can be used individually or in combination, depending on the objectives of the trainer and the needs of the student. Question and answer sections are provided to enable the user to test himself.

Available From: This document is not yet published. For availability information, call or write:

The National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
(703) 557-4780

29. A PRACTICAL APPROACH TO IN-PLANT ENERGY CONSERVATION

THE CENTER FOR PROFESSIONAL ADVANCEMENT

EAST BRUNSWICK, NEW JERSEY

Managers of institutional, manufacturing and processing facilities are in positions where they must find ways of conserving energy in order to meet economic goals. In the near future, the limited availability of some conventional types of energy will force managers to institute sophisticated conservation programs. This course demonstrates various practical means of implementing an energy conservation program in an existing facility, while providing additional help to those who have already started programs.

Plant managers and engineers who have operating responsibility in manufacturing and processing plants should plan to attend this course, as well as staff members charged with upgrading the efficiency of energy using equipment. Management staff will find the course of value as an aid to highlighting the relative importance and merits of energy economics presented for budgeting by plant and engineering personnel. Plant design and maintenance engineers are also potential students of this course.

CONTENTS

First Day — Course objectives include a practical approach to energy conservation, reasons to conserve energy and development of an effective conservation program. The course discusses the energy picture today including the laws which govern the reporting of energy use.

The course then looks at the cost trends of fuels and the relative cost of fuel sources. An in-depth presentation is made on how to perform energy inventories for heavy and light industries.

The first day also involves a detailed discussion on energy saving opportunities involving steam trapping.

Second Day — Discussion on this day includes utility rates and energy cost trends, minimizing system loads, reducing off-hour energy use, energy conservation in refrigeration, HVAC, and energy conservation in steam generation including the utility of coal and oil as boiler fuels.

Third Day	The topics on this day include fuel substitution for energy conservation and emergency energy supplies, monitoring energy use, energy management systems, measuring the effectiveness of an energy conservation program, selling an energy conservation program on governmental reporting requirements.
Fourth Day (Optional)	The fourth day is devoted to energy recovery and process energy conservation opportunities in chemical processing industries. Many case studies are discussed along with the actual saving achieved for each conservation project implemented.
Fifth Day (Optional)	The fifth day addresses the long term future of energy supplies and usage patterns in North America.

To receive information on price and course schedules, contact:

The Center for Professional Advancement
P. O. Box 997
Somerville, New Jersey 08876

30. PRACTICAL ENERGY MANAGEMENT IN HEALTH CARE INSTITUTIONS

BLUE CROSS OF GREAT PHILADELPHIA
FEDERAL ENERGY ADMINISTRATION
1977

An action guide for use by health care professionals. (127 pp.)

CONTENTS

Part I — Executive Summary of Practical Energy Management lists the systems which are the greatest energy consumers in a hospital and outlines energy management implementation with respect to operational expenses and organizational responsibility.

Part II — Practical Energy Management in Health Care Institutions details energy management and includes selected energy saving ideas. The goal is to encourage energy management and to indicate how it can be accomplished through practical measures.*

Section 1 — Steps of Energy Management guides the professional in committing and organizing the management in energy management, and finally in carrying out the plans.

Section 2 — Strategy for Energy Management outlines a strategy for use by directors and managers of health care facilities which will be useful in obtaining and maintaining financial aid from the administration.

Section 3 — Case Histories in Energy Management gives brief summaries of selected energy management actions in four hospitals. These case histories are included to further demonstrate practical means to save energy. They result from the instruction and on-site technical support provided all participating hospitals during the development of this guide.*

Section 4 — Energy Data Collection and Analysis contains practical steps to collect and analyze energy data in a hospital. It outlines energy records, data collection and data forms, energy indicators, and energy analysis.*

Section 5 — Building and Equipment Survey details the practical steps of conducting a facility survey to identify energy saving opportunities.*

*From the manual.

Section 6 Energy Saving Ideas discusses energy saving ideas found especially useful for health care institutions.*

Appendix Includes: (1) a checklist to conduct a facility survey; (2) energy data forms to collect, analyze, and calculate energy data; and (3) note on financial evaluation to explain rationale of suggested approach.

*From the manual.

Comments: The first part of the manual broadly covers the major concerns of energy management planners in health care facilities for use by all health care professionals. The second part details the process stepwise and answers the questions of the directors and management of health care institutions.
Scheduled availability in April 1977. First priority to hospitals in greater Philadelphia area.

Price: None.

Available from: Blue Cross of Greater Philadelphia
1333 Chestnut Street
Philadelphia, Pennsylvania 19107

Attention: Mr. Doug Worrall

31 - PROJECT RETROTECH:
TEACHER'S KIT FOR COURSE ON HOME WINTERIZATION

FEDERAL ENERGY ADMINISTRATION
MAINE UNIVERSITY
1975

A guide to teachers for developing lesson plans for a home winterization course to promote the utilization of known retrofit technology, to improve thermal characteristics and conserve energy in residential housing. Intended audiences are senior high school through non-specialist adult. (165 pp.)

CONTENTS

Section 1 General Lesson Plan delineates course objectives, instructional objectives, equipment required, student materials, lesson topics, instructional strategies and format of lesson plans.

Section 2 Lesson Plan 1 - Overview of Course points out the objectives of the course, which include developing skills in estimation and installation, and points out the course content including an introduction to heat loss, building heat loss by conduction, building heat loss by infiltration, four steps to home winterization, and laboratory and field exercises.

Lesson Plan 2 - Introduction to Heat Loss teaches a number of basic concepts including BTU, the calculation of total fuel use, the district heating factor and the causes of heat loss. An overview of the 4-step process of home winterization is then given.

Lesson Plan 3 - Building Heat Loss by Conduction elaborates on the concept of conduction and teaches the various types of insulation as well as the concept of R value and vapor barrier.

Lesson Plan 4 - Building Heat Loss by Infiltration explains the chimney effect and shows points at which cold air typically may enter a building.

Lesson Plan 5 - Home Winterization is reviewed as a four-step process and then detailed in terms of inspection of the building, calculation of heat loss, evaluation of the data and installation of the materials (a student job book is included that allows for entry of all items of data and provides all necessary formulas for performing calculations). Extensive guidance is given to the teacher on methods for setting up classroom demonstration of the concepts involved.

Lesson Plan 6 - Job Book Examples by Students is an actual field exercise in which students complete an evaluation of a building and prepare a job writeup specifying materials for improving the thermal efficiency of the building, including a calculation of costs and payback period. The student's results are then scored against the previously calculated figures for the building.

Comments: Project RETROTECH is a complete course in home winterization. It includes all necessary charts for use as transparencies, and specifies the necessary materials that should be brought to the classroom for demonstration purposes. The kit contains the Teacher's Guide to Home Winterization, the Home Winterization Job Book, the Home Winterization Manual and Home Winterization charts.

Cost: $6.75 (Document No. PB-250 148)

Available From: National Technical Information Service

32. SAVE ENERGY: SAVE MONEY!

COMMUNITY SERVICES ADMINISTRATION
1974

A guide to winterization for low-income homeowners. (40 pp.)

CONTENTS

Section I — Keeping Warm explains how to seal holes in foundations and floors against heat loss and how to install storm windows inexpensively. In addition, it offers commonsense tips on keeping warm in a cooler home.

Section II — Getting Heat Where You Need It suggests several do-it-yourself methods of heating living areas efficiently by distributing heat to areas where it is most needed.

Section III — Using the Sun tells how to make the best use of the winter sun in keeping a home warm.

Section IV — Furnaces, Stoves and Fireplaces stresses the necessity of keeping these heat-projectors clean and tells how to do it.

Section V — Other Energy Needs specifies other important areas in the home where energy savings may be substantial, e.g., appliances, insulation.

Comments: This guide being geared towards lower income families, suggests ways to lower the energy bill by employing do-it-yourself methods and devices. There is a list of references in the back of the guide that tells where to get more information.

Price: None.

Available From: Community Services Administration
1200 19th St., N. W.
Washington, D. C. 20506

33. SAVENERGY KIT

U. S. DEPARTMENT OF COMMERCE
1976

A kit to be used by manufacturing and retailing business managers in promotion of an energy conservation program.

CONTENTS

Print Media Materials includes press releases, photographs with captions, and suggested advertisements for promotion in newspapers and magazines.

Broadcast media materials suggests ways of getting the individual corporation's energy conservation story broadcast on radio or television.

Ideas for Special Events presents ways of obtaining and maintaining the attention of employees, the local media, or the general public, such as poster contests, booth, and other special events.

Materials for In-house Use includes sample speeches, posters, and envelope-stuffers to be used to promote energy conservation among employees.

Film: "Energy Critical Choices Ahead" is recommended as a part of this program.

Comments: This kit is most useful in the promotional stages of an energy management program. To organize the program initially and to continue by significantly reducing energy consumption, technical documents must be utilized at the management level.

Price: None.

Available From: Office of Energy Programs
U. S. Department of Commerce
Washington, D. C. 20230

34. SITE ENERGY HANDBOOK: VOLUME 1 METHODOLOGY FOR ENERGY SURVEY AND APPRAISAL

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
1976

An energy handbook which presents guidelines to evaluate energy usage, to identify energy-saving opportunities, and to recommend appropriate conservation measures at ERDA facilities (137pp).

CONTENTS

Comments:	An accompanying publication (Volume 2) contains all the necessary forms referenced in Chapters 1 through 4. The bulk of this text is in Chapter 5 which thoroughly covers energy conservation measures at industrial sites.
Price:	$6.75 (ERDA 76/131/1). $9.00 (ERDA 76/131/2 - supplementary forms)
Available From:	National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161

35. TECHNICAL OPTIONS FOR ENERGY CONSERVATION IN BUILDINGS

NATIONAL CONFERENCE OF STATES ON BUILDING CODES AND STANDARDS

AND

NATIONAL BUREAU OF STANDARDS JOINT EMERGENCY WORKSHOP ON ENERGY CONSERVATION IN BUILDINGS

1973

The purpose of this document is to provide reference materials on the technical options available for energy conservation in buildings. Options for both existing and new buildings are considered. Throughout the document, emphasis is placed on technical options — the economic implications of these options are not covered in any detail. (184 pp.)

CONTENTS

Chapter 1 — Summer Cooling - Existing Buildings suggestions are provided for reducing the cost of energy for summer cooling. Some of the suggestions can be implemented with little of no cost, while others will require investment in materials, equipment and labor. The suggestions include the raising of thermostat and humidistat levels, reduction of cooling loads produced by lights and appliances, the utilization of outside air for cooling, the reduction of ventilation, and proper maintenance. Items that would require some investment include the provision of solar shades, the addition of insulation, the installation of automatic controls on appliances, lights and fans, and basic modifications to cooling systems such as the installation of new types of cooling equipment. The information is summarized in a series of charts.

Chapter 2 — Winter Heating - Existing Buildings suggestions are provided for lowering the cost of winter heating through actions that require no cost and those that require expenditure of funds for equipment, materials and labor. In the first group the suggestions are quite simple, including lowering thermostats, wearing heavier clothing, closing off unused rooms and modifying ventilation schedules.

The extra cost items include the provision of timed controls for thermostats, the addition of insulation and the installation of heat recovery and conservation devices. The information is summarized in a series of charts, including a chart showing potential percentage savings through night thermostat setback for various cities in the United States.

Chapter 3 — Energy Conservation Features - Insulation — the value of proper insulation as an energy saving measure is discussed. Graphs are provided which show the potential energy and cost savings from thermal improvements for the national stock of residential buildings over the next 25 years.

Chapter 4 — Energy Conservation Features - Fenestration — the impact of windows on the heating and cooling loads imposed on building equipment is discussed both in the text and in diagrams. Suggestions, together with graphs of heat gain/loss, are provided to show building owners how negative aspects of windows may be compensated. The measures discussed include shading, the use of different types of glass, window placement in buildings and exposure orientation effects.

Chapter 5 — Energy Conservation Features - Lighting — the energy consumption of lighting and its effect on the cooling load of air conditioning equipment is discussed. It is suggested that the energy required for lighting can be reduced by as much as 25 percent through some simple measures. These include simply turning off lights that are not in use, using lighter color paints on walls, the application of more efficient light sources, and improved design of lighting fixtures. A chart is provided that shows the relative efficiency of different light sources.

Chapter 6 — Energy Conservation Features - Appliances — typical appliances used in a modern home are listed together with their approximate annual Kw-Hr energy usage. Suggestions are provided for reducing the energy consumption of cookers, refrigerators, dishwashers, television sets, washers, dryers and freezers. The majority of the suggestions are concerned with proper maintenance and use.

Chapter 7 — Energy Conservation Features - Domestic Hot Water — suggestions for reducing energy consumption for hot water heating include reduction of the hot water temperature, reducing water waste, repair of leaky faucets, the use of cold water detergents and shutting off the hot water circulating line pump at night if one is fitted.

Chapter 8 — Energy Conservation Features - Human Comfort — many of the methods recommended to save energy can possibly result in some form of human discomfort — too hot, too cold, too drafty, too humid. This section provides an excellent discussion of the various indices that have been developed over the years to describe the interaction between man and his environment. Information is provided showing how the various data in the charts were developed. The ASHRAE Standard 55-66 is discussed in some detail.

Chapter 9 — New Buildings - Building Design this section discusses steps that can be taken to conserve energy in new buildings at the design phase. Through a series of charts and discussion, it is shown that considerable energy savings potential exists through the proper use of insulation and the proper design of fenestration. Additional savings are possible through the use of outdoor air for natural cooling, the relaxation of rigid temperature limits and the proper sizing of mechanical equipment.

Chapter 10 — New Buildings - Building System Design this section discusses many of the areas that should be considered in the selection of equipment for a new building. Computer simulations of ducting systems are discussed and an example is provided. Some of the other subjects covered include thermal recovery systems, solar energy systems, waste heat reclamation, building occupancy scheduling, and the reduction of building electrical loads through demand limiters and power factor correcting condensers. No technical data is provided.

Chapter 11 — Mechanisms for Implementation of Energy Conservation Technology in Buildings - by Paul R. Achenbach this technical paper commences with the premise that energy conservation is desirable and economically sound. It addresses the important question of "How can energy conservation technology be implemented in our present inventory of buildings and new buildings that are being added each year?"

The prerequisite to implementation includes acceptance of the energy conservation potential by the public, builders, manufacturers, financial institutions and regulatory bodies. The mechanisms for implementation are broken down into three groups: Educational, Financial and Regulatory. The author discusses the implications of each, gives examples and mentions several developments that should lead to standards or specifications for energy conservation in buildings.

The remainder of the paper centers around the establishment of criteria for limiting energy use in buildings. The standards developed and promulgated by HUD, FHA and the State of New York are illustrated both by discussion and in table form: The author concludes that no single set of criteria now exist and suggests participation of all segments of the building industry in developing equitable guidelines for energy use in buildings.

The paper is summarized in chart form.

References: A total of 15 references are given, all dated before 1974.

Comments: This non-technical book is well written and fairly exhaustive in its approach to saving energy in buildings. It may be used as a starter text for professionals.

Price: $2.35 (Catalog Number: C13.46:789)

Available From: Superintendent of Docments
U. S. Government Printing Office
Washington, D. C. 20402

36. TIPS FOR ENERGY SAVERS

FEDERAL ENERGY ADMINISTRATION
OFFICE OF CONSERVATION AND ENVIRONMENT
1977

A guide to energy conservation in and around the home, on the road, and in the marketplace. The intended audience includes homemakers and their families (31pp).

CONTENTS

In and Around the Home focuses on measures that conserve electric energy year-round, then specifically goes into other cold weather and hot-weather energy savers. It also touches upon other areas in the home where energy may be conserved — the kitchen, laundry, bath, workshop, yard and garden.

Using the Family Car suggests ways to eliminate unnecessary trips through carpooling or other modes of transportation and some important factors to consider when buying a new car.

In the Marketplace mentions a few energy-wise buying practices.

Price: None.

Available From: Consumer Information
Public Documents Center
Pueblo, Colorado 81009

37. TOTAL ENERGY MANAGEMENT

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
U. S. DEPARTMENT OF COMMERCE
1976

A practical handbook on energy conservation and management for use by owners and managers of office buildings and small retail stores. (74 pp.)

CONTENTS

Chapter 1 — Introduction presents the integrated approach of total energy management in comparison with the approach of energy management in individual energy-consuming systems.

Chapter 2 — Energy Consumption in Buildings discusses the factors that affect energy consumption and efficiency.

Chapter 3 — Obtaining Initial Commitment and Cooperation stresses the need in obtaining strong commitment and cooperation from all involved personnel in order to have an effective program.

Chapter 4 — Establishing an Energy Conservation Goal describes the methods used in determining present energy use levels and using this data to establish a goal in terms of reduction in energy use.

Chapter 5 — Conducting a Building Survey provides general guidelines in conducting a building survey.

Chapter 6 — Guidelines for Energy Conservation identifies several ways in which office buildings and retail stores may become more efficient in energy use. This includes methods that cause significant, as well as, minimal expense.

Chapter 7 — Implementing the Program contains a brief listing of guidelines to be observed for implementing both initial and continuing elements of the program when the survey is completed.

Chapter 8 — Case Histories describes two case histories providing information on the building involved, the nature of energy conservation activities undertaken, and the results of the effort.

Appendix A — Contains a sample building survey form.

Appendix B — Lists sources of information on energy conservation.

Comments: This guide is a good introduction to the concept of total energy management. It provides sources of information in the appendices and bibliography which are helpful supplements to the text.

To receive information on price and publication availability, contact:

National Electrical Manufacturer's Association
Public Affairs Department
2101 L Street, N.W.
Washington, D.C.

38: UCAN TECHNICAL IMPLEMENTATION MANUAL

FEDERAL ENERGY ADMINISTRATION

1976

This UCAN (Utilities Conservation Action Now) Manual supplements The UCAN Manual of Conservation Measures by focusing on the methods adopted by utilities, public service commissions, and public interest groups which have proven to be successful implementation strategies in energy conservation. The primary audience includes the management and planning teams of these groups (170 pp)

CONTENTS

Section 1 — Rate Reform to Reflect Time-Varying Cost of Service examines the FEA recommendation that utilities adopt structural rate reforms that embody peak responsibility pricing and time-varying rates, based on marginal cost principles. It then illustrates the initiatives that may be taken by electric utilities, gas utilities, public service commissions, and public interest groups in applying this recommendation to their interests.

Section 2 — Load Management and Load Controls discusses the concepts and techniques of utility load management and how it may be encouraged by the utilities, public interest groups, and consumers.

Section 3 — Insulation Consultation and Financing describes a program for encouraging the retrofitting of insulation in three major phases: promotion, consultation, and financing. The active roles of utilities, public interest groups, and public service groups in this program is detailed here.

Section 4 — Consumer Usage Information describes the communication efforts to be taken by utilities and other groups to encourage reduction of energy use. Special emphasis is given to the residential customers who are normally given less information and attention in this important area. Included in this section, are sample utility bills which demonstrate attempts to explain to the residential energy consumer exactly what the bill says and means.

Section 5 — Energy Efficiency Awards explains the implementation of such a program as a vehicle through which the public, especially industrial and commercial customers, is encouraged to use energy more efficiently. Sample promotional materials, score sheets and checklists are provided to further illustrate the scope of an energy efficiency award program to be used effectively by utilities, public interest groups, and public service groups.

Section 6 — Energy Efficiency Promotion addresses itself to measures that can be taken in residential and commercial sectors to improve the efficiency of systems already in use, i.e., lighting systems and appliances. Consumer education programs are incorporated into this plan. The role of public interest groups in residences is particularly emphasized here.

Section 7 — Interior Environment Consultation Programs focuses on achieving energy savings through improved interior environmental control in commercial buildings, especially in space conditioning and lighting systems. The utility companies offer technical expertise, the public service commissions focus on consumer education, and the public interest groups raise consumer awareness to initiate a well integrated program.

(Inserted at this point is a supplement to the document, Energy Conservation Through Control of the Interior Environment of Commercial Buildings, which informs the commercial customer of the need for energy conservation, the cost benefits that are possible, and to suggest certain conservation measures that are readily implemented. These are specifically in lighting, heating, and cooling factors).

Section 8 — Building Code Revisions encourages revisions of building codes to promote energy conservation and to encourage innovative design. Participation of gas and electric utilities, public service commissions, and public interest groups at hearings and/or in lobbying are considered to be highly valuable functions.

Section 9 — Energy Audit Consultation recommends two energy audits within the context of the UCAN program — an overall audit by the utility which analyzes variation in energy use by the customer, and a more detailed audit by the customer to determine why these variations have occurred. The public service and public interest groups act to encourage industrial and commercial firms to use the audit services offered by utilities.

Section 10 — Individual Rather Than Master Metering of Electrical Service in Apartment Buildings discusses the advantages to energy management programs in the use of individual metering of electricity rather than master metering. This is based primarily on tenant response to individual electricity billings.

Comments: The manual is illustrated with many sample programs useful in the planning stages of other energy management programs. It covers all relevant topics well enough to encourage and promote energy conservation in industry, commerce, and residences.

Price: $7.50 (PB 261-094)

Available From: National T[illegible] Information Service
5285 Port [illegible] Road
Springfield, Virginia 22161

39. WASTE HEAT MANAGEMENT GUIDEBOOK

U. S. DEPARTMENT OF COMMERCE

FEDERAL ENERGY ADMINISTRATION

1977

Sources of waste heat in industrial processes are reviewed, and an overview of off-the-shelf technology available for its use is given. Discussions of waste heat measurement technology and economics are included, as are 14 case studies of successful industrial waste heat recovery installations. (264 pp.)

CONTENTS

Chapter 1 Sources and Uses of Waste Heat Waste heat is defined as heat that is rejected from a process at a temperature high enough to permit the extraction of additional value from it. The sources of waste heat are discussed, and grouped into three sections — high temperature (1000-2800°F), medium temperature (450-1200°F), and low temperature (80-450°F). A brief discussion is provided of the uses to which waste heat of various thermal content may be put. The organization and implementation of a waste heat management system are briefly discussed.

Chapter 2 Determination of Waste Heat Requirements discusses the need for economic recovery of waste heat. A clear discussion of the first and second laws of thermodynamics shows how the quantity and availability (quality) of waste heat is determined theoretically. Heat balance is covered in some detail with sections on energy input, energy losses, and energy discharges, and shows how these considerations must be combined when determining the economics of waste heat recovery. Fully worked examples are given for determining the heat balance of a boiler and the chemical energy in fuel, with reference to stack gas condensation problems. The economics of waste heat recovery are illustrated by an example of heat recovery from a steel tube furnace. A final section discusses methods of transferring the waste heat from the steam in which it is produced to the stream where it can be made to do useful work. All the basic thermodynamics equations and relationships are given, together with references for further reading.

Chapter 3 Economics of Waste Heat Recovery deals with concepts and analytical techniques that can guide the industrial plant manager in evaluating the economic efficiency of investments in waste heat utilization. It explains in text book fashion, and demonstrates in simplified but realistic examples the use of alternative methods of evaluating and comparing energy saving investments. The methods discussed range from simple techniques, such as determination of the payback period, to more sophisticated methods, such as benefit-cost analyses, life-cycle cost analysis, and the internal rate of return method. The discussion covers the treatment of taxes, inflation, and uncertainty in data estimates and assumptions. The kinds of financial data needed

Chapter 3 (Cont.) to perform the analyses are identified, and the appropriateness of the different evaluation methods for analyzing various kinds of investments is explained. The chapter concludes with tables of compound interest factors for both single payment and uniform payments from 6-25 percent discount rates for 50-100 interest periods.

Chapter 4 Case Studies of Successful Systems for Industrial Waste Heat Recovery provides summaries of several successful industrial installations of waste heat recovery systems. These case studies are selected to represent: (a) major commercial options in waste heat recovery equipment (examples are radiation recuperator, economizer, heat wheel); (b) various industrial applications of heat recovery equipment (examples are glass making, forge furnace, paint and varnish processing; and (c) various geographical locations throughout the United States.

Fourteen individual case studies are presented. Details include all thermal calculations, cost analyses, process diagrams, design details, flow diagrams, and before-and-after-operating parameters and cost savings.

Chapter 5 Commercial Options in Waste Heat Recovery Equipment reviews available industrial heat exchangers. Five categories are considered: gas-to-gas heat exchangers, gas or liquid-to-liquid regenerators, waste heat boilers, gas and vapor-expanders, and heat pumps. Within those categories, clear diagrams are provided to indicate the method of operation, flow paths, and design details. The diagrams are supported by the text, which discusses typical applications.

Chapter 6 Instrumentation provides a technical discussion of the various technologies that are available for measuring the essential parameters of a system prior to installation of waste heat recovery devices. Four areas are covered: thermometry, flow and pressure measurement, infrared thermography, and flue gas analysis. The theoretical basis of the measurement is discussed in detail together with the pertinent equations and relationships. Diagrams are provided for the various instruments and actual use examples are shown. Several references are given for further reading.

Chapter 7 Engineering Data for Waste Heat Recovery compiles various charts graphs, and tabulated data that are essential to the analysis of waste heat problems. The data have been gathered from various sources and provides a comprehensive reference section.

Chapter 8 Sources of Assistance for Designing and Installing Waste Heat Systems provides a very brief listing of some of the major engineering and electrical societies/institutions. For further assistance, the reader is directed to consulting engineers and manufacturers although no specifics are provided.

App[illegible] Provides a complete listing of all symbols and notation used in this publication.

Comments: This publication provides an excellent treatment of waste heat management suitable for both technical and non-technical personnel. The mathematics and diagrams are extremely well presented and fully supported by tabulated data. The publication is well written, logical in its approach, and covers all aspects of the subject. It should be an invaluable reference for industrial and mechanical engineers.

Price $2.75 Catalog Number C[illegible]

Available from: The Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

40. CAR AND BUS POOL MATCHING GUIDE

U. S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
1975

For use by employers in implementing a comprehensive carpool - buspool program. (150 pp.)

CONTENTS

Chapter 1 — Introduction describes the major purposes for devising a carpool locator service.

Chapter 2 — Successful Programs represents a cross-section of programs ranging from public and private carpool programs to commuter bus operation. Case studies illustrate the many considerations involved in the programs.

Chapter 3 — Carpool and Buspool Considerations covers public information, incentives, data processing, and continuing service as basic ingredients in a successful pooling campaign.

Chapter 4 — Conclusion reviews the major points of emphasis in the manual i.e. time-origin-destination similarities of employees, public information, incentives, and continuing service, as important phases in the successful program.

Appendix A — Introduction to the FHWA Computer Program for Carpool Matching describes the program logic, input, and output. Source is included.

Appendix B — Bibliography of Related Carpool Buspool Publications sources are included.

Comments: This guide is useful as a supplement to other pooling guides. It details the successful matching of compatible poolers.

Price:

Available From: U. S. Department of Transportation
Federal Highway Administration
Washington - HHP - 26
Washington, D. C. 20590

SECTION II

PRIMARY RESOURCES

PART 2

TRANSPORTATION

41. CHILTON'S MORE MILES-PER-GALLON GUIDE

RONALD M. WEIERS,
CHILTON BOOK COMPANY
1974

A do-it-yourself handbook for today's motorist that explains how to improve fuel economy. (131 pp.)

CONTENTS

Chapter 1 — The Costs of Driving fixed costs, such as insurance, taxes and fees, and depreciation, are described as costs over which the automobile owner has little control. These are distinguished from variable costs, i.e. gasoline, tires, maintenance, and repairs, which are dependent on how the vehicle is used. Methods of calculating these costs are provided.

Chapter 2 — The Science of Savings applies the laws of physics to automobile operation. The topics covered are rolling, air, rolling, acceleration, gravity and engine.

Chapter 3 — Buying for Economy advises the prospective car buyer. All topics covered are related to reduced fuel consumption. In addition, the author discusses economical [illegible] oil and tire purchases.

Chapter 4 — Driving for Economy couples the rules of physics to typical driving situations to give the motorist tips [illegible] fuel consumption.

Chapter 5 — Maintaining for Economy suggests standard maintenance requirements to reduce miles-per-gallon.

Chapter 6 — Planning for Economy discusses the planning considerations to be acknowledged before taking long or short trips which may lead to eliminating unnecessary trips.

Chapter 7 — 55 MPG on a Sunday Drive describes economy [illegible]

Appendix 1 — Trucks, Recreational, and Other Vehicles provides additional tips for drivers of these vehicles.

Appendix 2 — Alternate Power Sources describes the wankel rotary engine, the stratified charge engine, and the diesel engine.

ppendix

__ Ways to Improve Your Gas Mileage.

mments

The text is illu[illegible]cated with [illegible]graphs, charts, and photographs. The auth[illegible]r uses a semi-technical approach to the issue. The book is easy enough to follow by the average motorist, yet is technical enough to present a full description of each topic.

To receive information on price and publicat[illegible] availability, contact:

Chilton Book Company
Radnor, Pa. 19089

42. CONSUMER GUIDE TO AUTOMOBILE FUEL SAVING STRATEGIES

FEDERAL ENERGY ADMINISTRATION

1977

A guide designed for the instruction of current motorists in the techniques of energy conservation on the road.

CONTENTS

Section 1 Increase Your Miles Per Gallon outlines the major areas of automobile fuel savings.

Section 2 Introduction to Fuel Economy Savings stresses the need for fuel savings and the monetary implications of these savings.

Section 3 Need for a Personal Strategy describes the procedure for planning an effective fuel saving strategy.

Section 4 Using Know-How to Make Fuel Economy Work explains vehicle operation and design in terms of their effects on fuel economy.

Section 5 Guidelines for Purchasing Your Next Car suggests basic questions to be addressed when purchasing a car, with emphasis on "gas savers" and "gas wasters."

Section 6 Operating Tips That Save You Gasoline advises the motorists in methods of operation which will reduce fuel consumption.

Section 7 Use Your Head, Not Your Pocketbook suggests ways to reduce everyday automobile use and fuel waste.

Section 8 Maintenance and Fuel Economy places emphasis on the maintenance of parts which are vital in fuel economy.

Section 9 Emission Controls and Fuel Economy explains the role of emission control devices in automobile fuel economy.

Section 10 Final Remarks summarizes the guidelines of automobile fuel economy.

Comments: Numerous graphs clearly illustrate the text. It should be noted that this manual is still in draft form and subject to revision.

43. DOUBLE UP AMERICA

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
1975

A carpool kit that contains ride-sharing information for employers.

CONTENTS

1. Action Box "This kit is an introduction to a carpool program. More detailed, technical information is available."*

2. Why Carpool? "There are many excellent reasons for both the employer and the employee to get involved in a carpool program."*

3. Federal Aid "A Brief sketch of U. S. Government involvement in this important national effort."*

4. Carpools and the Employer "Seeks to answer these questions: How the employer can benefit, how the employees benefit, how the community benefits; how a program is started and how much it will cost."*

5. Carpool Matching Approaches "A brief introduction to carpool matching and how it's done and an explanation of computer-matching techniques."*

6. Carpooling Facts and Figures "Statistics show the economic advantages to carpooling."*

7. Success in Carpooling Programs "Success stories from companies that are running carpool programs."*

8. Carpools and the Community "There are successful carpool programs (and carpool incentive programs that are operating city-wide, area-wide and State-wide."*

9. Carpools and the Insurance Question "The answer to a question that comes up almost immediately whenever the subject of organized carpools is raised."*

10. Promotional Samples "Colorful materials are available to help kindle interest in carpool programs and to keep them rolling. Here are some samples, with order blank."*

— "Double Up, America" "A synopsis of "Double Up, America", a 15-minute, 16mm, color/sound motion picture highlighting some successful carpool programs currently operating around the country, and a reservation card."*

-- Federal Highway Administration Division Offices "Addresses and telephone numbers for more information."*

Comments: There is enough information here to facilitate implementation of a pooling program without necessary consultation of large numbers of other resources. Promotional materials are available at low cost or free of charge.

Price: None

Available From: Carpools
U. S. Department of Transportation
HHP-26
Washington, D. C. 20590

*From Publication

44. HOW TO CONSERVE ENERGY IN SCHOOL TRANSPORTATION SYSTEMS

COLORADO DEPARTMENT OF EDUCATION
1977

A guide to assist school transportation administrators to achieve better fuel and cost management goals (12pp).

CONTENTS

Comments: A brief document which provides basic measures to be considered in the early stages of energy conservation planning in school transportation systems.

Price: None.

Available From: Office of Supporting Services
Colorado Department of Education
State Office Building
201 East Colfax Avenue
Denver, Colorado 80203

45. HOW TO POOL IT

U. S. DEPARTMENT OF TRANSPORTATION/FEDERAL HIGHWAY ADMINISTRATION
1975

A ride-sharing manual for employers. (55pp.)

CONTENTS

Introduction presents the idea of ride-sharing to the employers and briefly outlines the benefits.

Chapter 1 — Management's Role emphasizes the importance of management support. It describes employer benefits, management commitment, and assignment of responsibility in coordination of the program.

Chapter 2 — Types of Ride Pools describes different types of carpools, vanpools, and buspools with respect to organizational arrangements.

Chapter 3 — Putting the Program Together suggests prematching planning which determines what has already been done; matching techniques, computerized or manual; and accurate maintenance of records which keep the program updated.

Chapter 4 — Selling the Program lists several factors which make the program more appealing to employers. This includes such things as finance, fuel and time savings, carpooler recognition and promotional techniques.

Chapter 5 — Legal Aspects deals with employer and carpooler liability and regulations.

Comments: This is a good concise guide for use by employers in organizing and implementing a ride-sharing program in his place of work.

Price: None.

Available From: U. S. Department of Transportation
Federal Highway Administration
Attention: HHP - 26
Washington, D. C. 20590

46. SPEED LIMIT 55

U. S. DEPARTMENT OF TRANSPORTATION (DOT)
1976

A kit designed to aid the States in devising and implementing effective public information and education campaigns in connection with greater voluntary adherence to the 55 MPH speed limit.

CONTENTS

Introduction Suggests an organizational approach to the "55 MPH Campaign." It lists the materials offered by DOT as aids and describes successful techniques previously implemented by various states.

Fact Sheet on National 55 MPH Speed Limit Contains information on the speed limit law and the benefits of the law.

Sample Speech to be used in organizing the campaign.

Promotional Materials such as bumper stickers and posters, that are available to the States or other organizations from DOT.

Price: None.

Available From: 55 MPH Campaign
Office of Public Affairs (S-80)
U. S. Department of Transportation
Washington, D. C. 20590

47. TRUCKER'S GUIDE TO FUEL SAVINGS

FEDERAL ENERGY ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL PROTECTION AGENCY
1975

A guide to reduced fuel consumption for truck operators (20 pp). Sample topics include:

- Power, and the kinds of resistance it can be used to overcome
- Engine-tuning, including particular items that should be checked regularly
- Diagnosing chassis problems by measuring tire wear
- The potential of payload increases, reduced wind resistance and reducing the number of drive axles
- Add-on equipment, such as temperature modulated fans and turbocharging kits
- A general method for matching engines, transmissions and axles for best fuel efficiency.

Comments: This booklet makes up in brevity and clarity what it lacks in detail. Its best instructional use would be either as a pre-class reading or a post-class reminder.

Price: None

Available From: National Energy Conservation Office
Office of Energy Conservation and Environment
Federal Energy Administration
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20461

Attention: Mr. Bill Freeman

SECTION II

PRIMARY RESOURCES

PART 3

FILMS, FILM STRIPS, VIDEOTAPES

48. "A CAP IN THE GAP"

FEDERAL ENERGY ADMINISTRATION

This is a film on low-income home weatherization. It is a step-by-step instructional presentation, showing in detail the processes and materials used in the insulation of a typical house. It is intended for individual homeowners and other non-professionals in the insulation installation field. It is suitable for showing at civic meetings and at seminars and workshops staged by various organizations for citizen groups. The film may be used in conjunction with "The Home Energy Savers Workshop," "In the Bank or up the Chimney," and other such Federal publications available from the U. S. Government Printing Office.

Comments: 25 minutes, color, sound, 16 mm.

Price: $137.

Available From: Monumental Films, Inc.
2160 Rockrose at Malden Avenue
Baltimore, Md. 21211

19. "CONSERVING ENERGY THROUGH APPLIANCE LABELING"

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

Explains the purpose and goals of the labeling program begun in 1973. Explains how the information on the labels can help a consumer buy the most efficient model for his or her needs and save energy and money in the process. Gives a look at room air conditioner energy guide labels. Room air conditioners are the first appliances to be labeled under the appliance labeling program. Show is aimed at consumer groups, home economics teachers and classes, and adult education courses; can also be used by retail appliance stores as a training aid for salespeople. Guide included.

Comments:	7 minutes, 56 2x2 slides, color, 1 audiocassette, 1 script, 1975.
Price	$12.00 (Sale)
Available From:	Available on loan from National Bureau of Standards, Washington, D. C. 20234.
	Source of purchase is National Audiovisual Center, GSA, Attn: Order Section, Washington, D. C. 20409.

50. "ENERGY CONSERVATION"

U. S. AIR FORCE

The first segment of this film develops a framework of energy orientation and man's dependence on oil products for most of his energy needs. It then relates the facts of the petroleum crisis to its effect on the world of the present and future. The next part presents some of the major activities of the U. S. Air Force in the development of good management practices in energy conservation. The third segment describes ways the average citizen can conserve petroleum energy, with major emphasis on driving techniques. This film is directed primarily at Air Force personnel but is suitable for showing at any adult group meeting.

Comments: 25 minutes, color, sound, 16mm.

Price: To be determined.

Available From: Headquarters Aerospace Audiovisual Service
Norton Air Force Base
California 92409

51. "ENERGY CONSERVATION FOR THE HOME: OR, HOW TO LOWER YOUR UTILITY BILL"

UNIVERSITY OF ARIZONA

This is a special short course at the lay level for the homeowner, builder, building material supplier, and real estate agent. This series of lectures is intended to provide the homeowner with the information needed to substantially reduce home energy consumption. The lectures start with an introduction on heat, energy and power. Topics covered in the lectures include fundamental definitions and units (What's a BTU?); tips on simple ways to reduce utility bills without major renovation; operating efficiencies of different types of heating and cooling systems (EER ratings); insulating properties of typical building materials (What's an R or a U value?); benefits and losses of shading devices and reflective coatings; and how to estimate heat gains and losses from various elements of a house. While the lectures are tailored more for warm climates, where air conditioning accounts for a significant part of home energy consumption, comments are included which make the lectures quite useful for cold climate regions as well.

Comments: The book associated with the course has the same title.

To receive information on book and film prices and availability, contact:

Book:
University of Arizona
Engineering Experimental Station
College of Engineering
Tucson, Arizona 85721

Videotape:
Genesys Systems, Inc.
1121 East Meadow Drive
Palo Alto, CA 94303

52. "ENERGY-EFFICIENT ELECTRIC MOTORS"

FEDERAL ENERGY ADMINISTRATION

This film brings viewers up to date on the latest data on electric motors which are very widely used throughout industry. It also emphasizes the fact that today's electric motors are capable of doing more work while using less energy if used properly. This film is another in the series of FEA films for industrial audiences. It is now in the final editing stages and should be available from Monumental Films, Inc. by March 31. It, too, has an accompanying publication which will be available through NTIS.

Comments: 25 minutes, color, sound, 16mm.

Price: $137.

Available From: Monumental Films
2160 Rockrose at Malden Ave.
Baltimore, Maryland 21211

53. "THE ENERGY GAME"

FEDERAL ENERGY ADMINISTRATION

This film is somewhat similar to "A Cap in the Lamp" but it is intended for a more general audience, as opposed to a low[illegible]e audience or emphasis. It deals with home insulation and other energy saving tips. It features the "Home Energy Savers Workbook" and encourages its use for obtaining additional details on home energy conservation. The film was produced for FEA's Office of Energy Conservation and Environment by the Argonne ERDA Laboratories in Chicago. It has been completed and approved.

Comments: 16 minutes, color, sound, 16mm.

Price: To be determined.

Available From: Copies will be available (starting in early April) from FEA Regional Offices and from the FEA State Technical Assistance Office, Washington, D. C. 20461. These will be loan copies only. Sale copies are expected to be made available later, either through Argonne Labs or through the National Audio-visual Center.

54. "HOUSEHOLD ENERGY MANAGEMENT"

FLORIDA POWER CORPORATI

The filmstrip first makes the viewer aware of the extent to which energy is used in the home. It then relates energy use to actual energy cost. A look at the thermal efficiency of a home develops an awareness of do-it-yourself ways to cut energy consumption without lowering levels of comfort. Helpful tips on cooking and the use of hot water along with positive steps to reduce waste and use energy more wisely throughout the home develop an understanding of the need for responsible energy use.

A discussion guide is supplied with the filmstrip which is geared primarily toward 7th -, 12th graders, and adult civic and consumer groups.

Comments: 35mm sound filmstrip/20 minute cassette tape/74 frame color filmstrip.

This version of the filmstrip is currently available on loan to school systems in the 32-county area serviced by the Florida Power Corporation. Plans are being solidified to repackage the filmstrip for sale.

To receive information on price and kit availability, contact:

Florida Power Corporation
3201 34th St., S.
P. O. Box 14042
St. Petersburg, FL 33733
Attn: R. F. Van Camp

55. "INDUSTRIAL INSULATION"

FEDERAL ENERGY ADMINISTRATION

This technically-oriented film is intended for audiences of industrial managers and is suitable for use as an industrial training film for employees as well. The presentation covers in outline form much of the material contained in the detailed, highly technical FEA publication, "ETI - Economic Thickness for Industrial Insulation."

Comments: 25 minutes, color, sound, 16mm.

Price: Book:
$2.70 (GPO, Stock No. 041-018-00115-8) (with a discount for orders of 100 or more copies).

$7.75 (NTIS, Order No. PB 259 937)

Film:
$137 including reel and shipping case.

Available From: Book:
Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Film:
Monumental Films, Inc.
2160 Rockrose at Malden Ave.
Baltimore Maryland 21211

Loan copies from FEA Regional Offices and from FEA's Office of National Energy Conservation Programs, Washington, D. C.

56. "IT'S DOLLARS AND SENSE"

U. S. HEALTH RESOURCES ADMINISTRATION

Aimed at the administrators, executives and engineering staffs of hospitals and other health institutions. Explains how the steps taken to reduce the use of energy have resulted in substantial dollar savings without affecting the quality of patient care. Explains load-shedding practices, heating and ventilation practices, efficiency testing and equipment maintenance, lighting, new innovations and designs and other measures which can be applied by hospitals interested in stretching their budgets by conserving energy.

Comments: 28 minutes, sound, color, 16mm.

Price: $127.00 (Sale)

Available From: National Audiovisual Center
GSA, Attn: Order Section
Washington, D. C. 20409

For address of loan source, contact:
National Audiovisual Center
GSA, Attn: Reference Section
Washington, D. C. 20409

57. "SAVING ENERGY AT HOME"

RAMSGATE FILMS

This film identifies major sources of home energy use and provides specific tips on where energy is often wasted and how to reduce this waste. The areas covered are thermostat regulation, insulation, windows, air conditioning, water heating, dishwashing, washer and dryer, refrigeration, food preparation and lighting.

Comments: 13 minutes.

To receive information on price and film availability, contact:

Available From:
Ramsgate Films
704 Santa Monica Blvd.
Santa Monica, CA. 90401

58. "SAVING ENERGY ON THE ROAD"

RAMSGATE FILMS

The film illustrates a variety of ways to reduce driving costs and maintain safe driving habits. Section One: Choosing the Right Car gives tips about determining the best car size and accessories to suit individual driving needs. Section Two: Driving Techniques demonstrates such practical gas-saving techniques as proper acceleration, braking, uphill driving, and optimal speeds. Section Three: Maintenance shows simple methods for keeping a car in condition for maximum economy, as well as for selecting the best gasoline and oil. Section Four: Driving Less suggests ways to cut down on car use without inconvenience. The final segment reviews and summarizes the major energy-saving points made in the film. This film is commonly used in driver training courses.

Comments: 15 minutes, color.

To receive information on price and film availability, contact:

Ramsgate Films
704 Santa Monica Blvd.
Santa Monica, CA 90401

59. "UP THE POWER CURVE"

FEDERAL ENERGY ADMINISTRATION

This film looks at energy conservation in business, the home and the automobile. It concentrates on the easy, affordable measures that are within easy grasp of most interested individuals. The recommended audiences are high school and college, business groups, adult groups and organizations, civic and youth groups, churches.

Comments: 10 minutes, color, sound, 16mm.

Price: Loaned at no cost.

Available From: Loan copies are available from Federal Energy Administration, Office of Communications and Public Affairs, Washington, D. C. 20461.

60. "WASTE HEAT MANAGEMENT - ENERGY UTILIZATION FOR PROFIT"

FEDERAL ENERGY ADMINISTRATION

This film is designed for use by industrial managers. It examines the basic concept of waste heat management and shows examples of waste heat recovery systems. It also features industry spokesmen describing some of their experiences with waste heat management. The film may be used at seminars and workshops and is especially well suited for industrial association or individual company training programs for employees.

The film mentions and encourages use of the "Waste Heat Management Guidebook," which is an FEA/National Bureau of Standards publication which offers detailed information on this highly technical subject.

Comments: 25 minutes, color, sound, 16mm.

Price: Guidebook - $2.75 (GPO Order No. C13.11:121, Stock No. 003-003-01669-1)(25 percent discount on 100 copies or more)

Film - $122.50 (Order No. 008-729)

Available From: The Guidebook is available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

Loan copies of the motion picture are available from FEA Regional Offices or from the Office of National Energy Conservation Programs, FEA, Washington, D. C. 20461.

Sale copies of the film are available from the National Audiovisual Center, General Services Administration, National Archives and Records Service, Washington, D. C. 20409.

FEA FILMS IN PROGRESS

61. "ENERGY CONSERVATION IN BOILER OPERATIONS"

This film will deal with combustion control and other techniques to increase the energy efficiency of boiler operations. The script has been completed and approved. Photography is now in progress. Will be available in mid-April.

Comments: 25 minutes, color, sound, 16mm.

Price: To be determined.

62. "ENERGY CONSERVATION IN TRUCK OPERATIONS"

Two 15-minute films. One for fleet operators; one for owner-operators. Scripts completed and approved. Both films now in editing stages. Should be available by mid-April.

Comments: 15 minutes each, color, sound, 16mm.

63. "VANPOOLS"

Still in first-draft script stage. Will be aimed at general audiences, through civic organizations, FEA-sponsored and conducted seminars and workshops and through other such means. Will encourage greater participation in vanpool programs - by individual and by business firms. Publications will be available.

Comments: 25 minutes, color, sound, 16mm.

64. "USED OIL RECYCLING"

Still in script research and drafting stages. Could be available by May or June. Will promote establishment of used oil return stations all over the country; used oil re-refining; changes in state and local laws dealing with such re-refining; etc. Publications will be available.

Comments: 25 minutes, color, sound, 16mm.

65. "TV PUBLIC SERVICE SPOT ANNOUNCEMENTS"

Two TV spots on energy conservation in the home. Still in the script stage. Will be distributed by FEA to local TV outlets in major metropolitan areas around the nation.

Comments: 30 seconds and 60 seconds.

All of these films are being produced for the Office of Energy Conservation and Environment, Federal Energy Administration, Washington, D. C. 20461.

SECTION III

SUPPLEMENTARY RESOURCES

1. BUILDINGS AND FIXED FACILITIES

1. An Advanced Energy Conservation Technology Program

AIAA, AICHE, ASHRAE, ASME

These are the proceedings of a workshop conference co-sponsored by several engineering societies with the support of ERDA. The conference goals were: (a) to identify advanced energy conservation technologies, (b) to determine the value of such technologies, and (c) to suggest the most effective organizational approach for implementation.

Available from American Institute of Aeronautics and Astronautics, 1290 Avenue of the Americas, New York, N. Y. 10019.

2. Alternative Strategies for Optimizing Energy Supply, Distribution, and Consumption Systems on Naval Bases

Department of the Navy, Civil Engineering Laboratory

Volume 2: Advanced Energy Conservation Strategies

This publication describes five strategies for optimizing energy supply, distribution, and consumption systems on naval bases: solar energy applications, automated building control and monitoring systems, electrochemical sources, advanced transportation technology, and total energy systems.

Volume 3: Assessment of Total of Total Energy System; Applications at Naval Facilities

The key topics of this report are: advanced research in total energy systems, opportunities for heat recovery from prime movers, and the feasibility of using "in-port steaming" to provide power for naval shore facilities.

Both volumes are available from Civil Engineering Laboratory, Naval Construction Battalion Center, Port Hueneme, California 93043.

3. An Analysis of the Impact on the Electric Utility Industry of Alternative Approaches to Significant Deterioration — FEA

Volume I: Executive Summary

NTIS: PB-246-205/AS ($4.50)

This report presents a summary volume of a two-volume study which evaluates the impact of proposed Senate, House, and EPA regulations regarding significant deterioration of air quality on the electric utility industry. Issues evaluated include: aggregate impact of significant deterioration

requirements on new coal-fired powerplants; implications of Class I area designations; impact of alternative Class II increments; implications of stack height limitations; and minimum degree of emission control. (44 pp)

Volume II;

NTIS: PB-247-385/AS ($6.00)

This report is the second volume of the two-volume study. It contains an evaluation of the impacts of approaches to prevent significant deterioration of air quality. (148 pp)

4. Army Regulation No. 11-27

Department of the Army

This regulation establishes policies, objectives, priorities, and procedures, and assigns responsibilities for the conduct of an Army Energy Program designed to efficiently manage energy resources.

5. ASHRAE Handbook of Fundamentals

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.

The handbook covers the entire field of heating, refrigeration, air conditioning, and ventilating, and serves AHSRAE members and the overall industry as a basic reference on theory, terminology, and general engineering data, all in one volume.

Available from AHSRAE, 345 East 47th Street, New York, N. Y. 10017. ($60.00 for non-members, includes AHSRAE Journal, AHSRAE Handbook and Product Director, and ASHRAE Handbook of Fundamentals; substantially less to members.)

6. ASHRAE Standard 90-75, Energy Conservation in New Building Design

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.

This document sets forth new building design requirements for efficient utilization of energy. It provides support data covering the design of exterior envelope, HVAC systems and equipment, service water heating equipment, and electrical distribution systems. It then establishes methods of determining the lighting power budget and the actual energy requirements.

Available from ASHRAE, Inc., 345 East 47th Street, New York, N. Y. 10017.

7. Assessing the Potential for Optimal Utilization of Off-Peak Power — FEA

Volume I: Executive Summary

NTIS: PB-254-774 ($3.50)

This report describes a 1-year, four-task demonstration study for assessing the potential for optimal utilization of off-peak power.

Volume II: Electrical Loads Offering Major Potential for the Use of Off-Peak Power

NTIS: PB-254-775 ($18.75)

This report describes Tasks 1 and 2 of the 1-year study for assessing the potential for optimal utilization of off-peak power. It includes the study of the major end uses of electric power, the potential uses of off-peak power, historical patterns of operation, off-peak power use options, energy conservation potential of each off-peak power use option, and power use options best suited for a pilot demonstration. (721 pp)

Volume III: Biddeford Demonstration

NTIS: PB-254-776/8ST ($7.75)

The feasibility of the off-peak power use concept is addressed. Five experiments were conducted: (1) air infiltration measurements, (2) thermographic analysis of building shells, (3) monitoring of applicance electric use, (4) heating system performance comparison, and (5) off-peak power use in space heating by means of thermal storage. (225 pp)

Set of Volumes I-III — NTIS: PB-254-773 ($28.00)

8. Assessment of the Impact of Proposed Thermal Effluent Guidelines for the Steam Electric Power Industry — FEA

NTIS: PB-255-937 ($5.50)

Studies of the system aspects of utility operation are presented. The intent was to assess the impact of controls imposed, on a plant-by-plant basis, according to uniform national limitations and the schedule for implementation. (113 pp)

9. Assessment of the Potential for Energy Conservation Through Improved Industrial Boiler Efficiency, Volume I

Federal Energy Administration NTIS: PB-262-576/AS

This report is an engineering analysis of a boiler-efficiency program intended for the technical specialist. It is a companion volume to Industrial Boiler Users Manual (see Section II).

Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161.

10. Barriers to Energy Conservation — FEA

NTIS: PB-259-812/6SL ($4.50)

The barriers to efficient energy usage are identified. (69 pp)

11. The Basis for Effective Management of Lighting Energy Symposium, October 29 and 30, 1976: Proceedings - FEA

NTIS: PB-256-070 ($16.25)

The papers presented discuss lighting design and the contemporary cross-disciplinary knowledge to provide lighting for human tasks that conserve energy without compromising performance. (613 pp)

12. Benefit-Cost Methodology for Evaluating Energy Conservation Programs — FEA

NTIS: PB-249-342 ($5.50)

This report develops and presents in lay language the basic concepts of benefit-cost analysis for conservation, and specific procedures for computing conservation benefits under different economic conditions. (107 pp)

13. Bibliography of Training Aids

Air Conditioning and Refrigeration Institute

This document was compiled as a service to schools and instructors conducting courses in air-conditioning, heating, and refrigeration. The materials listed are appropriate for vocational-technical courses at the high school, post-high school, and junior college level. No materials specifically aimed at energy saving are named.

Available from Air Conditioning and Refrigeration Institute, 1815 Fort Myer Drive, Arlington, Va. 22209.

14. Blowing Wool Application Manual (BW-201)

National Mineral Wool Insulation Association, Inc.

Designed originally for use by new employees of insulation contractors, this 20-page pamphlet measuring 4" x 9", published in September 1970, is used generally by those interested in the techniques of installing blowing wool pneumatically.

Available from National Mineral Wool Insulation Association, Inc. (No charge for single copies.)

15. Building Energy Authority and Regulations Survey: State Activity

Robert M. Eisenhard, National Bureau of Standards, Department of Commerce

NTIS: COM-75-11131 ($4.00)

This report provides the status of State authority to regulate energy use in new buildings and the status of bills creating such authority that were pending in the 1975 legislative session. Regulations that have been developed are identified and described. Legislation relating to solar energy, retrofitting, insulation, and other building energy matters is identified and the status indicated.

Available from NTIS, Springfield, Va.

16. Building Technology Publications 1965-1975

National Bureau of Standards, Department of Commerce

This report presents the National Bureau of Standards' Center for Building Technology publications of the past decade.

Available from the Center for Building Technology, Gaithersburg, Md. (No charge.)

17. The Challenge of Load Management. A Convergence of Diverse Interests: Proceedings of the Conference Held June 11-12, 1975 — FEA

NTIS: PB-244-576/AS ($5.50)

This publication contains a series of papers on the subjects of load management and electricity rate structures including load management potentials, technology, impact on utilities, regulator reliability districts, and consumer data.

18. The Chicago Project: Evaluation and Testing of Three Types of Energy Audit Processes for School Buildings — FEA

NTIS: PB-255-321/AS ($9.25)

Techniques for identifying and alleviating excessive and unnecessary energy use in public schools are evaluated. Three methods for accompanying these goals are analyzed: (1) a computer simulation model, (2) the Mini-Audit system, and (3) extensive energy use audits (Maxi-Audit). (280 pp)

19. Citizen Action Guide to Energy Conservation

Citizen's Advisory Committee on Environmental Quality
Stock No. 040-000-00300-2 ($1.25)

This booklet addresses the energy problem and offers practical suggestions on how citizens can reassess their use of energy and then use it less wastefully.

Available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

20. Commercial Floor Space: An Analysis of Methodologies Used To Estimate the National Inventory — FEA

NTIS: PB-248-900 ($5.00)

This report presents a technical survey of methods used to prepare commercial space inventories in the United States. It includes a comprehensive collection of published inventories of commercial space, along with evaluations of the methodologies used, and appraisals of their reliability. (85 pp)

21. Comparison of Energy Consumption Between West Germany and the United States — FEA

The differences in per capita energy consumption between the United States and West Germany are addressed. West Germany uses only half as much energy per capita as the United States. The total energy use in the United States, in relation to national income, is about 50 percent greater than in West Germany. This large disparity in energy use between the two countries suggests that continued economic growth and improvement in the standard of living in the United States should be possible without a proportionate increase in energy consumption. (112 pp)

Available from FEA, Office of Conservation and Environment.

22. The Conservation Education Association Newsletter

Conservation Education Association

Newsletter containing member news, reports of programs and legislation, and other news of conservation education.

Available by joining Conservation Education Association, UWGB, Green Bay, Wisc. 54302.

23. Conservation Material

Philadelphia Electric Company

This company makes available to its customers a variety of materials on insulation, electrical energy, heat pumps, and efficiency of electric appliances. Some are actual publications of the Philadelphia Electric Company; others are published by manufacturing industries.

Available from Philadelphia Electric Company, 2301 Market Street, 518-1, Philadelphia, Pa. 19101.

24. Conserve Energy by Design

The Trane Company

This manual is a reiteration of energy conservation discussions prepared by the Trane Sales and Application Engineering Departments in response to the energy crisis facing the nation. These discussions deal with the implementation of energy conserving steps that must be taken by the heating, ventilating, and air conditioning industry to fulfill its contribution toward the solution of the energy problem.

Available from The Trane Company, LaCrosse, Wisc. 54601.

25. Decision-Makers Guide in Solid Waste Management (SW-500)

Environmental Protection Agency

This guide presents the key issues of solid waste management in a decision-making context. It attempts to anticipate all of the important decisions which local government managers must make in the effort to develop and operate solid waste programs in a responsive, cost-effective manner. Each chapter presents an issue, describes the alternatives, gives the advantages and disadvantages, and concludes with a summary statement which may include an EPA recommendation in the issue.

Available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

26. Design and Evaluation Criteria for Energy Conservation in New Buildings (NBSIR 74-452) — FEA

NTIS: PB 204-586 ($5.50)

This document is a set of design and evaluation criteria for energy conservation in most types of new buildings. The technical portions of the document are organized into four complementary sections: requirements, criteria, evaluation, and commentary. Existing standards promulgated by other organizations are referenced. Prepared for the National Cancer of States on Building Codes and Standards.

Available from NTIS, Springfield, VA 22161.

27. ECASTAR - Energy Conservation: An Assessment of Systems, Technologies, and Requirements — FEA

NTIS: N76-21686 ($18.75)

ECASTAR presents a methodology for a systems approach display and assessment of the potential for energy conservation actions and the impacts of those actions. The U.S. economy, divided into four sectors (energy industry, industry, residential/commercial, and transportation), is assessed with respect to energy conservation actions and impacts.

28. Economic Impact Study of the Appliance Efficiency Program — FEA

NTIS: PB-251-665 ($9.25)

The objective of this report is to analyze the economic impact of technical improvements that would have to be incorporated into major household appliances to make 1980 models of such appliances provide a level of performance similar to 1972 models, but require on the average, 20 percent less energy to operate. The appliances addressed are: room air conditioners, electric and gas water heaters, refrigerators and refrigerator/freezers, freezers, electric and gas ranges, electric and gas dryers, washers, dishwashers, and black and white and color televisions. (20[illegible] pp)

29. Economic Thickness for Industrial Insulation (ETI) — FEA

NTIS: PB-259-937 ($7.75) GPO: 041-018-00115-8

This report provides a solution for economic thickness for both hot and cold systems. A procedure for calculating the economic thickness of insulation retrofitted in existing facilities is presented, along with sample calculations for economic thickness determination. (102 pp)

30. The Effects of Price on Energy Conservation— FEA

NTIS: PB-246-352/AS ($3.50)

Price effects and impacts are discussed for implementation of energy conservation measures.

31. Energy Advisory Service for Texas

Texas A&M University

This pamphlet describes the purpose and functions of the Energy Advisory Service for Texas (EAST).

Available from Energy Advisory Service for Texas, Center for Energy and Mineral Resources, Texas A&M University, College Staiton, Texas 77843. (No charge.)

32. Energy Alternatives: A Comparative Analysis — FEA

NTIS: PB-246-365/AS ($18.75)

This report addresses a methodology for systematically identifying, assessing, and comparing energy alternatives in environmental impact statements (EIS). It provides descriptions and data on the major energy resource systems in the United States and suggests procedures for using these data. (706 pp)

33. Energy Conservation and Window Systems — FEA

NTIS: PB-243-117 ($5.50)

The role of the architectural window as an important factor in reducing energy consumption for residential and commercial climate control is addressed. The report assesses the physics and technology of selective coating materials which act primarily as infrared reflectors to reduce thermal radiation transport. (106 pp)

34. Energy Conservation Applied to Office Lighting — FEA

NTIS: PB-244-154 ($9.25)

The report reviews the literature and findings upon which the past practice of lighting design has been based, and makes recommendations and suggestions for changes that can be instituted to make lighting design and installation in the future more responsive to the needs of energy conservation. (288 pp)

35. Energy Conservation Implications of Master Metering — FEA

Volume I

NTIS: PB-254-322 ($5.00)

The report presents a study of master metering of electrical service in apartment and office buildings. The objectives include determination of: (1) the difference between electrical energy consumption by tenants with master metered electric service and those who must pay individual electric bills; (2) the extent and trends of the use of master metering of electrical service in buildings; (3) the economic factors which influence metering; and (4) policy alternatives which could control the practice of master metering. (84 pp)

Volume II

NTIS: PB-254-323 ($6.00)

Seven appendices of the study discussed in Volume I are presented: (1) electricity rate structures; (2) information sources; (3) responses from public service commissions; (4) comparison of electricity consumption between master-metered and individual-metered apartments; (5) Census of Housing statistics; (6) load and consumption references; and (7) utility and estate management comments. (146 pp)

36. Energy Conservation in Buildings

National League of Cities - U.S. Conference of Mayors/
The Energy Policy Task Force of the Consumer Federation of America ($3.00)

This report is written especially for local government officials and members of community and consumer groups to provide a general background to an increasingly important and money-saving aspect of energy conservation—use less energy in large buildings. The annotated bibliography provides references to several of the more detailed publications concerning actual implementation of building energy concepts.

Available from NLC and USCM, Publications Center, 1620 Eye Street, N.W., Washington, D.C. 20006.

37. Energy Conservation in the Canning Industry (Bulletin 36-L)

National Canners Association

This bulletin examines the utility management concepts and ideas in use or under consideration in canning plants. It covers all phases of the canning industry in listing energy conservation practices.

Available from the National Canners Association, 1133 20th Street, N.W., Washington, D.C. 20036 (single copies free; $.50 each for two or more).

38. Energy Conservation in the Cement Industry — FEA (Technology Transfer Digest)

GPO: 041-018-00095-0 ($1.10)

This booklet summarizes a study of the cement industry, briefly discussing energy use in the industry's processes, energy conservation technology, investment costs and savings, and the prospects for applying energy conservation technology. (22 pp)

39. Energy Conservation in the Food System—A Publications List — FEA

NTIS: PB-255-942/AS ($5.00) GPO: 041-018-00110-7 ($1.45)

An annotated list of several hundred publications on energy conservation in the food system is offered, organized by food system sector, and includes the publications' prices and the names and addresses of the organizations distributing them. (73 pp)

40. Energy Conservation in New Building Design.
An Impact Assessment of ASHRAE Standard 90-75 — FEA

NTIS: PB-252-639 ($9.00) GPO: 041-018-000-98-4

This report assesses the economic and institutional impacts that may result from the broad voluntary adoption of ASHRAE Standard 90-75 by individual building regulatory authorities. This Standard deals with energy use in new buildings and is available for optional acceptance by state and local governments. (273 pp)

41. Energy Conservation Material

Tennessee Valley Authority

This is a package of materials that focus on conservation of electrical power. There are tips on saving which range from reading an electric meter to purchasing energy consuming appliances, and building your own energy efficient home.

Available from Tennessee Valley Authority, Consumer Communications Section, Electric Demonstration Branch, Chattanooga Power Service Center, Chattanooga, Tennessee 37401 (Attention: Noel E. Walker).

42. Energy Conservation Materials Package:
No. 1 District Level Plan for Conservation

Colorado Department of Education

This booklet is part of a series in energy conservation in public schools. It attempts to provide a step-by-step approach to develop a program through use of a memo series to carry the message.

Available from Colorado Department of Education, 201 East Colfox Ave., Denver, Colo. 80203 (no charge).

43. Energy Conservation Potential in the Cement Industry — FEA

This study offers background information for establishing energy conservation objectives for the cement industry. It assesses the potential for energy conservation within the industry and establishes the probable impacts of defined levels of Federal research, development, and demonstration support. (344 pp).

NTIS: PB-245-159 ($9.50)

44. An Energy Conservation Program for Employees

Allied Chemical Corporation

This pamphlet gives a brief description of the PULSE program developed by Allied Chemical Corporation and designed to promote energy conservation among corporate employees through communications media.

Available from Allied Chemical, Corporate Engineering Department, P. O. Box 2105R, Morristown, N. J. 07960 (no charge).

45. Energy Conservation Site Visit Report: Toward More Effective Energy Management

Federal Energy Administration

NTIS: PB-253-279 ($5.00) GPO: 041-018-00100-0 ($1.70)

The major findings, suggestions, and recommendations of energy management programs in buildings, motor vehicles, carpooling, energy education, and aircraft and ship operations are presented based upon visits to 287 Federal installations. (85 pp)

46. Energy Conservation Study: Report to Congress

Federal Energy Administration

NTIS: PB-243-369/AS ($7.50)

This report discusses the energy conservation potential of restricting exports of fuels or energy-intensive products or goods and the balance-of-payments and foreign relations implications of such restrictions.

47. Energy Conservation Through Effective Energy Utilization

(NBS Special Publication 403)

U. S. Department of Commerce, NBS

These are the proceedings of a conference sponsored by the National Bureau of Standards, the National Science Foundation and the Engineering Foundation. "The conference objective was to study the opportunities and implications of more effective utilization of thermal energy on an interdisciplinary basis. A clear conclusion of the conference is that while new technology is important, the introduction of more technology that is already available is equally, if not more important. Institutional barriers relating to economics, management, finance and national policy are the pacing factors." Available from Government Printing Office, Washington, D. C. 20402. (Publication No. C13.10:403) $3.30

48. Energy Conservation Through Improved Solid Waste Management (SW-125)

U. S. Environmental Protection Agency

'This paper presents four opportunities to conserve energy through better solid waste management: source reduction, energy recovery, recycling, and improved collection."* Available from U. S. Environmental Protection Agency, Solid Waste Information, Cincinnati, Ohio 45268.

49. Energy Conservation Training Program: Pilot Program for Six New England States

Federal Energy Administration

NTIS: PB-248-609 ($3.50)

The report summarizes the results of a project to implement a pilot energy conservation training project in six New England States. It describes the problems that arose and the lessons learned during the program directed toward high school students. (25 pp)

50. Energy Conservation — Understanding and Activities for Young People

Federal Energy Administration

GPO: 041-018-00091-7 ($0.85)

Designed primarily for use by junior high school age young people, this booklet contains information on energy sources, conservation and energy use, and suggested activities designed to increase an understanding of energy. (20 pp)

51. Energy Education/Conservation. A Selected Annotated Bibiography

Jonathan Wert, Sherry Beard

Environmental Center, The University of Tennessee

"This bibliography of curriculum guides, semi-technical, and technical documents, has been prepared primarily for teachers to use in developing energy education/conservation programs."* Available from Environmental Center, The University of Tennessee, South Stadium Hall, Knoxville, Tennessee 37916.

52. An Energy Education/Conservation Plan for Tennessee

John Gibbons, Jonathan Wert, Nancy Collins

Environmental Center, The University of Tennessee

This document describes a comprehensive plan of energy education/conservation for the State of Tennessee. Within this plan are program descriptions, and recommendations for programs for funding consideration. Program evaluation materials are included. Available from the Environmental Center, The University of Tennessee, South Stadium Hall, Knoxville, Tennessee 37916.

53a. Energy Education Materials Inventory. Booklet I. Print Materials

Federal Energy Administration

NTIS: PB-260-481

This booklet contains a listing of print materials, with sources, that is useful for teachers for grades K-12. The print materials are divided into ten categories: teachers' guides; curriculum guides; ditto masters; teacher background material; student materials; textbooks; enrichment materials; pamphlets; posters; and miscellaneous items.

53b. Energy Education Materials Inventory. Booklet II. Non-Print Materials, Part One

Federal Energy Administration

NTIS: PB-260-482 ($5.00)

This booklet contains a listing, with sources, of films, (8MM films), film strips, video-tapes, slides, transparencies, audio-tapes, records, etc., that would be useful to teachers for grades K-12.

53c. Energy Education Materials Inventory. Booklet III. Non-Print Materials, Part Two: 16MM Films

Federal Energy Administration

NTIS: PB-260-483 ($4.50)

This booklet contains a listing of 16MM films, with sources, that would be useful to teachers for grades K-12.

53d. Energy Education Materials Inventory. Booklet IV. Kits, Games and Miscellaneous Curricula

Federal Energy Administration

NTIS: PB-260-484 ($4.00)

This booklet contains a listing of kits/packages, simulations/games, multi-media programs, and programmed instruction units that would be useful to teachers for grades K-12.

53e. Energy Education Materials Inventory. Booklet V. Reference Sources

Federal Energy Administration

NTIS: PB-260-485 ($4.00)

This booklet lists sources of information and materials that could be made into curricula. The Reference Sources entries are recorded in two sections: Section I lists pertinent directories, indexes, and information services.

Section II contains individual reference sources that are not included in the directories cited in Section I.

Set of Booklet I -V - NTIS: PB-260-480: ($19.00)

54. Energy Efficiency and Electric Motors —A Technical, Economic, and Policy Analysis of Efficiency Standards in Commercial and Industrial Electric Motors and Equipment

Federal Energy Administration

NTIS: PB-259-129 ($7.50)

This report identifies areas of greatest energy conservation potential in electric motor use in the industrial and commercial sectors of the economy and assesses the technological potential and economic trends that might influence the use of more efficient electric motors. It outlines possible Government strategies encouraging such use.

55. Energy, Environment and Building

Philip Steadman

Cambridge University Press

Topics in this text include Energy Conservation measures in buildings; solar energy; solar space heating; wind power; water power; composting, waste treatment, and methane gas as fuel; and some autonomous, energy-conserving and ecological buildings and projects. Available from Cambridge University Press, Cambridge, England.

56. Energy, Environment, and Growth Planning Study

Federal Energy Administration

NTIS: PB-249-354 ($9.75)

This study assesses the impact of interactions between energy, environmental, and socio-economic factors on the future plans, policies and programs of a state. (325 pp)

57. Energy — Environment Source Book

John W. Fowler

National Science Teachers Association

"This is an authoritative treatment of the issues, problems, and facts of the complicated energy-environment-economic interactions. Written for teachers, it includes extensive tables and illustrations, technical appendices, and a glossary."* Available from NSTA 1742 Connecticut Avenue, N.W. Washington, D. C. 20009. (Publication No. 471-14692).

58. Energy in Solid Waste: A Citizen Guide to Saving

Citizen's Advisory Committee on Environmental Quality

This is a pamphlet which describes the waste disposal patterns on the U. S. nd suggest alternative solutions to this tremendous energy waste. It puts primary emphasis on citizen action that can be readily initiated. Available from Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. $1.25 (Stock No. 040-000-00310-3).

59. Energy in the U. S. Agriculture: Compendium of Energy Research Projects

Federal Energy Administration

NTIS: PB-247-642 ($7.50) GPO: 041-018-00096-8 ($3.05)

This document is a compendium of energy research in the production sector of U. S. agriculture. It presents approximately 1,250 entries of ongoing or recently completed research projects and article abstracts related to fuel requirements and energy conservation practices and technologies. (187 pp)

60. Energy Information Package

Michigan Department of Commerce

The State makes available to its residents a package of energy management materials which covers the areas of energy management in business, home insulation, community and school programs, and energy management in the home, as well as general information about energy use. These are available from the Michigan Department of Commerce, Office of Economic Expansion, 4th Floor Law Building, Lansing, Michigan 48913.

61. Energy Information Resources

Battelle Columbus Laboratories

"This publication is intended to provide scientists, engineers, and others concerned with research and development related to energy with a reference to potentially applicable sources of information within the United States. Very few of these information resources are dedicated solely to energy; most of them deal with subjects or missions that contain energy-related components. The inventory consists of three main sections: information resources, annotated publications, and indexes."* Available from American Society for Information Science, 1155 Sixteenth Street, N.W., Suite 210, Washington, D. C. 20036

62. Energy Management (Publication series)

U. S. Department of Commerce

Titles of the booklets in this series are:

- Marketing Priorities and Energy ($.25)
- Trade Associations and the Economy of Energy
- Energy Management in Health Care Institutes ($.30)
- How to Start an Energy Management Program ($.25)
- Economic Sense for Retailers
- 33 Money-Saving Ways to Conserve Energy in Your Business ($.25)
- Industry's Vital Stake in Energy Management ($.25)
- Energy Conservation Handbook ($.35)

Available at indicated prices from Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402

63. Energy Management Assistance Program

Boston Edison Company

This is a materials package compiled by the Boston Edison Company which contains three publications: 1) Guidelines for Conservation of Energy and Food Management for Industrial and Commercial Customers, which lists steps to be implemented, 2) How to Establish and Maintain an Energy Management Committee, which is a guide for the energy management coordinator, and 3) a set of analysis sheets that explains utility rates and assist in evaluation of energy use. Available from Boston Edison, 800 Boylston Street, Boston, Massachusetts 02199.

64a. Energy Management Case Histories — 1A

Federal Energy Administration

NTIS: PB-244-908/AS ($4.00) GPO: 041-018-00062-3 ($0.70)

This report discusses the experiences of four U. S. firms which have found that the financial benefits of an energy conservation program can be substantial and that such programs make for good business management practice. This study illustrates case experiences. (15 pp)

64b. Energy Management Case Histories — 1B

Federal Energy Administration

NTIS: PB-246-763 ($4.00)

Case histories of four additional companies are presented. (29 pp)

65. Energy Management Guide

Super Market Institute

A guide for energy management in the supermarket industry which is geared towards management in existing stores. Available from Super Market Institute. $1.00.

66. Energy-Related Technology Programs in Community and Junior Colleges

Oak Ridge Associated Universities

This report was prepared as an analysis and assessment of existing and planned programs in community and junior colleges in energy-related fields. Available from National Technical Inforamtion Service; Springifield, VA 22161.

67. Energy Saving Behavior Around the Home: Highlight Report Volume XXII

Federal Energy Administration

NTIS: PB-261-163/AS ($4.00)

68. Energy Strategies for Health Care Institutions (HRA-76-620)

U. S. Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration (HRA)

This report is compiled from the proceedings of four conferences sponsored by HRA and the American Hospital Association on the theme of Energy Strategies for Health Care Institutions. It serves as an orientation to the energy issue in addition to answering specific questions about energy conservation in new and existing health care buildings. Available from U. S. Department of Health, Education, and Welfare, Health Resources Administration, 5600 Fishers Lane, Rockville, Maryland 20852. Free of charge.

69. Energy Use in the Food System

Federal Energy Administration

NTIS: PB-255-943/AS ($6.00) GPO: 041-018-00109-3 ($2.65)

This publication defines the food system and its components and reviews energy use. The study was designed to determine the current status of energy consumptions data for the food system. The report addresses food system components and existing energy consumption data sources to determine what data are available on each food system component. (133 pp)

70. Energy — Who's Doing What

National Recreation and Park Association

"This is a list of approximately 200 U. S. citizen groups, companies, and non-profit agencies involved in some type of energy work. It was compiled as a service to interpreters, naturalists in parks around the nation participating in an experimental effort to encourage the use of energy conservation themes in park programs."* Available from Park Project on Energy Interpretation, National Recreation and Park Association, 1601 North Kent Street, Arlington, VA 22209. Free of charge.

71. Evaluation of the Air-to-Air Heat Pump for Residential Space Conditioning

Federal Energy Administration

NTIS: PB-255-542 ($9.25)

This report evaluates the (1) reliability, (2) market acceptance, and (3) energy effectiveness of the electric heat pump for residential space heating. It also assesses the impact of increased heat pump saturation upon the Nation's primary fuel reserves and recommends policy options. (293 pp)

72. Evaluation of Building Characteristics Relative to Energy Consumption in Office Buildings

Federal Energy Administration

NTIS: PB-248-774/2ST ($4.50)

The report presents a survey of office building factors which impact energy consumption. It offers a baseline for future research in buildings energy consumption monitoring. (69 pp)

73. Evaluation of the Theoretical Potential for Energy Conservation in Seven Basic Industries

Federal Energy Administration

NTIS: PB-244-772 ($11.75)

This report evaluates the minimum energy requirements in seven basic industries: Steel, copper, aluminum, glass, synthetic rubber, selected plastics, and the paper industries.

74. Existing State and Local Winterization Programs

Federal Energy Administration

NTIS: PB-246-091 ($5.50)

Winterization programs conducted by State and local government agencies are identified and evaluated for ten localities. The publication serves as a guide for conducting future efforts to save energy. (119 pp)

75. FEA/Conservation & Environment/RD&D: Five-Year Master Program Plan

Federal Energy Administration

NTIS: PB-249-453/2ST ($6.75)

This Five-Year Master Program Plan for FEA was prepared by the Office of Conservation and Environment (C&E) to help meet overall conservation goals of Project Independence. It constitutes a program for the creation, management, and execution of systematic Research, Development, and Demonstration Operations Plans. (152 pp)

76. Feasibility of a Single Tall Stack in Power Plant Construction

Federal Energy Administration

NTIS: PB-255-952 ($5.50)

This report analyzes the use of a simple stack to serve power plants with multiple boilers as an alternative to multiple tall stacks for pollution abatement control. (75 pp)

77. Federal Energy Conservation Briefs

Federal Energy Administration

This folder contains 24 one-page briefs summarizing energy conservation actions taken at Federal buildings. The situation, before and after the implemented actions, and the resulting energy savings, are presented.

78. Federal Energy Management Program: Fiscal Year 1975. First Annual Report.

Federal Energy Administration

NTIS: PB-241-620 ($4.50)

The report summarizes the energy savings that were achieved through the Federal Energy Management Program (FEMP) in response to the Presidential Order of June 29, 1973. The Federal Government energy savings in buildings, facilities, and vehicle operations are presented.

79. Federal Energy Management Program. Second Quarter Report, Fiscal Year 1975

Federal Energy Administration

NTIS: PB-245-183 ($3.50)

A summary of energy savings in the Federal Government is reviewed. During the second quarter of Fiscal Year 1975, the Federal Government used 26.6 percent less energy than it had used in Fiscal Year 1973. These savings totaled 156.8 trillion Btu. This report summarizes the energy savings. (8 pp)

80. Federal Energy Management Program. Third Quarter Report, Fiscal Year 1975

Federal Energy Administration

NTIS: PB-246-314 ($3.50)

This report summarizes energy use by the Federal Government during the third quarter of Fiscal Year 1975. The Federal Government used 28 percent less energy in this quarter than in the similar period of Fiscal Year 1973. Energy use was monitored in 26 Federal departments and agencies that accounted for 99 percent of all the energy expended by the Federal Government. (8 pp)

81. Food System Energy Consumption

Federal Energy Administration

The bakery and meat packing industry can benefit from this information on energy use and consumption in food preparation and equipment energy consumptions.

82. A Guide to Energy Conservation for the Soft Drink Manufacturer

National Soft Drink Association (NSDA)

This publication results from a workshop on Energy Conservation sponsored by NSDA. It offers suggestions to be considered in developing an energy conservation program for soft drink manufacturers. Available from National Soft Drink Association, 1101 Sixteenth Street, N.W., Washington, D. C. 20036.

83. Home Energy Savers' Workbook

Federal Energy Administration

GPO: 041-018-00116-8 ($0.35)

This easy-to-read workbook outlines steps to reduce home energy costs and provides guidance for the homeowner in evaluating home energy consumption efficiency.

84. How Businesses in Los Angeles Cut Energy use by 20 Percent

Federal Energy Administration

NTIS: PB-249-347 ($3.50) GPO: 041-018-00042 ($0.65)

This report discusses Los Angeles' way of dealing with the short-term effects of the National energy shortages during the winter of 1973-74. It describes how the plan worked and the benefits and hardships imposed on commercial firms. (22 pp)

85. How to Insulate Homes for Oil Heating (OH-603)

National Mineral Wool Insultation Association, Inc.

Installation procedures, vapor barriers, and ventilation are covered in detail in this 24-page pamphlet measuring 4" x 9". Available from National Mineral Wool Insulation Association, Inc.

86. How to Save Money by Insulating Your Home

Federal Energy Administration

This "how-to-do-it" instruction pamphlet offers tips for home insulation projects.

87. How to Save Natural Gas

Federal Energy Administration
Out of Print

Money saving tips for conserving natural gas in the home are offered. (12 pp)

88. Impact of Improved Thermal Performance in Conserving Energy

National Mineral Wool Insulation Association, Inc.

An analysis of NMWIA members of energy savings accomplished by insulation and storm doors and windows on a national basis over a ten year period. Published in 1972, this 8-3/4" x 11" brochure is available at no charge from the National Mineral Wool Insulation Association, Inc.

89. Incentives for Energy Conservation in Multi-Family Housing

Federal Energy Administration

NTIS: PB-255-655 ($7.50)

This report addresses a study to develop information about the multi-family housing market. It also defines the factors that determine present patterns of energy consumption, including present incentives and disincentives to conservation.

90. Industrial Energy Conservation: The CCMS Pilot Study. Project Area 1: An International Data Base

Federal Energy Administration

NTIS: PB-243-923/AS ($4.50)

This report summarizes a pilot study by the Committee on Challenges of Modern Society to develop international cooperation in achieving energy end-use conservation in industry and to construct an international data base of the information gathered on end-use conservation. (74 pp)

91. Industrial Energy Conservation Report

Federal Energy Administration

Industry energy savings are briefly summarized in this fact sheet.

92. Industrial Energy Conservation: 101 Ideas at Work

General Motors Corporation

This is a brief report of the approach to energy conservation used by the Energy Management Section of General Motors. Energy and cost savings have been included. Available from Energy Management Section, General Motors Corporation, 3044 West Grand Boulevard, Detroit, Michigan 48202.

93 Industrial Process; Heating, Ventilation, Air Conditioning, and Lighting; Boilers

Michigan Department of Commerce

These booklets comprise a series of energy management handbooks for small and medium sizes businesses. The purpose is to assist and advise Michigan business and industry in determining beneficial ways to eliminate waste, increase energy efficiency, maintain or increase productivity, and decrease energy costs. Available from Department of Commerce, Office of Economic Expansion, 4th Floor Law Building, Lansing, Michigan 48913.

94. Installation Made Easy

Owens-Corning Fiberglas

This flyer contains application instructions for Owens-Corning Fiberglas insulation. Available from Owens-Corning Fiberglas Corporation, Home Building Products Division, Fiberglas Tower, Toledo, Ohio 43659. Free.

95. Insulation Manual

National Association of Home Builders Research Foundation, Inc.

"The purpose of this manual is to provide home builders with a reliable and complete guide to the proper installation, use, and benefits of insulation."* Available from NAHB Research Foundation, Inc., P. O. Box 1627, Rockville, Maryland 20850. $4.00.

96. Life Cycle Costing: Procurement Case 1. Room Air Conditioners

General Services Administration

This study describes the cost savings which resulted from using Life Cycle Costing in the procurement of room air conditioners by the Federal Supply Service, General Service Administration, Crystal Mall Building 4, Washington, D. C. 20406. No charge.

97. Life Cycle Costing: Procurement Case 2. Water Heaters

General Services Administration

"This study describes the cost savings which resulted from using Life Cycle Costing in the procurement of residential-type water heater by the Federal Supply Service." Available from Federal Supply Service, General Services Administration, Crystal Mall Building 4, Washington, D. C. 20406. No charge.

98. Lighting and Thermal Operations

Federal Energy Administration

This publication contains guidelines which represent desirable targets for illumination levels, lighting efficiency, and operation of heating and cooling systems. It is based upon a study of 19 Federal office buildings. Energy consumptions are listed . . . before and after implementation of the energy conservation programs which included recommendations for illumination, thermostat settings, building occupany, and fan operation. (20 pp)

99. Listing of Ongoing Projects with Energy Manpower Employment and Training Implications

U. S. Department of Labor

Title of projects, scope, agencies involved and information contact are included in this listing; concentrates on energy production personnel. Available from Office of Technical Support, Office of the Assistant Secretary for Policy, U. S. Department of Labor, 200 Constitution Avenue, Washington, D. C.

100. Making the Most of Your Energy Dollars in Home Heating and Cooling

U. S. Department of Commerce, National Bureau of Standards

This booklet helps the homeowner determine the best combination of energy conservation improvements for his use. It also provides information on financing these improvements. Available from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402. (C13.53:8) $0.70.

101. A Market Study of Energy-Related Equipment for the Commercial Buildings Sector: Decision-Makers, Buying Process, and Marketing Strategies

Federal Energy Administration

NTIS: PB-248-618 ($6.75)

This report brings together detailed information about the market for conservation practices in the commercial buildings sector that may be stimulated or supported by Federal Government actions and initiatives. It describes the commercial building sector, both existing and projected through 1980. (148 pp)

102. Minutes Of and Commentary On Conference on Utility Load Management Held in Brussels on November 12-13, 1974

Federal Energy Administration

NTIS: PB-254-297 ($10.00)

The purpose of the Brussels conference was to bring representatives of the U. S. and European utilities together to resolve issues raised at previous meetings. This report discusses the issues raised concerning rate structure rationale, economics of time-of-day/peak-load metering, and the economics of European storage heating systems. (350 pp)

103. Modification of Fluorescent Luminaires for Energy Conservation

(NBS Technical Note 886)

U. S. Department of Commerce, National Bureau of Standards

This document investigates the possibility of reduced energy consumption by reducing the number of lamps in operation. " The purpose of this investigation was to determine if removing one fluorescent lamp from a two-lamp luminaire with a single ballast and replacing the lamp with various capacitors would permit the luminaire to operate safely, reliably and efficiently."* Available from Government Printing Office, Washington, D. C. 20402. (Publication No. C 13.46:886) $.65

104. The National Energy Outlook. 1980-1990

Shell Oil Company

This paper gives a view of the energy supply and demand in the United States in 1980-1990. Available from Shell Oil Company, Public Affairs, Room 1541, P. O. Box 2463, Houston, Texas 77001. Free.

105. Natural Gas Emergency Standby Act of 1975: Draft Environmental Impact Statement

Federal Energy Administration

NTIS: PB-247-306/AS ($9.75)

This report is the draft environmental impact statement on the proposed Natural Gas Emergency Standby Act (NGESA) of 1975. The statement describes the environmental and energy impacts that would result from the implementation of the proposed legislation or from alternatives to that legislation.

106. Opportunities and Incentives for Electric Utility Load Management

Federal Energy Administration

NTIS: PB-249-348 ($9.75)

This report examines the causes and effects of poor system load factors, a rationalization of rate structures, time-of-day metering, load control, load leveling, and related issues. (315 pp)

107a. The Potential for Energy Conservation in Nine Selected Industries. The Data Base

Federal Energy Administration

NTIS: PB-243-611/AS ($12.50)

This report provides basic data on energy consumption in

industry and identifies opportunities for energy conservation. The industries discussed are: petroleum refining, copper, aluminum, steel, paper, plastics, cement, synthetic rubber, and glass. (529 pp)

107b. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 1. Selected Plastics

Federal Energy Administration

NTIS: PB-243-612 ($6.00) GPO: 041-018-00064-0 ($2.15)

The energy consumptions for production that results in the output of the following thermoplastic resins are addressed: Low density polyethylene, high density polyethylene, polystyrene, and polyvinyl chloride. (149 pp)

107c. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 2. Petroleum Refining

Federal Energy Administration

NTIS: PB-243-613 ($10.75) GPO: 041-018-00065-8 ($4.40)

The report addresses conservation potentials associated with the process methods of separation of crude oil into its constituent parts and the conversion of intermediate materials into more valuable products to meet market demands. (390 pp)

107d. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 3. Cement

Federal Energy Administration

NTIS: PB-243-614 ($6.00) GPO: 041-018-00063-1 ($1.90)

This report summarizes a study dealing with the processing sequences used to manufacture portland cement. (127 pp)

107e. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 4. Copper

Federal Energy Administration

NTIS: PB-243-615 ($5.50) GPO: 041-018-00061-05 ($1.90)

This study deals with processes used in the production of refined primary copper. The traditional methods of copper production, mining and ore preparation, smelting, and refining, are addressed. (124 pp)

107f. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 5. Aluminum

Federal Energy Administration

NTIS: PB-243-616 ($6.00) GPO: 041-018-00067-4 ($1.90)

The materials balance and energy consumption data for the production of primary aluminum ingots is addressed. This study describes the production of primary aluminum ignots, refining bauxite into alumina, and smelting alumina into aluminum. (128 pp)

107g. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 6. Steel

Federal Energy Administration

NTIS: PB-243-617 ($6.00) GPO: 041-018-00068-2 ($2.05)

This volume of the industry study deals with energy consumption data for the production of raw steel, including ingots, steel castings, and strand or pressure cast blooms, billits, slabs, and other product forms. (144 pp)

107h. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 7. Glass

Federal Energy Administration

NTIS: PB-243-618 ($6.00) GPO: 041-018-00069-1 ($1.95)

This report addresses the energy consumption data for the production of glass containers. (131 pp)

107i. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 8. Selected Paper Products

Federal Energy Administration

NTIS: PB-243-619 ($6.75) GPO: 041-018-00070-4 ($2.25)

This study addresses energy consumption for four major paper and paperboard products: newsprint, writing paper (chemical), corrugated containers, and folding boxboard. (161 pp)

107j. The Potential for Energy Conservation in Nine Selected Industries. The Data Base. Volume 9. Styrene Butadiene Rubber

Federal Energy Administration

NTIS: PB-243-620 ($6.00) GPO: 041-018-00071-2 ($2.00)

This report deals with energy consumption data for the production sequence that results in the output of virgin styrene butadiene rubber (SBR). (137 pp)

[Set of Ten Data Base Volumes: NTIS: PB-243-610 ($58.00)]

108. Potential for Energy Conservation in the Steel Industry

Federal Energy Administration

NTIS: PB-244-097 ($10.00)

This report examines existing and new technologies in steelmaking that can offer significant opportunities for energy conservation over the next five years, including the increased use of continuous casting, better utilization of by-product fuel gases, and improved process design and control. (362 pp)

109. The Potential for Energy Savings through Reductions in Hot Water Consumption

Federal Energy Administration

NTIS: PB-247-370/AS ($4.00)

This report investigates America's patterns of heated water use. It estimates the energy savings obtained from various methods of using hot water; it evaluates the economic, social, and institutional problems involved in using hot water, and makes recommendations for legislation concerning hot water consumption. (46 pp)

110. Proceedings of the Conference on Improving Efficiency on HVAC Equipment and Components for Residential and Small Commercial Buildings

Federal Energy Administration

NTIS: PB-249-522 ($8.00)

The report discusses the goals of the FEA, NBS, and ASHRAE conference to exchange and document concepts and applications that could lead to a reduction of energy use in air conditioning and heating. (237 pp)

111. Proceedings of the FEA-PCA Seminar on Energy Management in the Cement Industry

Federal Energy Administration

NTIS: PB-261-943/AS ($9.75) GPO: 041-018-00121-2 ($3.75)

The proceedings of a series of three seminars co-sponsored by the Federal Energy Administration and the Portland Cement Association in 1975 on energy management in the cement industry are presented. Both domestic and international technologies are described. (319 pp)

112. A Program to Evaluate and Demonstrate Conservation of Fossil Fuel Energy for Single-Family Dwellings

Federal Energy Administration

NTIS: PB-245-064 ($4.50)

This report outlines a program which will demonstrate reduction in United States fossil-fuel energy usage, particularly residential, commercial, and commuting. (75 pp)

113. Project Conserve: A Pilot Program in Homeowner Energy Conservation

Federal Energy Administration

NTIS: PB-240-407 ($5.00)

The report presents a summary of the effectiveness, reliability, and costs of the Project CONSERVE program in Topeka, Kansas and Danbury, Connecticut. The aim of the program was to encdurage homeowners to voluntarily reduce fuel consumptions by measures that include insulation installation and thermostat settings. (84 pp)

114. Residential Paper Recovery. A Municipal Implementation Guide (SW-155)

U. S. Environmental Protection Agency

This publication deals with the recovery of residential materials through source separation and municipal collection on a regular basis. It covers the different methods of paper collection and separation, as well as the conservation implications involved. Available from the U. S. Environmental Protection Agency, Solid Waste Information, Cincinnati, Ohio 45268.

115. Retrofitting a Residence for Solar Heating and Cooling: The Design and Construction of the System

NTIS: PB-247-482 ($5.00) GPO: C13.46:892 ($1.70)

The report discusses the findings of a joint FEA/NBS study of retrofit system design and construction between 1972-74. Solar energy requirements and their practicality for dwelling heating and cooling applications are evaluated.

116. Retrofitting Existing Housing for Energy Conservation: An Economic Analysis

U. S. Department of Commerce, in cooperation with the Federal Energy Administration, December 1974

This study examines the economic aspects of energy conservation

techniques suitable for retrofitting into existing housing, including insulation, storm windows and doors, and weather stripping. The objective of this study is to determine that combination of techniques that will maximize net dollar savings in life-cycle operating costs for heating and cooling operations in existing homes, subject to specific climate conditions, fuel costs, and retrofitting costs. Available from Government Printing Office, Washington, D. C. 20402 (Catalog No. C13.29/2:64) $1.35

117. Retrofitting Homes for Energy Conservation: A Business Guide

Federal Energy Administration

NTIS: PB-250-0061 ($4.50)

This Guide provides information for the home building industry about potential new business opportunities for retrofitting existing single-family homes. It offers step-by-step worksheets for evaluating energy conservation improvements. (73 pp)

118. The Room Air Conditioner as an Energy Consumer (ORNL-NSF-EP-59)

John Meyers

Oak Ridge National Laboratory

"This study was undertaken to determine the range of operating efficiencies offered by the many models of room air conditioners available on the market to determine the extent to which adequate information is available to the propsective air conditioner purchaser, and to develop a method for comparing, differences in purchase price with differences in performance."* Available from ORNL, Oak Ridge, Tennessee 37830.

119a. Save Energy, Save Dollars

Cooperative Extension, New York State

This is a comprehensive consumer's manual covering all aspects of energy conservation in the home. Copies may be purchased from Mailing Room, 7 Research Park, Cornell University, Ithaca, New York 14853.

119b. Save Energy, Save Dollars: Energy Fact Sheets

Cooperative Extension, New York State

These fact sheets are published for wide distribution to New York State residents as a service of the state's coopefative extension. Topics covered include sealing cracks, storm window and door installations, the effects of humidity on comfort, thermostat settings, insulation materials, heating

system maintenance, and alternative sources of supplemental heat. Available from Energy Office, State of New York, Empire State Plaze, Core 1 - 2nd Floor, Albany, New York 12223, or from county extension offices throughout the state, at no charge.

120. Save LP-Gas and Your Dollars

National LP-Gas Association

This is a pamphlet which offers practical suggestions on conserving LP-gas in the home. Available from the National LP-Gas Association, 79 West Monroe Street, Chicago, Illinois 60603. Free of charge.

121. Schedule of Courses and Conferences

General Electric Lighting Institute

This pamphlet lists and describes the courses and conferences scheduled by the General Electric Lighting Institute in 1977. Areas of consideration are commercial and industrial Lighting Application Conferences. Available from the Electric Lighting Institute, Nela Park, Cleveland, Ohio 44112.

122. Second Conference on Utility Load Management

Federal Energy Administration

NTIS: PB-244-285/AS ($5.00)

This publication outlines the minutes of a conference held in Washington, D. C. on August 26, 1974 to review problems facing utilities and the role of load management in alleviating these problems.

123. Selected Bibliography of Research on the Employment and Training Implications of the Ongoing Energy Shortages

U. S. Department of Labor

This is an annotated bibliography available from Office of Technical Support, Office of the Assistant Secretary for Policy, Evaluation and Research, U. S. Department of Labor, 200 Constitution Avenue, N.W., Washington, D. C.

124. Simplified Thermal Design of Building Envelopes for Use with ASHRAE Standard 90-75

Stanley Goodwin and Morris Catani

Portland Cement Association

"Application of ASHRAE Standard 90-75 is explained in

detail to assist architects, designers, and building officials. Design aid chart, figures, and tables are presented to simplify calculations that are necessary to conform to the Standard's heating and cooling criteria. Emphasis is on benefits of thermal storage resulting from mass effects of concrete storage."* Available from Portland Cement Association, 5420 Old Orchard Road, Skokie, Illinois 60076

125. Solar Heating of Buildings and Domestic Hot Water

Department of the Navy, Civil Engineering Laboratory

This document serves to guide in the design and cost analysis of solar heating systems for buildings and domestic hot water. Among the topics included are solar radiation, solar system components, storage device, and design criteria. Worksheets for system and cost analyses, a directory of solar equipment manufacturers, and a selected bibliography also appear. Available from Civil Engineering Laboratory, Code L80, Naval Construction Battalion Center, Port Hueneme, California 93043.

126. Solid Waste Management — Available Information Materials (SW 58.26)

U. S. Environmental Protection Agency

The available materials listed in this document are from various sources — EPA, grantees, contractors. Available from the U. S. Environmental Protection Agency, Solid Waste Information, Cincinnati, Ohio 45268.

127. Speaker's Guide to Energy Conservation for Food Service

Federal Energy Administration

This guide explains how to save energy and money in food service operations. It includes a set of 35mm slides. (11 pp)

128. A Study of Energy Conservation Potential in the Baking Industry

Federal Energy Administration

GPO: 041-018-00117-4 ($3.30)

This is a report on energy audits that were conducted in five bakeries, varying in size and end product. The findings and recommendations presented represent specific examples of how to conduct a plant energy audit in the industry, resultant energy savings from taking energy conservation measures, and how to continue tracking energy use and savings. (269 pp)

129. A Study of Energy Conservation Potential in the Meat Packing Industry

Federal Energy Administration

GPO: 041-018-00118-2 ($3.40)

Energy audits that were conducted in five meat packing plants are discussed. The findings and recommendations presented represent specific examples of how to conduct a plant energy audit, and resultant energy savings from taking energy conservation measures. (283 pp)

130a. A Study of Inplant Electric Power Generation in the Chemical, Petroleum Refining, and Paper and Pulp Industries

Federal Energy Administration

NTIS: PB-255-659 ($9.75)

This volume represents the study of the maximum thermodynamic and economic potentials for increased inplant electric power generation as determined for the chemical, petroleum refining, and paper and pulp industries.

130b. A Study of Inplant Electric Power Generation in the Chemical, Petroleum Refining, and Paper and Pulp Industries. Executive Summary

Federal Energy Administration

NTIS: PB-255-658 ($3.50)

This is an executive summary of a final report which specifies the maximum thermodynamic and economic potentials for increased inplant electric power generated by steam turbine, gas turbine, and diesel topping and steam and organic bottoming cycles for the chemical, petroleum refining, and paper and pulp industries, with and without government sponsored economic incentives.

131. A Study of the Electric Utility Industry Demand, Costs, and Rates

Federal Energy Administration

GPO: 041-018-00111-5

This report documents past and probable future trends in demand and costs and examines potential benefits of a shift to alternative rate structures that might help reshape the patterns of demand growth.

132. A Study of the Energy Saving Possible by Automatic Control of Mechanical Draft Cooling Tower Fans - FEA

NTIS: PB-256-683/AS ($3.50)

The potential savings in energy use that can be achieved

through application of various control systems to mechanical draft towers are addressed in this publication. (25 pp)

133. A Study of the Impact of Reduced Retail Store Operating Hours on Sales, Employment, Economic Concentration, and Energy Consumption

Federal Energy Administration

NTIS: PB-243-579 ($10.00)

The report describes a project undertaken to analyze the possible impacts of government regulations on retail hours. It addresses energy savings which may accrue from regulating retail selling hours and regulatory programs deemed economically and socially feasible. (309 pp)

134. Study of the Physical Characteristics, Energy Consumption and Related Institutional Factors in the Commercial Sector

Federal Energy Administration

NTIS: PB-249-470 ($7.50)

This report addresses the physical characteristics of existing commercial buildings in Baltimore, Maryland and Denver, Colorado with emphasis upon factors related to constructing and/or operating energy efficient commercial buildings.

135. A Study of the Relative Economics and Total Energy Requirements of Natural Draft and Mechanical Draft Cooling Towers - FEA

NTIS: PB-256-762/AS ($3.50)

This report compares the capital investment, operating costs, and energy requirements for construction and operation of conventional mechanical-draft and natural-draft cooling towers. (19 pp)

136. Study of Technical Options Available for Reclaiming Heat Lost to the Atmosphere from Existing Mechanical Cooling Towers - FEA

NTIS: PB-261-752/AS ($4.00)

This study investigates options available for the recovery of waste heat currently lost to the atmosphere from mechanical draft cooling towers. (33 pp)

137. Technical Background Information for Appliance Efficiency Targets

Federal Energy Administration

Consumer product energy targets are presented for such appliances as clothes dryers and washers, dishwashers,

freezers, kitchen ranges and ovens, monochrom and color televisions, refrigerator and combination refrigerator-freezers, room air conditioners, and water heaters. Each subject is covered in a separate publication.

138. Technical Notes on Brick Construction Numbers 4 and 4A

Brick Institute of America

These technical briefs with heat gain and heat transmission coefficients of brick masonry walls are adapted from the AHSRAE Handbook of Fundamentals. Available from Brick Institute of America, 1750 Old Meadow Road, McLean, VA 22101.

139. Tips for Energy Savers

Federal Energy Administration

Simple and practical advice for saving energy is offered in this publication.

140a. Utility Load Management Conference, Paris, July 9-10, 1974: Minutes and Commentary - FEA

NTIS: PB-244-284/AS ($5.00)

This report is a summary of the minutes of the conference on utility load management held in Paris on July 9 and 10, 1974.

140b. Utility Load Management Conference Proceedings: August, 1975 - FEA

NTIS: PB-244-576/AS ($5.50)

Seventeen papers present a summary of key issues in rate reform, enabling technology, and load management in this publication. (113 pp)

141. Voluntary Industrial Energy Conservation Program

Federal Energy Administration

This fact sheet summarizes the voluntary industrial energy conservation program.

142. Waste Oil

Federal Energy Administration

This fact sheet briefly summarizes the opportunities associated with the recovery and re-use of waste oil.

143. Automobile Fuel Economy

Motor Vehicle Manufacturers Association of the United States, Inc.

This report was prepared to place the question of automobile fuel economy in the proper perspective. As a response to the "energy crisis," it deals with the topics of fuel economy and personal mobility and the influence of automobile power requirements, weight, size, and shape, engine, accessories, emission control devices, drive line, gasoline, driver, and maintenance. Available from Motor Vehicle Manufacturers Association, 320 New Center Building, Detroit, Michigan 48202. Free of charge.

144. Automobile Usage Patterns: Highlight Report. Volume XIV

NTIS: PB-244-076/AS ($3.50)

This study concentrates on automobile usage patterns. This study is based on 1,007 telephone interviews and includes topics such as how new car use is affected by life-style, car use patterns, planned trips as compared with routine or spontaneous trips; number of trips made each week, analysis of trips, the extent to which shopping trips are done by phone instead of by car, willingness to reduce number of trips, and factors deterring car use.

145. Baseline Energy Forecasts and Analysis of Alternative Strategies for Airline Fuel Conservation

Federal Energy Administratino

NTIS: PB-255-351 ($7.50)

The impact of fuel conservation strategies, baseline forecasts of airline activity, and energy consumption to 1990 are developed. Alternative policy options to reduce fuel consumptions are identified and analyzed for three baseline levels of aviation activity within the framework of an aviation activity/energy consumption model. Available from the Federal Energy Administration, Office of Conservation and Environment. (199 pp)

146. Carpool Incentives: Evaluation of Operational Experience

Federal Energy Administration

GPO: 041-018-00122-1 ($2.40)

A summary of energy conservation measures and their benefits are presented.

147. Confessions of a Mileage Champion — Ben Visser

Shell Oil Company

This booklet contains many tips on how to reduce fuel consumption. Available from Shell Oil Company, P. O. Box 61609, Houston, Texas 77028. Free.

148. Driving and Energy Conservation — Highlight Report Volume XXI

NTIS: PB-261-162 ($4.00)

This report summarizes the nationwide survey evaluating auto travel, use and maintenance. (14 pp)

149. Energy and Economic Effects of the Administration's Draft Bill on Airline Regulations, 1975-1980

Federal Energy Administration

This report forecasts the cost and requirements of the domestic trunk airlines under the present CAB regulatory structure and the proposed regulatory environment envisioned by the Administration's Aviation Act of 1975. (35 pp)

150. Energy Conservation Potential of Urban Mass Transit

NTIS: PB-249-336 ($4.00)

The future role of mass transmit in the U. S., the energy conservation potential of increased transit service, and long-term advantages —such as improved mobility, reduced urban congestion and air pollution — are summarized in this publication. (28 pp)

151. Energy Impacts of Proposed Changes in Airline Regulations

Federal Energy Administration

The Administration's draft bill on airline regulation and its impact on energy consumption in the 1974 time-frame is evaluated. (23 pp)

152. Energy Primer: Selected Transportation Topics

U. S. Department of Transportation, Office of the Secretary/ Transportation Systems Center

"This publication has been designed to provide broad overviews of the current and projected transportation energy situation in this country." Available from Mr. R. V. Giangrande, Chief, Office of Program Development, U. S. Department of Transportation, Transportation Systems Center, Kendall Square, Code 151, Cambridge, Massachusetts 02142. Free of charge.

153. Energy Use Implications of Proposed Changes in the Regulation of the Railroad and Motor Trucking Industries

Federal Energy Administration

The Administration's draft bills on airline and motor carrier regulatory reform and their impact on the intra- and inter-industry modal interrelationships in the intercity freight market are investigated. (200 pp)

154. The FEA/EPA Fuel Economy Labeling Program

Federal Energy Administration

This pamphlet specifies the fuel economy labeling criteria used for evaluating new car gasoline consumptions.

155. Gasoline Consumption

Federal Energy Administration

NTIS: PB-246-220/AS ($3.50)

An analysis of gasoline consumptions in the United States is presented. Regional variations of per capita consumption are also listed. The study shows the average gasoline expenditures per household and percentage of the family income spent on gasoline.

156. Gasoline Consumption Model. Volume I. Final Report

Federal Energy Administration

NTIS: PB-256-024 ($5.50)

This report discusses a computer model of the automobile sector of the economy. The model was designed to provide medium (3-5 years) and long term (through 1990) projections of gasoline consumption by passenger cars. (107 pp)

157. Gas Watchers' Guide

American Automobile Association

Written for motorists, this booklet provides several methods of reducing fuel consumption. Available from AAA, 8111 Gatehouse Road, Falls Church, VA 22042. Free.

158. Improving Urban Mobility — Barbara Reinhart

U. S. Department of Transportation, Federal Highway Administration

This publication illustrates what is being done to improve urban mobility. These techniques concentrate on 1) improving the efficiency of existing roads through more effective management; 2) improving transit operations; 3) utilization

of ride-sharing programs, and 4) the combination of these techniques. Available from Federal High Administration, Urban Planning Division, Transit and Traffic Engineering Branch, Washington, D. C. 20590. No charge.

159. Intercity Passenger Transportation: Mode/Energy Conservation (Executive Summary)

Federal Energy Administration

NTIS: PB-250-883/IAS

Alternative intercity passenger transportation policies for the United States are investigated for their energy conservation potentials. (29pp)

160. Locating and Operating Bus Rapid Transit Park- Ride Lots — Daniel M. Gatens

Urban Transportation Program, Departments of Urban Planning and Civil Engineering, University of Washington

This paper reviews past experience with locating and operating park-ride lots throughout the country and adds to the growing body of information concerning the location of these facilities. Available from U. S. Department of Transportation, Urban Mass Transportation Administration, Washington, D. C., Research Report No. UMTA-URT-3-73-3.

161a. A Marketing Approach to Carpool Demand Analysis, Evaluation of Model Impact Estimates

Federal Energy Administration

NTIS: PB-261-824 ($4.00)

This report details the model evaluation procedures and their application in assessing the policies examined in connection with the research effort examining the role of individual attitudes and perceptions in deciding whether or not to carpool. (47 pp)

161b. A Marketing Approach to Carpool Demand Analysis, Summary

Federal Energy Administration

NTIS: PB-261-825 ($5.50)

This report presents an overview of the major findings, conclusions, and recommendations of a study on Policy Research to determine policy incentives and to encourage people to alter their travel habits in favor of more energy-efficient modes. (94 pp)

161c. A Marketing Approach to Carpool Demand Analysis, Survey Documentation

Federal Energy Administration

NTIS: PB-261-821 ($4.50)

This publication details the survey design and methodology employed in connection with a research effort which examined the role of attitudes and perceptions in carpooling. The study was based upon a survey of commuters in 3 major urban areas. (70 pp)

161d. A Marketing Approach to Carpool Demand Analysis, Survey Tabulations and Evaluation

Federal Energy Administration

NTIS: PB-261-822 ($5.50)

This publication contains detailed tabulations, cross tabulations, and major conclusions for policy assessment resulting from a survey taken in connection with the research effort examining the role of individuals attitudes and perceptions in deciding whether or not to carpool. (107 pp)

161e. A Marketing Approach to Carpool Demand Analysis, Trade-off Model Theory and Policy

Federal Energy Administration

NTIS: PB-261-823 ($4.50)

This publication discusses the model and its adaptation in the simulation procedures used in evaluating specific carpool policies. The model was the primary instrument used in connection with the research effort examining the role of individuals attitudes and perceptions in deciding whether or not to carpool. (51pp)

162. Mass Transit and Energy Conservation

Federal Energy Administration

NTIS: PB-246-232/AS ($3.50)

Energy conservation potentials of improved mass transit, and the extent to which increased transit funding can promote substantial energy conservation is addressed. This study discusses trends in annual urban transportation, efficiencies of urban transportation modes, energy savings, energy conservation, potentials of policy actions, and the role of transportation in society.

163. Owners, Operators

Federal Energy Administration

Ways for truck owners and operators to save fuel and money are presented in this brief fact sheet. (1 pp)

164. Para-Transit: A Summary Assessment of Experience and Potential

Ronald F. Kirby

Prepared for U. S. Department of Transportation, Federal Highway Administration/Urban Mass Transportation Administration

"This study was designed to review experience to date with para-transit services, to assess their potential for serving urban transportation demand, and to design a research, development, and demonstration program as needed to identify and demonstrate innovations in the provisions of para-transit services which would be beneficial to U. S. cities."* Available from NTIS, Springfield, VA 22161.

165. The Potential for Transit As An Energy Saving Option

Federal Energy Administration
NTIS: PB-263-087/9BA ($5.50)

166. Preferential Facilities for Carpools and Busses (HHP-26)

U. S. Department of Transportation, Federal Highway Administration

"This report provides information on several recent projects to increase the person-moving capacity of the highway system by designating facilities for preferential use by high-occupancy vehicles."* Available from Government Printing Office, Washington, D. C. 20402. (Stock No. 050-001-00112-8). $1.10.

167. Price Elasticities of Demand for Transportation Fuels

Federal Energy Administration

The results of a study to develop and review estimates of the fuel price elasticity for gasoline, jet fuel, and diesel fuel use in the transportation sector is presented in this report. (348 pp)

168. The Public's Use of Automobiles and Attitudes Toward Three Gasoline Allocation Options

Federal Energy Administration

Survey findings in this report are based on 1,013 telephone interviews among a national probability sample of licensed drivers of age 18 and over. The survey addresses automobile usage habits and attitudes toward alternative methods of gasoline allocation.

169. Railroad Freight Car Requirements for Transporting Energy: 1974-1985

Federal Energy Administration
NTIS: PB-250-126 ($5.50)

170. Saving School Bus Fuel

Federal Energy Administration

This pamphlet suggests ways for schools to save fuel and money in the operations of school buses. (2 pp)

171. Secrets of a Successful Car Pool — Bernie Smith

Shell Oil Company

This booklet is directed towards the person who drives alone. It describes the common car pool problems and how to solve them. Available from Shell Oil Company, P. O. Box 61609, Houston, Texas 77208. Free.

172. Shell Answer Books No. 1 - 5

Shell Oil Company

This is a series of pamphlets which aid the motorists in spotting car problems early, handling breakdowns, and saving gasoline when buying, driving, and maintaining a car. Available from Shell Dealers or by writing Shell Oil Company, P. O. Box 61609, Houston, Texas 77208. No charge.

173. Telecommunications Substitutability for Travel: An Energy Conservation Potential

Federal Energy Administration

NTIS: PB-249-511/7ST ($6.00)

Telecommunications has the potential of conserving energy to a significant degree by substituting for functions currently being performed through the use of transportation. Two means of energy savings are explored: (1) decentralization of work forces, which would reduce commuter travel; and (2) the increased use of telecommunications by existing work forces in their current organizational structures. (150 pp)

174. Tips for Truckers

Federal Energy Administration

Heavy-duty truck owners and operators can save fuel and money by implementing the tips offered. (2 pp)

175. Transportation Energy Conservation Program Plan of Policy-Oriented Research

Federal Energy Administration

NTIS: PB-240-734/AS ($5.00)

This report reviews transportation's role in energy conservation

and presents proposed research programs. Project descriptions include definition of estimated costs, suggested scheduling, priority designation, interrelationships with other programs, and task descriptions.

176. Truckin' 'N' Energy

Federal Energy Administration

Hints for professional drivers on how to save fuel are summarized on this fact sheet. (1 pp)

177. Vanpool Implementation in Los Angeles — Leon R. Bush and George J. Todd

The Aerospace Corporation. Reprinted by U. S. Department of Transportation, Federal Highway Administration

"This paper documents the formation and operation of a very successful vanpool at The Aerospace Corporation and Air Forces Space and Missile Systems Organization."* Available from U. S. Department of Transportation, Federal Highway Administration, Washington, D. C. 20590. No charge.

178. Vehicle Inspection Handbook

Motor Vehicle Manufacturers Assocation

"This handbook is intended to be a guide for the individual vehicle inspection and for the person responsible for planning and implementing a meaningful inspection program based on sound engineering principle."* Available from Motor Vehicle Manufacturers Association, 320 New Center Building, Detroit, Michigan 48202.

179. Voluntary Fuel Economy Program for Trucks and Buses

Federal Energy Administration

This pamphlet suggests ways for improving fuel economy.

180a. 1976 Gas Mileage Guide for New Car Buyers

Federal Energy Administration

This pamphlet provides city, highway, and average fuel economy (mpg) values for each 1976 car along with engine size, number of cylinders and type of transmission data. (180 pp)

180b. 1977 Gas Mileage Guide for New Car Buyers

Federal Energy Administration

This booklet provides city, highway, and average fuel economy (mpg) for each 1977 car line along with data indicating engine size, number of cylinders, space, and type of transmission for U. S. cars and imports. A special edition is available for cars sold in California. (30 pp)

SECTION III

SUPPLEMENTARY RESOURCES

PART 3

OTHER SUBJECTS

181. Attitudes and Behavior of Residents in All-Electric Homes

NTIS: PB-244-981/AS ($3.50)

This report summarizes the results of interviews with residents of all-electric homes. It is based upon 100 personal interviews with residents in two all-electric communities in West Chester, New York.

182. A Brief Analysis of the Impact of Environmental Laws on Energy Demand and Supply

NTIS: PB-245-656/AS ($6.00)

This report identifies 10 key environmental issues and quatifies the energy impact of each. The issues given consideration are classified according to whether they tend to increase the demand for or decrease the availability of energy and according to when they occur in the energy production/consumption cycle. (130 pp)

183. Conservation of Energy in the Home: Highlight Report: Volume XVII

NTIS: PB-254-628/1ST ($3.50)

This report surveys public behavior and attitudes toward conserving home heating fuel, gasoline, electricity, and hot water. (12 pp)

184. Conserving Electricity by Ordinance: A Statistical Analysis

NTIS: PB-249-345/OST

This report provides policy makers with a statistical analysis to assist them in judging quantitatively the successes and limitations of an ordinance approach to energy conservation. (65 pp)

185. Consumer Attitudes and Behavior Resulting from Issues Surrounding the Energy Shortage: Highlight Report. Volume VII

NTIS: PB-244-985/AS ($4.00)

This survey report concentrates on consumer attitudes and behavior resulting from issues surrounding the energy shortage and includes data on the rising cost of electricity, rationing, the role of education in forming attitudes toward strip mining, energy self-sufficiency, power-plants and oil refineries as a cause of air pollution, and oil heat users.

186. Consumer Attitudes Toward Gasoline Prices, Shortages, and Their Relationship to Inflation: Highlight Report. Volume VI

NTIS: PB-244-984/AS ($4.00)

This survey report concentrates on consumer attitudes about gasoline prices and shortages, and the relationship of both to inflation.

187. Consumer Behavior and Attitudes Toward Energy-Related Issues: Highlight Report. Volume VIII

NTIS: PB-244-986/6ST ($4.00)

This report deals with general public behavior and attitudes. It concerns important problems facing the country, such as unemployment, inflation, energy shortage, rationing versus increased prices, increased oil import taxes, pollution control requirements, and nuclear power plants.

188. Consumption and Conservation of Natural Gas: Highlight Report: Volume XVIII

NTIS: PB-254-629 ($3.50)

This report deals with general public behavior and attitudes toward energy conservation. Results of a survey of attitudes towards natural gas are presented. (12 pp)

189. Electric Utilities, Clean Air Act Amendments, and Sulfates

NTIS: PB-243-574/AS ($4.50)

This document summarizes various analyses of the Clean Air Act of 1970. It includes findings of the Government, the scientific community, and private industry about the impact of the Act on the economy and on the availability of clean fuels. The report examines alternative public policies that would ensure the development of a coordinated environmental/energy program for the next decade and provides a factual basis for making decisions about the Clean Air Act Amendments of 1975. (61 pp)

190a. Energy and Economic Impacts of Mandatory Deposits: Executive Summary

NTIS: PB-258-637 ($3.50)

This executive summary examines the energy, capital, and labor impacts that could be caused by a five-cent deposit on beer and soft drink containers. (18pp)

190b. Energy and Economic Impacts of Mandatory Deposits: Study Report

NTIS: PB-258-638 ($18.75)

This study examines the energy, capital, and labor impacts

that would be caused by a five cent deposit on beer and soft drink containers. The study examines the range of potential impacts that could occur, given various market responses to a nationwide mandatory deposit law. (752 pp)

191. Energy Consumption and Attitudes of the Poor and Elderly: Highlight Report, Volume IV

NTIS: PB-244-982/AS ($3.50)

This study concentrates on the energy consumption and attitudes of the poor and elderly.

192. Energy Independence Act of 1975 and Related Tax Proposals

NTIS: PB-247-305/AS ($10.75)

This environmental impact statement assesses the proposed Energy Independence Tax of 1975 and related tax measures. (392 pp)

193. Energy-Related Attitudes and Behavior of the Poor and the Elderly: Highlight Report. Volume XIII

NTIS: PB-244-990/AS ($3.50)

The survey report concentrates on the energy-related attitudes and behavior of the poor and elderly. (25 pp)

194. The Energy Vista: Policy Perspectives on Energy Conservation through Land Use Management

NTIS: PB-259-417 ($11.00)

This report presents research into the relationships between energy consumption and land use. The reader may wish to consult a companion document: " An Overview and Critical Evaluation of the Relationship between Land use and Energy Conservation," to explore in detail the ways in which land use and energy consumptions interact.

195. Final Assessment of the Environmental Impacts of the State Energy Conservation Program

NTIS: PB-256-044 ($5.00)

The Energy Policy and Conservation Act (EPCA) (Public Law 94-163) provides for a program to be administered by each state in which the State and Federal Governments may work in partnership to develop comprehensive energy conservation plans. This report presents an environmental analysis of the cumulative national impact of the State Energy Conservation Program and provides data that can be employed by the states in assessing the environmental impacts of energy conservation measures which might br a part of their programs. (92 pp)

196. First Quarterly Report to U. S. House and Senate Committees on Appropriations

NTIS: PB-256-182 ($4.00)

This is the first of a series of reports to the House and Senate Committees on Appropriations describing the progress of the Federal Energy Administration's (FEA) energy conservation programs and short- and long-term accomplishments.

197. Five Year Program Planning Document for End Use Energy Conservation, Research, Development, and Demonstration

NTIS: PB-240-406 ($9.00)

This report describes Federal energy conservation research programs for a five year period prior to the Spring of 1974. The study considers what is needed to attain national energy self-sufficiency by 1980; it identifies energy conservation practices in society; and it describes the impact that a reduced demand for energy would have on society.

198a. General Public Attitudes and Behavior Regarding Energy Saving: Highlight Report. Volume IX

NTIS: PB-244-989/OST ($4.00)

This report addresses the energy shortage, methods of solving the energy problem, inflation and increased prices, unemployment, and the rebate plan, the role of rebates to encourage installation of storm windows, and insulation attitudes. (48 pp)

198b. General Public Attitudes and Behavior Regarding Energy Saving: Highlight Report. Volume X

NTIS: PB-244-968/AS ($4.00)

This study on energy savings is divided into six parts. The following topics are considered: responsibility for conservation of natural resources, public awareness, attudes related to daylight savings time, automobile use and alternatives, and insulation of homes. (27 pp)

198c. General Public Attitudes and Behavior Regarding Energy Saving: Highlight Report. Volume I

NTIS: PB-244-979/AS ($3.50)

This report is the first in a series of public opinion studies on energy issues. Public's attitudes on the following issues are discussed: seriousness and duration of the energy shortage; trust in sources of information on energy issues; general knowledge of energy issues; opinions as to solutions to the energy shortage; attitudes toward car pools; and, attitudes toward packaging.

198d. General Public Attitudes and Behavior Toward Energy Savings: Highlight Report. Volume II

NTIS: PB-244-980/AS ($3.50)

This report discusses a survey on reliability of energy information sources; reasons for the energy shortages; and support for legislation requiring automobile manufacturers to produce cars getting a minimum number of miles per gallon.

199. General Public Behavior and Attitudes: Highlight Report. Volume XII

NTIS: PB-244-969/AS ($4.00)

This survey report addresses vacation and business travel; attitudes regarding beverage containers; and reasons for using mass transit.

200. Group Discussions Regarding Consumer Energy Conservation

NTIS: PB-254-639/8ST ($4.00)

This report describes the results of a series of group discussions conducted to investigate consumer attitudes and motivations as they relate to energy conservation. (50 pp)

201. How the Public Views the Nation's Dependence on Oil Imports; A Possible Natural Gas Shortage this Winter; The Overall Need to Save Energy: Highlight Report. Volume XV

NTIS: PB-245-828/AS ($3.50)

According to this study, the public is ready to accept the fact that the era of cheap energy is over, and realizes that consumption of foreign oil needs to be reduced and domestic resources developed. (9 pp)

202. Low-Income Demographic Data

Federal Energy Administration

Demograhic data pertinent to the Weatherization Assistance Act of 1975 (H.R. 8650) is presented. (9 pp)

203. An Overview and Critical Evaluation of the Relationships Between Land Use and Energy Conservation. Executive Summary

NTIS: PB-258-877 ($4.00)

This is a study to identify and assess the interrelationships between land use patterns and energy consumption. Its objectives have been to order the interrelationships between land and energy uses in a new conceptual framwork. (27 pp)

204. An Overview and Critical Evaluation of the Relationship Between Land Use and Energy Conservation

NTIS: PB-258-876 ($12.00)

This report of the land use study investigates the relationships between land use — the pattern of activities and objectives on the land — and their associated energy uses. Technical supplements are included. (467 pp)

205. Parents Perceptions of their Children's Sources of Energy Information and Energy-Related Activities: Highlight Report, Volume XXIII

NTIS: PB-261-164 ($4.00)

This report summarizes the amount of energy information that has been transmitted to American homes by children who obtain such information in school. (20 pp)

206a. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments

NTIS: PB-259-612 ($4.00)

This report contains tabulations of the results of telephone interviews conducted from November 17 to November 19, 1974 to obtain information regarding attitudes toward electric rates.

206b. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 1 and 2

NTIS: PB- 255-003/6ST ($4.00)

This report contains tabulations of results of telephone interviews conducted on the attitudes and behavior patterns of poor and/or elderly as they relate to the current energy situation and as they compare to the attitudes and behavior of the public in general. (38 pp)

206c. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 3 and 4

NTIS: PB-254-591/1ST ($4.00)

This report contains tabulations of results of telephone interviews conducted on automobile usage patterns. A total of 1,007 interviews were obtained. (33 pp)

206d. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 5 and 6

NTIS: PB-254-304/9ST ($4.00)

This report contains tabulations of results of telephone

interviews on the public's attitudes toward the Nation's dependence on oil imports, a possible natural gas shortage this winter, and the overall need to save energy. (38 pp)

206e. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulation by U. S. Population Segments. Waves 7 and 8

NTIS: PB-254-590/3ST ($4.50)

This report contains tabulations of the results of interviews conducted with 604 adults, aged 18 and over. (57 pp)

206f. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 9 and 10

NTIS: PB-259-341 ($4.50)

This report contains tabulations of results of telephone interviews conducted on personal conservation efforts and opinions on a possible natural gas shortage.

206g. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 12 and 13

NTIS: PB-259-342 ($4.00)

This report contains tabulations of results of telephone interviews conducted on the public's attitudes towards the costs and availability of energy. This volume lists answers to questions on the: (1) seriousness and duration of the energy shortage, (2) its causes, (3) trust and performance of information sources, (4) knowledge of the energy shortage, (5) solutions to it, (6) car pools, and (7) packaging.

206h. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 14 and 15

NTIS: PB-259-343 ($4.00)

This report contains tabulations of results of telephone interviews conducted between September 15 and October 15, 1974. The survey covered public's attitudes towards issues as reliability of energy information sources; reasons for the energy shortage; use of public transportation; gasoline tax policy; foreign trade policy; home lighting; home heating; natural resource availability; and desirability of minimum miles per gallon by legislation.

206i. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 16 and 17

NTIS: PB-259-344 ($5.00)

This report contains tabulations of results of telephone interviews conducted between January 27, 1976 and February 25, 1976,

on 606 adults concerned with attitudes towards the role of schools in teaching children "why" and "how" to save energy.

206j. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 18 and 19

NTIS: PB-259-345 ($4.00)

This report contains tabulations of results of telephone interviews conducted on consumer attitudes toward gasoline prices, shortages, and their relationships to inflation.

206k. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 20 and 21

NTIS: PB-254-305/6ST ($4.00)

This report contains tabulations of results of telephone interviews on the public's attitudes on trends in attitudes and behavior resulting from issues surrounding the energy shortage, fuel use as it affects attitudes and behavior, and public willingness to pay for the environment. (27 pp)

206l. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population Segments. Waves 22 and 23

NTIS: PB-254-598/5ST ($4.00)

This report contains tabulations of results of telephone interviews conducted on public attitudes towards rebates to encourage installation of storm windows and insulation, gasoline use and gas taxes, appliance purchases, and returnable bottles and cans. (35 pp)

206m. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population Segments. Waves 26 and 27

NTIS: PB-254-588/7ST ($4.00)

This report contains tabulations of results of telephone interviews conducted on the public's attitudes toward responsibility for conservation of natural resources, public awareness of FEA, attitudes and behavior related to daylight savings time, automobile usage and attitudes, and insulation of homes among the general public. (33 pp)

206n. Public Attitudes and Behavior Regarding Energy Conservation; Detailed Tabulations by U. S. Population and Population Segments. Waves 28 and 29

NTIS: PB-254-592 ($4.00)

This report contains tabulations of results of telephone interviews conducted on topics that include attitudes toward nuclear

power plants, impact of school programs on home energy consumption, factors affecting the public's use of mass transit, and efforts at energy conservation.

206o. Public Attitudes and Behavior Regarding Energy Conservation: Detailed Tabulations by U. S. Population and Population Segments. Waves 30 and 31

NTIS: PB-259-346 ($4.50)

This report contains tabulations of results of telephone interviews conducted on the public's attitudes toward vacation and business travel, beverage containers, and reasons for using mass transit.

207. The Public's Attitudes Toward and Knowlege of Energy-Related Issues: Highlight Report. Volume IX

NTIS: PB-244-987 ($4.00)

This report concentrates on attitudes toward nuclear power plants, the impact of school programs on home energy consumption, factors affecting the public's use of mass transit, and company efforts at energy conservation. (32 pp)

208. Public Knowledge, Attitudes, and Behavior Relating to Natural Gas Issues: Highlight Report. Volume XX

NTIS: PB-261-161 ($4.00)

This report describes a nationwide probability sample survey conducted through November 1975. (15 pp)

209. A Public Opinion Survey on Energy and Economy Considerations and Air Pollution Controls: Highlight Report. Volume XVI

NTIS: PB-249-544/8ST ($4.50)

This volume summarizes findings of questions to the public on air pollution controls. (60 pp)

210. A Qualitative Study of Consumer Attitudes Toward Energy Conservation

NTIS: PB-25[illegible]564/8ST ($4.50)

A qualitative assessment of attitudes was explored and obtained in different regions of the country from a broadly-based cross-section of the population. (52 pp)

211. Trends in Energy Consumption and Attitudes Toward the Energy Shortage: Highlight Report. Volume V

NTIS: PB-244-983 ($4.00)

This report deals with general public behavior and attitudes

towards energy conservation. It concentrates on energy consumption and attitudes toward the energy shortage. (27 pp)

212. Understanding of the Energy Situation and Evaluations of Alternative Actions: Highlight Report Volume XXIV

NTIS: PB-261-165 ($3.50)

A nationwide probability sample survey was conducted during the period March 22 through April 19, 1976. It showed consumers appear responsive to "life-cycle" pricing information in terms of purchasing choice; also income tax credits are potent incentives for getting homeowners to make energy conservation home improvements. The report discusses the survey results. (23 pp)

213a. Western Regional Energy Development Study: Executive Summary

NTIS: PB-246-360/AS ($4.50)

This report examines the primary environmental impacts of 38 energy resource development scenarios, including development factors and levels, and impacts of pollution problems to be faced. (56 pp)

213b. Western Regional Energy Development: Volume I

NTIS: PB-246-361/AS ($7.50)

This publication represents Part I of the study documented to identify the impacts of 38 energy resource development scenarios. (186 pp)

213c. Western Regional Energy Development: Volume II

NTIS: PB-246-362/AS ($18.75)

Part II of the study of alternative energy development scenarios is presented in this volume. (705 pp)

Set (Executive Summary, Vol. I and II) - NTIS: PB-246-359 ($28.00)

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PRIMARY RESOURCES BY SOURCE: PRINTED MATERIAL

American Council on Education, Association of Physical Plant Administration, and National Association of College and University Business Offices

Energy Management: A Manual for Use in Workshops (P-10)

Auburn University, Engineering Extension Service

Measuring and Improving the Efficiency of Boilers (P-28)

Blue Cross of Greater Philadelphia

Practical Energy Management in Health Care Institutions (with FEA) (P-30)

Center for Professional Advancement

A Practical Approach to the In-Plant Energy Conservation (P-29)

Chilton Publishing Company

Chilton's More Miles-per-Gallon Guide (P-41)

Colorado Department of Education

How to Conserve Energy in School Transportation Systems (P-44)

Commerce, Department of

Energy Conservation Program Guide for Industry and Commerce and Supplement 1 (NBS) (P-7)
Energy Management Guide for Light Industry and Commerce (NBS) (P-15)
SavEnergy Kit (P-33)
Technical Options for Energy Conservation in Buildings (NBS) (P-35)
Waste Heat Management Guidebook (NBS) (P-39)

Community Service Administration

A Community Planning Guide to Weatherization (P-1)
Save Energy: Save Money! (P-32)

Construction Specifications Institute

Energy Conservation in Buildings: Techniques for Economical Design (P-5)

The Electric Power Research Institute

Efficient Electricity Use: A Practical Handbook for an Energy Constrained World (P-2)

The Electrification Council

Energy Management Course: Student Text (P-12)

Energy Research and Development Administration

Life Cycle Costing Manual (P-26)
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Guide to Energy Conservation for Food Service (P-20)
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National Electrical Manufacturer's Association

Total Energy Management: A Practical Handbook on Energy Conservation and Management (with NECA and Department of Commerce) (P-37)

Navy, Department of, Naval Facilities Engineering Command

Energy Conservation Through Utilities Operation (P-8)
Energy Management at Shore Activities (P-11)
Interim Design Criteria: Technical Guidelines for Energy Conservation in Existing Buildings (P-24)
Manual for Selection Application and Cost Analysis of Central Building Automation Systems (P-27)

Sheet Metal and Air-Conditioning Contractors National Association, Inc.

Guidelines for Energy Conservation in Existing Buildings (P-16)
Guidelines for Energy Conservation Systems in New Buildings (P-17)

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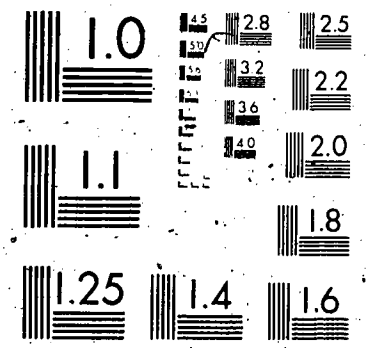
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A Note to the User:

Sections II and III highlight all the major topics in the resources they describe, and use the terminology of those resources as much as possible. This index is a topical reference to Sections II and III. This means that if a resource treats a topic only briefly or very generally, it will not appear next to that topic in the index.

It has also been necessary to take "poetic license" with terminology, because resources may use different words for the same topic, e.g., windows and fenestration. Thus a description may use a synonym for the index term that refers to it.

Some topics do not appear in this index because they are so pervasive. "Energy Conservation Opportunities" for example, appears not as a general heading but as a subheading under particular systems.

As with any index, the reader is encouraged to browse through this index before looking up a specific topic.

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