

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: 11/6/80

Project Title: Development of an Energy Conservation Assessment Procedure
for Cities in Georgia

Project No: B-547

Project Director: Larry Edens

Sponsor: Georgia Department of Community Affairs

Agreement Period: From 5/27/80 Until 9/1/81
~~6/30/81~~

Type Agreement: Letter dated May 27, 1980 (under NSF Prime Grant No. ISP79-08955)

Amount: \$4,998.00
\$2,103.00 (E-122-208)
\$7,101.00 TOTAL

Reports Required: Quarterly Reports

Sponsor Contact Person (s):

Technical Matters

Contractual Matters
(thru OCA)

Mr. Rod Terry, Director
Division of Technical Assistance
Georgia Department of Community Affairs
Suite 600 William Oliver Bldg.
32 Peachtree St. N.W.
Atlanta, GA 30303

Defense Priority Rating: N/A

Assigned to: EDL/ARD ~~School/Laboratory~~

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director-EES
Accounting Office
Procurement Office
Security Coordinator (OCA)
✓ Reports Coordinator (OCA)

Library, Technical Reports Section
EES Information Office
EES Reports & Procedures
Project File (OCA)
Project Code (GTRI)
Other Project Code (OCA)

SPONSORED PROJECT TERMINATION SHEET

10
11
12

Date 9/25/81

Project Title: Development of an Energy Conservation Assessment Procedure for Cities in Georgia

Project No: B-547

Project Director: Larry Edens

Sponsor: Ga. Dept. of Community Affairs

Effective Termination Date: 9/1/81

Clearance of Accounting Charges: 9/1/81

Grant/Contract Closeout Actions Remaining:

- Final Invoice ~~and Closing Documents~~
- Final Fiscal Report
- Final Report of Inventions
- Govt. Property Inventory & Related Certificate
- Classified Material Certificate
- Other _____

Assigned to: EDL/IED (School/Laboratory)

COPIES TO:

Administrative Coordinator
Research Property Management
Accounting
Procurement/EES Supply Services

Research Security Services
~~Reports Coordinator (OCA)~~
Legal Services (OCA)
Library

EES Public Relations (2)
Computer Input
Project File
Other _____

Project B-547-000
E-122-208

ENERGY CONSERVATION ASSESSMENT
FOR MUNICIPAL GOVERNMENTS

Prepared by
Larry R. Edens
Research Engineer

The preparation of this report was funded under a research project entitled "Development of an Energy Conservation Assessment Procedure for Cities in Georgia." The project was sponsored by the Georgia Inter-University Task Force with funds available from the National Science Foundation and the Georgia Department of Community Affairs.

Savannah Area Office
Economic Development Laboratory
Engineering Experiment Station
GEORGIA INSTITUTE OF TECHNOLOGY
September 1981

Table of Contents

	<u>Page</u>
INTRODUCTION	1
PHASE I - ORGANIZATION AND PLANNING	3
Step 1 - Commitment to the Program	3
Step 2 - Establishment of the Program Committee	3
Step 3 - Supportive Information and Assistance	4
PHASE II - THE ENERGY AUDIT	5
Step 1 - Review of Energy Consumption Data	5
Step 2 - Basic Information on Energy-Using Equipment	6
PHASE III - IDENTIFICATION AND EVALUATION OF ENERGY CONSERVATION OPPORTUNITIES (ECOs)	7
Step 1 - Identification of ECOs	7
Step 2 - Evaluation and Prioritization of ECOs	8
ESTABLISHMENT OF A LONG-TERM ENERGY MANAGEMENT PROGRAM	10
APPENDICES	12
A - Energy Conservation Reference List	13
B - Georgia Sources of Energy Conservation Assistance	14
C - Sample Forms: Energy Consumption Data	15
D - Sample Forms: Basic Information on Energy-Using Equipment	19

INTRODUCTION

Municipal governments are constantly confronted with decisions related to the provision of optimum services within the constraints of limited revenue. In recent years, the unprecedented rise in the price of energy has created a troublesome budgetary problem for city officials and administrators. Such changes in operating costs must be reconciled through increases in revenues and taxation or through the curtailment of services.

Obviously, energy conservation can play a major role in reducing the undesirable impacts of the rising energy costs. Experts generally agree that energy consumption by city governments can be reduced by at least 15 percent without significant change in the services provided. The rate of increase in the price of energy is expected to continue to exceed the overall rate of inflation. Savings from presently developed conservation efforts will multiply in future years.

City managers and their staffs have been deluged by promotional and technical information reporting the feasibility of numerous energy saving methods. With energy costs now typically representing over 10 percent of the total municipal budget, responsible governments realize that immediate action should be taken to eliminate the waste of energy and establish long-term conservation and management programs. However, many cities have not yet identified those actions which will significantly reduce their energy consumption. This is particularly true of smaller cities which may have no technical or managerial staff with experience in energy conservation programs.

The energy conservation assessment procedure outlined in this report is intended primarily for use by small municipal governments which need to initiate efforts to analyze their potential energy savings. The procedure entitled "Energy Month" is divided into three phases as follows:

- PHASE I (Week 1) - ORGANIZATION AND PLANNING
- PHASE II (Week 2) - THE ENERGY AUDIT
- PHASE III (Weeks 3 and 4) - IDENTIFICATION AND EVALUATION OF ENERGY CONSERVATION OPPORTUNITIES (ECOs)

Obviously, a city cannot achieve the maximum potentials for energy conservation during a one-month period. However, the deadlines of this procedure will induce a sense of urgency and provide momentum which will enable the staff to develop sufficient information on the government's energy consumption to assess conservation opportunities. The results of the assessment will provide a basis for immediate implementation of no-cost/low-cost conservation methods and for the establishment of a long-term energy management program.

PHASE I - ORGANIZATION AND PLANNING

The First Week, or Phase I, of the Energy Month Program should be used for generating a strong commitment from elected officials, organizing the energy task force, and planning the entire program. The following steps are recommended as guidelines for the initial week of the program:

Step 1 - Commitment to the Program

A successful Energy Conservation Assessment Program must be based upon a solid commitment from elected officials and city management. The program requires additional responsibility and performance from various city employees who will need motivation to meet established deadlines. The goals of the program may be achieved only with the expressed and demonstrated support of the administration. The importance of this project to the municipal government and tax-paying citizens of the city must be emphasized.

To reinforce this commitment, the city administration should issue a formal resolution announcing and expressing support for the Energy Month Program. Coverage by the local news media should be encouraged.

Step 2 - Establishment of the Program Committee

The establishment of the Energy Conservation Assessment Committee (or Energy Month Committee) provides the organization needed to coordinate the efforts of those persons whose functions are needed for successful implementation of the Program. The Committee operates under the leadership of the Program Coordinator or Director. If the City Manager chooses not to fill this position himself, he should designate a senior staff member to serve in this role. This person must be delegated the responsibility and authority to lead the Program effectively.

The success of the Program will be proportional to the dedication and commitment of the Coordinator and his Committee. The committee members should be selected wisely to utilize available expertise and experience in management, economics, and technical fields. The City Engineer and Senior Accountant should, generally, be appointed to the committee. The committee should also include a representative from each operating department

or major facility. It is imperative that appointed committee members have the available time and resources to effectively perform their roles in the Program. They must have the support of top city management. If it becomes apparent early in the Program that a member is not performing his duties satisfactorily because of lack of motivation or capability, he should be replaced on the committee by another individual.

Step 3 - Supportive Information and Assistance

At the beginning of the program, the Coordinator should review the complete procedure outlined in this report and determine the committee's need for outside assistance. In recent years excellent guidelines have been published on conducting energy audits and identifying and evaluating energy conservation opportunities. It is essential that the Program Coordinator obtain readily available reference materials for use by the committee members. Recommended sources of information for Georgia municipal governments are listed in Appendix A.

Federal and state supported energy conservation programs and public relation's activities by energy-related firms have made outside expertise available to local governments at no cost. The Program Coordinator should include expert technical support from outside sources in the overall assessment plan. A partial listing of Georgia agencies and private firms offering energy conservation services at no cost is presented in Appendix B. Manufacturers' representatives and consulting engineers who have working relationships with the local government are also excellent sources of technical expertise.

PHASE II - THE ENERGY AUDIT

A prerequisite for the identification of energy conservation opportunities and the establishment of an energy management program is the development of an accurate energy data base. This data base is developed during the Second Week, or Phase II, of the Energy Month Program by conducting a detailed energy audit. The audit involves the collection and documentation of energy consumption data for each operation or facility and the development of basic information on the energy requirements of major equipment or systems. The Program Coordinator will delegate the energy audit responsibilities and establish required deadlines.

Step 1 - Review of Energy Consumption Data

A month-by-month documentation of energy usage and costs should be prepared for each system or facility for the last two-year period. To begin this task, all sources of energy used by the municipal government must be identified. These may include natural gas, electricity, fuel oil, LP gas, propane, coal, gasoline, diesel oil, and others. The two-year period is recommended to show, reliably, seasonal variations in weather conditions and facility usage and to provide an indication of short-term consumption and cost trends.

The documentation process is relatively simple for all metered systems which are invoiced on a monthly basis. However, to review these data, properly, a complete understanding of the utility rate structures is a necessity. These rate structures generally include demand charges, consumption rate schedules, and fuel adjustment rates. Sometimes minimum charges and power factor adjustments are included. The utility company will provide current rate schedules and assistance in training municipal staff members to audit their invoices. It is recommended that the past invoices be recalculated as part of the two-year audit. Errors in invoices do inadvertently occur.

Some fuels may be purchased in bulk quantities and distributed by the city to various facilities or departments for consumption. Insufficient records on inventories and dispersements may make it impossible to determine monthly or even annual consumption by each facility or operation.

Lack of any specific data should not be an excuse for excluding the consumption of these fuels from the energy conservation assessment procedures; best estimates of consumption must be used. However, this situation signals the need for improved accounting and control measures.

Sample forms are provided in Appendix C for recording fuel consumption information. Similar forms may be found in References 1, 2, and 3 in Appendix A. The responsibility for performing this portion of the audit lies primarily with the accounting staff.

Step 2 - Basic Information on Energy-Using Equipment

Municipal governments have such diverse energy uses as vehicle operation, building heating and cooling, street and traffic control lighting, water pumping, waste water treatment, incineration, and swimming pool operation. In order to correlate energy consumption with specific connected loads and demands, basic information must be collected for all major energy-using equipment and systems. These data can best be collected by an on-site survey of each facility or operation. The survey team should include the city engineer or maintenance supervisor along with departmental staff members who are familiar with the equipment and facilities.

Most equipment information related to energy demand and usage is readily available from name-plate data and the manufacturers' published operating and maintenance manuals. Occasionally it may be necessary to request information from vendors or contractors. Obviously, information on insulation thickness and type, and types of lighting, number of lamps, etc., can be determined by visual inspection.

Forms are presented in Appendix D for recording basic data on common municipal facilities. More detailed and specialized forms are presented in References #1, 2, 3, 4, and 7 of Appendix A.

PHASE III - IDENTIFICATION AND EVALUATION OF ENERGY
CONSERVATION OPPORTUNITIES (ECOs)

Phase III, which is conducted during the Third and Fourth weeks of the Energy Month Program, involves the identification and evaluation of ECOs. Before entering this phase, the Program Coordinator and his Committee should have the following resources available:

- (1) Complete energy-related information developed in Phase II.
- (2) Appropriate References from Appendix A.
- (3) Commitments from selected agencies and firms (listed in Appendix B) for providing technical assistance.

Phase III is the crux of the energy conservation assessment process and will require a concentrated effort by persons with analytical skills in economics and engineering. However, the final results of this procedure will accurately define the city's energy conservation potential and provide a basis for establishing a continuing Energy Management Program.

Step 1 - Identification of Energy Conservation Opportunities (ECOs)

Energy conservation opportunities exist either because of wasteful or inefficient procedures and practices which employees use in performing their tasks or because of energy inefficient processes or capital equipment. The actions required to benefit from these opportunities vary from simple no-cost/low-cost changes in maintenance procedures and operational practices which result in immediate savings to the modifications or replacement of complex energy-using systems which involve large capital investments and long-term paybacks. During the Third Week of the Energy Month Program, a list of ECOs of every type should be developed for each facility or energy-using operation. The following approaches are recommended for the identification process:

1. Solicit suggestions on ECOs from municipal employees who work in each area or operation being investigated.
2. Review the data developed in Phase II. Inconsistent or unexpectedly high energy usage or unfavorable trends in consumption may indicate ECOs.

3. Utilize ECO descriptions and check lists which are included in the References listed in Appendix A.
4. Conduct an ECO survey of each facility or operation with a team consisting of departmental and maintenance employees and outside experts. Before conducting a specific survey, the team should review pertinent data from items 1-3 above.
5. Compare energy utilization against standards. Guidelines and target values exist for energy consumption as exemplified by the Energy Utilization Index (EUI) covered in References 1 and 2, and the Energy Consumption Estimates for Wastewater Treatment Processes presented in Reference 4, Appendix A. However, in actual practice, caution must be exercised to avoid making erroneous conclusions about the efficiency of a specific operation. A great many variables affect energy consumption and only qualified technical personnel should draw conclusions from comparisons between standards and actual data.

Step 2 - Evaluation and Prioritization of ECOs

After the ECO list has been developed for each facility, the energy conservation assessment for the city government is completed by evaluating, prioritizing, and summarizing the feasible listings. The Energy Conservation Assessment Committee, with assistance from outside technical consultants, must determine (1) the cost and useful life of any required capital investments and (2) the projected net annual energy and other savings which will result from the investment. During this evaluation process, some ECOs may be judged impractical, at the discretion of the Committee, because of noneconomic factors such as safety and health, security, or environmental protection.

Obviously, the no-cost/low-cost ECOs which have significant projected energy savings should be implemented immediately. Several techniques are available for comparing the value of investments which result in savings from ECOs. The simple payback analysis is adequate for small capital investments which result in large, immediate savings. It is determined by dividing the projected cost by the projected annual savings.

For payback periods of greater than 1-2 years, the effects of the discount rate and the escalation of energy prices must be taken into account when utilizing a payback period analysis. This method which is presented in References 1 and 4, Appendix A, can be used to determine if the payback period of an investment is less than the expected life and to compare similar investments.

The evaluation of alternate, large investments with long useful lives, which involve other factors such as salvage value and changes in maintenance or operational costs in addition to changes in energy costs, requires the application of life cycle - cost analysis. This method is described in Reference 7, Appendix A.

Payback period and life cycle costing evaluations should be made by persons trained in the use of these techniques. The Program Coordinator may need to involve outside consultants with expertise in economics.

At the completion of the ECO evaluation, the Committee can summarize the expected energy savings from projected implementations for each future year and complete the energy conservation assessment for the municipal government. This assessment will indicate the potential energy savings for the city and provide a plan of action for realizing those savings.

ESTABLISHMENT OF A LONG-TERM ENERGY MANAGEMENT PROGRAM

The potential savings projected by the energy conservation assessment procedure may be achieved through the establishment of a continuing Energy Management Program. The Energy Conservation Assessment Committee (or Energy Month Committee) must be replaced by or converted into an Energy Management Committee.

An annual energy conservation goal must be established by the city officials and the Energy Management Committee. The goal should be specific, attainable, and consistent with other administrative policies and regulations, e.g., a reduction of five percent in electrical consumption and motor fuel usage within the first year of the energy management program. This goal must be based upon the findings of the energy conservation assessment.

The monitoring and evaluation of the program should be a continuous process performed by the Energy Management Committee. Departmental representatives, along with other committee members, should continuously check the performance of employees to ensure that established operating standards are being followed. The City Engineer should monitor the implementation of equipment modification and maintenance procedures. All members should report periodically their findings to the full committee for evaluation. Continuous monitoring efforts will improve the performance and motivation of all employees and demonstrate the commitment of the administration to the program.

The Accountant should prepare energy consumption data on a monthly basis to submit to the committee for evaluation of program results. The committee should determine from these data whether or not the overall goal is being achieved. Current month data should be compared to the data from the corresponding month of the previous year to minimize the effect of weather conditions and seasonal activities which cause monthly variations. Deviations from expected results should be analyzed to determine probable causes. Unusual weather conditions, public activities, or equipment modifications and additions should be considered when evaluating the deviation from expected consumption.

The results of the program and its success or failure to meet the established goal should be reported monthly to all employees. It is suggested that a display chart be posted at City Hall to indicate the current year's consumption by month compared to the previous year. The chart should show clearly the goal for the current year. All reports and charts should use energy units (KWH or BTU) and not costs because changes in energy prices are beyond the control of the administration's program.

An annual program review should be made by elected officials and the Energy Management Committee to eliminate or modify unattainable objectives and to establish new ones. A revised goal should be set to avoid complacency or stagnation of the program, if previous goals have been achieved. The program must have successive refinements to remain a continuous process which produces favorable results.

APPENDICES

Appendix A

ENERGY CONSERVATION REFERENCE LIST

1. Community Handbook on Energy Conservation, Georgia Municipal Association, May 1978.
2. Energy Management Manual - Commercial Buildings, Georgia State Office of Energy Resources, Commercial Energy Extension Program, 1979.
3. Energy Conservation with Comfort - The Honeywell Energy Conserver's Manual and Workbook, 2nd Edition, Honeywell Corporation, 1979.
4. Energy Efficiency in Water and Wastewater Treatment Plants, Georgia Institute of Technology, Engineering Experiment Station, February 1981.
5. Improving Steam Boiler Operating Efficiency, Georgia Institute of Technology, Engineering Experiment Station, 1981.
6. Energy Conservation Guidelines for Existing Office Buildings, General Services Administration, Public Building Service, 1975.
7. Fleet Management, Georgia Office of Energy Resources, 1980.
8. Energy Efficient Purchasing for Local Governments, Institute of Government, University of Georgia, 1980.

Appendix B

GEORGIA SOURCES OF ENERGY CONSERVATION ASSISTANCE

Georgia Municipal Association
Suite 220
10 Pryor Street Building
Atlanta, Georgia 30303
(404) 688-0472

Municipal Electric Authority
of Georgia
800 Peachtree Center
South Tower
125 Peachtree Street, NE
Atlanta, Georgia 30303
(404) 522-8510

Georgia Office of Energy Resources
Room 615
270 Washington Street, SW
Atlanta, Georgia 30334
(404) 656-3874

Atlanta Gas Light Company
P.O. Box 4569
Atlanta, Georgia 30302
(404) 572-0123

Georgia Power Company
P.O. Box 4545
Atlanta, Georgia 30302
(404) 526-6526

South Georgia Natural Gas Company
P.O. Box 1279
Thomasville, Georgia 31792
(912) 226-4742

Savannah Electric & Power Company
P.O. Box 968
Savannah, Georgia 31402
(912) 232-7171

Gas Light Company of Columbus
P.O. Box 1657
Columbus, Georgia 31902
(404) 322-8891

Oglethorpe Power Corporation
2888 Woodcock Blvd.
Tulane Building
Atlanta, Georgia 30348
(404) 455-1121

Georgia Institute of Technology
Engineering Experiment Station
Economic Development Laboratory
Atlanta, Georgia 30332
(404) 894-3830

Appendix C
SAMPLE FORMS
ENERGY CONSUMPTION DATA

ENERGY CONSERVATION STUDY
ELECTRICAL ENERGY CONSUMPTION

Facility: _____

SUPPLIER:		RATE SCHEDULE:			
YR.	MO.	CONSUMPTION (KWH)	ACTUAL DEMAND (KW)	BILLING DEMAND (KW)	COST (\$)
	JAN.				
	FEB				
	MAR.				
	APR.				
	MAY				
	JUN.				
	JUL.				
	AUG.				
	SEPT.				
	OCT.				
	NOV.				
	DEC.				
TOTAL					

ENERGY CONSERVATION STUDY

GAS CONSUMPTION

Facility: _____

		NATURAL GAS		PROPANE		L. P. GAS	
YR.	MO.	CONSUMPTION (CU. FT.)	COST (\$)	CONSUMPTION (GALLONS)	COST (\$)	CONSUMPTION (GALLONS)	COST (\$)
	JAN.						
	FEB.						
	MAR.						
	APR.						
	MAY						
	JUNE						
	JULY						
	AUG.						
	SEPT.						
	OCT.						
	NOV.						
	DEC.						
TOTAL							

ENERGY CONSERVATION STUDY

MISCELLANEOUS FUEL CONSUMPTION

Department: _____

		FUEL TYPE:		FUEL TYPE:	
		BTU CONTENT PER UNIT:		BTU CONTENT PER UNIT:	
YR.	MO.	CONSUMPTION ()	COST (\$)	CONSUMPTION ()	COST (\$)
	JAN.				
	FEB.				
	MAR.				
	APR.				
	MAY				
	JUNE.				
	JULY				
	AUG.				
	SEPT.				
	OCT.				
	NOV.				
	DEC.				
TOTAL					

Appendix D

SAMPLE FORMS
BASIC INFORMATION ON ENERGY-USING EQUIPMENT

ENERGY CONSERVATION STUDY

BUILDING DATA SHEET

Building Name: _____

Building Area: Total _____ sq. ft.
Heated _____ sq. ft.
Air Cond. _____ sq. ft.

Primary Use of Building:

Operation of Facilities: Hours per day _____
Days per week _____
Days per year _____

Heating System: Type _____
Capacity* _____

Cooling System: Type _____
Capacity* _____

Hot Water Heaters: Type _____
Capacity* _____

Insulation: Type: _____
Thickness: _____

	<u>Ceiling</u>	<u>Walls</u>
	_____	_____

Lighting:

	<u>Incandescent</u>	<u>Fluorescent</u>	<u>Other</u>
No. of Lamps	_____	_____	_____
Wattage of Lamps	_____	_____	_____

* Use nameplate data such as BTU rating, HP, KW, etc.

(continued)

BUILDING DATA SHEET (Continued)

Other Major Energy-Using Equipment:

1. Type: _____
Capacity*: _____
Frequency of Use: _____

2. Type: _____
Capacity*: _____
Frequency of Use: _____

3. Type: _____
Capacity*: _____
Frequency of Use: _____

Additional comments related to Energy Consumption in this building and suggested methods or ideas for Energy Conservation:

* Use nameplate data such as BTU rating, HP, KW, etc.

ENERGY CONSERVATION STUDY

WELL AND LIFT STATION DATA SHEET

Facility: _____

Major Energy Using Equipment:

	<u>Type</u>	<u>Capacity (HP, KW, etc.)</u>
1.		
2.		
3.		
4.		
5.		

Comments or Energy Conservation suggestions related to the operation of this facility:

ENERGY CONSERVATION STUDY

SWIMMING POOL DATA SHEET

Facility: _____

Operation of Facility: Hours per day _____
Days per week _____
Days per year _____

Building Data: Heating System: Type _____ Capacity _____
Cooling System: Type _____ Capacity _____
Lighting: Type _____
Lamp size _____
No. of Lamps _____

Exterior Lighting: Type _____
Lamp size _____
No. of Lamps _____

Major Energy-Using Pool Equipment:

	<u>Type</u>	<u>Capacity (HP, KW, etc.)</u>
1.		
2.		
3.		
4.		

Additional comments or Energy Conservation suggestions related to the operation of this facility:

ENERGY CONSERVATION STUDY

VEHICLE DATA SHEET

Department: _____

Vehicle Listing:

	<u>Type of Vehicle</u>	<u>No. of Cylinders</u>	<u>Approx. No. of Miles Driven--19--</u>	<u>Estimated Efficiency (MPG) Under Use Conditions</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____

Comments or Energy Conservation suggestions related to the operation of these vehicles:

ENERGY CONSERVATION STUDY

WASTE WATER TREATMENT PLANT DATA

Facility: _____

Type of Treatment Process:

Building Data: Heating System: Type _____ Capacity _____
Cooling System: Type _____ Capacity _____
Lighting: Type _____
Lamp size _____
No. of Lamps _____

Exterior Lighting: Type _____
Lamp size _____
No. of Lamps _____

Major Energy-Using Equipment:

	<u>Type</u>	<u>Capacity (HP, KW, etc.)</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____

Additional comments or Energy Conservation suggestions related to the operation of this facility: