ATTACHMENT B

FASD Building Services

MEMORANDUM OF UNDERSTANDING
For
Comprehensive Energy Efficiency Services

Subject to the conditions listed below, execution of this Memorandum of Understand (MOU) establishes basic terms and conditions between Austin Energy's Municipal Energy Conservation Program, and Building Services Department, to provide Comprehensive Energy Efficiency Services.

It is hereby understood that:

(1) Austin Energy will facilitate and fund an audit of the department's facilities listed in **Attachment A,** at no cost to the department. A list of cost effective measures will be identified including but not limited to: Energy Conservation Measures, Water Conservation Measures, and possible operational and maintenance changes.

(2) Austin Energy will work with the department to identify appropriate measures for the various facilities based on simple payback, and estimated life and/or use of the facility.

(3) Austin Energy will assist in the procurement of funding for cost effective measures identified in the department's facilities. Such options include a Citywide, State of Texas, low interest, LoanSTAR Loan, third party financing, and municipal leases. In addition, Austin Energy will facilitate and manage the design and implementation process at no cost to the department.

(4) Austin Energy has established that measures with a seven (7) year simple payback (individual or composite) are cost effective, and that the loan term shall not exceed ten (10) years.

(5) Department agrees to assist in the audit process by providing access to the facilities, and assistance with the collection of data, utility accounts and bills, etc.

(6) Department agrees to implement ~~all~~ pending reasonable appropriate cost effective measures identified during the audit process, funding vehicle.

(7) Department may include other measures outside the established simple pay-back criteria, provided the composite of all measures do not exceed seven (7) years, or: A.) Department "Buys-down" the payback to seven (7) years, or B.) Department uses internal moneys to fund the measures.

(8) In accordance with Administrative Bulletin 05-01, department agrees to budget for and repay the cost of measures implemented in department facilities over the simple payback period or loan term. ~~as approved by~~ Request council approval Funding dependent on

Austin Energy	(Building Services Department)
by:	by: Jim Mavar
Title	Building Services Officer Title
Date	6/19/07 Date

BUILDING SERVICES
DEPARTMENTAL ENERGY CONSERVATION MANAGEMENT POLICY

- **PURPOSE**
  This departmental energy plan sets guidelines for Building Services employees, emphasizing the need to use energy resources efficiently to minimize the cost of City operations to City taxpayers and to protect and preserve the natural environment and quality of life in Austin and the surrounding areas.

- **SCOPE**
  To ensure successful and ongoing implementation, these requirements apply to each Building Services employee. Facilities subject to the requirements of this Energy Plan include all Building Services facilities, both present and future. All COA departments are encouraged to adopt energy-efficient practices included in this policy and to develop an Energy Plan uniquely tailored to address department-specific standards and practices.

- **POLICY**
  Building Services is committed to the efficient and sustainable use of energy and natural resources. Building Services will work to develop and implement processes and strategies that conserve energy, resources, and public funds, and meet the requirements and intent of Senate Bill 5, enacted into law in 2001, in all Department facilities and operations.

Director Approval _____

I. BUILDING SERVICES

A. **Departmental Energy Efficiency Plan**: Building Services site managers and employees will be responsible for following this Departmental Energy Efficiency Plan in accordance with these guidelines and any other possible means of increasing the level of efficiency with which energy resources are used.

1. The ultimate goal of these plans is to reduce operating costs and improve stewardship of natural resources and the environment.

2. Building Services' Departmental Energy Efficiency Plan includes guidelines for the efficient operation and maintenance of the department's facilities and equipment.

3. Building Services' Departmental Energy Efficiency Plan includes energy benchmarking to demonstrate and track effectiveness of conservation efforts implemented by the department.

B. **Identifying Cost-Effective Retrofits**: Building Services Site managers shall be responsible for assisting the Energy Manager with the identification of cost-effective retrofit projects in the department's facilities and processes.

C. **Funding Cost-Effective Retrofits**: Building Services management, is responsible for requesting adequate funds requested through the annual budget process for the implementation of cost-effective retrofit projects.

1. Cost-effective retrofit projects may be funded through operating budget funds, capital improvement projects, or through the repayment of alternative financing agreements, subject to budget approval and authorization.

2. In the case of alternative financing, shared savings, guaranteed savings, or other similar loan or Municipal Lease type agreements, departments shall be responsible for maintaining sufficient budgeted funds to repay the loan, subject to budget approval and authorization.

3. All ideas, procedures and recommendations proposed in this Energy Plan shall be analyzed and determined to be cost-effective before implementation. Those that fail to meet cost-effective criteria will not be implemented, unless other (possibly non-monetary) benefits are deemed to be as important as payback criteria.

D. **Implementing Cost Effective Retrofits**: Building Services will be responsible for implementing cost-effective retrofits identified independently through Austin Energy's Municipal Energy Management Program, subject to budget approval and authorization.

1. Cost-effective retrofit projects are projects with a simple payback of 5 years or less, based on energy savings.

E. **Maintenance and Operations**: Building Services Divisions and/or City site managers are responsible for implementing cost-effective maintenance and operational changes identified independently through Austin Energy's Municipal Energy Management Program. Likewise, City Divisions and/or Site managers are responsible for the proper maintenance and operations of new or renovated systems to maintain savings subject to budget approval and authorization of adequate funding.

F. **Maintenance of Equipment**: Building Services shall is responsible for maintenance of equipment retrofits implemented in the department's facilities. In the case of guaranteed savings contracts, Building Services is responsible for compliance with the terms of the contract subject to budget approval and authorization of adequate staffing levels and funding.

II. GENERAL GUIDELINES

A. Lighting

1. Except for security lighting during non-work hours, all lights shall be turned off in rooms that remain unoccupied for more than 30 minutes. Workers who use offices or shop areas outside of normal hours should minimize unnecessary overhead lighting by the use of switches and automatic lighting controls.

2. Planned lighting maintenance will be performed, including regular cleaning and timely lamp replacement. Group relamping will be implemented wherever feasible and when determined to be cost-effective, especially in areas of "Critical Sight".

3. Lighting in Building Services facilities will incorporate daylighting techniques wherever possible and cost-effective.

4. Maximum use of manual and automatic lighting controls will be used to manage electrical usage during occupied and unoccupied periods.

5. Existing lighting systems will be evaluated to identify opportunities where efficiency can be increased.

6. Lighting levels in buildings, public parking garages, on surface parking lots, and in outdoor areas will be kept as close as feasible to the acceptable minimum standards set by the Illuminating Engineering Society of North America (IESNA).

7. Exterior lighting systems including but not limited to: facade, area, parking, and security lighting, shall be controlled by photocells, electronic astronomic timers, or other automated control systems. Exterior lighting not required for egress or security shall not be operated during daylight hours.

B. **Office Equipment**

1. To the extent possible, subject to availability and in compliance with procurement regulations, new office equipment and appliances purchased shall be Energy-Star compliant.

2. Office equipment with Energy-Star energy-saving features will be enabled. This includes personal computers, computer monitors, printers, fax machines, vending machines, copiers, scanners and plotters.

3. Copiers and printers will be used to make double sided copies whenever feasible.

4. Personal computer monitors shall be set for the "sleep" mode after ten minutes of non-operation (or the time period in which a screen saver would otherwise be activated). Sleep mode reduces power to monitors without shutting down the computer and is to be used as an energy saving alternative to screen savers.

5. Monitors without sleep mode should be manually turned off when not in use for more than ten minutes.

6. Screen savers on personal computers shall be disabled if they interfere with the "sleep" mode feature.

7. Personal computer monitors that are not Energy-Star compliant shall be turned off during periods of inactivity of thirty minutes or more. **This does not require that the computer be turned off.**

C. **Heating and Air Conditioning**

1. Windows shall be closed in City buildings during periods when indoor heating or cooling systems are operating.

2. Electric heaters in garage stairwells that have no water pipes, or in other unoccupied areas will be disconnected.

3. Maximize the use of Energy Management Systems (EMS) to reduce energy consumption by scheduling shut down of appropriate HVAC equipment serving spaces during unoccupied periods.

4. Thermostats will be adjusted to maintain the best possible comfort level for all employees. It should not be necessary for employees to wear sweaters or operate space heaters during the summer months while air conditioning is operating. Likewise, winter heating temperatures should be maintained at a level that is comfortable for most employees. Buildings shall not be over-heated or over-cooled.

5. Buildings will be maintained in an acceptable range of operative temperature and relative humidity based on ASHRAE Standard 55 - 1992, or the most recent version of the Standard adopted by the City of Austin.

6. Facilities under construction or renovation that are required to meet the requirements of ASHRAE 62 for outside air, shall utilize "Demand Control Ventilation" rather than the constant introduction of outside air.

   a. Air handler fans will be allowed to cycle, and shall be limited in any 24/7 operation.
   b. Facilities or areas with variable occupancy rates will be designed using the minimum outside air allowed by ASHRAE 62 under the rules for variable occupancy.

7. All Heating and Air Conditioning equipment to be installed or purchased for use in Building Services facilities shall meet the current efficiency requirements set by the Municipal Energy Efficiency Program for that specific type of equipment. These standards shall be set based on cost-effectiveness and dependability.

D. New Construction and Renovations

1. Buildings will be designed, constructed, renovated and maintained in accordance with the International Energy Efficiency Code (IECC). Construction of new "habitable" and conditioned buildings shall strive to accomplish a minimum rating of LEEDS Silver.

2. Renovations and/or modifications to motors, lighting, energy management or HVAC systems or any other energy-using equipment shall not be implemented after-the-fact that violates any LEEDS or other appropriate standards, including the IECC.

3. Austin Energy Municipal Energy Conservation Program staff shall review all new construction or renovation projects during the design process and prior to final specification which will include the installation of energy-using equipment such as lighting and HVAC systems. Municipal Energy Conservation Program staff may make recommendations or changes as appropriate, to measure and

validate predicted equipment or system performance, to compute life-cycle costing and assess economic impact and returns, to assure minimum or targeted code compliance and to confirm equipment efficiency standards.

E. **Employee Suggestion Program**

1. Employee suggestions concerning energy conservation will be given serious consideration and implemented when determined appropriate and cost-effective. Top suggestions will be submitted for Star Awards consideration.

2. Each employee is knowledgeable about his or her particular job and is in the best position to make valuable suggestions toward our objective of energy efficiency.

III. CITY GOALS

The City established a goal to reduce energy by 5% each year for 5 years beginning in the year 2000.

IV. DEPARTMENT GOALS

A. Building Services will work each year to exceed this goal as set aside in Senate Bill 5 (SB5) and in the City Energy Conservation Policy effective on February 2005.

B. Building Services will review energy consumption each year and look for ways and ideas from staff and consultants to reduce energy. Each year, Building Services facility managers and the Energy Conservation Manager will:
- review program implementation and evaluate overall program success,
- continue to implement areas of success,
- identify adjustments to areas identified for improvement,
- review new ideas offered by staff and citizens,
- implement these new ideas as soon as they are determined feasible.

C. Building Services staff shall assist the Energy Conservation Manager with the identification of cost-effective retrofit projects in department's facilities and processes.

D. Building Services will review and identify funding needs on an annual basis for the implementation of cost-effective retrofit projects.

E. Building Services will observe water management provisions as outlined in City Ordinance No. 010426-17.

V. ENERGY CONSERVATION SPOC (ECS)

A. The Energy Conservation SPOC (ECS) shall provide support as requested to the Department's Energy Conservation Manager, and is thereby authorized to: coordinate, implement, document, and monitor their facility as required by the facilities' Energy Conservation Plan.

B. ECS is responsible for the proper maintenance and efficient operation of new or renovated systems to maintain savings.

C. **Standard Operating Procedures (SOP) for Energy Efficiency**: All facility site managers are responsible for assisting the Energy Conservation Manager and the Performance Contractor in developing an SOP for energy efficiency management for their specific facility and its equipment in accordance with these guidelines and any other possible means of increasing the level of efficiency with which energy resources are used. The SOP shall include energy benchmarking to demonstrate and track effectiveness of conservation efforts implemented by the department.

V1. IMPLEMENTATION OF ENERGY CONSERVATION PLAN

The implementation of Building Services' Departmental Energy Efficiency Plans shall include:

- Personal energy-consuming equipment that is non-essential to daily business functions, such as refrigerators, heaters, coffee pots, microwave ovens, shall be removed from work areas. Excessive numbers of personal appliances compromise safety, increase a building's electrical load and, thereby, utility costs, and could contractually jeopardize guaranteed savings agreements with City ESCO contractors.

- Austin Energy's Municipal Energy Conservation Program staff and its contractors will work with departmental staff to provide initial training for employees on instructions for efficient operation and maintenance of the department's facilities and equipment and this policy. Further training will be provided through multiple channels of communication including Safety Meeting presentations, broadcast e-mails, informational posters, newsletter and coordinated equipment-specific training sessions.

- Providing training for new employees on efficient operation and maintenance of the department's facilities and equipment and this policy through New Employee Orientation training sessions based on training staff availability.

- Conducting regular checks of personnel procedures to reinforce policy initiatives that are in place and measure the effectiveness of the procedures being used. The findings of the completed Energy Efficiency Inspection Checklist shall be forwarded to the Division Manager and a copy sent to the Energy Conservation Manager

VII. Capital Improvement Projects PLANNING & BUDGETING

A. **Identify Cost-Effective Retrofits**: Building Services site managers are responsible for assisting the Energy Manager with the identification of cost-effective retrofit projects in the division's facilities and processes.

B. Cost-effective retrofit projects may be funded through operating budgets, capital improvement projects or through the repayment of alternative financing agreements as appropriate, funding permitting.

C. In the case of alternative financing, shared savings, guaranteed savings, or other similar loan or Municipal Lease type agreement, Building Services is responsible for requesting sufficient funds to repay the loan, subject to budget approval and authorization.

VIII. COMMUNICATION

Each Building Services employee is asked to share ideas to conserve energy or natural resources with their supervisor or the Energy Conservation Manager. Specific communications for facility consumption shall be identified in that facilities' Energy Efficiency Plan. All employees shall be expected to clearly understand and follow the procedures outlined in this policy the Energy Plan and all associated Standard Operation Procedures (SOP's) for their facility.

IX. EMPLOYEE EDUCATION & TRAINING

A. Once an effective date has been determined for this policy, training shall be scheduled for all employees on the new policy and the Energy Efficiency Plan that has been developed for their specific area of responsibility. Building Services does not have trainers available to implement this at this time.

B. New employees shall receive Energy Efficiency training through New Employee Orientation training sessions.

The training shall include:

- Introducing the Department policy.
- Individual and Group expectations of their individual facilities according to the Energy Efficiency Plan
- Operating Procedures for all energy consuming equipment in their facility

X. DEFINITIONS

A. **Alternative Funding/Financing** – Funding such as a loan provided by Austin Energy, the State of Texas, or some other outside source, that the City is responsible for repaying in installments. This reduces the immediate impact on a department's operating budget, and allows the loan to be repaid with the benefit of budget savings generated by reduced energy use.

B. **Areas of Critical Sight** – Places where the ability to see and perform fine tasks is of very high importance. Examples would be reading (such as libraries), accounting, some repair shops, and areas where safety is an issue. In many cases, this is best accomplished by task lighting. These light levels are established by the IESNA.

C. **Automatic Lighting Controls** – Devices that turn lighting circuits on and off, based on a pre-established set of conditions, such as time delay, time of day, daylight, darkness, or movement/occupancy of an area.

D. **City Facilities** – The term City facilities as used in this document refers to all new, renovated, existing, owned or leased City facilities, both present and future.

E. **Cost-effective Retrofit Projects** – Retrofits deemed to be "cost-effective" are projects that meet predetermined payback criteria. It is generally accepted that a payback of 5 years or less complies with this requirement; however, these criteria are based on Life-Cycle Cost and may vary for specific measures. These measures may include retrofits that reduce electric use, natural gas use, or water use, however, it is required that the retrofit pay back in 75% or less of the average rated or useful life of the equipment.

F. **Daylighting** – The use of available natural sunlight to supplement and/or replace electrical lighting sources when possible and where appropriate.

G. **Demand Control Ventilation** – The controlled introduction of outside air into the return air stream, based on the CO2 levels in the return air. This automatically increases or decreases the amount of outside air required for good indoor air quality, based on the actual occupancy and the resulting internal CO2 levels. Constant outside air based on a "worst case" calculation, regardless of the occupant load, will not be allowed.

H. **Departmental Energy Efficiency Plan** – A standard that establishes the department's minimum requirements and goals for departmental operations and maintenance in a clear and concise document.

I. **Energy Benchmarking** – The collection of historical baseline energy consumption and cost data, for the purpose of evaluating current and future energy use. This can also involve calculating various annual energy use indexes such as Dollars/Square Foot ($/FT2), kilo-Watt-hours/Square Foot (kWh/FT2), or Thousand British Thermal Units/Square Foot (kBtus/FT2). This allows comparison of the most recent energy use and cost to the historical data, and to other similar facilities, for the purpose of evaluating a facility's "energy performance".

J. **Energy Conservation Measures (ECMs)** – Changes in equipment, control, operational methodology, etc, that reduce or "conserve" energy. Example: Changing out an old inefficient air conditioning unit with a new high efficiency unit or installing a new programmable thermostat that reduces the operating hours be turning the unit off when it is not needed.

K. **Energy Service Provider (ESP)** – A firm that performs or organizes turnkey services such as performance contracting, shared savings, or guaranteed savings type projects. The ESP may perform much of the work itself, or function like a general contractor and sub contract much of the work to be performed. These type services frequently include: initial engineering study and recommendations, design, construction, financing, and guarantee or insuring savings.

L. **Group Relamping** – The regularly scheduled cleaning and replacement of lamps in a specific area instead of replacing lamps only as they fail. In the average office with fluorescent lighting, where the lights burn 12 hours/day and 260 days per year, the fixtures would be cleaned and relamped every 6 to 7 years.

M. **Guarantee of Savings** – A contract between an Energy Services Provider (ESP) and a facility owner which guarantees the estimated savings of energy conservation upgrade projects. This may take the form of an insurance policy through a third party, or it may be offered directly by the ESP to the owner. These types of agreements always contain operating constraints such as heating and cooling setpoint minimum/maximums, and penalties for failing to operate an "insured" facility within the mandated parameters.

N. **Life-Cycle Cost** – The cost of owning a particular system or piece of equipment over the course of its useful life. This would include the initial purchase price and the cost of operation including energy use. Maintenance cost savings may be included also, but will not normally be a consideration. These calculations may require normalization to a common denominator such as rated life to be usable in a true comparison. A simplified example is shown below.

Incandescent Lamp: Cost $0.39, Load 60 watts, Life 750 hours
($0.39+ (((60/1000) x 750 hours) x $0.0717 / kWh)) = $3.62 Life-Cycle Cost

Compact Fluorescent Lamp: Cost $4.00, Load 14 watts, Life 10,000 hours
($4.00+ (((14/1000) x 10,000 hours) x $0.0717 / kWh)) = $14.04 Life-Cycle Cost

Rated Life Adjustment:
Incandescent Life-Cycle Cost ($3.62 / 750 hours) = $0.0048 / hour
($0.0048 / hour x 10,000 hours) = $48.27 cost to operate 10,000 hours

Result: While the incandescent lamp cost is only ~10% of a compact fluorescent lamp, the compact fluorescent's Life-Cycle Cost is approximately 29% of the incandescent, with an estimated savings of $34.23 over the rated life of the lamp. This makes the Compact Fluorescent Lamp preferable over the incandescent in spite of the initial cost difference.

O. **Maintenance and Operational Procedures** – Changing Maintenance and Operational Procedures can cover a wide range of actions including changing the operating schedule, changing setpoints, or implementing differed maintenance and repairs.

P. **Maintenance of Savings** – The Maintenance of Savings generated by cost-effective energy conservation retrofits. This type of maintenance involves making sure that the energy efficient equipment and operational procedures implemented are not defeated,

removed, modified, changed, or discontinued. In shared savings and guaranteed savings contracts, the Contractor may require additional conditions such as setpoint limits as part of the savings contract or insurance agreement that "Guarantees" the savings. The agreement may be voided or penalties charged if these conditions are not met.

Q. **Monitoring and Verification** – The collection of energy use data for a facility or an energy consuming system, and comparison of the data to a predetermined data set, for the purpose of verifying the facility or system's energy savings or increased costs. This is normally a required part of a performance contract.

R. **Non-Attainment and Near Non-Attainment Areas** – Non-Attainment Areas (counties in the case of SB5) have been designated by the US EPA as violating the standards for outdoor air quality. Near Non-Attainment Areas are locations such as Austin/Travis County where the air quality approaches the US EPA established threshold on Ozone Action Days.

S. **Obsolete Light Sources** – Light sources such as Mercury Vapor, T12 fluorescent lamps and ballasts, and incandescent lighting.

T. **Payback or Simple Payback** – As used in this document, this refers to the cost of a project or energy conservation measure divided by the savings per year.
(Project Cost/Energy Savings per Year) = Payback in Years
($1,000 cost/$400 savings per year) = 2.5 Year Payback

U. **Payback, Composite or Combined Payback** – The result of bundling several retrofit projects together into a single calculation.

Example:	Cost	Savings	Simple Payback	
Lighting Retrofit	$25,000		$5,000	5.0 Years
Demand Ventilation	$900	$400	2.25 Years	
HVAC Retrofit	$30,000		$2,500	12.0 Years
Totals	$55,900	$7,900		

Composite or Combined Payback 7.1 Years

V. **Performance Contracting** – The process of implementing energy conservation upgrade projects that "perform" by repaying the project costs by reducing annual energy costs. These are normally turnkey projects that can include the engineering, funding, installation of energy upgrades, and a guarantee of savings. State law sets the maximum term for this type of agreement at 15 years.

These types of projects are sometimes called "shared" savings agreements, because the Energy Service Provider (ESP) may take a third of the savings in addition to profits derived from the implementation phase of the contract. For Example: Because this is a turnkey process, the ESP makes management fees and a margin on implementing the retrofits. If a project's composite payback is 10 years, loan payments

to the ESP may be spread out over a 15-year period. Thus the ESP "shares" the savings.

W. **Re-Commissioning** – The on-site observation and confirmation of proper operation (as designed and/or intended) of a facility's systems, including the building envelope, lighting, and HVAC systems. In cases where these systems are inoperable, modifications and/or repairs may be recommended to make these systems usable again.

X. **Senate Bill 5 (SB5)** – A bill enacted by the Texas Legislature in 2001 requiring Political Subdivisions (such as cities) in non-attainment and near non-attainment areas to set a goal to reduce energy consumption by 5% per year for 5 years. The base year is 2001, and the subsequent years of 2002 through 2006 make up the 5 years. SB5 was passed as part of The State of Texas' Air Quality Plan for the US EPA.

Y. **Task Lighting** – Lighting that provides illumination on the specific work surface such as a desk or workbench. This can be accomplished in different ways, including under-counter cubicle lighting, desk lamps, portable lights, etc.

BUILDING SERVICES
DEPARTMENTAL ENERGY CONSERVATION MANAGEMENT POLICY

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A. Building Services will work each year to exceed this goal as set aside in Senate Bill 5 (SB5) and in the City Energy Conservation Policy effective on February 2005.

B. Building Services will review energy consumption each year and look for ways and ideas from staff and consultants to reduce energy. Each year, Building Services facility managers and the Energy Conservation Manager will:
- review program implementation and evaluate overall program success,
- continue to implement areas of success,
- identify adjustments to areas identified for improvement,
- review new ideas offered by staff and citizens,
- implement these new ideas as soon as they are determined feasible.

C. Building Services staff shall assist the Energy Conservation Manager with the identification of cost-effective retrofit projects in department's facilities and processes.

D. Building Services will review and identify funding needs on an annual basis for the implementation of cost-effective retrofit projects.

E. Building Services will observe water management provisions as outlined in City Ordinance No. 010426-17.

V. ENERGY CONSERVATION SPOC (ECS)

A. The Energy Conservation SPOC (ECS) shall provide support as requested to the Department's Energy Conservation Manager, and is thereby authorized to: coordinate, implement, document, and monitor their facility as required by the facilities' Energy Conservation Plan.

B. ECS is responsible for the proper maintenance and efficient operation of new or renovated systems to maintain savings.

C. **Standard Operating Procedures (SOP) for Energy Efficiency**: All facility site managers are responsible for assisting the Energy Conservation Manager and the Performance Contractor in developing an SOP for energy efficiency management for their specific facility and its equipment in accordance with these guidelines and any other possible means of increasing the level of efficiency with which energy resources are used. The SOP shall include energy benchmarking to demonstrate and track effectiveness of conservation efforts implemented by the department.

V1. IMPLEMENTATION OF ENERGY CONSERVATION PLAN

The implementation of Building Services' Departmental Energy Efficiency Plans shall include:

- Personal energy-consuming equipment that is non-essential to daily business functions, such as refrigerators, heaters, coffee pots, microwave ovens, shall be removed from work areas. Excessive numbers of personal appliances compromise safety, increase a building's electrical load and, thereby, utility costs, and could contractually jeopardize guaranteed savings agreements with City ESCO contractors.

- Austin Energy's Municipal Energy Conservation Program staff and its contractors will work with departmental staff to provide initial training for employees on instructions for efficient operation and maintenance of the department's facilities and equipment and this policy. Further training will be provided through multiple channels of communication including Safety Meeting presentations, broadcast e-mails, informational posters, newsletter and coordinated equipment-specific training sessions.

- Providing training for new employees on efficient operation and maintenance of the department's facilities and equipment and this policy through New Employee Orientation training sessions based on training staff availability.

- Conducting regular checks of personnel procedures to reinforce policy initiatives that are in place and measure the effectiveness of the procedures being used. The findings of the completed Energy Efficiency Inspection Checklist shall be forwarded to the Division Manager and a copy sent to the Energy Conservation Manager

VII. Capital Improvement Projects PLANNING & BUDGETING

A. **Identify Cost-Effective Retrofits**: Building Services site managers are responsible for assisting the Energy Manager with the identification of cost-effective retrofit projects in the division's facilities and processes.

B. Cost-effective retrofit projects may be funded through operating budgets, capital improvement projects or through the repayment of alternative financing agreements as appropriate, funding permitting.

C. In the case of alternative financing, shared savings, guaranteed savings, or other similar loan or Municipal Lease type agreement, Building Services is responsible for requesting sufficient funds to repay the loan, subject to budget approval and authorization.

VIII. COMMUNICATION

Each Building Services employee is asked to share ideas to conserve energy or natural resources with their supervisor or the Energy Conservation Manager. Specific communications for facility consumption shall be identified in that facilities' Energy Efficiency Plan. All employees shall be expected to clearly understand and follow the procedures outlined in this policy the Energy Plan and all associated Standard Operation Procedures (SOP's) for their facility.

IX. EMPLOYEE EDUCATION & TRAINING

A. Once an effective date has been determined for this policy, training shall be scheduled for all employees on the new policy and the Energy Efficiency Plan that has been developed for their specific area of responsibility. Building Services does not have trainers available to implement this at this time.

B. New employees shall receive Energy Efficiency training through New Employee Orientation training sessions.

The training shall include:

- Introducing the Department policy.
- Individual and Group expectations of their individual facilities according to the Energy Efficiency Plan
- Operating Procedures for all energy consuming equipment in their facility

X. DEFINITIONS

A. **Alternative Funding/Financing** – Funding such as a loan provided by Austin Energy, the State of Texas, or some other outside source, that the City is responsible for repaying in installments. This reduces the immediate impact on a department's operating budget, and allows the loan to be repaid with the benefit of budget savings generated by reduced energy use.

B. **Areas of Critical Sight** – Places where the ability to see and perform fine tasks is of very high importance. Examples would be reading (such as libraries), accounting, some repair shops, and areas where safety is an issue. In many cases, this is best accomplished by task lighting. These light levels are established by the IESNA.

C. **Automatic Lighting Controls** – Devices that turn lighting circuits on and off, based on a pre-established set of conditions, such as time delay, time of day, daylight, darkness, or movement/occupancy of an area.

D. **City Facilities** – The term City facilities as used in this document refers to all new, renovated, existing, owned or leased City facilities, both present and future.

E. **Cost-effective Retrofit Projects** – Retrofits deemed to be "cost-effective" are projects that meet predetermined payback criteria. It is generally accepted that a payback of 5 years or less complies with this requirement; however, these criteria are based on Life-Cycle Cost and may vary for specific measures. These measures may include retrofits that reduce electric use, natural gas use, or water use, however, it is required that the retrofit pay back in 75% or less of the average rated or useful life of the equipment.

F. **Daylighting** – The use of available natural sunlight to supplement and/or replace electrical lighting sources when possible and where appropriate.

G. **Demand Control Ventilation** – The controlled introduction of outside air into the return air stream, based on the CO2 levels in the return air. This automatically increases or decreases the amount of outside air required for good indoor air quality, based on the actual occupancy and the resulting internal CO2 levels. Constant outside air based on a "worst case" calculation, regardless of the occupant load, will not be allowed.

H. **Departmental Energy Efficiency Plan** – A standard that establishes the department's minimum requirements and goals for departmental operations and maintenance in a clear and concise document.

I. **Energy Benchmarking** – The collection of historical baseline energy consumption and cost data, for the purpose of evaluating current and future energy use. This can also involve calculating various annual energy use indexes such as Dollars/Square Foot ($/FT2), kilo-Watt-hours/Square Foot (kWh/FT2), or Thousand British Thermal Units/Square Foot (kBtus/FT2). This allows comparison of the most recent energy use and cost to the historical data, and to other similar facilities, for the purpose of evaluating a facility's "energy performance".

J. **Energy Conservation Measures (ECMs)** – Changes in equipment, control, operational methodology, etc, that reduce or "conserve" energy. Example: Changing out an old inefficient air conditioning unit with a new high efficiency unit or installing a new programmable thermostat that reduces the operating hours be turning the unit off when it is not needed.

K. **Energy Service Provider (ESP)** – A firm that performs or organizes turnkey services such as performance contracting, shared savings, or guaranteed savings type projects. The ESP may perform much of the work itself, or function like a general contractor and sub contract much of the work to be performed. These type services frequently include: initial engineering study and recommendations, design, construction, financing, and guarantee or insuring savings.

L. **Group Relamping** – The regularly scheduled cleaning and replacement of lamps in a specific area instead of replacing lamps only as they fail. In the average office with fluorescent lighting, where the lights burn 12 hours/day and 260 days per year, the fixtures would be cleaned and relamped every 6 to 7 years.

M. **Guarantee of Savings** – A contract between an Energy Services Provider (ESP) and a facility owner which guarantees the estimated savings of energy conservation upgrade projects. This may take the form of an insurance policy through a third party, or it may be offered directly by the ESP to the owner. These types of agreements always contain operating constraints such as heating and cooling setpoint minimum/maximums, and penalties for failing to operate an "insured" facility within the mandated parameters.

N. **Life-Cycle Cost** – The cost of owning a particular system or piece of equipment over the course of its useful life. This would include the initial purchase price and the cost of operation including energy use. Maintenance cost savings may be included also, but will not normally be a consideration. These calculations may require normalization to a common denominator such as rated life to be usable in a true comparison. A simplified example is shown below.

Incandescent Lamp: Cost $0.39, Load 60 watts, Life 750 hours
($0.39+ (((60/1000) x 750 hours) x $0.0717 / kWh)) = $3.62 Life-Cycle Cost

Compact Fluorescent Lamp: Cost $4.00, Load 14 watts, Life 10,000 hours
($4.00+ (((14/1000) x 10,000 hours) x $0.0717 / kWh)) = $14.04 Life-Cycle Cost

Rated Life Adjustment:
Incandescent Life-Cycle Cost ($3.62 / 750 hours) = $0.0048 / hour
($0.0048 / hour x 10,000 hours) = $48.27 cost to operate 10,000 hours

Result: While the incandescent lamp cost is only ~10% of a compact fluorescent lamp, the compact fluorescent's Life-Cycle Cost is approximately 29% of the incandescent, with an estimated savings of $34.23 over the rated life of the lamp. This makes the Compact Fluorescent Lamp preferable over the incandescent in spite of the initial cost difference.

O. **Maintenance and Operational Procedures** – Changing Maintenance and Operational Procedures can cover a wide range of actions including changing the operating schedule, changing setpoints, or implementing differed maintenance and repairs.

P. **Maintenance of Savings** – The Maintenance of Savings generated by cost-effective energy conservation retrofits. This type of maintenance involves making sure that the energy efficient equipment and operational procedures implemented are not defeated,

removed, modified, changed, or discontinued. In shared savings and guaranteed savings contracts, the Contractor may require additional conditions such as setpoint limits as part of the savings contract or insurance agreement that "Guarantees" the savings. The agreement may be voided or penalties charged if these conditions are not met.

Q. **Monitoring and Verification** – The collection of energy use data for a facility or an energy consuming system, and comparison of the data to a predetermined data set, for the purpose of verifying the facility or system's energy savings or increased costs. This is normally a required part of a performance contract.

R. **Non-Attainment and Near Non-Attainment Areas** – Non-Attainment Areas (counties in the case of SB5) have been designated by the US EPA as violating the standards for outdoor air quality. Near Non-Attainment Areas are locations such as Austin/Travis County where the air quality approaches the US EPA established threshold on Ozone Action Days.

S. **Obsolete Light Sources** – Light sources such as Mercury Vapor, T12 fluorescent lamps and ballasts, and incandescent lighting.

T. **Payback or Simple Payback** – As used in this document, this refers to the cost of a project or energy conservation measure divided by the savings per year.
(Project Cost/Energy Savings per Year) = Payback in Years
($1,000 cost/$400 savings per year) = 2.5 Year Payback

U. **Payback, Composite or Combined Payback** – The result of bundling several retrofit projects together into a single calculation.

Example:	Cost	Savings	Simple Payback	
Lighting Retrofit		$25,000	$5,000	5.0 Years
Demand Ventilation	$900	$400	2.25 Years	
HVAC Retrofit		$30,000	$2,500	12.0 Years
Totals	$55,900	$7,900		

Composite or Combined Payback 7.1 Years

V. **Performance Contracting** – The process of implementing energy conservation upgrade projects that "perform" by repaying the project costs by reducing annual energy costs. These are normally turnkey projects that can include the engineering, funding, installation of energy upgrades, and a guarantee of savings. State law sets the maximum term for this type of agreement at 15 years.

These types of projects are sometimes called "shared" savings agreements, because the Energy Service Provider (ESP) may take a third of the savings in addition to profits derived from the implementation phase of the contract. For Example: Because this is a turnkey process, the ESP makes management fees and a margin on implementing the retrofits. If a project's composite payback is 10 years, loan payments

to the ESP may be spread out over a 15-year period. Thus the ESP "shares" the savings.

W. **Re-Commissioning** – The on-site observation and confirmation of proper operation (as designed and/or intended) of a facility's systems, including the building envelope, lighting, and HVAC systems. In cases where these systems are inoperable, modifications and/or repairs may be recommended to make these systems usable again.

X. **Senate Bill 5 (SB5)** – A bill enacted by the Texas Legislature in 2001 requiring Political Subdivisions (such as cities) in non-attainment and near non-attainment areas to set a goal to reduce energy consumption by 5% per year for 5 years. The base year is 2001, and the subsequent years of 2002 through 2006 make up the 5 years. SB5 was passed as part of The State of Texas' Air Quality Plan for the US EPA.

Y. **Task Lighting** – Lighting that provides illumination on the specific work surface such as a desk or workbench. This can be accomplished in different ways, including under-counter cubicle lighting, desk lamps, portable lights, etc.