



EXECUTIVE ORDER RP-49

Quarterly Report for UT System – October 2008

By October 1, 2008, each agency shall submit an Update to its Energy Conservation Plan to the Office of the Governor and Legislative Budget Board. This update shall, at a minimum, provide the following information:

- A. The extent to which the agency has met the percentage goal it established for reducing its usage of electricity, gasoline, and natural gas;**

UT System Response: The UT System has been collecting extensive energy data from its 15 institution on an annual basis since 2001. In 2001, the Board of Regents established a goal of reducing energy consumption by 10-15% by the end of FY 2011. From FYE 2002-FYE 2007, the UT System had reduced overall energy consumption by 7.8%, saving an estimated \$110.4 million over the six-year period. Data for FY 2008 will be included in the quarterly report due January 1, 2009.

- B. The steps the agency may take to increase the percentage goal for reducing its usage of electricity, gasoline, and natural gas;**

UT System Response: The UT System reported its energy conservation goals in December 2006. These goals already include a “stretch” goal of reducing energy consumption per square foot by 10 – 15% as of FYE 2011.

- C. Any additional ideas the agency has for reducing energy expenditures relating to facilities;**

(See attached information.)

- D. Any additional ideas the agency has to minimize fuel usage in all vehicles and equipment used by the agency.**

(See attached information.)

Posting of Update to State Agency Energy Savings Program

Each agency shall post all quarterly progress reports on its website under the common heading “State Agency Energy Savings Program.” Copies of quarterly updates should be sent to the following:

energysavings@governor.state.tx.us

by mail:

Legislative Budget Board

P.O. Box 12666

Austin, TX 78711

dgeiger@governor.state.tx.us

dub.taylor@cpa.state.tx.us



UT SYSTEM INSTITUTIONS RP-49

QUARTER ENDED SEPTEMBER 30, 2008

1. UT ARLINGTON

Siemens Building Technologies, Inc. conducted an energy audit of each building on campus under a previous agreement with UT Arlington to determine the feasibility of additional utility savings to establish a performance contract in which they would guarantee that utility savings would be sufficient to pay back the amount of the contract within the time frame agreed. Siemens projected the simple payback for this project to be a favorable 7.99 years with an implementation cost of \$17,989,981. An energy performance contract to implement their recommendations was then signed with Siemens on August 28, 2006 after receiving approvals from appropriate authorities. UT Arlington has only one contract with Siemens. Every other contractor is considered a sub-contractor to Siemens.

The following items, while helpful in addressing facility infrastructure, were recommended as a result of Siemens' analysis based on both utility cost savings, and operation and maintenance (O&M) savings:

ECRM 1 - Comprehensive Lighting Retrofits - Completed July 13, 2007.

ECRM 2 - Occupancy Sensor EMS Input – Completed January 31, 2008.

ECRM 3 - Transformer Upgrade

The campus has electrical transformers located in most major buildings to reduce voltage for building use. Most were built in the 1970s and 1980s and can be replaced with more efficient units that reduce energy losses and improve reliability.

Status as of 9/30/2008 – Project was completed January 2, 2008 except for five transformers that will be installed during the next Christmas break in December 2008.

ECRM 4 - Campus Steam Traps - Completed July 15, 2007.

ECRM 5 - High Efficiency Motor Upgrades - Completed March 28, 2007.

ECRM 6 - Window Solar Film - Completed Dec 31, 2007.

ECRM 7 - EMS Re-commissioning - Completed May 17, 2007.

ECRM 8 - Vending Machines - Completed January 16, 2007.

ECRM 9 – NanoFab Building Chiller - Completed August 7, 2007.

ECRM 10 – Thermal Energy Plant Heat Exchanger - Completed January 16, 2007.



ECRM 11 – Capacitor Bank, formerly “ATI Building Heat Pump Unit Replacement” -
Completed March 28, 2007.

ECRM 12 - Computing Center Cooling Equipment Replacement –
Completed August 17, 2007.

ECRM 13 - Stadium Chiller Replacement - Completed May 17, 2007.

ECRM 14 - Wetsel Building Chiller Replacement - Completed March 28, 2007.

ECRM 15 - Satellite Chiller Plant – The current additions to the campus have increased the chilled-water pumping requirements and future scheduled construction will place further demand on the system. Adding a satellite chiller system with 4,050 tons of capacity will provide energy savings, back-up capacity, and defer expensive piping and pumping infrastructure projects that will be needed to support the growing campus loads and the Campus Master Plan.

Status as of 9/30/2008 - Project is 98% complete. Project is scheduled to be accepted the week of 10/30/08

ECRM 16 - Swift Center Rooftop Unit Replacements - Completed August 3, 2007.

ECRM 17 - Texas Hall – Three AHU Replacements - Completed August 31, 2007.

ECRM 18 - Air Mixing Box Modifications

Air mixing boxes in the Carlisle Hall, Geo-science Building, Hammond Hall and Trimble Hall are constant volume, and do not allow full utilization of the variable frequency drives on the air handlers in these buildings. Replacing these air mixing boxes and installing local temperature control will result in delivering to each zone the air volumes needed for conditioning, and minimize excessive energy use. In addition, many of the existing mixing boxes are old and require frequent maintenance. This measure will significantly reduce maintenance costs and improvements in reliability will result from these upgrades. An additional 44 mixing boxes for the Engineering Laboratory Building were just added to the scope.

This work is scheduled for completion October 24, 2008.

Separate from the Siemens' projects above, we have completed the campus natural gas meter consolidation project by the elimination of an additional 5 (five) meters. This should provide an annual utility meter cost savings of \$26,875.00.

Separate from the Siemens' projects above, we addressed some deferred maintenance by replacing existing FCU's (Fan Coil Units) in the Science Building with expenditures of \$145,773. This was reported to the THECB on MP-4 for FY 2007. Savings is based on an estimated 10% of the total 90-ton capacity of the existing FCU's operating an average of 8 hours per day and 365 days per year. The average \$/kwh in 2007 was \$0.0791 resulting in \$7,299 electrical savings for that year. In 2007 the \$/kwh increased 35% over the previous year. This % increase is assumed for future years.



Additionally, we have expended over \$579,800 on deferred maintenance projects that will directly affect energy savings. These projects consist of repairing, replacing and upgrading HVAC equipment in eight separate buildings. These projects were separated from the Siemens' projects.

2. UT AUSTIN

Energy Conservation Initiatives:

A. Energy Procurement

UT Austin continues to work with the General Land Office to establish a more effective approach for natural gas procurement.

Status as of June 1, 2008:

A long-term procurement agreement is in place and UT Austin has established a procurement portfolio that is diversified in terms of volume, pricing and time. This approach has allowed the University to more effectively manage risk and achieve budgeting goals for this commodity.

B. Energy Production

The BOR has approved the Utility Infrastructure Upgrade Phase II project, which will reduce energy consumption, an estimated 15%. The project has four major components: installation of a new high efficiency gas turbine and generator, installation of chilled water storage, renovation and upgrade of existing chilling stations and the addition of inlet air cooling to improve gas turbine efficiency. These projects are scheduled to begin in fall 2008 and be completed in approximately 24 months.

Status as of September 1, 2008:

- **High Efficiency Turbine** – project is designed and we have completed procurement of the turbine and the heat recovery steam generator (HRSG) that will provide combined cycle operation using the turbine. The demolition phase of the project has begun.
- **Chilled Water Storage** – this project is still in the initial design phase. It will be integrated into an expanded chilled water delivery system to provide necessary cooling for new facilities in the center of campus.
- **Inlet Air Cooling** – this capacity will be provided from the new chilling station currently under construction.
- **Renovation/Upgrade of Chilling Stations** – this effort is underway; chillers and the cooling tower equipment have been installed. This project is expected to be complete in early 2009.

C. Energy Demand

The BOR has approved three energy conservation projects; campus-wide lighting retrofit, upgrading all steam traps and water conservation. These projects are currently



scheduled to start in 2008 and will be completed by January 2009. These projects will reduce campus energy consumption by an estimated 10%. These projects are on schedule and currently estimated to exceed original energy reduction targets. Final energy savings estimates will be provided at project completion.

Status as of June 1, 2008:

- **Steam Trap Upgrade** – the University has received responses to the RFP issued for this project and has issued a contract for completion of the work.
- **Lighting Retrofit** – Installation of energy-efficient lighting and new control systems has begun. The estimated completion date is January 1, 2009.
- **Water Conservation** – Audit has been completed and the scope of work is being finalized prior to issuing the RFP.

D. Energy Sales

UT Austin has met with Austin Energy regarding the possible sale of energy and is moving forward in this area.

Status as of September 1, 2008:

- Modifications to the power plant operating systems that are necessary for this type of operation have been completed, and UT Austin met with Austin Energy in February to discuss possible energy sales. Control systems are in place but the removal of GT 6, required to install the new GT 10, has eliminated the equipment redundancy necessary to sell power outside the campus grid. This effort will be restarted after GT 10 is completely operational.

E. Fleet Fuel Management

Status as of June 1, 2008:

- Overall gasoline consumption by our fleet was down 2.04% from the same time period in the previous year.
- Mileage in this quarter was met is down from 10.54 mpg to 9.86 mpg, analysis is underway to determine the cause.
- Pickle Research Campus has moved to biodiesel, volumes will be provided in the next update.
- 1,143 gallons of LPG fuel have been dispensed as of March 1, 2008, at the Manor Road fueling station; an update will be provided in the next report.

3. UT BROWNSVILLE/TEXAS SOUTHMOST COLLEGE

Energy Conservation Initiatives:

- Cavalry wing project completed; included the replacement of two outdated HVAC units, new attic insulation, and the replacement of 27 2x4 lay-in fluorescent lights with new energy-efficient fixtures.



- Two in-house campus renovation projects are currently underway, which will include the installation of new energy-efficient light fixtures and the replacement of outdated HVAC.
- Two parking lot lighting projects are currently under design for upgrade. This will include the replacement of 1000-watt fixtures with new energy-efficient 250 and 400-watt fixtures.
- Programmable thermostats continue to be a routine replacement for manual thermostats where an Energy Management System is not available.
- Four outdated and inefficient HVAC units were replaced throughout campus with new energy-efficient models.
- Phase II of the MRC North and South Building is under design for energy management control upgrades. This will replace inoperable HVAC controls in these buildings.
- Preventive Maintenance program is in the process of being automated via our new computerized maintenance management system. PM program is currently completed through manual logs. New system will ensure that PM's are completed on time and schedule resulting in higher unit efficiency and operation.
- A new 600-ton chiller is in the process of being added to the EDBC Plant. Energy-efficient operation should complement the existing units in this facility.
- A new 1000-ton cooling tower is currently under design. This will help ensure that the existing systems operate correctly promoting energy saving.
- EMS building programmer will continue to be requested for expanded Energy Management System. This will allow full control and use of system in conjunction with room scheduling.

4. UT DALLAS

Energy Conservation Initiatives:

- UPDATE: The first consultant's report of the remote monitoring of the HVAC system of the Natural Science and Engineering Research Laboratory has been received. The report recommends optimization of multiple system devices with an estimated \$49,000.00 in annual energy savings for a period of one year starting in September 2008.
- The University is installing a Variable Frequency Drive (VFD) for the cooling tower #4 at the Central Energy Plant (CEP). We estimate that this measure will save \$8,000.00 annually in energy costs.
- The University is requesting a proposal to replace an old and inefficient cooling tower #3 at the CEP. By replacing this cooling tower, we estimate a \$10,000.00 annual savings in energy cost.
- The University is requesting a proposal to replace an old and inefficient 2,000-ton chiller with a new more energy-efficient one. Once the chiller is replaced this FY, the



University will achieve operating cost savings through: 1) Lower refrigerant cost since the existing chiller uses R-12, which is very expensive; and, 2) Lower energy cost, since the new chiller will be more energy-efficient.

- The University has initiated an aggressive maintenance program to run the CEP more efficiently by implementing several energy conservation measures such as :
 - Cleaning the chiller condenser tubes;
 - Turning off lights in areas during periods of non-use;
 - Cleaning cooling tower nozzles and tower basins;
 - Giving run-time primarily to the new, more energy-efficient chillers as opposed to the older, less energy-efficient ones.

5. UT EL PASO

Conservation Measures Project Implementation Schedule

- Thermal Plant Expansion Project: the two new energy-efficient 2000-ton chiller units are on line and performing as expected.
- Ongoing initiative: the SCORE consultant continues to work on benchmarking analysis of several types of buildings as part of our efforts to update our Energy Management Plan and Energy Benchmarking Report for the campus. Meters are being systematically installed on switch gear in order to monitor and adjust usage. We are currently planning to install 10 more meters this year. We have also undertaken a comprehensive short circuit and load coordination study to utilize our energy distribution infrastructure in a more efficient manner.
- Lighting: street lamps continue to be retrofitted to a higher efficient Metal Halide lamp, and the use of new LED type fixtures for street and parking garage lighting is being spot tested and evaluated. The use of interior drop in 2x2 LED lamps and LED cove lighting fixtures are also being spot tested and evaluated. We continue efforts to retrofit and/or remove lamps from fixtures offices, hallways and conference room without compromising safe lighting levels for lumens. In some areas, 50% of the lamps have been removed with no adverse impact to the occupant.
- Occupancy sensors: the initiative to install occupancy sensing light switches in building common areas continues. Many common areas throughout campus have now been equipped with occupancy sensors. All new construction projects on campus now incorporate the use of occupancy sensors as part of the project requirements.
- Hot water distribution service lines: replacement is underway and is expected to continue in phases through summer of 2010 to minimize disruption of service. The project will eventually result in the replacement of LF of leaking schedule 40 pipes with new properly insulated schedule 80 pipes that will help reduce energy losses.
- Retrofit Projects: continue with efforts to replace obsolete electrical switches, motor control centers, medium voltage transformers, and distribution panels in various buildings to include Liberal Arts, Miner's Hall, Vowell, Bell, Benedict, Hudspeth, Kelly, Psychology, Cotton Memorial, Quinn Hall, and Education. Electrical switches and motor control components are obsolete and will be replaced with energy-efficient components.



- New Initiative: have commenced design of a project to replace various 25-year old plus transformers with modern, energy-efficient units.
- New Initiative: have contracted with Siemens Building Technologies to conduct a thorough evaluation of the existing DDC System in various research buildings. The evaluation results will include recommendations to enhance system performance.

Project Implementation Update

- Update on UTEP's major construction projects: The build-out of the remaining shell space on floors 2 and 3 of the new Biosciences Research Building is complete. Construction of a new Basketball Practice Facility is underway and should be completed in March 2009. Construction of the new Bookstore is scheduled to be completed in May 2009. UTEP's core Science and Engineering Renovation and remodeling project has completed the facilities program and is currently selecting the project architect. The Chemistry Computer Science Building and College of Health Science Building are under design and scheduled to begin construction in November 2008. The design for the expansion of the Swimming and Fitness Center is underway. The scope of work for the design of all new buildings and major renovations includes requirements to meet or exceed energy code standards.
- Engineering HVAC Modifications: the replacement of leaking, energy-inefficient chilled water cooling coils located at the Engineering complex is out for bid.

Fleet Fuel Management

Overall annual fuel consumption in FY07/08 remained the same as compared with FY 06/07 which reflected a 3.6% reduction as compared to FY05/06 data.

6. UT PAN AMERICAN

Conservation Initiatives

- Electrically sub-meter auxiliary services buildings in order to conserve energy and improve utility cost allocation. Purchase order is in process.
- Replaced two non-functional VFD's.

Operations and Maintenance Initiatives

- Hired new full time preventive maintenance mechanic (July 1, 2008).
- Improving low delta chilled water temperature at Unity Hall through controls upgrade is under investigation.

Capital Investments

- Major lighting upgrades and occupancy sensors for selected buildings. OGC is reviewing the RFP.
- Phase out plan for non-serviceable building automation components. Purchase orders have been issued to upgrade five air handlers.
- Damaged chilled water insulation on the roof of the Health and Physical Education building has been replaced.



- Upgrade existing side-stream chilled water filter to improve the efficiency of heat transfer surfaces and thereby decrease energy costs. RFP is in process.
- UTPA chilled water distribution model update is due in early October.
- Old computer center machine room has been remodeled, including new Liebert units and upgraded controls.

7. UT PERMIAN BASIN

Energy Conservation Initiatives:

1. Occupancy Sensors

Several have been installed in various areas. More will go online this calendar year with still more scheduled for this fiscal year.

2. Vending Misers

Misers have been installed on every vending machine on campus. These maintain product quality while using the minimum amount of energy.

3. Non – Critical Hours Shut Down

We shut down the thermal plant on weekends, nights and holidays. Consider the savings of not having to heat and cool 700,000 sq.ft. during those times. Also, on mild days we ventilate with outside air to further save on electricity.

- For years we have used battery-powered utility carts similar to golf carts instead of costly gasoline powered vehicles.
- We have installed energy-efficient chillers and boilers in the Thermal Plant.
- An automated control system with "soft-start" controls on air handlers motors and energy saving devices on air mixing boxes and other climate control equipment have been installed.
- All existing light fixtures have been retrofitted with energy saving ballasts and light bulbs.
- All new light fixtures installed in construction projects must meet energy saving requirements.
- Class and event scheduling has been streamlined to minimize air handler and electrical use.

8. UT SAN ANTONIO

Energy savings initiatives currently under evaluation or in progress include the following:

1. A significant domestic water leak at our Child Development Center was discovered, and has been repaired. Initial review of consumption records indicates approximate savings of \$15,000/year.



2. Periodic checks of projects, particularly building lighting and air conditioning during the construction phase have resulted in reduction in utility consumption.
3. A funding request is being developed to implement energy conservation measures at the Monterey Building, which were identified by the Monterey Building Energy Audit.
4. Funding requests are being developed to install additional campus meters and to assess feasibility of undertaking other small-scale energy conservation retrofits.
5. UTSA is purchasing alternative fuel and hybrid vehicles to decrease consumption of gasoline.
6. Chaparral Village housing complex has completed replacement of all incandescent light bulbs with compact fluorescents. Energy reduction will be monitored against baseline data to determine savings.

9. UT TYLER

Significant impacts during past year and anticipated future impacts:

- A. Last Year's Impacts
 - Major savings by aggregating electrical contract
 - Major increase in natural gas prices
 - Purchased and Commissioned Graduate Nursing Ornelas Activity Center. Commissioned new major building (Bill Ratliff Engineering and Science Complex, North Building)
 - Completed new energy management system for chilled water distribution piping systems
 - Avoided costs due to energy management initiatives
- B. Anticipated Impacts
 - Projected future avoided costs by monitoring and metering electrical usage
 - One new buildings will be constructed (University Center Renovation/Expansion Phase I)
 - A new utility distribution system to be in operation
 - Additional 36,000 sq. ft. Building (University Center Expansion) will come online the end of December 2008
- C. Conservation Initiatives
 - Maximize use of variable speed drive 1,000 ton chillers
 - Maximize use of 500 ton Water Source Heat Pump
 - Develop/review technical specifications for energy-efficient motors, variable speed drives, lighting fixtures and lamps
 - Identify opportunities to consolidate activities and reduce energy consumption in resulting unoccupied spaces
 - Continuously monitor and measure building level consumption data
 - Reduce pneumatic controls with direct digital controls in all buildings
 - Install window film on the windows at University Center Link; this would reduce the solar heat transmitted to building space, thus decreasing cooling energy use.



- Installed window film in westward office in the Robert R. Muntz Library to reduce radiant heat load.
 - Installed internet enabled thermostats at the Graduate Nursing Ornelas Activity Center.
 - Networked existing thermostats in the Ornelas Residence Hall Dormitory for better temperature control.
 - Connected anemometer to Spence Fountain variable frequency drive pump to reduce water from blowing out of the fountain basin.
 - Installed 29 additional “Watt Stoppers” on vending machines to reduce energy consumption in times of inactivity; if no activity is sensed in the area, the lighting remains off and the compressor runs only to maintain the desired product temperature.
 - The campus has a number of opportunities for replacing larger, older motors on fans and pumps with new more efficient motors. The measure replaces the motors at Science & Math, Hudnall-Pirtle-Roosth and University Center. Energy-efficient motors quickly pay for themselves in lower energy costs and reduced maintenance.
 - Utilize bicycles in lieu of vehicles where applicable.
- D. Operations and Maintenance Initiatives
- Monitor maintenance activities with specific focus on maintenance energy conservation through preventative management program
 - Review and prioritize calibration plan for sensors and control devices
 - Institute a training program to make sure all mechanics and technicians understand the importance of energy conservation and the role system optimization plays
 - Identify early warning indicators in all buildings to help quickly identify problems that may result in excess energy consumption
 - Develop program to ensure system controllers are properly tuned
 - Replace incandescent lamps with compact fluorescent lamps
- E. Capital Investments
- Utility Assessment Report
 - Review energy consumption data to create capital investment opportunities
 - Energy Cost Savings Projects (New power plant and Ratliff Buildings)
 - Projects on CIP List
 - Commissioned at Ratliff Engineering and Sciences Project, a new central plant with variable volume water distribution, exhaust fan energy recovery systems resulting in 30% energy savings
 - Review campus standard specs to ensure that energy-efficient components and systems are included.
 - Require A/E consultants to describe and evaluate specific energy conservation measures of capital projects at programming stage
 - Savings monitoring and evaluation plan
 - Establish baseline consumption patterns and reduce expenditures



10. UT SOUTHWESTERN MEDICAL CENTER - DALLAS

Energy Conservation Initiatives:

A. Maintenance and Operations:

- NA Building Cooling Tower replacement/repair in progress. Repairing of the NA Cooling Tower completed – May 2008.
- University Hospital Zale Lipshy (UHZL) install VFD's on the AHU's not all hooked up yet. Estimated completion time December 2008.

B. Procurement:

- The gas supply contract is complete and it was awarded to TXU Energy Retail Company. The transportation contract review and analysis is complete and UTSWMC to contract directly with ATMOS.

C. Teaming and Training:

- By utilizing our existing electric meter for each building, we were able to determine the buildings' energy utilization indexes (EUI) that are out of range. RFQ was reviewed by Physical Plant energy task force to select energy engineers for qualifications. Energy Engineer was selected. The purpose of the study is to determine the inefficiency and make appropriate energy savings recommendations to the heating ventilation and air conditioning (HVAC) system for the identified buildings. The expected outcomes are to identify measurable inefficiency and implement the recommended energy conservation measures.
- Physical plant energy task force selected five buildings that appeared to be out of range in comparison from the rest of the buildings in the Campus. Due to budget constraints, the energy task force selected two buildings (Y & NA) out of the five buildings to determine why the buildings' energy utilization indexes (EUI) are out of range this fiscal year. The energy task selected Building NA for the final implementation phase.
 1. **Building Y** – Phase II – complete – Implementation phase remaining
 2. **Building NA** – Phase II – complete – Implementation phase remaining - Selected for higher priority - Funding for Option 1 has been approved. Phase III in progress.
 3. **Building G** – Phase I – complete
 4. **Building K** – Phase I – complete
 5. **Building L** – Phase I – complete

- #### **D. Project Plans for FY 2008:** Energy Projects Approved for FY 2008: The projects are in planning and implementation phase. Estimated completion is FY09.



	Description	Cost	M & V Cost	Savings	Payback
1	Install Substation Capacitor Banks -	\$200,000.00	\$4,000.00	\$80,000.00	2.6
2	S. Campus Air Balancing –	\$100,000.00	\$5,000.00	\$100,000.00	1.1
3	Insulate thermal energy lines campus-wide	\$100,000.00	\$1,666.67	\$33,333.33	3.1
4	University air handling systems are typically balanced to design and not to load.	\$95,000.00	\$6,500.00	\$130,000.00	0.8
5	The University has a great many laboratories that are 100% outside air. Implementing heat recovery could reap many dollars in savings. The cost will vary per system and will be evaluated on a system-by-system basis.	\$25,000.00	\$1,200.00	\$5400	4.9
6	Convert inlet vanes to VFD's at Zale.	\$65,000.00	\$1,800.00	\$36,000.00	1.9
7	NA Building - Reduction of the Energy Utilization Index - Implementation Phase - Option 1	\$292,073.00	\$9,959.00	\$199,180.00	1.5
TOTAL		\$877,073.00	\$29,195.67	\$583,913.33	1.6

- University Hospitals -- **St. Paul Building** Estimated completion is spring 2009
 - HVAC System
 - Insulation Systems
 - Replace AHU 10D3
 - Replace AHU LLD-2
 - Air Handler 5F6 Refurbishment
 - Replace AHU LLC1
 - Refurbish AHU 5C1
 - Controls System
 - HVAC Controls Upgrades
 - Plant Controls

- University Hospitals – **Zale Lipsy Building** – Estimated completion is spring 2009
 - HVAC System
 - Insulation System – Dec. 2008
 - Upgrade Surgery AHU and controls – Complete

The physical plant energy task force is meeting monthly to discuss accomplishments and future projects including commodity procurement, capital project progress, maintenance, and various initiatives.



11. UT MEDICAL BRANCH – GALVESTON (NO UPDATE DUE TO HURRICANE IKE)

- An important part of the University of Texas Medical Branch comprehensive program of Energy Management, Recycling and Environmental Control is the “*UTMB Resource Conservation Initiative.*” Representatives from Community Outreach, Utilities, Recycling, and Environmental Health and Safety lead in this effort. See <http://intranet.utmb.edu/conservation/>.
- The UTMB Resource Conservation Policy and Guidelines have been adopted, and are part of UTMB’S Institutional Handbook of Operating Procedures (IHOP). This sets the temperature parameters for winter and summer as well as outlines energy conservation, recycling and environmental practices to be followed by all departments in the University. This conservation policy and guideline is an important catalyst for implementing a campus wide conservation education. Thirty-minute conservation programs are given at department meetings, to contract employees and for student orientations. Additional support is achieved by establishing “Green Teams” in each building; these volunteers have a passion for environmental conservation. They promote cultural change with their co-workers, and help to implement UTMB’s Resource Conservation Initiatives, Policy & Guidelines.
- This program has been expanded to include Construction and Maintenance, Police/Security, and Public Information representatives. Materials and information are being developed or redesigned to further inform the University population about Resource Conservation programs and compliance with Conservation Policy.
- Another significant accomplishment is the completion of the utility infrastructure work around the Plaza Hospital parking project. This joins our East and West Loop Chilled Water and Steam systems together for greater efficiency and to provide redundant sources of supply for this critical system.
- UTMB started its Energy Conservation Initiative in 1999. The program’s goal is to reduce consumption of all utilities, ensure persistence of achieved reductions, and maintain a comfortable and productive environment for patients, students and staff. Campus-wide usage of water, electricity, gas and other utilities have been reduced by 15 percent since 1999.

The goal for FY 2008 is to maintain a .2060 energy use index.

- UTMB has begun the implementation of ANSI standards in compliance with ANSI/MSE 2000:2005 for our Energy Management Program
- The University has recently updated the Utilities Master Plan and is in the process of implementing its recommendations. This includes a significant amount of demand side management.
- UTMB has completed an AHU filtration study and application matrix for campus facilities. We are in the process of revising UTMB standard specifications to incorporate this information.
- Energy Studies of three buildings have been completed. The studies identified a matrix of Energy Conservation Measures (ECMs) with a potential reduction in these buildings of 20%. These ECMs will be evaluated and scored utilizing ANSI Standards.



- Earth Day Expo 2008 was celebrated April 25, 2008. This is an annual UTMB sponsored celebration that brings environmental awareness to our community. “Earthwhile” vendors and organizations shared their products and knowledge with thousands of University employees, students and community participants. This year’s Earth Day theme, Keen On Green, was selected and a graphic identity was designed through an area school art contest for T-shirts, posters, and other promotional items. As part of the celebration, a free No-waste lunch is served where all trash is recycled or composted. Free plants/trees and this year, energy-efficient compact florescent light bulbs were distributed to people at the event. It is estimated some 3,000 participants from UTMB and the Galveston County Community attended the Expo.
- Energy Policy Compliance Audits of 50 buildings of 4,810,280 Gross Sq Ft are under way; this is an increase over 2007 and is 77% complete through May 2008.
- Scorecards - These are used on the Audits by the Conservation Initiative team to record how the buildings are performing in terms of policy compliance and practice. The scorecard grades such things as room temperatures, policy knowledge, lights left on in empty rooms, recycling practices and other related activities. These scorecards have been redesigned this quarter with the annual utility expenses charted to show our stakeholders their building’s cost to the University. The results are sent to Green Team members and area maintenance for the buildings to focus their attention on areas for improvement. UTMB’s Energy Policy and Guidelines are also distributed to the building occupants during the audit.
- Recycling - In 1990 UTMB began “*A prescription for a healthier planet*” by recycling paper and cardboard. The program has grown to recycle more than a dozen items that average almost 100 tons a month that is diverted from the landfill. This gives us a recycle rate of over 20% from our municipal solid waste. A partial list of items recycled includes paper, cardboard, metal, plastics, landscape debris, pallets, x-ray film, toner/ink jet cartridges, oil, tires and paint. In FY2007 UTMB recycled 1,116 tons of paper, cardboard, pallets, landscape debris, metals, plastics and inkjet/toner cartridges. That equals 20% of our total waste stream. The paper and cardboard equaled 836 tons, which equates to 14,212 trees, 836 gallons of gasoline, 3,429,272 kwh of electricity, and 5,852,000 gallons of water.
- Chemical Recycling - A unique program is our chemical recycling: ChemSwap is a chemical redistribution program designed for recycling unopened, in-date chemical to UTMB laboratories free of charge. The solvent distillation program is designated for laboratories that use large quantities of solvents. Used xylene and alcohol are collected for solvent distillation. During fiscal year 2007 Environmental Health and Safety partnered with laboratories on campus to recover more than 6 tons of chemicals for reuse saving the University over \$12,000 from new chemical purchases and hazardous waste disposal costs
- UTMB became a Partner in the EPA's *National Partnership for Environmental Priorities* in October 2006.
- Propane fuel is used for forklifts along with two of our delivery trucks and 15 passenger vehicles. Fleet planning also has one hybrid vehicle. The gasoline at our fuel pumps has a 10% ethanol blend. In 2007 UTMB added 5 GMC/ISUZU delivery trucks to the campus fleet. These are ultra low sulfur diesel vehicles.



- Vanpools – With 6,000 employees coming to the work daily on the island, UTMB offers van pooling to reduce air pollution. We have 15, 12-passanger, vans that commute to campus five days a week. The Houston/Galveston area is designated non-attainment area, so this service receives partial funding through the federal *Clean Air Act*. In the last few months, we maximized most of our vans to 15-passangers and added 5 more vans. A recent survey showed 14% of UTMB employees on Galveston Island, now use alternative transportation to work as opposed to a single passenger automobile.
- Public Transportation – A partnership between UTMB and the Galveston Metro system provides free bus and trolley transportation to and from the university for employees and patients. This is another effort to reduce the number of vehicles on our roads. Additional campus trolley service was added during November and December 2007. UTMB employees are encouraged to ride the trolleys to the Historic Strand District for holiday shopping and restaurants.

12. UT HEALTH SCIENCE CENTER - HOUSTON

SON/SPH

- The School of Public Health Building and the School of Nursing and Student Community Center Building share a City of Houston domestic water line. A flow meter has been installed and commissioned to allow for more accurate metering of the domestic water for these two buildings. The flow meter confirms that the School of Nursing and Student Community Center Building use just 6% of the billed usage.
- Occupied/Unoccupied schedules and minimum/maximum set points have been established and are being reviewed for potential utility savings.
- The School of Public Health Building and the School of Nursing and Student Community Center Building share a CenterPoint power line. A KW meter has been installed to allow for separate metering of the KW for these two buildings. Trends have been put in place to better monitor the building usage.
- A strip heater audit was conducted to ensure no units are running during the summer months with minimal usage during the winter months.

SPH

- At the School of Public Health Building, control strategies and schedules have been implemented to reduce chilled water and natural gas consumption. These schedules are undergoing review and are being refined. For example, controls are programmed to run the chilled water pumps only on an as needed basis. Before, the chilled water pumps would run at a minimum of 20Hz regardless if they were needed or not. This reduces chilled water consumption and KW usage.



- The DDC VAV retrofit project for the first floor of The School of Public Health Building has been completed allowing for a reduction in utilities consumption. Schedules have been finalized and established.
- The installation of automatic damper actuators on the outside air intakes at the School of Public Health Building and the associated programming has been completed. This will allow for free outside air cooling when the outside air conditions are favorable.

MSB

- The installation of an FCU in the Heart Transplant Tissue Lab has been completed. The area has been commissioned to run efficiently. This will continue to reduce the 24/7 heat load on the AHU. As a result, we were able to raise the cold deck temperature to the other labs.
- The Medical School Building Steam PRV Station project is complete. In this case, we replaced all three existing steam valves with new ones. This project replaced six, four, and four inch PRV valve combination with a four, four, and two inch PRV valve combination. This enables an appropriate size valve to be used to meet smaller load demands of the building. Better control leads to more efficient use of the steam.
- The Medical School Building Complex Chilled Water Cla-Valves, which control the pressure on the North and South penthouse risers, were replaced. An operable DP can now be maintained on our risers. While doing so we are able to run our pumps efficiently while meeting the demand necessary to pump back to TECO. Pressure Sensors have been added to the valves to allow for trending. The trending to date shows the valves are operating efficiently.
- The Medical School Building Complex exhaust manifolds and risers are being evaluated for optimal control.
- A chilled water valve audit has been started and leaking valves are being replaced as needed.
- In the Learning Resource Center section, process controls were modified. As a result, heating occurs only when there is a need for heating and increased air volume for cooling occurs only when there is a need for cooling.
- With the completion of the new Research Replacement Facility/Medical School Expansion Building, major population changes in the Medical School Building Complex will be finalized and occupancy surveys will be conducted. The controls and utilities group has begun adjusting the building automation system sequences to reduce utility costs.

RRF/MSE

- With the completion of the new Research Replacement Facility/Medical School Expansion Building, major population changes in the Research Replacement Facility/



Medical School Expansion Building are being finalized and occupancy surveys are being conducted. The controls and utilities group is continuing to adjust the building automation system sequences to reduce utility costs.

- Lighting schedules are being reviewed for implementation as the Research Replacement Facility/Medical School Expansion Building becomes occupied. The schedules are installed and being adjusted as needed to meet the needs of the facility while minimizing utility costs.
- Detailed 10-minute trends have established and weekly graphs are being made with that data. This has allowed for reduced usage and the start of predictive maintenance. In addition, several warranty issues have been captured and will be addressed.
- The glycol heat recovery system is being evaluated for optimum performance.

UCT

- The project at the University Center Tower Building to retrofit the HVAC system with variable air volume systems and variable frequency drives is nearing completion. When the project is complete, there will be a significant reduction in chilled water consumption, natural gas, and electrical energy consumption related to HVAC applications.
- The installation of 1-hour temporary occupancy sensors is being planned. This will ensure the zones are able to return to an unoccupied mode even if the occupant leaves.
- A design to switch the MRI chiller to TECO chilled water is near completion. This will result in several improvements. First, the oversized unit running 24/7 will be removed. Second, the local CW storage tanks will be removed. This will result in a significant reduction in KW demand and an increase in assignable square footage.

IMM

- The manufacturer has modified the HeatPipe system design. This has improved efficiency by approximately 200% while in cooling mode. All five of the main air handlers have been retrofitted and tuned.
- In the lab section of the building, temperature sensors have been relocated to more appropriate locations to properly represent the zones they serve.
- In the lab section of the building, heating and cooling set points are being fine-tuned to insure that there are no temperature swings. As a result, heating occurs only when there is a need for heating and increased air volume for cooling occurs only when there is a need for cooling. The laboratory temperature sensors are being evaluated for accuracy.
- The first phase of programming for air handler temperature reset took place last winter. The needs for chilled water and gas for hot water have been reduced by raising the temperature set point of the main air handlers. This has been accomplished by



monitoring outside air dew point, outside air temperature, and inside worst-case temperature load.

- The next phase included resetting the DP set points for the chilled water and the hot water systems. This has been accomplished through cascade programming that uses the valve position of the system's greatest user to reset pressure set points to the supply water. As a result, there is a reduction in the building load. The variable frequency drives that circulate water thought the building can operate at a lower set point that is easier to achieve with less KW.
- The final phase will be to fine tune and combine the heat recovery system with secondary-air-handler supply temperature reset. The objective will be to properly switch between heating and cooling modes on the heat recovery system. The system will maintain inside temperature needs with free cool air during the winter and use only what is needed during the spring, fall, and summer months.
- A retrofit of the office section of the building has begun. First, the under-floor ventilation system is being reconfigured to meet the actual occupancy and furniture needs. Second, four VAV's will be installed and four zones will be added to the building automation system. Third, both the secondary-air-handlers and the local fan-powered boxes will have 1-hour temporary occupancy sensors installed. Fourth, using the secondary-air-handlers and the local fan-powered boxes, cascade controls will be established. The combined efforts will allow the offices to switch from 24/7 operation to a 12-on/12-off schedule.

DBB/MSI

- At the Dental Branch Building, new controllers are being added to the steam stations to reduce utility usage.
- At the Dental Branch Building and at the Mental Sciences Institute Building, a chilled water valve audit has been completed and leaking valves are being replaced as needed.
- At the Dental Branch Building and at the Mental Sciences Institute Building, a steam trap audit is under way and leaking traps are being replaced as needed.
- The combination new controllers, valves, and traps have allowed for an overall reduction in demand, pump usage, and pressure. In addition, this has led to increased stability and controllability of the water that is supplied to the air-handling units.

OCB

- Due to space reallocation, a stand-alone high-efficiency chiller has become available. Plans are being developed to tie this chiller into the existing chilled water loop to take advantage of the higher efficiency characteristics.
- Two of the oldest chillers are scheduled to be replaced with more efficient chillers.



13. UT HEALTH SCIENCE CENTER - SAN ANTONIO

Energy Conservation Initiatives:

A. Utility Contracts

- The HSC completed negotiations with CPS Energy for a long-term agreement to lower our natural gas costs.
- The HSC joined a consortium led by UTMB to aggregate electrical requirements with UTMB, UTHSCH, and MDA for our facilities in the Rio Grande Valley. GLO's retail provider, Reliant Energy Solutions, was selected as best value bidder. This contract began March 1, 2008 when the existing contract expired. We are using UTMB's energy consultant to determine when to purchase natural gas for generation of this electricity.

B. Energy Savings Initiatives

- Funding has been identified and we have replaced two of the three failed condensate return units and the third one is on order. This will enable these buildings to return all condensate back to the energy plant to conserve the thermal energy.
- The HSC just completed an energy study comparing the HSC energy cost and use with those of other UT institutions. Although the HSC compares favorably with others in pricing, consumption does not. We are evaluating both short and long-range actions that will help reduce energy costs. Most actions require significant funding to accomplish and may, or may not, be cost effective at this time.
- Facilities Management (FM) believes that energy conservation is not only the responsibility of their department, but also the faculty, staff, and students at the HSC. Therefore, we have prepared a list of energy conservation tips for individuals to implement in their labs, offices, classrooms, and clinics. This list has been incorporated into Facilities Management's website along with an article discussing energy management and energy awareness. Additionally, the Utilities Division has placed their SOP on their website.
- The new Chief Operating Officer at the HSC has decided to reinstate the Energy Conservation Committee. The members have been selected and will be given a "charge" at the first meeting. The goal of the committee will be to promote energy conservation initiatives and develop policies for the institution.
- The energy plant personnel are working with the building operations personnel to optimize the campus chilled water system so the energy plant can achieve a higher chilled water temperature differential to increase the overall plant efficiency. These



personnel also monitor steam consumption and condensate return to identify any deficiencies.

- Facilities personnel are pursuing the possibility of installing a “Super” boiler in the North Energy Plant when the South Texas Research Facility is constructed. We are currently working with Cleaver Brooks, CPS Energy, and the Gas Technology Institute to bring this to a reality. This boiler will operate at better than 90% efficiency.
- As new facilities are constructed, the HSC engineers insist that the design teams specify occupancy sensors, heat recovery equipment, energy-efficient equipment, and control schemes to provide the means to operations personnel to operate facilities more efficiently. HSC engineers have developed a set of energy conservation guidelines for new facilities. This list is given to consultants at the beginning the design phase for all new projects.
- The current design of the South Texas Research Facility (STRF) includes the addition of two 1250-ton chillers in the energy plant. This added capacity will allow the two stand-alone buildings on the Greehey Campus to be connected to the plant after construction is completed. Funding will have to be identified for this project.
- Our facility control technicians and electricians replaced five variable speed drives on air handlers that were placed in by-pass due to drive failures. These systems will operate at reduced horsepower. Due to a remaining fund balance, four additional drives were purchased and installed. Funding is continuously being sought to replace other failed drives.
- The HSC police and housekeeping staffs are tasked with turning off lights during evenings and nights when they discover areas that are not being occupied.
- The Central Energy Plant personnel saved \$26,500 by reducing the electrical demand by operating emergency generators for a limited time to avoid reaching new peak electric demands this summer.
- Facilities Management will continue to pursue funding for energy conservation initiatives such as the replacement of old, inefficient equipment, controls re-commissioning, air balancing, additional sub-metering, energy conservation projects, etc. A current PUF request includes replacing 40-year-old air handlers in the Medical School and replacing a 40-year-old boiler in the energy plant.
- The HSC has contracted with an engineering firm to perform an analysis on the Hayden Head Building to determine if equipment upgrades and existing building commissioning will provide a reasonable ROI.
- Installation of Vending Misers on cold drink machines for the three campuses in the San Antonio area is complete. HSC engineers are exploring the possibility of installing “Snack Misers” for non-refrigerated vending machines.



- Facilities Management has initiated a program to more closely evaluate and analyze data collected from our existing sub-meters.
- Sub-metering is being installed on the Cyclotron Addition to the McDermott Building that will assist engineers in analyzing energy consumption of the facility.
- The underground steam piping serving three buildings has been replaced. Replacing this “failed” piping system will save significant thermal energy and will reduce gas consumption this winter.
- As the new South Texas Research Facility is being designed, HSC engineers are insisting on heat recovery devices and connecting the building to the North Energy Plant for chilled water and steam service. Sub-metering will be included.
- HSC engineers completed development of a list of energy conservation measures (ECM’s) that will be presented to the administration for funding.
- As renovations occur in our existing buildings, we are converting our pneumatic controls systems to DDC, where feasible.
- HSC engineers continue to pursue funding to initiate re-commissioning of several buildings on our campuses.

Fleet Fuel Management:

- We have continued to purchase more fuel-efficient vehicles as replacements for older, less efficient models. This has helped reduce our overall vehicle fuel cost.
- The institution has purchased a hybrid vehicle and is in the process of evaluating the feasibility of replacing aging vehicles with hybrids where practical. We have also purchased John Deere Gators and GEM electric utility vehicles to reduce the use of full-size, gasoline-powered trucks.

14. UT HEALTH SCIENCE CENTER - TYLER

Energy Conservation Initiatives:

A. Operations and Maintenance:

- Thermostat recalibration is in progress and ongoing.
- Variable air volume units and controls calibration and repairs are in process and ongoing.
- Monitoring of filters on all air-handling units will improve the operating efficiency of the air-handling units, thereby reducing energy costs.



- Preventive maintenance is being completed on all kitchen equipment monthly and quarterly to eliminate improper operation that causes excessive energy consumption.
- Energy consumption will be reduced by the replacement of one Air Handling Unit (A8).
- Police and Housekeeping staffs are monitoring unoccupied areas for lights left on during routine rounds.

B. Capital Projects:

- A project for upgrades and expansion of the campus electrical distribution system is in progress. The scope of work includes a power factor correction capacitor bank to reduce electric use fees. The target completion date is December 2008.
- A project to replace the Information Technology computer room air conditioning system is completed. The new Liebert air conditioning units are energy-efficient units that will reduce energy consumption.
- A project to install backflow preventers in the main domestic water supply is completed. The water supply district has increased water pressure to this facility, and because of this, the Health Center can remove domestic water pumps and storage tanks.
- A project to convert the Graphics building to a Fitness Center is in progress. This will eliminate major printing equipment and allow for a reduction in energy consumption.
- A project to renovate the Police Dispatch Area is in progress. Upgrades of the air conditioning system and electrical components will be more energy-efficient thereby reducing energy use.
- A project to demolish four (4) older buildings is in progress. The utilities to these locations have been terminated, which eliminates energy use in these utilities.
- The project to replace air handling unit A-8 is in progress. B-9 has been completed. The existing units are over 25 years old. Installation of new, energy-efficient units will significantly reduce energy use.
- A project to replace kitchen steam tables with new energy-efficient units has been completed awaiting another unit.
- A project to replace door gaskets in all kitchen refrigeration units is completed. The new door gaskets will allow the units to perform more efficiently thus reducing energy consumption.
- A project to upgrade hallway C-100 is in progress. This will allow new energy-efficient lighting and water fountains along with new exterior doors for better energy efficiency
- A project is underway for a New Day Surgery. This project is 50% completed and there will be energy savings due to lighting and new a/c controls.
- A project to centralize patient check in The Riter Lobby is completed, thus allowing energy savings due to centralized locations of staffing and equipment.
- A project is in process to renovate the 5 West Nursing Floor. This will be an upgrade of lighting, wall coverings, flooring and doors. The upgrades will help with energy efficiency.
- A project to replace all vending machines with new more energy-efficient machines is in process. A new vendor has been awarded this contract and new machines should start arriving by October 1, 2008.
- New Medical Air pumps are being installed for better efficiency and operation.



15. UT M. D. ANDERSON CANCER CENTER

Energy Conservation Initiatives:

Research and Education Facilities

- The minimum air change standard for the institution's open laboratories has recently been reduced to 6 air changes per hour based on results from an extensive internal study. The new standard has now been implemented in the Basic Science Research Building. Rebalancing the South Campus Research Buildings 1 and 2 to the new standard is in progress.
- A study proposing new more energy-efficient air change standards for traditional laboratories without compromising lab safety is also nearing completion.
- Feasibility of installing a recool system in the Basic Science Research Building (BSRB) to further reduce outside air requirements for this building is in progress.
- The following energy saving fume hood projects are active:
 - Close the sash campaign
 - Test and evaluate zone presence sensors
 - Evaluate automatic sash positioner installation
 - High performance fume hood evaluation program
- BSRB and the Cancer Research Building (CRB) are being relamped with lower wattage fluorescent lamps.
- Measurement and verification of the following projects is underway to qualify for additional energy saving rebates from CenterPoint Energy as part of their standard offer program for 2008:
 - CRB AHU1-4 energy recovery system
 - South Campus Vivarium energy recovery
 - Basic Research Building chilled water bypass
- The feasibility of installing heat recovery chillers in the following two locations is in progress and has the potential to reduce energy costs in the main campus by \$3 million annually.
 - Develop G4 to serve BSRB, Gimbel, Anderson, BRB, Bates Freeman
 - Develop A8 to serve CRB and Alkek

Patient Care and Prevention Facilities

- The design of a heat recovery chiller to serve the Mays Clinic and the Cancer Prevention Building is in progress. This project has qualified for a subsidy from the CenterPoint Clean Air Technology Program. The project is expected to reduce energy costs by more than \$1 million per year.
- A preliminary study of retro-commissioning the Mays Clinic has been received and the following items have been approved for the development phase.



Chilled Water System Measures		Annual Savings
1	TECO Pump Savings Based on Maximizing HX Delta T Control Building Primary Pumps Based on Return Temperature	\$54,800
2	Remove Minimum Pressure Requirement for Primary Side	\$25,600
3	Reduce Secondary Chilled Water Pressure Set point	\$10,400
4	Critical Valve Reset Control	\$66,900
5	Open Pump Balance Valve	\$7,900
6	18F Chilled Water Delta T	\$23,200
7		\$46,800
Air System Measures		
	Dual Duct Unit Cold Deck Reset (Elimination of Constant Reheat)	
11		\$358,700
12	Cold Deck Critical Zone Reset	\$59,700
13	Dual Duct Unit Hot Deck Reset	\$301,600
14	Zone Temperature Revision	\$70,400
15	Revised OA Unit Static Pressure	\$70,000
16	OA Unit Critical Zone Reset	\$8,600
17	Stairwell Temperature Reset	\$3,800
18	Night Space Temperature Setback	\$178,100
19	Night Outside Air Reduction	\$213,400
Total annual estimated savings		\$1,499,900

- Retro-commissioning studies are also underway in CPB, New Clark, Love and LeMaistre
- The following projects are approved for rebate as part of the CenterPoint 2008 standard offer program.
 - Old Clark kitchen exhaust
 - Fannin Holcombe Building chiller
 - Pawnee Warehouse chillers
 - Energy-efficient motors
- A project to upgrade the Alkek G8 infrastructure has been awarded. Energy savings features to compartmentalize the hot and cold decks and return air to hot deck are expected to reduce the existing facilities energy cost by \$500,000 annually.