Revision 2: May 2012

Auburn Facilities
Energy Reduction Plan

Overall Plan: Auburn University Facilities will work to reduce energy usage, utility consumption, energy costs, and the University's carbon footprint by utilizing the following strategies:

1. Increased efficiency of utility production and distribution systems
2. Improved performance and efficiency of University building systems.
3. Increased use of energy saving or energy efficient technologies and operational best practices.
4. Increased energy awareness and energy conservation efforts by all AU Faculty, Students and Staff.

Auburn Facilities Energy Goals:

I. To reduce the overall consumption of purchased electricity (kWh) for the University a minimum of 5% by 2020 when compared to a 2010 baseline. This consumption number will include future growth of the campus.
II. To reduce the overall consumption of purchased gas (MMBtu) for the University a minimum of 5% by 2020 when compared to a 2010 baseline. This consumption number will include future growth of the campus.
III. To reduce the overall consumption of purchased water (kGal) for the University a minimum of 5% by 2020 when compared to a 2010 baseline. This consumption number will include future growth of the campus.
IV. To reduce the overall average electricity energy intensity (kWh use per square foot) of Auburn University facilities 10% by 2015 and 15% by 2020 when compared to a 2004 baseline.
V. To reduce the overall average gas energy intensity (Mcf use per square foot) of Auburn University facilities 10% by 2020 when compared to a 2010 baseline.
VI. To reduce the overall average water use intensity (kGal use per square foot) of Auburn University facilities 20% by 2015 and 30% by 2020 when compared to a 2007 baseline.
VII. To improve utility plant efficiency 10% by 2020 when compared to a 2014 baseline.
VIII. To reduce domestic water, natural gas, chilled water, and hot water utility distribution system losses 50% by 2015 and 75% by 2020 when compared to a 2012 baseline.
IX. To have utility plant and building energy systems operations and maintenance programs managed and conducted using industry best practices.

Auburn Facilities Energy Reduction Plan

Strategy 1: Increased Efficiency of Utility Production and Distribution Systems

1.1 Conduct a Thermal Imaging Survey of utility distribution Systems to identify energy losses.

Goal: To complete a thermographic survey of the Hot Water (HW), Steam, and Electric Distribution systems. Utilizing the results of this survey, develop FY12 and FY13 projects to repair leaks.

Target Completion: February 2013

1.2 Conduct an engineering survey of the domestic water and natural gas distribution systems to identify leaks.

Goal: To complete a survey of the potable water systems from the point of purchase from the City of Auburn and natural gas systems from the point of purchase from Alagasco throughout the University campus to identify areas were leaks or system losses occur. Utilizing the results of this survey, develop FY12 and FY13 project to repair leaks.

Target Completion: September 2012

1.3 Perform Retro-Commissioning of Utility Plants

Goal: Complete Retro-Commissioning of Central Chilled Water, Hot Water, and Steam Plants. Utilizing the results of this survey, develop FY11 and FY12 projects to improve plant efficiencies or operations.

Update: Retro-Commissioning study completed. Plans for low to no cost items are being developed. Funding will be sought for other items that require higher capital cost.

Status: Complete

Auburn Facilities Energy Reduction Plan

Strategy 1: Increased Efficiency of Utility Production and Distribution Systems

1.4 Implement a Predictive Maintenance Program for Utility Plant equipment

Goal: Apply predictive maintenance best practices into the maintenance programs for the equipment in the District Energy Plants.

Target Completion: June 2013

1.5 Increase the number of campus buildings connected to the HW and CW central distribution systems.

Goal: Continue to connect campus buildings to the HW and CW central distribution systems and eliminate standalone, building specific chillers and boilers.

Update: Over the last 2 years, a significant investment was made to connect remaining buildings to the chilled water and hot water systems. Those projects are complete. The remaining buildings that are not connected were either prepped for future connection (pipes stubbed out to building) or were cost prohibitive to connect at this time.

Status: Complete

1.6 Increase the metering of utility systems and campus buildings to provide more detailed utility consumption and usage data.

Goal: Develop a long range plan to increase the metering of utility systems and buildings to provide increased capability to monitor utility/energy usage. Implement top 10 priority meters in FY11.

Update: Projects were initiated to provide water meters to buildings that did not have them. This project is still in design and is to be bid out in the next few months.

Target Completion: November 2012

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1.7 Develop a Plan for Boiler ”Dry Lay-Up”

Goal: Develop a plan to place boilers in a dry lay-up status. Identify facilities where this is required. Implement several lay ups in FY11.

Update: Plan was developed and implemented by Utilities Plant Operations.

Status: Complete

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Strategy 2: Improved Performance and Efficiency of University Building Systems

2.1 Establish and implement a campus wide building setback standard.

Goal: To develop and implement a campus wide setback standard for night and weekend building systems heating, cooling, and lighting set points to conserve energy. Implement for top 50 academic and administrative facilities on campus in FY11. Implement for remaining academic and administrative facilities during FY12.

Update: Energy Management worked with the Sustainability Group to develop a proposed standard. It has not been approved as of yet. Building setbacks are continuing as part of other energy management projects.

Target Completion: February 2013

2.2 Expand Continuous-commissioning and Retro-Commissioning programs.

Goal: Expand the Continuous Commissioning and Retro-Commissioning programs to establish a review of all eligible campus buildings on a six year cycle. For FY11, implement improvement actions identified by FY10 studies. Initiate studies on 10 additional facilities in FY11.

Update: Plan has been developed. RFP for Retro-Commissioning phase 1 is with AU Purchasing. Current Continuous Commissioning project is continuing. Retro-Commissioning pilot project is nearing completion.

Statis: Complete

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2.3 Increase the utilization of Metasys Energy Management System to better manage building energy operations.

Goal: Increase the utilization of Metasys to reduce building energy use by managing facility heating/cooling operations through the use of system monitoring, setbacks, alarms. Increase the ability of the Facilities staff to operate campus buildings using Metasys to achieve this advanced level of operation.

Update: Controls standards are being developed. The 1st phase was to develop standards for items that should be replicated across campus to save energy. This phase is complete. The 2nd phase is to address alarm management of the Metasys system. The building alarms list has been developed. We are currently waiting on some specific information for 2 of the alarms and this will be complete. The last phase of this is to decide on how the system needs to be monitored from a personnel responsibility point of view.

Target Completion: December 2012

2.4 Improve the Preventive Maintenance Program for building energy equipment.

Goal: Improve the Preventive Maintenance Program for the AHUs, distributed chillers, coils, heat exchangers, pumps, boilers, and other equipment to improve equipment performance, efficiency and reliability. Increase the use of industry best practices and the use of predictive maintenance practices. Train Maintenance staff personnel as needed to achieve this goal.

Target Completion: TBD

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Strategy 2: Improved Performance and Efficiency of University Building Systems

2.5 Develop Building Commissioning Standards for new Facilities.

Goal: Develop a set of Building Commissioning Standards, tailored to specific building types, to be utilized on all new facilities. FY11 goal is to develop a contract specification to utilize on University construction contracts for new facilities.

Target Completion: TBD

2.6 Establish a LEED standard for new Auburn University Facilities.

Goal: Establish a University policy regarding the LEED standard, and any standard credits to be achieved on new University facilities.

Update: The proposed University policy has been developed. It is going to be presented to the University leadership for the decision for approval.

Target Completion: TBD

2.7 Develop and implement plan to replicate Discharge Air Temperature Resets, Static Pressure Resets, Secondary Hot Water Pressure Resets, Chilled Water Pressure Resets, and Hot Water Temperature Resets across campus.

Goal: Replicate program to all applicable buildings.

Update: This is a new item added to the Energy Reduction Strategy. A master sheet is being developed to track which buildings have been done. An implementation plan will be developed at that point.

Target Completion: June 2013

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Strategy 3: Increased Use of Energy Saving or Energy Efficient Technologies

3.1 Continue Building Lighting Retrofit Program.

FY11 Goal: Continue to replace lights in campus facilities with newer, more energy efficient bulbs.

Update: Approximately $150,000 was invested this past year to retrofit buildings from T12 fluorescent bulbs to T8. The majority of the remaining retrofits were addressed. A small number of buildings remain and should be addressed over the next year.

Status: Complete

3.2 Develop Projects for Solar Hot Water Pre-Heat

FY11 Goal: Investigate the feasibility of using solar hot water heaters to preheat or heat domestic water for use in University facilities. Develop several pilot projects to implement in FY12.

Update: Solar hot water was not used as one of the renewable pilot projects. With the renovation of the Hill Dorms in the next few years, this should provide the opportunity to test this technology.

Status: Deferred

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Strategy 3: Increased Use of Energy Saving or Energy Efficient Technologies

3.3 Initiate Feasibility Studies for Solar Photovoltaics, Ice Cooling, and Cogeneration

FY11 Goal: Conduct studies to assess the feasibility and applicability of using solar photovoltaics, ice storage/cooling, and cogeneration on the Auburn campus.

Update: A 6.2 kW Solar PV Pilot Project was completed on the roof of the stadium parking deck. A second solar installation was completed as part of the Village Mailroom project.

A feasibility study of the use of Cogeneration has been completed. Due to our low electric rates and ample hot water capacity, we are not good candidates for the technology at this time.

Ice Cooling/Cold Water Storage will be evaluated as part of the chilled water and hot water master plans which will be kicking off in the next year.

Status: Complete

3.4 Evaluate Hawk ICS Systems for Boilers for Use Across All District Systems

FY11 Goal: Evaluate Hawk ICS Systems for Boilers and potentially replicate across all District Energy Plants. Complete assessment in FY11 and if recommended, prepare for FY12 implementation.

Update: The Hawk ICS system was evaluated during the Retro-Commissioning of the Utility Plants study. The Hawk ICS system has improved the efficiency of our hot water boilers from approximately 82% to 87%. This is a good project to replicate with less than a 2 year payback.

Status: Complete

Auburn Facilities Energy Reduction Plan

Strategy 3: Increased Use of Energy Saving or Energy Efficient Technologies

3.5 Initiate Feasibility Studies for the Use of Economizers and Reheat Systems

FY11 Goal: Assess the feasibility of economizers using condenser water for pre-chilling CW systems. Assess the use of reheat systems to capture waste heat to pre-heat HW systems. Complete assessment in FY11 and if recommended, develop projects for FY12 implementation.

Update: These systems were evaluated as part of the Retro-Commissioning of the Utility Plants study. These technologies were determined to not have a good enough payback to pursue.

Status: Complete

3.6 Assess the Feasibility of "Green Roofs" on University Facilities

FY11 Goal: Assess the feasibility and applicability of the use of "green roofs" on University facilities. This study should consider maintenance and roof damage considerations. As applicable, identify candidate facilities or projects for implementation.

Status: Deferred

3.7 Assess the Feasibility of Power Factor Correction to Improve System Efficiency

FY11 Goal: Assess the feasibility of using power factor correction technology to improve the performance of major building or energy plant equipment. Identify key areas where this technology may be applicable. Develop pilot projects for FY12 implementation.

Target Completion Date: March 2013