

UNIVERSITY AT ALBANY ENERGY ACTION REPORT AND 2012 ENERGY ACTION PLAN

BACKGROUND

The purpose of this document is to share periodic progress related to energy use reduction on campus and provide updates regarding ongoing and planned efforts and projects to continue to reduce campus energy usage. The Energy Office within Facilities Management developed a draft Energy Action Plan in October 2008, approved by the University, targeted at the following goals:

1. Meet annual/short-term utility budget cost savings
2. Minimize cost impact of future changes in utility rates and weather/climate
3. Prepare the campus for carbon neutrality/energy independence

The plan included a portfolio approach comprising of several energy conservation initiatives, and energy efficiency and renewable energy technology projects. The plan estimated that the University can realistically reduce its energy usage by 14% to achieve an Energy Use Intensity of 140,000 Btu/SF/Year and energy costs savings of \$2 Million per year. However, it was estimated that the whole portfolio of projects may take 5-7 years to implement due to budgetary constraints and planning and design requirements.

PROGRESS ON 2008 ENERGY ACTION PLAN

Since the approval of the 2008 Energy Action Plan by President Philip and his senior staff, tremendous progress has been made to achieve the goals laid out in the plan. Few of the highlighted projects that were implemented include:

ENERGY CONSERVATION INITIATIVES

1. **Winter Intersession Energy Initiative:** The campus implemented a two-phase winter intersession energy initiative in Dec 2008-Jan 2009. The initiative resulted in approximately \$250,000 in utility cost savings. The campus has since implemented the initiative annually with a total utility cost savings to date of approximately \$1,000,000. More information about the initiative can be found at <http://www.albany.edu/facilities/energy/documents/Intersession-Shutdown-Policy.pdf>.
2. **Energy Campaigns:** The campus has been conducting energy reduction competitions between the Residence Halls every Fall since 2006. The campaign was extended to faculty and staff in the Academic Podium buildings in Fall 2009. A real time Energy Monitoring site was developed so anyone on campus can access real-time power demand on any building on campus. The site is located at <http://www.albany.edu/facilities/energy/dashboard.html>. The energy campaigns result in savings of approximately \$100,000 per year.
3. **Building Mechanical System Scheduling:** The operating schedules for individual building mechanical systems are programmed every semester to match the anticipated occupancy schedule of the building occupants served by the system. Turning the units off during periods when the building is unoccupied results in both electrical and cooling and heating energy savings. The current schedule for the mechanical systems in each building can be accessed at <http://www.albany.edu/facilities/energy/documents/AHU-Schedule.pdf>.
4. **Space Temperature Setpoint Policy:** The University adopted a Space Heating and Cooling (Temperature setpoint) policy that prescribes temperature set points to be maintained in the spaces during heating and cooling season to meet thermal comfort requirements of the occupants while minimizing heating and cooling energy costs. The policy is located at <http://www.albany.edu/facilities/documents/TempSetPointPolicy.pdf>.

ENERGY EFFICIENCY PROJECTS

1. **Envelope Upgrades:** The University has implemented several envelope upgrades including replacement of original single pane windows in the Fine Arts, Arts & Sciences, and Earth Sciences building with new double pane thermally-broken windows; roof replacement and addition of insulation on Social Science, Power Plant, and Earth Sciences; and window improvements in Downtown Campus academic buildings.
2. **Central Plant Upgrades:** A central plant mechanical upgrade project included significant equipment and efficiency improvements to the heating and cooling infrastructure of the entire Uptown campus. Older electric chillers were replaced with new high efficiency chillers with variable speed compressors, variable frequency drives were added to cooling towers and boiler draft fans, boilers were re-tubed, chiller and boiler plant controls were upgraded and heating oil was switched to ultra-low sulfur.
3. **Mechanical System Upgrades:** The University has implemented several other mechanical system upgrades, including but not limited to, replacing the old inefficient chiller in SEFCU Arena with new magnetic bearing, high efficiency chiller; upgrading the Air Handling Unit in Performing Arts Center with new motors, belts, variable frequency drives, and controls; insulating approximately 1,400 linear feet of high temperature hot water lines; implementing demand based ventilation controls in Lecture Center 3; installing variable frequency drive on the swimming pool motor in Physical Education; and several other motor replacements and VFD installations throughout campus.
4. **Lighting Upgrades:** The University is nearing completion of a lighting replacement project that replaced T12 and older T8 lighting in various classrooms, offices and conference rooms, throughout the academic Podium with new high performance T8 and occupancy controls. This project is being implemented by the New York Power Authority. Other notable lighting projects include the installation of LED lights for exterior box light fixtures; LED fixtures for one of Draper office suites; newly lit light wells installations; and upgraded efficient lighting in all Uptown elevators, installation of Siemens lighting controllers for all exterior lighting, and a pilot LED parking lot project at the Colonial Quad parking lot.
5. **Water Conservation:** University Hall, Science Library and LSRB irrigation system were connected to the Indian Pond to eliminate the use of potable water for irrigation. Low flow fixtures were installed in various academic buildings, residence halls and Physical Education building.
6. **Miscellaneous:** New electric meters were installed at the Downtown campus to measure individual building electric use. Facilities assisted University ITS in securing a \$200,000 grant from NYSERDA to implement a Data Storage consolidation project that resulted in significant reduction in energy used by the storage servers in the Data Center.

RENEWABLE ENERGY TECHNOLOGY PROJECTS

1. **Photovoltaic System:** The University won a Federal ARRA funded grant from the Department of Energy/NYSERDA to install 49.2kW Photovoltaic system on the roof of the Social Sciences building. The system was installed in Summer 2011. The system is performing as expected and providing nearly 5% of the building's annual energy usage. Information about the system including real-time data can be accessed at <http://sunviewer.net/portals/Albany/>.
2. **Geothermal System:** The University installed a 400-ton ground source heat pump system to provide heating and cooling to Liberty Terrace, the new student housing project on campus. The use of the system resulted in 50% estimated energy cost reduction in the new building when compared to a baseline building with conventional mechanical system.

SUSTAINABLE NEW CONSTRUCTION AND MAJOR RENOVATION

1. **UA High Performance Guidelines:** The University adopted the High Performance Building Guidelines in November 2010 to guide energy efficient and sustainable design on all new construction and major renovation projects on campus. The new School of Business building (slated to open in 2013) and the Liberty Terrace Apartments (opening August 2012) followed the guidelines and are on track to achieve LEED Gold rating. The guidelines are located at <http://www.albany.edu/facilities/energy/documents/UA-MinEESustainabilityGoals.pdf>.
2. **LEED:** Husted Hall became the first building on campus to achieve LEED certification by including sufficient energy and sustainability measures in the rehabilitation to achieve LEED Silver and recent new construction projects will likely achieve LEED Gold.

UTILITY COSTS REDUCTION

1. **Utility Audit:** The University utilized the services of a utility audit consultant on State Contract to review electric, gas and water bills for the last 2 years for any billing errors. While the audit did not uncover any errors, it provided reassurance about the accuracy of our utility accounting system.
2. **Switch Gas Supplier:** The University switched its natural gas supplier for its Uptown heating plant that lowered the commodity and delivery costs and eliminated the need to burn oil due to no interruption in gas service. The University also avoided burning any #4 oil at the Downtown campus heating plant by purchasing gas on the spot market during interruptions in service.

IMPACT OF ACTIONS

The implementation of the measures recommended within the 2008 Energy Action Plan and others as listed here have reduced the campus's electricity and heating fuel usage considerably resulting in a reduction in the Greenhouse Gas Emissions from energy usage on campus.

Since the baseline year of 2007-08, University campus electricity usage has **decreased** by approximately 8% and heating fuel usage has decreased by approximately 11%. Overall, the University has successfully achieved approximately 10% reduction in total energy usage which translates to annual utility cost savings of over \$1.5 million. The average Energy Use Intensity over the last 4 years is 141,000 Btu/SF/Year, with electricity contributing roughly 35% and heating fuel the remaining 65% of total energy use on campus. In summary, the University successfully implemented the 2008 Energy Action Plan to meet the targets set forth in the Plan.

2012 ENERGY ACTION PLAN

The goals laid out in the 2008 Energy Action Plan continue to guide the University's efforts. Additionally, the SUNY Strategic Plan 2010 and beyond sets forth a goal of at least 30% reduction in consumption by 2020 compared to 2010 baseline. To meet this target, the University has to reduce energy consumption to achieve an Energy Use Intensity of about 100,000 Btu/SF/Year.

The two primary focuses of the efforts in the next decade are:

1. **Develop a Sustainability Master Plan** that lays out the long-term vision as well short-term goals, strategies, and action items for a more sustainable campus. Energy and Built Environment will be one of the key components of the Plan.
2. **Increase the amount of on- and off-site renewable energy sources** to meet University demands. As part of the Master Planning exercise, a Renewable Energy Systems Feasibility study will be pursued to analyze the applicability of various types of renewable energy sources for UAlbany's various campuses. Some of the measures that will be evaluated include large scale photovoltaic systems, solar thermal for pool water and domestic hot water heating, passive solar systems, geothermal system for providing domestic hot water and process cooling to academic podium, fuel cells, and food-to-energy systems. Systems that are recommended as feasible will be pursued for implementation. External funding sources and partnerships are essential for implementation and affordability. Opportunities to include renewable energy systems in new construction and major renovation projects will be evaluated.

The University will also continue to implement energy efficiency and sustainability measures to meet the ever increasing targets for energy use reduction. The following is a list of highlighted projects that are included in this plan and are in some stage of development and/or implementation:

1. Installation of water meters in various academic buildings, residence halls and support buildings
2. Building Management System Upgrades at various buildings on campus
3. Air Handling Systems Upgrades at various buildings on campus
4. Heat Recovery Loop for Life Sciences Air Handling Units
5. Domestic Hot Water Replacement at Richardson Hall
6. LED Lighting at Colonial Quad Gold Parking Lot
7. LED fixtures for new Purple Path pedestrian pathway lighting
8. Fine Arts Museum Lighting and Controls Upgrades
9. Lighting Upgrades at SEFCU Arena
10. University Library Lighting Controls Upgrade
11. Lecture Center Lighting Controls

For more information, please visit the University Energy website at <http://www.albany.edu/facilities/energy/>.