

BOSTON UNIVERSITY

greening the campus

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Energy Management and Resource Conservation

The Facility and Energy Service (F&ES) department of Boston University's Office of Facilities Management and Planning oversees the energy and utility management function for the Charles River Campus. F&ES continually assesses and evaluates energy and utility requirements, provides master planning, and infrastructure evaluation. F&ES is also responsible for the development and implementation of broad-based conservation and management programs that reduces the operating cost for Boston University.



Boston University has completed several energy efficiency and environmental footprint reduction programs consisting of:

1. Retrofitting and Upgrading Lighting and Mechanical Systems
2. Consolidation and Improvements to Chiller Distribution Systems
3. Optimizing Boiler Efficiency and Controls Systems
4. Steam Trap Preventative Maintenance Program

Since 1990, the Facility and Energy Service department has initiated an increasingly aggressive energy conservation program for the Charles River Campus in order to reduce the base energy loads for electricity, fuel, water and sewer, and to incorporate energy conservation concepts into the design of new facilities. The F&ES's approach is to reduce the base loads of the Charles River Campus by replacing light bulbs with energy efficient lighting systems, replacing electrical motors with variable speed motor units, installing water conservation devices, installing boiler controls to optimize efficiency, and implementing preventative maintenance programs to maintain the reductions.

Because our overall capacity changes in many ways, it is impossible to quantify exactly the savings represented, but we estimate that these performance improvement programs have reduced Boston University's Annual Utility Cost as follows.

Utility	Usage Reduced	Cost Avoidance (FY2006 Dollars)
Electricity	11,672,983 kwh	\$1,400,758
Fuel Oil	719,266 Gallons	\$1,366,606
Water/Sewer	78,040,086 Gallons	\$864,910
Total Reduction		\$3,650,273

Future Improvement Program

The following are some of the initiatives the University is planning and considering for the near future:

Lighting

- Continue Lighting Retrofit Programs to include Occupancy Sensors and Lighting Controls with Daylight Dimmers
- Install Electrical Distribution Meters to audit buildings

Thermal Energy

- Consolidate Boiler Systems in Brownstones
- **Upgrade Central Heating and Cooling Plant**
 - **All five boilers are currently being retrofitted with new high efficiency Limpsfield burners, which are operated by a state of the art combustion management system manufactured by Autoflame. The partnering of Limpsfield and Autoflame and the installation of variable speed electric motors (for very precise control of fuel and air) will ultimately limit harmful emissions, tremendously increase the efficiency of steam generation, and save the university in expenditures for fuel and electricity. Additionally, each boiler will be fitted with Autoflame exhaust gas analyzers which measure carbon dioxide, carbon monoxide, and nitrous oxide emissions and provide "real time" overall operating efficiency.**
- Re-commission Existing Buildings to Optimize Operations
- Expand Building Automation Systems
- Install Thermal distribution Meters to audit buildings
- Expand Steam Trap Preventative Maintenance Program
- Explore Alternate Fuel Technologies

You can help to reduce utility consumption on the Charles River campus by:

- Turn off lights (including task lights) when exiting your room for more than ten minutes and at the end of the day. The energy used to start fluorescent bulbs is compensated by leaving them off for at least one minute. (1,500 persons turning off their lights for one hour would represent a savings of 300 kwh each hour.)
- Turn off your computer and power down your whole system when you are away, especially nights and weekends. (1,500 persons turning off their computers for one hour would represent a savings

of 750 kwh each hour. If 1,500 persons turned off computers that are currently left on when they were out of their offices, it would save over 4 million kwh, or over \$690,000 over the course of a year.)

- On campus residents should review their use of water (sinks and showers). (Each minute of extra water flow consumes 2.5 gallons multiplied by the student resident population, represents 25,000 gallons of water for each minute, plus the thermal energy required to heat the water.)

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- Energy Management and Resource Conservation
 - Solid Waste Management
 - Purchasing
 - Transportation
 - Construction
 - BU Events
 - What Can You Do?

RELATED LINKS

- Earth Portal
- Assoc. for the Advancement of Sustainability in Higher Ed.
- Campus Consortium for Environmental Excellence
- Green Schools listserv
- *Chronicle*: "The Sustainable University"
- *Science*: "Special Sustainability Issue"
- Global Climate Change
- New England Climate Coalition
- EPA New England - Greening our Operations



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