

As energy-saving technologies have evolved, so has the University of Maryland, Baltimore County. Years before “going green” and “climate change” were mainstream issues, UMBC embraced new technologies to conserve energy and minimize the university’s impact on the environment.

Summarized below are some of UMBC’s initiatives pertaining to Energy Efficiency and Conservation that have been **previously implemented:**

- Upgraded heating/cooling systems for campus by retrofitting the Central Plant with high-efficiency boilers, chillers, and hot water pumps.
- Installed thermal energy storage system to supplement the Central Plant. Charging the million gallon chilled water tank at night reduces the load on the electric grid during peak daytime hours.
- Converted air distribution systems from constant air volume to energy-efficient variable air volume (VAV) systems. For this extensive project, UMBC utilized energy performance contracting.
- Upgraded heating/cooling systems for student housing by replacing stand-alone units with Satellite Plant utilizing high-efficiency boilers, chillers, and pumps.
- Upgraded pneumatic controls with Direct Digital Controls tied to a Building Automation System with graphical user interface.
- Upgraded exterior lighting for roadways, walkways, and parking lots to high-efficiency metal halide lamps.
- Upgraded interior lighting from T12 to more efficient T8 and T5 lamps and ballasts. Replaced incandescent bulbs with compact fluorescent lamps.
- Installed low-flow toilets, urinals, faucets, and showerheads to reduce water consumption. Eliminated condensing units that used city water for cooling.

Summarized below are some of UMBC’s initiatives pertaining to Energy Efficiency and Conservation that are **ongoing:**

- Energy Procurement – By combining the buying power of several University System of Maryland (USM) institutions, UMBC purchases natural gas and electricity at favorable rates and reduced pricing volatility.
- Energy Rebates – By implementing strategic measures to reduce electrical load when the electric grid is stressed by high demand, UMBC increases the reliability of the regions’ distribution network and qualifies for energy rebates.
- Renewable Energy – UMBC gets one-fifth of its electricity from renewable sources via Renewable Energy Credits (RECs). UMBC is investigating the feasibility of onsite renewable energy, including solar PV on roofs, solar hot water for heating the pools, and geothermal opportunities for new construction.
- Clean Horizons – UMBC was involved in the State's collaborative process for "Generating Clean Horizons," a first-of-its-kind initiative to spur large-scale renewable projects in/near Maryland. With Clean Horizons, renewable energy will be produced where it is most physically and economically viable. As a result of a competitive bid, the recommended projects include land-based

wind, solar PV, and offshore wind. The renewable energy from Clean Horizons is expected to come online as early as January 2011 and ultimately produce 20% of all electricity used by State agencies. UMBC—along with all State agencies—will be buying this clean/green energy via long-term Power Purchase Agreements (PPAs) that include the electricity commodity and the associated RECs.

- **Set Point Standards and Scheduling** – Space temperature set points were lowered in the heating season and raised during the cooling season. Also, HVAC equipment on/off times were adjusted to more closely match the actual occupancy. Areas identified by the users and confirmed by Facilities Management to have special environmental needs have been granted exception waivers. The process to further improve set point control, equipment scheduling, and space utilization is ongoing.
- **Performance Contracting** – Facilities Management is working with NORESCO, a pre-qualified and approved energy savings company, to perform an energy audit for the campus to identify and quantify additional energy conservation measures (ECMs) that essentially pay for themselves via energy savings. UMBC is currently negotiating the detailed scope of a 15-year Energy Performance Contract. **Potential ECMs include the following:**
 - **Lighting** – Reduce wattage while maintaining IESNA-recommended lighting levels by upgrading to higher efficiency lamps and ballasts, adding occupancy sensors where cost-effective, and upgrading roadways/walkways/parking lots to LED lighting.
 - **Water Conservation** – Upgrade to the latest low-flow devices while maintaining or improving performance of the fixtures, including toilets (1.1 – 1.28 gpf), urinals (1.0 gpf), lavatory faucets/aerators (0.5 gpm), kitchen faucets/aerators (1.0 gpm), and showerheads (1.0 – 1.25 gpm). Add web-based irrigation controls so that Grounds can more effectively utilize the weather forecast and meter the water used for irrigation.
 - **Chilled Water Optimization** – Improve chilled water distribution and efficiency via improvements to the main loop and tertiary systems, including high efficiency pumps, variable speed drives, 2-way valves, and programming.
 - **Building Envelopes** – Improve weatherization (weather stripping, caulking, and insulation) throughout the campus.
 - **Demand Control Ventilation** – Utilize CO₂ sensing in lecture halls and UC multi-purpose room to control outside air intake of the associated air handling units for maximum energy efficiency.
 - **Behavioral Change** – Develop a customized awareness program to heighten and reinforce “green” initiatives.
 - **LEED-EB Screening** – Survey three buildings (Physics, ITE, and Public Policy) to determine the potential and feasibility to achieve LEED Silver Certification for Existing Buildings.
 - **Utility and Energy Sub-Metering** – Establish comprehensive campus-wide metering system to improve energy efficiency by using real-time and historical data to encourage and support energy efficiency.
 - **Lab Hood Controls** – Upgrade controls to safely and automatically reduce flow when no one is in front of the fume hood.
 - **Solar Energy** – Provide solar PV on a roof (such as the Commons) as a demonstration of onsite renewable energy.