

MC's Green Routine

Resource Conservation Program Overview

- Since the first energy crisis of the 1970s Montgomery College has been a leader in sustainability, energy and resource conservation and cost containment. Integrated life cycle management practices have reduced the College's environmental footprint while avoiding capital and operating cost. The following list is a brief description of the activities.
- Site Link:
http://www.montgomerycollege.edu/Departments/facilitiesca/energy_management.htm

Strategic Master Planning

- Managing a quality planning process whose goal is to integrate resource conservation principals into the College infrastructure and optimization of resources. Plans are developed for programs, space, facility condition assessment, utilities, information technology infrastructure, building automation, life safety systems, emergency response and environmental safety.

Storm Water Management

- Minimizing environmental effects of storm water run-off by reducing impervious surfaces, increasing on-site infiltration and installing and maintaining storm water structures on the campus.
- Use of green roofs to reduce storm water run-off and reduce heat island effect.

Heat Island Effect

- Use of high albedo (reflective) roofs, green roofs and enhanced landscape to reduce urban temperatures due to absorption of solar radiation and heating in structures.

Light Pollution and Dark Sky

- Best practices to optimize site lighting to provide appropriate lighting for occupants while reducing energy, reducing light pollution from spilling over into neighboring sites and limiting light pollution above the horizontal plane (Dark Sky).

Sustainable Sites

- Goal to limit consumption of undeveloped land by redevelopment of urban sites or development of existing sites in order to minimize impact of campus expansion. Properties already served by transportation, storm water and utility infrastructure tend to minimize environmental impacts and preserve and improve existing urban settings.

- Improved transportation management practices.

Water Conservation

- Best practices for conservation of water resources and sewer costs through specification, installation and maintenance of low water consuming devices.
- Use of drought resistant native plant species.
- Capture of condensate from air handling units and re-use as make-up water for cooling towers.
- Evaluation of rain water capture systems for domestic water use and storm water management reduction.

Forest Conservation & Native Plant Species

- Natural Resource Inventory and Forest Stand Delineation and preparation of Forest Conservation Plan for each campus.
- Conservation and maintenance of natural cover trees and native plant species to provide impervious surface and reduce the heat island effect.
- Plant species that have long lives, are resistance to pests and drought, are less dependant on chemicals and watering.

Renewable Energy

- Site generated solar electricity, site generated solar thermal energy conversion and purchase of renewable energy certificates (REC) reduce consumption of energy derived from other less environmentally friendly energy sources. Annually 160,000 kilowatt-hours (kWh) of photovoltaic (PV) electricity and 183,000 kWh(thermal equivalent) from evacuated tube collectors are generated college-wide. An additional 70kW of PV will be installed in the next five years and generate an additional 200,000 kWh of electricity.
- 75% of the Colleges projected fiscal year 2010 electricity is obtained from wind energy RECs up from the original 5% which began in fiscal year 2005.
- Renewable energy displaces approximately 27 million pounds of carbon dioxide (CO₂) annually

High Performance Buildings

- Since 1985, new and renovated buildings have been designed, constructed and maintained to minimize the impact on the environment.
- Energy efficiency, occupant comfort, indoor environmental quality, daylighting, high performance building automation systems, high performance lighting systems, high performance envelope systems, whole building total quality commissioning, environmentally friendly building materials and site infrastructure are routinely integrated into building designs.

- The two new science buildings, one under construction and one in design are being submitted for U.S. Green Building Council (USGBC) LEED Gold Certification which exceeds the County Council mandated LEED Silver Certification.

Transportation Management

- Encourage students to use public transportation by providing on-campus transportation facilities and free bus service on Montgomery County's Ride-On bus system. At the Takoma Park/Silver Spring campus this has resulted in single person use of vehicles to be less than 50%. Full automation of parking management systems for issue of parking passes, tickets and payments.

Utility Management

- Management of utility accounts, payment of bills, tracking consumption, auditing costs and utility database management is a basic function of utility cost center accounting. Maintaining accurate utility consumption records also provides measurement and verification of resource conservation program performance. Montgomery College has participated with other County Agencies in the procurement of deregulated natural gas and electricity procurement.

Utility Demand Management & Smart Grid Technologies

- Since the early 1990s the College has incorporated demand management features in central plants that are able to reduce utility peak demand and capable of responding to Smart Grid pricing signals.
- Four central plants include ice thermal storage with low temperature high efficient chillers and ammonia (R-717) refrigerant. Ice is made at night during low demand rate periods and melted during the day during high demand rate periods reducing electrical demand charges and more efficiently using the utility grid. Colder chilled water is then made available to the system which reduces pumping energy and improves heat transfer performance.
- Ammonia is also a highly efficient refrigerant with no global warming potential (GWP), no ozone depletion potential (ODP) and a low total equivalent warming index (TEWI).
- Building heating, cooling and power technologies (BHCP) are also incorporated which electrical demand while more efficiently using the available energy in the fuels. Three of the College's central plants use natural gas fired engine driven chillers during peak electrical periods to make chilled water for cooling while recovering waste exhaust and engine jacket heat for use in the central heating distribution system.

Operations & Maintenance

- Operation and maintenance of College resources in a safe, reliable and economical manner which maximizes the educational experience while minimizing life cycle costs.
- Best practice use of cleaning and pesticide chemicals reduce costs and environmental impacts.

- Grounds and landscape best practice use of drought, disease and insect resistant native species and use of high efficiency, low emitting grounds equipment.
- Management of recycling programs.
- Best practice vehicle fleet management maximizes life cycle costs.
- Use of recycled or reusable plastic instead of virgin materials such as woods for storage and moving containers.

Educational Programs

- Credit, non-credit and certificate programs related to sustainable or “green” collar jobs are offered at the College while many traditional courses have integrated sustainable concepts into their syllabi.
- Montgomery College has partnered with Montgomery County Government, University of Maryland, and the State of Maryland to support the new Clean Energy Center at the University of Maryland Shady Grove with the intent to further promote and stimulate sustainable programs and “green” collar jobs training.
- The College is developing strategic partnerships with commercial enterprises in the local clean energy industry to identify and address the workforce needs of the industry through training.
- Site Link:
<http://www.montgomerycollege.edu/wdce/bits/goinggreen.html>

Interagency Coordination

- Coordination with government and professional organizations maximizes communication and shares resources such as energy management, deregulated utility management, procurement, building systems and information technology.
- Participate in development of Montgomery County Climate Protection Plan, Greenhouse Gas Inventory, Clean Energy Center and legislative green initiatives working groups.
- Participate with NIST & ASHRAE in building system research studies and building automation systems standards development

Occupant Awareness & Outreach

- Publish annual Resource Conservation Plan and promote occupant awareness through various media outlet such as electronic and paper newsletter, e-mail distribution and management of the Montgomery College Speaker’s Bureau.
- Support for student MC Student Green Club.
- Production of Montgomery College Television (MCTV) programs highlighting sustainability efforts at Montgomery College.
- Spectrum Lecture Series on the Germantown Campus, since 1980 offers lectures from experts in the field of energy and the environment.

Environmental Safety

- Since late 1970s, management of occupational and environmental safety issues, including OSHA, asbestos abatement, hazardous waste stream management, occupant awareness and indoor environmental quality (IEQ). Introduce use of alternatives such as citrus based solvents for automotive and printing shop and lab cleaning rather than volatile organic compounds (VOC).

Recycling

- In calendar year 2008, Montgomery College recycled 69% of its waste stream, far exceeding the County's legally mandated 50% recycling requirement. This resulted in being awarded the County's Excellence in Recycling Award. This is the sixth such award in the past eight years for the College. This is also an increase in poundage of materials recycled from one million in 2002 to three million in 2008.

Building Automation Systems

- Planning, design, operations and management of multivendor, open protocol (BACnet) fully integrated building automation systems. Integrating direct digital systems that control, monitor, operate and record heating and air conditioning systems (HVAC), lighting systems, occupancy sensing, electrical system, fire protection systems and security and access control.

Administrative Functions

- Digital automation and management of administrative functions reduce time, paper and postage such as electronic processing and direct deposit of employee paychecks.
- Electronic distribution of W-2s.
- Provide automated web based financial systems for student bill paying and transportation management functions such as parking stickers and traffic enforcement.

Information Technology Systems

- Efficient management of information technology resources (IT). Use of high performance energy star equipment and low energy consuming LCD screens.
- Participation in interagency committees to share information and resources.
- Master planning for information technology life cycle infrastructure management.
- Use of e-mail and electronic newsletters rather than paper or mail distribution.

Procurement

- Digital automation of procurement process to reduce time and paper. Use of electronic media to reach out to broader audience, opportunity for more competition and reduced cost.

- Purchase material using existing procurement contracts to reduce administrative duplication.
- Purchase energy star equipment to reduce energy consumption.
- Participate in interagency committees to share information and resources and work towards common procurement guidance for purchase of “green” materials.

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