Monmouth University - EPA
Memorandum of Understanding
Update Report - July 16, 2009

This is Monmouth University's first Update Report on the various activities identified in the Memorandum of Understanding (MOU) entered into between Monmouth University ('Monmouth' or 'the University') and the United States Environmental Protection Agency (EPA) on January 16, 2009.

This Report is organized in accordance with the main headings of the MOU.

GreenPower Partnership

In March of 2009, the University submitted an application to become an EPA GreenPower Partner. The application was submitted based on our operating solar PV system, described below. We were informed that our application could not be accepted because we sell the Solar Renewable Energy Certificates that the system generates, and therefore could not claim the renewable energy or environmental benefits of the system under the GreenPower Partnership program.

The University's solar PV system continues to produce power and reduce greenhouse gas emissions. For the period from January 1, 2009 through June 30, 2009, the 470kW system produced 216,907.93 kilowatt hours of electricity. The system resulted in a reduction of 144,159.14 pounds of CO_2 during this period, as well as reductions of 160.42 pounds of NOx and 446.81 pounds of SOx.

In June and July of 2009, the University entered into contracts beginning in July and August of 2009 to purchase certain quantities of electricity from the Hess Corporation. Included in the fixed price for the electricity is 10% of National Green-e Non-Specific energy. Based on estimated quantities, this should amount to the purchase of 1,286,913 kWh of renewable energy over the lifetime of the contracts.

The University has committed 835kW to a PJM Demand Response program for the summer of 2009 to help lessen peak loads and the need to use high greenhouse gas emitting peaking plants during periods of high demand.

The University has submitted an application to the New Jersey Economic Development Authority, through the Clean Energy Solutions Capital Investment Loan/Grant Program for partial funding of a proposed 470kW solar PV system at our new Multi-purpose Activity Center.

ENERGY STAR Building & Plant Partnership

On March 4, 2009 Monmouth became an EPA ENERGY STAR Partner.

Since January of 2009, the University has implemented/installed the following energy conservation measures:

- Replaced 206 100 watt incandescent bulbs with 27 watt equivalent compact fluorescent bulbs in Wilson Hall Skylight
- Additional occupancy sensors have been installed in the Plangere Center and the Facilities Management Building.
- We continue to identify areas of campus to install warm air hand dryers
- The Wilson Hall mechanical control/equipment upgrade is nearly complete. This new system uses both web access and wireless technology to control the boilers, dampers, steam valves, and heat exchanger. The new technology will gives the University control of the boiler operation and local controls (thermostats). With better and more definite control Wilson Hall will experience not only more stable levels of comfort but should realize energy savings once the system is in full operation. The final phase will be completed as soon as the heating season winds down. It is then that new coils and dampers will be installed. This new equipment will be operated by the new control system. This new system will be accessed from anywhere in the world with access to the internet.

Through June of 2009, electricity and/or natural gas usage data has been entered into EPA Portfolio Manager for 25 campus buildings, representing 834,862 sf. Ten of these buildings are not residence halls, so benchmark ratings are not available. Benchmark ratings for the residence hall buildings range from NA to 100. However, many of these buildings are individually metered for only one energy source, and are therefore not eligible for an ENERGY STAR designation. The University is working towards metering each energy source in each residence hall.

Monmouth University, through the New Jersey Clean Energy Program, hosted a highly successful lighting fair in conjunction with Earth Day where high efficiency lighting products were offered to the campus community and the community at large at significantly reduced prices. Attachment 1 to this Report provides a summary of the benefits resulting from this lighting fair. A second lighting fair is being planned for student move-in day, 2009.

GreenScapes Partnership

Although Monmouth committed in the MOU to become an EPA GreenScapes Partner, we understand that as of February 1, 2009 the GreenScapes program will no longer be a member program but will continue to issue guidance on water conservation and re-use of industrial materials dealing with landscaping activities.

The following practices are employed on campus:

- Bedding trays and plant containers from annuals and other greenery are recycled and reused for the next planting season
- Plastic commercial containers are triple rinsed and recycled
- Used oil and tires from vehicles and equipment are recycled

- Equipment is cleaned with compressed air whenever possible
- Recycling receptacles are provided next to trash receptacles
- Mulch is placed over a plant's root zone to reduce moisture evaporation and conserve water
- Grasscycling-grass clippings are left in place when mowing
- Areas in need of treatment are spot treated whenever possible
- Mulch is used around trees and in flowering beds as weed prevention
- An Integrated Pest Management (IPM) program has been implemented
- Organic, biobased, or slow-release fertilizers have been utilized
- Weeds are hand cultivated
- Drought tolerant plants are used
- Additional areas have been added to the Web based irrigation system, including the new MAC. This plan will encompass the old Lot 25 irrigation system. The new controller would give access control from a wireless handheld device, a computer with network capabilities, or a PDA. The network control service would allow water savings based on weather and transpiration values. The controller would automatically adjust the irrigation operating schedule to coincide with the local conditions.

In accordance with the MOU, we are developing our written GreenScapes Program based on the EPA's Tip Sheets and Re-buy Checklist and will have it completed by the end of 2009.

WasteWise Partnership and Solid Waste Recycling

On March 13, 2009 Monmouth became a WasteWise Program Partner.

Monmouth continues to enforce recycling of the following materials: glass, aluminum and bi-metal containers; paper; cardboard; and electronic devices. This spring, we piloted a program that seeks to capture for recycling some of the textiles that, in the past, have left our campus as waste as our students have moved out of the residence halls. According to the EPA, only 15% of consumer textile waste in our country is currently being recycled. Textiles that are still useful -- clothing, shoes, bedding, books and the like, were placed in collection boxes provided by Planet Aid, a charity which raises funds for use in underprivileged countries. The program not only diverted readily recyclable items from the University's waste stream, but also helped our students to understand that even small actions on their part can help to alleviate suffering in underprivileged parts of the world, reduce pollution and help to combat the threat of global warming.

Attachment 2 to this Report provides volumes of material recycled, including the textiles, from December 2008 through May 2009.

Along with our food service vendor, we continue to evaluate food waste management technologies, including in-vessel composting demonstrated at Montclair University and the BioHitechAmerica organic waste decomposition system.

Re-use of Industrial Materials

The University is working to incorporate many of EPA's tools and initiatives for re-use of industrial materials into construction and renovation projects and campus operations. An update on specific achievements will be provided in the next Update Report.

Coal Combustion Products Partnership

Monmouth was welcomed as Coal Combustion Products partner on May 26, 2009. The only construction projects currently underway on campus are the Multi-purpose Activity Center (MAC) and a new residence hall. The MAC is substantially complete and will be ready for occupancy in August of 2009. Construction on the residence hall began in March of 2009, but design was completed several years ago. As such, no coal combustion products were used during the reporting period.

National Clean Diesel Campaign & Clean Construction USA

We understand from Jenna Salomone, the EPA Region 2 Mobile Source Team lead for Clean Diesel Construction, that there is not a specific process for joining Clean Construction USA as it is not a partnership program. However, we did participate in a conference call with Ms. Salomone and others from the Clean Construction USA team on March 12, 2009 to learn about the program.

At the construction site for the new residence hall, we are enforcing a "no idling" policy.

WaterSense Products

Monmouth is currently developing its Sustainability Web page. WaterSense products will be featured on the page when it is completed.

Annual water consumption data will be provided to EPA with our next update report.

Sustainable Design, Construction and Operations Practices

An evaluation of both on-going construction projects, the MAC and the new residence hall, has been completed to determine if LEED certification is attainable. Since both of these projects were designed several years ago, and the MAC will be completed in August of 2009, it was not possible to pursue LEED certification for either building without a significant increase in cost that could not be absorbed by the University. All future construction projects will consider LEED certification early in the design process.

Campus and Community Involvement

The Monmouth University Sustainability Council (SAC) was formed in January of 2009. It is an interdisciplinary work group of over 30 volunteers comprised of Students, Faculty, Staff and Administrators. The mission of the SAC is to promote environmental awareness and encourage

the development of an environmentally responsible and sustainable campus community in its operations, education, research, outreach and services. The SAC will propose and research energy and environmental sustainability policies and initiatives, and recommend specific policies and initiatives for the University to implement that will advance the University's sustainability goals. The SAC has established a committee structure for its research, with committees for Finance and Procurement; Outreach; Academic Programs and Research; Energy; Land and Water; Waste Management; and Greenhouse Gas. The Committees are beginning their work to research and evaluate several proposed initiatives, including:

- increasing student involvement in carbon footprint reduction studies
- green purchasing options
- developing outreach tools
- reducing the number of vehicles on campus

The full SAC has met twice and the Steering Committee, comprised of the SAC chair and the chairs of each committee, has met once.

On May 21, 2009, Monmouth University hosted a Carbon Inventory Training Workshop for community leaders, faculty, staff and students presented by Dr. Patrick Hossay of Stockton State College. The workshop was sponsored by Monmouth University's Urban Coast Institute, Monmouth University's Sustainability Advisory Council, Sierra Club Cool Cities Campaign and the Monmouth County Cool Cities Partnership.

The Monmouth University Urban Coast Institute (UCI), founded in September of 2005, continues to actively serve the University and the public interest as a forum for research, education, and collaboration in the development and implementation of science-based policies and programs that support stewardship of healthy, productive, and resilient coastal ecosystems and communities. The UCI builds on the University's program in Marine and Environmental Biology and inter-departmental strengths in marine biology, environmental science, business, economics and real estate, public policy, and the arts and social sciences. The UCI maintains a principal focus on the interactions between humans and the coastal and ocean environment, and sustainable coastal development along New Jersey's coasts and watersheds. The UCI seeks to foster collaboration among citizens, watershed and community organizations, governmental agencies, business, the scientific community, and other parties interested in coastal and watershed management, conservation, and restoration.

Monmouth University is a member of a consortium of New Jersey institutions of higher education and wind energy industries that submitted a letter of intent in June 2009 in response to the US Department of Energy's Funding Opportunity Announcement Number: DE-FOA-0000090. The consortium's proposal is to: Establish a Department of Energy Center of Excellence for Offshore Wind Energy.

Attachment 1 - Monmouth University - EPA
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Products that earn the ENERGY STAR prevent greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy.
www.energystar.gov

782 ENERGY STAR Qualified Compact Fluoresecent Lamp(s)

Monmouth University -- Campus

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors.

Enter your own values in the gray boxes or use our default values.

Number of units	782
Electricity Rate ($/kWh)	$ 0.100
Hours used per day	4

	ENERGY STAR Qualified Unit	Conventional Unit
Initial cost per unit (estimated retail price)	$1.00	$6.50
Wattage (watts)	..	..
Lifetime (hours)	10,000	...

Annual and Life Cycle Costs and Savings for 782 CFLs

	782 ENERGY STAR Qualified Units	782 Conventional Units	Savings with ENERGY STAR
Annual Operating Costs*			
Energy cost	$2,283	$10,047	$7,764
Maintenance cost	$0	$5,325	$5,325
Total	**$2,283**	**$15,372**	**$13,089**
Life Cycle Costs*			
Operating cost (energy and maintenance)	$11,970	$80,582	$68,612
Purchase price for 782 unit(s)	$782.00	$5,083.00	$4,301.00
Total	**$12,752**	**$85,665**	**$72,913**
		Simple payback of initial additional cost (years)†	N/A

* *Annual costs exclude the initial purchase price. All costs, except initial cost, are discounted over the products' lifetime using a real discount rate of 4%. See "Assumptions" to change factors including the discount rate.*

† *A simple payback period of zero years means that the payback is immediate.*

Summary of Benefits for 782 CFLs

Initial cost difference	-$4,301
Life cycle savings	$68,612
Net life cycle savings (life cycle savings - additional cost)	$72,913
Simple payback of additional cost (years)	N/A
Life cycle energy saved (kWh)	446,428
Life cycle air pollution reduction (lbs of CO_2)	638,392
Air pollution reduction equivalence (number of cars removed from the road for a year)	55.22
Air pollution reduction equivalence (acres of forest)	87.06
Savings as a percent of retail price	9324%

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Monmouth University Recycling Figures: December 2008 - May 2009			
	Cardboard OCC	Comingled Bottles/Cans/ Plastics	Mixed Paper
Cubic Yard Volume Generated at Capacity	1,628	485	416

Furniture	2.73 tons*
Textiles	1.82 tons

- 5 months of "in session" volume and 1 month of "out of session" volume
- Recycleables are serviced monthly, via 8 yard front end loaders, and measured in cubic yard volume
  - Bottles/cans/plastics are comingled in one dumptser
  - Cardboard (OCC) is serviced at the Student Center location and in the main Larchwood transfer station area
  - Mixed paper is serviced in 8 yard front end loaders in the main Larchwood .
- Volume is estimated in yards at capacity and is based on measurements and recommended service needed to accomodate the volumes produced.

* Material density chart was used to determine tonnage of furniture donated to Rescue Mission of Trenton