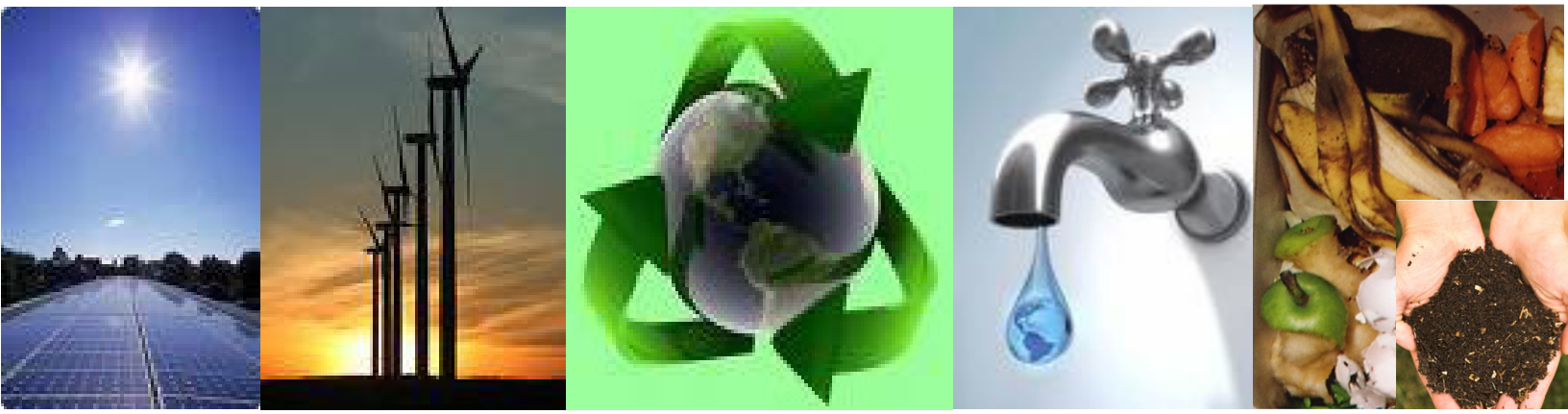
Montclair State University
Environmental Assessment:
MOU SemiAnnual Report
December 26, 2013



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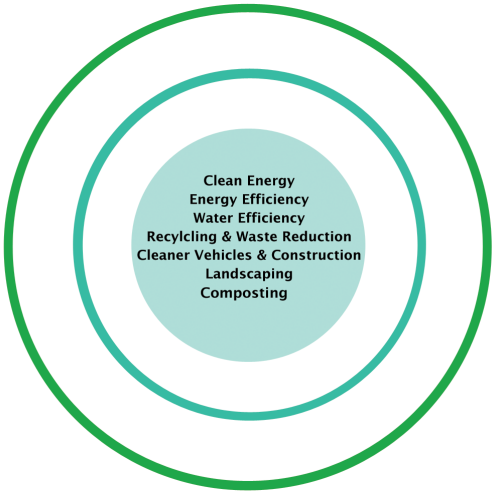
Accomplishments

Reductions of 152,605 MTCO2e



Memorandum of Understanding

On June 17, 2008, Montclair State University signed a Memorandum of Understanding (MOU) pledging to become an environmental steward by implementing a number of green initiatives that would reduce its carbon footprint and further improve our planet's environment. This partnership with the United States Environmental Protection Agency (EPA) and Montclair State University has resulted in reducing energy, water and solid waste production across campus operations.

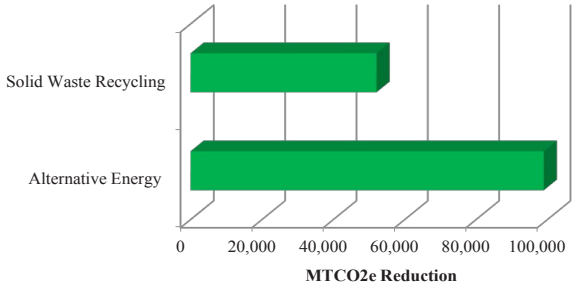
Reduction in Environmental Footprint

In the last five years, Montclair State University has provided ten updates documenting its green initiatives. The EPA has analyzed the submitted information and generated an environmental footprint for the organization. Due to the progressive green efforts of the organization, the university has managed to reduce its carbon footprint by 152,605 MTCO2e* and saved an estimated $13.6 million in operating expenses.

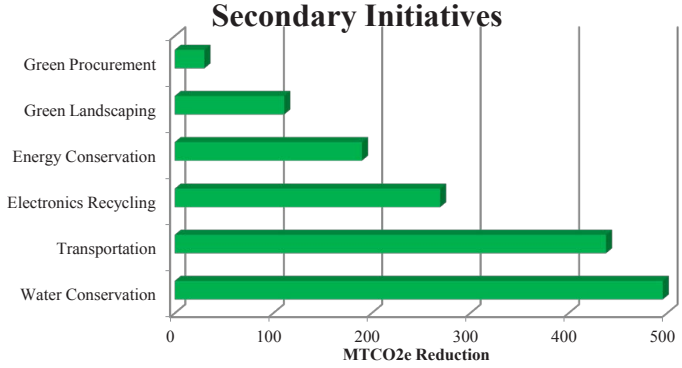
*Metric Ton Carbon Dioxide Equivalent

Environmental Metrics	Total Sector (MTCO2e)
Energy Conservation	190.2
Alternative Energy	98,970.9
Water Conservation	495.8
Solid Waste	52,099.1
Green Procurement	30.1
Green Landscaping	111.2
Electronics Recycling	269.6
Transportation	438.1
Total (MTCO2e)	152,605.0

Primary Initiatives



Secondary Initiatives



Measurement and Continuous Improvements

EPA uses these environmental conversion models to calculate metric tons of carbon dioxide equivalents:

Greenhouse Gas Equivalencies (GHG) Calculator converts GHG reductions into scenarios that can be easily communicated to the public.

eGRID Version 1.1 (2007) and the EPA Pollution Prevention (P2) GHG Conversion Tool which convert standard metrics for electricity, green energy, fuel use, chemical use, water use, and sustainable materials management into MTCO2e.

The EPA WARM Model which helps calculate GHG emission reductions from several different waste management practices, including source reduction, recycling, combustion, composting and landfilling.

The EPA Pollution Prevention (P2) Cost Calculator that estimates cost savings associated with GHG reductions.

Certain environmental data points cannot be converted to MTCO2e because scientific models do not currently exist. As methodologies improve, environmental assessments will be updated to include any new GHG reduction estimates.

Greenhouse Gas Equivalencies

What does the reduction of 152,605 MTCO2e represent ?
The organization's effort is equivalent to any one of the following:

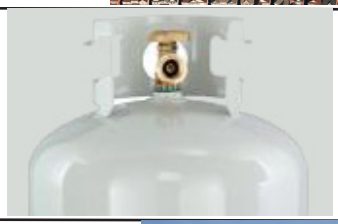
- Annual greenhouse gas emissions from 31,793 vehicles

- Carbon dioxide emissions from 17,108,184 gallons of gasoline

- Carbon dioxide emissions from 354,895 barrels of oil consumed

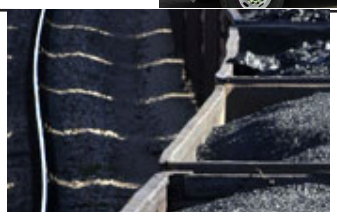
- Carbon dioxide emissions from the energy use of 7,623 homes for one year

- Carbon dioxide emissions from 6,358,542 propane tanks used for home barbeques



- Carbon dioxide emissions from gasoline carried by 2,013 tanker trucks

- Carbon dioxide emissions from burning 656 railcars' worth of coal (nearly 10 miles long)



Environmental Metrics	Jun 2008 MOU	Dec 2008 Update	Jun 2009 Update	Jun/Dec 2010 Update	Jun/Dec 2011 Update	Jun/Dec 2012 Update	Jun 2013 Update	Dec 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Energy Conservation										
Total Savings (MTCO2e)				***48.0***	***39.9***	***44.1***	***26.7***	***31.6***	***190.2***	***$32,109***
Misc. Energy Conservation										
Motors and transformers										
Lighting Project Fixtures (Bulbs and Ballast)										
High Temp Hot Water Pipe Replacement										
HVAC, Chiller & Electrical										
Bulb Replacement (CFLs) total 375					10,625 kwh	16,250 kwh	9375 kwh	9375 kwh	33.9	$5,717
Bulb Replacement (LEDs) total 1020				64,642.5 kwh	43,095 kwh	43,095 kwh	26,650 kwh	33,150 kwh	156.4	$26,392
Gas / Fuel Oil / Steam Savings										
Alternative Energy										
Total Savings (MTCO2e)	***5,161.3***	***5,161.3***	***5,161.3***	***20,895.0***	***20,225.6***	***20,326.4***	***10,057.5***	***11,982.5***	***98,970.9***	***$12,651,207***
On-Site Solar (kwh)	1,712	1,712	1,712	3,424	3,424	139,215	106,000.9	127,943.1	285.9	$48,258
On-Site Wind										
On-Site Geothermal										
On-Site Combined Heat and Power (4.3MW)	16,423.85 MWh	16,423.85 MWh	16,423.85 MWh	31,795 MWh	31,795 MWh	31,795 MWh	15,897.5 MWh	15,897.5 MWh	61,920.0	$11,522,286
Purchase of Green Energy (kwh)				5,518,000	11,036,000	11,036,000	5,339,267.7	7,910,359	30,317.6	($7,555)
Energy Returned to the Grid				1,772.9 MWh	2,304 MWh	2,304 MWh	1,152 MWh	1,152 MWh	6,447.3	$1,088,218
Water Conservation										
Total Savings (MTCO2e)					***165.2***	***165.2***	***82.6***	***82.6***	***495.8***	***$115,481***
Misc. Water Conservation										
Low Flow/Hands Free Faucets										
Low Flow Toilets (985)					3,940,000 gal	3,940,000 gal	1,970,000 gal	1,970,000 gal	29.0	$24,019
Low Flow Shower Heads (670)					1,541,000 gal + 201,000kwh	1,541,000 gal + 201,000kwh	770,500 gal + 100,500 kwh	770,500 gal + 100,500 kwh	459.0	$84,950
Low Flow Urinals (42)					193,200 gal	193,200 gal	96,600 gal	96,600 gal	1.4	$1,178
Waterless Urinals (35)					875,000 gal	875,000 gal	437,500 gal	437,500 gal	6.4	$5,334
Solid Waste Recycling										
Total Savings (MTCO2e)	***174.7***	***174.2***	***233.3***	***493.6***	***479.6***	***449.2***	***14,767.2***	***35,327.3***	***52,099.1***	***$745,698***
Mixed Recyclables	61.5 tons	61.5 tons	83 tons	176 tons	171 tons	160.2 tons	5274..01 tons	12616.88 tons	52,091.5	$744,164
Pallets Waste Avoided/Wood Recycled										
Steel Recycled during Deconstruction										
Concrete / Asphalt Recycled during Deconstruction										
Recycled C & D Waste										
Cardboard										
Mixed Metal										
Paper, Mixed										
Plastic, Mixed										
Blue Wrap										
Can / Bottle Recycling										

Environmental Metrics	Jun 2008 MOU	Dec 2008 Update	Jun 2009 Update	Jun/Dec 2010 Update	Jun/Dec 2011 Update	Jun/Dec 2012 Update	Jun 2013 Update	Dec 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Mixed Organics										
Food Donation (Waste diversion)										
Biosolids & Food Waste Recycling / Composting	25,000 lbs	20,000 lbs	8,914 lbs	8,400 lbs	8,200 lbs	6,200 lbs			7.7	$1,534
Fluorescent Bulbs										
Ceiling Tiles Recycled										
Carpet Recycled										
Waste Oil Recycled										
Magazines/ThirdClass Mail										
Newspaper										
Office Paper										
Textbooks / Phonebooks										
Dimensional Lumber										
Fly Ash										
Aluminum Cans										
Glass										
HDPE / LDPE / PET										
Appliances										
Non-Ferrous Metals										
Fats, Oils, Grease										
Green Procurement										
Total Savings (MTCO2e)					***11.9***	***11.9***		***6.4***	***30.1***	***$0***
Purchase of Materials with Recycled Content (Paper)					1440 cs 30%PC	1440 cs 30%PC		772 cs 30%PC	30.1	
Purchase / Use of Compost Socks										
Purchase of EPEAT Products										
Use of Recycled Steel during Construction										
Use of Recycled Iron during Construction										
Use of Recycled Plastic during Construction										
Use of Recycled Aluminum during Construction										
Use of Recycled Concrete / Asphalt during Construction										
Use of Coal Combustion Products										
Green Landscaping										
Total Savings (MTCO2e)	***10.5***	***10.0***	***8.9***	***26.3***	***19.0***	***18.4***	***9.8***	***8.6***	***111.2***	***$2,439***
Green Roofs										
Porous Pavement										
Grass										
Low/no mow area										
Re-use of Collected Stormwater										
On-Site Re-use of Compost / Mulch	25,000 lbs	20,000 lbs	8,914 lbs	24,000 lbs	24,000 lbs	12,000 lbs	12,200 lbs		12.6	
Moisture Sensing Sprinklers (40)					240,000 gal	480,000 gal	240,000 gal	240,000 gal	2.9	$2,439
Number / Acres of Trees	190 trees	190 trees	190 trees	190 trees	190 trees	190 trees	190 trees	190 trees	95.6	

Environmental Metrics	Jun 2008 MOU	Dec 2008 Update	Jun 2009 Update	Jun/Dec 2010 Update	Jun/Dec 2011 Update	Jun/Dec 2012 Update	Jun 2013 Update	Dec 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Reflective Roof										
Synthetic Turf										
Native Plants										
Leaves Composted										
Electronics/EPEAT										
Total Savings (MTCO2e)				***31.3***	***81.5***	***76.2***	***40.2***	***40.3***	***269.6***	***$1,508***
Recycling of Electronics					231 units	245 units	150 units	140 units	6.1	$153
Re-Use/Donation of Used Computers				2800 comp.	850 comp.	400 comp.	275 comp.	250 comp.	51.1	$869
Toner/Ink Recycling					1912 cart.	1806 cart.	925 cartridges	940 cartridges	210.6	$439
Battery Recycling					400 batteries	300 batteries	268 batteris	200 batteries	1.9	$47
Mass Transit										
Total Savings (MTCO2e)									***0.0***	***$0***
Miles Avoided										
Transportation										
Total Savings (MTCO2e)	***9.0***	***9.0***	***9.0***	***27.0***	***180.0***	***150.6***	***26.8***	***26.8***	***438.1***	***$82,278***
Hybrid Vehicles										
Gasoline/Ethanol Vehicles	3	3	3	3	19	19			282.0	$4,400
Electric Vehicles					16	13	19	19	129.6	$77,878
Biodiesel Vehicles					13				26.5	
Clean Construction Vehicles										
LNG Vehicles										
Alternate Fuel Vehicles (ULSDF)					2	2	3	3		
Smartway Transporters						2	2	2		
Bike Racks					42	42	42	42		
LEED Projects										
Total Savings (MTCO2e)									***0.0***	***$0***
Silver – 30%										
Gold – 40%										
Platinum – 45%										
MTCO2e Savings										
Total (MTCO2e)	***5,355.4***	***5,354.4***	***5,412.4***	***21,521.2***	***21,202.7***	***21,241.9***	***25,010.9***	***47,506.0***	***152,605.0***	***$13,630,720***
Energy	0.0	0.0	0.0	48.0	39.9	44.1	26.7	31.6	190.2	$32,109
Alternative Energy	5,161.3	5,161.3	5,161.3	20,895.0	20,225.6	20,326.4	10,057.5	11,982.5	98,970.9	$12,651,207
Water	0.0	0.0	0.0	0.0	165.2	165.2	82.6	82.6	495.8	$115,481
Solid Waste	174.7	174.2	233.3	493.6	479.6	449.2	14,767.2	35,327.3	52,099.1	$745,698
Green Procurement	0.0	0.0	0.0	0.0	11.9	11.9	0.0	6.4	30.1	$0
Green Landscaping	10.5	10.0	8.9	26.3	19.0	18.4	9.8	8.6	111.2	$2,439
Electronics	0.0	0.0	0.0	31.3	81.5	76.2	40.2	40.3	269.6	$1,508
Transportation	9.0	9.0	9.0	27.0	180.0	150.6	26.8	26.8	438.1	$82,278

2013

Montclair State University Additional Green MOU Accomplishments and Cost Savings

Green Buildings

Montclair State University (MSU) has one of their buildings (University Hall) certified under the LEED (Leadership in Environmental and Energy Design) program.

MSU has applied for LEED Certification for 3 additional buildings:
John J. Cali School of Music Department Building
New School of Business Building
Recreational Center

Green Purchasing

MSU purchases 100% recycled paper to use in their copy machines. The University also purchases roll paper towels and toilet paper that are made out of recycled materials. MSU also purchases green cleaning supplies. In fact, 80% of all cleaning products used on the campus are green cleaning supplies including glass cleaners, all purpose cleaners, neutral disinfectant floor cleaner, floor stripper, floor wax, and carpet shampoo.

Energy

Existing Combined and Power Co-generation Plant: The Co-generation plant produces thermal energy (steam) and electricity. The cogeneration facility has a yearly production of over 32 million kilowatt hours. Excess energy is sold back to the local distribution utility company under their existing buy back tariff. The co-generation plant generates more than 160 million pounds of steam every year. The majority of buildings on campus use energy produced by the co-generation plant for heating in winter and cooling in the summer.

Planned New Combined Heat and Power Co-generation Plant: A new state-of-the-art combined heat and power co-generation plant and its related infrastructure improvements will replace the campus' existing energy plant, which began generating steam in the 1940s and providing electricity as a co-generation plant in 1993. The new plant will provide natural gas-fired electric generation, chilled water, and steam for heat. The steam, condensate, and chilled water will be delivered to and returned from campus buildings via the new energy distribution system. The majority of the campus' electricity requirements will be satisfied by the onsite plant, which will be designed to operate continuously producing electric power of approximately 5.4 megawatts.

Waste Management

Organic/Food Waste Composting
Food scraps are collected from two kitchens on campus. The scraps are processed in an in-vessel aerobic digester after being mixed with wood chips (which serve as a bulking agent and carbon source for the bacteria that biologically decompose the food scraps). The compost is then used for landscaping projects around campus.

Electronic waste
The office of Information Technology at MSU has established a computer life-cycle replacement program to keep all computers for faculty and staff and those in public and teaching computer labs up to date. An inventory of all computers at MSU was compiled and a replacement program plan was created. The goal of the program was to replace the computers in the public and teaching labs and provide all faculty and staff members with one primary computer. The Office of Information Technology does three-year leases on the facilities computers. MSU has agreements with DELL, IBM and Hewlett Packard to send back old computers to the manufacturers so they can be recycled. MSU contracts with a computer and electronics recycling firm to properly handle the retirement of all E-waste that is not leased or returned to the supplier at the end of the life-cycle. In 2007, MSU launched a recycling program in collaboration with "Charitable Emporium.com, Inc." to recycle all brand name ink toner cartridges.

Transportation

To promote the use of public transportation and reduce the number of single occupant vehicles driven to campus, MSU and NJ Transit have partnered to offer full-time undergraduate and graduate students a 25% discount on a rail, bus, or light rail monthly pass when they enroll online through NJ TRANSIT's Quik-Tik program.
Buses - MSU's shuttle fleet runs on low sulfur diesel fuel. In addition to MSU's shuttle fleet, five bus lines currently operate on campus - four from NJ Transit and one private carrier.
Trains - There are two train stations adjacent to MSU's campus - Montclair State University station at the north end and Montclair Heights station at the south end.
Alternative fuel vehicles - MSU has electric vehicles for staff to use on campus as an alternative to diesel powered golf carts. These vehicles are used by various shops/ departments within Facilities and Dining Services.
Bicycle – MSU encourages students, faculty and staff to use bicycles. There are several bicycles racks on campus.

Water Use Reduction

Montclair State University has employed a program to reduce water usage at the University. MSU installed waterless urinals in the bathrooms located in University Hall in 2004. The waterless urinals use Ecotrap which consists of a lightweight biodegradable fluid called Blue Seal. The liquid traps the odors and sediment drops to the bottom of the trap to help prevent the pipes from clogging. The waterless urinals do not overflow and have reduced water usage by 45,000 gallons per year for each urinal. MSU has also reduced water usage by planting drought resistant and native plants for all newly constructed buildings. The facility does not need to install sprinkler systems or irrigation systems to water these plants.