



Montclair State University
Environmental Assessment:
MOU SemiAnnual Report
June 30, 2014



Environmental Protection Agency
Region 2

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Accomplishments

Reductions of 113,985 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.

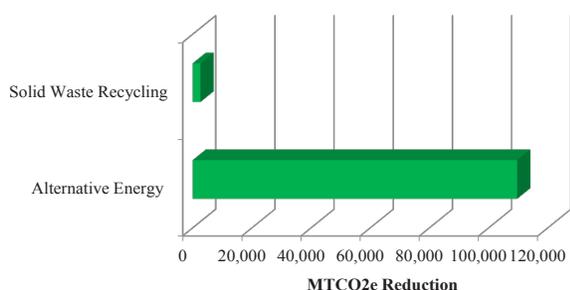
Reduction in Environmental Footprint

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 113,985 MTCO₂e* and saved an estimated \$13.6 million in operating expenses.

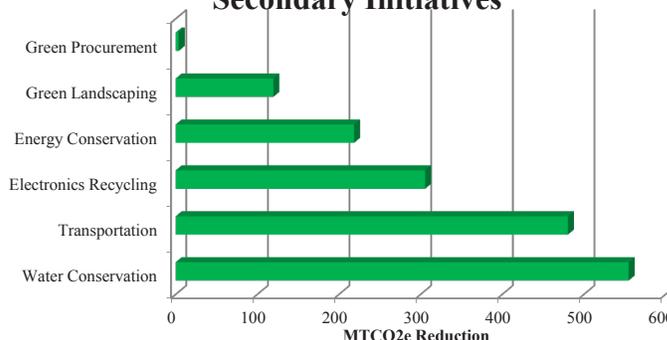
*Metric Ton Carbon Dioxide Equivalent

Environmental Metrics	Total Sector (MTCO ₂ e)
Energy Conservation	218.5
Alternative Energy	109,659.9
Water Conservation	554.8
Solid Waste	2,643.6
Green Procurement	3.7
Green Landscaping	119.6
Electronics Recycling	305.5
Transportation	480.4
Total (MTCO₂e)	113,985.9

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.

Accomplishments

Reductions of 113,985 MTCO₂e

Greenhouse Gas Equivalencies

What does the reduction of 113,985 MTCO₂e represent ?
The organization's effort is equivalent to any one of the following:

- Annual greenhouse gas emissions from 23,997 vehicles



- Carbon dioxide emissions from 12,826,139 gallons of gasoline



- Carbon dioxide emissions from 265,083 barrels of oil consumed



- Carbon dioxide emissions from the energy use of 10,400 homes for one year



- Carbon dioxide emissions from 4,749,413 propane tanks used for home barbeques



- Carbon dioxide emissions from gasoline carried by 1,509 tanker trucks



- Carbon dioxide emissions from burning 611 railcars' worth of coal (over 9 1/4 miles long)





Environmental Metrics	Jun 2008 MOU	Dec 2008 Update	Jun 2009 Update	Jun/Dec 2010 Updates	Jun/Dec 2011 Updates	Jun/Dec 2012 Updates	Jun 2013 Update	Dec 2013 Update	June 2014 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Energy Conservation											
Total Savings (MTCO2e)				46.0	38.3	42.3	25.7	30.3	36.1	218.5	\$38,456
Misc. Energy Conservation											
Motors and transformers											
Lighting Project Fixtures											
Hot Water Pipe Replacement											
HVAC, Chiller & Electrical											
Bulb Replacement (CFLs) total 375					10,625 kwh	16,250 kwh	9375 kwh	9375 kwh	9375 kwh	39.2	\$6,892
Bulb Replacement (LEDs) total 1020				64,642.5 kwh	43,095 kwh	43,095 kwh	26,650 kwh	33,150 kwh	41,275 kwh	179.4	\$31,564
Gas / Oil / Steam Savings											
Alternative Energy											
Total Savings (MTCO2e)	5,161.2	5,161.2	5,161.2	20,673.5	19,820.4	19,917.1	9,857.2	11,703.5	12,204.4	109,659.9	\$13,983,485
On-Site Solar	1,712 kwh	1,712 kwh	1,712kwh	3,424 kwh	3,424 kwh	139,215 kwh	106,001 kwh	127,943 kwh	125,000 kwh	363.2	\$63,921
On-Site Wind											
On-Site Geothermal											
Comb Heat and Power (5.4MW)	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	19,964 MWh	68,400.0	\$12,825,935
Purchase of Green Energy/ Green Power				5,518,000 kwh	11,036,000 kwh	11,036,000 kwh	5,339,267.7 kwh	7,910,359 kwh	7,800,000 kwh	34,631.2	(\$8,998)
Energy Returned to the Grid				1,772.9 MWh	2,304 MWh	2,304 MWh	1,152 MWh	1,152 MWh	115 MWh	6,265.5	\$1,102,627
Water Conservation											
Total Savings (MTCO2e)					158.5	158.5	79.3	79.3	79.3	554.8	\$134,728
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	1,970,000 gal	32.4	\$28,022
Low Flow Shower Heads (670)					1,541,000 gal + 201,000 kwh	1,541,000 gal + 201,000 kwh	770,500 gal + 100,500 kwh	770,500 gal + 100,500 kwh	770,500 gal + 100,500 kwh	513.6	\$99,109
Low Flow Urinals (42)					193,200 gal	193,200 gal	96,600 gal	96,600 gal	96,600 gal	1.6	\$1,374
Waterless Urinals (35)					875,000 gal	875,000 gal	437,500 gal	437,500 gal	437,500 gal	7.2	\$6,223
Solid Waste Recycling											
Total Savings (MTCO2e)	174.7	174.2	233.3	493.6	479.6	449.2	238.0	238.0	163.0	2,643.6	\$39,190
Mixed Recyclables	61.5 tons	61.5 tons	83 tons	176 tons	171 tons	160.2 tons	85 tons	85 tons	58.2 tons	2,635.9	\$37,656
Pallets / Wood Recycled											
Steel Recycled											
Concrete / Asphalt Recycled											
Recycled C & D Waste (Construction Waste)											
Cardboard											
Mixed Metal											
Paper, Mixed											
Plastic, Mixed											
Blue Wrap											
Can / Bottle Recycling											
Mixed Organics											



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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)					1.2	1.2		0.6	0.6	3.7	\$0
Purchase of Materials w/ Recyc Content (Paper)					144 cs 30%PC	144 cs 30%PC		77.2 cs 30%PC	77 cs 30%PC	3.7	
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	18.9	18.3	9.7	8.5	8.5	119.6	\$2,926
Green Roofs											
Porous Pavement											
Grass											
Low/no mow area											
Re-use of Collected Storm-water											
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	
Moist. Sens. Sprinklers (40)					240,000 gal	480,000 gal	240,000 gal	240,000 gal	240,000 gal	3.4	\$2,926



Environmental Metrics	Jun 2008 MOU	Dec 2008 Update	Jun 2009 Update	Jun/Dec 2010 Updates	Jun/Dec 2011 Updates	Jun/Dec 2012 Updates	Jun 2013 Update	Dec 2013 Update	June 2014 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Number / Acres of Trees	190 trees	190 trees	190 trees	190 trees	190 trees	190 trees	190 trees	190 trees	190 trees	103.6	
Reflective Roof											
Synthetic Turf											
Native Plants											
Leaves Composted											
Electronics/EPEAT											
Total Savings (MTCO2e)				31.3	81.6	76.3	40.2	40.3	35.9	305.5	\$1,654
Recycling of Electronics					231 units	245 units	150 units	140 units	200 units	7.7	\$193
Re-Use/Donation Used Computers				2800 comp.	850 comp.	400 comp.	275 comp.	250 comp.	150 comp.	52.7	\$898
Toner/Ink Recycling /Use Recycled Ink					1812 cartridges	1806 cartridges	925 cartridges	940 cartridges	840 cartridges	242.8	\$506
Battery Recycling					400 batteries	300 batteries	268 batteries	200 batteries	250 batteries	2.3	\$57
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	42.3	480.4	\$114,200
Hybrid Vehicles											
Gasoline/Ethanol Vehicles	3	3	3	3	19	19				282.0	\$4,400
Electric Vehicles					16	13	19	19	30	171.8	\$109,800
Biodiesel Vehicles					13					26.5	
Clean Construction Vehicles											
LNG Vehicles											
Alt Fuel Vehicles (ULSDF)					2	2	3	3	3		
Smartway Transporters						2	2	2	2		
Bike Racks					42	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	21,297.8	20,778.4	20,813.4	10,276.8	12,127.2	12,570.1	113,985.9	\$14,314,639
Energy	0.0	0.0	0.0	46.0	38.3	42.3	25.7	30.3	36.1	218.5	\$38,456
Alternative Energy	5,161.2	5,161.2	5,161.2	20,673.5	19,820.4	19,917.1	9,857.2	11,703.5	12,204.4	109,659.9	\$13,983,485
Water	0.0	0.0	0.0	0.0	158.5	158.5	79.3	79.3	79.3	554.8	\$134,728
Solid Waste	174.7	174.2	233.3	493.6	479.6	449.2	238.0	238.0	163.0	2,643.6	\$39,190
Green Procurement	0.0	0.0	0.0	0.0	1.2	1.2	0.0	0.6	0.6	3.7	\$0
Green Landscaping	10.5	10.0	8.9	26.3	18.9	18.3	9.7	8.5	8.5	119.6	\$2,926
Electronics	0.0	0.0	0.0	31.3	81.6	76.3	40.2	40.3	35.9	305.5	\$1,654
Transportation	9.0	9.0	9.0	27.0	180.0	150.6	26.8	26.8	42.3	480.4	\$114,200



2014

Montclair State University Additional Green MOU Accomplishments and Cost Savings

Food Waste / Composting

Montclair State University had a successful soft start for its new composter this spring, before the end of the semester. They anticipate that the unit will be fully operational once classes resume in September.

Energy Conservation

MSU's new Cogeneration plant went on line this past fall. The new state-of-the-art facility and its related infrastructure improvements replaces 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 provides natural gas-fired electric generation, chilled water, and steam for heat. The steam, condensate, and chilled water is delivered to and returned from campus buildings via the new energy distribution system. The majority of the campus' electricity requirements are satisfied by the onsite plant, which was designed to operate continuously producing electric power of approximately 5.4 megawatts.

LEED

MSU has two new LEED Silver registered buildings currently under construction with a fall 2015 anticipated opening.