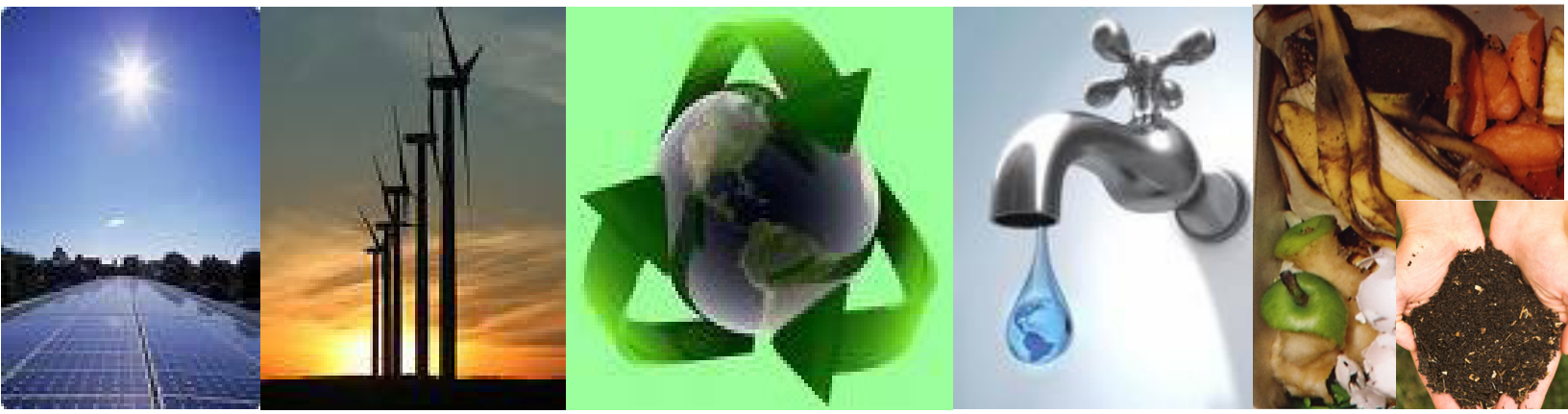
Rutgers University
Environmental Assessment:
MOU SemiAnnual Report
June 10, 2013 (Revised)



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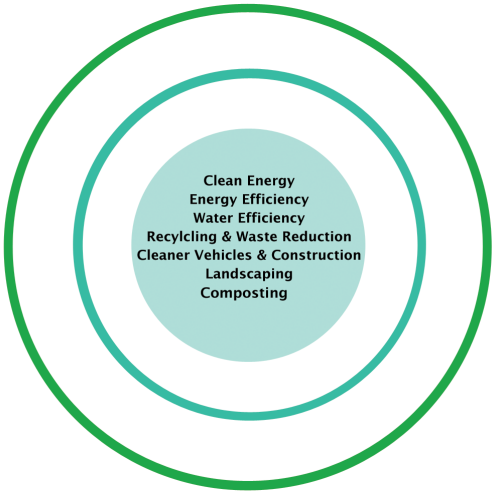
Accomplishments

Reductions of 236,486 MTCO2e



Memorandum of Understanding

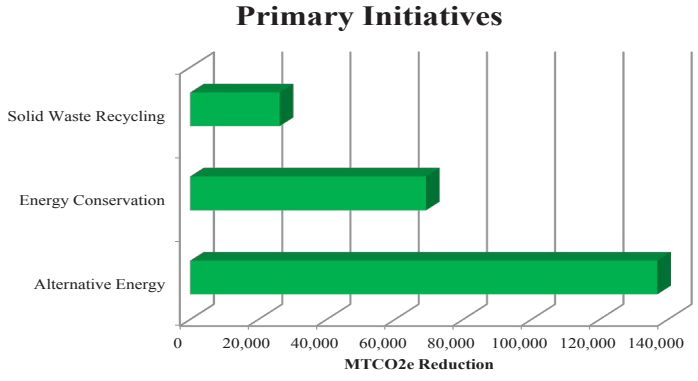
On November 3, 2009, Rutgers University signed a Memorandum of Understanding (MOU) pledging to become an environmental steward by implementing a number of green initiatives that would reduce its carbon footprint and further improve our planet's environment. This partnership with the United States Environmental Protection Agency (EPA) and Rutgers University has resulted in reducing energy, water and solid waste production across campus operations.

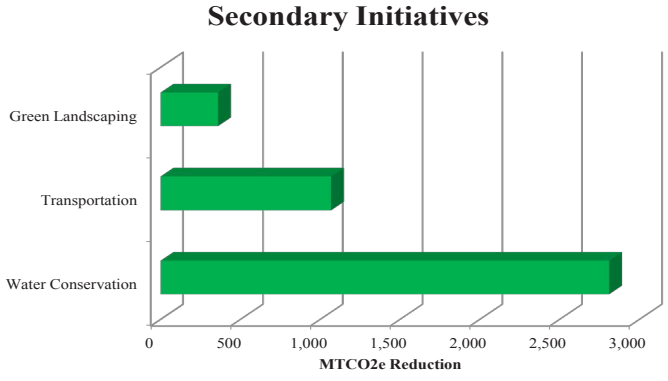
Reduction in Environmental Footprint

Rutgers University has provided seven 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 236,486 MTCO2e* and saved an estimated $35.9 million in operating expenses.

*Metric Ton Carbon Dioxide Equivalent

Environmental Metrics	Total Sector (MTCO2e)
Energy Conservation	69,108.5
Alternative Energy	136,909.0
Water Conservation	2,811.1
Solid Waste	26,229.6
Green Landscaping	360.0
Transportation	1,068.4
Total (MTCO2e)	236,486.5





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 236,486 MTCO2e

Greenhouse Gas Equivalencies

What does the reduction of 236,486 MTCO2e represent ?
The organization's effort is equivalent to any one of the following:

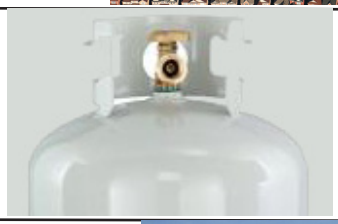
- Annual greenhouse gas emissions from 49,268 vehicles

- Carbon dioxide emissions from 26,511,939 gallons of gasoline

- Carbon dioxide emissions from 549,969 barrels of oil consumed

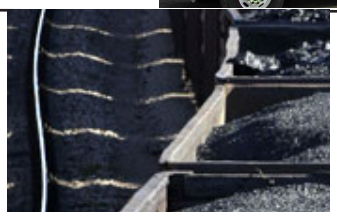
- Carbon dioxide emissions from the energy use of 12,171 homes for one year

- Carbon dioxide emissions from 9,853,604 propane tanks used for home barbeques



- Carbon dioxide emissions from gasoline carried by 3,119 tanker trucks

- Carbon dioxide emissions from burning 1,016 railcars' worth of coal (over 15 1/3 miles long)



Environmental Metrics	Nov 2009 MOU	May 2010 Update	Nov 2010 Update	May 2011 Update	Nov 2011 Update	May 2012 Update	Nov 2012 Update	May 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Energy Conservation/ Energy Star										
Total Savings (MTCO2e)	***9,002.8***	***6,143.2***	***5,760.1***	***9,640.5***	***9,640.5***	***9,640.5***	***9,640.5***	***9,640.5***	***69,108.5***	***$9,729,210***
Miscellaneous Energy Conservation										
Motors and Transformers	2,188,953 kwh	1,094,476.5 kwh	1,094,476.5 kwh	1,094,476.5 kwh	1,094,476.5 kwh	1,094,476.5 kwh	1,094,476.5 kwh	1,094,476.5 kwh	7,312.4	$1,234,241
Lighting Project Fixtures (Bulbs and Ballast)		3,797,699 kwh	3,797,699 kwh	3,797,699 kwh	3,797,699 kwh	3,797,699 kwh	3,797,699 kwh	3,797,699 kwh	19,734.8	$3,330,962
High temp Hot water Pipe replacement, therms saved	1,386,600 therms	472,000 therms	400,000 therms	1,129,300 therms	1,129,300 therms	1,129,300 therms	1,129,300 therms	1,129,300 therms	42,061.3	$5,164,007
HVAC, Chiller & Electrical										
Bulb Replacement (CFLs)										
Bulb Replacement (LEDs)										
Gas Savings										
Fuel Oil Savings										
Steam Savings										
Alternative Energy										
Total Savings (MTCO2e)	***16,899.0***	***16,903.4***	***16,867.6***	***16,734.5***	***16,895.2***	***16,959.5***	***16,812.5***	***18,837.0***	***136,909.0***	***$22,890,200***
On-Site Solar	874,235 kwh	880,201 kwh	831,926 kwh	652,652 kwh	869,093 kwh	955,681 kwh	758,141 kwh	3,484,856 kwh	6,909.0	$1,166,140
On-Site Wind										
On-Site Geothermal										
On-Site Combined Heat and Power (13 MW)	54,446,982 kwh	60,448,200 kwh	35,688,800 kwh	46,060,400 kwh	28,252,600 kwh	48,317,100 kwh	24,810,100 kwh	44,087,000 kwh	130,000.0	$21,724,060
Purchase of Green Energy/Green Power										
Water Conservation/ WaterSense										
Total Savings (MTCO2e)	***624.7***	***312.4***	***312.4***	***312.4***	***312.4***	***312.4***	***312.4***	***312.4***	***2,811.1***	***$2,331,818***
Miscellaneous Water Conservation	255,000,000 gal	127,500,000 gal	127,500,000 gal	127,500,000 gal	127,500,000 gal	127,500,000 gal	127,500,000 gal	127,500,000 gal	2,811.1	$2,331,818
Low Flow/Hands Free Faucets										
Low Flow Toilets										
Low Flow Shower Heads										
Low Flow Urinals										
Waterless Urinals										
Solid Waste Recycling										
Total Savings (MTCO2e)	***39.2***	***10,582.1***	***1,705.5***	***2,133.6***	***1,825.6***	***2,163.7***	***3,580.1***	***4,199.9***	***26,229.6***	***$519,388***
Mixed Recyclables (includes Wastewise)		3,743 tons	591 tons	762 tons	652 tons	696 tons	1,203 tons	1,406 tons	25,348.4	$362,120
Pallets Waste Avoided/Wood Recycled										
Steel Recycled during Deconstruction										
Concrete / Asphalt Recycled during Deconstruction										
Recycled C & D Waste (Construction Waste)		410 tons	17.42 tons						106.0	$17,097
Cardboard (construction/non-construction/sharp containers)										

Environmental Metrics	Nov 2009 MOU	May 2010 Update	Nov 2010 Update	May 2011 Update	Nov 2011 Update	May 2012 Update	Nov 2012 Update	May 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Mixed Metal (construction/non-construction)										
Paper, Mixed										
Plastic, Mixed (bottles, construction/non-construction)										
Blue Wrap										
Can / Bottle Recycling										
Mixed Organics										
Food Donation (Waste diversion)										
Biosolids & Food Waste Recycling / Composting						1074.25 tons	1058.25 tons	1315.5 tons	689.6	$137,920
Fluorescent Bulbs										
Ceiling tiles Recycled	25 tons								11.4	$1,000
Carpet recycled	11.727 tons		19.56 tons						74.2	$1,251
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)									***0.0***	***$0***
Purchase of Materials with Recycled Content (paper,tile,carpet,etc)										
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)	***45.0***	***45.0***	***45.0***	***45.0***	***45.0***	***45.0***	***45.0***	***45.0***	***360.0***	***$96,000***
Green Roofs / Reflective Roof										
Porous Pavement										
Grass										

Environmental Metrics	Nov 2009 MOU	May 2010 Update	Nov 2010 Update	May 2011 Update	Nov 2011 Update	May 2012 Update	Nov 2012 Update	May 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Low/no mow area	10 Acres (1/2 yr)	10 Acres (1/2 yr)	10 Acres (1/2 yr)	10 Acres (1/2 yr)	10 Acres (1/2 yr)	10 Acres (1/2 yr)	10 Acres (1/2 yr)	10 Acres (1/2 yr)	360.0	$96,000
Re-use of Collected Stormwater										
On-Site Re-use of Compost										
Moisture Sensing Sprinklers										
Number / Acres of Trees										
Synthetic Turf										
Native Plants										
Leaves Composted										
Electronics / EPEAT										
Total Savings (MTCO2e)										
Recycling of Electronics										
Re-Use/Donation of Used Computers										
Toner/Ink Recycling and Use of Recycled Ink										
Battery Recycling										
Mass Transit										
Total Savings (MTCO2e)										
Miles Avoided										
Transportation										
Total Savings (MTCO2e)	***5.6***	***151.8***	***151.8***	***151.8***	***151.8***	***151.8***	***151.8***	***151.8***	***1,068.4***	***$322,677***
Hybrid Vehicles										
Electric Vehicles	2	2 (1/2 yr)	2 (1/2 yr)	2 (1/2 yr)	2 (1/2 yr)	2 (1/2 yr)	2 (1/2 yr)	2 (1/2 yr)	25.4	$3,449
Biodiesel Vehicles		38	38	38	38	38	38	38	231.3	
Fuel Savings		13,000 gal	13,000 gal	13,000 gal	13,000 gal	13,000 gal	13,000 gal	13,000 gal	811.7	$319,228
Clean Construction Vehicles										
LNG Vehicles	3									
Alternate Fuel Vehicles (Zipcar)										
Bike Racks										
LEED Projects		4 buildings	4 buildings	4 buildings	4 buildings	4 buildings	4 buildings	4 buildings		
Total Savings (MTCO2e)									***0.0***	
Silver - 10%										
Gold - 17%										
Platinum - 20%										
MTCO2e Savings										
Total (MTCO2e)	***26,616.3***	***34,137.8***	***24,842.3***	***29,017.8***	***28,870.5***	***29,272.8***	***30,542.2***	***33,186.6***	***236,486.5***	***$35,889,293***
Energy	9,002.8	6,143.2	5,760.1	9,640.5	9,640.5	9,640.5	9,640.5	9,640.5	69,108.5	$9,729,210
Alternative Energy	16,899.0	16,903.4	16,867.6	16,734.5	16,895.2	16,959.5	16,812.5	18,837.0	136,909.0	$22,890,200
Water	624.7	312.4	312.4	312.4	312.4	312.4	312.4	312.4	2,811.1	$2,331,818
Solid Waste	39.2	10,582.1	1,705.5	2,133.6	1,825.6	2,163.7	3,580.1	4,199.9	26,229.6	$519,388
Landscaping	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	360.0	$96,000
Transportation	5.6	151.8	151.8	151.8	151.8	151.8	151.8	151.8	1,068.4	$322,677

2013

Rutgers University Additional Green MOU Accomplishments and Cost Savings

Recycling News

Rutgers University is an award-winning, nationally recognized leader in recycling. Over 67% of its waste is diverted from landfills.

Food Waste Diversion

The current EPA Environmental Assessment Report includes food waste diversion that Rutgers has been conducting over the past year. Food waste is sent to a local farm for animal feed. Over 3,400 tons of food waste has been diverted from landfills.

The Rutgers Center for Urban Environmental Sustainability

In response to the need to deal with suburban and urban environmental issues, Rutgers is expanding its focus on suburban and urban issues by creating a Center for Urban Environmental Sustainability (CUES).

To support this effort, Rutgers Cooperative Extension created a pilot program that hired five Environmental County Agents to work directly with municipalities, counties, and watershed groups to help develop and implement solutions to local environmental problems. Four of the five agents are placed in highly urbanized counties (Morris / Summerset, Camden / Burlington, Passaic / Essex, Union / Middlesex). These county agents will provide local leadership to implement environmental plans and initiatives. A portion of these efforts will be to develop educational programs that focus on changing the behavior of residents to achieve environmental improvements. The agents will reach out to children through the school districts, and they will also target adults, businesses, industries, and governmental agencies. Changes in behavior will be documented and linked to environmental improvements.

The environmental agents will also be required to implement on-the-ground environmental restoration projects. Agents will work with local partners to develop the new initiatives that are needed to address urban environmental problems. This will involve forming partnerships among local stakeholders, NJDEP and Rutgers Faculty through an interface with the center. The agents will use any available funds to leverage additional funds from federal, state, and other sources such as private foundations to complete these projects. Designs will be developed and projects will be built, always linking the project to environmental improvements and documenting the success. In the end, the agents will produce measurable outcomes.

The center's multi-disciplinary team of faculty has been assembled to provide technical assistance to these environmental county agents. The team will work with the agents to conduct the applied research needed to generate solutions to pressing urban environmental problems that are plaguing the state. This team will serve as the knowledge source to help the agents address emerging environmental issues.