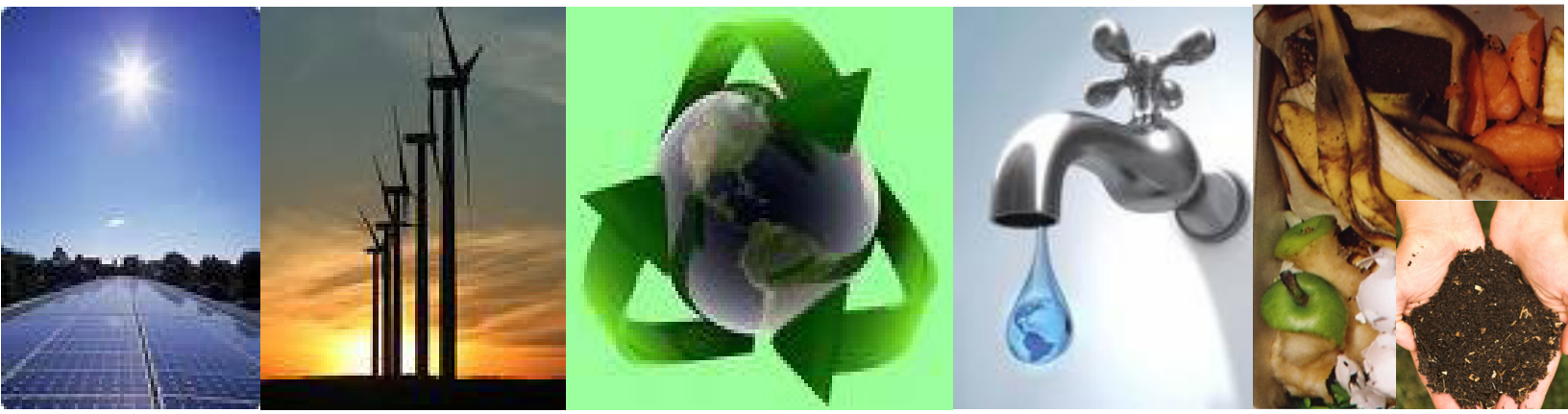
Raritan Valley Community College
Environmental Assessment:
MOU SemiAnnual Report
August 9, 2013



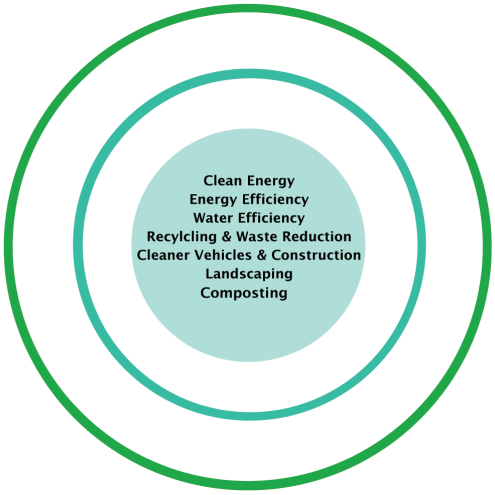
Environmental Protection Agency
Region 2

Andrew Bellina, PE
Senior Policy Advisor
212-637-4126

Jose Pillich
Michael Wanser
Research Analysts

Accomplishments

Reductions of 22,579 MTCO2e



Memorandum of Understanding

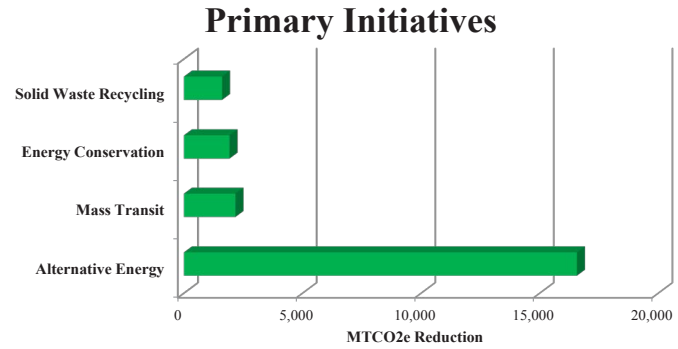
On June 16, 2009, Raritan Valley Community College signed a Memorandum of Understanding (MOU) pledging to become an environmental steward by implementing a number of green initiatives that would reduce its carbon footprint and further improve our planet's environment. This partnership with the United States Environmental Protection Agency (EPA) and Raritan Valley Community College has resulted in reducing energy, water and solid waste production across campus operations.

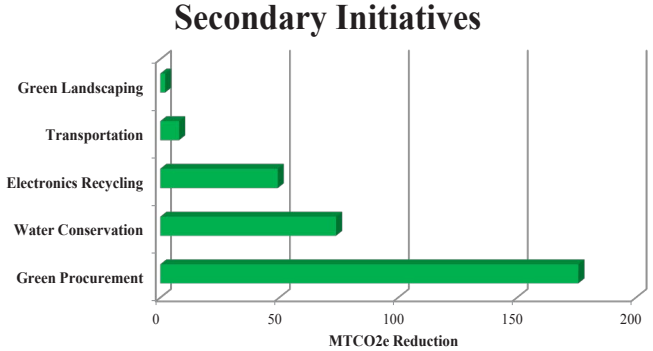
Reduction in Environmental Footprint

In the last few years, Raritan Valley Community College 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 college has managed to reduce its carbon footprint by 22,579 MTCO2e* and saved an estimated $3.8 million in operating expenses.

*Metric Ton Carbon Dioxide Equivalent

Environmental Metrics	Total Savings (MTCO2e)
Energy Conservation	1,921.2
Alternative Energy	16,570.7
Water Conservation	73.9
Solid Waste	1,607.6
Green Procurement	175.8
Green Landscaping	2.0
Electronics	49.4
Mass Transit	2,171.4
Transportation	7.9
Total (MTCO2e)	22,579.8





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 22,579 MTCO2e represent ?
The organization's effort is equivalent to any one of the following:

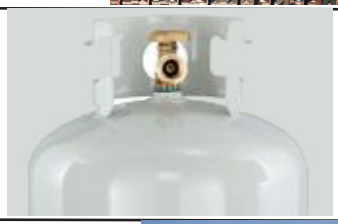
- Annual greenhouse gas emissions from 4,704 vehicles

- Carbon dioxide emissions from 2,531,368 gallons of gasoline

- Carbon dioxide emissions from 52,511 barrels of oil consumed

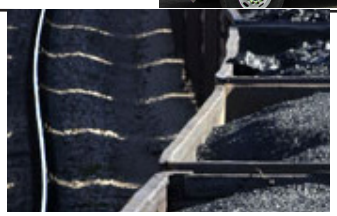
- Carbon dioxide emissions from the energy use of 1,162 homes for one year

- Carbon dioxide emissions from 940,825 propane tanks used for home barbeques



- Carbon dioxide emissions from gasoline carried by 298 tanker trucks

- Carbon dioxide emissions from burning 97 railcars' worth of coal (nearly 1 1/2 miles long)



Environmental Metrics	March 2010 Update	Nov 2010 Update	Jul 2011 Update	Jan 2012 Update	Jul 2012 Update	Jan 2013 Update	Jul 2013 Update	Total Conversion (MTCO2e)	Cost Savings (est.)
Energy Conservation / Energy Star									
Total Savings (MTCO2e)	***125.2***	***125.6***	***494.3***	***316.4***	***292.0***	***267.4***	***300.2***	***1,921.2***	***$271,335***
Miscellaneous Energy Conservation	(160,698.5 kwh) 41,900.5 therms	(160,698.5 kwh) 41,900.5 therms	232,048 kwh 56,400 therms	196,000 kwh 28,000 therms	(11,000 kwh) 52,000 therms	326,000 kwh	599,000 kwh (32,000 therms)	1,759.1	$250,830
Motors and Transformers									
Lighting Proj. Fixtures (Bulbs and Ballast)									
High Temp Hot Water Pipe Replacement									
HVAC, Chiller & Electrical									
Replace T12 bulbs with T8 bulbs	25 bulbs	67 bulbs	72 bulbs	92 bulbs	92 bulbs	188 bulbs	240 bulbs	6.2	$1,046
Replace T8 bulbs with T5 bulbs					80 bulbs	80 bulbs	80 bulbs	0.9	$150
Bulb Replacement (LEDs)					50 bulbs	100 bulbs	100 bulbs	6.0	$1,018
Gas Savings (pool heat exchanger)	4,000 therms	4,000 therms	4,000 therms	4,000 therms	4,000 therms	4,000 therms	4,000 therms	149.0	$18,291
Fuel Oil Savings									
Steam Savings									
Alternative Energy									
Total Savings (MTCO2e)	***2,521.5***	***2,241.5***	***2,241.5***	***1,681.5***	***1,885.6***	***2,137.3***	***2,181.8***	***16,570.7***	***$766,013***
On-Site Solar	2,000 kwh	2,000 kwh	2,000 kwh	2,000 kwh	277,000 kwh	216,000 kwh	276,000 kwh	576.8	$97,358
On-Site Wind									
On-Site Geothermal									
On-Site Combined Heat / Power (1.4 MW)	2,560 MWh	1,354 MWh	2,343 MWh	656 MWh	725 MWh	119 MWh	287 MWh	15,400.0	$668,803
Purchase of Green Energy/Green Power						400 MWh	400 MWh	593.9	($148)
Water Conservation / WaterSense									
Total Savings (MTCO2e)	***0.1***	***0.4***	***0.4***	***10.1***	***33.9***	***30.3***	***(1.4)***	***73.9***	***$61,300***
Miscellaneous Water Conservation				3,988,800 gal	13,683,800 gal	12,241,020 gal	(783,000 gal)	71.4	$59,196
Low Flow/Hands Free Faucets (66)	24,750 gal	22,000 gal	22,000 gal	16,500 gal	16,500 gal	16,500 gal	16,500 gal	0.4	$341
Low Flow Toilets (8)				16,000 gal	16,000 gal	16,000 gal	16,000 gal	0.2	$130
Low Flow Shower Heads									
Low Flow Urinals (9)	31,050 gal	27,600 gal	27,600 gal	20,700 gal	20,700 gal	20,700 gal	20,700 gal	0.5	$427
Waterless Urinals (7)		106,667 gal	106,667 gal	80,000 gal	80,000 gal	80,000 gal	140,000 gal	1.5	$1,206
Solid Waste Recycling									
Total Savings (MTCO2e)	***633.9***	***194.2***	***262.7***	***106.5***	***103.4***	***167.7***	***139.3***	***1,607.6***	***$22,948***
Mixed Recyclables (includes Wastewise)	34 tons	14.4 tons	93 tons	9.6 tons	10.4 tons	10.4 tons	12 tons	514.6	$7,352
Pallets Waste Avoided/Wood Recycled						60 cu yd (approx 25 T)	30 cu yd (approx 12.5T)	92.3	$1,500
Steel Recycled during Deconstruction									
Concrete / Asphalt recycled									
Ceiling Tiles recycled									
Carpet recycled									
Recycled C & D (Construction Waste)									
Cardboard (construction/non-construction/ sharp containers)	90 tons	23 tons		24 tons	11 tons	11 tons	11 tons	528.7	$6,800
Mixed Metal (construction/non-construc-tion)									
Paper, Mixed	73 tons	23 tons			11 tons	11 tons	11 tons	454.1	$5,160
Plastic, Mixed (bottles, construction/non-construction, sharp containers)									

Environmental Metrics	March 2010 Update	Nov 2010 Update	Jul 2011 Update	Jan 2012 Update	Jul 2012 Update	Jan 2013 Update	Jul 2013 Update	Total Conversion (MTCO2e)	Cost Savings (est.)
Blue Wrap									
Can / Bottle Recycling									
Mixed Organics									
Food Donation (Waste diversion)									
Biosolids & Food Recycling / Composting	9 tons	5 tons	10.64 tons	8 tons	2 tons	8 tons	2.77 tons	9.1	$1,816
Fluorescent Bulbs		1044 lbs	509 lbs	437 lbs	900 lbs	1045 lbs	6000 lbs	0.6	$199
Waste Oil Recycled				110 gal				1.3	$19
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 Recycled				165 gal		165 gal		4.0	$56
Ballast (mixed metal)		147 lbs	93 lbs		400 lbs	165 lbs	404 lbs	2.4	$24
Water Bottle Filling Stations (plastic bottles saved)					210 lbs (3)	420 lbs (6)	490 lbs (7)	0.6	$22
Green Procurement									
Total Savings (MTCO2e)	***10.9***	***16.3***	***5.6***	***50.8***	***63.1***	***3.6***	***25.5***	***175.8***	***$19,000***
Purchase of Materials with Recycled Content	5600 reams paper 3200 @ 100% PC 2400 @ 30% PC	8400 reams paper 4800 @ 100% PC 3600 @ 30% PC	6800 reams 30% PC	6000 reams 30% PC	4400 reams 30% PC	4400 reams 30% PC	6400 reams 30% PC	50.3	
Purchase / Use of Compost Socks									
Purchase of EPEAT Products				115 desktops	150 desktops		190 units	125.6	$19,000
Use of Recycled Steel during Construction									
Use of Recycled Iron during Construction									
Use of Recycled Plastic / Construction									
Use of Recycled Aluminum / Construction									
Use of Recycled Concrete / Asphalt during Construction									
Use of Coal Combustion Products									
Green Landscaping									
Total Savings (MTCO2e)	***0.0***	***0.0***	***0.0***	***0.0***	***0.7***	***0.7***	***0.7***	***2.0***	***$34***
Green Roofs					600 sq ft	600 sq ft	600 sq ft	2.0	
Porous Pavement									
Grass									
Low/no mow area									
Green Space									
Re-use of Collected Stormwater	2,000 gal	2,000 gal	3,000 gal	1,500 gal	500 gal	1,000 gal	6,600 gal	0.0	$34
On-Site Re-use of Compost									
Moisture Sensing Sprinklers									

Environmental Metrics	March 2010 Update	Nov 2010 Update	Jul 2011 Update	Jan 2012 Update	Jul 2012 Update	Jan 2013 Update	Jul 2013 Update	Total Conversion (MTCO2e)	Cost Savings (est.)
Number / Acres of Trees									
Reflective Roof									
Synthetic Turf									
Native Plants									
Leaves Composted									
Electronics / EPEAT									
Total Savings (MTCO2e)	***14.6***	***5.2***	***7.4***	***5.1***	***5.1***	***10.0***	***2.1***	***49.4***	***$838***
Recycling of Electronics	18,250 lbs	5,998 lbs	1,917 lbs	337 lbs	830 lbs	3,000 lbs	1,267 lbs	25.3	$632
Re-Use/Donation of Used Computers			26 units (208 lbs)			350 units (5645 lbs)		6.9	$117
Toner/Ink Recycling - Use of Recycled Ink			140 cartridges	105 cartridges	105 cartridges	75 lbs	75 lbs	14.9	$31
Battery Recycling		466 lbs	246 lbs	978 lbs	500 lbs	294 lbs	417 lbs	2.3	$58
Mass Transit									
Total Savings (MTCO2e)		***216.5***	***216.5***	***324.8***	***324.8***	***576.1***	***512.8***	***2,171.4***	***$2,702,041***
Miles Avoided		485,500 mi	485,500 mi	728,250 mi	728,250 mi	1,291,653 mi	1,149,390 mi	2,171.4	$2,702,041
Transportation									
Total Savings (MTCO2e)	***1.5***	***1.3***	***1.3***	***1.0***	***1.0***	***1.0***	***1.0***	***7.9***	***$3,223***
Hybrid Vehicles	1 car (9 mo.)	1 car (8 mo.)	1 car (8 mo.)	1 car (1/2 yr)	1 car (1/2 yr)	1 car (1/2 yr)	1 car (1/2 yr)	7.9	$3,223
Electric Vehicles									
Biodiesel Vehicles									
Clean Construction / LNG Vehicles									
Alternate Fuel Vehicles									
Smartway Transporters									
Bike Racks									
LEED Projects									
Total Savings (MTCO2e)									
Silver - 30%									
Gold - 40%									
Platinum - 45%									
MTCO2e Savings									
Total (MTCO2e)	***3,307.6***	***2,800.9***	***3,229.7***	***2,496.2***	***2,709.5***	***3,194.1***	***3,161.8***	***22,579.8***	***$3,846,732***
Energy	125.2	125.6	494.3	316.4	292.0	267.4	300.2	1,921.2	$271,335
Alternative Energy	2,521.5	2,241.5	2,241.5	1,681.5	1,885.6	2,137.3	2,181.8	16,570.7	$766,013
Water	0.1	0.4	0.4	10.1	33.9	30.3	(1.4)	73.9	$61,300
Solid Waste	633.9	194.2	262.7	106.5	103.4	167.7	139.3	1,607.6	$22,948
Green Procurement	10.9	16.3	5.6	50.8	63.1	3.6	25.5	175.8	$19,000
Green Landscaping	0.0	0.0	0.0	0.0	0.7	0.7	0.7	2.0	$34
Electronics	14.6	5.2	7.4	5.1	5.1	10.0	2.1	49.4	$838
Mass Transit	0.0	216.5	216.5	324.8	324.8	576.1	512.8	2,171.4	$2,702,041
Transportation	1.5	1.3	1.3	1.0	1.0	1.0	1.0	7.9	$3,223

Raritan Valley Community College Additional Green MOU Accomplishments and Cost Savings

2013

Smart Workplaces Gold Award

Through its prestigious state-wide Smart Workplaces program, the Transportation Management Association Council of New Jersey honors companies for their outstanding achievements in implementing programs that provide and promote commuting alternatives for their employees, thus reducing traffic congestion and improving air quality. This year, Raritan Valley Community College is being awarded at the Gold level. (The College was awarded at the Gold level in 2012 and Silver in 2011.)

ENERGY STAR Building & Plant Partnership

Energy Conservation

RVCC continues to improve HVAC controls. Old pneumatic HVAC controls have been replaced with more efficient digital controls and switched to an online monitoring system in the Physical Education building machine room and for most pumps for the hot water and chilled water campus loops. The College is currently in the process of converting over numerous unit ventilators in Hunterdon Hall.

Energy Curtailment

RVCC continues to participate in the Energy Curtailment program offered by PJM Interconnection, the regional transmission organization for electricity. When called upon by the power company, RVCC shuts down certain equipment (air conditioning) for short periods of time so as to help reduce load on the northeast grid.

WasteWise Partnership and Solid Waste Recycling

In June, the College's dining services vendor, Culinart, agreed to donate unserved trays of leftover food to the Somerset Food Bank on an ongoing basis.

Sustainable Design, Construction, and Operations Practices

Construction continues on the new Student Center, which will be LEED Gold and include a rainwater harvesting system, a green roof, and a green wall.
The College intends to pursue LEED Gold certification for the West Building.

Campus and Community Involvement

Green activities on campus are highlighted on RVCC's sustainability web site. The Environmental Club, Ecology and Environmental Studies students, and others have been involved in many campus and service learning projects. Recent activities include daily Earth Week events: a campus cleanup, a bottled vs tap water tasting contest and education, sustainable coffee and chocolate sales and education, composting education, Planetarium shows about Earth and Natural Selection, a climate change presentation, reusable water bottle and canvas tote sales, and Clean Ocean Action's beach cleanup. The club also tapped and made syrup from invasive Norway maple trees.
In the fall, students in the College's Geographic Information Systems class (ENVI 202) developed a map for a green tour of the College. The green tour was added to the sustainability web site.