

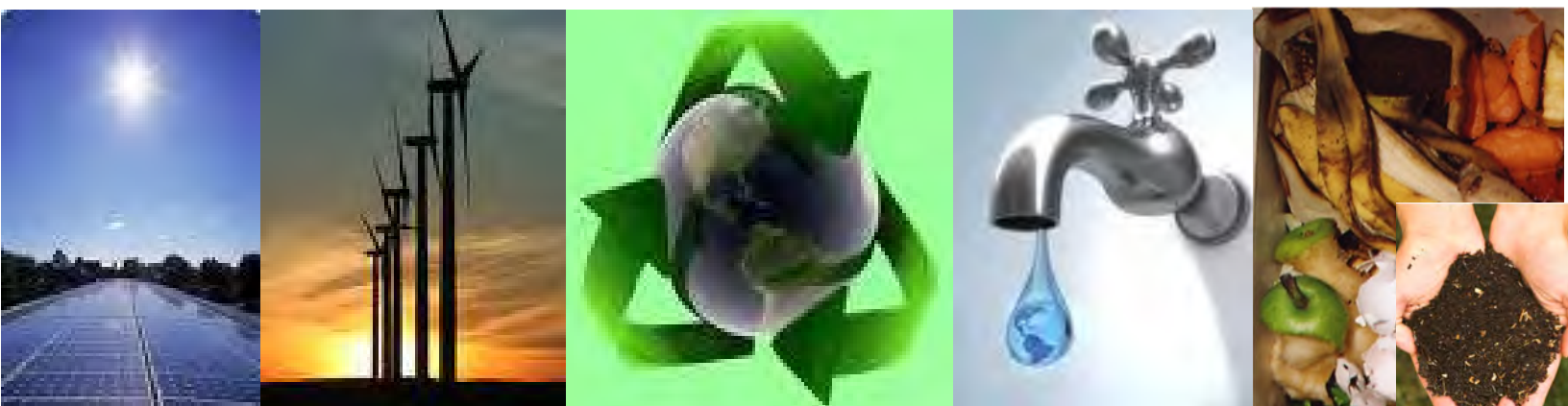


**MetLife Stadium  
(formerly New Meadowlands Stadium)**

**Environmental Assessment:**

**MOU Annual Report**

**March 20, 2013**



**Environmental Protection Agency  
Region 2**

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

Jose Pillich  
Michael Wanser  
*Research Analysts*

## Accomplishments

**Reductions of 234,834 MTCO<sub>2</sub>e**



## Memorandum of Understanding

On June 1, 2009, MetLife Stadium, home of the New York Giants and New York Jets, 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 MetLife Stadium has resulted in reducing energy, water and solid waste production across their entire operations.

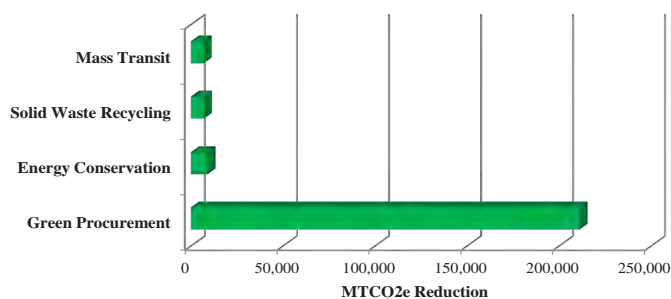
## Reduction in Environmental Footprint

In the last three and a half years, the MetLife Stadium has provided six updates documenting its green initiatives. The EPA has analyzed the submitted information and generated an environmental footprint for the organization. Due to their progressive green efforts, the organization has managed to reduce its carbon footprint by 234,834 MTCO<sub>2</sub>e\* and saved an estimated \$19,900,000 in operating expenses.

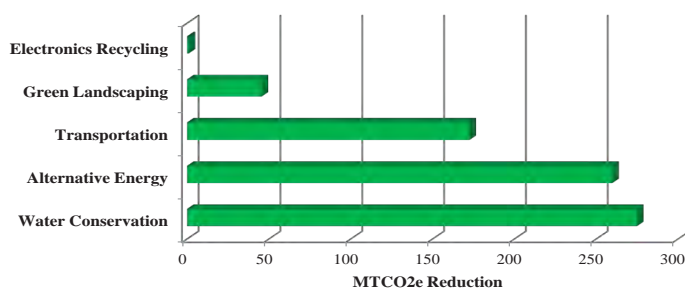
\*Metric Ton Carbon Dioxide Equivalent

Environmental Metrics	Total Sector (MTCO <sub>2</sub> e)	Cost Savings (Est.)
Energy Conservation	8,989.7	\$2,192,311
Alternative Energy	259.8	\$43,855
Water Conservation	274.9	\$185,675
Solid Waste Recycling	7,059.8	\$542,519
Green Procurement	211,150.2	\$8,243,440
Green Landscaping	45.6	\$37,797
Electronics Recycling	1.0	\$25
Mass Transit	6,880.7	\$8,562,263
Transportation	172.6	\$108,000
<b>Total (MTCO<sub>2</sub>e)</b>	<b>234,834.2</b>	<b>\$19,915,885</b>

### 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 MTCO<sub>2</sub>e.

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 MTCO<sub>2</sub>e 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 234,834 MTCO<sub>2</sub>e**

## Greenhouse Gas Equivalencies

What does the reduction of 234,834 MTCO<sub>2</sub>e represent ?  
The organization's effort is equivalent to any one of the following:

- Annual greenhouse gas emissions from 48,924 vehicles



- Carbon dioxide emissions from 26,326,682 gallons of gasoline



- Carbon dioxide emissions from 546,126 barrels of oil consumed



- Carbon dioxide emissions from the energy use of 12,086 homes for one year



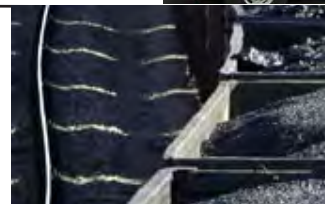
- Carbon dioxide emissions from 9,784,750 propane tanks used for home barbeques



- Carbon dioxide emissions from gasoline carried by 3,097 tanker trucks



- Carbon dioxide emissions from burning 1,009 railcars' worth of coal (over 15 1/4 miles long)





Environmental Metrics	Jun 2009 MOU	Dec 2009 Update	Jun 2010 Update	Nov 2010 Update	Jun 2011 Update	Feb 2012 Update	Feb 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
<b>Energy Conservation/Energy Star</b>									
<b>Total Savings (MTCO2e)</b>		<b>191.2</b>	<b>191.2</b>	<b>108.5</b>	<b>1,517.6</b>	<b>2,731.7</b>	<b>4,249.4</b>	<b>8,989.7</b>	<b>\$2,192,311</b>
Miscellaneous Energy Conservation		139,370 kwh	139,370 kwh	3,033 kwh	2,500,000 kwh	4,500,000 kwh	7,000,000 kwh	8,669.8	\$2,063,716
Motors and Transformers									
Lighting Project Fixtures (Bulbs and Ballast)									
High Temp Hot Water Pipe Replacement									
HVAC, Chiller & Electrical									
Bulb Replacement (CFLs)									
Bulb Replacement (LEDs)									
Gas Savings									
Oil Savings		10,424 gal	10,424 gal	10,425 gal				319.9	\$128,595
Steam Savings									
<b>Alternative Energy</b>									
<b>Total Savings (MTCO2e)</b>							<b>259.8</b>	<b>259.8</b>	<b>\$43,855</b>
On-Site Solar							350,000 kwh	259.8	\$43,855
On-Site Wind									
On-Site Geothermal									
On-Site Combined Heat and Power									
Purchase of Green Energy/Green Power									
<b>Water Conservation/WaterSense</b>									
<b>Total Savings (MTCO2e)</b>		<b>0.4</b>	<b>46.0</b>	<b>46.0</b>	<b>45.6</b>	<b>45.6</b>	<b>91.3</b>	<b>274.9</b>	<b>\$185,675</b>
Miscellaneous Water Conservation		158,632 gal	158,632 gal	158,632 gal				1.2	\$967
Low Flow/Hands Free Faucets (956)			239,000 gal	239,000 gal	239,000 gal	239,000 gal	478,000 gal	3.5	\$2,914
Low Flow Toilets (956)			1,912,000 gal	1,912,000 gal	1,912,000 gal	1,912,000 gal	3,824,000 gal	28.1	\$23,312
Low Flow Shower Heads (96)			110,400 gal + 14,400 kwh	110,400 gal + 14,400 kwh	110,400 gal + 14,400 kwh	110,400 gal + 14,400 kwh	220,800 gal + 28,800 kwh	65.8	\$12,172
Low Flow Urinals									
Waterless Urinals (600)			12,000,000 gal	12,000,000 gal	12,000,000 gal	12,000,000 gal	24,000,000 gal	176.4	\$146,310
<b>Solid Waste Recycling</b>									
<b>Total Savings (MTCO2e)</b>	<b>983.6</b>	<b>1,103.2</b>	<b>1,566.6</b>	<b>512.7</b>	<b>517.2</b>	<b>826.9</b>	<b>1,549.6</b>	<b>7,059.8</b>	<b>\$542,519</b>
Mixed Recyclables (includes Wastewise)			40 tons	69.5 tons	69.5 tons	123.54 tons	325.29 tons	1,801.9	\$25,113
Pallets Waste Avoided/Wood Recycled			30 tons	25.5 tons	25.5 tons	32.19 tons	47.47 tons	395.2	\$6,426
Steel Recycled during Deconstruction									
Concrete/Asphalt Recycled							3.44 tons	2.8	\$138
Drywall Recycled / Reused							6.61 tons	1.5	\$264
Recycled C & D Waste (Construction Waste)	3,966 tons	3,967 tons	3,967 tons			23.58 tons		2,957.1	\$476,943
Cardboard (construction/non-construction/sharp containers)			78 tons	58 tons	58 tons	58.72 tons	71.36 tons	1,004.7	\$12,963
Mixed Metal (construction/non-construction)				7 tons	7 tons	14.26 tons	27.72 tons	302.3	\$2,239
Paper, Mixed		34 tons	34 tons	7.5 tons	7.5 tons	18.77 tons	13.28 tons	403.8	\$4,602
Plastic, Mixed (bottles, construction/non-construction, sharp containers)						4.33 tons	4.07 tons	12.6	\$336
Blue Wrap									
Mixed Organics									



Environmental Metrics	Jun 2009 MOU	Dec 2009 Update	Jun 2010 Update	Nov 2010 Update	Jun 2011 Update	Feb 2012 Update	Feb 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Food Donation (Waste diversion)				3 tons	5.5 tons	4.2 tons	5.37 tons	3.6	\$723
Biosolids & Food Waste Recycling / Composting					20 tons	106.65 tons	153.15 tons	56.0	\$11,192
Fluorescent Bulbs									
Ceiling Tiles Recycled									
Carpet Recycled									
Waste Oil Recycled			11 tons	2 tons	2 tons	11.25 tons	13.25 tons	118.5	\$1,580
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									
<b>Green Procurement</b>									
<b>Total Savings (MTCO2e)</b>	<b>196,988.7</b>	<b>3,095.8</b>	<b>7,288.4</b>	<b>3,745.2</b>	<b>0.8</b>		<b>31.3</b>	<b>211,150.2</b>	<b>\$8,243,440</b>
Re-Use/Purchase of Materials with Recycled Content	16,000 tons steel pilings			160,000 sq ft wood 3,000,000 sf wallboard 250,000 sf ceiling tile	1,000 reams 30% PC		28.2 tons 100% recycled paper	29,937.6	\$751,500
Purchase / Use of Compost Socks									
Purchase of EPEAT Products									
Use of Recycled Steel during Construction	60,000 tons							108,000.0	\$2,400,000
Use of Recycled Iron during Construction	560 tons							3,024.0	\$22,400
Use of Recycled Plastic during Construction	51 tons							76.5	\$2,040
Use of Recycled Aluminum during Construction	40 tons							544.4	\$1,600
Use of Recycled Concrete / Asphalt	102,000 tons		8,000 tons	200 tons + 215,000 cu ft				60,279.7	\$4,601,500
Use of Coal Combustion Products	5,733 cu yd	5,733 cu yd	5,734 cu yd					9,288.0	\$464,400
<b>Green Landscaping</b>									
<b>Total Savings (MTCO2e)</b>			<b>7.6</b>	<b>7.6</b>	<b>7.6</b>	<b>7.6</b>	<b>15.2</b>	<b>45.6</b>	<b>\$37,797</b>
Green Roofs									
Porous Pavement (Granite dust)			1,000,000 gal	1,000,000 gal	1,000,000 gal	1,000,000 gal	2,000,000 gal	14.7	\$12,193
Grass									
Low / no mow area									
Green Space (shrubs and bushes)									
Re-use of Collected Stormwater									
On-Site Re-use of Compost / Mulch									
Moisture Sensing Sprinklers									



Environmental Metrics	Jun 2009 MOU	Dec 2009 Update	Jun 2010 Update	Nov 2010 Update	Jun 2011 Update	Feb 2012 Update	Feb 2013 Update	Total Conversion (MTCO2e)	Cost Savings (Est.)
Number / Acres of Trees									
Reflective Roof									
Synthetic Turf			1,750,000 gal	1,750,000 gal	1,750,000 gal	1,750,000 gal	3,500,000 gal	25.7	\$21,337
Native Plants			350,000 gal	350,000 gal	350,000 gal	350,000 gal	700,000 gal	5.1	\$4,267
Leaves Composted									
<b>Electronics/EPEAT</b>									
<b>Total Savings (MTCO2e)</b>				<b>1.0</b>				<b>1.0</b>	<b>\$25</b>
Recycling of Electronics				0.625 tons				1.0	\$25
Re-Use/Donation of Used Computers									
Toner/Ink Recycling and Use of Recycled Ink									
Battery Recycling									
Purchase of EPEAT Products									
<b>Mass Transit</b>									
<b>Total Savings (MTCO2e)</b>			<b>1,349.2</b>	<b>1,349.2</b>	<b>1,349.2</b>	<b>1,416.6</b>	<b>1,416.6</b>	<b>6,880.7</b>	<b>\$8,562,263</b>
Vehicles Miles Avoided(VMT)			3,025,000 miles	3,025,000 miles	3,025,000 miles	3,176,250 miles	3,176,250 miles	6,880.7	\$8,562,263
<b>Transportation</b>									
<b>Total Savings (MTCO2e)</b>			<b>1.7</b>		<b>44.3</b>	<b>50.6</b>	<b>76.0</b>	<b>172.6</b>	<b>\$108,000</b>
Hybrid / Electric Vehicles					32 vehicles	32 vehicles	32 vehicles	170.9	\$108,000
Biodiesel Vehicles									
Clean Construction Vehicles			1.68 MTCO2e					1.7	
LNG Vehicles									
Alternate Fuel Vehicles (Zipcar)									
Smartway Transporters									
Bike Racks									
<b>LEED Projects</b>									
<b>Total Savings (MTCO2e)</b>									
Silver - 10%									
Gold - 17%									
Platinum -20%									
<b>MTCO2e Savings</b>									
<b>Total (MTCO2e)</b>	<b>197,972.3</b>	<b>4,390.6</b>	<b>10,450.6</b>	<b>5,770.1</b>	<b>3,482.4</b>	<b>5,079.1</b>	<b>7,689.1</b>	<b>234,834.2</b>	<b>\$19,915,885</b>
Energy	0.0	191.2	191.2	108.5	1,517.6	2,731.7	4,249.4	8,989.7	\$2,192,311
Alternative Energy	0.0	0.0	0.0	0.0	0.0	0.0	259.8	259.8	\$43,855
Water	0.0	0.4	46.0	46.0	45.6	45.6	91.3	274.9	\$185,675
Solid Waste	983.6	1,103.2	1,566.6	512.7	517.2	826.9	1,549.6	7,059.8	\$542,519
Green Procurement	196,988.7	3,095.8	7,288.4	3,745.2	0.8	0.0	31.3	211,150.2	\$8,243,440
Green Landscaping	0.0	0.0	7.6	7.6	7.6	7.6	15.2	45.6	\$37,797
Electronics	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	\$25
Mass Transit	0.0	0.0	1,349.2	1,349.2	1,349.2	1,416.6	1,416.6	6,880.7	\$8,562,263
Transportation	0.0	0.0	1.7	0.0	44.3	50.6	76.0	172.6	\$108,000



2013

## **MetLife Stadium (formerly New Meadowlands Stadium) Additional Green MOU Accomplishments and Cost Savings**

### ***Energy Conservation Initiatives***

Despite the addition of over 40 significant Capital Improvement projects in 2012, MetLife Stadium's energy consumption remained at 25 million kilowatt hours. Significant energy conservation measures were undertaken in 2012 including the installation of devices to decrease energy use of water A/C controls, condensed water filters, refrigeration systems and lighting controls. MetLife Stadium's 2012 efforts on the energy conservation front and their cumulative efforts during design and construction has resulted in the Alliance to Save Energy organization naming MetLife Stadium as the top Energy Efficient Football stadium in the U.S.

In August 2012, MetLife Stadium completed construction on an iconic solar ring on top of the new stadium. No other stadium in the nation has such a feature. At its optimal state, the solar ring generates approximately 20% of MetLife Stadium's power needs on a non-game day

The following new energy conservation efforts were put in place over the past year and comparative energy use since opening has been reduced by 20%:

- Installation of the Siemens Demand Flow Logic to MetLife Stadium's chilled water A/C control.
- Addition of a condensed water side stream filter.
- Installation of E-cube refrigeration energy savings devices.
- Retrofit of select service level wall pack light fixtures to LED.

### ***Recycling and Solid Waste***

In 2012, MetLife Stadium diverted 39% of materials from the waste stream through:

- Establishment of designated recycling areas in the parking areas with blue bins for recycling; gray bins for trash. To improve upon this program, MetLife Stadium has changed the bins in the parking areas to differentiate among the types of material recycled (plastics, glass, aluminum).
- Installation of recycling bins close to trash bins in the stadium for patrons (sorted by type – e.g., cardboard, mixed paper, plastic, and aluminum). MetLife Stadium has bins in place that sort according to waste streams.
- Deployment of MetLife Stadium's cleaning teams in the stadium seating bowl immediately following an event to sort plastic, paper and other recyclable materials and to place the items in color-coded bags. In 2012, MetLife Stadium began collecting compostable items from the seating bowl. The goal is to build upon this program, ultimately collecting all compostable items from the stadium.
- Separation and bailing of all corrugated paper products/cardboard on site, both in stadium concourses and on service level, continues with great result.
- Recycling all wood pallets and small, off season construction project materials.

### ***Other Recycling Goals and Accomplishments in the Operations Phase***

In addition to these comprehensive operations' initiatives related to recycling, MetLife Stadium set forth a series of other goals that are in progress:

- Development of a program for the recycling and collection of office electronics (computers, printers, monitors), furnishings, light bulbs, paper, plastic.
- Development of waste management protocols for hazardous materials.
- Purchase of Energy Star office equipment (cordless telephones, computers, monitors, printers, faxes, copiers, scanners, water coolers).
- Purchase of compact fluorescent bulbs or high efficiency tube fluorescents for all fixtures throughout the new stadium.
- Purchase of alternative fuel vehicles for onsite use (gators, carts, etc).
- Use of 30% post consumer recycled paper supply in office and for publications.
- Use of 100% recycled soft tissue products.
- Conserve hard copy print run requirements and develop other strategies to reduce use of paper.
- Install automatic hand dryers in locker rooms and continue to assess their use in other areas
- Use of green products for cleaning purposes (floor wax, carpet shampoo, window cleaning, etc.).
- Develop green procurement standard specifications for maintenance-related RFPs.
- Sponsorship of employee "green" programs (e.g., community tree planting, clothes donation programs, etc.)

### ***Greening of the 2014 Super Bowl at MetLife Stadium***

As the host of the 2014 Super Bowl, MetLife Stadium is planning to conduct the most environmentally friendly major sporting event to date. The planning committees are working diligently to green all areas of the event including pre-event activities, transportation, mass transit, equipment, game day events, fan education, etc.