



University of Miami

# Sustainability Interim Report



Green 

Office of Sustainability

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# Introduction

The University of Miami's 2015 Sustainability Interim Report follows the steps of our first Climate Action Plan published in 2010. This report intends to give a snapshot of the State of Green Initiatives and achievements at UM, specifically for the campus of Coral Gables but also the Miller School of Medicine campus and the Rosenstiel School of Marine and Atmospheric Science campus. It is a part of the roadmap that the University follows in its journey towards carbon neutrality. In order to fulfill long-term goals of greenhouse gas emission reductions, UM has committed to various programs, projects and policies that will be outlined in this document. Future scenarios and strategic planning for emission reductions will be the object of a separate and more comprehensive Sustainability Action Plan that we are expecting to release in 2016.



As sustainability continues to be implemented further, it will be essential to keep track of our emissions on a regular basis. The data gap currently spanning between 2008 and 2013 will need to be filled in our 2016 Sustainability Action Plan. We already made the choice to use the Sustainability Tracking Assessment and Rating System as the most appropriate tool for this endeavor. The Sustainability Tracking, Assessment & Rating System™ (STARS) *is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance*<sup>2</sup>. UM is an active member of the Association for the Advancement of Sustainability in Higher Education.

Our application to STARS will ensure that the plan gets constant monitoring, evaluation and feedback.

2- <https://stars.aashe.org/>

# The University of Miami's Commitment

The University of Miami has long been cognizant of human's impact on the environment. The university strives to educate future leaders, and to *"transform lives through teaching, research, and service"*. This culture transformation the University has embarked on in the last few years embraces Sustainability as one of its guiding principles.

At the U, we transform lives through teaching, research, and service.



In 2005 the University launched Green U – Office of Sustainability, under the direction of Alan J Fish (Vice President of Business Services at the time) in order to have a more comprehensive approach to the numerous sustainability efforts the University was conducting. Green U aims at making UM a leader in environmentally responsible best practices by adopting sustainable guidelines in all areas of campus maintenance and operations.

The Green U – Office of Sustainability is supervised by the Environmental Health and Safety department (EHS). This department reports to Business Services, a division that oversees many branches of the school involved in sustainability projects.



In 2007, **President Donna E. Shalala signed the American College and University Presidents Climate Commitment.** This historical event sent

a strong and unequivocal message about University of Miami's dedication to sustainability. As part of this commitment, a Climate Action Plan was designed in 2009, the first of its kind. The University of Miami, since then, has taken steps towards carbon neutrality and has engaged in the path of Greenhouse Gas emissions reduction.

The American College & University Presidents' Climate Commitment (ACUPCC) is a “high-visibility effort to address global climate disruption undertaken by a network of colleges and universities that have made institutional commitments to eliminate net greenhouse gas emissions from specified campus operations, and to promote the research and educational efforts of higher education to equip society to re-stabilize the earth’s climate”<sup>4</sup>. As a member of the elite Leadership Circle, President Shalala is one of the original signatories.



***“The University of Miami is recognized for preparing students to be environmental thinkers and responsible citizens of the world. Now we are making a commitment to a sustainable future by broadening our approach to educating students on environmental sustainability and by fostering a culture of environmental awareness at the University.”***

- President Shalala on her historic signing (April 18<sup>th</sup>, 2007)

<sup>4</sup> <http://www.presidentsclimatecommitment.org/>



# Sustainability Projects at UM



## Green Building

The design, construction, and performance of buildings are a key piece in the University's commitment to Sustainability. This commitment is extraordinarily important as not only does it minimize the impact on the environment, but it also promotes quality of life and health of the occupants. The University of Miami Facilities Design and Construction Department has adopted an aggressive Green Building policy, following the US Green Building Council guidelines: Since 2007, all new buildings are to be designed and constructed in a manner to attempt to reach a minimum standard of LEED<sub>TM</sub> Silver rating, Projects will strive to achieve a higher level than LEED<sub>TM</sub> Silver whenever possible, major renovation of existing buildings will need to reach a minimum standard of LEED<sub>TM</sub> silver rating.



The University of Miami is home to the first high-rise in South Florida that was constructed using green principles-residential or commercial. **The Clinical Research Building** is home to clinical trials and other medical research at the UM Miller School of Medicine. Built using LEED<sub>TM</sub> principles and practices; reflective "Energy Star" roof reduces heat gain; double-pane

argon gas windows insulate building; curtain wall fins reduce solar heat; raised floor system provides for better indoor air quality and energy efficiency (first high-rise in South Florida with this technology); floor vents reduce ductwork improving air flow and efficiency; all lighting is low-energy fixtures; automated light and alarm timing save electricity; chilled water loop system provides more efficient cooling ; permeable pavers improve run off; carpet and other internal materials are certified green and are recyclable; modular floors, walls, carpet, outlets and vents are easy to reconfigure; close proximity to Metrorail and buses; Wellness Center showers and

lockers for cyclists and public transit users; and a landscaped river walk on Wagner Creek.

**10 other buildings are LEED™ certified or in the process of being certified:**

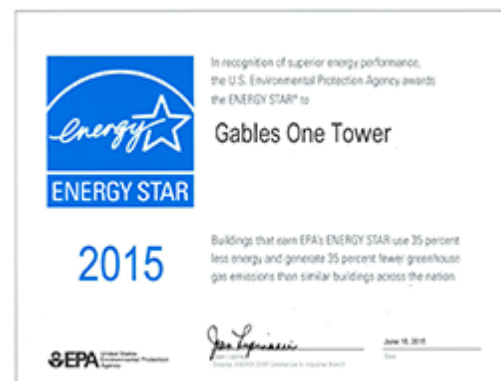
The Biomedical Research Building (Medical campus), the Cox Neuroscience and Health Annex (Coral Gables campus), the Hecht Athletic Center (Coral Gables campus), the Life Science and Technology Park (Medical campus), the Marine Technology and Life Sciences Seawater Research Building (RSMAS campus), the Multi-Purpose and Practice Facility Gold LEED™ (Coral Gables campus), the Robert and Judi Prokop Newman Alumni Center (Coral Gables campus), the Student Activities Center (Coral Gables campus), and the new **Patricia Louise Frost Music Studios (Coral Gables campus)**. **This last building is targeting a LEED Platinum certification:** Photovoltaic roof panels convert sunlight into electricity. Rainwater is collected and used around the building for landscaping irrigation. Serving as the equivalent of planting 320 trees, the amount of titanium dioxide mixed into the concrete remove air pollutants, and windows automatically adjust to bright or overcast conditions outside. *“It’s a groundbreaking building that it will save \$100,000 a year in electricity costs over a structure built with conventional materials”* Yann R. Weymouth, senior vice president and director of design for HOK Architects



The Smathers Four Fillies Farm, a residential community of 30 single-family homes built for the University of Miami faculty and located in the Village of Pinecrest, south of the University of Miami campus took the top prize of a regional award that recognizes sustainable development, the Urban Land Institute’s (ULI) Woolbright Dream Green Reality Award.

The Gables One Tower building located on the Coral Gables campus has been **Energy Star** rated by the EPA for the second year in a row.

The University uses these buildings as educational tools for those in and outside the University of Miami, and is an active member of the **Better Building Alliance**, a Department of Energy's (DOE) exceptional network of



research and technical experts with mission to develop and deploy innovative, cost-effective, energy-saving solutions for more sustainable buildings in the country.

University of Miami has also been listed as “Green Campus” in the Green Colleges Princeton Review for 3 years in a row.

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USGBC  
STUDENTS



AMERICAN COLLEGE & UNIVERSITY  
PRESIDENTS' CLIMATE COMMITMENT

### GREEN HIGHLIGHTS

With a team name like the Hurricanes, the University of Miami has no choice but to take sustainability seriously. In addition to signing the Talloires Declaration and the ACUPCC, UM has also signed the Panama Pact, collaborating on a cutting edge education and research facility that addresses “present and twenty-second century challenges” with an emphasis on sustainable technology. The university constructed the first green high-rise facility in South Florida, and the eight buildings give UM more than 1 million green square feet! In addition UM has achieved LEED Gold on the Coral Gables campus’ Fieldhouse. Seventy-five percent of campus buildings have seen energy-related retrofits in the past three years, and close to three-quarters of cleaning products used on campus are Green Seal-certified. The university recently adopted the more efficient and user-friendly single-stream recycling process, which has caused a spike in on-campus recycling volume. Through UBike, UM offers bicycle incentives on campus, such as free locks and safety classes. The university also gives parking rebates to hybrid drivers. As a large research university, UM has a vast array of sustainability-focused classes and majors, and research opportunities are available through the Abess Center for Ecosystem Science and Policy, the Clean Energy Research Institute, the Renewable Energy Research Lab, the Climate Studies Group, and the Pew Institute for Ocean Science. The career center also hosts dedicated green job fairs. Campus awareness and sustainability efforts are coordinated through Green U, an Office of Environmental Health and Safety organization, with an environmental emphasis.

### Green Facts

Available transportation alternatives:

indoor and secure bike storage, shower facilities, and lockers for bicycle commuters, school developed bicycle plan, free or reduced price transit passes and/or free campus shuttle, condensed work week option for employees, school offers a telecommute program for employees, carpool/vanpool matching program, cash-out parking, incentives or programs to encourage employees to live close to campus

School has formal sustainability committee	Yes
Sustainability-focused degree available	Yes
Public GHG inventory plan	Yes
School employs a sustainability officer	Yes
% school grounds maintained organically	5

### Student Body

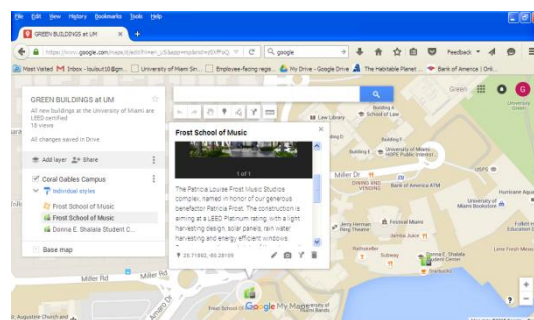
Total undergrad enrollment	10,237
# of applicants	27,757
% of applicants accepted	40
% of acceptees attending	18
Average HS GPA	4.2
Range SAT Critical Reading	600-700
Range SAT Math	630-720
Range SAT Writing	590-690
Range ACT Composite	28-32

### Cost

Annual tuition	\$41,580
Required fees	\$1,272
% needy undergrads receiving need-based scholarship or grant aid	96
% undergrads receiving any aid	77
Average cumulative indebtedness	\$26,786

### Projects for 2016:

- Our Dept of Design and Construction will install in each one of our LEED certified building a screen to highlight their Green features. An educational program will be developed to allow the self touring of UM students and educate our community on the benefits of sustainable construction. Along with these screens, an **interactive map of our LEED buildings** will be available online for whoever wants to learn about their LEED features and give the opportunity to graduate students to get directly in touch with each project manager if they need it for their





research.

- Our Coral Gables campus is expected to add several new buildings in the coming years, but probably the most impressive project will be the launch of the **Lennar Foundation Medical Center** that will deliver breakthrough health care to South Florida starting in the fall of 2016. This LEED-certified outpatient facility, designed by architects Perkins+Will, will be located at 5550 Ponce de Leon Boulevard, a short walk from the University Metrorail station. The building aims a LEED gold certification.

- Faculty members from the School of Architecture, our Real Estate Dept, Design and Construction Dpt and Green U will make a proposal to introduce into the curriculum a **LEED Lab pilot program** aiming at training our students in the LEED-Operations and Maintenance certification process (certified the Gables One Tower and other existing buildings for).

**THE CENTER  
FOR GREEN SCHOOLS**



## Transportation

We all continue to benefit from the actions of our responsible community members who understand clearly the transportation options that foster good environmental practices at the University of Miami. Transportation accounts for the second largest source of the campus emissions footprint. The University of Miami's transportation initiatives can serve as a model for the region. The University strives to maintain a campus-based multi-model transportation system that promote walking, bicycling, public transit, vehicle pooling and vehicle sharing.

**Public Transportation Passes:** University of Miami employees and students can take advantage of an environmentally friendly initiative that addresses some of the challenging transportation issues in our community: They can receive up to 50 percent savings on the monthly cost of Miami Dade County Mass Transit passes.



**Zipcar:** Imagine being able to have a vehicle at your disposal without having to buy or lease. Beginning on August 22, 2008, the University of Miami students, faculty, and staff were given access to a car-sharing program created in partnership with a company called Zipcar. The new program allows members to reserve fuel-efficient cars online, via phone or mobile

device, for an hourly rate of \$8 that includes gas and insurance. That's especially helpful for freshmen residents at UM, who are not allowed to have a parking permit on campus during their first year.



### Carpool to Campus

The University of Miami has partnered with South Florida Commuter

Services (SFCS), a program of the Florida Department of Transportation, to provide transportation related programs and services to UM students, faculty and staff. Students, faculty and staff that carpool to the

Coral Gables or RSMAS campus can register their carpools and be entered into SFCS Emergency Ride Home program.



**U Bike:** The program facilitates the selling of bicycles and helmets at the bookstore at a discounted price to students. Registered students will also have access to free bike locks that can be picked up at the UM police station. As part of this initiative, the University has widened sidewalks, and added bike racks and pump stations to the Coral Gables campus. The University of Miami also welcomes the use of skateboards, inline skates, scooters, and other human powered transportation. In 2012, The University of Miami was recognized as a **Bike Friendly University (BFU) by the League of American Bicyclists**, joining a small group of elite schools that have also earned the honor.

**UM's Bicycle Reuse program** recently partnered with **Magic City Bicycle Collective**, a locally rooted organization that works



for communities that need it the most. Magic City Bicycle Collective's mission is to empower the bicycling community with a workspace for affordable bicycles, repairs and educational workshops, thereby strengthening community bonds and encouraging Miami to adopt bicycling as a viable form of alternative transportation.

**Walking Canes,** The University of Miami is promoting healthy habits that are both eco-friendly and economical by encouraging members of the university community to walk to get around campus.



**GEM Neighborhood Electric Vehicles:** Road ready with speeds up to 35mph. The University has a fleet of 12 GEM vehicles. 2 of them works on Solar Photovoltaic energy

**Electric Segway:** UM Police Department also has five Segway scooters, all outfitted

with sirens and blue lights.

**UM Rosenstiel School Promotes A Greener Way to Drive School's using biosynthetic motor oil** in its fleet of passenger vehicles on Virginia Key campus. The University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science is using a greener, cleaner motor oil on its Virginia Key campus. California-based Biosynthetic Technologies provided the new type of biosynthetic motor oil – made from bio-based sources – for use in the school's fleet of passenger vehicles.



Partnering with Green U, UM Parking and Transportation is promoting an Idling Reduction program on our campus.

#### Projects for 2016:

- Despite the constraint and challenges of new parking space availability mandated by our local authority related to our new Health care facility, the Coral Gables campus will add **4 Level 2 Charging stations for Electrical Vehicles** to the already existing 5 Level 1 outlets available in our CRB building (Medical campus) and our new Marine Technology & Life Sciences Seawater Research Building (RSMAS).
- Our Planning and Development Dpt in collaboration with UM Parking and Transportation will develop a new Mobility Plan this year that will **prioritize pedestrian access** to the different part of the Coral Gables campus. Housing Residence Life is also working on centralizing package delivery and this way minimizes truck emissions.
- UM is also actively looking at a **Bike Share program** as a viable transportation alternative on campus.





## Green Purchasing and Printing

University of Miami strives to purchase environmentally and socially responsible materials and products. Our Purchasing Department is committed to purchasing products that have earned the Energy Star label, and have met the Energy Star specifications for energy efficiency, wherever possible and practical.



**Recyclable Carpet:** New Carpet contracts states that new carpet must comply with LEED standards as well as green carpeting standards. Old carpet must be recycled and new carpet must be recyclable.

**Light bulbs:** All light bulbs are energy efficient, at least CFL or T9 ballast. The University is pursuing an aggressive Smart LED lighting installation program.



**Mercury-free medicine:** All mercury-based medical instrumentation are being phased out from the Miller School of Medicine campus and Jackson Memorial Hospital



**Cleaning Products & Equipment:** Our Custodial Companies are required to follow those guidelines and many of the products that they use have one of the main Sustainable/Green labels like Green Seal. Staples is our official office supply provider and offer a wide range of “Easy on the Planet” products.

**Paper Reduction program:** One of the Human Resource Departments on the UM Miller School of Medicine campus has gone 100% paperless. Many other departments at UM are working to implement similar programs. The University of Miami’s Document Management System can help with these problems. The ECM Team has helped over 100 University departments streamline their operations and eliminate the paper. Major savings and paper reduction occurred on the Medical Campus with both the Medical Billing conversion to online platform, and the launch of patient records programs like the Online My UHealth Chart.

### More environmentally preferable products at our bookstore:

Recycled paper agendas to T-shirts made from recycled plastic bottles



**Managed Print Services:** The Department of Managed Print Services and Canon Solutions America have joined forces with Green U to promote the University of Miami's environmental awareness initiatives. Canon establishes environmental goals and monitors its progress on a yearly basis. Initiatives are continually undertaken to reach these goals, which focus on minimizing lifecycle CO2, raw materials/use CO2, and the energy consumption at operational sites.



### Green Committee at Miller

In the summer of 2015, Green U invited several stakeholders on the Medical campus to form a Green Committee at Miller, with the objective of adopting a comprehensive approach to Sustainability in our Research and Healthcare facilities.

With the help and resource provided by the Healthier Hospital Initiative and Practice Green Health, we are bringing greener solutions to our operations challenges.

Our Purchasing Dept is noticeably involved in implementing a Single Use Devices Reprocessing and Buyback program for our Hospitals. New systems of storage and medical supply delivery are minimizing cardboard accumulation on site. Constant review of surgical kits allow for more efficiency in the OR as well as waste reduction.

### Project for 2016:

- Our Purchasing department in collaboration with Green U is reviewing its **Sustainable Procurement guidelines**. Examples of best practices are the adoption of 30% recycled paper as standard copy paper and the drastic reduction of Styrofoam among our Caterers.







## Recycling & Reuse

The University of Miami is committed to recycling and waste minimization. On all campus areas the University is constantly working to find better end uses for our waste that benefit the economy and the planet. Here are the main programs promoting Recycling on campus:

**Single Stream Recycling:** The University has been implementing an aggressive single stream recycling campaign, sometimes called



commingled or mixed recycling (all recyclable items like clean paper, bottles, cans, and cardboard are collected in a single bin). Our goal is to constantly increase our rate of diversion from landfills. This is done through application of best practices and education campaigns both for end users and custodial employees.

**Confidential Paper Shredding and recycling:** Third parties companies are in charge of collecting our confidential paper shred it and recycle it.

**Mulching and composting:** All yard waste, landscape trimming, tree pruning waste is recycled in our Mulch/Composting area. This program does not include any food waste, but is used for our extensive landscaping mulch and fertilizing needs. Our Mulching on site practice offset 470 Tons per year of green waste from our landfills.



**Toner and Cartridge recycling:** In place since 2014, this program helps UM Employees, and Copier maintenance workers recycle all toner cartridges, printer cartridges and toner bottles. The program generates revenue since those items are repurposed by the third party company in charge of this program. All proceeds from this program go to a local Charitable non-profit.





## Food waste

**Tray-less Dining Halls:** The two main dining halls on the Coral Gables Campus have gone Tray-less. The purpose of this program is to reduce food waste and water/energy use associated with the use of dining hall trays.

The Hecht Dining halls is now equipped with a **Bio Digester** that convert all pre-consumer food scraps into liquid waste, offsetting almost 20,000 Lbs of solid waste from landfills per month, and avoiding greenhouse gases release.

In 2015, UM Dining decided to standardize our **Used Cooking Oil** disposal practices on our 3 campuses by contracting with a new vendor. This change will allow recycling more than 15,000 Lbs of Used Cooking Oil a year.



A new program launched in partnership with Green U, UM Dining and Grounds Management will reuse the **Coffee ground** generated in our Starbucks for Soil amendment in some of our

landscaping areas

**E Waste, appliances, furniture and bulk recycling:** The University of Miami Property Surplus Department handles all transfers, disposals, and recycling of University Property. The Surplus Office will contact the department and arrange for free pick-up and/or disposal.

For personal electronics, our U Tech Source located in our Book Store takes old technology and gives a trade-in quote for the device even if it is broken. All trade-in are repurposed, nothing goes to landfill. For Rechargeable batteries, our Facilities customer service picks them up on demand and dispose of it with certified third parties for recycling.



**Reuse programs:** Periodically, during Move out, Earth Week and other events, the University partners with Good Will to make sure students used belongings don't end up in a landfill and are reused. Containers are placed throughout campus for drop off.

As an end result of these efforts, our **rate of waste diversion is constantly over the 30%**. Our goal in the next 2 years is to reach a 40-45% diversion rate with the implementation of more reuse, recycle and reduce programs.

#### Projects for 2016:

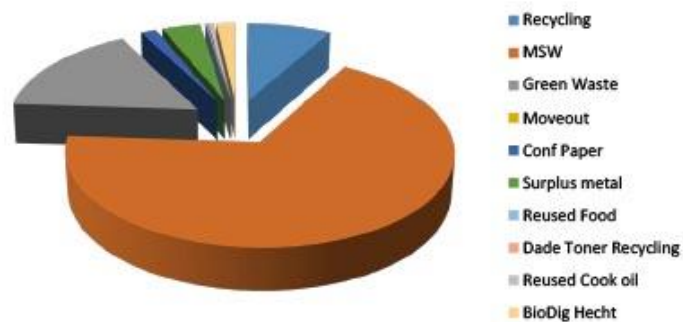
- In 2015, an aggressive educational and retrofitting campaign started on our Medical campus to increase our single stream recycling with the intent to cover all of our buildings by the end of 2016. Antos

Environmental, our consultant is approaching our 3 hospitals with trainings and retrofitting to increase SSR and **reduce the Regulated Medical Waste** generated.

- As part of the Green Committee at Miller resolutions, a recycling program for non-conventional items will start in the OR, addressing the **Sterilization wraps** first.

- Green U is exploring alternative ways to **compost pre-consumer food** in our dining halls.

**Coral Gables campus**  
Rate of Waste Diversion as of 9/1/15: **32.10 %**



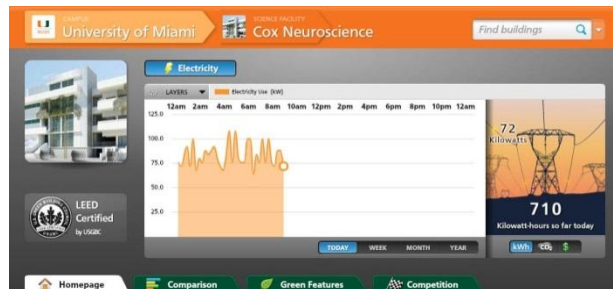


## Energy

Building and facility Energy use is a major contributor to greenhouse gas emissions, as the more energy is required the more work a plant must provide to supply that energy. As a result the University of Miami is constantly looking for ways to reduce energy requirements.

### Energy saving dashboard

As part of our ongoing energy and sustainability conservation efforts, we are monitoring our building energy performance in an effort to reduce our consumption and carbon footprint. All buildings on the Coral



Gables campus are now entered in our Energy saving dashboard, with real time access to KWH consumption.

### IT Energy saving pilot program

In collaboration with the EPA, UM IT, and Green U, our Facilities Management Dpt is putting computers on sleeping mode. If applied massively, this could save UM a lot of energy and reduce our carbon footprint



### Energy Efficiency

Electrical consumption reduction has been the main focus over the past 5 years. Significant energy conservation improvements and activities during this period have included:

- Construction of new LEED Buildings.
- Improved management of our Utility Plants CHW loop control strategies and set points to reduce the cost of Chilled Water production.
- Refrigerants upgrades to improve our chilled water loop system performance.
- Interior Lighting retrofit from T12 to T8 lamps with electronic ballast.
- Exterior LED and CFL lighting retrofits reducing wattage.

- Occupancy sensors in all buildings.
- BACnet EMS installation.
- Utility Plants upgrade of chiller to High performance energy efficient units to address additional load.
- High Efficiency Motor replacements.
- Campus wide efficiency setback of thermostats during campus break.
- Establishment of a campus Wide Set point of 74 Deg (+/- 1.5)
- On-going routine and preventive maintenance of building mechanical systems equipment to maximize their efficiency.
- Energy Audits: FPL in 2011 found the campus to be advanced in energy saving activities and improvements.

#### **Future electricity conservation actions:**

- Continue load shifting to off peak hours.
- Continue including lighting retrofits, EMS and multi-zone Variable-Air-Volume HVAC systems, Variable Frequency Drives on Air Handler Units and pumps on major and minor building remodel projects as appropriate.
- Continue Interior lighting retrofits as equipment's fail.
- Continue installing occupancy and daylight harvesting sensors where applicable.
- Continue installing converting exterior lighting from timers to photocell.
- Continue High Efficiency Motor replacements as motors fail.
- Continue EMS retrofits during major remodels.
- Consolidate off period activities into selected energy efficient buildings so less efficient buildings can be set to unoccupied status.

#### **U Conserve - Energy Conservation Campaign:**

This Campaign is a partnership between students, UM office of Sustainability and UM Facilities Management. Reminders are regularly sent to the whole UM community on Energy Conservation duties.



The **Green Office Certification Program** is in its 2<sup>nd</sup> year with 20 offices applicants. To facilitate the adoption of behavioral changes that will make an impact on our general carbon footprint, Green U offers a simple checklist program for offices that want to go green in the workplace. Offices Green leaders can take a “Sustainability 101” workshop as part of their Professional Development credit requirement.





## Renewable Energy

The brand new **Patricia Louise Frost School of Music building** is equipped with a **70 KW Photovoltaic solar panel system** that offsets 20 to 30% of the building's current load!



Another **20 KW Photovoltaic system** is now installed on the Coral Gables campus' Food Court rooftop. This system sponsored by the Student Government organization, ECO Agency will also have an educational mission, inviting students to learn about Solar Energy. The system is connected to an online dashboard that will give visitors a clear picture of the savings and offsets associated with the PV system.

UM has installed a **Solar Thermal system** as part of our Silver LEED Neuroscience Center hot water system to reduce total energy demand for scientific research. The system has reduced total hot water energy demand for cage wash, lab sinks and domestic use on the site by 30%. Students can also charge their phone with our **Soofa Solar benches**.



## Project for 2016:

### - Green Revolving Reserve

UM Real Estate and Facilities Department will be launching a Green Revolving Reserve with College of Engineering, Green U and Students. GRR will be an internal investment vehicle that will provide financing to parties within UM for implementing energy efficiency and other sustainability projects that generate cost-savings. The participation to the Billion Dollar Green Challenge will grant us access to online tools. The first project will actually be our application to the **STARS-AASHE benchmarking system. This baseline** will be our first step in building a road map to Sustainability at UM for the 5 years to come.



### RSMAS (Marine School Initiatives):

In 2008, the chiller plant on the Virginia Key campus was replaced in order to make the cooling of buildings on campus more efficient. The refrigerator R-123 was selected after a careful look into the environmental impact of the different choices available. This refrigerant is very efficient, has the lowest global warming index of all common fluorocarbons, has a long life cycle, and reduces the emission of greenhouse gases (CO, NO and SO).

The installation of the new chiller plant, along with the other energy saving measures (insulation, EMS, Motion Sensor lighting...) that the Rosenstiel School has undertaken in the past few years have resulted in a reduction of almost 2 million kWh, which is equal to driving 925,545 miles (calculated for 27 miles per gallon), or 20% reduction over its 2004 baseline.

In the original SLAB, on demand water heaters were installed throughout the building that only provides hot water as needed. The rest of the day the heaters are not running, so they are not wasting energy.



## Water

Water use is a major contributor to greenhouse gas emissions, as the more energy is required to move large amounts of water, and water itself is a resource that must be conserved. As a result the University of Miami is constantly looking for ways to reduce water use.

The department has adopted aggressive practices and technologies to optimize the campus's water use and further promote the University's water conservation efforts.

**ECO Agency promotes Water Conservation at the Wellness Center.** Big Achievement in our Wellness Center: the Water Conservation measures that the ECO Student Government Agency promoted there allowed the Center to achieve some substantial savings

Our Water conservation initiatives in this area include:

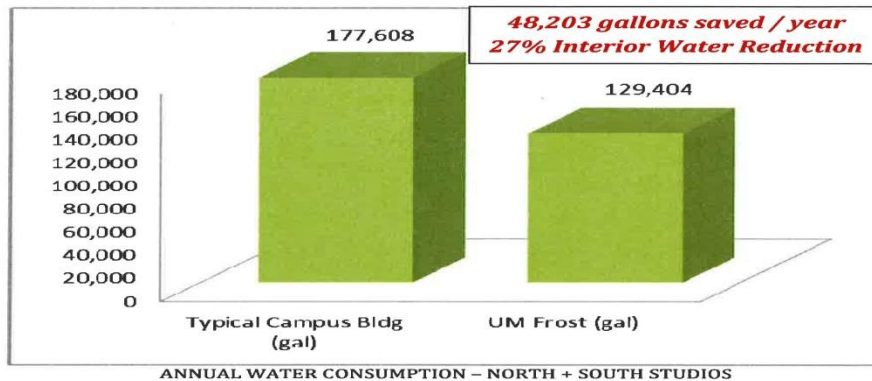
- The replacement of all resident halls and apartments shower heads to low flow models.
- The installation of timer setting controls on the campus irrigation systems.
- An ongoing aggressive leak detection program to prevent excessive water consumption.
- An ongoing replacement program of urinals and toilets to low flow models.
- An ongoing conversion of campus irrigation systems to well water in lieu of domestic water usage.

The main advancement in water conservation is the installation of a cistern in the new **Frost School of Music LEED Platinum building** that captures rainwater to be used to answer the onsite non-drinking water demand.

Projects for 2016:

A partnership with the Florida Water Management Districts will plan the installation of a **smart irrigation system** that will result in water savings in the years to come.





As Orientation week kicks in, a **Green U and ECO tradition is always back: a reusable bottle is offered to every freshman.** This year, students also discovered our new online Hydration stations map



On the RSMAS campus, a **closed loop system has been installed in the Chiller plant: 90% of condensate** water is recirculated in the system as makeup water for the cooling towers. Submeters have been installed to measure percentage of condensate in the mix. We anticipate generating an average of 300 gallons per day or 10% of the cooling tower demand.



## Nature

The University of Miami - Coral Gables Campus has recently been designated **TREE CAMPUS USA** by the Arbor Day Foundation. Our campus has a unique landscape architecture with elements designed specifically for its climate and natural setting. It conveys a positive and unified sense of



 **Arbor Day Foundation**

place, coherency, and consistency. Its thoughtful landscape planning has become renown worldwide as a “campus-in-a-tropical garden”. The campus enjoys a number of important vegetated areas which include Lake Osceola, The Gifford Arboretum, the Ibis Natural Trail, the Palmetum and the Butterfly Garden. Our goal is to preserve and enhance the following important features. Our general purpose is to guarantee that the standards of beauty, sustainability and environmental stewardship are respected and applied on our campus landscape.

### ECO signs on Lake Osceola

If you stroll around the Lake Osceola now, you will discover new signs about the ecology of our historical lake. This partnership between ECO and UM Administration gives us a renewed sense of belonging and connection with our environment.



### Project for 2016:

- **Tree Campus USA** renewal application will plan for the mapping of our arboretum.
- A Florida Forest Service Educational grant will be sent in conjunction with the official UM partner NGO Treemendous to warrant funding for educational programs related to our Tree Campus USA recognition.
- **Coordination of a Garden design** in the Baptist Collegiate Ministry on Stanford Drive with the UM Garden Club and the Abess Center





## Green U - Office of Sustainability

In 2005 the University launched Green U, under the direction of Alan J. Fish (The Vice President of Business Services at the time) in order to officially categorize and direct the numerous sustainability efforts of the University.



*Programs for staff:*

- **The Green Office Certification program** is a voluntary program. It helps Faculty and Staff to go green in the workplace with an easy step by step guideline. Our Green Lab Certification and Green Event Certification programs are scheduled for launching in the Fall 2015. NEW: any applicant receives 50 points on their Well Canes account.
- **The Green Team Program:** Small groups of faculty, staff, or students passionate about the environment and willing to volunteer to take on innovative sustainability projects.
- **Sustainability 101:** This is a 2 hour workshop open to anybody who wants to learn about being green at UM. The workshop is mandatory for Green leaders on campus applying for the Green Office certification program. It will introduce the participant to environmental science and climate change science basics. More than a theoretical approach to pollution and the environment, the workshop offers solutions in the workplace for environmentally minded workers who want to make a change at UM.

- **Green Event Certification**

Don't feel bad if you think that your events are generating too much impact on the environment, Green U can help! Here is an easy way to

make sure your next event will be green: apply to our Green Event Certification. Certification process is for an event of 50 guests or less.



### Green Lab Certification:

If you work in a lab, manage a lab, study in a lab, and you want to make it more sustainable, Green U is here to help! Get your Lab Certified by Green U



### Programs for students:

- **Our Green Rep program** recruits passionate people, concerned with environmental awareness and willing to share their expertise in Social Media and Communication campaigns, spend only a few hours a week on specific projects, work from home, and make a big difference on your campus.
- **Our Green Patrols** are here to help Green U follow up with some programs like our Single Stream Recycling or our Toner recycling program. Students spend a few hours a week walking or running around campus and monitor our recycling bins, report anomalies, survey or promote the program in new places.
- **Green U internships:** under the validation of our Toppel Center "Internship at UM" program, 1 to 2 interns work every semester on specific sustainability projects.
- **Student Orgs:** There are several environmental related student groups. These organizations have put countless events on over the years greatly contributing to the University's Sustainability efforts. The **Student Government organization, Energy & Conservation Organization (ECO)** determines and implements sustainable initiatives to "green" the U. They are inspired by our students, faculty, campus, the local environment and current green choices being made globally.



### Projects for 2016:

- **Green receiving area program**
- **Alumni for Sustainability network** in collaboration with the Alumni Center and the College of Engineering

## Green Events in 2015:

### Jan:

**ENVIRONMENTAL LAW AND JUSTICE** symposium with School of Law: Taking a closer look at the Miami Environmental Movement

### Feb:

- Green U - Sustainability manager, Teddy Lhoutellier spoke about UM 's efforts to conserve water on our 3 campuses. At the **WATER CONSERVATION EXPO & VENDOR FAIR** Reducing Your Water Footprint: Corporate & Institutional Practices(South Florida Water Management District )

- **World Water Day:** Join Take Back the Tap University of Miami, Engineers Without Borders - University of Miami, Green U, USAID at UMiami and University of Miami Student Government ECO Agency for a day of celebration all about H2O!

### March:

- University of Miami - Green U is proud to support **Coral Gables 2015 Bike Day!**

- On Saturday **March 7, for the CGIU big luncheon, Butler Center, Green U and ECO** Agency trained volunteers will be present to help attendants recycle their waste. We will also promote Butler's [Take back the Tap](#) campaign to conserve water and reduce plastic bottle waste.

### April:

- University of Miami HR Benefits invites you to celebrate the **WEEK of WELL-BEING 2015**. Green U and [Earth Learning](#) are proud to partner with HR Benefit to bring you this new workshop: "HOW TO BUILD YOUR EDIBLE ECO GARDEN"

VISIT OUR BOOTH under the big tent at Coral Gables / Medical / RSMAS  
Come taste our Solar Power smoothies!

- Green U will be representing UM at the **Air Quality Awareness Day on April 10**  
The event is organized by Miami Dade County RER-DERM's Division of Air Quality Management.

- University of Miami - Office of Sustainability invite you to pass by Merrick Park ( Coral Gables City Hall )on **April 22nd from 11 am to 2 pm to celebrate Earth Day** with the City of Coral Gables

- **CELEBRATE EARTH DAY 2015, HUG the LAKE!:** Random Acts of Kindness at UM invite you to join us for our annual Hug the Lake as we join hands around Lake Osceola in celebration of Earth Day

- **Get excited for University of Miami's Earth Week 2015!**

Each day we will have ECO-activities, free food, and cool prizes.

Like University of Miami Student Government ECO Board and #UMiamiEarthWeek on Facebook, Twitter, and/or Instagram during the event to enter a chance to win a solar-powered watch, solar-powered charger, or \$25 Chipotle Gift Card.

**July: Green U Hosts Sustainability Forum for South Florida Hospitals:** The University of Miami's Green U – Office of Sustainability recently hosted the Florida Hospital Association's Annual Roundtable titled "Sustainability in Healthcare Facilities."

**Aug: REUSABLE WATER BOTTLES :** As Orientation week kicks in, a Green U and ECO tradition is back: a reusable bottle was offered to every freshman.

**Oct: Food DAY:** Food Day inspires Americans to change their diets and our food policies. Every October thousands of events all over the country bring Americans together to celebrate and enjoy real food and to push for improved food policies.

**Nov: Green Fair:** Carbon Footprint Interactive displays, ECO Art happenings, Recycling games, Art Craft with reused material (soap, bags, and t shirt...) Learn how to get engaged with UM' Sustainability programs

**Dec: "CLIMATE CHANGE: What lies ahead?"**

Panel discussion- A first-hand report of the Climate Change Summit (COP21): What are the impacts on local communities and how does South Florida address the climate issue?

#### **Projects in 2016:**

##### **Feb-March: Recyclemania**



April: Earth Week



## Food and Well Being

**UM Dining Sustainability program** features Certified Sustainable Seafood, certified Humane Cage Free eggs, AG Hormone free Dairy products, Fair Trade coffee, Antibiotics free poultry, maximizing the use of local products to support Local farmers.



**UM DINING is partnering with MIAMI RESCUE MISSION** to serve food to the homeless and the **needy**. Last year alone, our Dining Halls, our Food Court and Catering services gave 3.5 tons of food to this great organization, the equivalent of 5000 ready to eat meals.

Every Wednesday from 9 am to 2 pm faculty, staff and students can visit and buy from local vendors selling fresh fruit and vegetables, kettle corn, cheeses, at our **Farmer's Market**.



### Now available on the Medical Campus

Through programs like the **Well' Canes** and its points award system, UM promotes healthy living style in the workplace (Week of Well Being). Our **Health and Wellness** System makes sure that students receive all the help they need to quit smoking, exercise and educate themselves on healthy diet.



### NUTRITION WEEK 2015



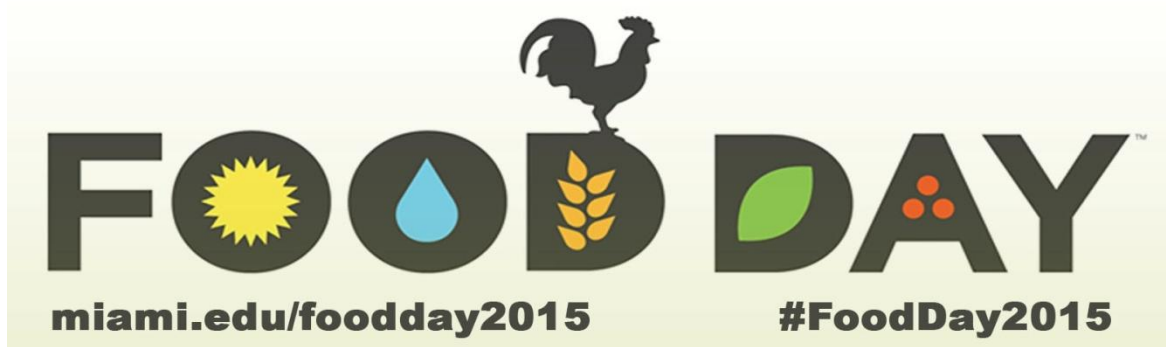
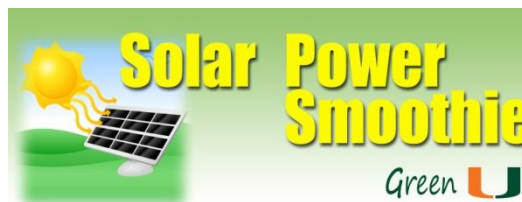
**Nutrition Week 2015 - March 30 to April 3** presented by UM Student Health Services, P&A. Herbert Wellness Center, UM Dining, with the participation of Green U . Solar Power Smoothie on the Rock on



Thursday 12 pm to 2 pm

**University of Miami HR Benefits invites you to celebrate the WEEK of WELL-BEING 2015**

The University of Miami's Week of Well-Being features five days of events and activities aimed at transforming the lives of faculty, staff, and students through wellness. Green U and Earth Learning are proud to partner with HR Benefit to bring you this new workshop: "HOW TO BUILD YOUR EDIBLE ECO GARDEN"



With the intent to raise awareness about Sustainable Food on campus, Green U along with the Office of Civic and Community Engagement and the Butler Center for Volunteering and Leadership launched a FOOD DAY initiative that kick started a conversation about food growing, nutrition and food composting at Coral Gables, connecting UM Garden Club, faculty, existing gardens on campus in BCM and Wesley Foundation, UM dining as well as members of our community.



## Education

**Research Institutes:** The Clean Energy Research Institute at UM, led by T. Nejat Veziroglu, Ph.D., a distinguished leader in the alternative fuel technology field and professor of mechanical engineering at the University of Miami, focuses on issues surrounding global dependence on non-renewable sources of energy and the need to shift towards alternative energy sources.

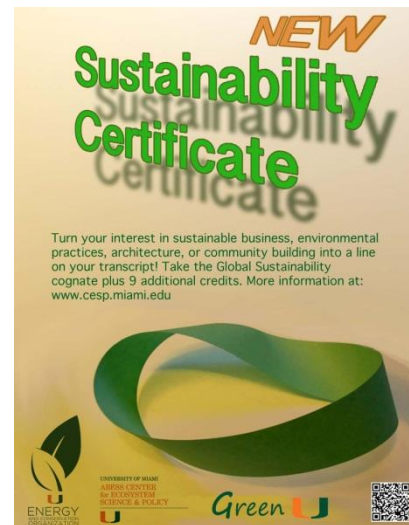
**Renewable Energy Research Lab:** The UM College of Engineering houses the Renewable Energy Research lab. Under the leadership of Hongtan Liu, Ph.D., assistant professor of mechanical

engineering, the lab focuses on energy storage and fuel cell technology. In 2009, The FPL Endowed Student Scholarship Fund awarded \$250,000 in scholarships to engineering students pursuing a career in the emerging fields of alternative energy and fuel cell technology.

#### **The Center for Ecosystem Science and Policy (CESP):**

The CESP creates innovative, interdisciplinary initiatives that bridge the gap between science and environmental policy. The Center offers an **Environmental Sustainability Certificate**. Knowledge of sustainability is now a requisite for a growing number of professions, as businesses, organizations, and educational institutions confront the challenges of a rapidly modernizing and increasingly connected world subject to climate change, mass movements of people, limits to energy and water supplies, and diminishing biodiversity.

The program serve as a curricular adjunct to sustainable initiatives at UM, foster a culture of conservation , enhance students' preparation for a variety of careers ( engineering, architecture, business, marketing, government), and affirm UM's commitment to sustainability and complement its efforts to enhance environmental education.



#### **The Climate Studies Group:**

The Climate Studies Group at the UM Rosenstiel School involve faculty members from all six Rosenstiel School divisions (Applied Marine Physics, Marine and Atmospheric Chemistry, Marine Affairs and Policy, Marine Biology and Fisheries, Marine Geology and Geophysics, Meteorology and Physical Oceanography). Research and course work are designed to address fundamental questions about the Earth's climate and its impacts on society using a broad range of approaches.

#### *College of Engineering:*

Professors from the College of engineering are partnering with UM Facilities Management Dpt to start a Living Lab pilot project around a crucial topic in Green Building engineering: Building Energy



Modeling.

#### *School of Architecture:*

Partnerships with the community allow students to work on projects like the Underline from Miami Dade County Mass Transit System. The Underline will connect communities, improve pedestrian and bicyclist safety, create over a hundred acres of open space with restored natural habitats, encourage a healthy lifestyle, provide an easily accessible place to exercise, create a mobility corridor that integrates transit, car, biking and walking, provide a 10-mile canvas for artistic expression, attract development along US1, and generate significant economic impact.

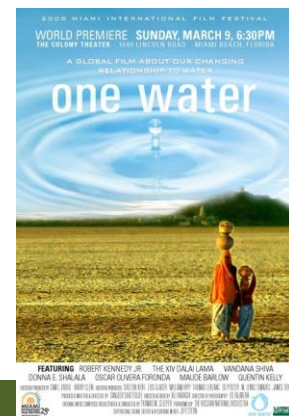


**The Center for Urban and Community Design** is part of the UM School of Architecture and fosters a collaborative interdisciplinary approach that supports the people, places and processes essential for creating and sustaining family oriented and environmentally responsible communities as near as West Coconut Grove and as far as Mexico

#### *School of Communication:*

**Center for Communication, Culture, & Change** seeks to address urgent societal issues, and make a positive difference in people's lives. The Center's projects are geared to discovering communication's contribution to accelerated, but sustainable, participatory change.

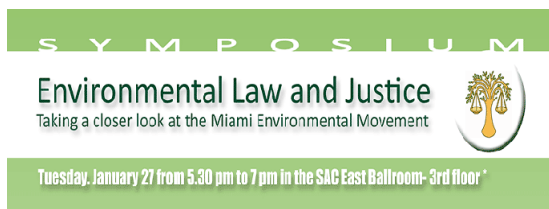
**Professor Chatterjee** is producer, co-director and writer of a global motion picture project about our changing relationship to fresh water entitled "One Water". The film is the recipient of the Best Environmental Feature award from the Artivist Film Festival, 2008, Best Documentary Cinambiente 2008, Turin, Italy and Best Documentary at the Foyle Film Festival 2008, Derry, Ireland. An international television version of the film was completed in 2009 for which Chatterjee wrote a new script



narrated by actor Martin Sheen and has reached over 4 million television households worldwide.

### *School of Law*

Founded in 2012, the **Environmental Justice Project** works to increase awareness and provide support to communities affected by issues related to environmental justice throughout Miami-Dade County, Florida.



The Environmental Justice Project conducts research into the environmental, community, and public health impacts of environmental justice cases. It also serves as a liaison between impacted

communities and public officials and policy makers. Currently research is focused on the site placement of a City of Coral Gables trolley depot in a residential West Coconut Grove neighborhood.

**Academic Experts:** The University has faculty researchers working on various aspects of environmental issues. UM is home to world-renowned experts on global warming, alternative energy, sustainable fisheries, ocean policy, and issues relating to Everglades restoration. For a full list of experts see: [www.miami.edu/experts](http://www.miami.edu/experts).



In 2007 President Donna E. Shalala signed the American College and University Presidents Climate Commitment. This historic signing demonstrated the University of Miami's dedication to sustainability. As part of the **President Climate Commitment**, the University of Miami was required to initiate two or more tangible actions to reduce greenhouse gases from the following list:



- Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.
- Adopt an energy-efficient appliance purchasing policy requiring purchase of

ENERGY STAR certified products in all areas for which such ratings exist.

- Encourage use of and provide access to public transportation for all faculty, staff, students and visitors at our institution.
- Participate in the Waste Minimization component of the national Recycle Mania competition.

The University actually adopted the implementation of all 4 of those actions.

### **Community Involvement:**

On top of improving its own footprint, UM is also deeply involved in the community to enhance understanding of Climate Science, Climate Mitigation and Adaptation policy making:

UM participated to the **South East Florida Regional Climate Leadership Summit** in 2014: The annual Summit is coordinated by the Southeast Florida Regional Climate Change Compact, a partnership between Broward, Miami-Dade, Monroe and Palm Beach counties, their municipalities and the Institute for Sustainable Communities to prepare for Climate Change impacts, as our region remains the most vulnerable to Sea level rise in the nation.

During her term as President, Dr. Shalala has always affirmed her commitment to Sustainability: *"In many ways, Florida is a testing ground for how the United States will manage the risks of climate change. Will we sit by and watch as many of our coastal cities face an ever-rising sea, and as severe heat strain our electric grids and hobble our workers? Or will we act now to help reduce the risk that these impacts will spiral out of control in the future? It's time for us all to step up."*

Donna A. Shalala has been a member of the **Risky Business Project Committee** that helped evaluate the economic risks of Climate Change in the United States.

### **Groundbreaking Research at RSMAS:**

The University of Miami's Marine Technology & Life Sciences Seawater Complex was inaugurated in 20014 at the Rosenstiel School of Marine & Atmospheric Science. The new complex provides research and teaching laboratories in two critical areas: air-sea interactions and biology of living marine organisms, including a wind-wave-storm surge simulator capable of generating Category 5 hurricane-force winds in a three-dimensional test environment.





### **Greenhouse Gas inventory:**

As part of this commitment, a Climate Action Plan was designed in 2009, its first benchmark carbon footprint analysis for the years 2005 to 2007 and for the three main campus areas (Coral Gables, Medical, and Marine). The University of Miami, via this report, has taken its first steps towards carbon emission reduction.

# Interim GHG Inventory - FY 2013 - 2014

## Green House Gas Baseline

This inventory was completed in January of 2009 and performed using standards set forth by the Association for the Advancement of Sustainability in Higher Education (AASHE), the World Business Council for Sustainable Development and the World Resource Institute (WBCSD/WRI), and the American College & University Presidents Climate Commitment (ACUPCC). In accordance with these standards and generally accepted methodology among universities the report data was collected and analyzed using Clean Air - Cool Planet (CACP)'s Campus Carbon Calculator version 5.05.

The Interim report for the Fiscal years 2013 and 2014 presented in this document used the same standards of methodology. The report data was collected and analyzed using Clean Air - Cool Planet's Campus Carbon Calculator version 7.00

This interim report focuses on the Coral Gables and RSMAS campuses and excludes the Medical campus. We opted for that approach after considering the very different nature of our operations on the Medical campus that includes Biomedical labs, Doctors 'offices, and 3 hospitals. In 2016, a 200,000-square-foot ambulatory center will operate on the University's Coral Gables campus, blurring the lines between the Medical Campus and the Coral Gables campus. As a recommendation for our STARS (Sustainability Tracking, Assessment and Rating System) application, we may want to expand the boundaries of the next GHG inventory to include the 3 campuses (Coral Gables, Medical and RSMAS).

## Inventory Methodology

Given the excel spread sheet format from CACP, the following is a description of the procedure for data collecting and input by category that is required by the calculator to quantify all sources of Green House Gas emissions.

## **Coral Gables Campus Boundaries**

The Coral Gables campus is a 260-acre tract in suburban Coral Gables. It has 125 buildings occupying well over 5.5 million gross square feet. Since 2007, approximately 1,000,000 square feet of new facilities have been added or are under construction on the Coral Gables campus. The Coral Gables Campus houses the School of Architecture, College of Arts & Sciences, School of Business Administration, School of Communication, School of Education, Graduate School, School of Law, Philip & Patricia Frost School of Music, School of Nursing & Health Studies, Continuing and International Education, and the College of Engineering.

## **Rosenstiel School of Marine and Atmospheric Science Campus Boundaries**

The Rosenstiel School of Marine and Atmospheric Science (RSMAS) is located on an 18-acre waterfront campus on Virginia Key, Florida, in Biscayne Bay.

The Rosenstiel School is one of the top five marine and atmospheric research and graduate education programs in the U.S. In addition to this location, much of the school's records include the Richmond Campus with RSMAS. The Richmond campus, established in 2001, is a 76-acre site about ten miles southwest of the Coral Gables campus. The campus houses research facilities for the Rosenstiel School's Center for Southeastern Tropical Advanced Remote Sensing (CSTARS) and Richmond Satellite Operations Center.

## **Emission Types**

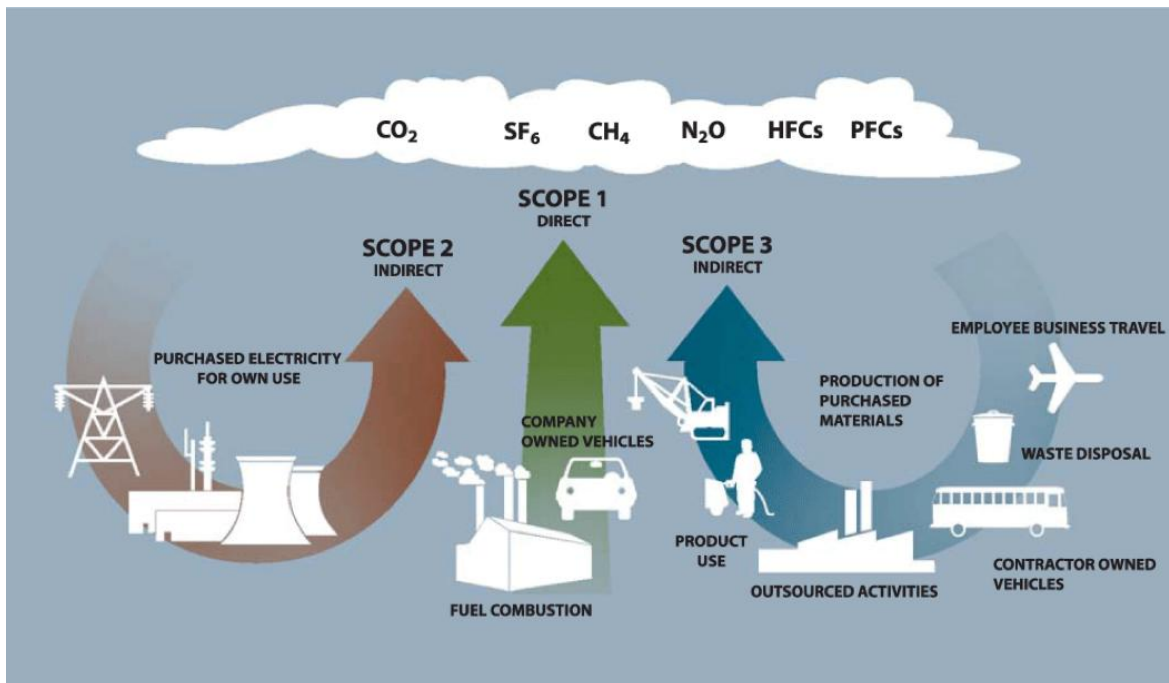
The greenhouse gas sources are broken up into three different "scopes" of emissions as defined by the World Resources Institute (WRI) along with the World Business Council for Sustainable Development (WBCSD) standards.

**Institutional Data:** Financial Budget information, student numbers, faculty/ staff numbers, and total building square footage. Total building square footage and research Square footage does not include leased space and is limited to the boundaries defined for this inventory (Coral Gables and

RSMAS only).

The three scopes are as follows and are also illustrated in Figure 2.

Figure 2- Three Scopes of Emissions <sup>5</sup>



<sup>5</sup> <http://www.cleanair-coolplanet.org/>

### Scope 1, Direct Sources (produced on campus):

For this report, only on campus stationary sources (backup systems, Labs), direct transportation sources (UM fleets), and agricultural sources (fertilizer used for landscaping), were included.

#### On campus stationary sources:

The University has stationary sources that are for heating, cooling, cooking, labs etc. Natural gas is mainly used on the Coral Gables campus and propane on the RSMAS campus.

#### Direct Transportation sources- UM Fleets:

Gasoline is the fuel of choice for both campuses vehicle fleets. Diesel is the fuel used for the boat fleet at RSMAS. The university uses many electric vehicles to reduce gas needed however these are charged on power grid so goes into the overall KWh count.

**Agricultural sources – fertilizer application:**

The University of Miami fertilizer use and nitrogen percent was obtained from the Facilities Management Dpt. Fertilizer can release nitrous oxides into the environment so it contributes to overall GHG emissions.

**Refrigerants sources:**

This information was not included in this report because data was not readily available, but some recommendations will be made to make sure that it will in the future.

**Scope 2, Indirect Sources (produced off campus but imported on):**

For this report, only electricity and chilled water were included.

**Purchased Electricity, Steam and Chilled water:**

FPL data was provided by our Facilities Management Dpt. The data was provided in kWh and MMBtu respectively, and is entered into the calculator using the SE Florida's known power mix factor (source of energy production provided within the calculator). The CACP Carbon Calculator converts automatically all data into greenhouse gas emissions.

No campus areas purchase steam. Purchased chilled water is used for air condition on both campuses.

**Scope 3, Indirect sources (produced off campus but related to institution):**

For this report, only commuting (for faculty, staff and students), directly financed outsourced travel (air/ground travel; personal mileage reimbursement for faculty and staff; study abroad travel for students), solid waste (methane captured and flared in landfills), paper consumption by rate of recycled content, and offsets (on-campus composting/mulching) were included.

**Commuter Traffic:**

The variables we were looking for were: the number of commuters per category (students, staff and faculty), the number of One-way trips per week, the number of weeks per year for each category, the trip distribution in % (between Bike, Walk, Drive alone, Carpool, and Bus/Commuter rail), and finally the average trip distance in miles for each of those % categories. Since no transportation survey on commuters' habits was available, we had to find alternative ways to get some of those variables.



The number of commuters per category was easily accessible through our yearly Fact book. Some assumptions and averages had to be made regarding the number of One-way trips per week per categories, the most difficult one being the students. The number of weeks per year was assumed by getting the Academic calendar for Faculty and students, and HR calendar of holidays for staff. The headcounts of parking permits, U Bike registrations and Metro Passes gave us the % distribution, assuming no carpooling for parking permits. Zip codes associated with those headcounts allowed us to determine the average trip distance for each of those % categories (data was weeded out of outliers like out of state zip codes). With this method, overlapping of certain categories (a student can be a biker and have a parking permit) is inevitable, and that is why ultimately our recommendation is to launch a survey that will provide a better picture of that commuting behavior distribution.

#### **Air Traffic:**

Only school-sponsored travel expenses are included in this section. Air traffic is a major source of emissions and a very difficult one to catalog. Especially because the previous agreements with travel agencies, and “ghost card” (travel card) payment system are obsolete. We had to get the data (dollar amounts) from Accounts payable and UM IT Enterprise Application Services, in charge of our procurement system. We converted the dollars amount into miles by applying the rates and standards provided by the Association for the Advancement of Sustainability in Higher Education (AASHE).

#### **Solid waste sources:**

After a discussion with our vendor, Waste Management, we came to the conclusion that the data provided by them were actually tons of Solid Waste buried in landfills that capture CH<sub>4</sub> (methane) and “flare” it, which is not the case of the data collected for previous inventories. This drastically reduces the amount of emissions.

#### **Paper sources:**

Total dollars amounts per office supply were provided by our Purchasing Dpt. We had to separate paper from the rest and get the price per weight for each type of paper in order to get the total weight by each recycled content paper.

#### **Offsets:**

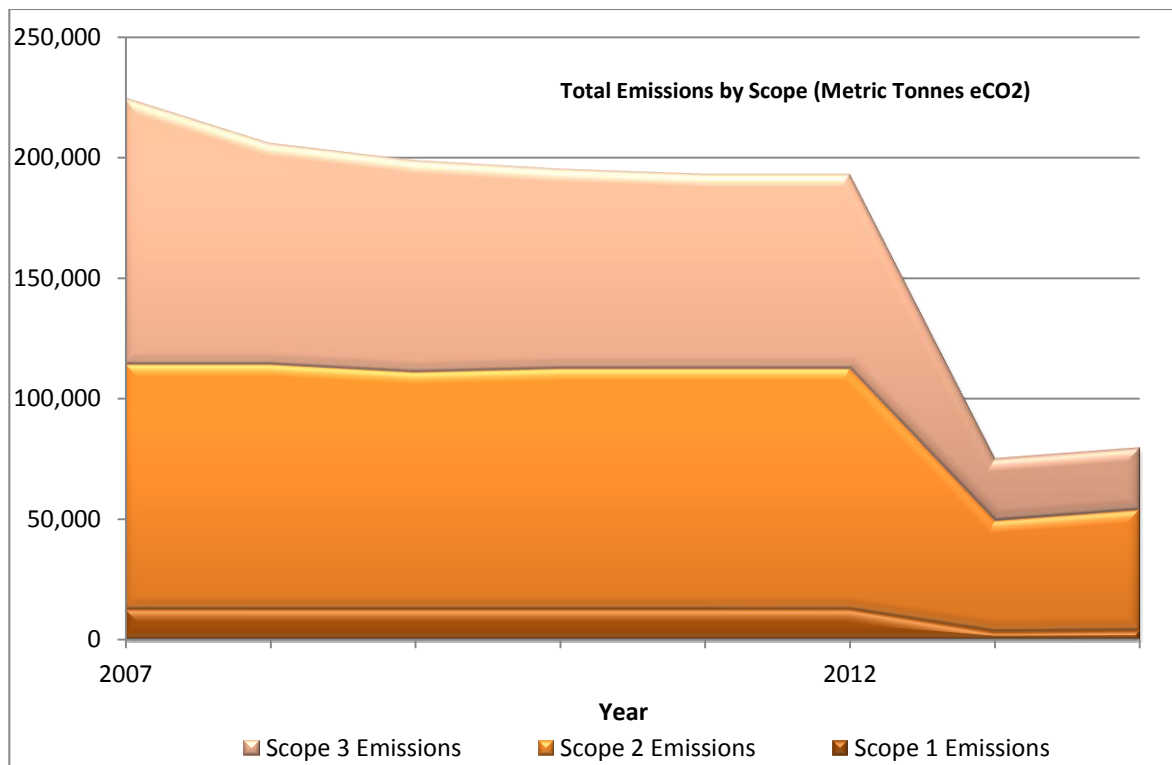
On campus composting/mulching data was provided by our yard trimming vendor in dollars amount. We calculated the total weight based on their per unit price.

Offsets coming from forest lands managed for preservation were not included in this report because the methodology for such an endeavor would require a specific team of experts.

## Greenhouse Gas inventory and analysis

This carbon footprint only includes the Coral Gables campus and the Rosenstiel School of Marine and Atmospheric Science Campus Analysis (RSMAS) campus. Drastic drops in GHG emissions can be attributed for the most part to drastic reduction in the study geographical boundary. The information is reflecting emissions for Fiscal Year 2013 and Fiscal Year 2014.

Figure 1- Total Equivalent CO<sub>2</sub> emissions (FY 2007-2014) by scope

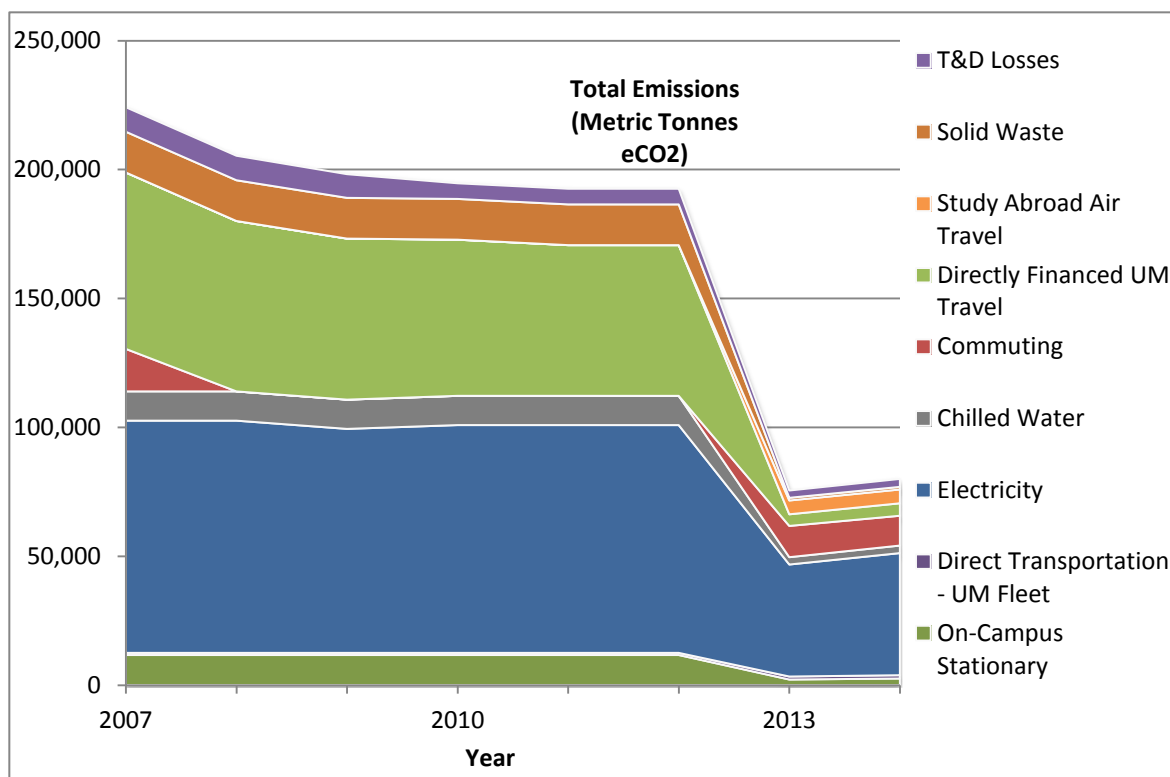


A set of parameters are distorting the analysis that can be made from this data:

- The drop by more than 50% in emissions is mainly attributed to the change in geographical boundaries of this interim inventory that excludes the entire Medical campus from it.
- Between the last inventory and this one, new versions of the CACP calculator have been edited; we went from v5.0 to v7.0. New versions of the calculator integrates the latest scientific data from the IPCC (Intergovernmental Panel on Climate Change), modifying certain rates of emissions. The v7.0 of the carbon calculator also put a newly designed emphasis on Scopes, rearranging some categories in different scopes [Direct Transport - UM Fleet (Scope 1) is now separate from the Indirect Transport - Commuting, sponsored Air travel, Study Abroad (Scope 3). New categories have been created that did not exist in v5.0: Paper, Study Abroad, Scope 2 T&D loss, Waste Water.

- The previous inventory had some references to its methodology inserted in the Climate Action Plan 2009, but not a comprehensive journal tracking the data collection process. This made the new process and the comparative analysis with the old one more difficult.

**Figure 2- Total Equivalent CO2 emissions (FY 2007-2014) by category**



#### **Specific changes between 2007 and 2013:**

- The drop in emissions for “on campus stationary” between 2007 and 2013 (-81%) is due to the fact that most of them come from the Medical campus.
- The surprising increase in “direct transport” emissions (40%) is due to the fact that boat fleet fuel was not included in the 2007 report.
- The slight drop in Fertilizer emissions (33%) is due to the exclusion of Medical but also to the increase in mulching and composting on site on the Coral Gables campus.
- The big drop in Electricity emissions (52%) is explained by the exclusion of the Medical campus. Chilled water emissions (75%) experienced the same phenomenon, most of it being used on the Medical campus, and very little in CG and RSMAS.

- The drop in Staff/Faculty commuting emissions could be attributed to the Medical campus exclusion, although a lot of gaps in data collection methodology between 2007 and 2013 makes this change difficult to interpret.
- Student commuting emissions: Since most of the undergrad students are in CG, we don't see the big cut we see in Faculty/Staff commuting. However, the 2008 implementation of the Zip Car share program, the Metro pass discount policy and the No car for freshmen policy should have lowered the emissions from Drive alone.

Explanation: the commuting emissions calculation methodology has changed between the 2 calculator versions. The percentage of Drive alone for 2013 is 63% of the total commuter students, but we don't have any idea of how much that % is for 2007. Data on commuting was not entered in the 2007 report. CACP analysts were able to transfer manually the emission data kept on the v5.0 file. Unfortunately, we did not have any indications on how this had been calculated.

- The huge decrease in Directly Financed air travel (94%) can be explained by either: the over representation of travels from Medical staff and faculty in 2007, or the changes in subcategories and their respective emission rates in the v7.0 calculator.
- Both Other Directly Financed travel (train, bus and personal mileage reimbursement) and Study Abroad were not included in the v7.0 calculator.
- Solid Waste emissions: The 2007 inventory reported these emissions in the wrong subcategory (No CH<sub>4</sub> Recovery instead of CH<sub>4</sub> Recovery and Flaring in Landfills) which add to the drop from the exclusion of the Medical campus. It leaves this source section with very few emissions.
- Paper emissions are minimal and were not part of the v5.0 calculator
- Scope 2 T&D Loss emissions are related to Electricity and the drop reflects the drop occurring for Electricity emissions.
- Offsets from Compost/Mulching on site are actually a deduction to the overall emissions. No data was available in 2007, most of the mulching has happened since then.

#### **Changes between 2013 and 2014:**

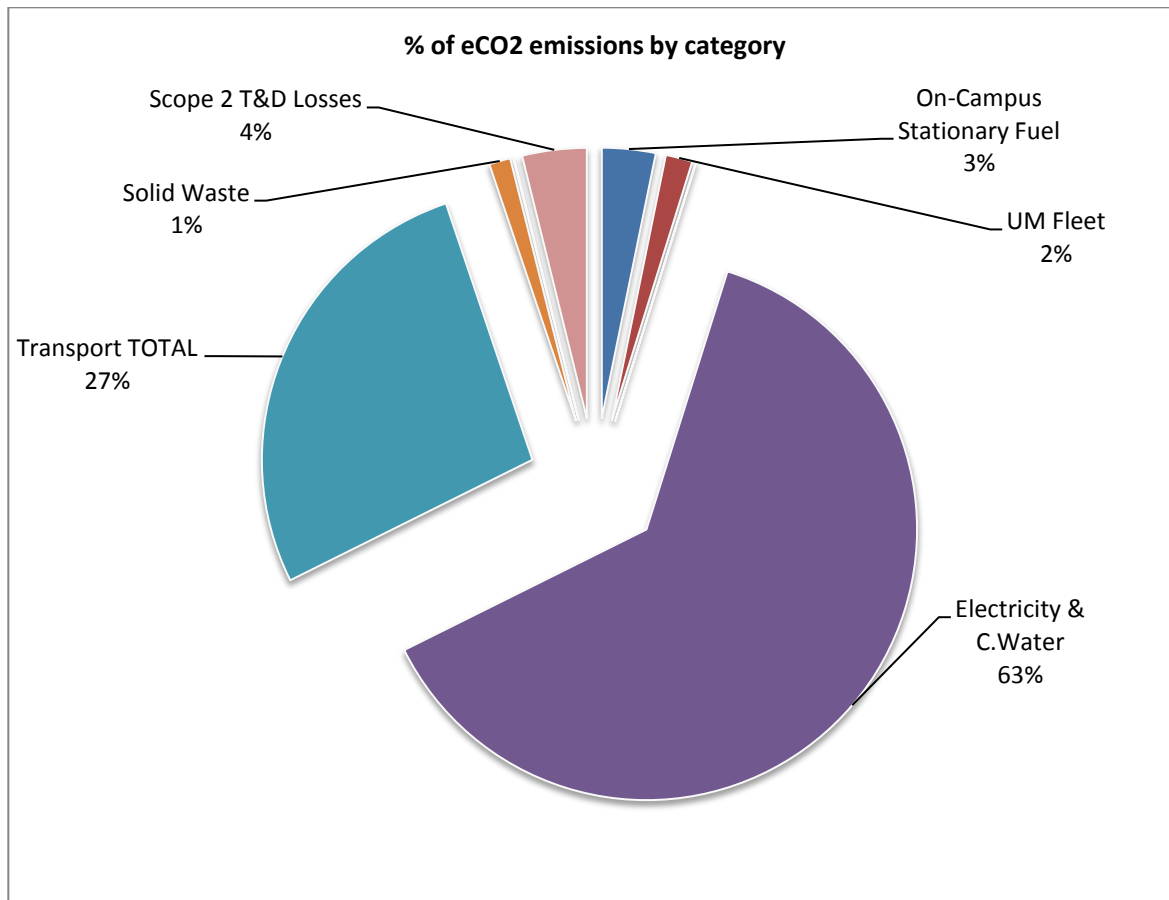
The increase in budget (6%) follows the increase in physical size (5.5%). The total emission increase (6%) is congruent with the increase in physical size of the Coral Gable and RSMAS campus.

Table 1- Total University of Miami Emissions Breakdown for 2014

MODULE	Summary					
WORKSHEET	Overview of Annual Emissions					
UNIVERSITY	Please enter university name on 'Introduction' sheet					
Select Year -->	2014	Energy Consumption	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	eCO <sub>2</sub>
		MMBtu	kg	kg	kg	Metric Tonnes
Scope 1	Co-gen Electricity	-	-	-	-	-
	Co-gen Steam	-	-	-	-	-
	Other On-Campus Stationary	48,029.0	2,558,040.4	232.3	5.0	2,565.3
	Direct Transportation	17,355.7	1,259,548.4	171.8	61.4	1,282.1
	Refrigerants & Chemicals	-	-	-	-	-
	Agriculture	-	-	-	106.6	31.8
Scope 2	Purchased Electricity	668,436.0	47,071,612.5	1,032.5	916.9	47,370.6
	Purchased Steam / Chilled Water	45,958.6	2,909,556.0	324.8	15.1	2,922.2
Scope 3	Faculty / Staff Commuting	71,580.6	5,112,170.6	1,001.3	338.8	5,238.2
	Student Commuting	86,517.8	6,186,417.1	1,092.3	376.6	6,326.0
	Directly Financed Air Travel	23,839.4	4,649,392.1	46.1	53.0	4,666.3
	Other Directly Financed Travel	2,270.1	161,147.7	32.4	10.9	165.2
	Study Abroad Air Travel	27,368.5	5,337,683.9	52.9	60.8	5,357.1
	Student Travel to/from Home (OPTIONAL)	-	-	-	-	-
	Solid Waste	-	-	40,808.4	-	1,020.2
	Wastewater	-	-	-	-	-
	Paper	-	-	-	-	48.7
	Scope 2 T&D Losses	43,733.5	3,062,528.9	80.9	57.5	3,081.7
	Offsets	Additional				
	Non-Additional					-
Totals	Scope 1	65,384.7	3,817,588.8	404.1	173.0	3,879.3
	Scope 2	714,394.6	49,981,168.5	1,357.3	931.9	50,292.8
	Scope 3	255,309.9	24,509,340.3	43,114.3	897.7	25,903.4
	All Scopes	1,035,089.1	78,308,097.6	44,875.7	2,002.6	80,075.5
	All Offsets					(857.2)
	Net Emissions:					

Figure 3- Total % of Equivalent CO<sub>2</sub> emissions by category for FY 2014





#### **2014 emissions:**

The main observations that can be made from Table 1 and Figure 3 are as follows:

- Electricity, Chilled Water, on campus Stationary Fuel and Transmission/Distribution loss represent alone 70% of our emissions on Coral Gables and RSMAS.
- Solid Waste, Paper, Fertilizers represent a negligible amount of emissions compared to the rest.
- Transport Total (Students, Faculty and Staff commuting; Directly Financed Air Travel, Other Directly Financed Travel, Study Abroad Air Travel) and UM Fleet emissions represent only 29% of the total.

Interpretation of these observations is difficult due the factors stipulated previously, but it would tend to confirm that our main emission reduction projects in the future will need to focus on Energy consumption in our buildings. With a growing square footage, the challenge is to achieve substantial energy savings. UM's 2008 mandate to build LEED Silver has helped reduce our total energy consumption, but more needs to be done for proper maintenance and operation of this recent portfolio of buildings, as well as better efficiency for existing buildings.

The distribution is hard to interpret because of the lack of certainty regarding the changes in

Transportation emissions. These percentages would tend to show that many of our recent policy (Zip car share program, No Car for Freshmen policy and Mass Transit Discount program) were effective, but when numbers are analyzed year by year, we realized that the emissions from Student commuting remained almost the same despite the exclusion of the Medical campus, whereas the emissions from Directly Financed Air Travel experienced a drastic drop.

In order to have a more accurate analysis, we will need to review the data by including the Medical campus, although it won't totally resolve the discrepancies or gaps between 2007 and current data collection methodology.

Despite these challenges, some recommendations can be made to improve the data collection process itself.

## Recommendations for Data Collection

### Commuting emissions

- Surveys would be the best way to get more accurate information on commuters' habits. The first survey could be very short and included in the registration form for anyone who purchases a parking permit. Example of questions: If you don't live on campus, what is the zip code of your current residence? On average, how many one-way trips do you make to and from campus every week? If you carpool daily, please state the number of people that you carpool with?
- In order to properly evaluate the Students Commuter rail emissions, the IT department in charge of the Metro pass "swiping machines" (allowing the Student Affairs Dpt to distribute those passes on campus) must generate a list of Cane ID numbers and send it to the Ass. Director of SCC after each distribution. This will allow us month after month to get a clear list free of doubles with associated zip codes.

- In order to properly evaluate the Staff/Faculty Commuter rail emissions, more accurate data from the Security department would be needed: split data between FY years, between faculty and staff.
- Create a short survey to insert into the U-bike registration form. Example of questions: On average, how many one-way trips do you make to and from campus every week on your bike? Are you Faculty, Staff or Student?
- Resume agreement with travel agencies to report mileage on directly financed air travel. Create a travel management system that tracks every mile traveled by UM staff/faculty/and students through directly financed outsourced travel (P cards, Accounts Payable... could report their yearly numbers to a centralized data center)

#### **Other Suggestions**

- Track new PV solar and Solar Thermal systems on campus through partnership with Energy management.
- If the central travel management system is only able to provide dollar amounts, we will need to find the official price per mile for bus transportation (not available in this report)
- Refrigeration: Get our Energy Management to ask our chiller maintenance companies to keep track of the amount of refrigerants used each fiscal year on campus (Coral Gables). If they cannot track it themselves, they should provide us with the yearly invoices per company per chiller.
- Paper: Add categories to the ARIBA procurement system to separate office paper from the rest of office supply items. Add "Recycled content %" column to easily classify the type of paper.
- Offsets: Trees- need complete survey of trees on land managed and owned by UM for preservation – need mapping of land (including Richmond)- convert to metric ton of CO2

equivalent> a team of students from one of our ecology classes could probably take charge of such project.

- A general online survey for faculty, staff and students will help better evaluate the % distribution of commuters' habits on campus. Here is a sample of questions for this survey:

1. Are you a Student / Faculty / Staff?
2. What is your primary mode of transportation to commute to and from campus:  
a- DRIVING   b- BUS/METRO-RAIL   c- BIKING   d- WALKING
3. How many one-way trips (campus to/from home) do you make per week?
4. If the BUS / METRO-RAIL is your primary mode of transportation, how many times do you use your metro pass per week?
5. If DRIVING is your primary mode of transportation, do you carpool daily?

## Conclusion

The latest report from the Intergovernmental Panel on Climate Change (IPCC) is listing South East Florida as one of the three coastal areas in the World most vulnerable to Sea Level Rise. The adaptation to the changes this threat will bring to our region is on its way. Community leaders, elected officials and private partners are calling for more actions. The University of Miami, as a leader in Higher Education, Health and Research has a special role to play. To be a role model for other institutions in the region, and make sure that our goals are met, we need to improve our benchmarking, monitoring and evaluation of Sustainability projects. We need to update our Climate Action Plan and create a new roadmap towards Carbon neutrality. This renewed and systematic approach will be provided by completing a comprehensive Sustainability Action Plan, and the best tool to date for Higher Education Institutions in the US remains the Sustainability Tracking, Assessment and Rating System™ (STARS). We believe that the application to this AASHE sponsored program will drastically improve our overall understanding and planning of sustainability actions at UM.

This interim report highlights the need for a holistic approach to sustainability on our campuses. We hope to foster a culture transformation that will put sustainable behaviors and investments at the core of our institution values. The first installment of the University of Miami's Climate Action Plan in 2009 proposed a tentative timeline, as well as various possible methods to reduce our carbon footprint. The university will need to build on this foundation, review it, and update it. We are confident that by the end of 2016, we will have completed this task and open a new chapter in UM's journey to Sustainability.

