



**Climate Action Plan (CAP) v1.0**  
***(September 2009)***



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## Executive Summary

For the last decade the University of Florida (UF) has been expanding its commitment to addressing energy and climate challenges. As far back as 2001, UF realized the potential benefits of high performance buildings by adopting the U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Certified standards for all major new construction and renovation projects. Through three iterations, this strengthened commitment now requires buildings to achieve LEED-Gold certification.

In 2004, UF completed its first look into the energy and climate related opportunities and constraints on campus - the *Carbon Neutral Assessment Project*, also known as the UF Greenhouse Gas Emissions (GHGE) Inventory v1.0. This effort helped pave the way for UF President, Dr. Bernie Machen, to become the first signatory to the American College and University Presidents Climate Commitment (ACUPCC) in 2006. That commitment led to the September 15, 2008 submission of the UF GHGE Inventory v1.1 for calendar year 2006, an externally assisted evaluation and learning process. The UF GHGE Inventory v1.2 for the five fiscal years FY 2004/2005 through FY 2008/2009 is a refinement of v1.1, established through an internally managed evaluation and institutional change process, and developed as a foundation for the UF Climate Action Plan (CAP) v1.0.

In the summer of 2009, key institutional stakeholders committed UF to a first phase goal of reducing main campus (Site 0001) GHGE to at least 3% below 2005 levels by 2012. This goal is in line with the June 26, 2009 version of the federal American Clean Energy and Security Act (ACES Act), passed by the House of Representatives and currently awaiting a vote in the Senate. Though future versions of the UF CAP will re-evaluate goals beyond phase one, UF is currently targeting the remaining interim milestones of the ACES Act (17% below 2005 levels by 2020, 42% below 2005 levels by 2030, and 83% below 2005 levels by 2050).

During implementation of the UF CAP v1.0 (FY 2009/2010 through FY 2011/2012), UF will focus on the following:

1. Foster organizational leadership and create a foundation for long-term institutional culture change in climate change mitigation and natural resource management.
2. Initiate, implement, and monitor the efficacy of key infrastructure energy efficiency strategies identified in the ongoing Energy Summits and outlined in the Office of Sustainability Vision and Implementation Plans.
3. Continue and expand GHGE reduction campaigns via the Office of Sustainability Green Team Network and other outreach efforts with a focus on the conservation of electricity and water, the reduction of vehicle miles traveled, and utilizing the three R's (reduce → reuse → recycle) of materials and waste.
4. Evaluate, finance, and install a minimum of 100 kW of on-site renewable energy generating capacity within the main campus and/or its local environs.

The UF CAP will be reviewed for progress annually and revised/updated every three years based on experiences and lessons learned throughout implementation of each progressive phase. UF additionally commits to investing in, and developing capacity to, transparently share GHGE inventories and climate actions with faculty, staff, students, alumni, and our local community.

## Introduction: Context and Considerations

[Crafoord Prize](#)<sup>i</sup> winning and preeminent University of Florida ecologist, [Howard T. Odum](#)<sup>ii</sup> is credited with saying, the “human is the biosphere’s programmatic and pragmatic information processor for maximum performance.” Furthermore, Dr. Odum’s theories place information as the highest quality form of energy. As anthropogenic climate change is predominantly an energy challenge, one might argue that at its highest form it is fundamentally an information challenge.

In the spirit of Dr. Odum, the UF CAP v1.0 focuses on addressing organizational leadership and information management - the realm with the most potential to affect the long-term institutional change necessary to make all other GHGE reduction actions possible. As UF gets a better handle on information management, both in the flows of energy and GHGE and in the generation of institutional wisdom (i.e., knowledge, attitudes, beliefs, and courses of action), the minor and major revisions of the CAP will become more refined in their analysis of actions, impacts, and next steps.

The UF CAP is *not* a holistic plan to address sustainability across the University of Florida. These wide-ranging interconnected issues are addressed in the broader [Vision for a Sustainable UF](#)<sup>iii</sup> document and the larger mission of the UF Office of Sustainability. Additionally, the UF CAP does *not* provide a review of the science behind climate change, the rationale for mitigating its anticipated effects, nor the details surrounding the fluid regulatory environment at local, state, and/or federal levels. This material, extensively covered elsewhere, is considered beyond the scope of this document. With these caveats in mind, the structure and update cycles for the cap are summarized below.

### **Structure of the CAP**

The UF CAP v1.0 includes the following:

- Overview of GHGE Inventory V1.2 boundaries and baselines
- Overview of purchased power considerations and impacts on UF GHGE
- Explanation of CAP v1.0 goals and targets
- Details and visualization of the five most recent UF GHGE inventories and opportunities for moving forward
- Explanation of CAP integration with Vision for a Sustainable UF Implementation Plan through actions and mitigation strategies
- Summary of notable recent energy and climate achievements to date hierarchically and chronologically organized
- Summary of notable recent sustainability achievements in teaching, research, and outreach to date and opportunities to expand sustainability education and outreach
- Overview of the financing strategies under evaluation for CAP implementation

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## Endnotes

<sup>i</sup> <http://www.crafoordprize.se/>

<sup>ii</sup> <http://www.sustainability.ufl.edu/about/howard-t-odum.html>

<sup>iii</sup> <http://www.sustainable.ufl.edu/documents/sustainability-vision.pdf>

- Overview of the tracking methods evolving toward improved information management and decision-making
- Relevant appendices

### **Review/Revision Cycles**

- Align and integrate the UF CAP with the Vision for Sustainable UF Implementation Plan
  - Focus CAP on boundaries, baselines, goals, targets, financing, and performance tracking
  - Focus Vision for Sustainable UF Implementation Plan on visions, outcomes, and actions
  - Review progress and performance annually
  - Revise with a new version every 3 years
    - Flexibly update with sub-versions as frequently as needed
- Align and integrate the UF CAP with the UF Campus Master Plan (CMP) as feasible and logical
  - Review and revise alignment of CAP and CMP as per the existing, state-mandated UF Campus Master Plan process

## **A Prioritized Approach**

In a fashion similar to the many excellent academic institutions taking a leadership role within the ACUPCC, UF will take a prioritized approach to addressing the complex challenges contributing to climate change. This approach consists of two overlapping hierarchies as bulleted below. One prioritizes the desired actions chronologically by outcome and the other prioritizes the desired actions categorically by key GHGE source types where UF has the most institutional power to affect change. We believe Tavey Capps, our colleague at Duke University, said it best in stressing an approach to “reduce, renew, then offset...in ways that are local, tangible, and reliable.”<sup>iv</sup>

### **Hierarchy of Actions (Temporal Prioritization of Outcomes)**

1. Organizational Leadership
2. Conservation / Behavior
3. Efficiency / Infrastructure
4. Low Carbon Energy
  - 4.1. Fuel Switching
    - 4.1.1. UF Owned (First) → Purchased Power (Last)
  - 4.2. Renewable Energy
    - 4.2.1. On-Site (First) → Off-Site (Last)
    - 4.2.2. UF Owned (First) → Purchased Power (Last)
5. Carbon Offsets
  - 5.1. Local (First) → Distant (Last)

### **Hierarchy of Actions (Categorical Prioritization of Source Types)**

1. Buildings
  - 1.1. Electricity - General
  - 1.2. Electricity - Chilled Water
  - 1.3. Hot Water
  - 1.4. Steam

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<sup>iv</sup> Quote excerpted from Tavey Capps’s presentation entitled, “*Building Sustainability in the Southeast: Duke University Climate Action Plan*” at the June 27-30, 2009 NACUBO Annual Meeting in Boston, Massachusetts.

- 1.5. Natural Gas
- 1.6. Electricity - Water/Wastewater
- 2. Transportation
  - 2.1. UF Vehicle Fleet
  - 2.2. Commuter
  - 2.3. UF Sponsored Air Travel
  - 2.4. UAA Air Fleet
- 3. Non-Energy Related GHG Emissions

## Boundary, Baseline, & UF Demographics

As the State of Florida's main land grant institution, UF owns and leases sites, facilities, and other assets distributed throughout the state in all 67 counties. Accurately and exhaustively inventorying all owned assets for an institution of this size is not feasible under past and present institutional information management abilities.

Like most institutions, the vast majority of our major assets and operations reside at one main campus. In UF's case, this campus is located in the City of Gainesville within Alachua County, Florida. Though this single site houses approximately 48% of all owned buildings, it accounts for over 87% of the total owned gross square footage statewide (see synopsis below).

As a result of the spatial proximity and concentrated density of the buildings on this site and the significance of the commuter component associated with the site's tens of thousands of faculty, staff, and students, UF has chosen its main campus (Site 0001) as the boundary for this version of the GHGE Inventory.

In the future, UF will aim to improve and expand its enterprise information management systems to include energy, water, and climate data for assets beyond Site 0001. It is hoped this will include a comprehensive look at both sources and sinks in the UF GHGE Inventory ledger, especially in the context of UF's extensive conservation land holdings and land management practices across Florida.

### **ACUPCC Boundary for UF GHGE Inventory v1.2 (Site 0001)**

- Sites: One Total
  - 0001 – UF Main Campus
- Acres:
  - As of FY 2004/2005 (Baseline): 1,902 acres
  - As of FY 2008/2009: 1,902 acres
- Buildings:
  - As of FY 2004/2005 (Baseline): 898 buildings at 17,436,606 gross square feet
  - As of FY 2008/2009: 919 buildings at 20,019,096 gross square feet
- Associated Faculty, Staff, & Students
  - As of FY 2004/2005 (Baseline): 12,126 total employees and 48,765 students
  - As of FY 2008/2009: 12,439 total employees and 52,112 students
- Average Climate Impact:
  - As of FY 2004/2005 (Baseline): 21.1 MtCO<sub>2e</sub> per 1,000 gross square foot
  - As of FY 2008/2009: 17.5 MtCO<sub>2e</sub> per 1,000 gross square foot

### **Total UF Owned Infrastructure (Including Site 0001)**

- Sites: 44 Total
- Buildings:
  - As of FY 2004/2005: 1,948 buildings at 20,189,201 gross square feet
  - As of FY 2008/2009: 1,934 buildings at 22,988,555 gross square feet
- Associated Faculty, Staff, & Students
  - As of FY 2004/2005: 26,308 total employees and 48,765 students
  - As of FY 2008/2009: 27,364 total employees and 52,112 students

### **ACUPCC Baseline: FY 2004/2005**

Changes to the Florida State Education Code in 2001 and 2002 led UF to launch Enterprise Resource Planning (ERP) software that went live in July 2004, replacing legacy systems with a new web-based, integrated system that provides real time information designed to improve UF business processes.<sup>v</sup> As a result of this major institutional transition, data from FY 2003/2004 and prior is more difficult to access and data from FY 2004/2005 to present is more accurate. In light of the ERP data management transition, and the contextual and logistical advantages of the main campus, UF has chosen FY 2004/2005 as the GHGE Inventory data collection baseline and the 2004 details for Site 0001 as the GHGE Inventory boundary.

Campus development is guided by the UF Campus Master Plan (CMP). The 2005-2015 CMP projected an annual population growth rate of approximately 1% per year for students and employees through 2015. Between FY 2004/2005 through FY 2008/2009, statewide employment growth has averaged approximately 1%, in line with CMP projections. Total headcount enrollment during the same five year period has also averaged approximately 1%, though changes in reporting methodology may suggest up to 1.4% annual enrollment growth.

The net new completed building gross square feet (GSF) for the 2005-2015 CMP are 1,082,107 GSF. Of this campus total, 812,044 GSF (or 75% of net new GSF) are dedicated to research space. With the highest energy intensity (btu/sf) of any building category, the growth in research space has a significant impact on the UF carbon footprint. The 2010-2020 CMP update is currently underway with document drafting in Fall 2009 and final CMP adoption in 2010.

### **UF Purchased Power Considerations**

Like most ACUPCC signatories, the UF carbon footprint is primarily a product of the energy consumed by its buildings, vehicles (commuters and fleet), and airplanes (sponsored travel and fleet) and the natural resource mix used to generate the power for these end uses. The University of Florida main campus is served primarily by Progress Energy Florida through the former Florida Power Corporation power control area (PCA). Additional utility services, including the provision of electricity, natural gas, and water, and the disposal of wastewater bio-solids and mixed solid waste (MSW), are provided by Gainesville Regional Utilities (GRU) on the main campus and throughout much of Alachua County, Florida.

Progress Energy Florida has filed with the Public Service Commission to substantially expand its Crystal River nuclear facility, and has negotiated a power purchase agreement with Biomass Investment Group for a 130MW biomass plant. Collectively, through fuel switching, efficiency improvements, and other measures, by 2018 Progress Energy Florida projects a nearly 40% decrease in the GHGE intensity of the generation capacity serving its Florida retail customers.

GRU has been a Florida municipal utility leader in energy efficiency programs since the late 1970s and offers an extensive series of rebates and incentives for heating and air conditioning efficiency improvements, added insulation, solar photovoltaic (PV), fuel switching to natural

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<sup>v</sup> Further information about this transition can be found via the UF Bridges <http://bit.ly/wJUCn> and the State Library and Archives of Florida <http://bit.ly/lkv9b>.

gas for heating, drying, and cooking, and other programs. Currently, GRU is in the planning stages for a 100-megawatt (MW) biomass-fueled power plant to be built in conjunction with a private company and located on GRU property in Gainesville, Florida. Additionally, GRU recently signed a contract to expand its landfill gas purchases and became the first utility in the United States to implement a European-style solar PV feed-in-tariff (FIT). Within weeks, the GRU FIT reached its 4 MW annual capacity for applications for the first two years of the program, instantly launching GRU into position as a solar industry leader among Florida utilities. By 2013, these initiatives and other GRU strategic programs are projected to help the City of Gainesville reach the Kyoto Protocol targets of reducing GHGE to seven percent below 1990 levels by 2012, only one year after these ambitious targets.

UF’s carbon footprint, both today and into the future, will be significantly impacted by the choices made at these purchased power providers. We encourage their continued innovation and look forward to assisting them in their efforts. A comparison of these two utilities’ power generation resource mix can be found in Appendix D.

### CAP Goals & Targets

In the summer of 2009, key institutional stakeholders reviewed the details, background, and progress-to-date on developing the UF GHGE Inventory v1.2 boundary and baseline. Multiple benchmarks offered guidance including those of peer institutions, the American Clean Energy and Security Act (ACES Act), and the State of Florida targets as shown below and further explained in Appendix C.

#### State and Federal Targets

Milestones	ACESA (Federal)			Executive Order 07-126 (State of Florida)		
	Target	Baseline	Goal Year	Target	Baseline	Goal Year
Interim #1	03% below	2005	by 2012	10% below	2007	by 2012
Interim #2	17% below	2005	by 2020	25% below	2007	by 2017
Interim #3	42% below	2005	by 2030	40% below	2007	by 2025
Interim #4	83% below	2005	by 2050	N/A	N/A	N/A

Ultimately, these key institutional stakeholders committed UF to a first phase goal of reducing main campus (Site 0001) GHGE to at least 3% below 2005 levels by 2012. This goal is in line with the June 26, 2009 version of the American Clean Energy and Security Act (ACES Act), passed by the House of Representatives and currently awaiting a vote in the Senate. This federal target was identified as a suitable benchmark because of its national applicability, its shared baseline year with the UF GHGE Inventory v1.2, and its ability to foster organizational leadership toward a realistic near-term goal that will allow UF to successfully build on lessons learned in the hopes of achieving increasingly more aggressive goals going forward. Though future versions of the UF CAP will re-evaluate goals beyond phase one, UF is currently targeting the remaining interim milestones of the ACES Act.

#### University of Florida Targets

Milestones	Reduction Target	Baseline	Goal Year
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UF Milestone #1	03% below	FY 2004/2005	by 2012
UF Milestone #2	17% below	FY 2004/2005	by 2020
UF Milestone #3	42% below	FY 2004/2005	by 2030
UF Milestone #4	83% below	FY 2004/2005	by 2050
UF Carbon Neutrality	<i>Neutral by 2025</i>		

## UF GHG Emissions Overview

The UF GHGE Inventory v1.2 consists of 9 major emissions categories in three scopes and numerous sub-categories as detailed in the inventory status section. As of the release of this document in September 2009, UF is still compiling the complete GHGE Inventory v1.2 for FY 2004/2005 through FY 2008/2009. Our ACUPCC GHGE inventory report page will be updated upon completion of these more detailed inventories as they are different than the currently posted CY 2006 UF GHGE Inventory v1.1.

As revealed in a preliminary analysis of the CY 2006 inventory, buildings and transportation account for over 95% of the main campus carbon footprint. These major categories are included in the inventory distribution chart below and have been collected and quantified for the purpose of guiding the development of the UF CAP v1.0. De minimis sources (shown as TBD in the inventory status section) are not included in these graphics or in the UF CAP v1.0, but will soon be incorporated into the GHGE Inventory v1.2 and future versions of the UF CAP.

### *UF GHGE Inventory Distribution (FY 2004/2005 Baseline)*

**UF GHGE Inventory Status**

Scope	Category		FY	FY	FY	FY	FY
		Sub-Category	2004/2005 (MtCO <sub>2</sub> e)	2005/2006 (MtCO <sub>2</sub> e)	2006/2007 (MtCO <sub>2</sub> e)	2007/2008 (MtCO <sub>2</sub> e)	2008/2009 (MtCO <sub>2</sub> e)
1	Stationary Combustion						
		<i>Diesel (Emergency Generators)</i>	TBD	TBD	TBD	TBD	TBD
		<i>Natural Gas</i>	9,495	9,663	17,781	23,558	11,459
1	Fugitive Emissions						
		<i>Fertilizers</i>	TBD	TBD	TBD	TBD	TBD
		<i>Livestock</i>	TBD	TBD	TBD	TBD	TBD
		<i>Refrigerants</i>	TBD	TBD	TBD	TBD	TBD
1	Mobile Combustion						
		<i>UAA Air Fleet</i>	700	725	798	649	619
		<i>UF Vehicle Fleet</i>	3,148	3,361	3,333	3,200	2,878
2	Purchased Electricity						
		<i>Electricity (for Chilled Water Generation)</i>	70,177	68,954	67,449	77,274	73,693
		<i>Electricity (for General Use)</i>	183,722	167,938	157,028	178,126	155,563
		<i>Electricity (for Wastewater Treatment)</i>	TBD	TBD	TBD	TBD	TBD
2	Purchased Steam						
		<i>UF CHP Plant (Owned &amp; Operated by PE Florida)</i>	36,427	30,273	30,019	31,027	34,221
3	Commuting						
		<i>Faculty, Staff, &amp; Student Parking</i>	31,112	31,727	30,604	33,054	32,444
		<i>RTS Buses</i>	6,268	6,295	6,552	6,687	6,581
3	Directly Financed Travel						
		<i>UF Sponsored Air Travel</i>	18,743	23,356	25,557	26,080	25,217
3	Water						
		<i>Domestic Water Use</i>	563	581	594	459	429
		<i>Reclaimed Water Use</i>	TBD	TBD	TBD	TBD	TBD
		<i>Wastewater Treatment Biosolids</i>	TBD	TBD	TBD	TBD	TBD
3	Solid Waste						
		<i>Non-Hazardous MSW (Landfilled)</i>	7,899	7,232	7,603	7,784	7,208
		<i>Hazardous MSW (TBD)</i>	TBD	TBD	TBD	TBD	TBD
		<i>Biomedical Waste (Incinerated)</i>	TBD	TBD	TBD	TBD	TBD
<b>Total Emissions (MtCO<sub>2</sub>e)</b>			<b>368,254</b>	<b>350,106</b>	<b>347,318</b>	<b>387,898</b>	<b>350,311</b>
<b>Total Building Space (GSF)</b>			<b>17,436,606</b>	<b>17,453,367</b>	<b>18,261,701</b>	<b>19,258,215</b>	<b>20,019,096</b>
<b>Total Research Space (GSF)</b>			<b>1,170,455</b>	<b>1,255,415</b>	<b>1,272,379</b>	<b>1,293,814</b>	<b>1,307,684</b>
<b>MtCO<sub>2</sub>e per 1,000 gross square feet</b>			<b>21.1</b>	<b>20.1</b>	<b>19.0</b>	<b>20.1</b>	<b>17.5</b>

\*Note: Scope 3 transmission and distribution losses for electricity, steam, and chilled water are currently not included in these calculations.

*UF Climate Action Plan Reduction Wedge Scenarios*

## Actions & Mitigation Strategies

During the UF CAP v1.0 (FY 2009/2010 through FY 2011/2012), UF will broadly focus on the following:

1. Foster organizational leadership and create a foundation for long-term institutional culture change in energy, water, and climate change mitigation and resource management.
  - a. Treat energy flows and GHGE like dollars and track them with the same due diligence and transparency.
    - i. Assess data concerns & direct relevant units to improve data collection at the original source.
    - ii. Expand the use of advanced metering infrastructure and enterprise building management systems.
    - iii. Create a plan to continuously improve energy consumption and GHGE data granularity from coarse, campus-wide detail to fine, building-scale and/or time interval detail.
  - b. Integrate the CAP with the Vision for a Sustainable UF Implementation Plan.
  - c. Coordinate the CAP with the Campus Master Plan.
  - d. Refine and expand the use of methodologies and metrics to evaluate efficacy of energy efficiency and GHGE reduction strategies.
2. Initiate, implement, and monitor the efficacy of key infrastructure energy efficiency strategies identified in the ongoing Energy Summits and outlined in the Office of Sustainability Vision and Implementation Plans.
3. Continue and expand GHGE reduction campaigns via the Office of Sustainability Green Team Network and other outreach efforts with a focus on the conservation of electricity and water, the reduction of vehicle miles traveled, and utilizing the three R's (reduce → reuse → recycle) of materials and waste.
4. Evaluate, finance, and install a minimum of 100 kW of on-site renewable energy generating capacity within the main campus and/or its local environs.

For a complete look at the more detailed set of climate actions, please download the [Vision for a Sustainable UF Implementation Plan](#)<sup>vi</sup> currently being finalized for Fall 2009 publication. These actions are categorized and tracked according to [14 major sustainability guiding principles](#)<sup>vii</sup>. The existing [Vision for a Sustainable UF](#)<sup>viii</sup> document offers additional context and support for the Implementation Plan.

## UF Climate and Energy Successes to Date

### Organizational Leadership

- **2004:** UF completes the *Carbon Neutral Assessment Project*, the University's first look into the energy and climate related opportunities and constraints on campus.

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<sup>vi</sup> <http://www.sustainability.ufl.edu/about/>

<sup>vii</sup> <http://sustainable.ufl.edu/about/mission.html>

<sup>viii</sup> <http://www.sustainable.ufl.edu/documents/sustainability-vision.pdf>

- **2006:** University President, J. Bernard Machen, becomes the first to sign the President’s Climate Commitment during the leadership phase. University First Lady, Chris Machen, is a key supporter and a major ally in these efforts.
- **2006:** UF creates the Joint Standing UF Sustainability Committee.
- **2006:** UF officially forms the Office of Sustainability, housed within the Office of the Vice President of Business Affairs and hires its first Director.
- **2006:** UF becomes an institutional member of AASHE.
- **2006:** UF Office of Sustainability facilitates diverse interdepartmental workshop series to develop a collaborative Vision for a Sustainable UF.
- **2008:** UF faculty and students participate in Focus the Nation.
- **2008:** UF Office of Sustainability facilitates follow-up workshop series to create an Implementation Plan for outcomes and actions to achieve the Vision. This plan houses actions for the Climate Action Plan with progress to be reviewed annually and the plan to be revised every three years.
- **2008-2009:** The VP of Business Affairs hosts a series of “Energy Summits” to bring operational leaders together for a frank brainstorming session on ways the university can become more energy efficient. Major stakeholders include:
  - Academic Technology (AT)
  - Computing and Networking Services (CNS)
  - Environmental Health and Safety (EHS)
  - Facilities Planning and Construction Department (FPC)
  - Health Science Center (HSC)
  - Housing
  - Institute of Food and Agricultural Sciences (IFAS) & Florida Cooperative Extension Service
  - Office of Sustainability (OoS)
  - Office of the Vice President for Business Affairs
  - Physical Plant Department (PPD)
  - University Athletic Association (UAA)
- **Ongoing:** The VP of Business Affairs and the President meet regularly to review potential creative strategies for investing ongoing funding for maximum payback, including discussions of large-scale renewable energy installations.
- **Ongoing:** The Joint Standing Sustainability Committee supports task forces and working groups that work on complex sustainability issues:
  - Energy and Climate Change Task Force
    - Carbon Neutrality Working Group
    - Sustainable Transportation Working Group

### ***Efficiency / Infrastructure***

- **2003:** UF implements the [Environmentally Preferable Purchasing Policy](#)<sup>ix</sup> to foster purchasing strategies to reduce energy consumption and environmental footprint of purchased goods and services.
  - **2007:** UF upgrades to a more broadly encompassing [Sustainable Purchasing Directive](#)<sup>x</sup> expanding on past successes.
- Adoption of USGBC LEED criteria for all major new construction and renovation projects:
  - **2001:** minimum USGBC LEED Certification
  - **2006:** minimum USGBC LEED Silver Certification

<sup>ix</sup> <http://www.admin.ufl.edu/ddd/default.asp?doc=8.10.1419>

<sup>x</sup> <http://www.admin.ufl.edu/ddd/default.asp?doc=13.1.2099>

- **2009:** minimum USGBC LEED Gold Certification
- **2007:** UF Facilities, Planning, and Construction Department undertakes the USGBC LEED-EB Portfolio Pilot, becoming one of 12 entities selected to pursue this program.
- USGBC LEED building certification status on campus (as of August 2009):
  - Platinum: 1
  - Gold: 2
  - Silver: 1
  - Certified: 9
  - Registered: 20
- **2008:** UF installs its first green roof on the Charles R. Perry Construction Yard building.

### Conservation / Behavior

- **2006:** Students initiate an annual Spring Battle of the Halls energy conservation competition.
  - **2007:** Battle of the Halls competition results in a 24% overall average savings.
  - **2008:** Participating residence halls reduce their collective energy use by 14,500 kWhs (9 MtCO<sub>2e</sub>)
- **2008:** The [Green Team Network](#)<sup>xi</sup> is established in 2008 to involve members of the campus community, at all levels, in achieving a more sustainable university.
- **2009:** Office of Sustainability student interns launch the “Sustainability Hut,” a mobile interactive educational pavilion staffed by student interns and volunteers and frequently used both on campus and for major off-campus events to promote improved knowledge, attitudes, and behaviors about the sustainable use of resources.

### Transportation

- **1998:** The [Regional Transit System](#)<sup>xii</sup> (RTS) begins partial funding by student transportation fees and provides a pre-paid unlimited-use universal bus pass for UF students, faculty, and staff with their GatorOne ID card.
  - Since 1998, the UF transportation fee has contributed increasing funding to RTS, spurring additional services such as:
    - [Gator Aider](#)<sup>xiii</sup> – a football shuttle service that connects gameday fans to distributed parking garages to reduce traffic on campus.
    - **Later Gator & Good Night Gator Stops** – a service for after hours routes along prime nightlife corridors.
    - [Gator Locator](#)<sup>xiv</sup> – a real-time Web-based GPS bus tracking system to improve transit planning for bus riders.
  - **2008:** Annual ridership on RTS bus system approaches nine million, rising from less than one million in 1998 prior to UF’s partnership with the City of Gainesville to create the universal bus pass for the UF community.

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<sup>xi</sup> <http://www.sustainable.ufl.edu/greenteam/>

<sup>xii</sup> <http://www.go-rts.com/>

<sup>xiii</sup> <http://www.go-rts.com/GatorAider.html>

<sup>xiv</sup> <http://ufl.transloc.com/>

- **2006:** U.S. Environmental Protection Agency names [UF one of the best workplaces for commuters among colleges and universities](#)<sup>xv</sup>, a national list of innovative college and university employers committed to improving air quality, saving energy, and reducing traffic congestion while improving quality of life for employees.
- **2006:** UF commits to [purchasing high fuel efficiency hybrid and/or alternative fuel vehicles](#)<sup>xvi</sup> whenever possible.
- **2008:** UF hosts first annual alternative transportation fair showcasing the multi-modal and energy efficient transportation options available in Gainesville and emerging in the marketplace with linkages to campus clubs, local organizations, the UF Zipcar program, the [One Less Car Challenge](#)<sup>xvii</sup>, the Gainesville Regional Transit System's Gator Locator Web-based GPS tracking system and more.
- **2008:** The Student Government Senate votes to negotiate with RTS to run all buses that serve campus routes on a B20 biodiesel mixture.
- **2008:** UF Office of Sustainability holds the first annual [One Less Car Challenge](#)<sup>xviii</sup>, catalyzing 1,798 participants in a two month long campaign to reduce vehicle miles traveled (VMT) by switching to one or more alternative modes of transportation resulting in an estimated 223 MtCO<sub>2e</sub> avoided (as reported in participants' online travelogues).
- **Ongoing:** UF incentivizes [alternative modes of transportation](#)<sup>xix</sup> through discounted [carpool decals](#)<sup>xx</sup>, an online [rideshare matching service](#)<sup>xxi</sup>, a [Campus Cab](#)<sup>xxii</sup> (taxi) service, and a [Zipcar](#)<sup>xxiii</sup> shared vehicle program with 8 fleet vehicles stationed on campus.
- **Ongoing:** UF Student Government offers free bicycle repair outside the Reitz Union from 10:00 am to 4:00 pm on weekdays.

### ***Fuel Switching***

- **2006:** UF begins stocking biodiesel for use in fleet vehicles in December 2006.
  - **2007:** 7,594 gallons of biodiesel used.
  - **2008:** 11,564 gallons of biodiesel used.
- **2006:** UF begins stocking E85 ethanol for use in vehicle fleets.

<sup>xv</sup> <http://news.ufl.edu/2006/05/23/uf-commuters/>

<sup>xvi</sup> <http://www.admin.ufl.edu/ddd/default.asp?doc=11.7.1867>

<sup>xvii</sup> <http://www.sustainability.ufl.edu/onelesscar/>

<sup>xviii</sup> <http://www.sustainability.ufl.edu/onelesscar/>

<sup>xix</sup> <http://www.hr.ufl.edu/infogator/2008/june/transportation.htm>

<sup>xx</sup> <http://www.parking.ufl.edu/pages/alcar.htm>

<sup>xxi</sup> <http://uf.greenride.com/en-US/>

<sup>xxii</sup> <http://www.ppd.ufl.edu/campuscab.htm>

<sup>xxiii</sup> <http://www.zipcar.com/>

- **2006:** 5,673 gallons of E85 ethanol used.
- **2007:** 19,246 gallons of biodiesel used.
- **2008:** 34,863 gallons of biodiesel used.

### **Renewables (Production & Purchasing)**

- **2006:** The Student Renewable Energy Coalition runs a \$.50/credit hour Renewable Energy Fee ballot referendum that passes with 78% of students voting in favor.
  - **2008:** Bill left in committee in the Florida Legislature after it gets through the Board of Trustees. Students begin planning to bring the proposal to the floor in the next session.
- **Ongoing:** UF conducts extensive research on liquid fuels from renewable resources including cellulosic ethanol and biodiesel integrating the research into applied case studies on campus whenever possible.

### **Carbon Offsets (Local First...Distant Last)**

- **2006:** UF begins CFL distribution campaign as an experimental locally-focused carbon offset project.
- **2007:** UF begins exploring carbon offset opportunities for major athletic events as a high-profile way to raise awareness and reduce the campus carbon footprint.
  - **2007:** UF offsets the home football game against intrastate rival Florida State University.
  - **2008:** UF partners with [Neutral Gator](#)<sup>xxiv</sup> to support carbon offset projects within the local community.
  - **2008:** UF offsets seven home games to host the first carbon neutral college football season.
  - **2009:** University Athletic Association commits to being a carbon neutral athletic program.

### **Non-Energy Related GHG Emissions**

- **2005:** UF President Bernie Machen commits to a *Zero-Waste* campus by 2015.
- **2006:** UF initiates *Tail-Gator* volunteer-based waste recycling program for football home game days.
  - **2006 Season:** *Tail-Gator* Green Team collects over 17,000 lbs of recyclables.
  - **2007 Season:** *Tail-Gator* Green Team collects over 26,000 lbs of recyclables.
  - **2008 Season:** *Tail-Gator* Green Team collects nearly 26,000 lbs of recyclables.

## **The Triple Play Mission: Sustainability in Teaching, Research, & Outreach**

As a top-tier research and land grant university, UF is uniquely positioned to combine its research capacity and teaching prowess with its outreach and extension mission to develop interdisciplinary institutes and programs that deliver important sustainability related information to the public. UF hosts myriad centers for energy and water resource management, environmental research, conservation, planning, design, policy, and law.

Additionally, UF offers more than 110 courses related to sustainability, many college-level certificates, a new minor in Sustainability Studies, as well as specialized sustainability majors and masters degree programs. As evidenced in the teaching, research, and outreach successes to date that follow below, UF students are exposed to sustainability as freshmen and asked to “walk the talk” through an ever-increasing commitment to a more sustainable

<sup>xxiv</sup> <http://www.neutralgator.org/>

lifestyle as they transition from the student experience to alumnus status. This evolution from classroom to community is a commonly unreferenced aspect of outreach to the general public as the Gator Nation grows.

Actions for further expansion and refinement of campus climate neutrality and sustainability into the integrated operational, research, curricular, and extension arms of the UF institution are expounded upon in the [Vision for a Sustainable UF Implementation Plan](#)<sup>xxv</sup>. Furthermore, a detailed [report](#)<sup>xxvi</sup> published in June 2009, was conducted by the President's Strategic Initiative on Academics and Sustainability Designee and Professor of Architecture, Dr. Kim Tanzer, in association with the Provost's Fellow in Sustainability and Clinical Law Professor, Tom Ankersen, to address the interconnectivity of this triple play mission and create the foundation for a pathway to improve our institutional approach as excerpted below:

“Over the past five years the University of Florida has gained a strong national reputation for its commitment to sustainability, built largely on the basis of the Office of Sustainability's efforts to improve campus operations. During this time a number of faculty initiatives to coordinate academic offerings--including teaching, research, service learning and extension--have been developed, largely by faculty members serving in volunteer capacities. Their efforts have been encouraged by UF's President Bernie Machen, and modestly supported through the Office of Sustainability.

To take advantage of UF's momentum and opportunities emerging nationally, during the 2008-09 academic year, President Machen requested that increased efforts to coordinate UF's academic sustainability offerings be made. A number of specific tasks were completed with the goal of reviving, updating, and strengthening faculty commitment to academic sustainability. Several funding opportunities that arose during this time were addressed. A prolonged attempt was made to create a process to inventory, assess, and prepare to report UF's coursework on behalf of our students and for the AASHE STARS system. These efforts are detailed in the report that follows and its accompanying appendices...”

### ***Teaching, Learning, & the Sustainable Student Experience***

- **2004:** An ad hoc Sustainability Committee was established through appointments from the Faculty Senate and President Machen.
- **2006-2007:** Members of the sustainability committee prepare a legislative budget request for an academic center for sustainability at UF. This proposal has moved to a request for congressional funding.
- **2007:** UF creates a Sustainability Joint Committee of the Faculty Senate, as high as a committee can be organizationally located at UF. Membership includes 19 faculty, staff, and students and a Faculty Fellow in Sustainability to facilitate the integration of sustainability into the UF curriculum.
- **2007:** New Student Programming begins incorporating sustainability into orientation and other freshman programming on campus.

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<sup>xxv</sup> <http://www.sustainability.ufl.edu/about/>

<sup>xxvi</sup> <http://www.sustainable.ufl.edu/documents/AcademicsAndSustainabilityAtUF-AReport.pdf>

- **2007:** Student leaders launch the *Green Graduation Pledge* and an associated [Facebook page](#)<sup>xxvii</sup> and web site.
  - **2009:** Over 700 graduating Gators sign the pledge and join the [UF Green Alumni Network](#)<sup>xxviii</sup>, vowing to bring their sustainability knowledge, attitudes, and behavior with them into their careers and communities.
- **2007 (ongoing):** UF begins the [Common Reading Program](#)<sup>xxix</sup>, designed to provide all 6400 new first-year students with a common intellectual experience to stimulate discussion, critical thinking, and encourage a sense of community among students, faculty and staff. The first three books each weaved together one or more sustainability related issues such as social justice, natural resource management, human health, and cross-cultural international challenges.
- **2007 (ongoing):** UF publishes the annual *Green Guide: A Gator's Guide to Sustainable Living* now in its [Third Edition](#)<sup>xxx</sup> as of Fall 2009.
- **2008:** UF adds a new 18-credit interdisciplinary [Minor in Sustainability Studies](#)<sup>xxxi</sup> to the general education curriculum.
  - *Facets of Sustainability* (IDS 2935) serves as the core course in the minor with a requirement for four additional courses from a wide variety of disciplines as well as an internship and/or service learning component.
- **2008:** UF becomes the [first university in the country](#)<sup>xxxii</sup> to create a new [Master of Laws in Environmental and Land Use Law](#)<sup>xxxiii</sup> within the Levin College of Law.
- **2008:** UF creates a new four-year 120-credit intra-college, multi-departmental [Bachelor of Science in Sustainability and the Built Environment](#)<sup>xxxiv</sup> (BSSBE) through the College of Design Construction and Planning.
- **2007:** A new [textbook recycling web site](#)<sup>xxxv</sup> launches allowing students to sell books directly to each other via Classified Ads (textbook listing) and/or by receiving Buyback Alerts from the University of Florida Bookstore.
- **2009 (ongoing):** UF offers more than 110 courses related to sustainability.

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xxvii <http://www.facebook.com/group.php?gid=74327656443&ref=mf>

xxviii <http://www.ufgreenalumni.org/>

xxix <http://www.dso.ufl.edu/nsp/firstyearexperience/commonread/>

xxx <http://www.sustainable.ufl.edu/documents/Guide-RevisedFinalEditionForWebsite-081109.pdf>

xxxii <http://www.clas.ufl.edu/sustainability>

xxxiii <http://news.ufl.edu/2008/06/12/law-degree/>

xxxiii <http://www.law.ufl.edu/elulp/>

xxxiv <http://www.dcp.ufl.edu/sustainability>

xxxv <http://www.bsd.ufl.edu/bookmarket/>

### **Sustainability Related Student Representation & Equality**

- [Graduate Assistants United](#)<sup>xxxvi</sup>
  - Represents graduate students in forming contracts with the University and fights for benefits such as health care and pay-raises for graduate students.
- [Chomp the Vote](#)<sup>xxxvii</sup> (UF Student Government Agency)
  - Registers UF students to vote and increases student voter turnout.
- [Gators Going Green](#)<sup>xxxviii</sup> (UF Student Government Agency)
  - Seeks to be the link between Student Government and the Student Body, the University of Florida, and the Gainesville Community by promoting sustainable initiatives, addressing the needs of the student body for future generations, and establishing a permanent culture of environmental awareness.
- Joint Standing UF Sustainability Committee
  - Seeks to enhance the university's standing as a global leader in sustainability through two annually appointed student representatives.
- **2006 (Ongoing):** Office of Sustainability begins offering student internships.

### **Sustainability Related Campus Organizations & Chapters**

- [American Solar Energy Society: UF Student Chapter](#)<sup>xxxix</sup>
  - Encourages education, research, and development on renewable and alternate energies at UF and gathers, compiles, and disseminates information promoting them as viable and environmentally friendly sources of energy both to UF and the community at large.
- [Bioenergy and Sustainable Technology Society](#)<sup>xi</sup>
  - Provides a forum within which to discuss and educate the members and the public at-large about the technological realities, politics, and economics of bioenergy and renewable resources, energy conversion and distribution, and sustainable technologies.
- [Change the World: Student Social Entrepreneurs at UF](#)<sup>xii</sup>
  - Aims to educate students to think innovatively about social problems in the local community and around the world and empower them to create positive social change.
- [enVeg](#)<sup>xiii</sup>

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xxxvi <http://www.ufgau.org/>

xxxvii <http://www.sg.ufl.edu/organizations/OrganizationInfo.aspx?organization=310>

xxxviii [http://www.sg.ufl.edu/branches/legislative/senate\\_docs/bills/2009%5C1034-Gators%20Going%20Green%20Creation%20Act.pdf](http://www.sg.ufl.edu/branches/legislative/senate_docs/bills/2009%5C1034-Gators%20Going%20Green%20Creation%20Act.pdf)

xxxix <http://www.ufases.org/>

xi <http://grove.ufl.edu/~bests/>

xii <http://www.changetheworlduf.org/>

xiii <http://www.enveg.org/>

- Encourages people to reduce their industrial-raised meat, dairy, and egg consumption in order to help slow climate change by promoting and increasing the ease of cooking without meat.
- [Gators for a Sustainable Campus](#)<sup>xliii</sup>
  - Aims to increase awareness of sustainability on campus and encourages students to lead more sustainable lives. GSC is affiliated with the UF Office of Sustainability and leads the Renewable Energy Fee initiative.
- [Human Rights Awareness on Campus](#)<sup>xliv</sup>
  - Promotes awareness and activism concerning human rights abuses around the world, particularly in cases of genocide.
- [UF Greeks Going Green](#)<sup>xlv</sup>
  - Promotes environmental awareness and resource conservation within the UF Greek community.
- [UF Students in Free Enterprise](#)<sup>xlvi</sup>
  - Facilitates student teams to take what they are learning in the classroom and use that knowledge to create and implement educational outreach projects in their community. One of SIFE’s “pillars” is sustainability.
- UF United World Organization
  - Aims to enable young people to become responsible citizens, environmentally and politically aware, and committed to the ideals of peace and justice, understanding and cooperation, through international education, experience, and community service.
- U.S. Green Building Council: UF Student Chapter
  - Works to raise awareness of green building principles and practices among the design, construction, planning, engineering, and real estate communities.

### **Research**

- Collaboration and support from diverse energy and climate related academic programs, centers, and institutes including:
  - [Carbon Resources Science Center](#)<sup>xlvii</sup>
  - [Florida Energy Systems Consortium](#)<sup>xlviii</sup>
    - UF led interdisciplinary collaborative of research, outreach, and economic development experts among the 11 Florida state supported universities and the energy industry reporting to the Florida Energy and Climate Commission on over 50 research categories and charged by the Florida State government to “*perform research and development on innovative*”

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xliii <http://www.sustainablegators.org/>

xliv <http://grove.ufl.edu/~hra/>

xlv <http://ufgreeksgoinggreen.wordpress.com/>

xlvi <http://www.ufsife.com/>

xlvii <http://carboncenter.ifas.ufl.edu/>

xlviii <http://www.floridaenergy.ufl.edu/>

*energy systems that lead to alternative energy strategies, improved energy efficiencies, and expanded economic development for the state.”*

- [Florida Institute for Sustainable Energy \(FISE\)](#)<sup>xlix</sup>
  - Collaborative of more than 150 UF faculty working on policy, production, conservation, and other realms of energy research and application.
- [Office of Sustainability](#)<sup>l</sup>
- [Powell Center of Construction and Environment](#)<sup>li</sup>
- [Southeast Climate Consortium](#)<sup>lii</sup>
- [UF Water Institute](#)<sup>liii</sup>

### **Community Outreach and Other Efforts**

- **2006:** UF creates and hosts [inaugural Florida Campus and Community Sustainability Conference](#)<sup>liv</sup> followed by Florida State University (2007), University of Central Florida (2008), and University of South Florida (2009).
- **2007-2008:** 5<sup>th</sup> Avenue Arts Festival: The Office of Sustainability and sustainability related student groups participate in this annual cultural celebration, hosting interactive activities and recycled craft projects.
- **Ongoing:** The UF Institute of Food and Agricultural Sciences (IFAS) Cooperative Extension Service improves and expands its sustainability related offerings (sampling of programs and outreach platforms and their inception dates below).
  - **1994:** [Florida Yards & Neighborhoods \(FYN\)](#)<sup>lv</sup>
  - **1997:** [Integrated Pest Management Florida](#)<sup>lvi</sup>
  - **2004:** [Program for Resource Efficient Communities](#)<sup>lvii</sup>
  - **2005:** [Bushnell Center for Urban Sustainability in Pinellas County, FL](#)<sup>lviii</sup>

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<sup>xlix</sup> <http://www.energy.ufl.edu/>

<sup>l</sup> <http://www.sustainable.ufl.edu/>

<sup>li</sup> <http://www.cce.ufl.edu/>

<sup>lii</sup> <http://www.seclimate.org/>

<sup>liii</sup> <http://www.waterinstitute.ufl.edu/>

<sup>liv</sup> <http://www.sustainability.ufl.edu/conference/schedule.asp>

<sup>lv</sup> <http://fyn.ifas.ufl.edu/>

<sup>lvi</sup> <http://ipm.ifas.ufl.edu/>

<sup>lvii</sup> <http://www.buildgreen.ufl.edu/>

<sup>lviii</sup> <http://pinellas.ifas.ufl.edu/sustainability/index.shtml>

- **2006:** IFAS launches [Solutions for Your Life](http://www.solutionsforyourlife.com/)<sup>lix</sup> web site with an extensive sustainable living section.

## Financing Strategies

In 2008, the University of Florida spent approximately \$40 million on roughly 470,000 megawatt-hours of electricity, which makes up nearly three quarters of UF's GHG emissions. These costs are expected to jump over 20% in 2009 alone due to rate escalation in UF's purchased electricity.

If the price of carbon in the United States were \$10/MtCO<sub>2e</sub> today, it would cost UF over \$4 million per year to offset our main campus GHGE at current emissions rates. Though this multi-million dollar investment would help us meet our carbon neutrality goals, it would fail to offer the synergistic multi-factorial recurring benefits inherent to energy conservation, energy efficiency, and renewable energy strategies. These benefits might include reduced institutional operating costs; job retention/creation; and improved energy and climate knowledge, actions, and behaviors of staff, faculty, students, and alumni.

Financing for the first wave of climate actions originated from a portion of UF's public educational capital outlay (PECO) funds, which are allocated to K-20 state schools through the Florida State Legislature via a tax on utilities. The scope and scale of projects set aside to receive these funds were collaboratively determined in a series of cross-campus Energy Summits directed by the Office of the Vice President of Business Affairs throughout the 2008/2009 fiscal year. The full suite of UF CAP v1.0 actions can be found in the [Vision for a Sustainable UF Implementation Plan](#)<sup>lx</sup>, while an overview of the currently funded and potential major future actions and their potential impact can be found in Appendix A.

Beyond the PECO funds used for the first wave of climate actions, there are a series of traditional funding sources available to state universities in Florida which may provide potential pathways for further funding. Creative opportunities within these traditional pathways might include campaigns to solicit alumni and other donors interested in financing efficiency improvements to chiller plants and other major currently non-sponsored infrastructure. Options both inside and outside of these conventional sources are currently under investigation and will be refined and reported in future major and/or minor versions of the UF CAP. Additionally, UF is committed to tracking and reporting the efficacy of our CAP from planning/design, to construction/implementation, and ultimately through operations/maintenance for each action.

### **State University System (SUS) of Florida Fixed Capital Outlay Funding Sources**

- Public Education Capital Outlay (PECO)
- State Matching
- General Revenue
- Capital Improvement Fees
- Private Donations
- Grants
  - Facilities Challenge Grants (Private)

<sup>lix</sup> <http://www.solutionsforyourlife.com/>

<sup>lx</sup> <http://www.sustainability.ufl.edu/about/>

- State and Federal Agency Grants
- Grant Overhead

### **Financial Measures to Track and Report Efficacy of CAP**

- Capital Outlay
- Annual Financing Costs
- Annual Operating Costs
- Duration of Project & Savings
- Simple Payback (Years)
- Total Net Present Value
- Annual Savings (Projected &/or Actual)
  - Dollars (\$)
  - Energy (btu)
  - GHG Emissions (MtCO<sub>2</sub>e)
- Other Non-Financial Return(s) on Investment

## **Tracking Progress**

As part of our first priority action to foster organizational leadership and lasting institutional culture change, UF spent FY 2008/2009 transitioning from an externally subcontracted GHGE inventory process to an internally motivated and directed process, which will include institution-wide energy and climate information management and strategic planning. With this evolving transition, UF has begun to reap the rewards of improved stakeholder buy-in and resource sharing toward the common goal of improving energy efficiency, mitigating the UF carbon footprint, and reducing operational costs.

Throughout the process of conducting a more refined in-house GHGE inventory for the last five fiscal years (FY 2004/2005 through FY 2008/2009), UF has identified multiple areas where energy, water, and climate information flows can be improved. To facilitate improving data at the source and to improve transparency of institutional opportunities and constraints, time-interval performance, and success stories, UF has centralized the GHGE inventory recording and reporting into one commonly accessible platform, the UF Space Tracking and Reporting System (STARS).

### **UF STARS: Home of the GHGE Inventory**

The UF Space Tracking and Reporting System (STARS) is an enterprise-scale Oracle database with a web enabled graphical user interface. STARS integrates and communicates with a wide variety of other critical UF units and data sources including those from Facilities Planning and Construction, Physical Plant, Transportation and Parking Services, the Institute of Food and Agricultural Sciences (IFAS), the GIS-based campus map and others. The scope, scale, and flexibility of this key UF platform are a natural fit for tracking the UF carbon footprint. As such, it has been selected to house all historical and future UF GHGE inventories, as well as ultimately to provide energy, water, and GHGE reduction actions and progress.

Additionally, STARS will filter UF's institutional infrastructure assets according to the boundary and baseline detailed herewith and agreed upon by key institutional stakeholders. Housing the GHGE inventory in this system offers the following benefits over using a third-party contractor or generic carbon calculator tool:

- Utilizes UF's internal talent and assist with institutional "buy-in"
- Creates permanence and adaptability

- Fosters cross-campus information sharing
- Eases accessibility & reporting
- Develops a foundation upon which dynamic tools and services can grow

### **Consolidating & Collaborating: UF Enterprise Building Management Systems (EBMS)**

Beyond the STARS interface, in the second quarter of 2009 UF created and filled a new position within the Physical Plant Division to accelerate and assist with the expansion of the campus advanced metering infrastructure (AMI) and the integration of synergistic enterprise building management systems (EBMS). This multi-year AMI and EBMS effort, in tandem with the continued development of the STARS platform, will allow for real-time energy and GHGE performance monitoring at the building scale. The resulting benefits will include the ability to provide on-site and/or virtual building dashboards and carbon footprint overlays linked to the UF campus map as well as more temporally and spatially relevant performance tracking and efficacy evaluations of energy, water, and climate actions around campus.

For much of its history, UF operations staff members have focused on providing superior customer service to campus units and people. The emergence of enterprise-scale information management flows at building and sub-building scale resolution will create new opportunities to simultaneously maximize the potential for success on energy, water, and climate actions while further improving building occupant comfort, safety, and wellbeing.

Additionally, the interactivity, transparency, and timeliness of these new tools will provide the teaching, research, and outreach branches of UF a more functional educational environment for a living laboratory approach to addressing the energy and climate challenges. Lastly, as information management processes evolve, the ability to devise, implement, and monitor financing and investment schemes for actions will correspondingly improve.

## Acknowledgements

The University of Florida (UF) greenhouse gas emissions (GHGE) Inventory v1.2 and Climate Action Plan (CAP) v1.0 have been compiled by the UF Office of Sustainability on behalf of an interdisciplinary collaboration of key institutional stakeholders. Participation in the development and discussion of specific actions has been extensive and is acknowledged within each individual section of the [Vision for a Sustainable UF Implementation Plan](#)<sup>lxi</sup>.

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- John Lawson (UF Physical Plant Division)
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<sup>lxi</sup> <http://www.sustainability.ufl.edu/about/>

## Appendix A: UF CAP v1.0 - Actions Under Evaluation & Estimated Impacts

Projects	Estimated Cost	Currently Funded	Estimated Savings (kWh)	MtCO <sub>2</sub> e Reduction	Cost per MtCO <sub>2</sub> e	Payback (Years)	ROI
<b>Lighting retrofits</b>							
<i>Parking Garages (retrofitting HPS to Induction)</i>	\$1,200,000		3,500,000	2,367	\$507	3.43	22%
<i>Street Lights (retrofitting MH to Induction)</i>	\$830,000		2,350,000	1,589	\$522	3.53	21%
<i>Interior Lights (retrofitting T-12 to T-8)</i>	\$500,000	\$500,000	3,500,000	2,367	\$211	1.51	68%
<b>Retro-commissioning</b>							
<i>Phase 1 (General System Performance)</i>	\$23,000,000	\$3,150,000	91,269,841	61,726	\$373	2.52	35%
<i>Phase 2 (Controls and Sequencing)</i>	\$28,000,000	\$4,200,000	100,000,000	67,630	\$414	2.80	30%
<b>Chiller Plant Optimization</b>	\$3,000,000	\$500,000	9,375,000	6,340	\$473	3.20	25%
<b>Equipment Replacement (VFD, Pumps, &amp; Other AHU Equip.)</b>	\$15,000,000		32,193,000	21,772	\$689	4.66	11%
<b>Steam Chillers</b>	\$2,300,000		5,800,000	3,923	\$586	3.97	17%
<b>Lab Air Reduction Program (LARP)</b>	\$8,000,000		26,666,667	18,035	\$444	3.00	27%
<b>Occupancy Sensors</b>							
<i>Parking Garages (Perimeter/Stairwell Sensors)</i>	\$300,000		1,000,000	676	\$444	3.00	27%
<i>Bathrooms/Stairwells (Ultrasonic Sensors)</i>	\$150,000		409,600	277	\$542	3.66	19%
<i>Auditoriums/ Large Classrooms (Ultrasonic Sensors)</i>	\$225,000	\$225,000	1,350,000	913	\$246	1.67	58%
<i>Offices</i>	\$600,000		2,181,818	1476	\$407	2.75	31%
<b>Thermal Storage</b>	\$4,000,000		5,970,149	4,038	\$991	6.70	1%
<b>Solar Power (Beta test next generation solar panels)<sup>†</sup></b>	\$3,500,000		4,562,500	3,086	\$1,134	7.67	-2%
<b>Solar Water Heating</b>	\$3,500,000		7,494,647	5,069	\$690	4.67	11%
<b>Negotiated Utility Fuel Mix Adjustment</b>	-	-	-	60,000	-	-	-
<b>Totals</b>	<b>\$94,105,000</b>	<b>\$8,575,000</b>	<b>297,623,222</b>	<b>261,284</b>	<b>\$360</b>	<b>3.16</b>	<b>25%</b>

\* Includes projects such as replacing a 58 year old steam turbine and a chiller replacement program.

<sup>†</sup> Includes local utility subsidies.

## Appendix B: UF Commitments & Compliance to the ACUPCC

ACUPCC Steps	Compliance Status	Details
Sub-Steps		
<b>1. Initiate climate neutrality plan development.</b>	Yes	See details in Sub-Steps below.
a. Create institutional structures to guide plan (within two months).	Yes	UF Office of Sustainability established in February 2006 as official cross-campus unit after 10 years of unofficial sustainability efforts.
a. Complete GHG inventory & commit to biennial updates (within one year).	Yes	UF will track and publicly report annual boundary-scale updates with goal of increasing spatial and temporal resolution over time.
a. Develop institutional climate neutral action plan (within two years).	Yes	UF Climate Action Plan (CAP) born as living document in Fall 2009.
i. Set neutrality target date.	Yes	Neutrality by 2025.
i. Set interim targets & goals.	Yes	<b>As of UF CAP v1.0:</b> 03% below FY2004/2005 by 2012 17% below FY2004/2005 by 2020 42% below FY2004/2005 by 2030 83% below FY2004/2005 by 2050
i. Establish actions to create sustainability related curricula & educational experience.	Yes	Actions embedded within overarching <i>Vision for a Sustainable UF</i> and associated <i>Implementation Plan</i> .
i. Establish actions to expand research on climate & energy.	Yes	Actions embedded within overarching <i>Vision for a Sustainable UF</i> and associated <i>Implementation Plan</i> .
i. Develop mechanisms to track progress.	Yes	Preliminary mechanisms described in this CAP with more refined mechanisms under development to be embedded within the UF Space Tracking and Reporting System (STARS) and the UF Campus Map.
<b>1. Initiate ≥ 2 of these suggested tangible GHG emission reduction actions.</b>	Yes	See details in Sub-Steps below.
a. Establish USGBC LEED Silver as minimum new building standards.	Yes	Adoption of USGBC LEED criteria for all major main campus new construction and renovation projects (by year each standard was implemented): <ul style="list-style-type: none"> <li>• <b>2001:</b> minimum “Certified”</li> <li>• <b>2006:</b> minimum “Silver”</li> <li>• <b>2009:</b> minimum “Gold”</li> </ul>

	<p>a. Adopt ENERGY STAR certified purchasing policy for all applicable products.</p>	<p>Partial</p>	<p>In 2003, UF implemented the <a href="#">Environmentally Preferable Purchasing Policy</a> to foster purchasing strategies to reduce energy consumption and environmental footprint of purchased goods and services. In 2007, UF upgraded to a more broadly encompassing <a href="#">Sustainable Purchasing Directive</a> expanding on past successes and including the procurement of electronics and appliances that meet ENERGY STAR and/or EPEAT standards. However, this directive it is not enforceable because UF as an institution does not have centralized control of purchasing at the unit/departmental level.</p>
	<p>a. Establish policy of offsetting university sponsored air travel induced GHG emissions.</p>	<p>No</p>	<p>UF does not currently have plans to directly offset air travel GHG emissions (partly due to our very dirty air travel datasets which need to be improved at the source). However, the University Athletic Association (UAA) is developing a strategy to achieve a carbon neutral 2009/2010 sports season.</p>
	<p>a. Encourage use of &amp; provide access to public transit for faculty, staff, students, &amp; visitors.</p>	<p>Yes</p>	<p>In 1998, UF began partially funding the Gainesville Regional Transit System by assessing student transportation fees and provides a pre-paid unlimited-use universal bus pass for UF students, faculty, and staff with their GatorOne Identification card. Alternative transportation modes have expanded to include discounted carpool decals, a Web-based rideshare matching service, a Zipcar shared vehicle fleet, and other options.</p>
	<p>a. Begin purchasing/producing <math>\geq</math> 15% of institutional electricity from renewables (within one year).</p>	<p>No</p>	<p>UF does not currently purchase nor produce electricity from renewable sources, though some RECs are purchased at a small scale for achievement of USGBC LEED certification on some new buildings.</p>
	<p>a. Establish policy or committee supporting climate/sustainability shareholder proposals for institutional endowment corporate investments.</p>	<p>No</p>	<p>UF does not specifically address sustainability within its endowment at this time.</p>

	<p>a. Participate in RecycleMania Waste Minimization competition &amp; adopt <math>\geq 3</math> or more waste reduction measures.</p>	<p>Partial</p>	<p>Though UF is an annual participant in the RecycleMania Waste Minimization competition the adoption of associated measures has not previously been official. However, the University is currently conducting a needs assessment and developing an action plan for sustainable solid waste management.</p>
<p><b>1.</b></p>	<p><b>Provide inventory, action plan, &amp; progress reports to AASHE for public transparency.</b></p>	<p>Yes</p>	<p>UF submitted a calendar year 2006 Carbon Inventory in September 2008 and will submit its Climate Action Plan and more complete fiscal year Carbon Inventories (from FY2004/2005 through FY 2008/2009) in September 2009. Progress Reports will be made annually.</p>

## Appendix C: Federal and State of Florida Greenhouse Gas Emissions Reduction Goals and Targets Used for UF CAP Planning Meetings

### ***Federal***

“On June 26, 2009, the American Clean Energy and Security Act (ACES Act) was passed by the U.S. House of Representatives by a vote of 219 to 212. The bill contains five distinct titles: I) clean energy, II) energy efficiency, III) reducing global warming pollution, IV) transitioning to a clean energy economy and V) agriculture and forestry related offsets...The [American Clean Energy and Security Act of 2009, a bill by Waxman-Markley] establishes emission caps that would reduce aggregate GHG emissions for all covered entities to 3% below their 2005 levels in 2012, 17% below 2005 levels in 2020, 42% below 2005 levels in 2030, and 83% below 2005 levels in 2050 [all equal to, or more aggressive than, President Obama’s February 24, 2009 recommendations to a joint session of Congress<sup>lxii</sup>]. Commercial production and imports of HFCs would be addressed under Title VI of the existing Clean Air Act and are covered under a separate cap. The bill also establishes economy-wide goals for all sources, including but not limited to those covered by the cap-and-trade program. These goals are the same percentage reduction and timetables as the cap-and-trade program, except that the 2020 target is 20% rather than 17% below 2005 levels.”<sup>lxiii</sup>

### ***State of Florida***

“[On July 13, 2007] *Executive Order 07-126* directed state government to ‘lead by example’ by quantifying operational emissions and meeting specific reduction targets by implementing a range of GHG emission reduction efforts that impact state government facilities and vehicle fleets, and by using the purchasing power of state government to promote energy efficiency and reduced emissions.”<sup>lxiv</sup> Thus establishing “greenhouse gas emission reduction targets for state agencies and departments under the direction of the Governor as follows: a 10 percent reduction from current [2007] emission levels by 2012, a 25 percent reduction from current [2007] emission levels by 2017, and a 40 percent reduction from current [2007] emission levels by 2025.”<sup>lxv</sup>

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<sup>lxii</sup> See ([http://www.pewclimate.org/what\\_s\\_being\\_done/in\\_the\\_congress](http://www.pewclimate.org/what_s_being_done/in_the_congress))

<sup>lxiii</sup> See (<http://www.pewclimate.org/docUploads/Waxman-Markey-short-summary-revised-June26.pdf>)

<sup>lxiv</sup> See (<http://www.flclimatechange.us/ewebeditpro/items/O12F20138.PDF>)

<sup>lxv</sup> See ([http://www.dep.state.fl.us/ClimateChange/files/200707\\_13\\_eo\\_07\\_126.pdf](http://www.dep.state.fl.us/ClimateChange/files/200707_13_eo_07_126.pdf))

## Appendix D: Purchased Power Generation Resource Mixes

<b>UF Utility Provider Power Generation Resource Mix Comparison</b>					
	<b>Progress Energy Florida (2005)#</b>	<b>Progress Energy Florida (~ 2018)</b>	<b>GRU (2005)#</b>	<b>GRU (2009)*</b>	<b>GRU (~ 2013)*</b>
Utility Total Capacity (MW)	13,277	TBD	693	TBD	TBD
Utility Net Generation (MWh)	46,756,696	TBD	1,873,540	TBD	TBD
<b>Annual Output Emissions#</b>					
Annual CO2 (lb/MWh)	1,325.57 <sup>°</sup>	815.48 <sup>°</sup>	1,968.57	TBD	TBD
Annual CH4 (lb/GWh)	45.62	TBD	24.68	TBD	TBD
Annual N2O (lb/GWh)	20.70	TBD	29.76	TBD	TBD
<b>Fossil Nonrenewable</b>					
Coal	40.35%	TBD	77.63%	59.90%	50.40%
Oil	16.07%	TBD	4.31%	0.70%	0.00%
Gas	26.66%	TBD	17.77%	17.10%	13.00%
Other Fossil	0.77%	TBD	0.00%	-	-
Other Unknown / Purchased Fuel	0.65%	TBD	0.00%	17.30%	13.90%
<b>Total Fossil Nonrenewable</b>	<b>84.50%</b>	<b>TBD</b>	<b>99.71%</b>	<b>95.00%</b>	<b>77.30%</b>
<b>Nuclear Nonrenewable</b>					
<b>Total Nuclear Nonrenewable</b>	<b>13.58%</b>	TBD	<b>0.00%</b>	<b>4.10%</b>	<b>4.90%</b>
<b>Renewable</b>					
Wind	0.00%	TBD	0.00%	0.00%	0.00%
Solar	0.00%	TBD	0.00%	0.02%	0.30%
Geothermal	0.00%	TBD	0.00%	0.00%	0.00%
Biomass	1.92%	TBD	0.29%	0.00%	16.30%
Hydro	0.00%	TBD	0.00%	0.00%	0.40%
Landfill Gas	-	TBD	-	0.90%	0.80%
<b>Total Renewable</b>	<b>1.92%</b>	TBD	<b>0.29%</b>	<b>0.92%</b>	<b>17.80%</b>
<p># Per U.S. EPA eGRIDweb (<a href="http://cfpub.epa.gov/egridweb/">http://cfpub.epa.gov/egridweb/</a>)</p> <p>° PE Florida CO2 coefficients provided directly by PE Florida liaison to UF.</p> <p>* Per "Gainesville, Florida: One community's strategy to reduce global warming" (<a href="http://www.gru.com/Pdf/Final%20Climate%20Change.pdf">http://www.gru.com/Pdf/Final%20Climate%20Change.pdf</a>)</p> <p>NOTE: Progress Energy's 2005 eGRID data is housed under the "Florida Power Corporation" Power Control Area (PCA) and total capacity and net generation numbers are inclusive of all power produced by the utilities and are not limited to the portion of power purchased by UF as a retail client.</p>					

