



Hillsborough County Government Energy and Sustainability Plan

Overview and Proposals

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Executive Summary

Hillsborough County initiated the development of a comprehensive plan – the Energy and Sustainability Plan (ESP). The ESP also includes the County’s updated greenhouse gas inventory, carbon storage potential in County land and updates the County for any future legislative mandates or policies on climate change.

For years, Hillsborough County government has been making strides to reduce its energy needs, resulting in costs savings and protection of the local environment. To date, the County implemented over 120 initiatives related to energy and sustainability issues. Hillsborough County established its first greenhouse gas (GHG) inventory for the 1990 base year; this work was used as a valuable foundation to track GHG emission reductions over nearly two decades. The ESP will help to track greenhouse gas emissions for specific facilities that report their emissions under the Environmental Protection Agency (EPA) GHG reporting rule. Regular tracking of GHG emissions will facilitate reporting in the future, particularly if the current EPA rule is expanded. The ESP also contains a modest outreach and education plan that provides the general approach to communicate and encourage sustainability initiatives within the County. For example, energy challenge programs are a good way of promoting energy efficiency and conservation.

The Hillsborough ESP is viewed as a living document that constitutes the County’s blueprint to plan for and adapt to a more sustainable future concerning energy reliability, resource conservation and climate change. The analysis was based on aspects of implementation costs, cost savings, staff time and emissions avoided within five sectors. The Prioritized Actions shown below were ranked highest based on the needs assessment, implementation time and priority.

Prioritized Actions:

LEADERSHIP, POLICIES AND PLANNING

1. LPP 1.1: Set Energy and GHG Reduction Goal.
2. LPP 1.2: Create Sustainability Vision and Mission.
3. LPP 2.1: Assign permanent staff for Office of Sustainability.
4. LPP 2.2: Coordinate Energy Management Team.
5. LPP 2.3: Incorporate Environmental Preferable Procurement Policy.
6. LPP 4.1: Employee Outreach and Education Program.

SECTOR 2: ELECTRICITY, WATER AND FUEL

1. EWF 1.2: Reduce electricity usage of County owned buildings by 10% over 5 years.
2. EWF 1.4: Assess Sheriff’s Office electricity usage.
3. EWF 1.6: Consider Lighting Timers at Athletic Fields.
4. EWF 1.7: Continue to reduce electricity peak demand.
5. EWF 2.1: Reduce Office Water Consumption by 1% each year.
6. EWF 3.1: Purchase more fuel efficient trucks.
7. EWF 3.2: Increase Fleet Economy by 10% within 5 years.

SECTOR 3: NATURAL ENVIRONMENT

1. NE 1.1: Pilot Project to Assess Feasibility of Forestry Offsets.
2. NE 1.3: Expand Urban Forests.

SECTOR 4: TRANSPORTATION

1. T 1.2: Increase Participation in Employee Commuter Programs.
2. T 2.1: Expand Infrastructure for Low Carbon Fuels.

SECTOR 5: WASTE

1. W 2.2: Expand current waste to energy initiatives.
2. W 1.1: Develop and promote ambitious waste reduction goal.

Introduction

Hillsborough County is the largest county in the Tampa-St. Petersburg-Clearwater area and the fourth most populous in Florida. The County is located on the Gulf of Mexico on the western coast of Florida. Hillsborough County has had a long history of commitment to become a more sustainable community. Hillsborough County was recently described as a “Local Leader in Sustainability” and a “Green County” (*American Institute of Architects, 2006*), particularly with regards to its comprehensive energy management and conservation efforts.

In 1996, the Board of County Commissioners (BOCC) passed a resolution to voluntarily participate in the International Council for Local Environmental Initiatives (ICLEI), Cities for Climate Protection Campaign. In 2000, the County proceeded to develop a Local Action Plan (LAP) that addressed energy use, cost savings, global warming and climate change. The purpose of the LAP was to document baseline 1990 energy data to set a target goal for reducing emission levels. It presented data on existing energy reduction projects, as well as information on proposed projects that could provide cost savings and further reduce energy use and emission levels. In 2010, the County initiated the development of a more comprehensive plan – the Hillsborough County Energy and Sustainability Plan (ESP). The ESP includes the County’s updated greenhouse gas inventory, carbon storage potential in County land and prepares the County for any future legislative mandates or policies on climate change.

At the end of 2009, the staff of the Environmental Protection Commission of Hillsborough County created an Office of Sustainability. The office works to foster collaboration on energy projects and seeks to promote alternative sources of fuel to improve energy efficiency. The Office of Sustainability works closely with the Hillsborough County Energy Management and

Sustainability Workgroup initiated by Commissioner Rose Ferlita. Future projects will target ways to reduce the County’s energy usage and the resulting greenhouse gas emissions.

For years, Hillsborough County government has been making strides to protect the local environment and reduce its energy needs. The county passed its first ordinance relating to green building in 2007, establishing regulations for expedited building review for residential buildings and expedited site-plan review for commercial and industrial projects. Before this policy had even taken effect, other initiatives had been proposed to make the overall sustainability program even more robust. In addition to the permit incentives that were originally passed, the county provides an incentive for green roofs by counting the green roof towards the green space requirement for development. Hillsborough County has had a long-standing internal policy relating to energy efficiency. Since 2000, Hillsborough has employed a full-time energy manager with a broad mandate to improve the efficiency of all county facilities. It is estimated that between 2000 and 2006, the improvements made have saved the county over \$1.6 million annually in energy costs.

Many departments have undertaken best management practices to help make sustainability a reality. To date the county implemented over 120 initiatives related to energy and sustainability issues. Hillsborough County established its first greenhouse gas inventory for the 1990 base year; this work was used as a valuable foundation to track GHG emission reductions over nearly two decades. In 2010, a detailed GHG inventory was established using updated electricity, fuel, natural gas and other data. Additionally, a land analysis was performed that evaluated carbon storage potential of County owned lands. The data and analyses helped to assess the County’s level of preparedness for climate action. Presented here are updated action items and recommendations providing the County

with sustainable options to save energy, conserve resources and prepare for changes in climate.

Plan Development Process

The Hillsborough ESP is viewed as a live document that constitutes the County's blueprint to plan for and adapt to a more sustainable future concerning energy reliability, resource conservation and climate change. The scope of this document includes most County operations and facilities; however certain entities such as the Hillsborough County School Board or the Tampa Port Authority are not included (for detailed scopes see references; p. 48). The ESP is limited to actions which will most significantly conserve energy and mitigate emissions of greenhouse gases from county operations and processes. Because of this scope, the ESP does not address, or mentions only briefly, many other related environmental issues such as air pollution or water quality, amongst others.

Over the course of six months, County staff provided data to assess the County's GHG and land inventory including but not limited to:

- Electricity data base. The County's 2,000 electricity accounts were used to estimate expenditures, performance and opportunities to reduce electricity usage.
- Fuel data base. A detailed data base was analyzed containing fuel consumption, vehicle types and department usage.
- Natural gas demand. Natural gas consumption was assessed.
- Large plant operations. County owned large plants and their energy usage were analyzed including water and wastewater treatment, waste to energy and landfills.
- County lands. A land inventory was conducted that assessed the County's carbon storage (sequestration) potential.
- Current policies and initiatives.
- Past, current and planned projects and respective budget relating to energy and GHG emissions.

Additionally, three workshops were held that provided a platform to discuss and review County-wide initiatives and efforts relating to energy, climate change and sustainability aspects. Site visits were conducted to understand County works and services. Over 20 county employees were interviewed and provided insights into daily operations and specific actions. Several opportunities were given to County employees to provide feedback. Many internal and external County policies were assessed and past studies and action plans were reviewed. A comprehensive desktop review was conducted that assessed information from neighboring municipalities or other Florida governments including: *Sarasota County, Alachua County, Pinellas County, City of Tampa, City of St. Petersburg, Broward County, Miami Dade County, and Monroe County*. This information was matched with existing databases from established climate change mitigation projects and organizations such as: *EPA Local Climate and Energy Program; ICLEI Climate Air Pollution Planning Assistant; Center for Climate Strategies; King County Sustainable Cities; NACo's Green Government Initiative*. The results presented in the document adhere to scientific methods, use strategic planning tools and follow generally accepted standards and protocols including:

- Local Government Operations Protocol (version 1.1.) developed by California Air Resources Board, California Climate Action Registry, ICLEI - Local Governments for Sustainability, The Climate Registry.
- Greenhouse Gas Protocol developed under the auspices of the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD)
- Climate Action Handbook developed by ICLEI – Local Governments for Sustainability, City of Seattle and the US Conference of Mayors.
- Climate Action Reserve Forest Project Protocol (version 3.2.)
- Florida Green Local Government Standard.

The information was organized, analyzed, and evaluated in order to create the county's first overarching framework. In order to assess costs and other benefits of individual action items, general assumptions were made. Where feasible estimates were given in terms of dollar savings, staff time and greenhouse gases avoided. Calculations for specific actions can be found in the reference section. Where general assumptions were not accessible, the benefits were labeled as "unknown"; where a large range of options existed, benefits were labeled as "variable".

DISCLAIMER:

Recommendations found within each action item should be further analyzed and reviewed by individual department heads. The 1% reduction goal, for example, is found several times and should be used first and foremost as a reference tool. The analysis is a snapshot overview of county operations. Therefore, all recommendations must be further constrained before implementation in order to assure applicability and feasibility.

Energy and Sustainability Plan

The implementation of Hillsborough County's Energy and Sustainability Plan should be a countywide effort – everybody is encouraged to participate, from County employees, to utilities, to residents, businesses and municipalities. Furthermore, this blueprint ESP is only the first step and it will be paramount that the County takes the lead in pursuing the goals set forth here. The plan encourages its stakeholders to conserve energy, reduce GHG emissions and increase efficiency and save money.



An important part of the ESP implementation will be to incorporate other local and regional initiatives into the plan, regularly research best practices and maintain a comprehensive data base to measure progress toward achieving targets. It is recommended that Hillsborough County's policies related to energy conservation, green building and development and climate change are integrated with policy and budget decisions. Additionally, information should be formatted in a way that is more accessible to the public.

Each of the following sectors will be introduced with a general outlined, followed by individual goals that are comprised of specific action items. The latter will reference existing efforts in order to avoid redundant recommendations. The action items of high priority and short timeline include specific details such as cost savings, staff time, implementation costs, estimate of GHG emissions avoided, benefits, challenges, case studies and references. Action Items of lower priority will be less detailed and only contain general descriptions, costs and references where available.

The following outline describes the goals that were identified following a comprehensive review of existing initiatives:

SECTOR 1: LEADERSHIP, POLICIES AND PLANNING

- Goal 1 – “Create Mission and Set Ambitious Goal”
- Goal 2 – “Administer, Promote and Implement County Energy and GHG Emission Initiatives”
- Goal 3 – “Plan for Community Sustainability”
- Goal 4 – “Foster Education, Reach Out and Communicate Sustainability Goals”

SECTOR 2: ELECTRICITY, WATER AND FUEL

- Goal 1 – “Continue to Implement Actions to Reduce County Electricity Usage”
- Goal 2 – “Continue to Implement Actions to Reduce County Water Demand”
- Goal 3 – “Decrease Fossil Fuel Dependence of County Fleet”

SECTOR 3: NATURAL ENVIRONMENT

- Goal 1 – “Continue to Conserve and Improve County’s Natural Environment”

SECTOR 4: TRANSPORTATION

- Goal 1 – “Plan to Reduce Vehicle Miles Traveled”
- Goal 2 – “Introduce Low Carbon Transportation Fuels”

SECTOR 5: WASTE

- Goal 1 – “Develop Waste Reduction Goal”
- Goal 2 – “Promote Waste to Energy Initiatives”

SECTOR 1: LEADERSHIP, POLICIES AND PLANNING

Hillsborough County engaged in many initiatives concerning energy, resources and sustainability. Most notably, an Energy Management and Sustainability Workgroup was set up by Commissioner Ferlita that works to minimize carbon burden on the County, engage public and private fleet operators to consider alternative fuels, pursues energy reduction projects for the County, and initiates a pilot program for natural gas vehicles. Additionally, the County developed several ordinances to encourage green buildings and developments, renewable energy, tree preservation and others that help to foster a more sustainable way of living. Internally, there are many efforts to reduce the County’s energy usage, encourage resource conservation and emit less GHG emissions.



However, the Board of County Commissioners has yet to develop a resolution to support a comprehensive sustainability mission and vision. This commitment could be part of the County’s Strategic Plan and would also help to set concrete reduction goals. Additionally, it is recommended to expand the County’s sustainability outreach and education efforts by coordinating individual efforts that currently stand alone.

Goal 1: “Create Mission and Set Ambitious Goal”

Action LPP 1.1:

Set Energy and GHG Reduction Goal.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Board of County Commissioners (BOCC)		
Cost Savings:	Unknown		
Staff Time:	100 hours (one time)		
Cost:	Staff time		
GHG avoided:	Unknown		
Benefits:	Reduced energy usage Improved air quality Long term energy reliability		
Challenges:	Finding realistic and attainable goal Implementation of goals		

Recommendation:

Hillsborough County’s government leaders are recommended to set an ambitious goal to reduce energy usage and GHG emissions. The goal setting will help express the County’s commitment to support sustainable initiatives ranging from electricity conservation and fuel savings to renewable power generation. As the County already employs an Energy Manager, the understanding of current electric usage and renewable alternatives is advanced. The County’s fleet management department has shown many innovative initiatives to reduce fuel usage and increase the fleet’s fuel economy. This understanding will facilitate the setting of a concrete fuel savings goal. The County has supported power generation from renewable sources for many years. The County Commission in collaboration with Covanta Energy and TECO Energy are recommended to set a voluntary goal that will support renewable energy sources, such as part of a renewable portfolio standard. The reduction of electricity of all county operations by 1% can result in estimated cost savings of \$158,239 per year based on 2009 energy data.

The County’s 2009 GHG emission inventory is based on one year. In order to set an attainable goal it is recommended to continue monitoring GHG emissions (also see action LPP 2.6). In contrast to GHG emissions, the County’s energy usage is well documented and could be used to extrapolate both energy and GHG emission reduction goals. A standard methodology to calculate the Return on Investment (ROI) on green initiatives is a visual and concrete way to illustrate mission accomplishments.

Existing Efforts:

In 2000, the County hired an Energy Conservation Manager, who has instituted programs that have saved the County more than \$2.2 million dollars annually from energy cost avoidance and eliminates more than 17,000 tons of carbon dioxide emissions annually. The County’s Energy Manager has a goal of energy reduction in the amount of 20% by the end of fiscal year 2012.

Examples:

Alachua County (government)

20% below 1990 levels by 2010

Broward County GHG emission reduction targets

County operations (short term): 7% below 1997 by 2015

Miami Dade County

Community (short term): 20% below 2005 by 2020

U.S. Conference of Mayors

7% reduction from 1990 levels by 2012

International Panel of Climate Change (IPCC)

Short term: 1990 levels by 2020

Long term: 80% below 1990 levels by 2050

Action LPP 1.2:

Create Sustainability Vision and Mission.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	BOCC		
Cost Savings:	Unknown		
Staff Time:	30 hours (one time)		
Cost:	Staff time		
GHG avoided:	Unknown		
Benefits:	Support of County leaders		
Challenges:	Incorporation of vision into overall strategy		

Recommendation:

It is recommended that the County develops a common vision and mission for the future development of the County. The vision should be developed in a stakeholder process that would provide a long-term orientation for a period of at least 15–20 years. By clearly balancing the interests of the triple bottom-line in the vision, all three dimensions of sustainability are taken into account. To do so, a common understanding of sustainable development is of key importance. It is recommended to incorporate this vision into Hillsborough County’s Strategic Plan (e.g. Goal 7 of Strategic Plan). When crafting the vision, the County should consider:



- What are the results you are trying to achieve?
- What activities will lead to those results?
- What benefits to the community or the County will your actions result in?

Goal 2: “Administer, Promote and Implement County Energy and GHG Emission Initiatives”

Action LPP 2.1:

Assign Permanent Staff for Office of Sustainability.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	EPC		
Cost Savings:	\$45,000.00		
Staff Time:	1 FTE position		
Cost:	\$45,000.00 (salary of Sustainability Officer)		
GHG avoided:	331 MTCO ₂ e (0.3% reduction annual electricity)		
Benefits:	Identify funding opportunities Streamline future sustainability efforts Work with stakeholders		
Challenges:	Budget constraints		

Recommendation:

The County can enforce its commitment for sustainability by assigning permanent staff for the Office of Sustainability. The sustainability officer could help coordinate existing initiatives and work closely with the Energy Manager, Fleet Manager and other staff to identify new energy and GHG reduction projects. As part of the job description, the officer could be encouraged to particularly focus on sourcing new funding opportunities or identify cost savings related to sustainability projects. Additionally, the officer could develop lasting public-private partnerships with a focus on cost-effective financing of capital improvement projects or energy programs. It is recommended to encourage the Sustainability Officer to look for savings or revenue opportunities matching the amount of the annual salary; this would make this a self-paying position. For example, the annual salary quoted (\$45,000) equals total electricity expenditures of around 0.3%.



A designated Sustainability Officer can coordinate existing initiatives and streamline efforts that are ongoing within the County. Additionally, the Officer can reach out to other stakeholders such as residents, business owners, or utilities. Current budget constraints will pose a significant challenge to creating the Sustainability Officer position.

Case studies:

City of Tampa Green Officer

The Mayor of Tampa has designated a senior staff member as the City Green Officer (CGO). Mr. Snelling is the Green Officer for the City of Tampa and the manager of Administration for the department of Growth Management and Development Services. The CGO’s tasks include:

- Ensuring that the city, in its operations and other functions, becomes a model of sustainability
- Developing and recommending additional green building and sustainable design practices and standards
- Administering a community outreach program for green building and sustainable design.

Office of Sustainability Miami Dade County

The Miami-Dade Office of Sustainability collaborates with County agencies, business groups, non-profit organizations and other partners to protect and enhance the County's distinct environmental quality and livability. The Office coordinates and assists with organization-wide and department-level change towards sustainable government culture, operations and service delivery in order for the County to provide lean green government, encourage strong environmental practices, create healthy urban environments, and provide smart mobility.

Additionally, the Office leads the development and implementation of the County's sustainability plan “GreenPrint”. The plan will set the framework for the County to inspire, inform and enable our communities to improve quality of life and increase economic prosperity through environmental responsibility. The Office is also overseeing the implementation of Miami-Dade County's Energy Efficiency and Conservation Block Grant (EECBG) program where approximately \$13 million are used for different projects and programs.

Recently, Miami-Dade County received the "Most Outstanding Green Government" award on August 28, 2010 at the U.S. Green Building Council (USGBC) South Florida Chapter. An important aspect of this award was the County’s advocacy of a sustainable lifestyle by creating sustainability/green branding for Miami-Dade County to better communicate green and sustainable messaging; re-designing *green.miamidade.gov* in order to educate its visitors on sustainability; the launch of the CFL Light Bulb Exchange program alongside the already popular and successful showerhead exchange; and the launch of the residential and business energy savings challenges and the home energy savings workshops.

Action LPP 2.2:

Coordinate Energy Management Team.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	County Administrator/Energy Manager		
Cost Savings:	\$158,239 (1% reduction in electricity)		
Staff Time:	0.5 hour per week		
Cost:	Variable		
GHG avoided:	1,165 MTCO ₂ e (1% reduction in electricity)		
Benefits:	Implement internal policies Develop new ideas to save energy Engage employees		

Challenges: Additional work load for employees

Recommendation:

It is recommended to coordinate existing efforts and officially assign an energy management team (EMT) member for each department. These “champions” should act as implementers to reduce energy usage and to work closely with Office of Sustainability and Energy Manager building on existing infrastructure. It suggested that the County’s Energy Manager and/or the Office of Sustainability will coordinate these meetings and lead the energy management team. Currently, there are two laudable energy team initiatives – Energy Management Teams and Energy Efficiency Task Force - that should be built upon and in the future include departments not represented in these teams. The recent economic downturn has delayed the implementation of this program in many departments; however, the Energy Manager should continue to go forward with this initiative.

The assignment of energy point persons is not part of current job descriptions; in essence this means staff member have to take on extra work on top of their current workload. It is suggested to identify employees that have an expressed interest to be part of this team and who already have a good understanding of the issues.

The goals of an energy management program can often overlap with other best management practices. The EMT can also help improve staff communications, morale, and understanding of the County’s energy usage. Generally, energy teams should have several characteristics:

- Have a motivated leader (e.g. Energy Manager)
- Understand energy costs and drivers
- Enjoy the energy management task
- Engage other employees as needed
- Have effective meetings.

Energy Management must be a practical approach in order to be efficient and effective. It must be assured that team members are not simply appointed on paper; it is paramount to assign personnel that have a natural interest and even enthusiasm for the task. The EMT meetings should take place about once a month on a set fixed day and time, maintain a good meeting pace, let members define next project tasks and spread responsibilities. An effective and experienced facilitator is paramount in order to achieve meaningful results.

Existing Initiatives:

County Energy Management Teams (Facilities Management)

The Department of Facilities Management under the leadership of the County’s Energy Manager began establishing a County Energy Management Team (EMT) under each Assistant County Administrator that would identify and reduce energy waste. All County departments are generally required to participate and follow energy programs that are introduced by these teams. This recommendation is viewed as an encouragement to create a permanent and active EMT.

Public Utility Department Energy Efficiency Task Force

The Hillsborough County Public Utility Department (PUD) has formed an Energy Efficiency Task Force with a mission to significantly reduce the Water Resources Division’s (WRD) annual TECO bill of \$12 M per year and the Solid Waste Management Division’s (SWD) bill of \$300 K per year. This will include:

- Reduce energy usage (kWh) from each of the PUD’s buildings, starting with the seven largest Water Resource Division’s (WRD) buildings and then moving to accomplish the same for the remaining WRD buildings and for Division’s buildings.
- Reduce energy usage (kWh) and power demand (kW) for each of the Water Resources Division’s (WRD) 12 plants.

- Reduce energy usage (kWh) and power demand (kW) for each of the Solid Waste Management Division’s major facilities.

Case studies:

Energy Management Team Miami Dade County

The Miami Dade Office of Sustainability has assigned individual energy management team representatives from County departments to regularly report and meet on energy issues. Soon after the inaugural EMT meeting it became obvious, that there were two distinctly different groups in the EMT. The first group consisted of departments that maintained large facilities and plants while the second group was comprised of many smaller facilities. It was quickly decided that the EMT would be split into these two groups in order to address their specific needs more specifically.

“Water & Wastewater Energy Management – Best Practices Handbook”

The New York State Energy Research & Development Authority developed a Water and Wastewater Energy Management Best Practices guide. The handbook provides the water and wastewater sectors with guidance on the development of an energy conservation program, implementation of capital and operational improvements to reduce energy consumption, and methods to track performance and assess program effectiveness. This handbook provides a good overview for energy management programs for a specific sector; however general practices that are discussed in this handbook are also useful for a more general energy management program.

Action LPP 2.3:

Incorporate Environmental Preferable Procurement Policy.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Procurement		
Cost Savings:	Unknown		
Staff Time:	80 hours (one time)		
Cost:	Staff time		
GHG avoided:	Unknown		
Benefits:	Reduced waste Reduced toxicity Increased product life Resource conservation		
Challenges:	Additional work load for employees		

Recommendations:

The County Purchasing Department is encouraged to incorporate a county-wide Environmental Preferable Procurement Policy (EPPP) based on existing but fragmented informal purchasing policies. The goal of this policy is to encourage procurement of products and services that are less harmful to the environment and more sustainable long-term. Such a policy can be broad (green building practices, recyclable products) or specific (using recycled paper, bio-degradable, available locally). A number of departments are already spearheading this effort and a new policy should build on these efforts.

Setting up the initial policy will require significant staff time. Note, that there is a substantial amount of information available that will facilitate the policy development. It is recommended to consider a pilot project that will help to assess the best way of implementation. Alternatively, a more compressed EPPP could be

developed initially that is expanded over time and reflects lessons learned. Once the policy is set in place and guidance is provided, implementation will be straightforward.

Existing Initiatives:

Department of Facilities Management:

The Facilities Management department uses environmentally friendly products in the County’s facility custodial program such as “Green Seal” cleaning products and pest control products. The department coordinates a commercial paper product recycling program in downtown County offices, the Roger P. Stewart complex, and a paper and plastic recycling program at 32 County satellite offices. This program recycled more than 334 tons of material in 2008. Additionally, the department is also testing rapidly renewable paper towels and toilet paper in County Center with plans to incorporate products in other buildings.

Fleet Management Department:

The Fleet Department is purchasing and using hydrophobic mops in fleet facilities that will enable them to recover more oil, and specific mops that will recover antifreeze. The Department also purchased and evaluated two aqueous parts cleaners that contain microbes which break down hydrocarbons and oils into harmless waste (carbon dioxide and water) through a process called bioremediation.

Information and Technology Services (ITS) Department:

The ITS department participates in Hewlett-Packard (HP)’s Green initiative by purchasing computer hardware that is Energy-Star 4.0 compliant.

Department of Public Works:

The Public Works department uses environmentally-friendly products to clean mold, mildew and stains off of road signs.

Case studies

Miami Dade County Green Purchasing

The Department of Procurement Management has created guidelines for county departments to reduce waste and increase environmental efficiency when make purchases. The “Buy Green Purchasing Guide” also includes other Miami-Dade legislation that ensures the purchase of environmentally-preferred products and services. Miami Dade’s Department of Procurement Management has identified 30 current contracts, or solicitations underway, that include environmentally-preferred criteria or options. The purchasing system allows departments to "opt-in" to green purchasing.



University of Florida Sustainable Purchasing Policy

In 2007, the University of Florida (UF) instituted a sustainable purchasing policy to support the purchase of products that will minimize any negative environmental or societal impacts of university operations. UF’s Purchasing Department hosts an annual Sustainable Products Trade Show each spring. The policy includes overall responsible purchasing language, department responsibilities, best practices and procurement strategies, current guidelines and goals, socially responsible purchasing standards, responsible procurement resources, and a glossary of terms.

Action LPP 2.4:

Achieve Green Local Government Certification.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Office of Sustainability		
Cost Savings:	Unknown		

Staff Time: 80 hours (one time)
Cost: \$6,000.00
GHG avoided: Unknown
Benefits: Public recognition
 Efficiency in operations
Challenges: Budget constraints

Recommendation:

The County is encouraged to apply for the Green Local Government designation by the Florida Green Building Coalition (FGBC) and become a certified green municipality. The standard presents a comprehensive list of criteria, organized in terms of local government department functions. It focuses on improving environmental performance through a number of mediums (energy, water, air, land, waste), and evaluates environmental practices done "in-house", incentives and ordinances to foster green practices and educational activities to improve the environment.

Green certified governments will not only gain recognition and publicity. They also function in a more efficient manner through better internal communication, cost reductions, and effective risk and asset management. It is also a useful benchmarking tool for local governments.

To obtain the green certification, the first step is to download the Application & Checklist Tool, complete the pre-application form and submit with a deposit (minimum of \$500). Once FGBC receives the pre-application, they will assign the County a technical resource person (Project Evaluator) to help through the certification process. Once the County commits to the process, it then needs to establish a coordinator/champion to spearhead the process. The next step is to use the Application/Checklist Tool to get a baseline of where the County is now in terms of sustainability. Generally, the process is:

- Local government commitment (see LPP 1.2.)

- Establish coordinator (e.g. Sustainability Officer)
- Determine applicable criteria
- Undertake evaluation process – with team
- Assemble application package
- Evaluation by FGBC
- Designation awarded.

Note, that much of the research has already been conducted within this plan; it is anticipated that the process could be sped up considerably compared to other standard application.

Case studies:

In 2009, the City of Tampa received a gold level certification of green local government designation by the Florida Green Building Coalition. The City of Tampa is the second city in Florida to receive gold designation, joining Tallahassee. Counties receiving gold designation include Orange and Sarasota Counties.

Action LP 2.5: Expand Dedicated County Website for Sustainability, Green and Energy Issues.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Office of Sustainability		
Cost Savings:	Unknown		
Staff Time:	50 hours per year		
Cost:	Staff time		
GHG avoided:	Unknown		
Benefits:	Public recognition Engaging stakeholders		
Challenges:	Continuous maintenance of webpage		

Recommendation:

The County is recommended to expand the existing County “Green” website specifically dedicated to green and sustainability issues. This website should be used to communicate the County’s GHG inventory and ESP amongst others.

Action LPP 2.6:

Conduct and Publish GHG Inventory Report.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Energy Manager/Office of Sustainability		
Cost Savings:	Unknown		
Staff Time:	100 hours per year		
Cost:	Staff time		
GHG avoided:	Unknown		
Benefits:	Prepare for compliance reporting Show environmental leadership		
Challenges:	Data collection		

Recommendation:

The County is urged to prepare an update of its municipal greenhouse gas inventory every two years. It will take 100 hours per year to gather and analyze all relevant data and subsequently prepare an inventory report. The data collection will take most of the work and it is recommended to set up an efficient monitoring framework. Reporting greenhouse gas emissions will have several benefits. It will help to prepare for future reporting requirements, solidify Hillsborough County as an environmental leader and help to save costs by improving energy and resource conservation. It will also help track the success of future initiatives and help publicize success on the county website.

Action LPP 2.7:

Start Energy Challenge Programs.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Office of Sustainability		
Cost Savings:	\$158,239 per year (1% electricity reduction)		
Staff Time:	40 hours per year		
Cost:	Staff time		
GHG avoided:	1,165 MTCO2e (1% reduction of County emissions)		
Benefits:	Reduced energy usage Resource conservation		
Challenges:	Participation incentives		

Recommendation:

It is recommended that the County implement energy challenge programs that help reduce energy consumption. This could be done on a facility or department basis. Depending on the program, it will take about 20-40 hours to develop a challenge program (one time) and 20 hours to implement the program (each year). The first year would thus take about 40 to 60 hours to initiate the challenge. An internal energy challenge program could also prepare a facility or department for future reporting requirements. Assuming a 1% reduction of County electricity this could result in cost savings of over \$158,000 each year.

Case studies:

Broward County Climate Challenge

Broward County initiated the Conservation and Climate Change Challenge (C3 Challenge) for Broward Schools, an educational competition intended to engage students, teachers, school administrators, staff, and parents in practical actions to reduce greenhouse gas emissions at school and at home. Through improved energy efficiency, reduced consumption increased recycling and changes in transportation behaviors, participants will

learn how simple actions, taken together, can create a climate of change. All educational activities are aligned with the Next Generation Sunshine State Standards. The school with the highest percentage of classroom teachers participating wins.

Chicago Green Office Challenge

The City of Chicago implemented the Green Office Challenge that helps participants achieve strategies that reduce energy use, waste, and water use, and provides an exciting way for businesses to make Chicago a greener place to live and work. The Chicago Green Office Challenge is a friendly competition for commercial property managers and office tenants that acknowledges participants for their achievements in greening their operations through Mayoral and media recognition. The Green Office Challenge helps participants move down the path towards environmental sustainability, and, in some cases, towards third-party green building certification through the ENERGY STAR and LEED™ rating systems.

Action LPP 2.8:

Promote Alternative Work Schedules.

Priority: High **Medium** Low
Timeline: Short Mid **Long**
Lead: Human Resources
Cost Savings: \$123,368 (total employee savings)
Staff Time: 20 hours per year
Cost: Staff time
GHG avoided: 471 MTCO_{2e}
Benefits: Fuel savings
Challenges: Implementation not realistic for certain work
Connectivity to workplace

Recommendation:

The County is encouraged to promote amongst its employees alternative work schedules in the form of a compressed work week and/or a telecommuting program. Assuming that 1% of employees stay home one day of the week, this results in fuel savings of over \$120,000 and GHG emissions avoided of over 470 MTCO_{2e} per year. It is estimated that it would take staff 8 hours for program set up and 1 hour per month for promotional activities each year.

Existing Initiatives:

Human Resources adopted a flexible work schedule policy in July 2007 that allows certain employees to request flexible hours. The program seeks to do its part in decreasing traffic congestion on County roads.

Case studies:

City and County of Honolulu, HI

Honolulu established a policy to provide eligible employees the opportunity to participate in setting their own work hours within specified time limits. Starting times for this program are anytime between the hours of 7:00 a.m. and 8:30 a.m., except that employees who normally ride express buses may start as early as 6:30 a.m. Ending times are between the hours of 3:15 p.m. and 5:15 p.m., provided that the 8-hour work requirement is met by employees.

Action LP 2.9:

Turn off Lights Earlier At Night.

Priority: High Medium **Low**
Timeline: Short **Mid** Long
Lead: Building Operators
Cost Savings: \$27,791
Staff Time: 5 hours per year
Cost: Staff time

GHG avoided: 205 MTCO₂e
Benefits: Electricity savings
Challenges: Security aspects

Recommendation:

Hillsborough County facilities are recommended to review their lights off at 11 pm schedule, to align with the energy management program. It is recommended to inquire actual implementation and consider an earlier time, e.g. 10 pm. Each building operator would need about 5 hours (one time) to inquire about current habits and custodial needs. If all real estate facilities reduce their lighting by one hour a day this would result in annual cost savings of nearly \$28,000.

Goal 3 - "Plan for Community Sustainability"

Action LPP 3.1:

Address Climate Change in Comprehensive Plan.

Priority: High Medium Low
Timeline: Short Mid Long
Lead: Planning Commission/Public Works Stormwater
Cost Savings: Unknown
Staff Time: 40 hours
Cost: Staff time
GHG avoided: Unknown
Benefits: Prepare for future planning mandates
Challenges: Integration into Comp Plan

Recommendation:

It is recommended to include a climate change or sustainability element in future comprehensive plan amendments. This can be a useful strategy to promote climate change, energy and/or sustainability initiatives. The element can promote ways of saving energy, reducing GHG emissions, encourage renewable energy,

foster responsible community revitalization and develop sustainable business opportunities. This will also prove the intent to create a community built on sustainability. Generally, the plan could also consider requiring offsets for greenhouse gases produced or vehicle miles traveled for large developments.

Current "Green" Ordinances

The Planning and Growth department approved a number of incentives related to "green" buildings and development including:

- Green roof incentive that allows builders to count the space on the roof as part of the green space that is a requirement in all developments.
- Expedites the building permitting portion for residential projects that are considered green.
- Green building policy in the Land Development Code that reduces the number of parking spaces required for certain commercial developments in the unincorporated County, which will ultimately increase the amount of green space.
- Site plan review incentive was introduced into the Land Development Code that will require the department to expedite green development site plans.
- Small lot zoning district which reduces the consumption of land.
- Wind energy regulations for small and medium scale wind energy conversion systems (WECS).
- Amending the Land Development Code (LDC) to reduce barriers to providing solar panels.
- Consideration of community gardens and urban agriculture to include in the next round of text amendments to the LDC.



Real Estate Sustainable Buildings

In 2008, the Real Estate Department adopted consideration of sustainability and energy conservation factors when planning to build new County facilities and to make these items factors in awarding building and design contracts.

Case studies

Broward County will include a Climate Change Element in their Comprehensive Plan which was funded through the recent stimulus EECBG grants. The County will develop and implement adaptive planning and zoning policies, regulations and programs to ensure appropriate land use, construction and redevelopment activities address the potential impacts of climate change, and include mitigating the impacts of sea level rise on Broward County's economy and infrastructure are proposed.

Goal 4 - "Foster Education, Reach Out and Communicate Sustainability Goals"

Action LPP 4.1:

Employee Outreach and Education Program.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Office of Sustainability		
Cost Savings:	\$33,381 (saving 1,000 kWh per year and building)		
Staff Time:	20 hours		
Cost:	Unknown		
GHG avoided:	232 MTCO ₂ e		
Benefits:	Stakeholder participation		
Challenges:	Buy-in and general interest		

Recommendation:

The County should create or expand a comprehensive multi-facet employee outreach and education program. In particular, it is

proposed to consider expanding staff training (for both new hires and present employees) to include aspects of energy conservation and waste avoidance. Secondly, it is recommended to consider setting up an employee recognition program that encourages staff members to find ways to make the County greener. Thirdly, based on staff interviews it seems necessary to assess the current level of participation of employees in recycling activities. Therefore an internal recycling survey is proposed.

Example: Staff Training

The County is encouraged to facilitate specific training for employees and newly hired staff. Specifically, it is suggested to train building operators in energy management. Building Operator Certification (BOC) is a nationally recognized professional certification for facilities operations and maintenance staff. The program is a proven way to train and certify facilities staff with regards to facility electrical, HVAC and lighting systems; indoor air quality; environmental health and safety; and energy conservation. Each participant who completes the program can expect to save, on average, 172,000 kWh per year, equivalent to \$12,000 annually at average national electricity rates. In addition to the BOC program, many local colleges and university are now offering certification and training programs, such as Rhode Island Community College. For new hires it is recommended to include resource conservation into the training's curriculum during employee orientation.

Example: Employee Incentive Program

The County should expand employee incentive programs for cost saving ideas and ways to reduce resource consumption. The recognition could be developed similar to 'Employee of the Month' programs that can be promoted through communication channels such as newsletter and internal websites.

Polk County, FL, for example, is implementing a broad strategy to ensure employees who adhere to fuel-efficient guidelines share in the rewards. The county's fleet department developed an "Employee Incentive Program for Fuel Efficiency" and is currently implementing the program, expected to save the County an estimated \$250,000 annually in fuel costs. That savings pool would then be split 50/50 with employees who drive county-owned vehicles on a daily basis. The employee share of savings could amount to \$100-\$400 per eligible employee as an annual bonus.

Existing Initiatives (Community)

Workshops and Classes

Hillsborough County's Cooperative Extension provides or participated in several outreach programs including:

- Educational publications and resources on green topics to the public.
- Classes for homeowners on building green and remodeling green. Topics included energy and water efficiency, and focused on inexpensive "off-the-shelf" technology.
- Free gardening workshops and plant clinics at local libraries, the Florida-Friendly Yard designation program, Water-Wise Awards competition, and presentations to garden clubs and civic and community associations.
- Florida Yards and Neighborhoods (FYN) Program that educates homeowners and other community members about the benefits of Florida-friendly landscaping.
- Free "Water-Wise" workshops, rain barrel and "Compost Happens" classes to the public and includes distribution of free compost bins, environmentally-friendly irrigation kits, and rain barrels. Programs are sponsored by County and City of Tampa water departments and County Solid Waste Management Division.

A regional Energy Management and Sustainability Forum was held on January 29, 2010 in Tampa. The E3 forum provided regional fleet managers and facility managers an environment for sharing best practices and practical ways to save energy. There were also discussions about carbon credits that communities and businesses can earn based on current green activities.

The Environmental Protection Commission (EPC) manages the federal "Pollution Prevention (P2)" program locally, which provides free audits to local businesses to identify ways to reduce or eliminate pollutants.

The Neighborhood Relations Department encourages neighborhood clean-up and beautification projects through its clean-up grant, which is offered through Neighborhood Relations and sponsored by the Solid Waste Management Division. The County supplies the dumpsters and the neighbors pitch in and clean up their community. Each grant is for \$2,000 which can be applied on an annual basis. Fifty of these grants have been issued in the last five years.

The Solid Waste Management Division hosted a free Green Certification Workshop in 2007 that was attended by over 60 professionals in the public and private sectors. The program educated and encouraged the commercial sector on various topics including how to create a "green" and profitable work environment; green building design; environmentally sound management of construction and demolition debris; and the purchase and use of products with recycled content. Attendees also received free manuals and samples funded through a grant that the department received for the program. The Department also funds anti-litter and anti-dumping education campaigns, inspections and clean-ups continuously throughout the County.



Green Summits and Events

The County's Economic Development organized one of the first sessions in the area on green commercial development for commercial real estate developers and investors in 2007 for the Florida Gulf Coast Association of Realtors, which included speakers from the County's Planning & Growth Management Department and County Planning Commission.

EPC held the first environmental summit in 2006, which brought together environmental groups, consultants, political leaders and the public to discuss environmental concerns. It also hosts "Clean Air Month" events every year including activities during May to increase the public's awareness of air quality issues.

Green Programs and Grants

The Department of Economic Development works closely with Tampa Bay & Company to promote Florida Department of Environment Protection's green-certified lodging properties in Hillsborough County.

EPC implements the "Green Star" program, started in 2005, which encourages automotive repair facilities to undertake similar best management practices and pollution strategies, and helps them become certified as a "Green Star" facility. Currently, 15 automotive repair facilities have been certified as Green Stars. Certified facilities display a "Green Star" decal in their store and are listed on the EPC's website. The Commission also manages the Pollution Recovery Fund grants program, which provides funding of environmental projects that help clean up polluted areas and pays for a portion of the Artificial Reef program. This program, which is funded from penalties paid by EPC rule violators, is offering more than \$200,000 in 2009. Another program is the "Green Yards" program, started in 2004, that assists automotive recycling yards in the County with becoming more environmentally-friendly through implementing best management practices and pollution prevention strategies, and

helps them become certified by staff as a "Green Yard." Currently 33 yards are participating in the program, and eleven have been certified as Green Yards. Certified yards display "Green Yard" flags and are listed on the EPC's website.

The Planning and Growth department secured a grant through the Southwest Florida Water Management District and hosted a one-day green roof symposium in Hillsborough County in June 2008 with the "Green Roofs for Healthy Cities" group from Canada.

The Public Works department conducts several stormwater and environmental education programs in partnership with the Southwest Florida Water Management District. The "Pirate Pelican Pete" program for elementary school children and the "Stormwater Ecologist" program for middle/high school children teach about stormwater pollution, recycling and reducing waste. Public Works also created and manages the Pond Watch, Lake Management Program and Stream Waterwatch programs, which teaches volunteers to collect water quality samples for local ponds, lakes and streams, and submit them to the Watershed Atlas for monitoring and research purposes. These programs are undertaken in cooperation with several partners such as the Southwest Florida Water Management District, Hillsborough Community College, University of Florida and University of South Florida. The department's Storm Drain Marking program provides interested neighborhoods with colorful marker signs to glue on their storm drains and educational door hangers reminding residents to not pour illegal materials down drains.



Case study

Energy Recognition Program 3M

Manufacturing giant 3M has been demonstrating a new way to drive energy efficiency improvements through its Annual Energy Recognition Program. Established in 2003 to boost employee participation in the company’s energy efficiency efforts, the program has enabled 3M to implement more than 1,900 employee-inspired projects from 2005 to 2009. 3M’s Annual Energy Recognition Program boosts employee participation and provides an individual sense of accomplishment in its manufacturing plants. The program formulates a four-level rating system ranging from Bronze to Platinum, based on 3M’s internal Energy Program Dashboard and EHS Scorecards. Winning teams are rewarded with a variety of prizes ranging from certificates to dinners with 3M management.

Example: Conduct Staff Recycling Survey.

An employee recycling policy is in place that encourages recycling in County facilities. A recent review revealed that many employees are not aware of this policy. The County is recommended to conduct a recycling survey amongst its employees. This helps to assess the efficacy of existing recycling programs and provides ideas for improvement.

Action LPP 4.2:

Partnership with UF/IFAS for Sustainable Technologies.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Office of Sustainability		
Cost Savings:	Unknown		
Staff Time:	40 hours		
Cost:	Unknown		

- GHG avoided:** Unknown
- Benefits:** Job creation
- Challenges:** Investment costs

Recommendation:

The County is recommended to explore a potential partnership with the University of Florida/Institute for Food and Agricultural Sciences (UF/IFAS) to develop sustainable technologies such as renewable energy (wind, solar, geothermal) or biofuel development. The idea of partnerships with UF IFAS should be expansive and include the diversity of disciplines from engineering to natural resource management. A University of Florida IFAS-Extension campus exists in Seffner, FL. The Hillsborough County Extension Office should be the initial contact point for building partnerships with UF IFAS.



Existing Initiatives

Watershed Atlas Project

The Public Works Department conceived the idea of the Watershed Atlas project and developed it in partnership with the Southwest Florida Water Management District and the University of South Florida Center for Community Design and Research. The Atlas is a website that provides information on all lakes, ponds, streams and watersheds in Hillsborough County, including aerial images and photos, water quality data, hydrologic data and history that can be analyzed, downloaded and updated by users. The Watershed Atlas concept has since been adopted by numerous other counties in Florida, and a statewide, seamless Atlas is planned.



SECTOR 2: ELECTRICITY, WATER AND FUEL

Hillsborough County has committed to resource conservation for many years and employs highly skilled personnel to implement efficiency and conservation measures. The County hired an energy manager who helps to save significant electricity costs each year; the water resources and solid waste teams are constantly seeking innovative ways to improve operations; the fleet operators have won many awards for efficient fleet management. All of the county’s employees are constantly seeking to improve operations and services. The recommendations following represent general ideas of action items that have not yet been considered or that have been of lower priority in the past. Generally, this sector is already well represented within County operations.

Goal 1 – “Continue to Implement Actions to Reduce County Electricity Usage”

Action EWF 1.1:

Apply Integrated Resource Planning.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	County Administrator		
Cost Savings:	Unknown		
Staff Time:	Unknown		
Cost:	Variable		
GHG avoided:	Unknown		
Benefits:	Energy reliability Energy efficiency		
Challenges:	Cost of implementation		

Recommendation:

The County is recommended to use integrated resource planning as a tool to assure the long term sustainability of the County’s resources with special focus on energy.

Background:

An integrated resource plan should include the full range of energy supply options, ranging from traditional power plants to more innovative sources of electricity supply such as power purchases, independent power plants, cogeneration, demand-side management (effective energy efficiency programs that are designed to reduce customers’ electricity consumption, especially during peak periods) and renewable energy sources. The County should continue to work closely with its local utility TECO Energy. Current projections indicate that hundreds of billions of dollars will have to be spent on new electric power resources in the next 10–15 years. Integrated Resource Planning (IRP) is a well-known tool to plan for future energy demand and to increase system reliability, comply with regulatory objectives, minimize short-term and long-term power costs, and improve efficiency.

Case studies

City of Gainesville

The City of Gainesville assessed its electricity options which included a detailed evaluation of all fossil, renewable, and energy efficiency alternatives, and assessed the implications for power costs, air emissions, public health, and city revenues. The process was designed to take into account a wide range of stakeholder inputs, including those from the local utility staff, elected officials, public interest groups, and the general public. The City Commissioners and Mayor evaluated measures and criteria to identify the best resource options for the future.

Existing initiatives:

The County has completed the following energy efficiency and conservation projects:

- Central Cooling Plant for Edgecomb Courthouse and five other County buildings downtown, which saves \$1.5 million and prevents the release of more than 9,600 tons of carbon dioxide annually.
- Installation of more efficient lighting, HVAC systems and automatic shut-off sensors on lights in county buildings.
- Lighting retrofit for Orient Road Jail (cost \$700,000)
- Lighting retrofit to two County warehouse buildings on Falkenburg Road (cost \$300,000)
- Awarded Energy Star designation on three County buildings in downtown Tampa—Water Resource Administration building, County Center and Court Annex also recognized by Southeast Rebuild Collaborative with 2009 “Kept the Challenge” awards.
- Public Works Traffic Division completed retrofit of more than 15,000 County-owned traffic and pedestrian signals with LED lights instead of incandescent lights, and replaced the fluorescent lights on 890 overhead street signs with electronic lamps in 2008, greatly reducing the department’s energy costs and output. Project saves 4,843,742 kilowatt hours in energy and \$515,517 in funds annually, with monitoring ongoing for the next five years to ensure energy savings.

The County has completed the following renewable energy projects:

- Solar panel installation at County's judicial center (196 kW; see picture).
- Solar photovoltaic system on the Tax Collector building on Falkenburg



Road (cost \$218,000)

- Solar photovoltaic system on the gymnasium roof of the All People's Life Center (cost \$750,000).

Action EWF 1.2:

Reduce Electricity Usage of County Owned Buildings by 10% over 5 Years.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Energy Manager		
Cost Savings:	\$33,349 per year (1% reduction in buildings)		
Staff Time:	20 hours per year		
Cost:	Variable		
GHG avoided:	245 MTCO ₂ e per year		
Benefits:	Cost savings		
Challenges:	Cost of implementation		

Recommendation:

The County is encouraged to set a 10% reduction goal in electricity usage for its office buildings over 5 years. This action should be coordinated with *LPP 4.1. Sustainability Outreach and Education Program* and *Action LPP 2.2: Coordinate Energy Management Team*. Behavioral changes will be an important tool to achieve this reduction in electricity usage.



Action EWF 1.3:

Continue to Purchase or Rent Energy Efficient Equipment.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Energy Manager		
Cost Savings:	\$260		
Staff Time:	10 hours		
Cost:	\$424 (cost for one vending miser)		
GHG avoided:	2 MTCO _{2e} per year		
Benefits:	Cost savings		
Challenges:	Cost of implementation		

Recommendation:

The County is encouraged to continue to purchase or rent energy efficient equipment; particularly energy efficient vending machines and water coolers provide good opportunities to reduce the electricity usage. An alternative to purchasing new more efficient vending machines are vending misers. Vending miser controls are devices that can be installed quickly and that help to control beverage vending machines. These controls power down vending machines when the surrounding area is vacant, they monitor the room's temperature, automatically repower the cooling system at one- to three-hour intervals, but ensure that the product stays cold.

Existing Initiatives:

ITS Department

The Department also uses AMD processors with cool and quiet technology on the County's standard computers. Outdated computers are replaced with new HP computers that have received top honors for their energy efficiency. All County computer equipment includes a stand-by mode that shuts off when not in use.

Action EWF 1.4:

Assess Sheriff's Office Electricity Usage.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Sheriff's Office		
Cost Savings:	Unknown		
Staff Time:	20 hours		
Cost:	Unknown		
GHG avoided:	Unknown		
Benefits:	Cost savings		
Challenges:	Cost of implementation		

Recommendation:

It is recommended to assess the Sheriff's Office electricity usage as this sector was not sufficiently analyzed due to data availability in the most recent GHG inventory. This will also help pinpoint areas of improved energy efficiency and conservation.

Existing Initiatives:

The Sheriff's Office is looking into ways to become more sustainable. In 2007, the Sheriff's Office shifted to a paperless report and inmate processing system. It is about 10 cents cheaper per box to shred and recycle the paper than to send it to the incinerator, and transportation costs are cut, deputies said. Storage boxes are reused, which saves about \$27,000 each year. Reusing file folders saves \$20,000 each year. Additional benefits are for every ton of paper they shred and recycle, Hillsborough County sheriff's deputies save 17 trees, 60,000 gallons of water, 225 kilowatt hours and 3.3 cubic yards of landfill space.

Action EWF 1.5:

Consider Solar Water Heating.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Energy Manager		
Cost Savings:	\$1,000 per year (per solar water heater)		
Staff Time:	20 hours		
Cost:	Variable		
GHG avoided:	7 MTCO ₂ e (per solar water heater)		
Benefits:	Cost savings Electricity displacement		
Challenges:	Cost of implementation		

Recommendation:

The County should assess the feasibility of installing solar water heaters on their buildings and facilities.

Case studies

Solar Water Heater on White House

In October, 2010 Energy Secretary Steven Chu and White House Council on Environmental Quality Chair Nancy Sutley announced that the administration will install solar panels and a solar hot water heater on the roof of the White House residence as part of a broader DOE solar demonstration project.

Other examples

All new single-family homes built in Hawai'i will have to include solar water heaters (unless builders can demonstrate a compelling obstacle, such as underneath forest canopies). Some 90% of homes in Israel already have solar water heaters, and they are common in the Caribbean and on other islands.

Action EWF 1.6:

Improve Lighting Timers at Athletic Fields.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Parks and Recreation		
Cost Savings:	\$11,864 per year		
Staff Time:	20 hours		
Cost:	variable		
GHG avoided:	87 MTCO ₂ e per year		
Benefits:	Cost savings		
Challenges:	Cost of implementation		

Recommendation:

The County is recommended to improve the operation of the lighting timers at athletic fields in order to more efficiently control the lighting usage. If electricity usage of Parks, Recreation and Conservation Facilities would be reduced by 1 hour per day, this could result in cost savings of nearly \$12,000 per year (assuming that 20% is used for lighting).



Existing Initiatives:

The Department of Parks and Recreation converted the majority of lighting at the County's 250 recreational sports fields from conventional bulbs to metal halide lighting, which provides concentrated lighting, creates less light pollution and is more energy efficient.

Action EWF 1.7:

Continue to Reduce Electricity Peak Demand.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Energy Management Team		
Cost Savings:	\$316,478 (10% reduction, off peak)		
Staff Time:	50 hours		
Cost:	Variable		
GHG avoided:	11,646 MTCO ₂ e per year		
Benefits:	Cost savings Energy reliability		
Challenges:	Implementation costs Staff training		

Recommendations:

The County is encouraged to continue to look for additional opportunities to reduce peak electricity demand within its operations. Peak demand is the greatest amount of electricity that is needed during a certain time period. As demand rises, so do electricity costs and therefore prices are highest when most electricity is needed. Lowering the peak demand of facilities can help greatly reduce these costs. Reducing peak demands may also yield electricity savings. Demand is typically lowest from mid-evening to the early mornings; therefore assessing if certain activities can be shifted to this time will help save electricity costs (particularly automated processes). Assuming that 10% of total electricity demand is shifted to off-peak times, this could lower the costs by 2 cents per kilowatt hour and result in cost savings of over \$300,000 per year. The Public Utilities Division is currently conducting a demand reduction study for three water and wastewater treatment plants.

Case studies

TECO Peak Demand Program

TECO Energy offers several peak demand programs. The Energy Planner program is for residents and businesses and is designed to save demand and energy through a multi-tiered rate structure combined with price signals conveyed to participating customers during the day. This price information is designed to encourage customers to make behavioral or equipment usage changes to their energy consumption, thereby achieving the desired high-cost period load reduction to assist in meeting system peak. Price information from the utility is used by the customer to program a “smart” thermostat to preset actions based on the level of pricing. Equipment may be turned on, turned off or changed to a different temperature setting automatically by the smart thermostat or manually by the customer in response to either the multi-tiered rates or critical price signals.

Goal 2 - “Continue to Implement Actions to Reduce County Water Demand”

Action EWF 2.1:

Reduce Office Water Consumption by 1% Each Year Until 2020.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Public Utilities Division		
Cost Savings:	Unknown		
Staff Time:	20 hours		
Cost:	Unknown		
GHG avoided:	Unknown		
Benefits:	Cost savings related water and wastewater		
Challenges:	Participation		

Recommendation:

The County is recommended to reduce its water demand in office buildings by 1% each year. This could be achieved through staff education or by exploring additional water conserving devices that may be available in the market. Water efficiency measures can reduce water and sewer costs by up to 30%. Encouraging conservation efforts through behavioral changes typically needs continuous effort and engagement. This could mean extra work for employees involved in the outreach programs. It is suggested to assure that all conservation efforts – including energy or waste management – are streamlined and that no duplicate work efforts will occur.



Existing Initiatives:

Customer Education and Incentive Programs

The Water Resource Services Department established a pro-active and thorough water conservation education and enforcement program. Since 1989, when the County began a formal water

conservation program, customers have cut their average daily water use by nearly one-third – today saving up to 32 million gallons of water a day over what they were using 20 years ago.

The department also provides no-cost irrigation system evaluations to property owners. Individualized reports are provided back to the property owners with recommendations on how to correct problems that are discovered which frequently result in water use efficiencies.

Additionally, a toilet rebate program is offered since 1994 to help residents replace older model toilets with ultra-low flow toilets. Approximately 80,000 have been replaced since the beginning of the program.

Water Conservation in Hotels And Motels Program (CHAMP)

Water Resources Services provides joint funding for Southwest Florida Water Management District's Water Conservation in Hotels And Motels Program (CHAMP) to purchase promotional materials that are placed in the participating lodging rooms. These materials encourage voluntary choice of room occupants to not have their linens washed on a daily basis, saving water and energy.

Water Conservation Research

The Water Resources Services Department is conducting a scientific evaluation of weather-based, or evapo-transpiration based, irrigation controllers with the Institute of Food and Agricultural Sciences at the University of Florida to evaluate if this technology is valid for our climate and geology.

Neighborhood Relations Grant Program

The Neighborhood Relations department encourages the conversion of traditional irrigation systems on homeowner association common areas to micro-irrigation through a low-volume

irrigation installation grant program. Each grant is for \$2,500 and is sponsored by the Water Resource Services Department.

Miscellaneous Initiatives (non-office):

- The Planning and Growth department enacted a rain sensor ordinance applicable to all functioning automatic irrigation systems.
- The Public Works department utilizes reclaimed water whenever practical for street sweeping, cleaning out stormwater pipes and watering vegetation.
- Improvements to the County's wastewater sludge de-watering facility, which will increase its energy and water-use efficiency and reduce tonnage of sludge that has to be transported, cost \$2.45 million.

Action EWF 2.2:

Research Feasibility on Water Reuse.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Public Works Department – Stormwater Division		
Cost Savings:	Variable		
Staff Time:	20 hours		
Cost:	Staff time		
GHG avoided:	Unknown		
Benefits:	Disposal management alternative Cost savings related water and wastewater Water and energy conservation		
Challenges:	Cost analysis of all alternatives Public acceptance		

Recommendation:

The County is recommended to research the feasibility of water reuse opportunities within County operations. This could include

assessing opportunities in the collection of rainwater and stormwater to be reused for irrigation purposes. By providing an additional source of water, water recycling can help find ways to decrease the diversion of water from sensitive ecosystems. Other benefits include decreasing wastewater discharges and reducing and preventing pollution.

Existing Initiatives:

Reclaimed Water Usage

Hillsborough County supplies an average of 22 million gallons of reclaimed water per day to more than 15,800 residential and commercial customers. Another 10,000 locations are in the queue for connection to the distribution system. The program started for residential use in 1994, and is the largest residential retail reclaimed system in the state.



Case Study

Orange County, CA, is held up as a model for promoting public acceptance of reuse as a saltwater intrusion barrier, for industrial uses and now for groundwater recharge.

Goal 3 - "Decrease Fossil Fuel Dependence of County Fleet"

Action EWF 3.1:

Purchase More Fuel Efficient Trucks.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Fleet Management		
Cost Savings:	\$8,869 per year (truck diesel)		
Staff Time:	20 hours		
Cost:	variable		
GHG avoided:	39 MTCO ₂ e		
Benefits:	Fuel savings Air quality improvement		
Challenges:	Implementation costs		

Recommendation:

The County is encouraged to strategically purchase more fuel efficient trucks and improve the fleet's overall fuel economy. Assuming 1% savings in truck diesel and unleaded fuel purchases could result in cost savings of nearly \$9,000 per year. As shown in the 2009 GHG inventory, the County fleet comprises over 1,100 trucks, almost 50% of the total fleet. Trucks have on average lower fuel economy compared to passenger sedans. Therefore, the County should set in place mechanisms that support the purchase of fuel efficient trucks in future acquisitions. Typically, the County truck fleet has a lower turnover rate than its passenger vehicles, for example. Therefore, it will take considerably longer to replace all



trucks with more fuel efficient ones.

Case study

Wal-Mart Improving Truck Fleet

Wal-Mart's goal is to double the truck fleet's fuel economy by 2015, thereby reducing carbon dioxide emissions by 13 million metric tons between 2007 and 2020. Even as the retailer works to dramatically increase the fuel efficiency of its trucks, small efficiency savings have added up. Increasing the fuel economy of its long haul trucks by just 1 mile per gallon can save the retailer an estimated \$35–50 million per year in fuel costs alone.

Action EWF 3.2:

Increase Fleet Economy by 10% within 5 years.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Fleet Management		
Cost Savings:	\$287,008 per year		
Staff Time:	30 hours per year		
Cost:	Variable		
GHG avoided:	1,274 MTCO ₂ e		
Benefits:	Fuel savings Air quality improvement		
Challenges:	Implementation costs		

Recommendation:

The County is encouraged to strategically increase the fleet's overall fuel economy by 10% within 5 years. This could result in estimated cost savings of nearly \$300,000 per year. Several strategies can help to achieve a better fuel economy of the County's fleet including choosing the best vehicle in class with focus on fuel efficiency, tire specification, including tread patterns, aspect ratio and low rolling resistance options, right sizing of fuel tank size and position fit for

purpose. While not a high priority it is recommended to assess feasibility of introducing nitrogen filled tires and nitrogen filling stations.

Existing Initiatives

The County purchased a new fuel monitoring and automation system, anti-idling technology that will help to substantially reduce the fleet’s fuel consumption. Additionally the County’s fuel policy was enacted October 2009 which mandates that all vehicles under control of the County Administrator are not to be idled in non-emergency situations. Fleet Management also pursues fleet right sizing efforts by identifying vehicles whose continued ownership is not warranted by the current level of usage and disposing of them.

Action EWF 3.3:

Assess Feasibility of AFV and Bicycle Patrol.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Sheriff’s Office		
Cost Savings:	Unknown		
Staff Time:	10 hours		
Cost:	Unknown		
GHG avoided:	Variable		

- Benefits:** Fuel savings
Air quality improvement
- Challenges:** Technology advancement
Safety
Limited usage

Recommendation:

The County’s Sheriff’s Office is encouraged to assess the feasibility of expanding or adding alternative fuel vehicles and bicycle patrol to their fleet. Alternative fuel vehicles (AFV) run on fuel that is not

derived from fossil fuels such as gasoline or diesel. AFV can use alternative fuels such as compressed natural gas, biodiesel, liquified petroleum gas or hydrogen, to name a few.

However, there is currently only a limited number for AFV models available; e.g. EPA lists only one car model that runs on any of these fuels: the Honda Civic GX (Hillsborough County owns one). The technology is not widely accepted yet and it will probably take a few more years before AFVs become mainstream. In a county with limited bicycle lanes, the safety of the officers riding bicycle patrol may be jeopardized. Additionally, bicycle patrols can typically not be used for traffic accidents due to the limited amount of equipment carried on the police bicycle.

Existing Initiatives

The Hillsborough County Sheriff's Office is utilizing pedal power in the fight against crime. Deputies are now using bikes to patrol trails, greenways and neighborhoods that are not always motor vehicle friendly. The bikes give the deputies the ability to maneuver through tight areas and to do so stealthily.



Case Study

City of Los Angeles AFV Fleet

The City of Los Angeles controls a growing fleet of 2,455 alternative-fuel vehicles that run on propane, electricity, liquefied natural gas, compressed natural gas, and hydrogen fuels. Dual fuel and gasoline/hybrid models are also counted as a part of the alternative fuel fleet. The City has the largest municipally-owned alternative fuel refuse collection fleet in the nation. The City owns or is a partner in 18 alternative fuel dispensing stations and over 175 electrical recharging stations, including 2 state-of-the art fueling facilities for hydrogen vehicles. The City conserved approximately

10.6 million gallons of gasoline through alternative fuel use and fuel economy programs in 2006. This equates to approximate cost savings of close to \$25 million and avoided GHG emissions of approximately 93,000 metric tons.

Action EWF 3.4:

Assess Sheriff's Office Fuel Usage.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Sheriff's Office		
Cost Savings:	Unknown		
Staff Time:	10 hours		
Cost:	Staff time		
GHG avoided:	Variable		
Benefits:	Fuel savings Air quality improvement		
Challenges:	Staff time		

Recommendation:

The County's Sheriff's Office is encouraged to assess their annual fuel usage to complement the County's GHG inventory. The Sheriff's Office fleet is a large contributor to the County's fleet. It is paramount to have a better understanding of the Office's overall contribution to the GHG inventory. This will help to pinpoint areas in need of improvement such as increased fuel economy. It is suggested that the Sustainability Officer assists the Sheriff's Office in this task.

Action EWF 3.5:

Continue to Purchase CNG vehicles.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Fleet Management Department		

Cost Savings:	\$479 per vehicle and year
Staff Time:	10 hours
Cost:	\$9,685 per upgrade
GHG avoided:	0.9 MTCO _{2e} per vehicle and year
Benefits:	Fuel savings Air quality improvement
Challenges:	Technology advancement Limited number of fueling stations

Recommendation:

The County is encouraged to add more CNG vehicles to its fleet when replacing vehicles. Honda Civic CNG costs over \$9,000 more than a comparable regular Honda, however annual fuel cost savings amount to \$479. Compressed Natural Gas (CNG) vehicles have many advantages over regular gasoline powered vehicles. CNG fuel costs on average a third less than gasoline, is safer to use (it dissipates into the air when released), and CNG vehicles emit less pollution. It is important to point out that CNG vehicles are currently not mass produced due to low driving range, limited storage space, and initial cost. This also prevents the expansion of public natural gas fueling stations. However, it is expected that with improved technology, research, and infrastructure, the use of CNG vehicles will increase in the future.

Existing Initiatives

The Environmental Protection Commission (EPC) purchased the County's first CNG vehicle in 2009. The Honda Civic GX is recognized by the U.S. Environmental Protection Agency as the cleanest commercially available, internal-combustion vehicle; it produces less than two pounds of hydrocarbons in 100,000 miles (equivalent to spilling one pint of gasoline); it has a City/Highway fuel economy of 24/36 mpg, respectively; and it has an estimated driving range of 170 miles.

Case Study

Montgomery County, MD

In June 2010, Montgomery County's Division of Solid Waste Services put into service the first 20 of 100 refuse and recycling collection trucks powered with compressed natural gas. Running on compressed natural gas allows the trucks to operate quieter than their diesel-powered predecessors. The new CNG refuse trucks meet the stringent 2010 heavy-duty diesel vehicle emission standards, producing less smog forming compounds and particulate matter than the older diesel trash truck fleet.



SECTOR 3: NATURAL ENVIRONMENT

Hillsborough County along with the Environmental Protection Commission (EPC) has a strong commitment to protect the natural resources of the county through local control and regulation of activities that may cause pollution. The EPC of Hillsborough County was created in 1967 by special act of the Florida Legislature to control and regulate activities which are or may reasonably be expected to cause pollution or contamination of air, water, soil and property, or cause excessive and unnecessary noise.

Similarly, the County's Parks, Recreation and Conservation Department focus is on conservation. The department maintains and protects more than 80,000 acres of parkland in Hillsborough County, which improves the environment and quality of life. Approximately, 61,000 acres have been acquired through the County's Environmental Lands Acquisition and Protection Program (ELAPP). It maintains environmental demonstration /learning centers at three parks—Lettuce Lake Park, Alderman's Ford Park, and Upper Tampa Bay Park. Some of the programs include partnerships with Hillsborough Community College and the Audubon Society. Environmental information also is available at numerous kiosks in other parks and trailheads. The department applies green landscaping, irrigation standards, integrated pest management and other environmentally-friendly practices on Parks, Recreation and Conservation Department lands. It also undertakes an invasive species removal program throughout publicly-owned lands in the County.



The natural environment is well represented within the County's operations and therefore only a few general goals are recommended in this sector.

Goal 1 "Continue to Conserve and Improve County's Natural Environment"

Action NE 1.1:

Pilot Project to Assess Feasibility of Forestry Offsets.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	Parks, Recreation and Conservation Dept.		
Cost Savings:	Variable		
Staff Time:	20 hours (procurement) 250 hours (in house)		
Cost:	\$15,000 (external pilot project)		
GHG avoided:	23,670 MTCO ₂ e per year		
Benefits:	Potential revenue source		
Challenges:	Funding for pilot project		

Recommendation:

The County is recommended to assess the feasibility of implementing a reforestation, improved forest management or avoided conversion forestry offset project as recommended in the land inventory. Assuming 10,000 acres are reforested this would result in carbon sequestration of over 20,000 metric tons per year. All reforestation proposals recommended for ELAPP lands from both internal and external agencies must come through the Conservation Services section for review as well as the ELAPP Management Committee. Any reforestation project must have the commensurate understory species, grasses, shrubs and wildflowers that comprise a native ecosystem.

Background:

In 2010, the County conducted a land inventory to assess the carbon sequestration potential of its lands. The study results showed that there are opportunities to generate additional revenue by developing forestry offset projects under the Climate Action Reserve platform. It is recommended to assess the feasibility of project development in a pilot study that evaluates the potential on a specific County land (e.g. Cone Ranch). A challenge is that most forestry projects take a long time and considerable upfront investment. However, viable projects have the benefits of not only reaping extra revenues, but also improving current forestry lands in an environmentally friendly way.



Existing Initiatives

Hillsborough County acquired more than 60,831 acres of land through the County's Environmental Lands Acquisition and Protection Program (ELAPP) since its inception in 1987 at a total price of \$240 million. The County received \$76 million of that in joint funding. This program preserves natural habitat, water quality, and reduces the flood risk in flood-prone areas. ELAPP was recognized with the County Leadership in Conservation Award in the large county category in March 2009 by the Trust for Public Land and the National Association of Counties. County voters approved a bond referendum in November 2008 to provide up to an additional \$200 million for the program.

Action NE 1.2:

Promote Farming Practices that Reduce GHG Emissions.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	EPC		
Cost Savings:	Variable		
Staff Time:	30 hours		
Cost:	Variable		
GHG avoided:	5,000 MTCO ₂ e per year		
Benefits:	Improved water quality		
Challenges:	Buy-in and interest		

Recommendation:

The County is encouraged to promote farming practices that reduce GHG emissions. This can include soil carbon management (e.g. continuous no-till or strip-till conservation tillage to leave soil undisturbed), land-use management that promotes permanent cover (to avoid release of GHG from soil), or nutrient management (more efficient use of fertilizer). Assuming that improved soil carbon management is used for 10,000 acres this could result in avoided GHG emissions of approximately 5,000 MTCO₂e per year.

Another area of improvement in this initiative relates to procurement of fertilizer. Some of the newer and more environmentally friendly fertilizers are measured in units different from current bids. The County should consider updating fertilizer language in procurement documents.

Background:

In Hillsborough County, 243,388 acres are devoted to agriculture. The County covers more than 1,000 square miles and 38% of that is used for agricultural production. The CO₂ emissions occurring from the cultivation of organic soils is a significant source of Florida's

total agricultural GHG emissions. By 2025, the contribution from this source is estimated to be more than 70% of the total agricultural emissions. Incentive programs are needed to protect crop lands from conversion to developed use or the conversion of lands in conservation programs back to conventional tillage/plowing which releases CO₂. By protecting these areas from development, the carbon in above-ground biomass and below-ground soil organic carbon can be maintained and additional emissions of CO₂e to the atmosphere can be avoided. Indirectly, these measures also support the objectives of "smart" development by helping to direct more efficient development patterns.



Existing Initiatives

Economic Development Agriculture Stewardship Program

The Department of Economic Development oversaw the Agriculture Stewardship Program Agreement between Hillsborough County and agricultural landowners, which provided an incentive to landowners

in the form of an annual grant, in exchange for an agreement from the landowner to not convert agricultural land to non-agricultural use for a period of 10 years. The grant was equal to 75% of the ad valorem tax value on the agricultural land and agriculture production-related structures. Approximately 9,000 acres and 220 properties were participating in the project. The program was recently suspended due to budget cuts. It could be reinstated once County revenues have recovered at the discretion of the Board of Commissioners.

Pesticide collections

The Economic Development department implemented a program, in cooperation with the Solid Waste Management Division and Cooperative Extension Service, to provide agriculture pesticide collections for farmers to dispose of cancelled, suspended and unusable agricultural pesticides. Funding is through the Environmental Protection Commission’s Pollution Recovery Fund.

Lead by Example

The Parks, Recreation and Conservation Department applies green landscaping, irrigation standards, integrated pest management and other environmentally-friendly practices on Parks, Recreation and Conservation Department lands.

**Action NE 1.3:
Expand Urban Forests.**

- Priority:** High Medium Low
- Timeline:** Short Mid Long
- Lead:** Hillsborough County Cooperative Extension/Parks, Recreation and Conservation Department
- Cost Savings:** Variable
- Staff Time:** 30 hours
- Cost:** Variable
- GHG avoided:** 5,000 MTCO2e per year

- Benefits:** Improved air quality
Standard of living
- Challenges:** Funding for tree planting

Recommendation:

The County is encouraged to expand urban forests (excluding highly maintained urban greenspace) through promotional or financial incentives programs building on existing initiatives. Urban forests of 10,000 acres have the potential to sequester 5,000 MTCO2e per year.



Natural urban green spaces have a number of benefits aside from GHG sequestration, such as biodiversity conservation, reduced stormwater runoff, and reduced fertilizer applications. One of Florida’s Energy and Climate Change Action Plan goals is to increase canopy cover in Florida communities such that by 2025, 3% of total metropolitan GHG emissions will be offset through carbon sequestration and energy reductions. It is important to point out that highly maintained lawns and trees sequester much less CO₂ than more natural areas with little maintenance as assessed by a recent urban greenspace study (see references).

Existing Initiatives

Neighborhood Relations

The Neighborhood Relations department encourages planting of trees in County neighborhoods through its tree mini-grants program, which is managed by Neighborhood Relations and sponsored by Planning & Growth Management department. Each grant is for \$2,500 and must be used for trees and plants that are Florida friendly, as approved by the County Urban Forester. Over eighty grants have been issued in the last five years. The funds used for this grant are generated through fines and money paid to the

County to remove trees. None of the grants are funded with ad valorem money.

Planning and Growth Tree Ordinance

A tree preservation and land-clearing ordinance has been enacted for construction projects.

Children’s Services

The Children’s Services departments educates about creating sustainable gardens and natural green spaces on playgrounds, using Florida-friendly landscaping practices, teaching water conservation techniques to children, and creating worm composting bins to teach children about natural fertilizer.

SECTOR 4: TRANSPORTATION

The Metropolitan Planning Organization (MPO) for Transportation develops comprehensive long-range transportation plans which support the mobility needs and economic development of the community as reflected in the adopted comprehensive plans. The MPO has an Interlocal Agreement with Hillsborough County and an integral part outlines policies to guide the development of a balanced transportation system. These policies shall encourage preservation of neighborhoods, protect the environment, enhance the community's quality of life and promote public transportation.

In the current sector, only action items were addressed that relate to the County’s *internal* policies or initiatives regarding transportation planning. For future initiatives, it will paramount to incorporate community wide efforts that are coordinated with the MPO, neighboring municipalities and other stakeholders.

Goal 1: “Plan to Reduce Dependence on Fossil Fuels”

Action T 1.1:

Co-locate County Facilities for Less Commuting.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	County Administrator		
Cost Savings:	Unknown		
Staff Time:	50 hours		
Cost:	Variable		
GHG avoided:	Variable		
Benefits:	Fuel savings Synergy of services		
Challenges:	Feasibility		

Recommendation:

The County is recommended to co-locate its facilities – where feasible – in order to reduce vehicle miles traveled for both citizens and County staff. Urban sprawl is caused by designing communities with increasing distances traveled to work, school, and services thus increasing vehicle miles traveled (VMT). This in turn means more GHG emissions and destruction of natural habitat, and water quality degradation. By co-locating County facilities travel time will be reduced and building use will be maximized. However, unexpected, uneven growth and changes in demographics can lead to inaccurate population predictions. If County facilities are located in areas that do not fulfill predicted demand this could lead to sub-optimal services or inadequately covered demand areas. Rapid development can significantly limit the amount of land available to the local government.



Existing Initiatives:

County Services

Recently, County governmental activity is being transferred to venues closer to citizens. Keeping pace with a growing national trend to expand uses of public libraries, the administration is encouraging scheduling certain functions in the county’s outlying libraries with extension service programs being an example. And, although it is not yet known when a full complement of services again can be delivered from facilities such as the Southshore Services Center on 30th Street, certain services continue to be fielded from senior centers in the South County and from facilities such as the Joyce Ely Health Center. Furthermore, a new administration system has been introduced. The Citizen Request Management System (CRMS) is being designed to give Hillsborough County residents a central point of contact where complaints can be

registered, questions posed, issues raised, either by telephone or email or fax, with replies then provided, she said.

Case Study

Loudoun County

Loudoun County is a rapidly growing county in northern Virginia. In 2004, recommendations were made to encourage the co-location of County and School facilities. Loudoun County has co-located public facilities based on four models. The first model covers public facilities co-located on proffered land sites. These co-location projects involve the soliciting by the County of proffer sites large enough to install co-located facilities based on County capital facility standards. The second model deals with co-locating departmental programs in a combined facility. In this case, the programs or services operate within a single facility. Combining services in one building reduces the amount of acreage that would have been required had the services been housed in separate facilities. The third model co-locates public facilities on existing property owned by the County. The County is particularly targeting schools for this type of co-location. The fourth model covers co-locations achieved through acquisition of large land tracts and master planning. This type of co-location tends to involve the most resources and the most intensive long-term planning. This case study is documented in a recent study (see references).

Action T 1.2:

Increase Participation in Employee Commuter Programs.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	County Administrator		
Cost Savings:	Unknown		
Staff Time:	30 hours		

Cost: Variable
GHG avoided: Variable
Benefits: Fuel savings
Challenges: Buy-in and interest

Recommendation:

The County is encouraged to increase the participation of current commuter programs. Programs should receive more exposure and advertisement efforts should be increased. Hillsborough ranks nearly last among comparable metropolitan areas in its ability to move people and goods. Hillsborough County has many programs that encourage employees to reduce their commuting, however many of these are not used to full capacity.

Existing Initiatives:

Human Resources Education Campaign and Commuter Programs

The Human Resources Department undertook an education campaign in 2008 to help employees understand commuter options, including hosting a transit fair in County Center. An employee-to-employee section was created on the County’s Intranet for staff to request carpool buddies. Several incentive programs have been introduced including:

- All County employees are eligible to receive 75% discount on monthly bus passes.
- Employees that carpool to work with three or more people receive free parking in County-owned garages.

Goal 2: “Introduce Low Carbon Transportation Fuels”

Action T 2.1:

Expand Infrastructure for Low Carbon Fuels.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	BOCC		
Cost Savings:	\$95,800 per year (when replacing 200 vehicles)		
Staff Time:	50 hours		
Cost:	\$350,000 (station) plus costs for upgrading vehicles		
GHG avoided:	180 MTCO _{2e} per year		
Benefits:	Fuel savings Job creation		
Challenges:	Implementation cost		

Recommendation:

The County is encouraged to expand the infrastructure for distribution of low carbon fuels in the County. Fuels that have lower carbon content than petroleum based fuels include ethanol, biodiesel, natural gas, hydrogen, and electricity. It is recommended the County develop a strategy that includes expanding current infrastructure such as CNG and electric charging stations.

At present, the cost of a typical CNG refueling station is high, between \$350,000 to well over a \$1,000,000 for the mechanical systems alone (compared to gasoline station: \$50,000 to \$150,000). Several issues tend to create the large difference in cost including the need for specialized equipment for storing and handling the cryogenic liquid (mostly methane) that constitutes CNG fuel.

Significant start-up costs and space requirements for charging stations can be realized in creating large-scale networks. Electricity has the advantage of not requiring an entirely new production and

distribution infrastructure. However, the GHG benefits of electricity will depend strongly upon the source of electricity generation. Coal fired electric plants may provide only modest benefits, or even increase net GHG emissions, unless successful carbon sequestration technologies are developed.

Background:

Technologies that can provide low carbon fuel alternatives exist and are continuing to be developed. Natural gas, for instance, can provide about a 15% GHG reduction relative to gasoline vehicles, roughly equivalent to diesel vehicle benefits. However, it requires more significant vehicle modification and distribution infrastructure, and its use is likely to be limited primarily to fleet vehicles utilizing central refueling and maintenance. Electricity shows similarly strong potential for GHG reductions, due to the inherent efficiency of electric motors. Electric vehicles release no GHG emissions when running purely on electric power. Therefore, meaningful climate change strategies include and encourage wide adaptation of electric cars. However, a widespread shift to electric vehicles will be delayed if there is no adequate infrastructure. The lack of an available network of charging stations restricts drivers to short commutes, while it can take several hours to fully recharge an electric vehicle. Additionally, the cost of electricity for powering a vehicle is lower than that of gasoline on a per mile basis. Also concerns remain about the effect electric vehicles will have on a nation's power grid.

Existing Initiatives

Hillsborough County joined Get Ready Tampa Bay, a regional collaboration between the Tampa Bay Regional Planning Council, local governments, electric utility companies, business partners, and other interested groups to prepare Tampa Bay for the roll-out of electric vehicles in the very near future. Plug-in electric vehicles will be launched into the marketplace late in 2010 and aggressively into

2012. Cities and regions that demonstrate they are getting “plug-in ready” will attract the vehicle manufacturers to launch in their area.

Case Study

CNG Station Deployment in Florida

Refuse operators in Florida have opened new compressed natural gas (CNG) fuel stations to support deployment of their growing fleets of CNG refuse collection trucks. The new CNG stations were designed and built by Clean Energy Fuels Corp. for Choice Environmental Services, Fort Lauderdale, FL. CNG trash trucks reduce greenhouse gas emissions by 23% compared to conventional diesel-powered models, and are quieter. CNG fuel costs significantly less, on average, than diesel. The new Choice Environmental Services CNG station supports South Florida's first privately owned fleet of clean and green natural gas refuse trucks. The Choice CNG fleet serves commercial and residential customers in the City of Fort Lauderdale. The company plans to expand CNG truck deployment throughout its service area, which encompasses Palm Beach, Broward, Dade, and Collier counties.



SECTOR 5: WASTE

Hillsborough County operates the Public Utilities Department/Solid Waste Management Division (SWMD) that collaborates closely with other departments and county stakeholders in order to reduce waste and improve waste management. The County implemented innovative technologies and the SWMD is being recognized as one of the foremost solid waste management systems in the country.

This sector contains general recommendations that build on existing initiatives. Most of the action items are focused on County internal operations; however future plan amendments need to be broader and include community wide efforts.

Goal 1 – “Develop waste reduction goal”

Action W 1.1:

Develop and Promote Ambitious Waste Reduction Goal.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	BOCC		
Cost Savings:	Variable		
Staff Time:	10 hours		
Cost:	Staff time		
GHG avoided:	Variable		
Benefits:	Waste reduction		
Challenges:	Implementation cost Feasibility Buy-in and interest		

Recommendation:

The County is encouraged to develop and adopt an ambitious county-wide waste reduction goal that goes beyond mandated targets. This should include an ambitious recycling goal focusing on materials other than yard waste. An ambitious waste goal helps to support cleaner production and pollution prevention strategies. Waste reduction will improve efficiency, save costs and lower the need for energy generation by implementing an improved materials flow. This will help use less raw materials as they would either return as reusable or recycled materials or would be suitable for use as compost. The County is very active and engaged in its waste reduction efforts. Therefore it is recommended to adopt a concrete goal that supports and builds on these initiatives. As with most goals related to resource conservation, motivating individual behavioral change can be a significant barrier to successful implementation. Effective education and outreach programs are key to inspire increased participation.

Existing Initiatives

Solid Waste Management Division Programs

The SWMD conducts a number of programs related to waste reduction and recycling including:

- Waste reduction and recycling education programs for schools, community organizations and at area events.
- Office recycling program for County offices. In 2009, over 96 tons of recyclable materials were collected in this program and waste disposal costs were lowered correspondingly.
- Recycling Planet newsletter for residential customers. This publication informs residents about acceptable solid waste management practices, current trends and developments.
- Education efforts to encourage commercial recycling through offering free audits and assistance to businesses interested in starting a recycling program and starting a pilot program for recycling at multi-family complexes.

- Annual grants provisions to: Keep Hillsborough County Beautiful, Teaching Tools for Hillsborough Schools and the Hillsborough County Cooperative Extension Service, for waste reduction programs offered through their outreach activities.
- Curbside recycling program to all 265,000 residential customers, which diverts approximately 30,000 tons of recyclable materials from the waste stream annually and saves valuable landfill space.
- Operation of two recycling drop-off locations that is available to all County residents, which diverts approximately 75 tons of recyclable materials from the waste stream annually.
- Conversion of more than 200,000 tons of vegetative waste into mulch and other beneficial products annually, and provides mulch to residents at yard waste facilities.
- Sells many materials that are diverted from the waste stream and can be recycled to various industries, such as metal, shredded tires for ground cover, and mulch. Also diverts the used paint that it receives and re-mixes it into high quality paint for donation to community groups.



a direct economic incentive for residents of unincorporated Hillsborough County to recycle more, and generate less waste.

The County's Resource Recovery Facility (RRF) accepts most of the County's municipal solid waste. Additional recycling programs can help to insure that the RRF can manage possible increases in the waste stream well into the future. Based on 2010 population and residential tonnage figures, a countywide PAYT program is estimated to reduce solid waste generation by 42,659 tons per year and reduce collection costs as a result of source reduction. A PAYT program could essentially reduce the overflow of solid waste from the WTE plant to the landfill. Ultimately, PAYT and the resulting increase in residential recycling will assist with the conservation of County landfill airspace, considered a valuable financial asset, and thus extend the operating life of existing disposal facilities. This type of program could assist the County with meeting the State of Florida's 75% recycling goal (The Energy, Climate Change, and Economic Security Act of 2008 - House Bill 7135). As so few communities are currently operating PAYT programs in the State of Florida, Hillsborough County has the potential to become a model of waste reduction and recycling practices in the State.

Children's Services

The Children's Services department formed Recycling Clubs where children and parents will recycle and take a field trip to local recycling center to learn about recycling. Children will re-purpose many of the recycled materials in creative art projects. The department is also teaching environmentally-friendly practices to children in the County's Head Start program as a result of two grants received, a 2008-2009 SWFWMD Splash mini-grant and a 2008-2011 Head Start Innovation and Improvement Grant.

County Research Grant for PAYT Programs

Hillsborough County Solid Waste Management Division applied for and was awarded a FY 2006-2007 Innovative Recycling Grant from the Florida Department of Environmental Protection (FDEP) to research variable rate, or pay-as-you-throw (PAYT) programs, where customers are charged for waste collection and disposal based on how much – or how little – waste they generate. PAYT would create

Information Technology Services Department

The Department implemented a program whereby computer hardware that is replaced is sent to the County's surplus and recycling program, and then donated to non-profit organizations or sold at auction to recycling companies.

Surplus Program

The County's facility management department manages a variety of recycling programs within County operations:

1. Implemented surplus program for equipment, supplies and furniture. Items are available for re-use by County departments, are donated to charities or are auctioned off to recycling companies.
2. Developed a toner and print cartridge recycling and reuse program in County buildings in conjunction with Solid Waste Management Division.
3. Implemented a program to separate precious metals from old scrap air conditioning units from County facilities to resell them to recycling companies for a higher profit.

Emailing Newsletters

Neighborhood Relations reduced paper waste and costs by ending mailing of quarterly newsletters to 1,000 neighborhood associations registered with office and instead e-mailing to these associations.

Recycled Construction Material

The Public Works department utilizes recycled, crushed concrete for stabilization of road slopes and stormwater installations to allow for better drainage. Also recycles asphalt milled off of roads for use in asphalt mix on future road repair and resurfacing projects. Additionally recycles other materials such as concrete, metal, tires, and brush and tree debris trimmed from rights-of-way. It also undertook a program to safely remove and dispose of or recycle approximately 3,000 pounds of hazardous materials annually of

traffic equipment-related materials, such as street lights, industrial batteries, and copper wire and cabling, in accordance with industry and environmental requirements.

Case Studies

Sarasota County Recycling Programs

Recycling is mandatory for both residents and businesses in Sarasota County. The current recovery rate is 43%; 50% in the commercial sector and 38% in the residential sector. Sarasota County's commercial sector recycling success has been achieved through aggressive education campaigns aimed at local businesses. Businesses must contract independently for trash and recycling collection services; the county programs serve residences only. The county has offered on-site waste assessments, technical advice, workshops, presentations, training, awards programs, and other educational information in order to encourage commercial sector recycling. As a last resort, county code enforcement has the authority to ensure businesses comply with the mandatory recycling program.

King County Eco-Industrial Districts

King County manages regional services including solid waste and wastewater treatment, and has resources—traditionally thought of as waste byproducts—to offer to the private industry. These include heat from wastewater trunk lines, treated wastewater effluent, mixed municipal waste and solid waste recyclables. Eco-industrial districts offer opportunities for advancing energy efficiency and sharing energy resources. Eco-industrial districts can be thought of as a type of industrial ecology that helps create sustainable communities by using waste byproducts, maximizing resources, and promoting the creation of green jobs. Businesses that participate in eco-industrial districts make a commitment to apply sustainable practices. Eco-industrial districts can vary in size, from a few properties to a large industrial community. Manufacturers are

typically located close to one another so the waste products from one firm can be an input resource for a neighboring firm. In addition to using byproducts, eco-industrial districts typically share services such as training resources, common infrastructure, site/facility management, green building standards, recreational facilities, etc. Ideally, eco-industrial districts are part of larger livable communities served by public transit with nearby affordable workforce housing and recreational amenities.

Goal 2: “Promote Waste to Energy Initiatives”

Action W 2.1:

Review Economic Study of Sludge Incineration.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	BOCC		
Cost Savings:	\$22,080 per year		
Staff Time:	5 hours (procurement for consulting services)		
Cost:	\$10,000 (study)		
GHG avoided:	98 MTCO _{2e} per year		
Benefits:	Fuel savings		
Challenges:	Implementation cost Feasibility and permitting		

Recommendation:

The County is recommended to review an economic study currently finalized to assess the costs and benefits of using sludge generated at the Falkenburg Road wastewater treatment plant to incinerate at the Resource Recovery Facility (RRF). Currently, the sludge from the Falkenburg Plant is hauled to the residuals management facility and the Okeechobee landfill for further treatment and disposal. The residuals are land applied by private firms at multiple permitted land application sites. In order to accept sludge at the RRF a new permit and change of filters would be required. Furthermore, it is unclear if there is a net heat value to be gained; sludge generally

has higher nutritional than energy values, i.e. land application may be more beneficial than burning the sludge.

Action W 2.2:

Expand Current Waste to Energy Initiatives.

Priority:	High	Medium	Low
Timeline:	Short	Mid	Long
Lead:	BOCC		
Cost Savings:	Variable		
Staff Time:	5 hours (procurement for consulting services)		
Cost:	\$10,000 (study)		
GHG avoided:	3,504 MTCO _{2e} per year		
Benefits:	Energy savings Job creation		
Challenges:	Implementation cost Feasibility		

Recommendation:

The County should consider expanding current waste to energy initiatives such as landfill gas or waste to energy. Hillsborough County has implemented and is planning several waste to energy initiatives. The first one is the current incineration of municipal solid waste at the Resource Recovery Facility on Falkenburg Road. Part of the generated electricity is currently sold while another part is used at the neighboring wastewater treatment plant, Brandon Service and Operation Center (BSOC) and the main Woodberry lift station. Currently, the Falkenburg Water Treatment Plant is also being added to the power connection of the Resource Recovery Facility. In addition, the Solid Waste Management Division is considering expanding the gas collection system at the Southeast County landfill to include an electricity generator. It is recommended to assess whether the County has other opportunities to generate electricity from waste.

EPA GHG Reporting Rule Strategy

Many municipalities are already required to track their greenhouse gas (GHG) emissions as required by the Environmental Protection Agency (EPA GHG Reporting Rule 40 CFR Part 98). The rule does not require control of GHGs, rather it only requires that sources emitting above certain thresholds monitor and report GHGs. Entities that are affected need to prepare for this federal regulation which is still evolving. Here is an outline of the current EPA GHG rule:

- Mandatory comprehensive GHG reporting for 10,000+ US facilities
- Currently affects activities resulting in direct GHG emissions of over 25,000 metric tons per year
- Rule requires certain entities to provide a detailed monitoring plan
- First annual monitoring report expected for September, 2011.

The rule was issued in order to establish a nationwide mandatory reporting system. Emissions are reported for each individual facility. Facility means any physical property, plant, building, structure, source, or stationary equipment located on one or more contiguous or adjacent properties. Overall, approximately 85% of the total US emissions will be covered under the rule. The greenhouse gases covered under this rule include carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), hydrofluorocarbon (HFCs), perfluorocarbon (PFCs) and sulfur hexafluoride (SF₆).



First monitoring reports were due on March 1st, 2011; however this deadline has been delayed. The rule allows for one designated representative per facility. Annual GHG reporting also requires facilities to have in place a detailed and comprehensive monitoring plan that needs to follow the code of federal regulations. Generally, reporting is different from existing GHG reporting protocols such as issued by the Carbon Disclosure Project, The Climate Registry and other organizations. Reported emissions will be verified by the EPA who is facilitating electronic reporting.

Hillsborough County Facilities Affected by GHG Rule

To determine possible compliance requirements, Hillsborough County must first understand the nuances of the rule. One critical piece of information is the EPA accepted definition of a facility. As the reporting threshold is based on a per facility basis this definition is required to determine compliance requirements.

A facility is defined in 40 CFR 98.6 *“as any physical property, plant, building, structure, source, or stationary equipment located on one or more contiguous or adjacent properties in actual physical contact or separated solely by a public roadway or other public right-of-way and under common ownership or common control, that emits or may emit any greenhouse gas.”*

Once the facilities are defined and bounded, the next step is to determine whether or not the facilities are required to report. As stated above, any facility with emissions over 25,000 MT will be required to report, but there are additional metrics as well. The EPA rule introduces the notion of “source categories” and any given facility may fall into multiple categories. Each facility must be evaluated to determine its applicability to the rule. There are two general categories, “All-in” and “Threshold”, those facilities that fall into the All-in category must report regardless of their emissions.

The EPA has provided guidance for the formatting and calculation methods for each category-specific source. Annual GHG reporting also requires facilities to have in place a detailed and comprehensive monitoring plan that needs to follow the code of federal regulations. Continuous emissions monitoring systems (CEMS) are required to be utilized if they are already in place (e.g. landfills under NSPS compliance), and are optional for additional sources. The category-specific calculation methods require basic monitoring of process parameters and fuel usage. The emissions are then calculated by using provided equations as defined in each of the subparts of 40 CFR Part 98 (i.e. for landfills utilize equations from subpart HH).

Reported emissions will be verified by the EPA who will facilitate electronic reporting (e-GGRT/web-based systems). These electronic submissions will include built-in calculation and completeness checks for the reporters to ensure compliance of their submissions. The GHG report contains the facility information and contact, year and months covered in report, annual facility emissions, activity data (fuel use, feedstock inputs) and quality assurance and control data. Some projects will require additional EPA Quality Assurance consistency checks and others may include site-specific or on-site audits.

Hillsborough County operates several facilities that must report their greenhouse gas emissions to the EPA including:

- Resource Recovery Facility
- Southeast County landfill
- Hillsborough Heights/Taylor Road landfill

For the Resource Recovery Facility various units are regulated under different tiers of the GHG Reporting Rule. Units 1 through 3 are regulated under Tier II while Unit 4, because of its size, is regulated

under Tier IV of the Reporting Rule. Tier II relies on emission factors to “estimate” the greenhouse gas emissions. Tier IV requires actual measurement using a greenhouse gas analyzer and a stack gas flow meter. For purposes of the Reporting Rule, the results of quarterly biogenic/anthropogenic fraction are applied and only the fossil-derived portion of the total greenhouse gas emissions is reported to EPA (approximately 35% of the total).

For the Southeast County and Hillsborough Heights/Taylor Road landfill, employees preparing an electronic report to the EPA due each year for the previous year's emissions using the electronic greenhouse gas reporting tool (e-GGRT). The first report is due September 30, 2011.

The Northwest landfill is not subject to the rule as it emits less than 25,000 MTCO₂e. Similarly, the County wastewater facilities or fleet operators are not required to report their emissions yet. However, the 2009 base year GHG inventory conducted for the County will be a useful starting point to prepare for future greenhouse gas reporting requirements.

The County should continue to monitor developments which may eventually be a required source category and would need to be reported. At this point – given the information received – the County will be in full compliance with the rule as contact for the Certification of Representation has been identified, paperwork is ready for submission, and the emissions calculations are underway and will meet the current September deadline.

Outreach and Education

Hillsborough County engages its community, employees and stakeholders in many different areas. Future initiatives that relate to energy and sustainability should be communicated using existing structures and channels of communication. There will be distinct differences in approach whether the target audience is internal or external. The following section provides an overview of general strategies and first steps to create a comprehensive outreach and education program.



Employee Outreach and Education

Hillsborough County's employees show passion and enthusiasm towards sustainability and have helped implement a number of internal programs. The following steps are recommended to set in place meaningful programs which are described in more detail in the next section.

1. Follow Goal and Mission

The County Administration is recommended to guide their employees toward a clearly established goal based on a long-term mission on sustainability. This step will facilitate the buy-in of employees in subsequent outreach and education efforts.

2. Compile and Examine Current Initiatives

In order to efficiently implement and expand the outreach and education program, the County should review existing initiatives and build upon these. Such a baseline assessment will help to use existing structures instead of re-inventing new ones. Several initiatives have already been identified within this plan (**Table 1**). It is suggested to dedicate a County employee for this task who has a

good understanding of energy, resource conservation and environmental initiatives. If the County decides to hire a Sustainability Officer, then this employee could be tasked with this effort.

3. Provide Staff with Information and Seek Input

All County employees should receive this plan and be given ample opportunities to provide feedback. Suggestion boxes could be introduced where staff members leave their opinions and ideas.

4. Design Framework Program

Using baseline information and staff input, a framework for outreach and education can be established. Focus areas should build on the Energy and Sustainability Plan and reflect the County's mission and goals. The County Administration is encouraged to build in responsibilities into employee position descriptions as appropriate. This will ensure a framework of accountability is in place.

5. Create Tracking Scheme

In order to track the efficacy of the programs it is recommended to assign a staff member who delivering progress reports and updates at staff meetings. It is suggested to regularly provide verbal, written and/or visual presentations of progress in specific programs. Highlights and successes should be acknowledged in the County's newsletter or on bulletin boards. It is paramount that a system of metrics, tracking, and reporting is internalized into County operations, in order to properly incentivize employees into supporting and participating as stakeholder partners as it relates to energy, climate change, and sustainability.

Community Outreach and Education

Hillsborough County's government has implemented a number of outreach and education programs (**Table 1**). It is suggested to create

a website that features relevant initiatives under the auspices of sustainable development. The County already features a dedicated



“Green” website and an additional page is recommended that helps to quickly navigate relevant programs.

It is also suggested to add outreach and education programs that encourage

residents, business and other stakeholders to conserve energy. A program could be developed in close collaboration with Tampa Electric Company that builds on existing energy efficiency and conservation programs. The utility has implemented several programs that relate to this topic including:

- Free home energy audits (offered online, via phone or in person)
- Energy efficiency world website (educational website for children)
- Energy saving programs (peak demand, duct work, residential new construction, heating and cooling rebates, low income weatherization).

It is suggested to develop a marketing plan which should include a vision statement, goals, action items and milestones. It should also lay out the strategy that will be implemented and provide an overview of the implementation tactics. Specific sustainability goals should be included such as “reach and educate 1% of Hillsborough County’s population” or “reach a minimum of 1,000 residential and 300 small commercial businesses within the first 12 months.” A detailed budget should be created that includes an expenditure forecast and various scenarios (best and worst case). The plan should also address the success criteria and which metrics will be used to measure success and how they will be sourced.

Furthermore, using existing programs to ‘piggy-back’ can be a successful way of reaching the audience. As outlined under LPP 2.7 it was recommended to develop challenge programs that target residents and/or businesses. Existing challenge programs within the County will be evaluated in order to assess whether these can be expanded to include an energy savers challenge, for example. A variety of challenge programs relating to energy or climate change have been implemented throughout the nation. It is suggested to start with a challenge pilot program that can be expanded in the future. A recommendation is to target a specific audience including:

- Schools
- Office buildings
- Neighborhood organizations
- Home Owner Associations

The program can be based on points and run throughout the year. Incentives should be given to the challenge winners that can include monetary prizes or recognition awards. It is recommended to monitor the programs by producing progress reports, develop a unique metrics management database, summary evaluation reports or conducting regular surveys.

Energy Star Pledge

Hillsborough County is encouraged to participate in Energy Star’s national campaign that encourages residents to take a pledge to make small contributions to reduce energy consumption and fight climate change. This is a useful PR tool that could spark the competitive spirit of County residents.



Table 1: Current outreach and education programs examples.

No.	Department	Details
2	Children's Services	Teaching environmentally-friendly practices to children.
3	Children's Services	Teaching water conservation techniques to children.
4	Children's Services	Recycling Clubs
5	Cooperative Extension	Educational publications and resources on green topics to the public.
6	Cooperative Extension	Coordinated and co-taught classes for homeowners on building green.
7	Cooperative Extension	Free gardening workshops and presentations to garden clubs and civic and community associations.
8	Cooperative Extension	Florida Yards and Neighborhoods (FYN) Program.
9	Cooperative Extension	Provides free "Water-Wise" workshops, rain barrel and "Compost Happens" classes.
10	Economic Development	Promotes the FDEP's green-certified lodging properties.
11	Economic Development	Organized sessions on green commercial development for commercial real estate developers and investors.
12	Env. Protection Comm.	Environmental summit to discuss environmental concerns.
13	Env. Protection Comm.	Hosts "Clean Air Month" events and activities.
14	Env. Protection Comm.	Manages the federal "Pollution Prevention (P2)" program locally.
18	Human Resources	Education campaign for employees on commuter options.
19	Human Resources	Created employee-to-employee program for staff to request carpool buddies.
20	Parks & Recreation	Environmental demonstration/learning centers at three parks.
21	Parks & Recreation	Owns a nature center at Camp Bayou Nature Preserve in Ruskin. Offers group tours of Coackroach Bay Preserve in south Hillsborough County.
22	Solid Waste	Funds anti-litter and anti-dumping education campaigns.
23	Solid Waste	Conducts waste reduction and recycling education programs for schools, community organizations and at area events.
24	Solid Waste	Coordinates an office recycling program for County offices in downtown Tampa together with the Facilities Division of the Real Estate Department.
25	Solid Waste	Develops and distributes the Recycling Planet newsletter to residential customers.
26	Solid Waste	Undertaking additional education efforts to encourage commercial recycling.
29	Water Resource Services	Established water conservation education and enforcement program.

Examples of community programs:

Broward County Conservation and Climate Change (C3) Challenge for all Broward Schools:

<http://www.broward.org/PollutionPrevention/AirQuality/EducationalPrograms/Pages/C3.aspx>

Fort Lauderdale Smart Watts Energy Savers Program:

<http://ci.ftlaud.fl.us/smartwatts/index.htm>

Lake County Energy Rebate Program:

http://www.lakecountyfl.gov/green_team/energy_efficiency_and_conservation_block_grant/activity_2.aspx

References and Calculations

American Institute of Architects (2006). Local Leaders in Sustainability - Green Counties. By Brooks Rainwater and Cooper Martin. Available online:

http://onondagacitizensleague.org/ocl_studies/2009/pdfs/Local_leaders_counties.pdf

Climate Wizard. Available online: <http://www.climatewizard.org/>

Detailed Scopes - RFP Addendum: 2.2.1

“A complete greenhouse gas emission inventory for all Hillsborough County government owned buildings, facilities, vehicles, landfills and any other Hillsborough County government activity or property which emits greenhouse gases. For the sake of this project, vehicles to be included shall be limited to County vehicles which use any of the County’s Fleet Management or the Sheriff’s refueling systems. Operations will include, but not be limited to, the Resource Recovery Unit of Falkenburg Road, the SE landfill and any other County operated landfill, and the County’s waste water treatment facilities. Buildings and facilities shall include, but not be limited to, departments which operate under the County Administrator, the EPC, the Sheriff, the Property Appraiser’s Office, the Tax Collector’s Office, the Medical Examiner’s Office, Civil Service, the Planning Commission, and the Clerk’s Office. It is not to include the Hillsborough County School Board, the Tampa Port Authority, the Aviation Authority, the Hillsborough Area Rapid Transit Authority or the County Health Department amongst others.”

LPP 1.1. Set Energy and GHG Reduction Goal.

1% reduction in electricity (2009 data):

158,238,816 kWh (1% = 1,582,388 kWh)

\$0.1 per kWh

Cost savings: \$158,239 per year

Emission factor (TECO): 0.74 kg carbon dioxide per kWh

GHG emissions avoided (1,582,388 kWh x 0.74 kg/kWh/1,000 =) 1,165 MTCO_{2e}.

LPP 1.2. Create Sustainability Vision and Mission.

Broward County Climate Change Task Force Mission:

<http://www.broward.org/NATURALRESOURCES/CLIMATECHANGE/Pages/Mission.aspx>

Sarasota County Sustainability Mission

<http://www.scgov.net/sustainability/>

LPP 2.1. Assign permanent staff for Office of Sustainability.

Assuming \$0.1 per kWh - 450,000 kWh must be avoided to pay back \$45,000.00 in salary (0.3% reduction of total annual electricity usage). At 0.74 kg emissions per kWh this equals (450,000 x 0.74/1,000=) 331 MTCO_{2e}.

LPP 2.2: Coordinate Energy Management Team.

Calculation: see LPP 1.1.

“Water & Wastewater Energy Management – Best Practices Handbook”:

http://www.nysesda.org/programs/Environment/best_practice_handbook.pdf

LPP 2.3. Incorporate Environmental Preferable Procurement Policy.

Miami Dade Green Purchasing:

http://green.miamidade.gov/library/green_purchasing.pdf

University of Florida Sustainable Purchasing:

<http://fa.ufl.edu/uco/handbook/handbook.asp?doc=1.4.12.16>

LPP 2.4. Achieve Green Local Government Certification.

Florida Green Building Coalition:

<http://floridagreenbuilding.org/local-governments>

LPP 2.5. Expand dedicated County Website for Sustainability, Green and Energy Issues.

http://www.tampagov.net/dept_green_tampa/

<http://www.pinellascounty.org/greenpinellas/>

<http://green.miamidade.gov/>

<http://yourgreencity.sarasotagov.com/>

LPP 2.6. Conduct and Publish GHG inventory Report.

King County GHG reports:

<http://your.kingcounty.gov/dnrp/measures/indicators/at-ghg-emissions.aspx>

LPP 2.7. Start Energy Challenge Programs.

Reducing county electricity usage by 1% through energy challenge programs results in (158238816 kWh x 1% x \$0.1 =) \$158,239 in cost savings.

Broward County Climate Challenges:

<http://www.broward.org/PollutionPrevention/AirQuality/EducationalPrograms/Pages/C3.aspx>

Green Office Challenge:

<http://greenofficechallenge.force.com>

LPP 2.8. Promote Alternative Work Schedules.

Assumptions:

Average 31 miles per day per employee (from commuter survey)

24 miles per gallon fuel efficiency

Saving 1 gallon per day per employee

6,852 employees (2010)

783 gallons saved per year per employee

1% of employees save \$123,368 per year and avoid (783 gal x 9 kg/gal x 68 employees x 1% / 1000 =) 471 MTCO_{2e}.

City and County of Honolulu Case Study:

http://www.google.com/url?sa=t&source=web&cd=1&ved=0CB0QFJAA&url=http%3A%2F%2Fwww.honolulu.gov%2Fhr%2Fpersonnel%2Fviii_1_flexible_work_hours_program.pdf&rct=j&q=flexible%20work%20times%20in%20city%20operations&ei=JlXWTazOG4OCgAF9l9SnBw&usq=AFQjCNEI6dUt_clrq4t7bt5BsDpsBOfdjQ&cad=rja

LPP 2.9. Turn off Lights Earlier At Night.

2009 electricity usage (Real Estate): 33,348,863 kWh

Electricity costs: \$3,334,886 (divided by 365 and 24 =)

\$381 per hour (x365 =)

\$138,954 savings per year total building (x20% =)

\$27,791 savings from 20% reduced lighting (divided by \$0.1/kWh =)
277,907 kWh saved per year
(0.74 kg/kWh =) 205 MTCO_{2e} avoided.

LPP 3.1. Address Climate Change in Comprehensive Plan.

Broward County Climate Change

<http://www.broward.org/NaturalResources/ClimateChange/Pages/Default.aspx>

LPP 4.1: Employee Outreach and Education Program.

1,000 kWh saved per year in all of County's 315 buildings equals (1,000 kWh x 315 x \$0.1 =) \$33,381 in cost savings per year and (1,000 kWh x 315 x 0.74 kg/kWh / 1,000 =) 232 MTCO_{2e} avoided.

Polk County Fleet Program:

<http://www.government-fleet.com/Article/Story/2009/01/Polk-County-Incentivizes-Employees-to-Reduce-Fuel-Costs.aspx>

EERE Industry Case Studies:

<http://www1.eere.energy.gov/industry/saveenergynow/pdfs/3m.pdf>

Building Operator Certification

<http://www.mwalliance.org/programs/building-operator-certification>

LPP 4.2. Partnership with UF/IFAS for Sustainable Technologies.

Lee County Community Sustainability Advisory Committee:

<http://www.lee-county.com/gov/dept/sustainability/Documents/Sustainability-Goals-2011.pdf>

LPP 4.3. Partnership with UF/IFAS for sustainable technologies.

Hillsborough County Water Atlas:

<http://www.hillsborough.wateratlas.usf.edu/>

EWf 1.1. Apply integrated resource planning.

Integrated Resources Planning:

<http://www.aceee.org/research-report/i953>

EWf 1.2. Reduce electricity usage of County owned buildings by 10% over 5 Years.

Real Estate electricity usage (2009): 33,348,863 kWh (1% reduction = 333,489 kWh)

Cost savings (333,489 kWh x \$0.1 =) \$33,349 per year

GHG emissions avoided (333,489 kWh x 0.74 kg/kWh =) 245 MTCO_{2e}.

EWF 1.3. Continue to Purchase or Rent Energy Efficient Equipment.

Vending Miser Study:

http://www.usatech.com/energy_management/downloads/testimonials/KPPC-Pepsi_VMstudy.pdf

Cost of vending miser: approximately \$424

Annual electricity savings: 2,604 kWh

Electricity cost savings (at \$0.1 per kWh): \$260

Emissions avoided (=2,604 kWh x 0.74 kg/kWh / 1,000): 2 MTCO_{2e}

EWF 1.4. Assess Sheriff's Office electricity usage.

Hillsborough County Sheriff's Office bike patrol:

<http://www.hcso.tampa.fl.us/Articles/Articles/Pedal-Power-Patrol.aspx>

EWF 1.5. Consider Solar Water Heating.

Electricity cost savings per year: \$1,000

Electricity savings: (\$1,000 x \$0.1/kWh =) 10,000 kWh

GHG emissions avoided (10,000 kWh x 0.74 kg/kWh / 1,000 =) 7 MTCO_{2e}

Solar Water heating:

<http://www.thedailygreen.com/green-homes/latest/homemade-solar-water-heaters-460709>

Solar Water Heater on White House:

<http://voices.washingtonpost.com/44/2010/10/white-house-goes-solar.html>

EWF 1.6. Improve Lighting Timers at Athletic Fields.

Annual electricity usage for Parks, Recreation and Conservation (entire department): 14,236,606 kWh per year

Per hour: 1,625 kWh

20% reduction: 118,638 kWh

Electricity cost savings 118,638 kWh x \$0.1 /kWh =) \$11,864

GHG emissions avoided (118,638 kWh x 0.74 kg/kWh =) 87 MTCO_{2e}

EWF 1.7. Continue to reduce electricity peak usage.

Annual electricity usage (all accounts): 158,238,816 kWh per year

10% reduction (during peak hours): 15,823,882 kWh

Electricity cost savings (15,823,882 kWh x \$0.02 /kWh off peak pricing =) \$316,478

GHG emissions avoided (15,823,882 kWh x 0.74 kg/kWh =) 11,646 MTCO_{2e}

TECO Case Study:

http://www.tecoenergy.com/data/files/env08/Sec4_EnergyEffRenewablesStewardship.pdf

EWF 2.1. Reduce Office Water Consumption by 1% each year Until 2010.

Hillsborough County Water Division

<http://www.hillsboroughcounty.org/green/water.cfm>

EWF 2.2. Research feasibility on Water Reuse.

Hillsborough County Water Division

<http://www.hillsboroughcounty.org/green/water.cfm>

EWF 3.1. Purchase More Fuel Efficient Trucks.

Fuel truck diesel consumption: 385,615 gallons

1% reduction: 3,856 gal

Cost savings (3,856 gal x \$2.30/gal): \$8,869

Diesel emission factor: 10.21 kg/gal

GHG emissions avoided: 39 MTCO_{2e}

Wal-Mart Case Study

<http://walmartstores.com/Sustainability/7674.aspx>

EWF 3.2: Increase Fleet Economy by 10% within 5 years.

Fuel consumption (gasoline and diesel): 1,247,863 gal per year

10% reduction: 124,787 gal per year

Cost savings (124,787 x \$2.30/gal): \$287,008 per year

Emissions avoided (123,787 gal x 10.21 kg/gal /1,000): 1,274 MTCO_{2e} per year.

EWF 3.3: Assess Feasibility of AFV and Bicycle Patrol.

Los Angeles Case Study:

http://www1.eere.energy.gov/cleancities/toolbox/pdfs/western_region.pdf

EWF 3.5: Continue to purchase CNG vehicles.

Price difference Honda Civic and CNG: \$9,685

Fuel savings (CNG): \$479 per year

GHG Emissions avoided: 0.9 MTCO₂e

EPA Fuel Economy:

www.fueleconomy.gov

Montgomery County Case Study:

<http://www.government-fleet.com/News/Story/2010/06/Montgomery-County-Deploys-New-CNG-Trash-Trucks.aspx>

NE 1.1: Pilot Project to Assess Feasibility of Forestry Offsets.

Carbon sequestration rate: 2.36 MTCO₂ per acre per year

Acreage: 10,000 acres

Sequestration potential (2.36 MTCO₂e/ac/yr x 10,000 ac =)

23,670 MTCO₂e per year

Sequestration Rate from Chicago Climate Exchange:

http://www.chicagoclimatex.com/docs/offsets/CCX_Soil_Carbon_Offsets.pdf

NE 1.2: Promote Farming Practices that Reduce GHG Emissions.

Carbon sequestration rate: 0.5 MTCO₂ per acre per year

Acreage: 10,000 acres

Sequestration potential (0.5 MTCO₂e/ac/yr x 10,000 ac =)

5,000 MTCO₂e per year

Sequestration Rate from Chicago Climate Exchange:

http://www.chicagoclimatex.com/docs/offsets/CCX_Soil_Carbon_Offsets.pdf

NE 1.3: Expand Urban Forests.

Carbon sequestration rate: 0.5 MTCO₂ per acre per year

Acreage: 10,000 acres

Sequestration potential (0.5 MTCO₂e/ac/yr x 10,000 ac =)

5,000 MTCO₂e per year

Study by University of Florida IFAS Extension:

http://edis.ifas.ufl.edu/uw324#TABLE_1

T 1.1: Co-locate County facilities For Less Commuting.

ICLEI recommendations:

http://www.iclei.org/documents/USA/documents/CCP/Climate_Action_Handbook-0906.pdf

T 1.2: Increase Participation in Employee Commuter Programs.

Hillsborough County Initiatives:

<http://www.hillsboroughcounty.org/green/hr.cfm>

T 2.1: Expand Infrastructure for Low Carbon Fuels.

Cost saving per CNG vehicle: \$479 (also see EWF 3.4)

Cost savings replacing 200 vehicles (\$479 x 200 =) \$95,800 per year

Emissions avoided (0.9 MTCO₂e/yr x 200; EWF 3.4.): 180 MTCO₂e

Low-Cost Refueling Station (Idaho):

<http://www.inl.gov/lng/projects/refuelingstation.shtml>

Case studies:

<http://www.inl.gov/lng/projects/refuelingstation.shtml>

<http://www.government-fleet.com/News/Story/2009/12/Major-Refuse-Operators-Open-CNG-Fuel-Stations-in-4-States.aspx>

W 1.1: Develop and Promote Ambitious Waste Reduction Goal.

King County Eco-Industrial Districts

<http://www.triplepundit.com/2010/10/waste-resource-seattle-moving-eco-industrial-districts/>

W 2.1: Review Economic Study of Sludge Incineration.

Current sludge transportation:

72 tons a day or three loads per day normally

128 miles from RRF to Okeechobee landfill

Assuming fuel efficiency of 5 miles per gallon for one truck

Fuel Consumption: 77 gallons per day (for three trips)

Annual fuel consumption (125 days per year): 9,600 gal

Cost savings (9,600 gal x \$2.30 =) \$22,080 per year

GHG emissions avoided: (9,600 gal x 10.21 kg/gal =) 98 MTCO₂e per year

W 2.2: Expand current waste to energy initiatives

Solid Waste Management Division Initiatives

<http://www.hillsboroughcounty.org/green/sw.cfm>

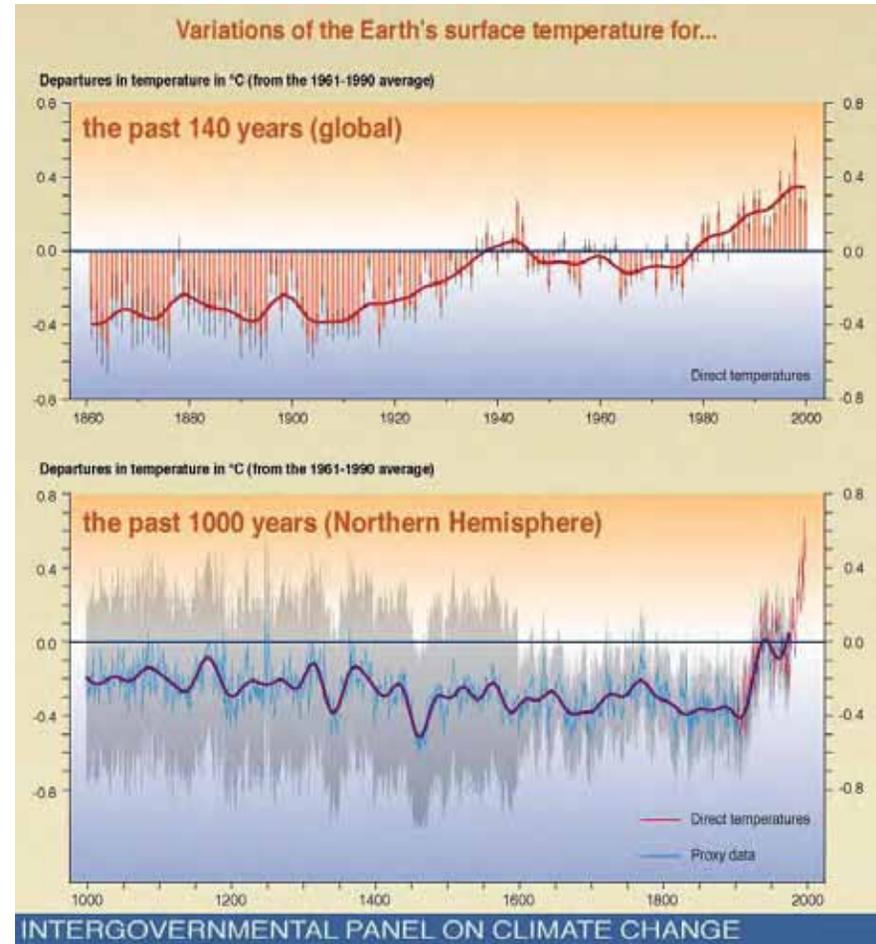
Appendix

Climate Change in Florida

There is broad consensus that the climate is undergoing a pronounced warming trend beyond the range of natural variability (see graph). The major cause of most of the observed warming is rising levels of the greenhouse gas carbon dioxide (CO₂). The increase in atmospheric CO₂ is the result of burning fossil fuels; if CO₂ continues to increase over the next century, the warming will continue. A climate change of the projected magnitude over this time frame represents potential danger to human welfare and the environment.

The uncertainty that exists mostly relates to when and how the greatest impacts will be experienced. Current measurements that include studies by NASA and NOAA using satellite data, borehole analysis, and sea level observations, amongst others, show that average global atmospheric temperatures have risen by about 1 degree Fahrenheit over the last century. This is considered the fastest rise in a thousand years. In Florida, it is estimated that temperatures will rise an additional 5°F by 2050 (*Climate Wizard*) if no greenhouse gas (GHG) abatement measures are implemented. This would lead to a rise of sea level by approximately 27 inches in 2060 meaning that 9% of Florida current land area would be submerged at high tide (*Stanton and Ackerman 2007*).

In the Tampa Bay area there are miles and miles of highly developed areas that are low lying and at direct risk from sea level rise. The current global rate of sea level rise is 1.8 mm/yr (0.07 inches/yr), while sea level rise in the Tampa Bay region (St Petersburg, Florida) is rising at 2.3 mm/yr (0.9 inches/yr; Tampa Bay Regional Planning Council). The sea level rise project study, referenced below, included Hillsborough County due to its location adjacent to Tampa



Bay, as well as for its tidally-influenced rivers (Alafia, Hillsborough, and Little Manatee). The entire western border of the county was also included in the study because it is affected by the tidal influence of Tampa Bay. Hillsborough County has over 130 linear miles of shoreline.

Climate change virtually affects every aspect in our daily lives through the threat of rising sea levels, more weather extremes, saltwater encroachment, to name a few. The United Nations Intergovernmental Panel on Climate Change (IPCC) has found that a 50-85% reduction in greenhouse gas emissions from 2000 levels by 2050 is necessary in order to restrict global warming to what are believed to be manageable levels (*IPCC 2007*).

In July 2007, Governor Charlie Crist established greenhouse gas emission targets for the state of Florida. This included an 80% reduction below 1990 levels by 2050 as recommended by the IPCC. Although achieving this target will involve significant expenditures, the failure to avert severe climate change would be even more costly to Florida, in cold hard cash as well as human and ecological impacts. The annual costs of inaction are projected to total \$92 billion by 2050 and \$345 billion by 2100, figures that respectively would constitute 2% and 5% of the projected Gross State Product (*Stanton and Ackerman 2007*).

Awareness of the complications associated with a possible climate change has risen. In Florida, many understand now that this is a global problem that requires local action (*Kates and Torrie 1998*). Particularly, local municipalities are looking for ways to mitigate or adapt to climate change. There are clear technological and strategic options to avert the impacts and to reduce GHG emissions. Governments can help improve their day to day operations by reducing energy usage and conserving resources. Additionally, 'green' codes and ordinances are efficient ways to save electricity, fuel and avoid GHG emissions; this includes establishing standards for insulation and lighting standards for new construction or retrofits for existing buildings. Investing in and planning for transportation modes such as mass transit, bicycle infrastructure and alternative fuels will help to slow rising energy usage and thus

decrease the emission of GHG. Cost savings and other environmental benefits will be co-benefits of these actions.

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