Moving Martin Forward

Strategic Energy Master Plan

2012

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Martin County Has Always Been Different

The unique character of Martin County, along with its Growth Management Plan, has created a distinct community. While its neighbors have approved higher of levels of intensity of development, which led to overbuilding and turned much of their agricultural lands into residential and commercial properties, which was a factor in the foreclosure crisis. Martin County was able to control expansion beyond its urban service boundaries through policy. The Growth Management Plan clearly defines goals such as Green building practices: The application of development standards that are aimed at utilizing sustainable site development practices, saving energy, utilizing renewable energy sources, reusing existing materials, improving water efficiency, reducing carbon dioxide emissions, improving environmental quality, improving air quality and conserving resources. [1]

Thanks to a well-informed Board of County Commissioners and an active and vocal community, Martin County was for the most part spared from the severe economic downturn that has affected commnities throughout the region. This desire to properly manage growth has allowed Martin County to distinguish itself from its peers. It has also been given Florida Green Builders Coalition (FGBC) Green Local Government Certification, and in the past few years has lowered its energy usage significantly through a series of performance contracts. Martin County government has been incredibly transparent in its effort. The public can view via the County's website how its buildings are performing, not just in regards to utilities, but also the costs of maintaining its buildings. There is a serious ongoing discussion of a consolidation of fleet facilities between Martin County, City of Stuart and the Martin County

1 Martin County Comprehensive Growth Management Plan

School District with a possible Compressed Natural Gas (CNG) and fueling facility. There is a 62 acre brownfield site that would give the county and incredible opportunity at renewing the land. and producing clean energy. This could also be a potential net zero site. Martin County is not only making the improvements to their buildings in regards to what they are spending on utilities that must take place, but also in the implementation of the metrics. Metrics are crucial in that they allow for monitoring these modifications going forward. This transparency allows for the residents to know what it really costs for its government to operate their buildings, as well as shows proof that they are indeed good stewards of the tax dollars they receive from the public at large. Just in the past year, Martin County saved $500,000 in energy costs at 26 county buildings and parks as a result of a performance contract with Trane Corp. Previous performance contracts for Holt Correctional Facility and other county structures continue to reap savings for the taxpayers along with reducing its carbon footprint. Usually, it is the private sector driving efficiency, but as we have learned, Martin County has always been different.

In 2011, the county put out a Request for Proposal (RFP) for a Strategic Energy Master Plan (SEMP) to be created for Martin County. This allows for the county government to examine its past and current initiatives in regards to energy and water conservation and to build a path for its residents to follow. It is time that the residents and business owners learn that one can achieve energy and water savings just like its county government, and pay for those improvements through the savings they generate. It allows the consumer to know the Return On Investment (ROI) and to make educated decisions based not just on the money and the kilowatts saved, but in Martin County's case, the carbon that has been reduced from its environment. In implementing the recommendations from the SEMP, Martin County will create a paradigm shift and will continue to lead the region, as these recommendations also build the necessary funding mechanisms to finance future energy efficiency and renewable energy efforts. The SEMP recommends that Martin County create a means to collect and report on the progress of the proposed inititaives ,as well as monitor the data being produced by the its residents and create a program to assist in providing its residents with healthy locally produced foods. This entity will also report on a regular basis the reduction of energy and carbon, as well as creating educational and job opportunities for its community. This plan allows Martin County to begin to reduce its controllable carbon in a measured and scientific manner. The plan recommends utilization of tools such as: Energy Star's Home Energy Rating System, Portfolio Manager, the U.S. Department of Environmental Protection EPA's Watersense program and Florida's WaterStar designation. The plan also seeks to utilize the residential checklist created by the Florida Green Building Coalition to assist in the implementation of the program. The SEMP will also promote the U.S. Department of Energy's Building Performance Database to allow for the uploading of data. This plan will allow for these initiatives to provide critical data as it relates to measure the successful implementation of these programs. By creating a standard of metrics we will be able to attract capital, as presently Bank of America and other federal and private institutions have decided to invest billions into sustainability grants and loans. Martin County, with its comprehensive and strategic plan , can now compete for these on a national basis. These are just a few of the many outlets for funding that the County can now go after, as the SEMP would create a clear and concise roadmap for implementation as well as measures to ensure our ability to monitor the work. It will be in keeping with the ideals laid out in the Growth Management Plan and the past government initiatives that this county continue to lead its citizens in being good stewards of the environment.

Acknowledgments

The DC Group of South Florida, Inc. (Project Consultant) would like to acknowledge the visionary leadership of Martin County Board of Commissioners. The Board was able to recognize the long-term impact of climate change and the serious economic impact of increasing energy costs to county residents. Bold decision-making was needed to seek out economically feasible methods to meet these challenges and to preserve Martin County's way of life for decades to come. These are not easy choices in such a difficult time and they should be commended. The Board should be praised for their commitment to being good stewards of the environment.

In addition, we would like to thank the staff of the Martin County General Services Administration for their commitment to lowering energy costs through performance contracts, which spurred this effort. We thank them as well for their transparency in reporting to the public and the Board of County Commissioners. We would also like to acknowledge the hard work of the Strategic Energy Master Plan subcommittee; Frank Slifka of General Energy Services Partners and Larry Maxwell from the Architects Association Marty Lavin from Hoyt Murphy Realtors, Gary Koser from Indian River State College, Tom Cooper from the Architects Association, Cindy Hall, President of the Florida Green Builders Coalition, Peter G. Merritt from the Treasure Coast Regional Planning Council, Dale Gregory from Cherrystone Management Consultants, and Jack Ahern from the Architects Association.

We also would like to thank Cody Taylor from the Department of Energy, Office of Energy Efficiency and Renewable Energy as well as Leslie Cook, the Director of the Energy Star program from the Environmental Protection Agency, along with the Cadmus Group and the entire SEE ACTION team, who provided us with invaluable information, technical support, and webinars, allowing the SEMP to include best practices in energy efficiency.

In more than a year of meetings, webinars, surveys, conference calls and several visits to the U.S. Department of Energy and the Environmental Protection Agency's headquarters in Washington, D.C., we were able to create a plan that built a vision of Martin County that will not only maintain its present quality of life, which is the envy of the region, but to also ensures that future generations live in an environment that produces less carbon, more jobs and a truly sustainable economy for its residents.

Definitions

Strategic Energy Master Plan (SEMP):

A detailed economic and environmental program to implement energy efficiency solutions. It has clear and concise goals as well as short-term, mid-term and long-term goals and objectives. It seeks to lower Martin County's energy and water consumption as well as its carbon footprint by utilizing the best practices and latest technology available.

Energy Star:

EPA introduced ENERGY STAR as a voluntary labeling program to identify and promote energy-efficient products, new homes, commercial and industrial buildings, and design projects for commercial buildings. The program provides businesses and organizations with easy-to-use online tools and resources to help establish energy benchmarks in commercial and industrial buildings.

HERS (Home Energy Rating System):

A standardized system for rating the energy-efficiency of residential buildings. HERS's are currently governed by three national industry standards: 1) the NASEO Technical Guidelines (2), which prescribe the accepted methods and procedures for rating a home; 3) the Mortgage Industry HERS Accreditation Procedures (4), which prescribe the methods and procedures for the certification of Home Energy Rating System by individual state governments and the national home mortgage industry.

Portfolio Manager:

This tool is used to rate the energy performance of operating buildings from energy (utility) bills. It uses EPA's energy performance rating system, the same metrics as Target Finder uses. Buildings that earn an EPA energy performance rating of 75 or higher for 12 consecutive months of energy bills, and receive verification by a professional engineer or registered architect that the building meets indoor environmental standards, qualify to earn the ENERGY STAR label.

WaterSense:

WaterSense is a partnership program sponsored by EPA with the goal of protecting the future of the U.S. water supply. By promoting and enhancing the market for water efficient products and services, WaterSense makes every drop count by leveraging relationships with key utility manufacturer and retail partners across the U.S.

Florida Water Star^{SM} :

A water conservation certification program for new and existing homes and commercial developments. Standards and guidelines for water efficiency are included for: Indoor fixtures and appliances, Landscape design and Irrigation systems.

Carbon Footprint:

The amount of carbon dioxide or other carbon compounds emitted into the atmosphere by the activities of an individual, company, country, etc.

Greenhouse Gases GHG:

Any of the atmospheric gases that contribute to the greenhouse effect by absorbing infrared radiation produced by solar warming of the Earth's surface. They include carbon dioxide (CO2), methane (CH4), nitrous oxide (NO2), and water vapor. Although greenhouse gases occur naturally in the atmosphere, the elevated levels especially of carbon dioxide and methane that have been observed in recent decades are directly related, at least in part, to human activities such as the burning of fossil fuels and the deforestation of tropical forests.

Metric Ton of Carbon:

Common international measurement for the quantity of greenhouse gas emissions. A metric ton is equal to 2205 lbs.

Florida House Bill 697:

Building Code Standards: Revises provisions authorizing use of solar collectors & other energy devices; revises requirements for future land use element of local comprehensive plan to include energy-efficient land use patterns and greenhouse gas reduction strategies; revises eligibility requirements for rebates under Solar Energy System Incentives Program; expands required codes to be included in Florida Building Code updates, etc.. It was signed into law on July 1, 2008

Florida House Bill 7117:

Energy; Adds factors for PSC to consider in reviewing 10-year site plans submitted to commission by electric utilities; provides for portion of proceeds of local government infrastructure surtax to be used for financial assistance to residential & commercial property owners who make energy efficiency improvements or install renewable energy devices; deletes obsolete directive to PSC to adopt rules for renewable portfolio standard; prohibits cultivation of certain algae in plantings greater in size than 2 contiguous acres; requires DOACS to conduct statewide forest inventory; provides appropriation from Florida Public Service Regulatory Trust Fund for purpose of PSC, in consultation with DOACS, to contract for independent evaluation of Florida Energy Efficiency and Conservation Act. APPROPRIATION: $250,000 was signed into Rick Scott on

Executive Summary

The Strategic Energy Master Plan (SEMP) is a detailed economic and environmental program to implement energy efficiency solutions. The plan seeks to educate residents on water conservation and agricultural solutions that could have a positive economic impact on the county. This strategic review and immediate action plan empowers policy makers to manage and establish goals towards improving the county's energy and water resources. The plan creates a positive impact on the environment by creating local jobs, increasing disposable income of county energy users and significantly improving the health and quality of life in the county. This approach allows policy makers to manage the key economic drivers in the region and focus the end users to become energy independent over time. The plan has been created to demonstrate that there are significant economic opportunities for a detailed action plan that will result in energy efficiency, economic development, and improved standards of living.

At the core of any good strategy is pragmatism: we must first decide what can be done given the resources presently available and understand any/all time constraints. Good strategies fail in the implementation phase because they do not include resource constraints. The foundation of the plan is fully understanding of the resource constraints that face its local governments, residents and the business community. Next, we isolate the key energy reductions that can be leveraged, and determine the impact on bottom-line performance community-wide. The analysis first reveals that the key area for energy reduction is to focus on the Building Envelope, as that has been traditionally ignored, especially during the building boom. Florida experienced during the last thirty years. The next step is a management system to systematically measure and reduce energy consumption within Martin County. The Energy Management As A Systems chapter addresses the specifics of the energy program and the process to achieve consistent energy reductions that are measurable and quantifiable. This program will progressively reduce energy costs and enrich the residential and business community over time. In order to actually implement the energy management program, resources will be required -- ranging from workforce training, education and outreach, as well as creating a benchmarking component. An organizational structure with specific objectives must be established in order to do the actual energy reduction work. This organization must also provide data to the entity the SEMP recommonds Martin County create. The plan recommends the establishment of The Martin Sustainability Initiative to actually execute on the energy efficiency program. We must also look at the transportation and water needs of the community moving forward, as well as the cost feasible implementation of renewable energy in the near future. Finally, the Micro-Farming/Sustainable Agriculture chapter addresses the key areas of quality and healthy living that can be achieved through locally produced agriculture.

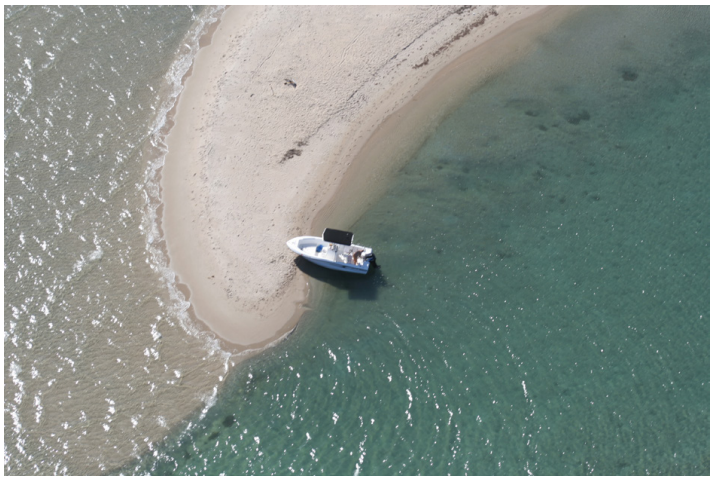
The consultant requested that the members of the Martin County Strategic Energy Master Plan development committee respond to three surveys: Energy, Water and Transportation. These results help to build the background of information of what the committee members thought about Energy, Water, Transportation and Martin County.

The Martin County Strategic Goals Section highlights the key achievable goals for the county in the next ten years. The Strategic Goals Section focuses on two specific achievable goals; the first of which is to reduce the carbon footprint or improve energy efficiency by 20% over the next 10 years. The following sections identify key specific goals. These include opportunities in energy reductions in transportation, renewable energy adoption, broader energy efficiency education, and cost relationship between water use and energy usage. The plan deals with the most challenging energy efficiency opportunity: economics and financing investments in energy efficiency. Because energy is such a core component to local economies, it plays a pivotal role in economic development, job creation, and improved living standards. The closing sections deal with renewable energy opportunities, agricultural sector opportunities, water management, renewable energy education, and renewable energy. Finally, this is a comprehensive action program that addresses the key interrelationships that exist in local public policy issues. Public policy makers can now take action and achieve measurable results.

Martin County, Florida Overview

The Board of County Commissioners is the legislative body of the county and has charge of all county executive and administrative functions, except those assigned by the Constitution to its independent county officers or to the independent school district. The Board also has some quasi-judicial functions. Some of functions exercised by the Board are countywide, while others are applicable only in the unincorporated areas of the county where the Board has many of the functions of a municipality. The county commissioners are elected by countywide vote, but each one represents a specific district. The Board appoints the county administrator who is responsible to it for the day-to-day operations of the county government. The current county commissioners by district are:

- Doug Smith
- Ed Fielding
- Patrick Hayes
- Sarah Heard, Vice Chair
- Ed Ciampi, Chair



Martin County Incorporated and Unincorporated Communities:

Incorporated

1. Town of Jupiter Island
2. Town of Ocean Breeze Park
3. Town of Sewall's Point
4. City of Stuart

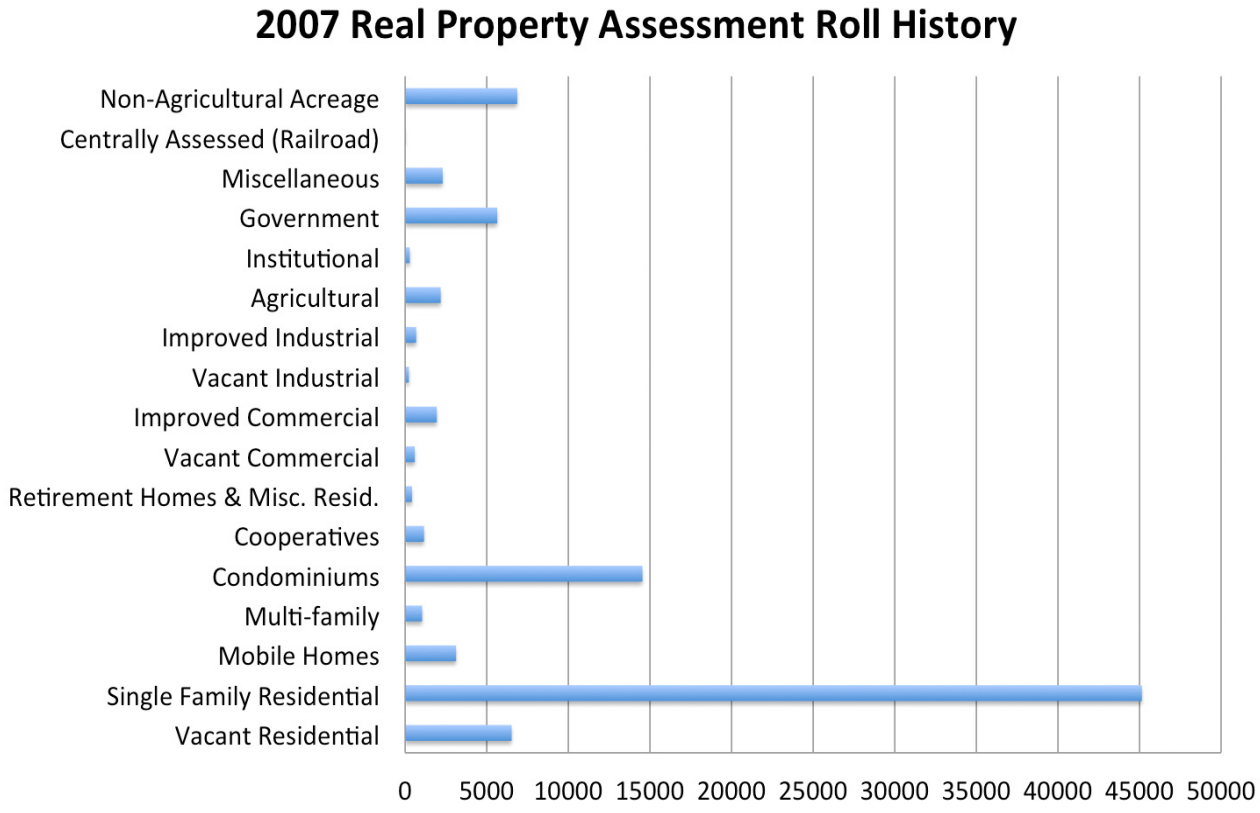
Unincorporated

5. Hobe Sound
6. Hutchinson Island part
7. Indiantown
8. Jensen Beach
10. Palm City
11. Port Salerno
12. Rio

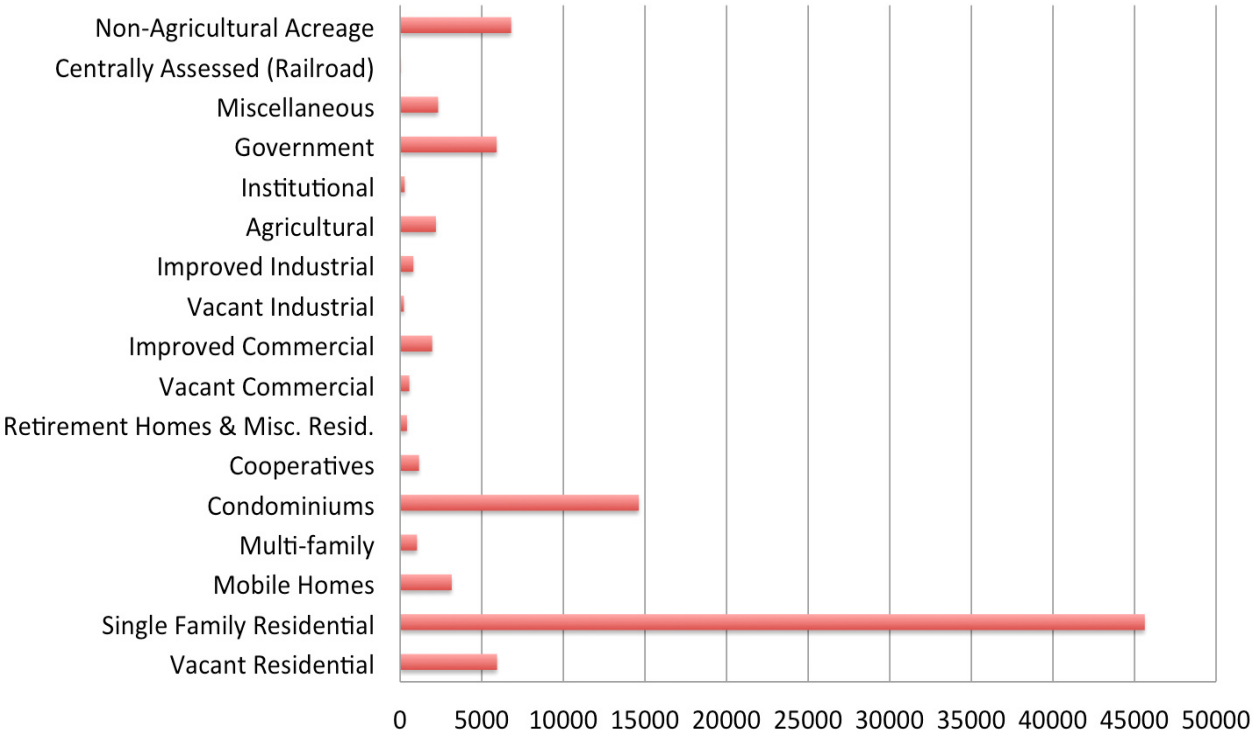
Martin County Largest Employers

Top 10 Tax Payers 2010	Top 10 Employers 2010	
Florida Power & Light Company	Local Government	4,031
Indiantown Cogeneration, LP	Martin Memorial Health Systems	2,400
Treasure Coast-JCP Associates LTD	Publix Supermarkets	1,168
Gulfstream NaturalGas	State of Florida	653
Louis Dreyfus Citrus, Inc	Old Cell Phone	450
Jeffrey H. Sands	The Home Depot	400
Bellsouth Telecommunications, Inc	Wal-Mart	390
Lowe's Home Centers, Inc	Winn-Dixie	382
Sandhill Cove Properties, Inc	Turbocom bustor Technology	374
Fl East Coast Rwy	Seacoast National Bank	282
Source: Martin County Tax Collector	Source: Martin County CAFR 2010, Martin County Business Development Board	

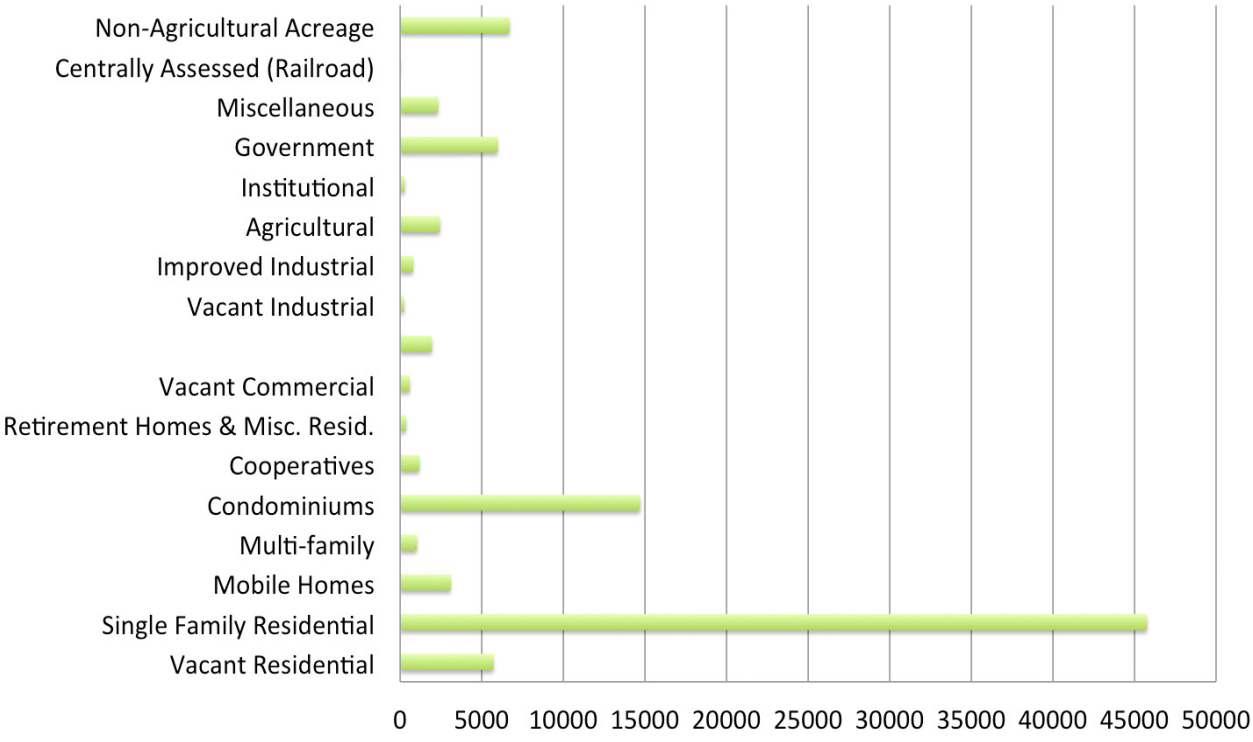
Martin County has total housing units of 78,131. Total households number 59,203.[1]The population estimate for 2010 was 146,318 and is expected to grow to 158,000 by 2020.



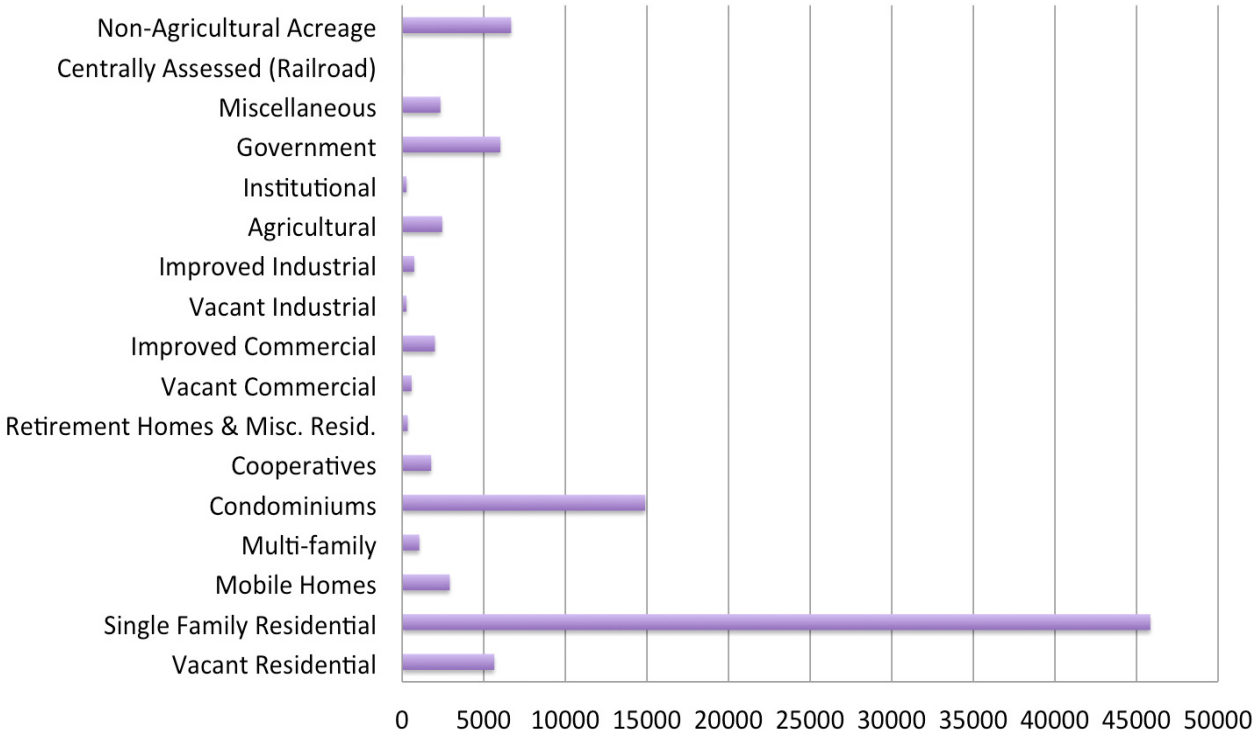
2008 Real Property Assessment Roll History



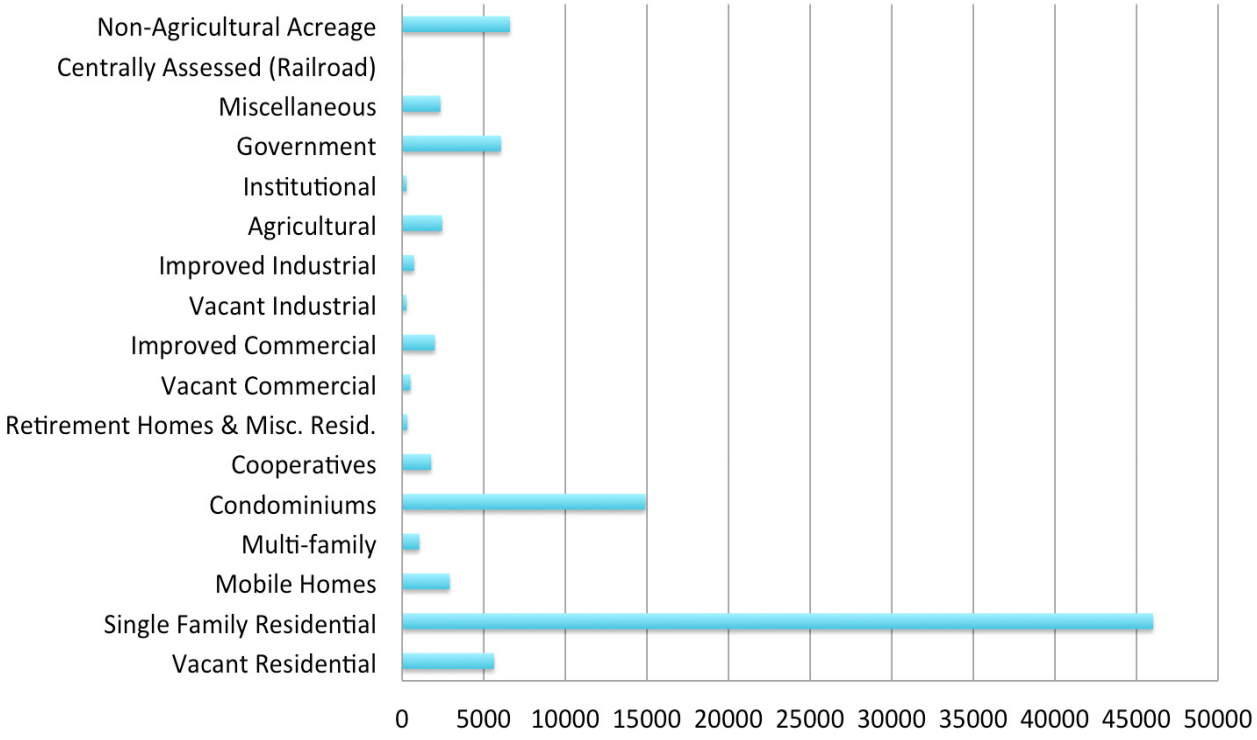
2009 Real Property Assessment Roll History



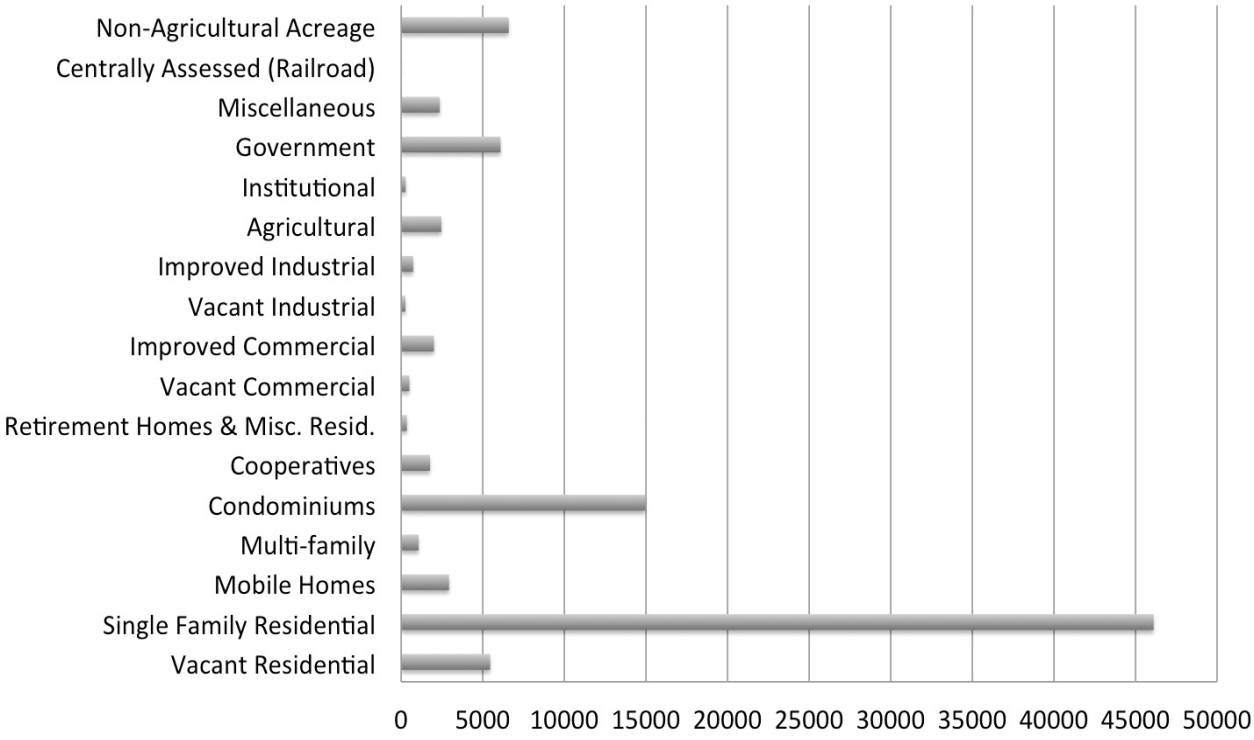
2010 Real Property Assessment Roll History



2011 Real Property Assessment Roll History



2012 Real Property Assessment Roll History



Strategic Energy Master Plan

The Martin County Board of Commissioners has determined that in order to execute effective public policy and to make every effort to improve and maintain the quality of life in the county, it is committed to preparing and adopting a countywide Strategic Energy Master Plan. This plan is designed to identify efficient, cost effective, and achievable reductions in the county's carbon footprint.

The term "Martin County" used throughout this document includes government-owned buildings, and commercial, industrial and residential structures. Also included are municipal structures in the City of Stuart, Town of Jupiter Island, Town of Ocean Breeze Park, and the Town of Sewall's Point.

The Commission also recognizes that increasing energy demand poses an immediate threat due to climate change. This threat will ultimately require Martin County to establish financially feasible and cost effective energy efficiency models, so that the County's energy users can adopt and maximize the current and future sustainable energy efficiency opportunities. These sustainability opportunities are designed to create a positive impact on the environment and achieve significant reductions in carbon-based energy demand and usage.

In addition, by meeting this energy challenge, Martin County energy users will have the added benefit of lower energy costs and, at the same time, lower the carbon footprint. The county population, according to Enterprise Florida, is projected to grow to 163,300 by 2020 and to 194,700 by 2040.[1]The commissioners recognize this opportunity to strike a balance between managed population growth and escalating energy costs.

In order to accomplish measurable reductions in the carbon footprint, the Board of Commissioners established this initiative for the development a countywide Strategic Energy Master Plan designed to address short-term, intermediate, and long-term goals. It's goals are to reduce the county's carbon footprint by 20 percent by 2022. These goals are driven by current cost-effective technology that produces efficient sustainable energy use reductions at specific and critical energy-demand areas such as building and residential envelopes, plug loads, water, transportation, and agriculture sectors. This initiative will serve as a guideline for energy users and provide the necessary implementation features that allow for the county to meet ambitious, yet financially feasible energy efficiency goals. The proposed plan recommends the establishment of a goal to reclaim brown field sites, to develop agricultural lands for biofuels and other energy producing crops and to build a unified county government center for shared services funded by the energy savings for the entire community.

4 Enterprise Florida, Inc. Orlando, Florida, "Martin County Profile", 2010 http://www.eflorida.com/profiles/CountyReport.asp?CountyID=67&Display=all

Once the implementation phase begins, it can assist the sustainability movement to expand and gain momentum, while also providing comprehensive assistance in strategic energy planning. The impact of sustainable energy affects all aspects of the community and can be applied to purchasing, agriculture, schools, commercial businesses, transportation, zoning, and codes.

The SEMP recommends using the national standards created by the U.S. Department of Environmental Protection Agency and the U.S. Department of Energy. These programs promote energy efficiency, water conservation, updating building codes, education and awareness initiatives, renewable energy and economic development. Martin County government has been at the forefront of energy efficiency and carbon footprint reductions, and has served as the facilitator in creating a countwide strategy. They accomplished this by obtaining the services of a consultant through a competitive process and in assembling a committee to investigate energy efficiency, renewable/alternative energy and sustainability options on a communitywide basis to lower Martin County's carbon footprint.

Strategic Planning Process

The county government's carbon reduction efforts have produced significant successes to date in terms of costs and carbon reduction. These accomplishments, as well as the development of a strategic plan for energy with a proposed third-party non-governmental organization (NGO) an will continue to build momentum and demonstrate that there is incredible potential for a market transformation. This kind of change would allow for capital and industries related to sustainability to relocate to Martin County. The plan sets forth a clear roadmap for energy efficiency and renewable energy in Martin County, articulating both a clear vision with goals for all county economic sectors and identifying specific short-term, immediate-term, and long-term strategies to assist in achieving these objectives.

The SEMP recommends establishing guidelines to lower barriers of adoption for energy efficiency methods and to assist in the establishment of funding that is driven by market demand and not solely by government grants. The plan provides potential methodologies for the successful funding of energy efficiency and renewable energy programs through innovative funding options.

Building on the success of the initiatives started by the county government, the plan will be applicable to the entire county, utilizing a systems approach that will include all energy users within the county. We will also focus on how HB Bill 697 and the recently passed HB 7117 has brought many changes in Florida, as it modified not only the buildings codes to reflect energy efficiency design, but also authorized the use of solar collectors and other energy devices. HB 7117 began allowing a portion of the proceeds generated by the law to be used by local governments to create an infrastructure surtax. This could be used for financial assistance to residential and commercial property owners who make energy efficiency improvements or install renewable energy devices. House Bill 697 also revised requirements for the future land use element of any local comprehensive plan to include energy-efficient land use patterns and greenhouse gas reduction strategies. This was a major step forward for Florida, as it began to understand and integrate energy into its local comprehensive plans, which brought energy efficiency design and carbon reduction to the county and municipal level on a statewide basis.

Energy Master Plan Development Model

1. **Consistent** - Align federal, state, regional, and local priorities such as House Bill 697[2]
2. **Measurable** - Use baseline research to set measurable goals, objectives, and actions and develop sound data management practices
3. **Cost Effective** - Select Projects with the highest Returns on Investment (ROI)
4. **Collaborative** - Encourage multi-jurisdictional Private/Public Partnership coordination with neighboring local governments, regional planning councils, and the State
5. **Financially Feasible** - Build a core component with organizational capacity to manage, finance, and publicize the SEMP

Energy Efficiency Metrics

The goal of the plan is designed and modeled to achieve the United States Department of Energy's (DO and the Environmental Protection Agency's (EPA) Home Energy Rating System (HERS) energy efficiency guarantees as well as achieving a countywide "Energy Star" rating. For the commercial sector, Energy Star's Portfolio Manager will be used for energy and water conservation benchmarking.

The plan recommends that Martin County use national metrics and benchmarking programs to measure energy efficiency. Martin County should use these measurement systems because they are scalable, measurable, and

5 http://www.slideshare.net/nzconsultants/house-bill-697-presentation

comparable for benchmarking, as well as the current best practices in energy efficiency metrics. In addition, this will provide Martin County with a competitive advantage for federal and private foundations. There are three primary measurement tools used by the federal government to achieve standard energy use measures. They are the Home Energy Rating System (HERS), Energy Star, and Portfolio Manager.

The HERS rating system begins analysis with a standard "reference home." This standard "reference home" is the basis of the analysis for the rating system. All additional homes are compared to this standard. This rating can compare any residential structure to a baseline standard residential structure or reference home and measure relative energy use or efficiency performance. By using this standard Martin County can achieve Net Zero Energy ratings in the time frame recommended by the SEMP. The optimal goal in HERS is to achieve a Net Zero Energy rating. The real estate market can use the HERS rating system to compare various consumer products and measures their energy use. The Energy Star rating is a labeling program that attempts to compare various consumer products and measure their relative energy use. The Energy Star rating system is primarily used on broad range of consumer products including refrigerators, computers, printers, televisions and other consumer products.

Energy Star Rating system has an online database called Portfolio Manager. Portfolio Manager database is designed to the allow the measurement the energy and water performance usage of building structures in a secure online environment and compare energy use by buildings of similar size and usage. The Portfolio Manager system will allow an energy resource manger to measure and compare energy and water utilization in real time of all portfolio buildings in a designated area.

Martin County Strategic Energy Master Plan

Vision Statement

Martin County, Florida, aspires to be a sustainable community facilitated by County government's stewardship. It strives to engage all aspects of sustainable best practices for the benefit of stakeholders within a cost/benefit analysis framework. We will look to build a strategic environmental stewardship plan designed to protect our environment for future use, while creating a cost-effective sustainable resource plan that establishes economic value.

Mission Statement

In continuing its commitment to environmental stewardship, the County will continue to promote best practices in protecting its natural resources and reducing its carbon footprint in a transparent, expeditious, and efficient manner. The County's goal is to transition all government operations, as well as commercial and residential stakeholders, toward adopting sustainable practices. Martin County will implement resource management goals, educate stakeholders, establish cost-effective projects that utilize independent metrics to measure the success of the sustainable goals, and create economic development.

The County will facilitate a public and private partnership between the government, local commercial enterprises, and residents to build sustainable practices designed to establish willingness by all stakeholders to innovate, change, and evolve into a sustainable, environmentally resource-friendly community.

To facilitate the achievement of this endeavor, the county will commit to the following actions:

1. The County will continue to reduce greenhouse gas and carbon emissions that result from energy consumption by employing alternative resources (i.e. solar, wind, geothermal, biomass, etc.)
2. Reduce reliance on finite resources
3. Survey and conduct a cost/benefit analysis of the environmental impact of alternative energy usage, water systems, transportation systems, and waste disposal
4. Facilitate community outreach and educational programs to inform the community about the importance of energy and water sustainability, and of opportunities to reduce their energy and water consumption

Martin County Strategic Energy Goals

There are two overriding strategic goals that define Martin County's Strategic Energy Master Plan. They are to and to measure and track energy usage throughout the county and reduce the Carbon Footprint 20 percent by 2022. These goals can be achieved through a policy of diligent government and private sector resource management, rigorous cost/benefit analysis, and developing best practices principles for energy efficiency techniques within the county. These strategic goals can be achieved through; Policy changes and minimal additional government resource investments. Achieving these strategic goals will provide energy independence and reduce the government and private sector operating costs.

I. Strategic Goal - Reduce Martin County's Carbon Footprint by 20 percent by 2022

Specific Objectives:

1. Develop strategies that target carbon reductions through technological developments, better processes, and product management.
2. Seek out best practices for green initiatives, examine public and private procurement practices for green targets, develop carbon capture programs, and consumption strategies.
3. Examine impact of greenhouse gases being emitted through transportation, land clearance, and production and consumption of agricultural, manufacturing and service sector good and services in the county.
4. Seek ways to mitigate carbon footprints through alternative and renewable fuel projects when cost feasible
5. Target drivers on carbon footprints such as population growth, economic activity and energy use, and develop affordable programs designed to decrease carbon footprints.

II. Strategic Goal - Measure and track the energy use in the county including residential, government, commercial, and industrial buildings in order to gain EPA's Energy Star 1-100 and HERS Residential Ratings based on energy national performance certifications

Specific Objectives:

1. Measure and track the energy use of all applicable buildings.
2. Encourage measures to assist buildings in Martin County to rank in the top 25 percent nationally for energy efficiency.
3. Encourage residents and business owners to obtain professional verification of indoor environmental standards that enable application for Energy Star designation.

Short-Term Objectives:

The SEMP will establish short-term objectives over a three-year period to enable Martin County to create a sustainable energy future:

Action Items 1:

1. Begin to benchmark all applicable housing and commercial units utilizing H.E.R.S. and Portfolio Manager.
2. Implement energy efficient incentives and programs that result in the reduction of energy demand.
3. Offer low cost financing and incentives along with possible rebates for energy efficiency upgrades and renewable energy purchases.
4. Develop energy efficiency and renewable energy educational programs
5. Support programs directed at reducing energy related waste, air and water carbon emissions, and land degradation.

Action Items 2:

1. Designate an organization to oversee the progress of the initiatives, to pursue future grant funds and to implement the programs to encourage energy efficiency, renewable energy and sustainable agriculture
2. Encourage the development of new technology that promotes energy efficiency, clean energy and the jobs they create
3. Seek reductions in energy cost countywide, including low-income households and small businesses.
4. Assist in the county's economy and improve its environment by partnering with government, business, and residence to bring about energy savings in a cost efficient manner.
5. Investigate cost-effective, energy-efficiency options calculated to reduce the energy cost of county residents by developing energy alternatives that reduce the impact of energy price increases.
6. Mitigate impact of energy use by increasing energy efficiency; improve support services for renewable energy resources.
7. Develop economic opportunities promoting emerging energy technologies.
8. Encourage participation in energy reduction competition and support productivity intended to grow Martin County energy businesses.

The SEMP focuses on programs in strategic areas that include alternative fuel technologies, building envelopes, agriculture, workforce development, lighting, transportation, and educational institutions and hospitals.

The SEMP proposes performance metrics that are tied to energy programs starting with planning stages and continuing through program development, implementation, and program tracking. Performance metrics will include:

1. Energy savings, load demand reductions, program and energy affordability.
2. Administration, operations, maintenance, and processing cost reductions.

3. Economic growth through both employment and energy product development and market and behavioral transformations toward energy efficiency
4. Energy product sales and job creation
5. Emissions tracking and reductions.
6. Investment in energy technologies

Action Item 1

Promote standards for targeted buildings that use 35 percent less energy and water than the average building nationally.

1. Encourage the development of educational programs for building owners and their tenants, customers, and employees that should focus on using resources responsibly
2. Encourage improved energy performance measures for targeted buildings
3. Demonstrate the county's commitment to sustainability by sending positive messages to lenders, appraisers, owners, investors, and potential tenants or customers within the targeted building population

Action Item 2

Encourage the owners of the county's building inventory to achieve Energy Star Eligibility Requirements.

1. Encourage all commercial buildings to benchmark their efficiency through Portfolio Manager
2. Assess building inventory that is underperforming and determine retrofit requirement to bring buildings up to Energy Star certification.
3. Identify possible financial assistance to perform retrofit requirements of deficient building inventory.

Action Item 3

Determine compliance with each space in building stock meeting minimum and maximum thresholds for key operating characteristics.

1. Assess for each building space the key operating characteristics
2. Determine applicable Energy Star building key operating minimum and maximum thresholds for comparison to peer group.
3. Assess deficiencies and retrofit requirements to bring each building within the minimum and maximum peer group thresholds.

Objective 4

Account for all energy use regardless of fuel type used for building inventory within the county.

Policy:

1. Collect energy data for applicable building stock on an ongoing basis for all active meters within the county.
2. Train with the guidance of DOE/EPA Energy Star personnel using SEMP assistants to enter county energy use data into Portfolio Manager.

Objective 5

Encourage all of Martin County to reach the goals for energy and water efficiency in new and existing commercial buildings.

Policy:

1. Encourage Martin County to adopt more robust energy codes and standards for buildings and plug loads
2. Align commercial building benchmarking, advanced metering infrastructure, energy, and operations and maintenance practices to increase energy efficiency
3. Target financing and incentives to support commercial sector goals for achieving Net Zero Design (NZD) efficiency levels for a substantial fraction of the new commercial buildings
4. Create integrated programs for the delivery of retrofit solutions
5. Support targeted research and development for the promotion of emerging technologies.
6. Encourage new construction to use zero net energy performance ratings and achieve 80 percent market share of new build starts by 2022

Objective 6

Establish incentives for county residents to join efforts to promote energy efficiency by obtaining a HERS residential rating.

Policy:

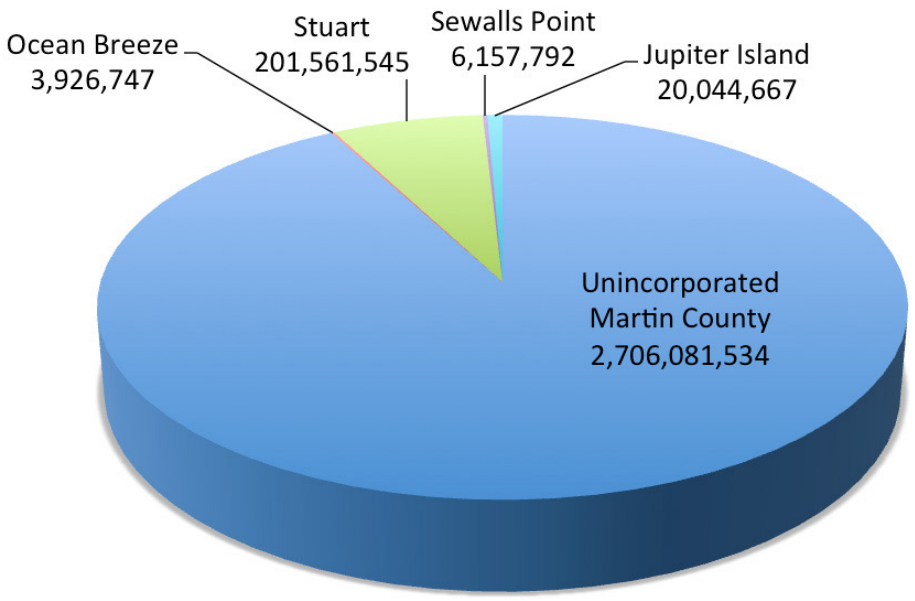
1. Encourage homeowners to utilize on-site inspections and testing by certified Home Energy Raters, using specially designed software, to analyze the expected home energy use.
2. Facilitate opportunities for residential homeowners to reach energy efficient HERS Index scores.
3. Encourage residents to use Florida Green Building Coalitions "Residential Retrofit Checklist"
4. Encourage residential homeowners and businesses to use Florida Power & Light's (FPL) free audits

Action Item 7

Promote building standards for new construction to reach Net Zero ENergy Design performance for all new single and multi-family homes by 2022.

Policy:

1. Educate home improvement markets to apply energy efficient building envelope solutions to existing homes.
2. Seek market transformation to change the energy efficiency behaviors of residential energy end-users, product supply chain, and services.
3. Develop innovative initiatives to reduce growing energy demand.
4. Assist home buyers, owners and renovators to employ a "whole house" approach to energy consumption and efficiency design that will guide purchase behavior.
5. Develop strategies designed to promote the upgrade efficiency in existing multi-family dwellings.
6. Encourage development of building and appliance codes to support building energy efficiency goals with active technical support and expertise.
7. Encourage residential builders to construct new homes with HERS. ratings of 60 or lower



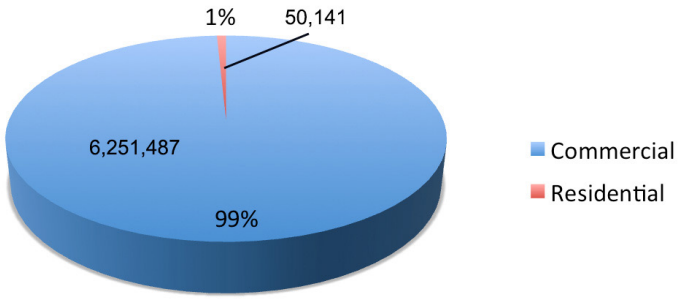
In order to understand our controllable carbon we need to first begin with our past electrical usage. In this endeavor, we were able to review the complete county-wide electrical usage for unincorporated and incorporated Martin County for the complete years of 2008-2010. In this chapter we will look at these years, as they are critical to establishing a true benchmark, and for Martin County and its residents to achieve its goal of reducing its controllable carbon by 20% in the next decade. In the next chapter we discuss Martin County's carbon footprint, as we were able to compile this raw data from FPL, Florida Department of Revenue and the U.S. Environmental Protection Agency to produce a true and accurate picture of what is being emitted. Most importantly, we can identify what areas can be controlled to reduce our negative impact upon the environment.

The charts reveal just how much Martin County has consumed energy during these years. We can now develope the strategies can be implemented to achieve the goals of the plan. For the plan to accomplish one its stated goals to measure the reductions of carbon and energy Martin County must receive more analytical data moving forward, allowing for the residents of Martin County to better understand their direct impact in regards to both carbon and energy. Martin County and FPL should create a partnership to receive and review this data on an ongoing basis, and seek to create even more detailed reports by industry, building type and utilization. This would create a data set unmatched in the state of Florida, and allow for better planning and greater cost savings to be realized by increased efficiencies and to promote awareness

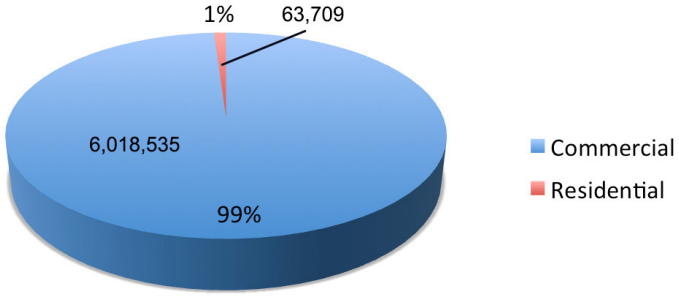
These charts reveal just how Martin County has consumed energy during these years, and then begin to see how the strategy can be implemented to achieve the goals. The goal of the plan is to receive more analytical data moving forward, allowing for the residents of Martin County to better understand their direct impact in regards to both carbon and energy. The Plan going forward, Martin County and FPL should create a partnership to receive this data on an ongoing basis, and seek to create more detailed reports by industry, building type and utilization. This would create a data set unmatched in the state of Florida, and allow for better planning, greater cost savings to be realized by increased efficiencies and to promote awareness in regards to energy consumption.

The data has been broken into graphs for each incorporated municipality and for unicorporated Martin County. This data was provided to us by FPL, as it allowed us to create a more detailed plan. In fact, as few counties in Florida have their energy consumption data so readily available. As the plan stated earlier, this data provides a true and accurate benchmark in regards to energy consumption and allows for our government leaders, business owners and residents to now start using the metrics and best practices described in the proposed SEMP.

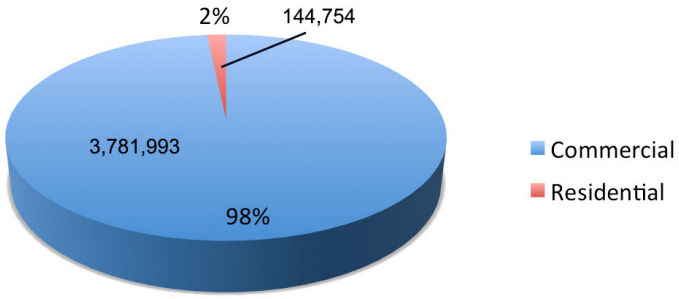
2008 Ocean Breeze Energy Use (kWh)

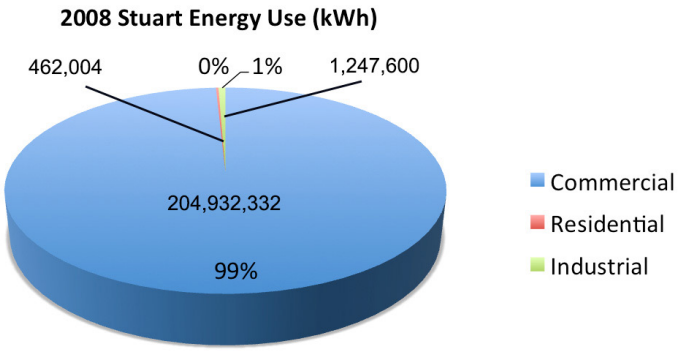


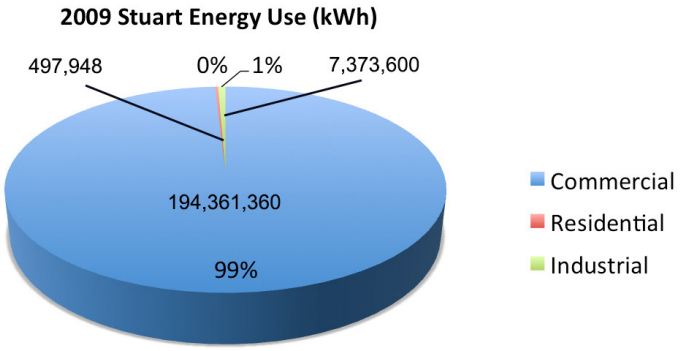
2009 Ocean Breeze Energy Use (kWh)

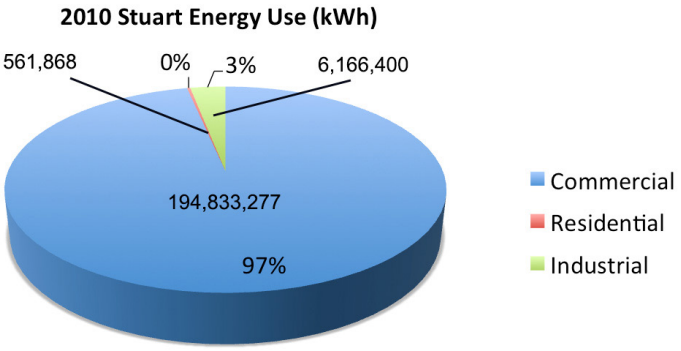


2010 Ocean Breeze Energy Use (kWh)

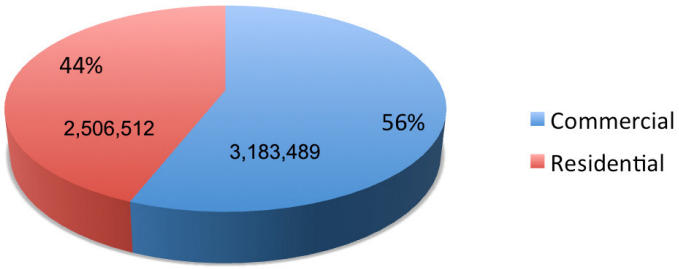



2008 Stuart Energy Use (kWh)
462,004
0%
1%
1,247,600
204,932,332
99%
Commercial
Residential
Industrial

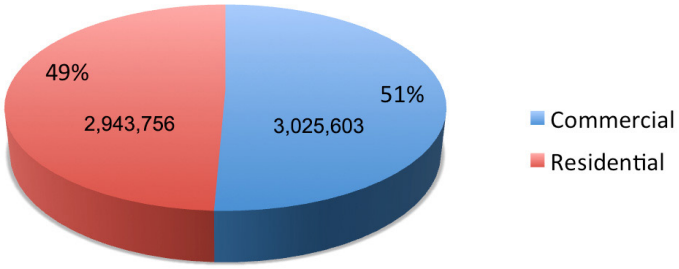

2009 Stuart Energy Use (kWh)
497,948
0%
1%
7,373,600
194,361,360
99%
Commercial
Residential
Industrial


2010 Stuart Energy Use (kWh)
561,868
0%
3%
6,166,400
194,833,277
97%
Commercial
Residential
Industrial

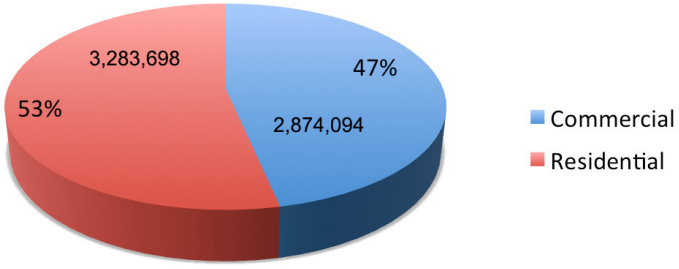
2008 Sewalls Point Energy Use (kWh)



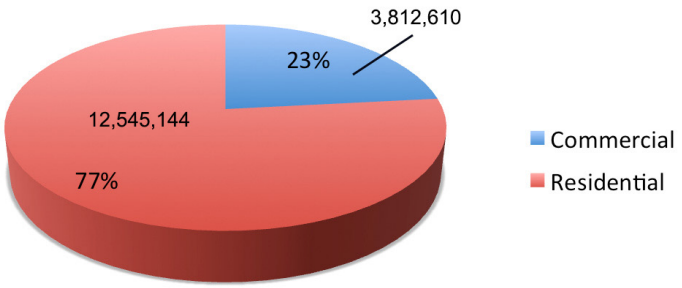
2009 Sewalls Point Energy Use (kWh)



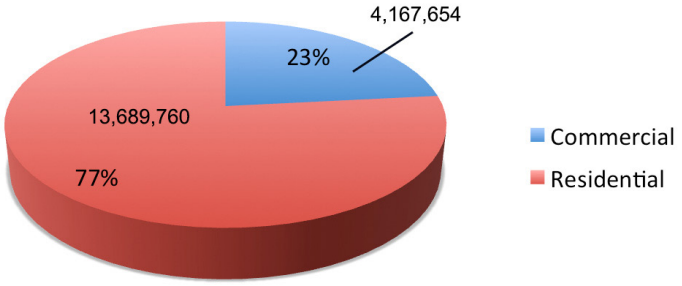
2010 Sewalls Point Energy Use (kWh)



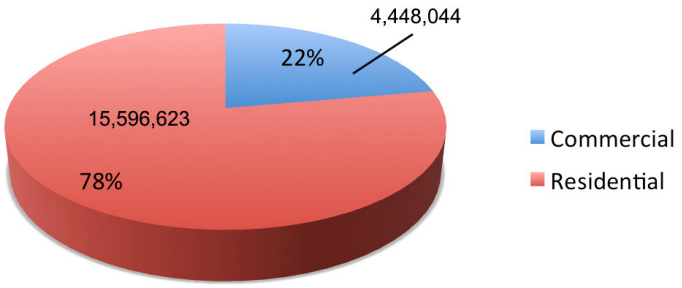
2008 Jupiter Island Energy Use (kWh)



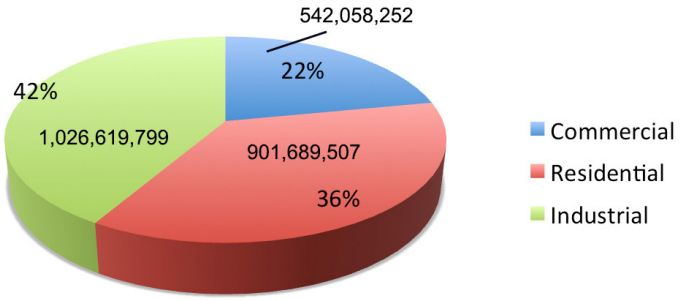
2009 Jupiter Island Energy Use (kWh)



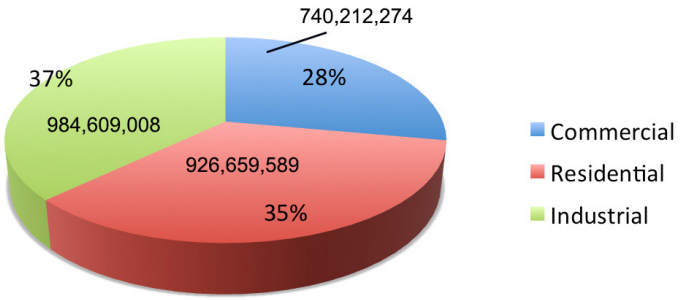
2010 Jupiter Island Energy Use (kWh)



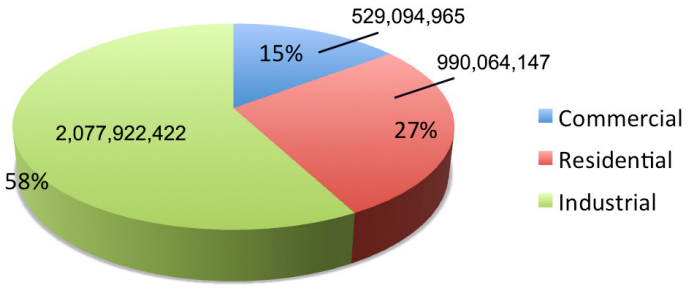
2008 Unincorporated Martin County Energy Use (kWh)



2009 Unincorporated Martin County Energy Use (kWh)



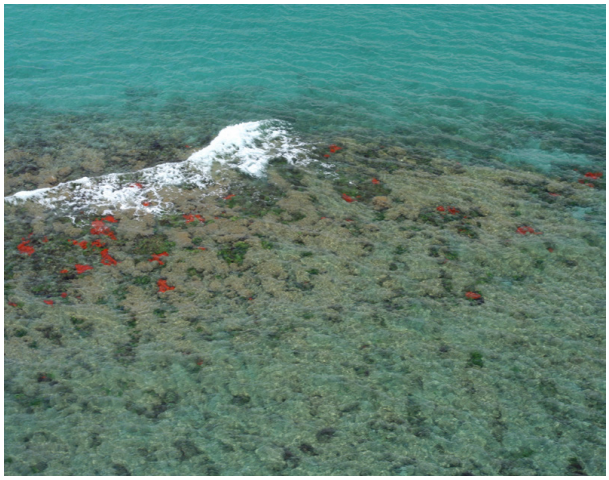
2010 Unincorporated Martin County Energy Use (kWh)



Carbon Footprint and Martin County

Carbon Footprint Defined

A carbon footprint is a greenhouse gas measurement tool. These gases are released because of daily activities such as heating and cooling homes, commuting to and from work, and using appliances. The gases, carbon dioxide (CO2) and methane (CH4) can be measured on a wide scale, from determining the carbon footprint of a nation or just the footprint of a single household. Measuring these gases helps determine the effect human activities have on the environment. Because of the net effect of greenhouse gas emissions, one can accurately predict a negative economic and environmental impact worldwide. To put this in perspective, the average American generates more than 20 metric tons of carbon annually.[1]



An individual's carbon footprint is the direct effect their actions have on the environment in terms of greenhouse gas emissions. The biggest contributors to the carbon footprints of individuals in industrialized nations are transportation and household electricity use. An individual's secondary carbon footprint is dominated by their diet, clothes, and personal products. This means that we can control and reduce our carbon by reducing our energy consumption, using fuel efficient vehicles and purchasing locally produced fruits, vegetables, beef, etc.

When released into the atmosphere, excessive carbon dioxide and methane gas are dangerous to the environment and contribute to climate change. If these changes result in the rise of sea levels, Florida coastal areas may see unprecedented flooding, far beyond that which already exists during the rainy season. In addition, radical climate changes can have a potentially devastating effect on the fishing, farming and tourism industries. These changes threaten the survival of coastal ecosystems, a billion-dollar industry.

In response to rising sea levels that the Southeast Florida Regional Climate Change Compact

Changes in ocean temperatures and rising sea levels threaten the survival of our fragile marine ecosystems and impact fishing, which is a multi-billion dollar industry. Higher levels of CO2 in the ocean affect fish and plant life, which would lead to a decrease in the fish population. Changes resulting from the release of these gases also affect air and sea temperatures, which can harm sensitive crops or cause a rise in sea level. These changes could poten-

6 http://www.eoearth.org/article/Carbon_footprint

tially affect crops that are sensitive to those changes which then would put the food supply at risk. This would also severely reduce Florida's third largest industry, agriculture.

According to The University of Florida Extension Center, "the Treasure Coast produces some of the finest citrus fruit in the world.[2] The Treasure Coast is home to many of the groves that make up the nine billion dollar Florida citrus industry. The local citrus industry not only adds to our economy but employs thousands of local workers."[3] This does not take into account the nursery plant industry, which could also be affected by climate change.

Florida could also experience a decrease in tourism, as changes to natural ecosystems such as the Everglades and beaches would result in fewer visitors, due to rising sea levels and other disruptive climate factors. If the carbon footprint is not reduced through energy efficiency, water conservation and a greater usage of non-finite energy production, the quality of life we have become accustomed could one day disappear. We can minimize our impact upon the world's environment, create jobs and economic development opportunities right here in Martin County.

Lowering the Carbon Footprint

There are several practices and simple strategies that end-users can implement to reduce their carbon emissions. These will lower the negative effects related to the carbon footprint produced by individuals, corporations, and counties.

Some states have set standards and created policies that will reduce emission levels in the future; these programs require industries to report and verify emissions. For example, the state of California passed The Global Warming Solutions Act in 2006. This act created a law to cap emissions to a specific level by the year 2020. The law also requires large industries to track emissions progress.

There are countless examples of energy efficiency programs that utilize renewable energy. The solar panels or photovoltaic (PV) cells are used to convert sunlight directly into electricity. This technology is important in lowering the carbon footprint because it provides cleaner alternative sources of energy. Increasing the use of solar panels reduces the demand for fossil fuels such as coal, diesel fuel, or natural gas.

The Florida Power and Light Company (FPL) has reduce its carbon emissions converting several of its diesel fuel plants to natural gas and with projects like the Martin Next Generation Solar Energy Center has begun to utilize renewable energy in greater proportions. The SEMP recommends to assist the energy sustainability movement in gaining momentum and becoming widespread by providing comprehensive assistance in the area of sustainable energy planning on a regional level. The impact of sustainable energy affects all aspects of the community and can be applied to purchasing, agriculture, schools, commercial businesses, transportation, zoning, and codes.

7 University of Florida IFAS Extension, "Agriculture", 2006 http://martin.ifas.ufl.edu/agriculture.shtml

8 University of Florida IFAS Extension, "Agriculture", 2006 http://martin.ifas.ufl.edu/agriculture.shtml

The FPL's Martin Next Generation Solar Energy Center was placed into its power portfolio in 2009. The estimated annual generation of energy from this plant is 155,000-megawatt hours, enough power to serve about 11,000 homes. The project also will reduce fossil-fuel usage by approximately 41 billion cubic feet of natural gas and 600,000 barrels of oil. It will also save FPL customers an estimated $178 million in fuel cost as well as prevent 2.75 million tons of greenhouse gases, equivalent to removing more than 18,700 cars from the road every year for 30 years. Energy efficiency, along with renewable energy projects like the Martin Next Generation Energy Solar Center, will play an important part in lowering the carbon footprint for years to come.[4]

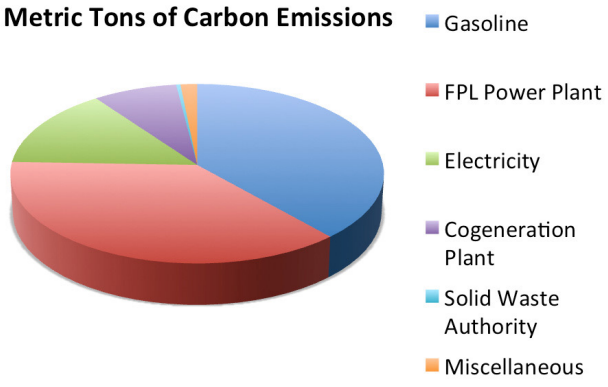
There are many other ways to reduce carbon emissions by individuals, many far less drastic than building a solar farm. Some of the simplest actions an individual can take are to exchange lights from incandescent to compact fluorescent light bulbs, change out old water fixtures for low-flow ones, or to sort recyclables from trash. Establishing programs to educate residents about conserving freshwater is an important step in protecting this vital resource. For example, switching from bottled water to filtered water is an important step in water conservation, as bottled water has to be transported and thus increases the carbon footprint of those who consume them.

Energy efficiency planning can be applied to purchasing, agriculture, schools, commercial businesses, transportation, zoning, and codes. Retrofitting buildings with state of the art energy efficient insulation material is critical to reducing their carbon footprints. Plug load appliances are another aspect of the program; we examine how appliances can be built to optimize everyday energy use in homes and to produce savings. Similiarly, making sure homes are well insulated during summer and winter seasons has proven to save households' money by reducing the demand for air-conditioning and heating loads. Proper home insulation lowers the amount required to heat or cool a property.

Methods of transportation and the impact they have on our carbon footprint must also be seriously considered in this discussion. We must continue to investigate the feasiblity of using hybrids, compressed natural gas (CNG) for fueling our vehicles bicycling, and a greater use of public transportation. Electric, hybrid, CNG, or vehicles that utilize bio-fuels can help to reduce greenhouse gases by decreasing the amount of fossil fuels necessary to power a vehicle. These cleaner fuel vehicles lessen our dependency on fossil fuels, have less price volatility and can be either found or produced right here in America. We also need to continue to advocate for the greater use of public transportation and carpooling, as it allows its users to collectively lower their impact.

9 http://www.fpl.com/environment/solar/martin_faq.shtml

Martin County's Carbon Footprint



In Martin County, a carbon footprint baseline was established, which met the first goal of the vision and mission statements. With data from FPL, the Florida Department of Revenue and the EPA, we were able to establish a baseline. From there, we created strategic goals designed to produce reductions in greenhouse gasses and carbon emissions. This all culminated with the recommendations of financially feasible best practices and technology to bring about reductions in the County's carbon footprint. The carbon footprint base lining process is critical, because it measures the past and current footprint. It also allows us to predict and monitor future carbon footprint levels for Martin County's end users. We have established a baseline, utilizing data from the Florida Department of Revenue and the U.S. Environmental Protection Agency, to highlight the current amount of carbon emissions that are being emitted in Martin County in the most recent past.

In 2010, Martin County produced 7,284,428 metric tons of carbon emissions from its consumption of gasoline (FL. Dept of Revenue). Another 7,023,496 metric tons was emitted at the FPL Martin Power Plant, while the county's homes and businesses produced another 2,736,945 metric tons through the use of electricity. The Indiantown Cogeneration Plant generated another 1,517,513 metric tons, and lastly its Solid Waste Authority added another 77,283 metric tons at its facilty.[5] The Martin Metropolitan Planning Organization 2035 Regional Long Range Transportation Plan estimated that the Historical Trend Land Use Plan would have 7, 348,530 lbs. (3674 tons) of-greenhouse gas emissions from vehicles traveled in Martin County. [6]These baseline numbers will be critical in the future because they give Martin County the ability to measure its future in a quantifiable manner, since the data is derived from reliable sources that can all be independently verified and (in the future) monitored effectively. Having the overall number is quite an achievement, but done alone without an action plan, or in Martin County's case, a SEMP, would leave the county not understanding the magnitude of its controllable footprint or give it the ability to change for the better.

10 http://ghgdata.epa.gov/ghgp/main.do

11 Treasure Coast Regional Planning Council; "Enhancing Mobility 2035 Martin-St. Lucie Regional Long Range Transportation Plan" February, 2011 Page ES-12

The SEMP will propose possible financing initiatives that will be necessary to achieve concrete results in reducing its carbon footprint in a way that will utilize the best practices on a regional, national, and global basis. We need to examine what is a carbon footprint and how to best measure it, what is the importance of measuring it, and what are the best ways to reduce it from a global, local, and individual basis. The biggest challenges we face this century are climate change, decreasing fossil fuel reserves, and the scarcity of potable water. The proposed SEMP is Martin County's response to these potential crises.

Strategic Goal of Reducing the Martin County's Carbon Footprint

The key strategic goal is developing specific actions that meet the cost/benefit analysis test to reduce Martin County's carbon footprint over the next 10 years. This is discussed in detail in the strategic goals section. Overall, the plan's goal is to have all commercial and residential buildings lower their carbon footprint by using green technologies. Motion sensors for lighting, solar thermal for heating water and energy efficiency codes are several ways to lower the carbon footprint and save on energy. Martin County residential and business entities should investigate if placing solar panels on roofs of buildings that are at certain heights and get optimal sunlight might be an option available to reduce energy use and create costs savings for the operation of these structures. Behavioral changes can lead employees to take the stairs, or turn off the lights when they leave the room, which can bring about significant reductions in energy consumption. The plan was created to support the implementation of solutions that can shrink the county's carbon footprint in a fiscally feasible manner .

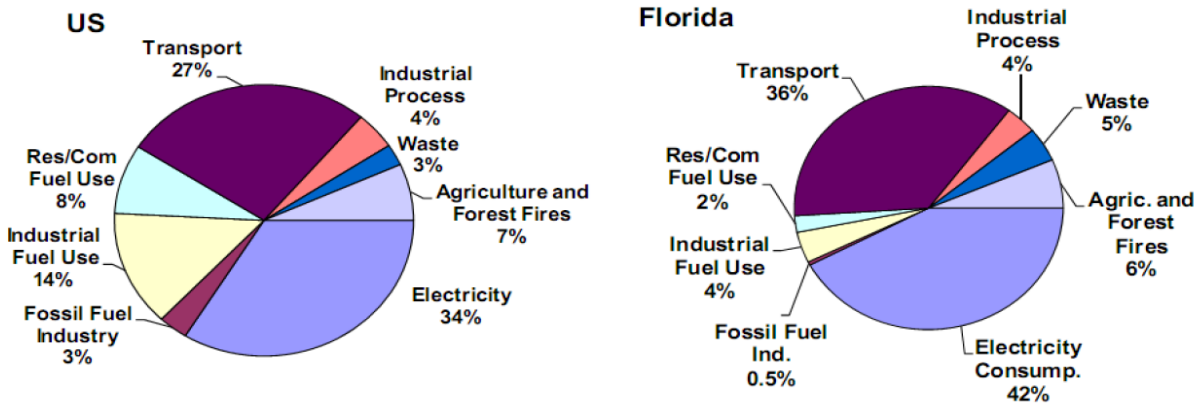
Martin County seeks to have their buildings ranked in the top 25 percent nationally for energy efficiency. Moving forward with the professional verification of the indoor environmental standards is a good start. This would enable participants in the proposed SEMP to apply for the ENERGY STAR designation.

To reach the overall goal of reducing the carbon footprint of Martin County, it is necessary to determine the compliance of each space in the county's building inventory, making sure the buildings meet minimum and maximum thresholds for key operating characteristics. The plan will recommend professionals, either engineers or registered architects, to serve as liaisons to the future SEMP Committee. These professionals would verify the accuracy of energy data collected as it relates to key operating factors and energy use. These professionals would be vol-

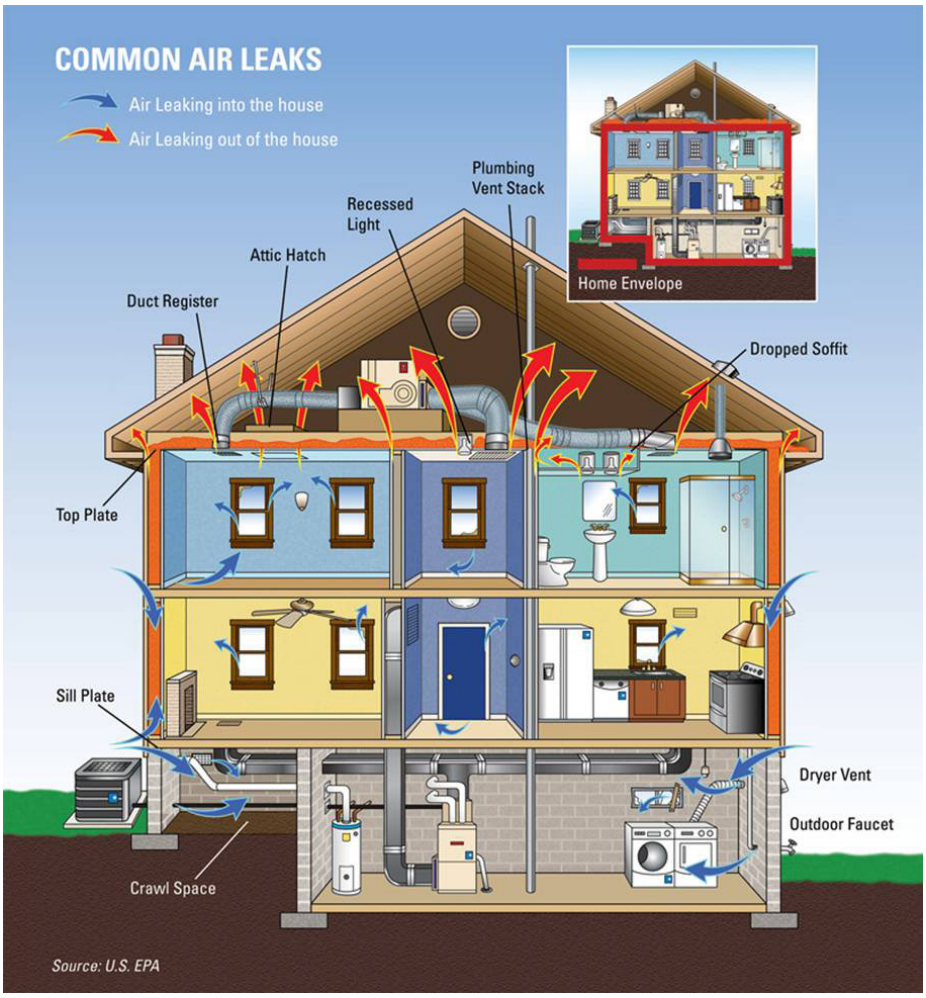
unteers brought in to participate in the verification of all building characteristics, and to seek consensus on how to best address energy efficiency. They would be provided access to information pertaining to building energy and water consumption, allowing them to make recommendations on a countywide basis. The plan also calls for establishing metrics for reporting on energy use, and for ensuring that the reporting and assessment of the building inventory is accurately accounted for. This would allow for building types within their proper categories to significantly improve the peer comparison process. Finally, after the review is completed, these new energy ratings would certify that the buildings are fully compliant and in accordance with industry standards.

The initiative proposes to review the buildings that have been assessed and or retrofitted for compliance with Energy Star. Building owners would be encouraged to apply for the Energy Star designation, as this would add to marketability. Benchmarking the county building inventory for each qualifying structure is required in this process.

Figure EX-2. Gross greenhouse gas emissions by sector, 2005: Florida and U.S.



The Building Envelope: The Key to Energy Efficiency

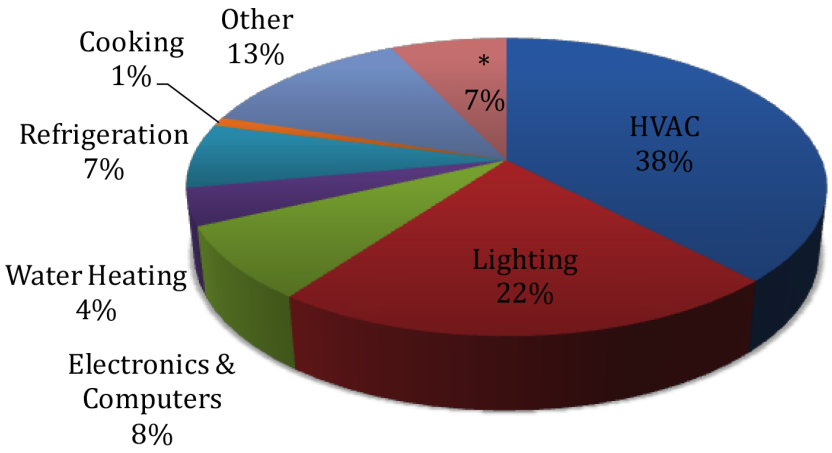


Commercial and residential building and their envelopes are vital to understanding energy efficiency in Martin County. The building envelope is the interface between the interior of the building and the outdoor environment, including the walls, roof, and foundation. Managing the building envelopes in Martin County directly correlates with managing and controlling Martin County's carbon footprint. Success in managing the building envelope will result in direct energy cost savings to property owners, and a reduction in the carbon footprint. On average, residential and commercial buildings consume 39% of the electricity generated and create 38% of all carbon emissions in Martin County. Managing the building envelope offers the end user many no or low cost modifications to reduce energy consumption. In fact the energy we consume in buildings is the most controllable in regard to both costs and carbon. The United States Department of Energy estimates that 40% of all energy used is to cool/heat our homes and businesses is wasted by faulty building envelopes. [1]

12 www1.eere.energy.gov/consumer/tips/pdfs/energy_savers.pdf

This simple fact holds true for homes and businesses here in Martin County and gives us an opportunity to begin reducing our energy consumption. This would aid in achieving the goal of lowering our carbon emissions by 20% by 2022. With the average American family spending $1,900.00 a year on their utility bills and with 43% of our energy use dedicated for cooling and heating, we can see the importance of taking care of the envelope. Controlling the building envelope can be done simply and very cost effectively. Here are several (no or low cost) recommendations to achieve energy efficiency. Each recommendation provides a payback in as little as a few months or as long as three years.

Residential Sector Energy Use

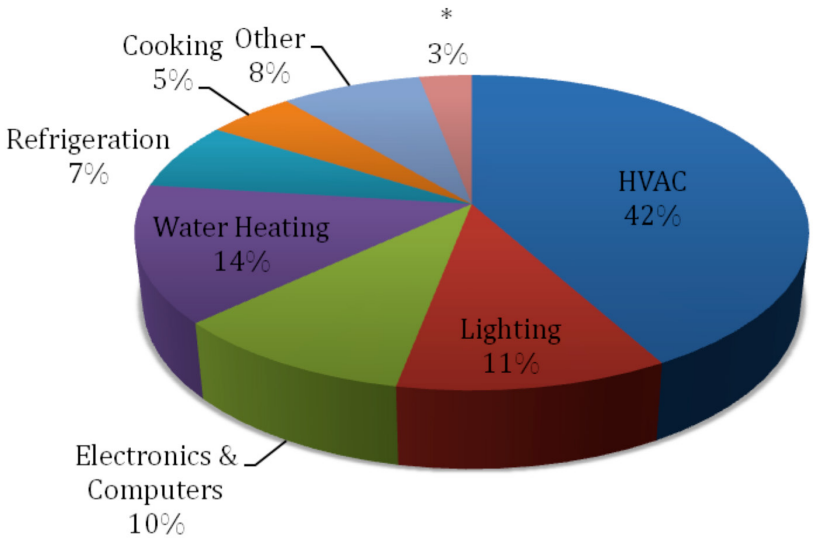


*This pie chart includes an adjustment factor used by the EIA to reconcile two datasets.

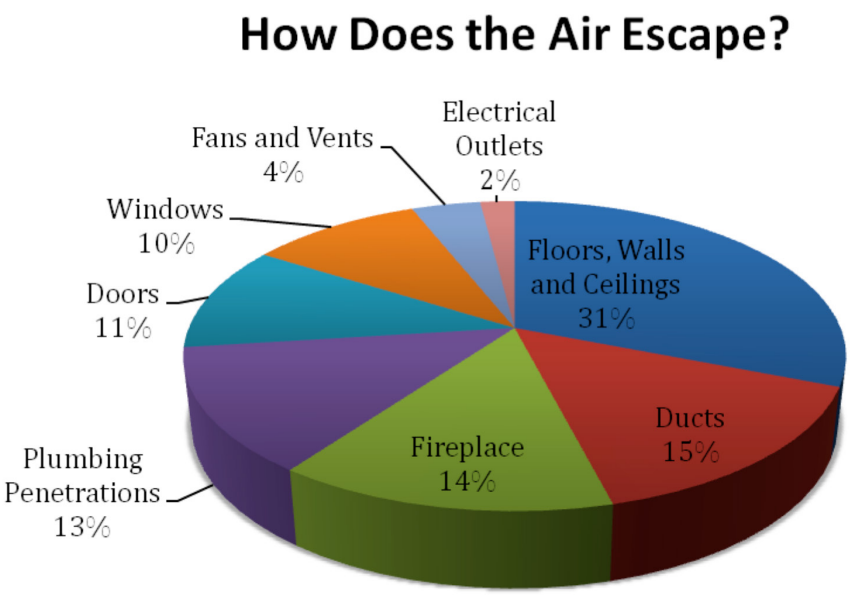
Insulation and Air Sealing

Heat naturally flows from a warmer to a cooler space; insulation provides resistance to heat flow, thereby reducing the amount of energy needed to keep cool a building year round in our region. Insulation is frequently discussed in terms of its ability to resist heat flow (R-Value). A variety of insulation options currently exist: Fiberglasss, insulating concrete forms, spray foam insulations (both open cell and closed cell), rigid foam board, and natural fiber insulation.

Commercial Sector Energy Use



*This pie chart includes an adjustment factor used by the EIA to reconcile two datasets.



Adding insulation strategically can improve the efficiency of the building; however, it is only effective if the building is properly sealed from uncontrolled infiltration of outside air. Sealing cracks and leaks prevents air flow and is crucial for effective building envelope insulation. Leaks can generally be sealed with caulk, spray foam, or weather stripping. However, pressure differentials can also be generated within a residence of commercial that can have tremendous impacts on air leakage from infiltration. Typically, the pressure differentials are created when a portion of the HVAC system (either the air handlers or the ductwork is located outside the conditioned envelope such as ductwork in a ventilated attic space or the air handler located in the attic or the garage. If any of the duct work has any leakage, the uncontrolled infiltration of hot humid air can be significant. The HVAC system and ductwork should be located within the conditioned envelope in every possible opportunity, and if it is located outside of the conditioned space duct leakage tests and repairs should be utilized as a tremendously cost effective way to improve efficiencies.

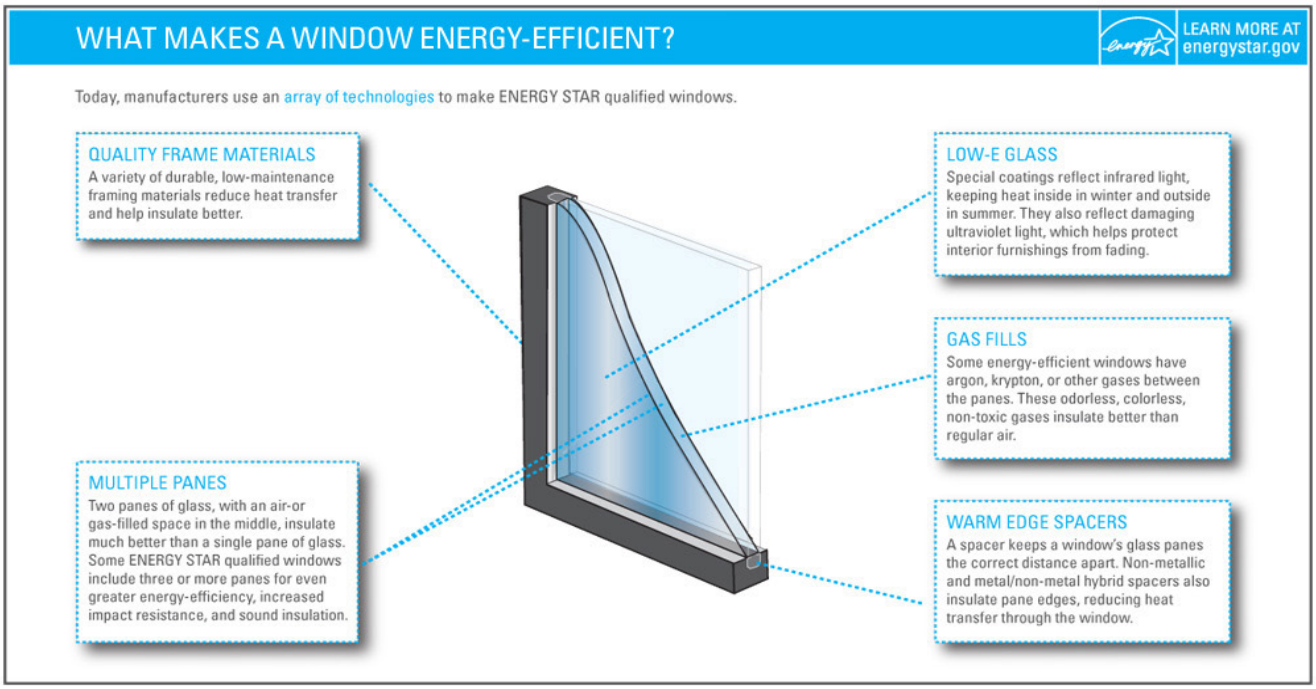
Roofs

Roof design and materials can reduce the amount of air conditioning required in hot climates by increasing the amount of solar heat that is reflected, rather than absorbed, by the roof. For example, roofs that qualify for ENERGY STAR® are estimated to reduce the demand for peak cooling by 10 to 15 percent. Proper insulation is also important in attics and building cavities adjacent to the roof. It is recommended that roof materials have a solar absorbance of a maximum of 20%. White roofs will provide tremendous energy savings. In addition, roofs also offer several opportunities for installing on-site generation systems. Solar thermal (solar water heating) and photovoltaic (PV) systems can either be installed as a rooftop array on top of the building or a building-integrated photovoltaic system can be integrated into the building as roofing tiles or shingles.

Walls

Like roofs, the amount of energy lost or retained through walls is influenced by both design and materials. Design considerations affect the placement of windows and doors, the size and location of which can be optimized to reduce energy losses or heat gains. Decisions regarding the appropriate material can be more complicated because the energy properties of the entire wall are affected by the design. Importantly, material selection and wall insulation can both affect the building's thermal properties.

A building's thermal mass – i.e., building materials with mass that have the ability to store heat – is determined



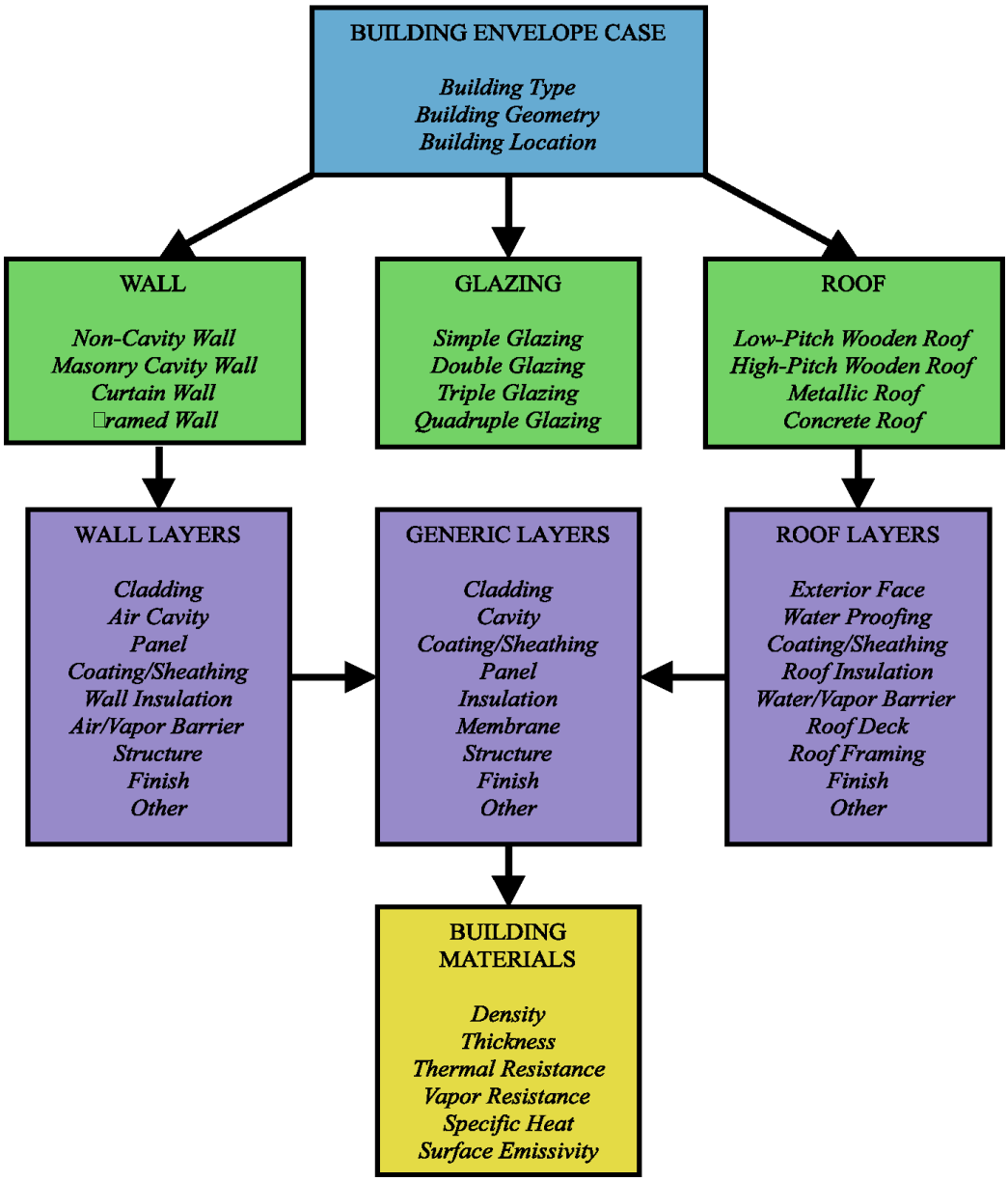
in part by the building materials used. Buildings with high thermal mass can absorb energy more slowly and then hold it longer, effectively reducing indoor temperature fluctuations and reducing overall heating and cooling requirements. Thermal mass materials include traditional materials, such as concrete, stone, and adobe. New cutting edge products, such as those that incorporate phase change materials (PCMs), which are solid at room temperature and jell or liquefy as they absorb heat; the absorption and release of energy through PCMs helps to moderate building temperature throughout the day.

Windows, Doors, and Skylights

Windows, exterior doors, and skylights influence both the lighting and the HVAC requirements of a building. In addition, to design considerations (the placement of windows and skylights affects the amount of available natural light), materials and installation can affect the amount of energy transmitted through the window, door, or skylight, as well as the amount of air leakage around the window components. New materials, coatings, and designs all have contributed to the improved energy efficiency of high-performing windows, doors, and buildings. Some of the advances in windows include: multiple glazing, the use of two or more panes of glass or other films for insulation, which can be further improved by filling the space between the panes with a low-conductivity gas, such as argon, and low-emissivity (low-e) coatings, which reduce the flow of infrared energy from the building to the environment.

In residential buildings, using optimum window design, location, and glazing specification is estimated to reduce energy consumption from 10 to 50 percent below accepted practice in most climates; in commercial buildings, an estimated 10 to 40 percent reduction in lighting and HVAC costs is attainable through improved fenestration. In commercial buildings daylighting can be one of the most effective energy saving strategies, but only if properly located and placed to insure high and even levels of quality lighting without unwanted direct solar gains or glare.

Whether commercial or residential, preventing unwanted solar gains into the building can have tremendous positive impacts on the energy use of the building in our climate.



Energy Management as a System

A systematic approach is required to make energy a controllable cost going forward. The key factors impacting energy cost reduction opportunities are available technology, amount of available resources and any other variables that allow energy cost controllability (Chart 1). All these variables are dynamic, and thus can change as governments or the private sector can at any point time lose focus due to a crisis. When making energy cost-savings decisions, policy makers must evaluate market conditions and select the best alternative available in a given time period. Over time, a systematic reduction strategy will yield energy cost reductions due to their implementation and will bring about savings to such a level that energy will no longer be a major factor within the a operational cost structure. This systematic approach can be applied to government, business, or any individual homeowner.

Chart 1

Factors Influencing Energy Opportunities at a Given Point in Time

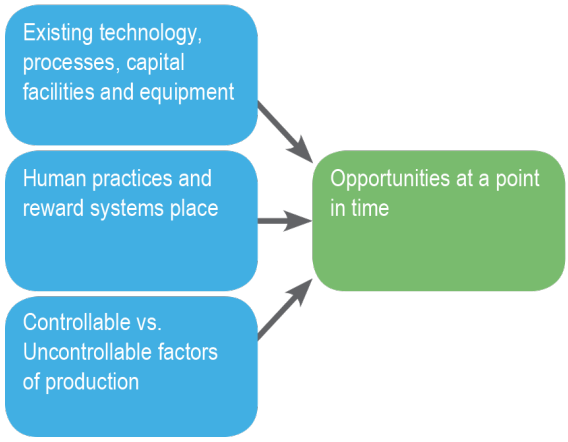
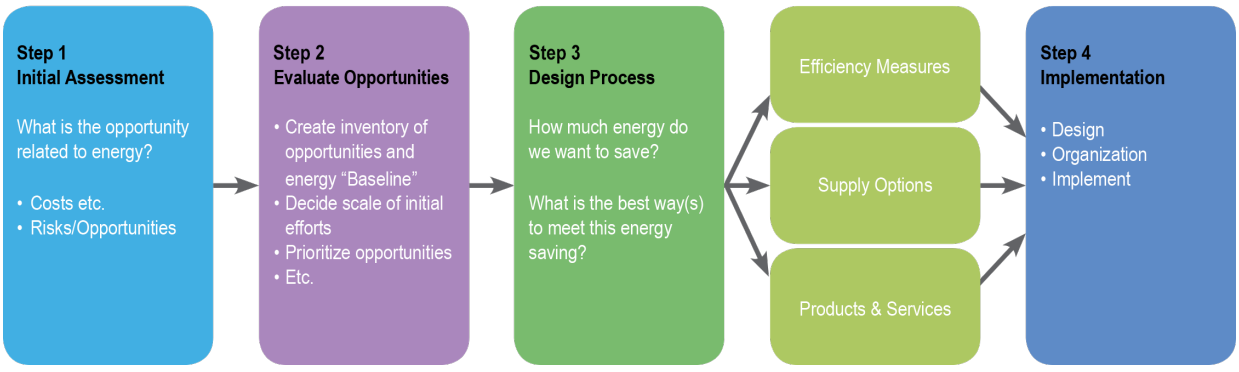


Chart 2 outlines a detailed process to develop an Energy Planning and Management Roadmap. Chart 3 details the continuous nature of this process. The Energy Star guidelines for Energy Management utilizes the principles of continuous improvement to achieve significant energy savings through diligent efforts to reduce energy consumption. With continual modification of behavioral and technological advancements these savings can be realized over time. This process requires a systematic effort of benchmarking, metrics and using the process above will allow for measurement and evaluation of these efforts.

Chart 2

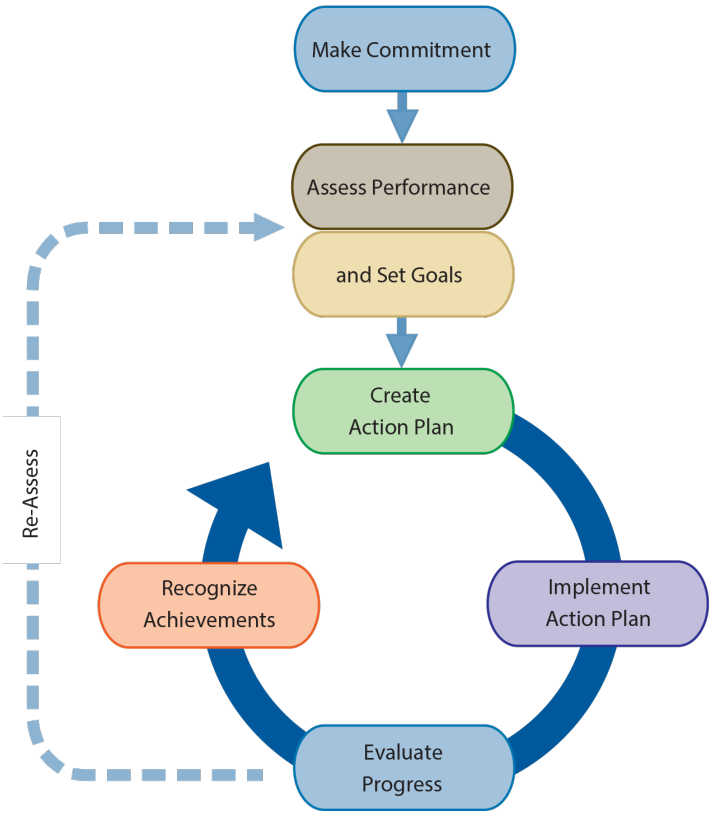
Energy Planning and Management "Roadmap"



Energy Resource Utilization and Benchmarking

Benchmarking is the process of measuring performance outcomes against the best in the same industry. More specifically, benchmarking is a key measurement tool used in a comprehensive management system. Continuity is the primary system mechanism used to improve efficiency and productivity . This management tool can be used to monitor energy usage and recommend areas for enhancement by comparing business processes and [1]performance outcomes to other industry peers.

Chart 3



Benchmarking for Energy Efficiency

Energy efficiency programs have been implemented by various organizations for over 25 years with differing amounts of success. Succesful efforts have evolved and improved by taking advantage of programs such as Energy Star, Portfolio Manager and the HERS system. These programs are the accepted best practices of energy efficiency throughout our nation. Martin County can build off this experience and knowledge by establishing a structure for analyzing and communicating best practices to help meet today's complex energy challenges.

The purpose of the above mentioned programs is to develop and communicate excellent practices being done nationwide in order to enhance the design, implementation, and evaluation of energy efficiency programs. The SEMP will recommend that Martin County should implement the Energy Star's Portfolio Manager for commercial, multifamily, and governmental buildings and the Home Energy Rating System (HERS) for residential units. Martin County should also participate in the State and Local Energy Efficiency Action Network (SEE ACTION).
The SEE Action network is a vital network to develop and implement energy efficiency programs locally and compare results and experiences among peers. It also provides a roadmap with a timeline that Martin County follow to utilize Energy Star and Portfolio Manager to benchmark and track energy savings going forward.

The key features of Portfolio Manager and the HERS programs are that they are both national and allow similar properties to be measured against others on a nationwide basis. Portfolio Manager and HERS will help Martin County to measure energy performance and to establish best practices in energy efficiency, renewable energy and water conservation. Property managers will then be able compare similar structures and rate them by accessing a national database. Portfolio Manager will assist property management firms to track and assess energy and wa-

13 William J. Stevens, Operations Management 7th Edition, McGraw Hill Irwin 2002, 488

ter consumption within individual buildings, as well as across their entire portfolio. Consumers will then be able to enter energy and water consumption and cost data into a Portfolio Manager. This will allow them to monitor building energy performance, assess energy management goals, and identify strategic opportunities for savings. These pilot programs will help Martin County to become the leader in the region and to contribute to national performance statistics in energy efficiency.

The Commercial Buildings Resource Database provides resources developed by the U.S. Department of Energy's Building Technologies Program (BTP) and its partners that Martin County can now use. This database offers guides, case studies, webinars, software tools to improve the energy efficiency of new and existing commercial buildings based on BTP's research. These projects will facilitate cost-effective investments in energy efficiency in the commercial buildings sector. This program is a national standard for the commercial building industry and along with the asset rating system will create a tool to assist building owners to identify and implement actionable strategies.

The Asset Rating (AR) program aims to evaluate the physical characteristics of existing commercial buildings and their energy efficiency, independent of their occupancy and operation, by taking into account the building envelope, mechanical and electrical systems, along with any other major energy-using equipment.
Finally, the focus of the programs mentioned above is to bring about the best practices in energy efficiency and building metrics to Martin County. These programs will allow Martin County to seek state, federal and private foundation grants. This is due to Martin County being one of the few counties in Florida to have this kind of data and can now use state of the art measument tools that can effectively quantify how each building is operating and using energy.

The State and Local Energy Efficiency Action Network

The State and Local Energy Efficiency Action Network (SEE ACTION) is a state and local effort facilitated by the federal government that is assisting states, utilities, and other local stakeholders to bring energy efficiency to a local level to achieve cost-effective energy efficiency by 2020. This initiative has engaged a diverse group of stakeholders in the development and implementation of eight energy efficiency roadmaps across the residential, commercial, and industrial sectors. This program also produces key crosscutting topics, including evaluation, measurement, and verification; financing; building codes; consumer information and behavior; and driving ratepayer-funded efficiency through regulatory policies and workforce development. The SEE ACTION program has eight workgroups, each with their own goals, as well as scope and support teams to provide critical technical assistance, broken down into the following areas:

1. **Existing Commercial Buildings Workgroup.** The activities of the Commercial Working Group targets both public and private existing commercial buildings.
2. **Customer Information and Behavior (CIB) Working Group.** The CIB Working Group is a behavioral focused working group that alters energy consumption by improving energy consumption awareness.
3. **Evaluation, Measurement and Verification Working (EMV) Group.** The EMV Working Group addresses the evaluation needs of residential, commercial, and industrial programs.
4. **Industrial Energy Efficiency and Combined Heat and Power Working Group.** This working group is primarily responsible for dealing with energy efficiency issues in the manufacturing sector.

5. **Building Energy Codes (BEC) Working Group.** The activities of the Building Energy Codes Working Group target both adoption and compliance.
6. **Financing Solutions (FS) Working Group.** The FS working group will employ a standard set of energy efficiency measures that rely on well-established technology (heating, ventilating, and air conditioning, building shell measures).
7. **Residential Retrofit (RR) Working Group.** The RR Working Group will build a home energy upgrade industry in which home energy upgrades will be comprehensive (e.g. multiple measures and end uses) and performance-based.
8. **Driving Ratepayer-Funded Efficiency through Regulatory Policies Working Group.** The scope of activities of the Driving Ratepayer-Funded Efficiency through Regulatory Policies Working Group includes the electric and gas power sectors.

If Martin County wants to become energy efficient it could make a difference in regards to assisting it residents in saving money, creating local jobs and reducing its controllable carbon footprint, it will be in creating a means to become energy efficient.

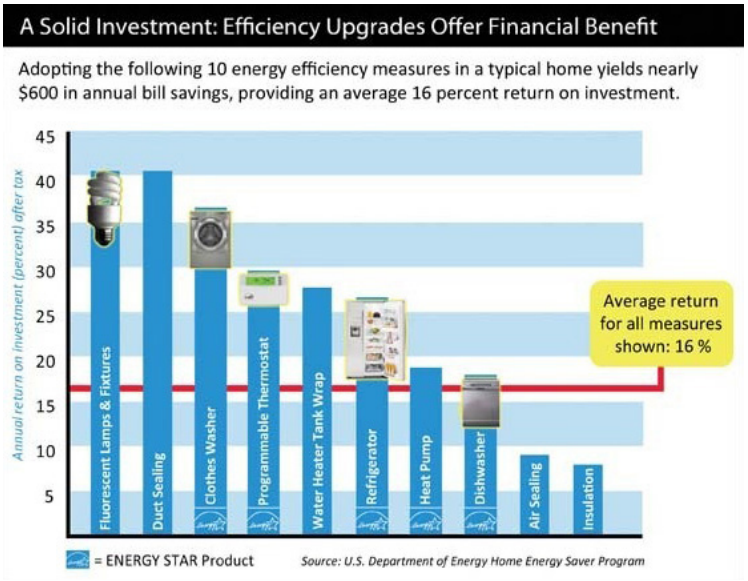
Recent data reflects a 2 percent increase in household spending on utilities annually, but refers to both gas & electric. The Energy Information Administration indicates that when isolated, electricity rates are rising at an even higher rate, adding about $300 a year to a household's electricity spend.

- Average rate is now 11.8 cents per kilowatt hour.
- Electricity experienced the fifth consecutive yearly increase above the inflation rate.
- Electricity now accounts or about $1.50 of every $100 of our after-tax income.

Indiantown Non Profit Housing Inc. (INHPI)

Through the process of creating the SEMP we spoke with Donna Carmen at Indiantown Non Profit Housing, as they have already retrofitted and weatherized through a federal grant more than 300 low and moderate income homes in Martin County. Organizations such as INPHI will be invaluable to assiting Martin County become energy efficient. In our meetings with Donna she stated that if they could partner with the county that there were federal grant funds available to expand the program and she provided the data in regards to employment: "As for employment opportunities, our agency is currently capable of conducting 200 inspections a month with 8 inspectors and 3 schedulers/client intake specialist. Thusly, given that you wish to perform a minimum of 600 residential Audits, it would provide an opportunity to hire 28 new employees. That would equate to 16 additional inspectors with average starting salaries of $30,000 annually plus benefits and 12 schedulers/client intake specialist at an average salary of $25,000 annually plus benefits. It is estimated that the cost per home to schedule the inspection, conduct the Inspection, run the NEAT Audit or HERS Rating, prepare a work write up and provide a follow up diagnostic evaluation after the work is complete would be about $350 per home". This would allow for more homes in Martin County to receive a HERS rating at a very affordable price, as they would review the home prior to the work being done and most importantly after. One of the biggest obstacles to moving forward was the lack of auditors and this can be solved through utlizing in the beginning INPHI and their skilled team to achieve the goal. We believe that the SEMP can be the outline for Martin County and INPHI to obtain federal funds to begin a program in a rel-

ative short period of time. In November of 2011, the U.S. Department of Energy through its National Renewable Energy Laboratory completed and published a study of energy efficiency by retrofitting homes in 37 locations, one of which was located in St. Lucie County. This program was called the Energy Savings Measure Packages. This information showed how making relatively low cost improvements brought about 15% and 30% reductions in energy consumption. The St. Lucie example is critical to this plan as it shows the improvements that can be done to a home in our climate and region. This is an excellent reference study for Martin County because the study uses the same energy efficiency measurement tools used and recommended in the SEMP. The study uses Energy Star as the metric to measure success/failure allowing it to be replicated. More importantly, this study documented the specific potential savings available in energy consumption by improving the energy efficiency. We further detail how to obtain these savings by using the technology listed below.



The average American family pays $1,900.00[2] for energy annually. Floridians pay 16 percent higher than the national average[3]. Martin County in part due to the low rates presently given by FPL pays slightly less then those in non FPL territories. Energy rates are a variable but have been increasing in the past few years,. By implementing a countywide energy efficiency program creates an opportunity for Martin County residents to achieve a 30% reduction in their energy consumption and can provide a family with an additional $600.00 a year in after tax disposable income. For example, a continuous economic stimulus can be created if 10,000 building owners improve their building envelopes; that would translate into a direct local injection of about six million dollars a year into the local economy. In short, by implementing just a few of the recommendations listed in the SEMP, Martin County could achieve energy savings and at the same time reduce its carbon footprint. Listed below are several ways residents and business owners can begin saving money immediately.

Once the building envelope has been sealed, we can now begin to look at making investments into indoor lighting. Lighting is now the low hanging fruit of energy efficiency, as changing from incandescent bulbs to Compact Fluorescent Lighting (CFL) or LED bulbs can bring about energy reductions of 75% or more. These changes allow for both residential and commercial users to lower their energy consumption without requiring

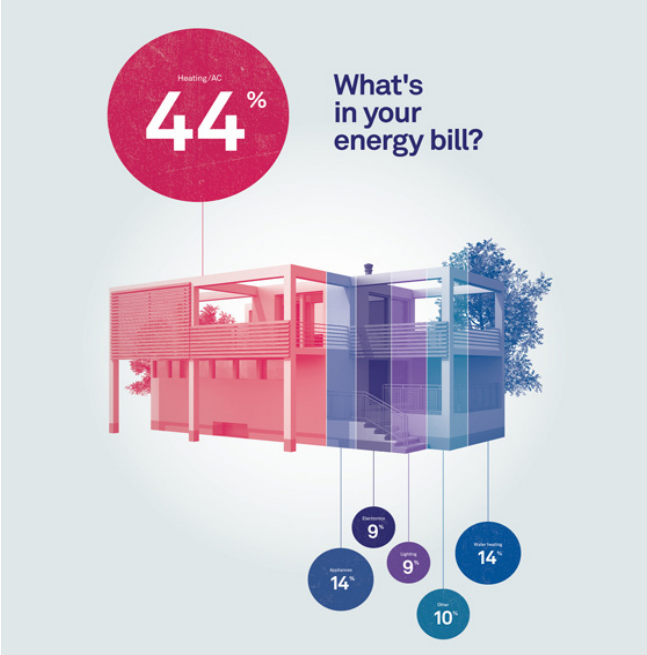
huge capital investments, as well as the engineering costs that can be associated with deep retrofits. By simply replacing 15 energy inefficient incandescent bulbs in your home with CFL's could save you $50.00 a year (EPA).

This does not even take into account the energy savings from the reduced HVAC loads associated with the incandescent bulbs. The change to CFL and LED lighting also brings to its user a return on their investment that can take from a

14 www1.eere.energy.gov/consumer/tips/pdfs/energy_savers.pdf
15 http://www.instituteforenergyresearch.org/states/florida/

few months to several years depending on their usage. As you can see their long lives eliminate the need to purchase replacements for years or in some cases a decade or more. They also can be rapidly deployed as they require very little education for the consumer and can begin reducing their energy consumption and carbon emissions immediately.

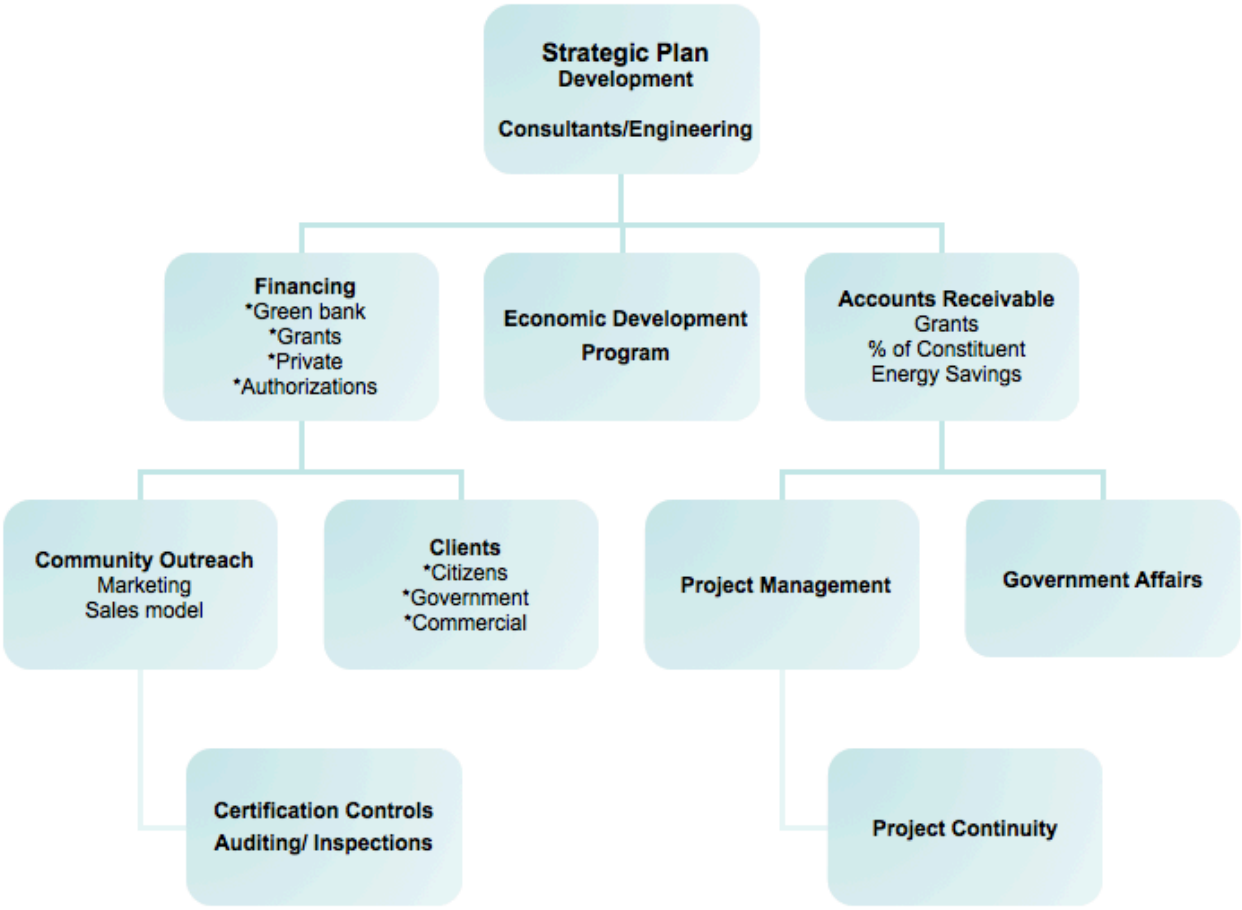
Induction and LED street and parking lights offer Martin County business owners and property management firms a path to create significant savings that can be paid for by the savings generated. This is an area that Martin County should look not just for its parks, streets, schools, businesses but also for its HOA's and communities, as today the typical halogen street light consumes from 250 to 1000 watts, whereas Induction and LED street/parking lights consume 100 to 400 watts. This would not only significantly reduce the energy costs associated with street lighting but provides a return of investment typically of two years or less. These types of lighting typically last a minimum of seven to fifteen years compared to 18-24 months of a halogen bulb, thus eliminating maintenance, as well as the risk of injury, as crews no longer have to either climb ladders, or rent a bucket truck to change out the halogen bulbs every 18 months. We should seek to educate the community about these products and if necessary review local ordinances to see if there are ways to mandate their adoption. This effort should also include options to finance these improvements to lower the barrier to the adoption. This would save millions of dollars a year and attract an industry that is already in many cases manufacturing these lights right here in our state.



It is important to note, we are conservatively only calculating direct investment regarding economic stimulus. Additional, economic stimulus will also occur because people are employed and significant savings results for consumers because of lower energy bills. In short, some additional multiplier effect will result in approximately 214 jobs and energy cost reduction for users. Furthermore, we calculated the financial impact long-term to an individual home owner. We estimate on average an individual homeowner will invest about $1800 given the various rebates subsidies available to homeowners. This is taken off the $5500 of gross investment. If on average a homeowner saves the $63 per month the annual savings will be $756. The internal rate of return of the cash flow stream over 20 years is 49% assuming a 5% decrease in electricity rates over time. The internal rate of return is 31% in just five years.

Martin County Strategy for Financing Energy Efficiency and Water Projects

A Sustainable Investment Strategy



Financing Energy Efficiency Market Overview

Martin County can develop a sustainable strategy for financing energy efficiency and water projects by proactively sponsoring and attracting investment opportunities for infrastructure to accommodate future commercial and residential energy requirements through implementation of strategic financing mechanisms. To support these projects, the federal government has invested billions of dollars to fund state and local energy projects. In the past several years, there have been many attempts across the country at creating energy efficiency project financing mechanisms and models.

However, these investments often fail to produce long-term and sustainable successes because government funds are to be used as seed monies for future innovations. Unfortunately, when the funding runs out, usually so does the interest of the end users. Ideally, state and local governments should facilitate programs that create jobs and promote both energy efficiency and renewable energy on a self-sustaining basis. Although the financial, environmental, and social benefits of government-sponsored energy efficiency projects are straightforward, the needed legal and administrative support for stimulating governmental energy efficiency financing is weak. Therefore, it is important to have a strategic plan to accomplish the desired outcomes.

Outcomes

To effectively develop a sustainable energy efficiency investment strategy, we must

- Establish funding mechanisms that are sustainable.
- Support programs that build access to a majority of end users that are most in need.
- Create effective marketing and education programs that drive up participation rates.
- Generate incentives for deep energy retrofits.
- Establish metrics that effectively capture costs recovery.

The objectives are the starting point for reviewing the appropriate types of financing mechanisms and strategies that will provide the resources necessary to implement sustainable, countywide energy efficiency projects and allow investment funding to support future growth of the programs.

Funding Options Recommendations

The proposed SEMP is an opportunity for Martin County to identify the needs of its residents and to develop a strategy to attract funding for energy efficiency and water conservation projects. This will involve identifying impediments to sustainable energy efficiency project investments and ways to overcome these barriers.

Energy efficiency project financing for commercial and residential end users can be characterized as external and/or internal funding. For example, homeowners and businesses rely on their own equity internal financing, external financing deals with borrowed funds, or increased debt. In most cases the percentage of the total project costs must come from internal financing. However, this poses a problem for the private sector to provide enough internal funding to enable a sizable project that would generate return on investment (ROI) quickly enough to ensure sufficient external borrowing capability. External financing can be achieved through bank loans, bonds, leasing, and government subsidies. Even though a variety of financing instruments exists, there is still a limited capacity in the local financial market's ability to provide adequate financing of residential and business energy efficiency projects.

In preparing the plan, the committee and staff reviewed options that did not solely depend on government funds to implement the proposed energy efficiency program. The plan will look more broadly to review options for funding community-wide energy efficiency initiatives for residential property owners, businesses, and governments, including cities, unincorporated areas of Martin County, Martin County School District, Martin Health Systems, and Indian River State College facilities that are located within its jurisdiction.

The government can act as the facilitator in defining the importance of energy efficiency so that businesses and residential property owners can take into account the strength and availability of financing options when choosing a financing mechanism for their energy efficiency projects. End users need to be aware of the available financing options, and they must have assistance in order to prioritize the energy efficiency and maximize the savings from these proposed projects.

I. Potential Financing Mechanisms

This section is a brief summary of the funding options and mechanisms available in both the private and public sector that could be used to create a sustainable energy future for Martin County.

A. Grants

Energy Block Grants were initially funded by the American Recovery and Reinvestment Act (Recovery Act) of 2009 through the federal government and included funding opportunities such as rebates to homeowners to finance appliances and energy efficient products, as well as renewable energy initiatives. Grants are now in short supply because of budget cuts, making obtaining those funds significantly more competitive. We recommend that the focus should be shifted from government-funded programs to private programs that are supported by private foundations, corporations, and/or financial institutions. Private organizations can provide both program related investments and direct grants, allowing initiatives that can provide for vital startup capital and eventually long-term funding to maintain program sustainability.

B. Revolving Loan Funds

A Revolving Loan Fund (RLF) is usually established to fund a specific activity that is defined by the investors and owners of the fund. Because a RLF requires a one-time initial investment, if it is managed properly to accumulate adequate savings to sustain future financing, it does not depend on external investors or on the county government's credit rating. The county can assist in establishing energy efficiency RLF, or apply to participate in an existing RLF operated by a private company, a non-profit organization, or by other government entities. The original investment in a RLF can come from a variety of sources, such as targeted budget funds, local bank investment/loans, donors, private companies, organizations, and the government. One statewide program that has been successful is the revolving fund managed by the Commonwealth of Pennsylvania.

1. 1/2 cent sales tax - The proposed plan recommends that Martin County considers establishing a 1/2 cent sales tax, which we believe could generate anywhere from seven to ten million annually. This could fund the proposed MSI and be leveraged with private sector and government monies allowing it to be truly sustainable for decades, as well as attracting capital and industry on a world-wide basis. If we conservatively use a 3 to 1 ratio for leveraging this could become a fifty million dollar plus fund in the three years we would recommend the sales tax be utilized for. It would also allow Martin County to create the MSI, fund the operations and intiatives and make the county into a leader in sustainabilty in Florida.

2. Florida Power and Light (FPL) Utility Franchise Fee Option - If Martin County adopts a FPL Franchise Fee, the County could utilize the fee or private sector financing to provide funding for SEMP initiatives. The potential use of FPL Franchise Fee could create an Energy Rebate Program for residential properties and businesses that provide rebates and financing for purchases of new energy saving equipment that meet Energy Star Standards, provide initial capital funding of a rebate program, and create a Revolving Loan Fund that is designed to provide loans for the benefit of residents and businesses.

Impact:

The combination of funding channels, using private/public partnerships consisting of local, national, and other

financial institutions that utilize a non-profit organization to administer the funding and monitor the programs, provides the best practice and creates sustainability. The seed funds for this effort could potentially be obtained by utilizing the franchise fee.

3. FPL/Franchise Fee Agreement - We have seen municipalities negotiate with Florida Power and Light (FPL) to receive a franchise fee. A possible agreement could provide a source of funds that Martin County in exchange for the non-exclusive rights and privileges of supplying retail electricity service free of competition and pursuant to certain terms, conditions, and set forth limitations in the agreement. For example, funds in excess of the agreed upon franchise fee (that are estimated at approximately five million dollars) would be allocated to the property assessed for clean energy (PACE) or similar financing program.

Impact:

This form of funding is negotiated between the jurisdiction and FPL. Both parties must agree to the scope of funding, such as products or programs that are permitted to use the franchise fee funds. In a possible agreement, the following initiatives could be negotiated:

- Educational programs to inform residents about energy efficiency
- Energy audits on city and consumer accounts
- Home energy makeovers for a select number of homes in the community
- Electric vehicle charging stations, to be replaced over time
- A longer-term promise to install a large-scale rooftop solar facility and LED Street Light pilot program

4. Solar Energy Loan Fund SELF (Fort Pierce) - Since its inception in 2010 the SELF initiative has become a national model for providing low cost loans to those seeking to make energy efficiency improvements to their homes and businesses. We believe that with it moving to become a state-wide entity that Martin County should create a relationship to allow its residents to utilize the services provided by SELF. Its Executive Director Doug Coward has built a program that should be commended for its forward thinking. Its current board also has 3 Martin County residents allowing for it to quickly be integrated into our community. The SELF fund has built in policies and procedures that we believe would allow for Martin County and its residents to achieve measureable results, which will encourage others to participate.

II. Barriers to Development of Financing Mechanisms

Given the constraints on budgets, financing for projects must come from other sources, and there are conditions upon which of those sources, grantors, lenders, or co-investors (e.g., shared savings for a performance contract) will contribute their resources to projects. Grantors need some assurance that the money they provide to projects will be used for its intended purpose. Lenders and co-investors need a guarantee of repayment and their agreed-upon share of a project's payback.

Various financial, legal, and institutional barriers to financing government Energy Efficiency (EE) projects are abundant. Presented by category below, some of the most acute reasons that impede EE project implementation are the following:

A. Financial

i. Lack of credit guarantee mechanisms

ii. Insufficient transparency of financial transactions

iii. Low activity of existing lending institutions in EE area

iv. Incongruous government financial policies

v. Current economic constraints on lending institutions

B. Legal

i. Lack of clear and transparent ownership rights within the existing legal framework

ii. Ease of entry into industry by entreprenuers

C. Institutional

i. Lack of an energy master plan

ii. No standardized measuring system utilized

iii. Absence of energy procurement practices for businesses, property owners, and government

iv. Underdeveloped ESCO market (e.g., in the State of Florida, there are less than a dozen Energy Service Companies recognized on the State Procurement System)

v. Lack of experience in project financing, managing budgets, assets, or debt

vi. Inadequate managerial and technical expertise to design and implement bankable EE projects

vii. Inadequacy of information about the financial markets and services available to the county, the city and the region

III. Suggestions for Moving Forward

The following steps can be used to promote energy efficiency finance programs:

1. Create a nongovernmental agency that is responsible for energy-related performance of all energy-consuming entities.
2. Incorporate EE retrofit funding into the existing utility structure, thereby enabling existing levels of business opportunities to support EE retrofits.
3. Devote an increased share of the budget to EE so that the internal financing acts as a catalyst for attracting co-financing.
4. Make budget planning long-term to enable large-scale project implementation.
5. Establish energy monitoring services that could be provided by the government, a not-for-profit company, or nonprofit organization.
6. Implement medium- to long-term planning of budgets.
7. Build technical, managerial, and institutional capacity.
8. Consider private sector participation to provide services.

A. Policy

i. Adjust the existing legal and regulatory frameworks to enable synergies and promotion of EE financing, technologies, and project implementation.

ii. Reform legislation, where necessary, to encourage the establishment of energy efficiency in the County.

iii. Promote energy sector reform, mandates, and standards to promote EE; this includes utilizing the na-

tionally recognized Energy Star Program as the matrix for measuring energy efficiency.

iv. Ensure transparency in enforcement of laws and regulations for government and energy sectors.

B. Financing

i. Develop mechanisms for enforcing payment for services by end-users.

ii. Establish guarantee funds for ESCOs to decrease financial risks.

iii. Explore possibilities for vendor credit financing.

iv. Empower and educate the local commercial banking sector on the benefits of financing EE projects.

v. Encourage the commercial banks to work with credit guarantee institutions to obtain credit guarantees in order to promote EE financing.

Energy Driven Economy

Introduction & the Economic Facts of Energy Use

Energy is a basic economic factor of production for all human activity. Like food, energy functions as a basic necessity that determines the quality of economic development of an economic system. If food and energy prices rise to a high level relative to income, a modern-day economic system cannot function properly. This is why most governments subsidize food and energy production--to keep these economic resources plentiful, available, and, more specifically, at low cost. Moreover, core inflation indicators are primarily food and energy costs. In short, all advanced economic systems maintain relatively low food and energy costs so that the consumer's disposable income can be used to purchase higher level services in a consumer-driven economy.

Like food, energy is relatively inelastic, meaning that the consumption of energy does not vary with price proportionally. If prices rise, people tend to consume the same amount of energy because they cannot change their current resource circumstances in the short run. Some economists argue that energy is unitary elastic, meaning that energy consumption varies with changes in energy prices. In the long run, this may be true, however, most businesses, consumers, or governments are locked into building structures or transportation vehicles that inhibit significant reductions in energy use immediately without a significant investment. Therefore, in order to have significant changes in energy utilization, consumers, businesses, and governments need to change or modify their existing energy fixed cost structures or infrastructure, which requires an investment. This usually occurs in the intermediate term, once businesses, consumers, and governments conclude that they have significant energy resource exposure and decide to manage and reduce the energy cost exposure. Finally, because there is an investment required in order to obtain lower energy usage and leverage the capital asset, often the federal and/or state governments provide subsidies to incentivize market participants to upgrade existing facilities.

Finally, the energy marketplace has been remarkably dynamic throughout history. Technological innovations and the application/adoption of these technologies have driven increased efficiencies and driven down energy costs in relative terms. Energy costs savings have continued to fall over the past several decades. In fact, every industrial revolution in modern economic history has been accompanied by a significant reduction in energy related costs either through technological advancement or a resource discovery. Energy efficiency breakthroughs are expected to continue resulting in improved energy resource utilization and improved environmental sensitivity.

Energy Efficiency and Job Creation

The US Department of Energy & the EPA has extensively researched the economic impact of energy-related investments and their impact on jobs and economic development. Over the course of the last decade, numerous studies have been done that show that energy investment projects have consistently created jobs.[1]The rule of thumb on job creation is about 10 jobs per $1 million invested. Studies have shown that job creation has ranged from 5 to 20 jobs created per $1 million invested. One study conducted by the American Council for Energy-Efficiency Economy[2], estimated that 5 jobs were created for every $1 million invested. Another study, conducted by the University

16 United States Environmental Protection Agency and the United States Department of Energy; Rapid Deployment Energy Efficiency Toolkit; December 2009.

17 Ehrhardt-Martinez, Karen, Laitner, John A., "The Size of the US Energy Efficency Market: Generat-

of Massachusetts, estimated as many as 20 jobs were created on $1 million invested[3] An additional study by the International Monetary Fund had demonstrated convincingly back in 2002 that investments in energy efficiency have a strong impact on job creation and training and are a excellent fiscal stimulus, with a good multiplier effect, throughout the economy on par with new construction spending.[4] These job creation calculations include a detailed analysis of direct, indirect job creation, and the multiplier effect. In addition, there is a breakdown by job complexity and job skill level based on the type of program or type of work completed. Energy efficient project jobs could range anywhere from 5 jobs to 25 jobs per $1 million invested.[5] The specifics of the particular project are important to consider as well as the labor force used in tabulating these estimates. It should not be considered an easy process to accurately predict the exact level of jobs created on any specific project. However, the ballpark range is a good rule of thumb.

Another excellent job creation study was conducted at the Powell Center for Construction and the Environment at the University of Florida.[6] This project study compares directly to the Martin County Region and gives a specific potential jobs creation matrix for the construction and manufacturing industry. A unique feature of the study was that it broke down job creation by the type of building undergoing energy efficiency improvements. For example, there were differences in single-family versus multifamily residential homes, offices, schools, and the different impacts at each level. Even with this level of analysis, we find that the number of jobs being created can range from one project to another. However, the rule of thumb of 10 jobs per $1 million invested is still a good estimate.

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ing s More Complete Picture," American Council for Energy Efficiency Economy, Report #E083, May 2008.

18 Pollin, Robert et el., "Green Recovery: A Program to Create Good Jobs and Start Building a Low Carbon Economy, Department of Economics and Political Economy Research Institute, University of Massachusetts Amherst, Sept 2008

19 United States Environmental Protection Agency and the United States Department of Energy; Rapid Deployment Energy Efficiency Toolkit; December 2009. 166

20 United States Environmental Protection Agency and the United States Department of Energy; Rapid Deployment Energy Efficiency Toolkit; December 2009. 167

21 Charles J. Kilbert and Richard Fobair, Center on Wisconsin Strategy and the Powell Center for Construction and Environment, University of Florida, "Assessing Job Creation Potential of Energy Conservation Investments" , August 2007, page 3

Southeast Region Jobs Created for $1 Million Investment in Energy Conservation[14]

Division		Construction Jobs	Manufacturing Jobs	Total Jobs Created For One Work Year
1	General Contractor	8.75	4.08	12.82
7	Weather Proofing	12.02	4.08	16.10
7	Roofing	10.57	4.08	14.64
7	Insulation	10.94	4.08	15.02
8	Doors & Windows	10.45	4.08	14.53
15	HVAC	10.81	4.08	14.89
16	Electrical	10.49	4.08	14.57

Southeast Region Jobs Created for $1 Million investment in Energy Conservation Per Type of Building[15]

Southeast	Supervisor	Skilled Labor	Semi-Skilled Labor	Unskilled Labor	Install Phase Total	Upstream Manufacturing	Total Jobs
Residential - Single Family	0.45	2.16	3.90	4.28	10.78	6.40	17.19
Residential - Multi Family	0.40	2.13	3.94	4.19	10.66	6.40	17.06
Residential - Institutional	0.40	2.10	4.04	4.09	10.63	6.40	17.03
Retail	0.41	2.11	3.87	4.14	10.53	6.40	16.94
Office - Low Rise	0.40	2.11	4.00	4.09	10.60	6.40	17.01
Office - High Rise	0.40	2.11	4.00	4.09	10.60	6.40	17.01
School	0.41	2.12	4.03	4.11	10.67	6.40	17.07
Health Care	0.40	2.11	4.03	4.11	10.64	6.40	17.05
Industrial	0.40	2.11	4.04	4.09	10.64	6.40	17.05

The University of Florida study was completed in August of 2007, at the height of the building boom. This was an extraordinary period for the construction history in Florida. Given the Great Recession since 2008 and the significant number unemployed in the construction trade, it is expected that more jobs would be created per $1 million invested. Difference in employment impact in today's environment would certainly be a consideration. Certainly, wage rates are lower, material cost are lower, and energy costs are higher--these should significantly impact the return on investment on energy efficiency projects for the positive in today's market.

Energy's Impact on the Economy

Electricity prices "are a critical factor in economic development," says Florida Retail Federation CEO Rick McAllister. "People look at that."[7] The plan recognizes that energy is a major economic factor in Florida's economy and the impact of funding high energy costs has had on the economy during the Great Recession.

While the SEMP's focus is on reducing the county's carbon footprint, it anticipates an ancillary benefit designed to impact positively on the county's main industries such as building construction, real estate, tourism, and agriculture. Florida's dependence on imported fossil fuel is a major factor in its continued economic vulnerability and is addressed within the SEMP's goals through the implementation of sustainable energy systems. Florida's per capita

22 http://www.tampabay.com/news/business/big-disparities-in-utility-rates-may-stunt-floridas-economic-growthbr-br-/1217021

residential electricity demand is among the highest in the country, due in part to high air-conditioning use during the hot summer months and the widespread use of electricity for home heating during the winter months. More petroleum-fired electricity is generated in Florida than in any other State.[8]
This provides us with an opportunity for Positive Cost/Benefit and Increased Energy Efficiency due to the fact that we are so locked into a fuel source that is almost exclusively obtained from outside the State of Florida and in some cases beyone our nation's borders.

The proposed plan recognizes that strategic energy efficiency projects require rigorous cost benefit analysis to justify the investment. New technology has proven at times to not be able to provide an ROI that would allow for capital investment.

Capital invested in renewable energy technology will at some time in the near future provide a positive cost benefit or Return on Investment (ROI) that will result in significant reduction in energy depletion and costs that can drive efficient operations and build cash reserves.

Most energy efficient capital investments do not require huge government subsidies because the ROI are excellent and the projects can begin paying for themselves almost immediately. Project implementation risk is usually the greatest project risk, but the performance contract model utlized by the county successfully creates guarantees that remove that risk completely.

Driving Forces

A core focus of the proposed SEMP is designed to position Martin County as Florida's leading sustainable energy efficiency and renewable energy center. This will be due to the fact that it has first created a plan and then will begin to implement financially feasible energy programs developed through a true Private/Public Partnership network geared to realize substantial cost reductions and savings based on the "New Energy Economy."
The plans strategic goal of reducing the county's carbon footprint will produce a healthier climate, create jobs, produce economic diversification, and energy independence.

Scope of Achievements under the implementation of the plan

1. Energy Audit and Policy Development
2. Project Management
3. Project Financing
4. Economic Development
5. Project Monitoring

23 United State Energy Information Administration, Florida Analysis 2009 http://205.254.135.7/state/state-energy-profiles.cfm?sid=fl

Adhering to the proposed plan will assist Martin County realize many important benefits, including the following:

1. Countywide cost savings and greenhouse gas emissions reductions through energy efficiency improvements and adaptation of renewable energy.
2. More effective application of financial resources on energy efficiency.
3. Development of Institutional capacity to implement and manage projects and programs.
4. Increased competitiveness to win future energy related grants and to attract energy related business and investment.
5. Improved platform to communicate energy related successes to the surrounding community and local government organizations

Local Project Management

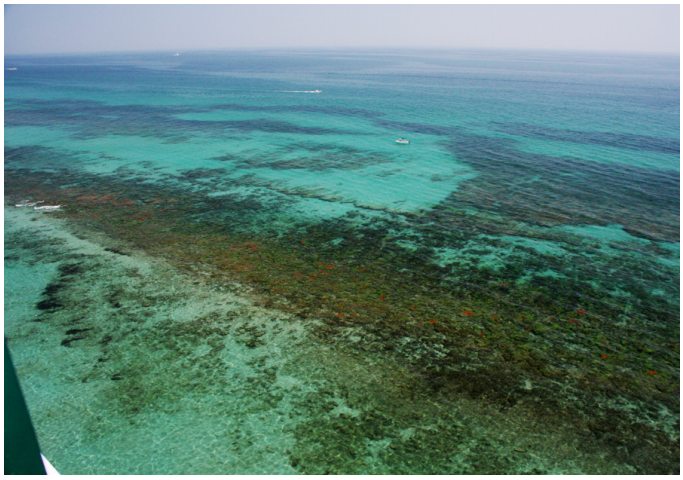
The SEMP's proposed aim is to coordinate efforts of companies presently engaged in the energy efficiency and sustainable energy products and businesses. The plan is established to provide a guideline for county organizations to assist in the creation of a marketplace with incentives to attract companies engaged in energy efficiency and sustainable energy to relocate to Martin County and provide employment opportunities for county residents. The plan is designed to coordinate with the local economic development agencies to ensure that the proposed programs create the maximum amount of jobs for the residents of the County, as well as encourage a new class of "Green Entrepreneurs."

Statewide Regional Project Management

Martin County will seek to develop projects and will coordinate with the Governor's Energy Office, Department of Energy, HUD, Commerce and the EPA and other relevant governmental agencies to ensure the use of best practices, as well as identify grant and funding opportunities for Martin County and its residents. Martin County will seek to develop projects and coordinate these activities with local, regional and national foundations to seek financial and technical support. This program needs to be crafted to assist those in the low and moderate income community as well as those who are better off to allow for a consistent economic development initiative.

Martin Sustainability Initiative

In order to execute the proposed energy efficiency and renewable energy initiatives, Martin County will need to establish a Private/ Public partnership organizational structure to manage, monitor, and fully implement these programs. Over the last 30 years there have been many attempts by local governments to create and implement sustainability programs. History shows that most sustainability plans fail to execute. Typically, accountability is neglected and other government priorities invariably take precedence. In short, most other sustainability plans lack a detailed systematic program to manage their implementation that delivers the energy reduction benefits the local citizens require. Therefore, the key to success is to create a dedicated local entity that monitors and manages the implementation of the intiatives going forward.



The chief focus of the Martin Sustainability Initiative (MSI) is to implement the recommendations called for in the propsed plan using the management techniques presented in the "Energy Management As A Systems" chapter. The key implementation area is data collection, as the information collected by getting a HERS rating or entering a commercial building into Portfolio Manager must be maintained. Good data gathering and being transparent in its reporting allows for better energy saving decisions, improved performance monitoring, and an ongoing ability to execute on energy-saving opportunities as they arise. It will also allow for the advances in technology to be properly measured allowing for these improvements to be quickly utilized on a county-wide basis. Data needs to be collected, managed reported regularly and transparently to create meaningful energy performance benchmarks, develop energy project evaluation criteria, standardize energy quality control standards. This will also allow for life cycle costing methodologies for renewable energy investments. Data collection is also essential in order to develop energy vendor performance evaluation methodologies and track vendor energy performance, develop financial performance measures and report the history of all past and ongoing energy projects. The MSI must also communicate energy performance data with county stakeholders on a regular basis, as this will assist in obtaining grant funding.

The second focus of the MSI is to create a mechanism to help finance energy efficiency and renewable energy projects throughout the county. The MSI will invest in energy efficiency and renewable projects using both public and private funds that become available. In addition, the MSI will share its energy expertise and database with community, regional and national banks, the Florida Solar Energy Center, Indian River State College and private

foundations interested in investing in private energy efficiency and renewable energy related investment projects.

The third focus of the MSI is to develop a micro farming initiative and the "Martin Grown" certification program. In order to stimulate micro-farming in Martin County, the MSI will develop a certification program in which fresh produce sold in restaurants, hotels, schools, hospitals, and other government agencies will have a locally grown product differentiation label. This label will indicate that the produce is locally grown and free from pesticides and other harmful chemicals. Micro-farming is a valuable tool to also reduce energy consumption because 40% of the cost of food is transportation. This also significantly increases our carbon footprint, as most of our food travels 1500 miles before it reaches our grocery stores, kitchens, schools, hospitals and restaurants.

The funding source that we recommend for the MSI should be either a half cent sales tax or a franchise fee agreement with FPL. The county could create and partially fund the MSI for a minimum of 5 years so as to allow it to attract investors and partners and to become truly sustainable. This will demonstrate the programs longevity and the county's commitment to sustainability and energy reduction. In addition, the longer time duration will allow for private and other public funding sources to commit more resources to this private public partnership. In the past short-term programs failed to attract funding on a continual basis and were not able to develop traction to become fully self-sustaining in the time allotted.

Finally, we recommend that this be a Martin County only organization as the focus has to be on reducing Martin County's energy and water consumption and creating a feasible and responsible renewable energy marketplace . It will need to in the beginning to rely upon the expertise of those residing in its community to provide the necessary local knowlege and experience that will be vital to the success of the MSI.

In this chapter we discuss our recommendations and provide a current overview of programs offered by FLP. Many of these recommendatiosn will guide the future implemenation phase. It will be here that Martin County and its residents and business owners can begin to see the initiatives being proposed as well as current programs being run by the FGBC and FPL locally.

Martin County will help promote FPL's free energy audit program

FPL offers excellent free energy audits and a has a robust energy rebate program to assist residents and business owners energy to reduce their energy consumption. These programs are free and are a great value for residential and business customers. Martin County will work to promote the use of these programs to create a greater awareness for its residents.

Martin County will use the Florida Green Building Coalition's (FGBC) retrofit guidelines

The updated FGBC retrofit guidelines will be used by Martin County along with their checklist instructions. This is a way to allow homeowners to understand their energy usage and to make low to no cost improvements. This should lead to substantial energy savings as well as significant carbon emission reductions.

Martin County should also take the following steps in regards to improving its energy efficiency situation:

1. Make available smart thermostats for its homeowners at a low or no cost option. Presently some models sell for as low as $100
2. Provide residents with a H.E.R.S rating for their homes, as they can range from $300.to $500
3. Provide commercial property owners the ability to enter their energy and water data into Energy Star's Portfolio Manager. This process takes anywhere from 30 minutes to an hour and these services could be provided by volunteers or interns from Indian River State College, as well as the USGBC and the FGBC
4. Create a rebate program for Martin County residents to purchase energy efficient lighting, smart thermostats and obtain energy ratings for their properties, both commercial and residential
5. Create a training program for Martin County residents to obtain licensing to perform ratings for commercial and residential properties. Current estimate is $25,000 a year to maintain program
6. The MSI should be created so as to monitor the progress of the program and report on a monthly basis
7. Set a goal to retrofit 19,500 homes over a five-year. This is roughly 25% of the total existing homes in Martin County. This is roughly 3900 homes per year. On average about $5500 gross investment (before rebates and subsidies) will be spent on each home. Annually, $21,450,000 will be investment into Martin County. This would yield approximately 214 jobs (10 jobs per million invested) per year.
8. Adopt the EPA Watersense and Florida Waterstar programs to lower its water consumption by 20%
9. Require all new commerical construction to be built to recieive an Energy Star Certification upon completion
10. Require all new housing to achieve a H.ERS rating of 60 or below
11. Require all new housing to be built with a solar thermal system to meet its need for hot water
12. Require its businesses and homeowners associations to replace all halogen street lighting with LED or Induction Lighting. This would significantly reduce energy consumption as well as carbon emissions, as these lights use less than 50% of what we typically see along our roads presently.

13. Martin County through the MSI should provide low interest loans to homeowners and businesses seeking to reduce their energy and water consumption
14. Seek to establish the SEE Action Network locally to allow for energy efficiency metrics and standards to be implemented and most importantly monitored.
15. All governmental buildings that have a ten year or more life cycle should seek to receive an energy star certification. This can be done through a perfomance contract allowing the governmental agencies to pay for these improvements through the savings generated

A Leader in Demand-Side Management

Florida Power & Light's programs to encourage customers to use energy more efficiently have made them a national leader for demand-side management, according to the most recent U.S. Department of Energy data. They have partnered with their customers to avoid the need to build 13 medium-sized power plants since 1981, avoiding more than 4.4 million megawatt-hours of electricity and an associated 2.44 million tons of CO2 in 2009.

FPL offers the following DSM programs to its customers:

Residential DSM Program

Online Home Energy Survey: FPL's Online Home Energy Survey gives the customer a personalized savings plan filled with energy-saving tips and recommendations for even more FPL programs and incentives, based on their unique patterns of energy consumption.

On Call® Savings Program: FPL's On Call® Savings Program provides a monthly credit on the electric bill when the customer voluntarily enrolls in On Call® program, which connects selected appliances to an energy management device installed free by FPL. During periods of high electricity demand, appliances selected by the customer may be interrupted briefly. FPL applies a direct credit on the participant's electric bill regardless of whether On Call® is activated or not.

Duct System Test/Repair Program: FPL's Duct System Test/Repair Program checks for air leaks in home's electric central air conditioning duct system.

Ceiling Insulation Program: FPL's Ceiling Insulation Program pays part of the cost of installing recommended levels of ceiling insulation.

Solar Rebate Program: Residential customers may receive a rebate for installing new solar water heating systems and photovoltaic (PV) system as part of a five-year pilot program authorized by the Florida Public Service Commission.

For more information on FPL's programs for residential customers, please visit www.FPL.com/programs

Business DSM Programs

Business Energy Evaluation: FPL's Business Energy Evaluation offers free standard level energy evaluations on-site and on-line (for non-demand small business customers). More detailed evaluations are available through this audit program with costs shared between FPL and the participating customer. Participation in FPL's other business DSM programs is promoted through this program.

Business Heating, Ventilating, and Air Conditioning (HVAC): FPL's Business HVAC Program offers business customers financial rebates to upgrade to higher efficiency HVAC equipment that exceed the minimum efficiencies mandated by the Florida Building Code. The current FPL program includes rebates for:

1) thermal energy storage
2) chillers
3) energy recovery ventilators
4) direct-expansion (DX) units and efficient air-conditioning room units
5) demand control ventilation systems including kitchen hood control
6) electrically commutated motors for air conditioning systems

Business Efficient Lighting: FPL's Lighting Program offers business customers financial rebates to install high efficiency lighting measures at the time of replacement. FPL's program addresses linear fluorescent, plus other efficient lighting technologies.

Solar Rebate Program: Business customers may receive a rebate for installing a new solar water heating system and a photovoltaic (PV) system as part of a five-year pilot program authorized by the Florida Public Service Commission.

Solar for Schools Program: FPL's Solar for Schools Program helps Florida schools reduce their energy consumption and educate the next generation by installing PV systems in at least one school in each of the 28 districts we serve. School districts will select the schools. This rebate program is not open to individual applicants and is part of a five-year pilot program authorized by the Florida Public Service Commission.

For more information on FPL's programs for business customers, please visit www.FPL.com/bizprograms

Other Programs

Net Metering: Allows FPL customers to earn a payback from connecting approved renewable generation systems – such as solar panels – to the electric grid. Electricity generated from renewable sources like the sun and wind provide energy for your home or business and reduce the amount you purchase from FPL and your monthly bills. If your system ever produces more energy than you need, the excess is supplied to the grid and that amount is subtracted from your current monthly bill or banked for use on a future bill in the same calendar year. For more information see www.FPL.com/netmetering

Renewable Energy is Achievable Only Through Energy Efficiency

The overwhelming focus of the SEMP has been the "Negawatt", which is created by reducing your energy consumption. We strongly believe that renewable energy should be only considered after a significant reduction of energy consumption. The main reason for this is that for nearly three decades governments have attempted to subsidize (with little or no success) one renewable energy technology or the other. The lesson learned is that these front-loaded subsidies limit the technolog, as when the subsidies are lowered or ended. We find that the incentive to utilize these products also are lowered. When you reduce your energy consumption you are creating a truly sustainable subsidy, as the energy savings can be used to purchase renewable energy. Currently, systems can be "right sized" due to efficiencies put in place. For example, this would allow an entity that is currently spending $100,000.00 a year on energy to cut its consumption by 30%, and then use the savings to purchase renewable energy, as this "energy" annuity could fund the implementation for the entirety of the project. We are seeing on a global basis the reduction of subsidies for renewable energy as governments struggle with insurmountable debt and rising energy costs. In Germany they are predicting that they will install 8 gigawatts of solar energy this year[1] - a great proposition but one fraught with peril, as the subsidies involved will cost billions to prop up an industry that is failing to compete against low cost panels from China. We saw the same problem in the American Recovery and Reinvestment Act (ARRA), when the U.S. Government poured billions into solar companies, only to see them go bankrupt, in some cases before they could bring their products to market. This will be a difficult proposition going forward as China subsidizes its own solar industry, allowing them to produce panels at $1.00 a KW. If we here in America and especially Martin County can build energy efficiency first, then we can start to create opportunities for renewable energy. American monies would be better spent on research and development, as the more efficient we can make our technology the lower the costs will be, thus eliminating the opportunity for imports from China to decimate the marketplace.

Martin County, in regards to renewable/alternative energy, has many options and should allow the marketplace to be the creator of these opportunities. This approach, combined with the fact that Martin County does not presently have a franchise agreement with FPL, allows it to make decisions that others in the region will not be able to due to the 30 year contractual agreements. Martin County if it chooses to could become a "Beta" sitecreate for demonstration projects from around the world to come and display their goods at either low or no cost options. This could lead Martin County to choose to power its own buildings using new technologies or selling any excess

24 (http://www.bloomberg.com/news/2012-03-09/germany-to-install-record-solar-panels-this-year-dihk-says.html)

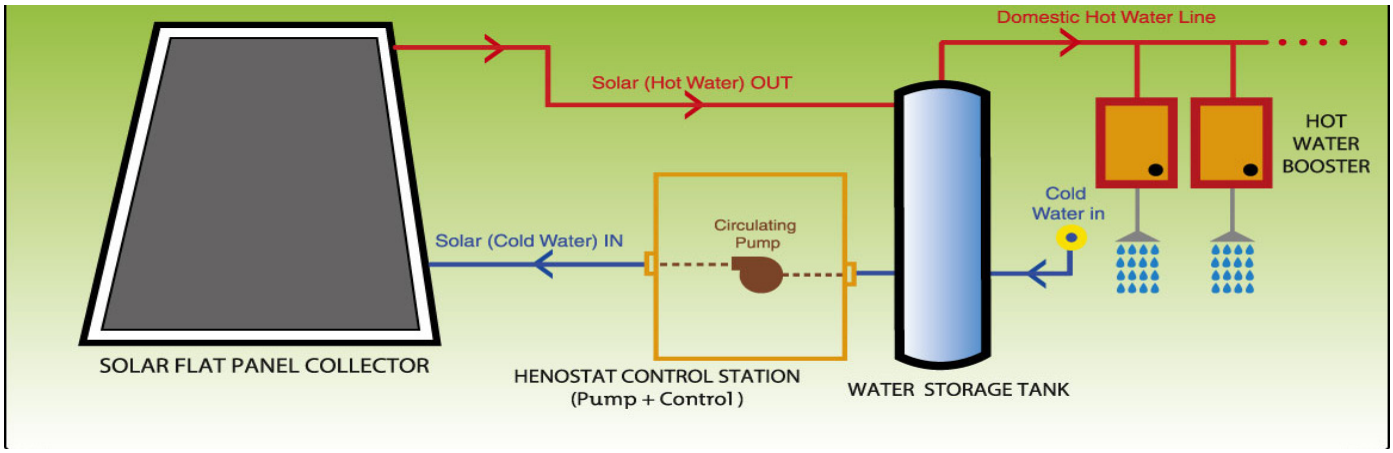
to its residents and a host of other opportunities. We believe that the performance based model must take hold as it is not the goal of the SEMP to push one technology or the other but create a place for the best technology and practices to thrive in open competition. We recognize that in the next several years improvements in wind, solar, geo-thermal, hydrogen and a host of others will be coming to the marketplace bringing an incredible opportunity for communities that have first become energy efficient and then can take advantage of these advances.

At present Martin County can undertake the following steps in encourage its residents to utlize renewable energy.

- Martin County should seek a partner that could propose both lowering its energy and water consumption at its governmental buildings and at the same time bringing renewable energy opportunities.
- Work with its educational institutions to train its residents to apprenticeship on these projects involving its own buildings.
- Showcase any/all renewable energy projects being done on its facilities allowing the community to see the different technologies

If we can begin creating the "energy efficiency" subsidy for renewable/alternative energy here in Martin County we can begin changing the dynamic that has our state importing 97% of its energy and sending 15 billion dollars a year around the globe to power its homes, businesses and transport its residents and their goods. This could lead to hundreds of well paying jobs being created right here in Martin County and continue its competitive advantage over its neighbors, as they seek to live and work in a community dedicated to sustainability.

We will now discuss some of the technology that is currently available and in many cases already being used here in Martin County to produce energy from the sun and other renewable resources.



Solar Thermal

A solar water heater can cut a family's water-heating costs by up to 85 percent, according to the Florida Solar Energy Center (FSEC). The average person uses $20 to $25 per month in hot water. An average household of 3 - 5 spends approximately $45 to as much as $100 per month in electricity for hot water heating purposes. These figures are conservative as long showers, lots of clothes washing, and dishes can push water heating cost even higher and savings can be even greater. In a climate like ours solar hot water heaters are actually more about energy efficiency, as

if without doing anything else to a home you could reduce its energy consumption by up to 30% and at the same time save thousands of metric tons of carbon from being emitted. We believe that in the future all new residential construction in Martin County should have a solar thermal component. This would create a new marketplace and to spur the utilization of solar hot water in current and future residential and commercial buildings. This would save millions in energy costs, create hundreds of jobs, and significantly reduce Martin County's carbon emissions. One of the members of the SEMP Committee provided us a with an example of how incorporating the rebates and tax credits with a possible rebate from the proposed MSI would bring a return of investment of three years. This would make it not just a commonsense decision in regards to saving money but serve to "Keep Martin Beautiful" and to promote sustainability as an economic system, as its residents would make the decision based on the financial feasibility.

SOLAR HOTER WATER SYSTEM FOR SEMP (Solar Thermal)/Residential System

Solar* hot water system:

- One (1) 4 x 10 solar collector with a ten (10) year warranty. Design life 25 years.
- One (1) solar hot water storage system (tank) with six (6) year warranty.
- PV assist using a dc motor (System operates independently of the electrical panel)
- Five year warranty on all parts and labor.

Cost For Proposed System:

- $6,000.00
- $500.00 - System discount for Martin County Residents
- $1,650.00 - 30% Fed tax credit (Based on discounted price)
- $1,000.00 -FPL rebate (if available) through 2014
- $1,000.00 - MSI rebate (if available)
- $1,850.00 – final out of pocket cost to purchaser

ROI – based on a family of four (4) saving $50.00 per month on using solar hot water versus an electric hot water system – 3.08 years. This is based on current utility rates. The final ROI is dependent upon hot water use in the household.

Commercial systems – these are designed and installed on a case by case basis and cost varies as to number of collectors, storage tanks needed, where the system is mounted etc.. An FPL commercial rebate is available. A 10% discount would be extended by GES on any commercial system. The 30% Fed tax credit also applies. SEMP could also extend a rebate.

This solar hot water collector is made of aluminum, cooper, tempered glass, 10 watt PV assist panel with an electric dc motor, mounting brackets, flashing, cooper piping, and the necessary one way and over pressure relief valves. An increase in cost of any of these components could cause the need for a price increase. *The solar collector in this program is FSEC approved and is manufactured in Florida. All the monies generated will stay in the state! This system can provide hot water in the event of an electrical outage. It should be also noted that the FPL rebate is in place to run for two more years, so we should plan appropriate for this if it and when it occurs.

Solar Photo-voltaic - Today we are seeing more and more applications of solar as California and New Jersey lead their respective coasts in installed solar both residential and commercial. One would not think of New Jersey being a leader of solar photo-voltaic usage but it did this through policy in 2004 when it created the Solar Renewable Energy Certificates (SRECs). This was an incredible boost for the solar industry as today Solar Renewable Energy Certificates (SRECs). New Jersey installed more solar systems in the first three months of the year than any other state in the nation.New Jersey installed a total of 174 megawatts of solar systems in the first quarter of 2012, or nearly one-third of the total arrays put in across the country, according to the U.S. Solar Market Insight. SInce 2001 the state of New Jersey has installed 769,955.4 Kwh and has almost 16,000 installations (www.njcleanernergy.com). This is a tremendous accomplishment, as we have to remember that the cost of a solar panel in the past 4 years has gone from $800 to $200.00, so much of this was done with a much higher cost structure. This also means that as these panels with a 25 year lifespan will be producing no cost energy typically around year seven, meaning that for 18 years the customer will be receiving free clean energy. The SEMP does not call for a program like the SREC in Florida but recognizes that an open market and capitalism would bring about a more commonsense approach to energy production, as the consumer can choose between the higher upfront costs of solar vs. the long term costs associated with nuclear, coal, diesel and natural gas. This open market place would create jobs, allow for capital investment into Florida and reduce its dependence on imported fossil fuels.

We recently saw that the Florida House and Senate passed a renewables bill as HB 7117, which is designed to expand renewable-energy production tax credits, allow local governments to use discretionary sales tax revenue to assist homeowners who make energy-efficiency improvements, and reduce the state's dependence on natural gas that is pumped into Florida along two pipelines from the Gulf Coast. This law is a critical first step as this will allow for more diversification of our fuel supply and for more companies to particpate in the marketplace, attracting more capital for renewable energy projects here in Florida. We are already seeing the impact as last quarter Florida ranked 2nd in the nation for jobs created in the renewable energy field.[2]

Technological Advances - Solar energy was once thought to be incredibly inefficient, as panels struggled to achieve 10 percent efficiency. This has changed dramatically as according to the U.S. Department of Energy, solar panel efficiency has more than quadrupled since the 1970's. With an average between 15-19% it sits in the same efficiency range as the gas in your car. Unlike gas though, the technology continues to advance, in turn, so will efficiency. We stress that the SEMP is focused on what we can install in our homes and businesses today as with 15 to 19% efficiency we can go to a Net Zero environment, which should be the goal as Martin County moves forward. Below you will see how a home in Sewall's Point has gone completely Net Zero and is actually putting energy back on the grid.

Net Zero

When we say Net Zero we mean a structure that as a net zero energy consumption and zero carbons annually.

25 http://www.tampabay.com/news/business/energy/florida-ranked-2nd-in-creating-clean-energy-jobs-last-quarter/1246168

This is a very important distinction as Net Zero Design has been around for decades and with the recent costs of construction decreasing you are seeing it becoming more and more competitive with traditional architecture. We are giving an example here of a family of five living (with several teenagers) in Martin County that decided after completing a Home Energy Rating System (H.E.R.S.) audit to go Net Zero. This process involved purchasing energy efficient lighting, reviewing and making changes to their insulation, setting their thermostat at 79 degrees and other energy efficient strategies to allow them to first reduce their consumption, which in turned required a smaller photo-voltaic system reducing the overall costs. After reducing their consumption they purchased a solar hot water heater and a few months later added a solar photo-voltaic system, which today produces more energy than they consume. It is vital that in this plan we show how a family of five has already accomplished this feat using today's technology, located only a few miles from the County's Administration Building. Below we are showing the timeline, process and how even when we met to discuss this at the Osceola Cafe, Mr. Rivera was able to monitor his home's energy consumption and production in realtime. It is not that the home is Net Zero that solely makes it distinct, but that by benchmarking and monitoring their consumption they are able to manage their energy utilization in a home with several teenagers and in a very active environment.

Wind

Recent advances in technology may make large (Wind Capital in the Glades) and small (South Beach, see photo) wind energy projects in Florida possible. New generations of vertical axis wind turbines which operate efficiently in low wind (6 mph) may offer Martin County residents and small business owners another economically viable renewable energy source. Caution, however, is needed as no active demonstration projects of this type have been suggested or planned for this area. Updated wind maps now suggest that these new wind turbines will produce enough energy at an acceptable ROI. Consideration for a few of these new generation turbines should be considered. Martin County could encourage these projects through small grants or a wind rebate program.

Biomass

Biomass offers Florida, especially Martin County an opportunity to enter the energy marketplace for both fuel and energy. Also with a considerable agriculture community located in the region, as Palm Beach, Okeechobee and St. Lucie Counties engaged in large scale agricultural production it would be incredibly affordable using the CO-OP model already in place. It is here that the current state regulations would need to be changed, as Florida farmers have been basically shut out of this marketplace, losing a vital new revenue stream and not allowing them to be as competitive as they should be in the global marketplace. This is due to the fact that here in Florida farmers must pay tipping fees to have the vegetative and agricultural waste hauled away, where farmers throughout our globe our turning this waste into energy and fuel. This is a marketplace that our state and region should invest in but not

until the legislators in Tallahassee allow for an open energy marketplace.

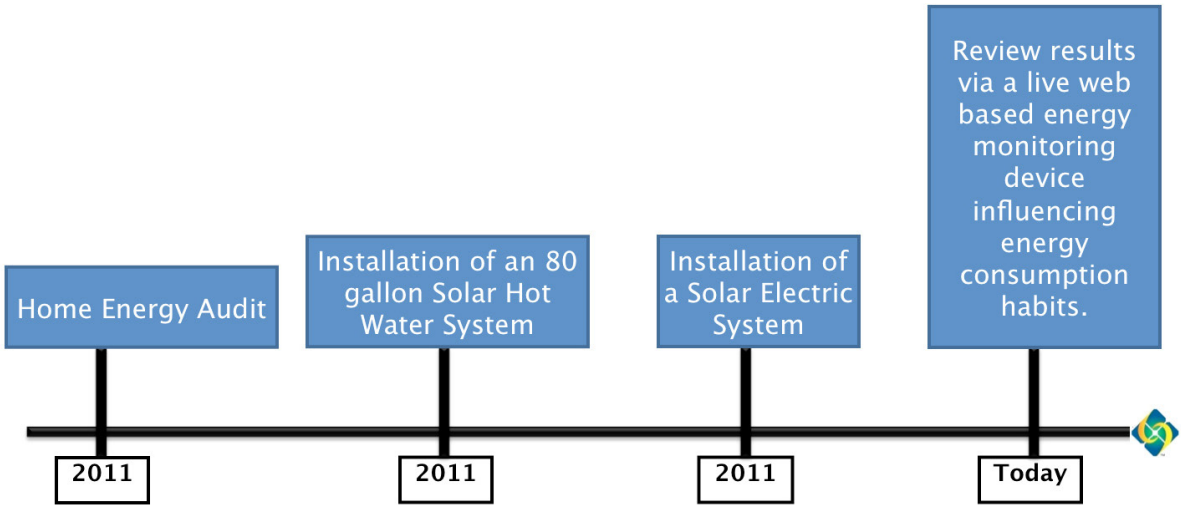
SUBJECT

3 EMARITA WAY
SEWALL'S POINT

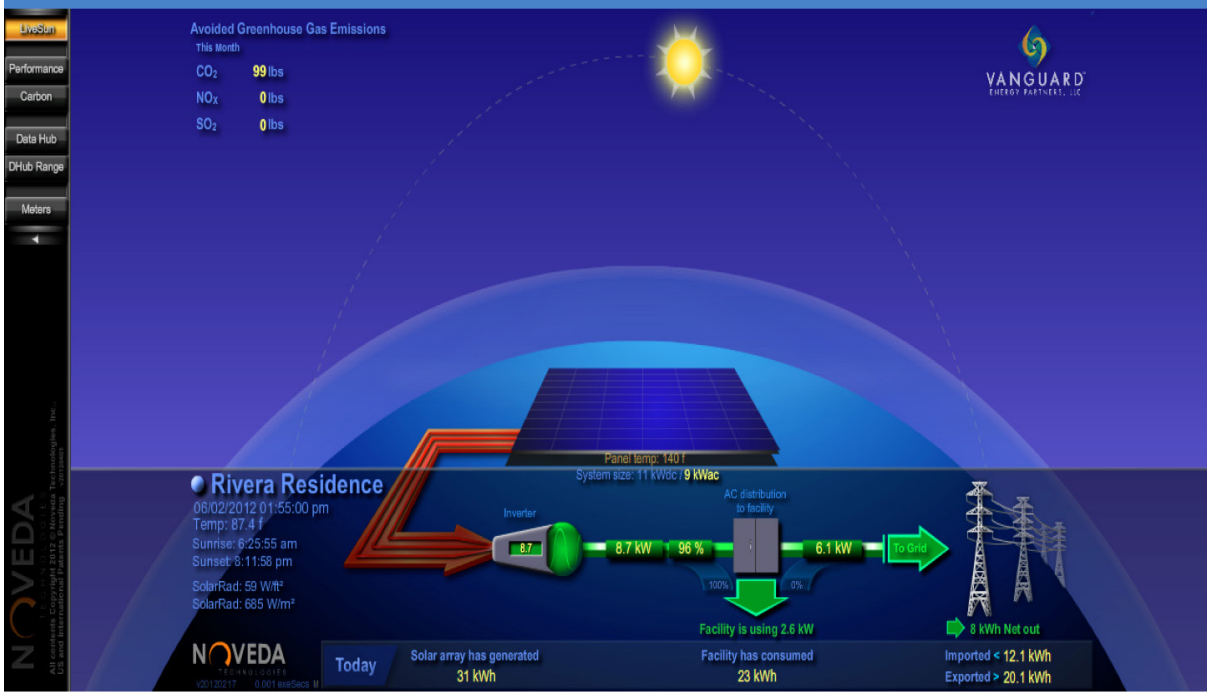
- RIVERA RESIDENCE NET ZERO ELECTRIC PROJECT

- The owners of this 25+ year old residence in Seawalls Point have engaged in a sustainability oriented plan aimed to reduce its electricity consumption, generation of renewable solar energy and address its overall carbon footprint.
- Results: This residence since September 2011 has reduced its electricity consumption and generated over 400 kWh more energy than its overall consumption to date making it a "net Plus electricity home" or one that has generated more energy than it has consumed.

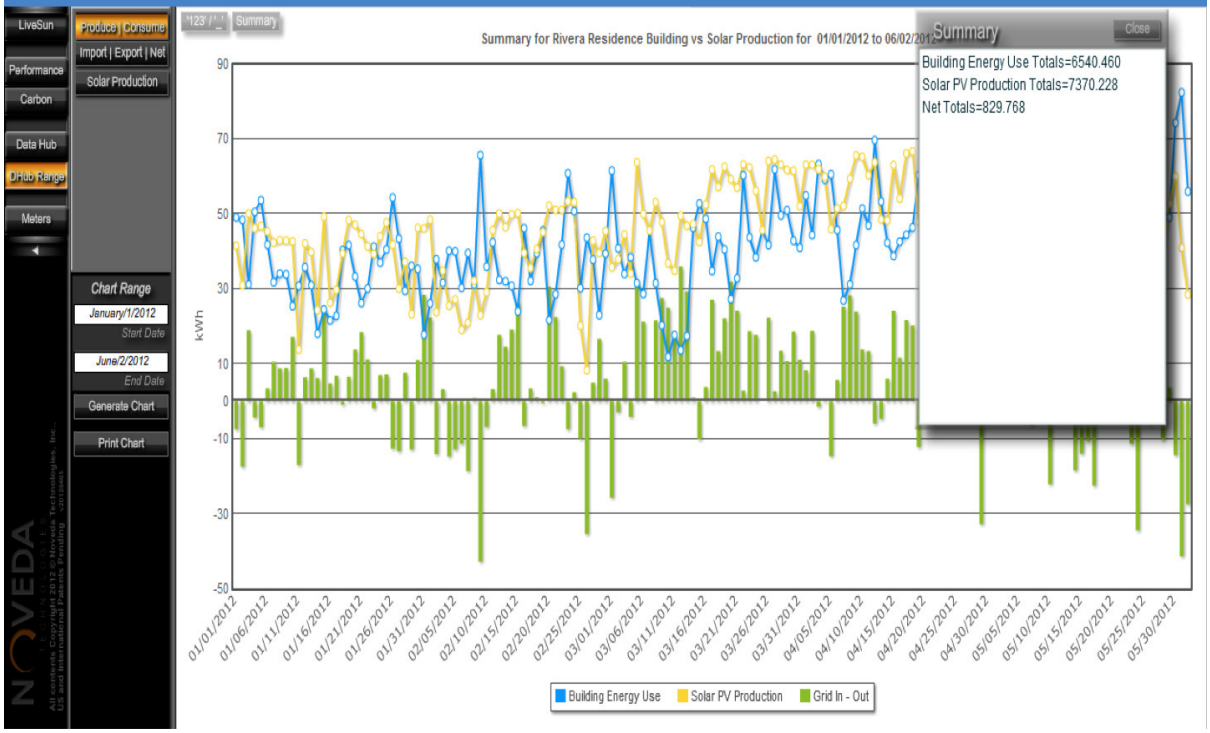
INITIATIVES



AWARENESS LEADS TO SAVINGS



YEAR TO DATE RESULTS



ELECTRICITY BILL- FPL

FPL

Bill Statement

Customer Name: [redacted]
Service Address:
FPL Account Number:
E-Mail Address: ALEX@VANGUARDENERGYPARTNERS.COM

Service Dates: 03/07/2012 to 04/06/2012
Statement Date: 04/09/2012
Next Scheduled Read Date: 05/07/2012

Amount of your last bill	Payments (-)	Additional Activity (+ or -)	Balance before new charges (=)	New charges (+)	Total amount you owe (=)	New charges due by
6.42	6.42CR	0.00	0.00	6.42	$6.42	Apr 30 2012

EDI File Transmitted Separately

Amount of your last bill		6.42
Payment received - Thank you		6.42CR
Balance before new charges		$0.00
New charges (Rate: RS-1 RESIDENTIAL SERVICE)		
Electric service amount	5.90**	
Gross receipts tax	0.15	
Franchise charge	0.37	
Total new charges		$6.42
Total amount you owe		$6.42

-Payment received after April 30, 2012 is considered LATE; a late payment charge of 1.50% will apply and your account may be subject to an adjusted deposit billing.
-1,133 kWh were sent to the grid this period. 731 kWh were applied to reduce your bill. Your kWh reserve increased by 402. The kWh in your reserve is 598
-Minor adjustments to the storm charges were recently approved by the Public Service Commission and will apply to your May bill. Visit www.FPL.com/rates for more information.

Meter reading - meter BC68748

ROOFTOP SOLAR

NOVEDA TECHNOLOGIES

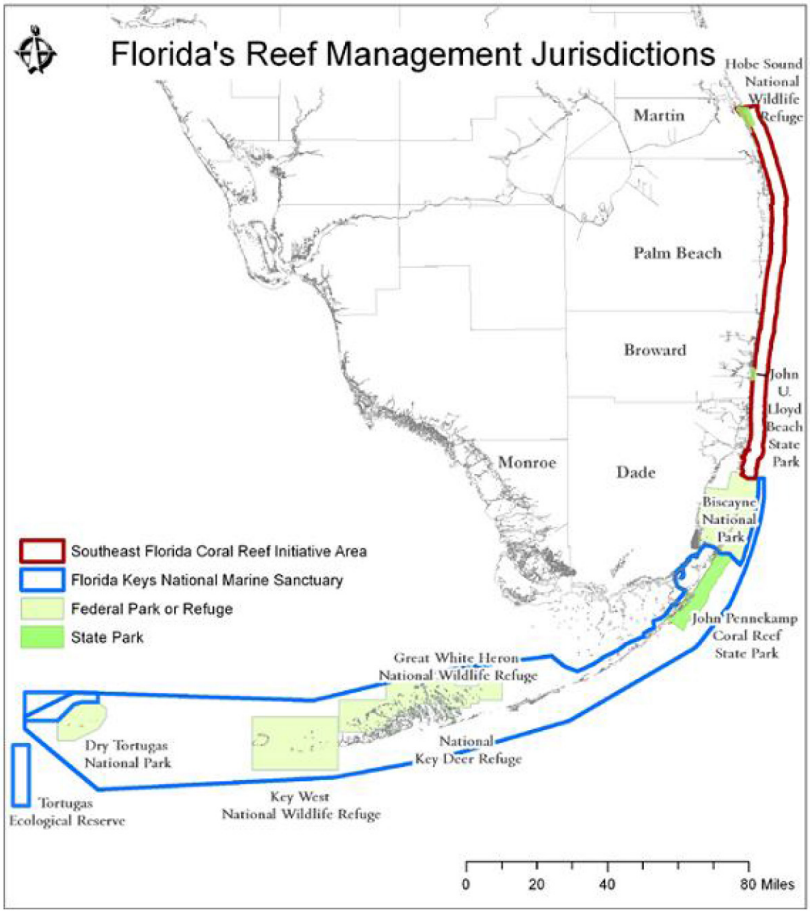
LED LIGHTS SAVINGS

Location	#Buls	Saved watts watts	Daily Hours of Usage	Daily Watt/Hours Saved	**Yearly kWh Savings**	kWh Rate	**Yearly Cost Savings**
					kWh-Year		**$**
Kitchen	11	50	7	3850	1309	0.12	157.08
Family	9	50	2.5	1125	382.5	0.12	45.9
Office	3	50	0.5	75	25.5	0.12	3.06
Play	4	50	3	600	204	0.12	24.48
Kendall	4	50	2	400	136	0.12	16.32
K Bath	2	50	3	300	102	0.12	12.24
Ricky	4	50	2	400	136	0.12	16.32
R Bath	1	50	2	100	34	0.12	4.08
Rbath	3	46	1.5	207	70.38	0.12	8.4456
K Bath	5	46	2	460	156.4	0.12	18.768
Hallway	3	50	3.5	525	178.5	0.12	21.42
Master	4	50	2.5	500	170	0.12	20.4
Alex Closet	1	50	0.5	25	8.5	0.12	1.02
Alex Bath	3	46	0.5	69	23.46	0.12	2.8152
D Closet	2	50	0.5	50	17	0.12	2.04
D Bath	2	50	2.5	250	85	0.12	10.2
D Bath	4	46	2.5	460	156.4	0.12	18.768
Play Lamp	2	46	1	92	31.28	0.12	3.7536
Ricky	1	46	0.5	23	7.82	0.12	0.9384
A Foyer	1	50	0.5	25	8.5	0.12	1.02
K Lamp	1	46	1	46	15.64	0.12	1.8768
Family Lamp	2	46	2.5	230	78.2	0.12	9.384
Outside Garage	2	46	2	184	62.56	0.12	7.5072
Backyard	2	46	0.5	46	15.64	0.12	1.8768
					3414.28		409.7136

PROJECT CONTRIBUTORS:
ALEX RIVERA– VANGUARD ENERGY PARTNERS, LLC
DESIGN & INSTALLATION TEAM– VANGUARD ENERGY PARTNERS, LLC
FRANK SLIFKA– ENERGY PROFESSIONAL– GES PARTNERS

Water Conservation

When Martin County first undertook the mission of creating a baseline for energy usage, it also began to understand the issues surrounding water. As we use more energy, we also consume more water, as power-generating plants require millions of gallons of water to cool facilities on a daily basis. As we learn more about energy efficiency we must also begin to conserve water because water is also becoming scarce.



The Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA) established the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.

Florida and Martin County

Water is a resource that normally requires public policy intervention to resolve the many diverse needs of water users. Today, a key issue is fertilizer runoff from farms and lawns combined with waste from old and faulty septic tanks. Those and other contaminants can lead to water with high levels of nitrogen and phosphorous, also known as nutrients. Waters with too many nutrients can be permanently polluted and bloom enough algae to damage entire ecosystems. This debate has caused tension between the State of Florida and the Federal Government regarding the amount of nutrients in its water supply.

Martin County's utility has taken the lead by reducing the number of regional plants from four to two and modernizing its systems creating greater efficiencies. It also has a very active and educated community, which has allowed it in the past few years to accomplish goals greater than its neighbors in the region have achieved. Martin County residents taxed themselves eight of the past ten years to generate seventy-five million to buy land for environmental reasons.[1] This also includes twenty-seven million for a reservoir to hold and store water at the C-44 canal near Indiantown. Martin's public lands increased from eight percent in the year 2000 to twenty five percent today. Martin County also purchased 45,000 acres for various Comprehensive Everglades Restoration Project activities, including restoring wetlands.

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26 "Martin County's Everglades effort long, impressive, inspiring", Palm Beach Post Blog Sally Swartz, January 13,2012, http://blogs.palmbeachpost.com/opinionzone/2012/01/13/martin-countys-everglades-effort-long-impressive-inspiring/

These restoration projects can be as simple as filling in drainage ditches or storing water. The formerly parched brown pastures on the Allapattah Ranch lands the county bought to restore now are a green, wet haven for roseate spoonbills and other wading birds. The county used state and regional grants to build $50 million worth of projects to clean storm water before it flows to the rivers. It has dredged 300,000 cubic yards of muck from Manatee Pocket, a component of the Indian River Lagoon project that is part of Everglades's restoration. With another 4 million dollar grant from the National Oceanic and Atmospheric Administration, which was part of the Federal Government's stimulus plan, residents are now restoring oyster habitat in the St. Lucie and Loxahatchee rivers.

We are more reliant upon captured rain and grey water than in the past and need to plan for the ability to use reuse water in ever increasing ways. We will need to look at our needs and begin to adapt and mitigate our uses of white water (clean), black (sewage) and grey (something in between black and white). The water use in most homes has long been thought of in terms of clean white water coming in and sewage, or black water, going out. Grey water, as the name implies, is something in between. By most domestic definitions, grey water is tap water soiled by use in washing machines, tubs, showers, and bathroom sinks. It is not sanitary, but it is also not toxic and generally disease free. Grey water reclamation is the process by which households make use of grey water's potential instead of simply piping it into overburdened sewage systems with all the black water.

The advantage of gray water reclamation is a lower water and sewage bill. Reusing gray water has otherwise wasted nutrients from soap (nitrogen and phosphorous) and food (potassium) can sustain plant life and recharge topsoil. Recycling gray water requires more effort. Because there is a higher risk of contamination and pollution if mismanaged and installation and maintenance costs are higher.

This recent past allows Martin County to be aggressive and forward thinking in terms of storm water runoff and water reclamation and re-use. The plan recommends that the County explore ways of increasing the use of rainwater barrels and other water retention devices at not just governmental buildings but also at commercial and residential units.

The plan proposes establishing a goal of reducing water waste at homes by 20% by 2022. EPA's WaterSense Program and Florida Water Star Program try to protect the future of our nation and Florida's water supply by promoting water efficiency and enhancing the market for water-efficient products, programs, and practices.

One of the ways to reduce water consumption is to have a water-efficient landscape. If you're designing a new landscape or rethinking your current landscape, the WaterSense Water Budget Tool can help you plan your landscape for water-efficiency. With two simple inputs – zip code and yard size – the water budget tool helps users design their landscape to use a level of water that is appropriate for their climate.

Water Supply-Side Strategies

Accounting for Water

Accounting for water is an essential step toward ensuring that a water utility is sustainable. This is best accomplished when water systems meter use by their customers. Metering helps to identify losses due to leakage and also provides the foundation on which to build an equitable rate structure to ensure adequate revenue to operate the system.

American Water Works Association's free Water Audit Software

National Environmental Service Center Tech Brief: Water Meters

Water Loss Control

National studies indicate that, on average, 14 percent of the water treated by water systems is lost to leaks. Some water systems have reported water losses exceeding 60 percent. Accounting for water and minimizing water loss are critical functions for any water utility that wants to be sustainable.

National Environmental Service Center Tech Brief: Leak Detection and Water Loss Control

Demand-Side Strategies for Water Suppliers

Consumer Efficiency—Consumers can reduce water use by installing water-efficient products or employing efficiency practices. Water systems can promote these actions through consumer rebate and education programs.

Martin County Water and Waste Water Service Area

Martin County has a population of 146,318 (U.S. Census Bureau, 2010) and the county's water and wastewater service area does not include the Town of Jupiter Island or the City of Stuart.

Water System

The county's potable water system consists of the water supply, treatment and transmission, and distribution systems (the water system). During fiscal year 2011, the water system provided service to 26,090 retail and service average monthly accounts, and residential service to a monthly average of 1,984 connections within the water system service area. (p.111 Table 1, line 32 28,074 = total accounts) Of these total accounts, 93% were classified as individually metered residential accounts and the remaining 7% were master metered residential, commercial, and irrigation service accounts. Martin County's Water System as of June 2009 serviced 28, 151 water accounts and 20,341 wastewater accounts.

In 2011, the water system provided service to 2,146 (projected) retail and service accounts and to 28,022 (projected) residential connections within the water system service area. Of these accounts, 93% of the accounts are classified as individually metered residential, 7% are master metered residential, commercial, and irrigation services. The data are from the PRMG, (September 14, 2009), Consulting Engineers and Bond Feasibility Report, (Draft).

Transportation

Introduction

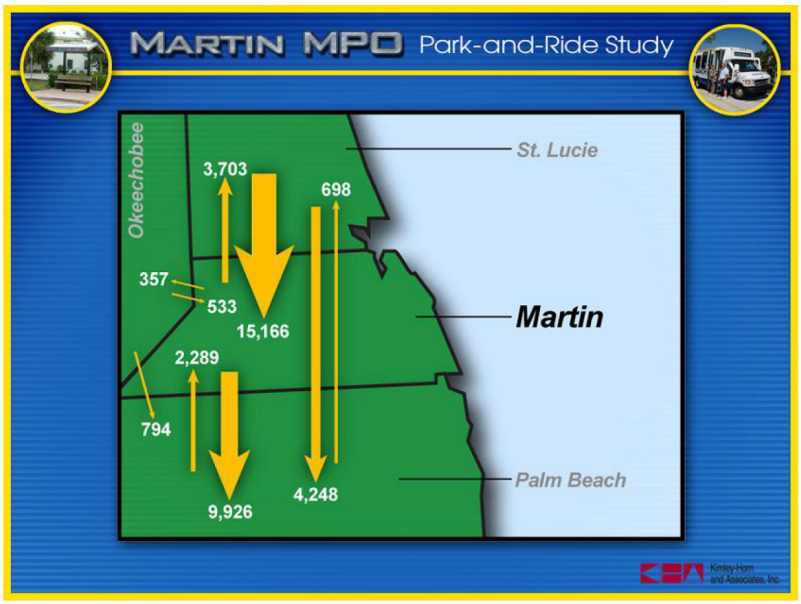

Figure 4. Commuter Flows
Source: *United States Bureau of the Census, Census 2000*

The United States consumed about 134 billion gallons (or 3.19 billion barrels) of gasoline, a daily average of about 367.08 million gallons (8.74 million barrels) in 2011 This was about 6% less than the record high of about 142.38 billion gallons (or 3.39 billion barrels) consumed in 2007. Energy Information Agency (EIA).[1] estimates that U.S. gasoline and diesel fuel consumption for transportation in 2009 resulted in the emission of 1,137.5 and 404.7 million metric tons of CO2 respectively, for a total of 1,542.2 million metric tons of CO2. This total was equivalent to 83% of total CO2 emissions by the U.S. transportation sector, 28% of total U.S. CO2 emissions, and 23% of total U.S. greenhouse gas emissions. About 29% of our nation's energy usage is in the transportation sector and if we continue to increase our consumption without diversifying our fuel supply we will not only suffer higher prices at the pump but see the costs of our food, energy and goods equally increase as transporting them becomes more expensive. [2] This is accelerating, as the price of gasoline has increased almost 100% in the past three years, as it has gone from $2.03 per gallon to over $3.45 a gallon today[3]. We are also seeing this crisis cripple transportation fleets for buses as school districts and governments can no longer rely upon rising property values to provide the tax revenue to cover the ever increasing costs of energy.

The U.S. Department of Transportation (DOT) has created the Federal Transit Livable and Sustainable Communities Initiative. The U.S. Department of Transportation has identified livability as a key priority for transportation. The DOT policies will focus on people and communities who use the transportation system.[4]

U.S. DOT's Livability Initiative will enhance the economic and social well-being of all Americans by creating and maintaining a safe, reliable, integrated and accessible transportation network that enhances choices for transportation users, provides easy access to employment opportunities and other destinations, and promotes positive effects on the surrounding community. Under the Livability Initiative, Federal policy will enable communities to:

- Better integrate transportation and land use planning.
- Foster multimodal transportation systems and effective multimodal connections.

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27 US Energy Information Administration, Frequently Asked Questions, http://205.254.135.7/tools/faqs/faq.cfm?id=307&t=10

28 US Energy Information Administration, Frequently Asked Questions, http://205.254.135.7/tools/faqs/faq.cfm?id=307&t=10

29 GasBuddy.com, http://gasbuddy.com/gb_retail_price_chart.aspx

30 US Department of Transportation, Federal Transit Administration, "Livable and Sustainable Communities" http://fta.dot.gov/about/13747.html

- Provide more transportation options to improve access to housing, jobs, businesses, services and social activities
- Increase public participation and enhance coordination of transportation and housing and healthy communities
- Reduce emissions
- Plan for unique needs

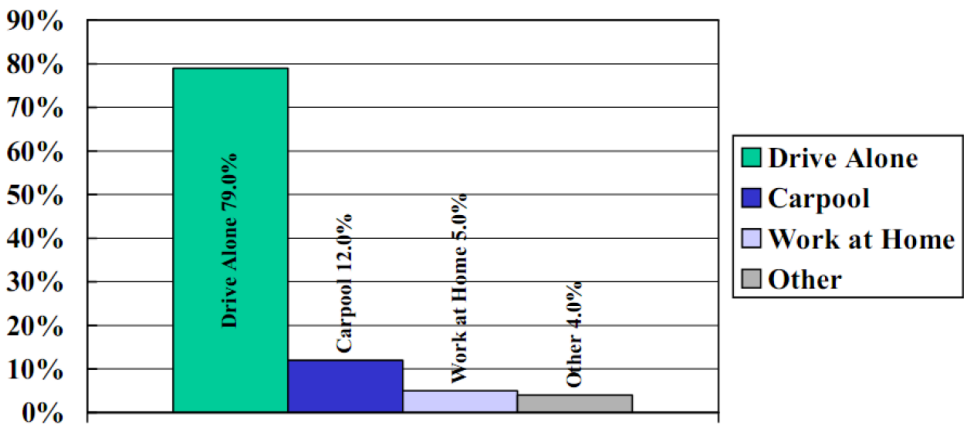

Figure 5. Travel Mode for Martin County Work Trips
Source: *United States Bureau of the Census, Census 2000*

Martin County should continue to manage construction and developments beyond its urban service boundaries. In addition, Martin County should encourage its population to utilize public transportation.[5] In the SEMP, we understand that changes in transportation and the roads we travel are done mostly at the state and federal level there are many opportunities to bring our communities closer by factoring in infill and smart growth design that allows for our shopping and community centers to be within walking and cycling distances.

In the near future, Martin County will have to incorporate concepts involving sustainable/green transportation. Sustainable transport (or green transport) refers to any means of transport with low impact on the environment, and includes walking and cycling, transit oriented development, green vehicles, Car Sharing, and building or protecting urban transport systems that are fuel-efficient, space-saving and promote healthy lifestyles.
Sustainable transport systems make a positive contribution to the environmental, social and economic sustainability of the communities they serve. Transport systems exist to provide social and economic connections, and people quickly take up the opportunities offered by increased mobility. The advantages of increased mobility need to be weighed against the environmental, social and economic costs that transport systems pose. In this new economy with gasoline prices increasing will force consumers to travel smarter (hybrids, electric vehicles) and less in the future. This change in our driving habits will directly impact our governments at all levels as they all receive the tax money that we all pay per gallon at our local gas stations. The State of Florida, Martin County and its municipalities will all have to adjust to a population seeking more public transportation, bicycle and walking paths as well as greater connectivity and at the same time few resources to meet this demand.

Goal: Diversify fuel supply for Martin County government transportation fleet

As fuel prices increase our schools, cities and counties and their fleets should establish a goal to diversify their fuel supplies to either natural gas, biofuels or a combination of both in order to be able to provide a level of service

31 US Department of Transportation, Federal Transit Administration, "Livable and Sustainable Communities" http://fta.dot.gov/about/13747.html

their communities have become accustomed. The need to utilize not only fuel efficient vehicles for governments but also for commercial and private use will bring about innovations in hybrid and electric car technology.

Goal: Increase Car/Van Pool participation by 10%

About 11.7% of the Martin County workforce uses Car/Van pools as a mode of transportation to work.[6] The Florida state average is 11.3%. However, Martin County's largest employers are concentrated with about 2,710 employees working for the Martin Health System, 2,552 employees working for the School District, 1,644 employees at Martin County, and 679 employees that work for the State of Florida.[7] A large percentage of the Martin County workforce is employed by large institutions namely the Martin Memorial Health System, Martin County Schools, Martin County government, the State of Florida, and Indian River State College. This type of workforce organization lends itself very well for car/van pool transportation. However, only 11.7% of the workforce uses a car/van pool almost matching the Florida State average of 11.3%. This is a good opportunity for energy conservation. In addition, in a website survey by the MPOs when preparing the 2035 Regional Long Range Transportation Plan 49% of respondents indicated they drove less because of rising fuel prices.[8] The Federal Transit Administration study calculated that an average private auto produces about .95 pounds of CO2 per passenger mile while an average Car/Van pool produces about .25 pounds of CO2 passenger miles.[9] In short, Car/Van pools are an excellent solution and energy saving opportunity based on recent compiled evidence.

Transportation Efficiency Measure	Martin County			St. Lucie County			Martin/St. Lucie Counties		
	HIST TREND	INFILL	% Diff	HIST TREND	INFILL	% DIff	HIST TREND	INFILL	% Diff
Vehicle Miles Traveled (VMT)	7,689,444	7,432,006	-3.35%	13,716,100	13,675,116	-0.30%	21,364,561	21,148,107	-1.01%
Vehicle Hours Traveled (VHT)	329,087	303,841	-7.67%	496,159	484,566	-2.34%	825.246	788,408	-4.46%
Greenhouse Gas Emissions	7,348,530lbs 3674 tons	7,102,507lbs 3551 tons	-3.35%	13,068,828lbs 6534 tons	13,068,828lbs 6534 tons	-0.30%	20,417,361lbs 10,209 tons	20,210,503lbs 10,105 tons	-1.01%

Goal: Continue Infill Alternative Plan Land Use Process

The table above illustrates of the Regional Long-Range Transportation Plan for Martin and St. Lucie County.[10] The table demonstrates a 7.67% reduction in vehicle hours traveled and a 3.35% reduction in greenhouse gas emis-

32 Martin Metropolitan Planning Organization and the Medical Transportation Management, "Martin County 2009-2013 Transportation Disadvantage Service Plan", April 2009, Page 11

33 Martin County 2009-2013 Transportation Disadvantage Service Plan" Page 10

34 "Treasure Coast Regional Planning Council; "Enhancing Mobility 2035 Martin-St. Lucie Regional Long Range Transportation Plan" February, 2011 Page 1-16

35 Federal Transit Administration, "Impact on Public Transportation" 2007, Page 11

10 Treasure Coast Regional Planning Council; "Enhancing Mobility 2035 Martin-St. Lucie Regional Long Range Transportation Plan" February, 2011 Page ES-12

sions by using the Infill Alternative land use plan vs. the Historical Trend land use plans. The infill alternative land use plan focuses attention on community redevelopment areas. This fact is compelling evidence. In short, Martin County has the greatest opportunity to benefit from the infill alternative plan versus the historical trend plans in future development. Therefore, Martin County should continue its efforts in using the Infill Alternative Land Use plan.

Goal: Continue 2012 Bicycle & Pedestrian Action Plan

The February 2012 Bicycle and Pedestrian Action Plan makes a compelling argument for an investment in bicycle and pedestrian walkways throughout the county and demonstrates the benefits these walkways provide for the community and the environment. The benefits include reduces energy usage, health benefits, and job creation related (about 10 jobs per $ 1 million invested) to building pedestrian transportation infrastructure. The Treasure Coast Loop Trail Project and the Livable Communities Initiatives are excellent demonstrations of community initiatives. These projects continue to reinforce the SEMP through energy efficiency and better quality of life in Martin County.

Mode of Travel to Work

Table 8
Mode of Travel to Work Distribution, 2007

Area	Drive Alone	Carpool/Vanpool	Public Transportation	Bike/Walk/ Other	Work at Home
Martin County	79.3%	11.7%	0.4%	3.4%	4.5%
Florida	82.6%	11.3%	2.0%	2.4%	4.2%

Source: US Census Bureau, 2007 American Community Survey
Totals may be more than 100% reflecting the use of more than one mode of work related travel.

Sustainable Agriculture for Martin County

A critical component of Martin County's future sustainability will be its ability to integrate its agricultural community into creating a marketplace for locally grown produce for its residents, businesses, schools. Martin County can use the thousands of fallow land in the near future to produce algae for feedstock, fertilizer, biofuels, plastics and dozens of other products. It can grow the crops needed for the next generation of biofuels, as the USDA, the Department of Defense and other entities are spending billions to assist in the creation of this marketplace. This is an incredible opportunity, as presently thousands of acres sit fallow waiting for the chance to become force for change for energy and carbon reduction. With gasoline prices recently pushing past four dollars a gallon we are seeing billions of dollars being spent by the private sector as well as the federal government to develop biofuels using crops that could be easily grown and harvested here in Martin County. We will go into greater detail but these opportunities for commerce as well as reducing our nation's dependence on fossil fuels as we examine the ability of these crops to clean our water supply, create biofuels and to provide our residents with fresh locally produce fruits and vegetables. It is here in agriculture that Martin County can remain a good steward of its natural resources, slow the move to transition agricultural lands into residential, compete regionally, nationally and globally for dollars being spent on transportation fuels and other products created by these crops.

Micro-Farming/Martin Grown

Martin County has a long history of agriculture as it was has grown many crops and at one time was the Chrysanthemum Capital of the world and actively farmed pineapples and a host of other crops profitably until competition on a global basis combined with increased costs of production and transportation caused this market to collapse.[1] Now forty years later Martin County has another chance to create agriculture through micro-farming. In the plan we envision micro-farms ranging in size from one fifth of an acre up to 50 acres. In the course of the SEMP we visited several micro- farms in Martin County and spoke to them about the challenges, obstacles, rewards and what they see as the future of their chosen fields and their place in the Martin County. We are hoping that by creating a pathway for other farmers like them will provide Martin County with local fresh produce free from pesticides and with a carbon footprint of less than 25

36 (http://www.tcpalm.com/news/2009/feb/12/martin-county-flower-farmers-wilting-under-competi/

miles, in comparison to most of the foods at our dinner table travel an average of fifteen hundred miles or more, losing much of the vitamins and minerals our bodies need in transit. The first farm we visited was Vertical Horizon located on one fifth of an acre in a residential neighborhood in Hobe Sound uses a very successful vertical hydroponic growing system. In a small space, they are able to grow tomatoes, peppers, lettuces, herbs, kale, swiss chard, beets, onions, spinach, beans, even edible flowers using no herbicides, pesticides or other toxic chemicals (This approach to farming using organic growing methods and sustainable farm practices (such as a reduction of water use by 85% over traditional growing) translates into safe and delicious food you can feel really good about eating! [2]The second farm we visited was much larger in scale as Kai Kai Farms grows on fifty acres and is able to deliver almost fifty different types of fruits and vegetables and is in the process of attempting to grow even during the summer months. Kai Kai Farms is also adding livestock, as its clientele want locally produced beef and chickens run by a couple with five employees and we spoke with Diane Cordeau who has several decades of experience in growing in Martin County. This was an incredible find, as typically what little agriculture in Martin County is typically done on a much larger scale. It is farmers like Diane who are able to make a living as they see a growing clientele willing to pay a little more to get good locally produced without pesticides and other harmful chemicals fruits and vegetables. It is these pioneers who are presently operating without peers in their community that give Martin County the opportunity to become the region's leader in micro-farming. We recently saw even at the large scale buyers such as Tropicana have gone to using all Florida grown oranges to make their juices, as before this they obtained a mix from places as far away as Brazil. It will be educated and informed consumers who will seek out local produce, as Kai Kai farms meets this need by selling boxes locally to those who subscribe monthly to receive their produce, as this niche grows daily, as Vertical Horizon reported that most Saturdays they were sold out before 10:00am due to the demand for their produce being so high.

What Can be Done...

Martin County can take the following steps to build a micro farming community, as these were the answers given by the famers themselves. Diane Cordeau Kai Kai Farms. "The Martin Grown certification would tie in well with the nationwide emphasis on "locally grown" produce. We encounter customers, daily, who would like to support local farms, who would like the freshest produce grown for taste not transport, who need a local farm to visit for their children's sake, and who trust a local grower over an anonymous one in a distant nation" We can see from this very detailed answer that this is not only a great opportunity to provide healthy produce to the

37 (http://stuartgreenmarket.org/vertical-horizon/)

residents but also an opening to partner with the Martin County School District, as children should be taught the value of eating healthy produce and how it can be grown in places as small as one-fifth of an acre to fifty acres. This would also tie into the Florida Department of Agriculture and Consumer Services "Fresh From Florida" campaign and would provide funding opportunities from private foundations, financial institutions and the federal government. We must also seek to avoid the potential pitfalls as the proposed NGO will have decide the distinction between fresh local produce and value added products with a blend of local and non-local produce, a graphic logo for use by genuine local growers, the foundation of a grower-funded entity supported by tariffs to perpetuate "locally grown".

What could Martin County's role be in promoting micro-farmers? Diane states "In consideration of constrained budgets any proposition should first give importance to the sustainability of any initiative toward helping Martin County farmers. Martin County could support the 4-H organization hosted by the local county extension office. We advise care in creating any new government on behalf of local farms and recommend using the Extension personnel first in this initiative. Another key area for local growers is access to institutional kitchens, specifically government run, like schools, hospitals, and prisons". It is access to this vital marketplace that will give rise to this new industry, as children eating local produce and being exposed to these farms would bring this news to their parents, in essence educating the family on the availability of these commodities. We must also look to the support that both of these farms have relied so heavily upon, as University of Florida's Institutional Food and Agricultural Sciences (IFAS) Extension with offices in Stuart and Fort Pierce have provided invaluable assistance to micro-farmers throughout the region, as Diane state "If it was not for IFAS we doubt we would be farming in Florida, as having peers in the farming community is critical to success as IFAS and their resources in Gainesville provide us considerable technical assistance in the science of farming and the art of marketing". In this endeavor annually IFAS hosts the Florida Small Farms Alternative Enterprises Conference over three days annually in Kissimmee. This is a great opportunity for those both versed in farming and for novices to learn how to start their own micro-farm, learn from others the potential pitfalls and perils as well as learn best practices and the latest technology in regards to both growing and marketing of their products. Fred Burkey is an incredible local resource, as his family has a long history of growing in Martin County and through his work at IFAS is able to assist those wishing to become the next generation of micro-farmers that will be needed to support the ever growing demand that our community is expressing for locally, free from pesticides and healthy foods.

There are other considerations to "Martin Grown" as Natalie from Vertical Horizons stated "When considering what might be included in "Martin Grown", perhaps you should be aware of the vast types of agricultural products that

do exist. Everything from eggs to honey to fresh cut flowers to farm-raised seafood - and other products that are not on the food front - such as sod, bamboo, or nursery plants". This creates quite a new marketplace for entrepreneurs to fill as consumers become more aware of the nutritional value of locally grown produce, as flowers, seafood, worms (for organic fertilizer) and other products. This is a task that we believe the can be achieved through the proposed MSI and collaborating with University of Florida and IFAS Extension. It will be through education and awareness that the residents and those who come to visit Martin County on a yearly basis that will come to appreciate the value of micro-farming and its role in sustainability as healthy foods that also require less resources (water & fuel), have a much smaller carbon footprint and a higher amount of vitamins and nutrients as presently both time and travel reduce vital nutrients. for example Spinach stored at room temperature loses between 50 and 90 percent of its vitamin C within 24 hours of being picked[3]. We also know that both Time and exposure to light destroys folic acid, a vital nutrient in many green leafy vegetables, which means while we believe ourselves to be eating healthy we lose out on the nutrients due to the travel time and exposure to the elements. In this endeavor we must understand the importance of Vitamin C, the B vitamins and vitamin E are all important antioxidants that protect against disease, because they attack free radicals which cause oxidative stress and damage our cells leading to cancer and heart disease. If we lose these nutrients we also decrease our overall health and with a nation that leads the world in the percentage of those both overweight and obese, this becomes an area that can alleviate a problem plaguing us both locally and nationally. It is not the fact that they taste better but actually provide the vital nutrients that are rarely found in our schools, fast food restaurants and unfortunately at our local supermarkets.

Biofuels

This will be an area that Martin County could become a leader as Algea, Biomass and other crops offer the ability to take a state that presently imports ninety seven percent of its fuel for both transportation and electricity to actually begin to produce some of its own energy. We all must remember that Brazil not too long ago teetered on bankruptcy but through several decades of programs in went from a nation that was utterly dependent upon foreign fuels to one that today is about to become one of the largest exporters and today stands as America's thirteenth largest creditor. One of the most dramatic turnarounds for this nation involved its ability to no longer ship vital capital around the world to purchase fuel for its homes and vehicles. We here in Florida face this dilemma as we are the nation's fourth largest state with an economy that dwarves many of our international trading partners. In this fragile economy we are reliant upon fossil fuels both foreign and domestic and thus suffer when fuel prices increase, as that requires more capital leaving our state with no benefit that would be seen in Texas, California, North Dakota, etc, as when prices increase so do their revenues and tax base. When prices increase these exporters get new schools, roads, hospitals, etc, while at the same time Florida is forever poorer. For too many years Florida has ignored the simple truth that fossil fuels are a very finite resource and one that Florida produces very little of itself and thus it cannot plan its long term economic viability properly as the volatility of the marketplace could

devastate its tourism and agricultural industry. It is in this vein that we discuss how critical it is for Florida, especially our region to produce its own fuel to ensure that our economy is not destroyed or crippled in the long term due to the price fluctuations of the fossil fuel market.

What is being done...

This critical dynamic has Florida importing ninety-seven percent of its fuel to cool, light, heat its homes and to power their cars and trucks. This is both a crisis and an opportunity, as we see billions of dollars as BP recently purchased Verenium Corp's lignocellulosic biofuels assets for $98.3 million, will start building a 36-million gallon biofuels plant in Florida this year.[4] This industry is already here in Florida and one that needs partners like Martin County who understand that a performance based system combined with good stewardship of its environment would allow it to not only produce these biofuels here but work with them to utilize it in their fleets and those of its schools and others who have large fleets throughout the Treasure Coast region. We also see how other counties here in Florida are starting up large scale algae projects ranging from a few acres to proposals for twenty thousand and more, as companies flock to Florida in hopes are creating this new cash crop. We see companies like Agrisys, a troop of other Florida companies — including PetroAlgae of Melbourne; Algenol of Bonita Springs; AquaFiber of Orlando; and Algae Aviation Fuel of Sarasota — sees the same promise in algae as a source of biofuel. Algae grows faster than any other potential crop, reaching maturity in less than 24 hours. As it grows, it devours CO2, generating oxygen as a by-product. Most important for its potential as fuel, algae produce lipids, which store energy as fat. http://www.floridatrend.com/a54228_florida-algae-preneurs--making-fuel-from-algae). Martin County has the combination of a government that is united in its desire to "Keep Martin Beautiful", not to allow the transition of agriculture lands into residential and at the same time looking to prepare its residents for a future where fossil fuels are no longer cheap and plentiful. We see algae and the products it produces as well as the fact that it is already here in Florida, except in our region. These biofuels could also assist the large recreational marine industry that is already suffering under high prices of fuel at its docks. This industry desperately needs support if it is to continue to be a thriving and ongoing concern here in

39 (http://www.reuters.com/article/2012/04/04/us-biofuels-idUSBRE8331FH20120404)

Martin County. As fuel prices rise, fewer and fewer will be able to use its waterways to view the amazing beauty that exists here, but this gives us an opportunity to partner with the recreational marine industry to produce biofuels at a reasonable price allowing for boats that would otherwise be idle to venture forth again. These biofuels, such as ethanol, methanol, butanol and others could be made locally from waste and not from feedstock, which would allow them to thrive here in South Florida. There are already farmers in Florida responding to this new market as they seize the opportunity to produce fuels to power their own vehicles and soon sell the excess to a marketplace that is desperate to control its fuel prices, as Biofuels Digest[5] is predicting the global demand for biofuels to double by 2025. This will be a marketplace created out of necessity but also one that is in its infancy stage here allowing for Martin County to build an industry that is truly sustainable as well a highly profitable bringing good paying jobs without the need for huge county investments like we have seen with other industries that have relocated to Florida.

40 (http://www.floridafuturessurvey.com/2012/02/agriculture.html)

In Summary

We believe that Martin County with its fully completed and adopted SEMP can now compete not only regionally but nationally for grant and private investor funding. This plan was built using surveys completed by industry represenatives from the energy and renewable energy fields, as we firmly believe that the private sector has valuable insight into how to accomplish these goals. The recommendations we received from the SEMP Committee, Harold Markey and the General Services Administration staff provided critical and invaluable data that allowed us to create a complete picture of Martin County's energy and water consumption. The information we received from FPL and other sources allowed us to present its Board of County Commissioners an accurate picture of the amount of carbon being emitted, as well as what is and can be controlled moving forward. It will be this benchmarking of the energy and carbon that will allow for Martin County to fully asses its current situation and using the recommendations provided by the plan to achieve its goals of reducing its energy and carbon emissions by 20% in the next decade. We have sought to provide a realistic timeline, as well as an action plan to meet this ambitious goal. In our review of sustainability plans done throughout our region we saw that many called for goals but left out a clear pathway, as without metrics and best practices that are easily found and obtained from the EPA and the U.S. Department of Energy and its partners such as SEE Action Martin County would not be able to achieve these savings and reductions. It will be utilizing these metrics that will allow it measure these modifications going forward and to attract capital.

We must keep in mind that as energy prices continue to increase that Martin County just like the rest of Florida and our nation remains vulnerable to these fluctuations,. This is due to the fact that locally, regionally and on statewide basis we produce precious little of our own energy. This will dictate much of our economic success moving forward, as our leaders must seek to mitigate the costs of energy, as with energy efficiency and renewable energy we can seek to create jobs, savings and provide a stable cost environment for companies looking to relocate to Martin County.

We strongly believe in the recommendations provided by the SEMP, as the MSI and other initatives called for will create a truly economically and environmentally sustainable Martin County, as with its message of growth management now being combined with a strategic vision on energy will keep our county moving forward as a leader without peers.

Appendix

Florida Green Home Retrofit Guidelines
Checklist Instructions

Version 1

Effective January 1, 2012

Revised 2/13/12

The state of Florida has over 8 million existing homes, which provides an excellent opportunity to save energy and save money. Homeowners that wish to green their existing homes may be on a limited budget, so the FGBC wishes to recognize even small efforts to improve the performance of your home.

The FGBC Florida Green Home Retrofit Guidelines were developed to assist homeowners and remodelers in making home improvement decisions to improve the efficiency, health and environmental friendliness of their homes. The Green Home Retrofit Guide includes assessments in 5 Categories: Energy, Water, Health, Materials, and Durability.

The Florida Green Building Coalition is providing these guidelines as an information tool and opportunity for homeowners who may wish to receive third-party verification that efficiency improvements have been incorporated into their homes.

Disclaimer

The Florida Green Building Coalition (FGBC) Green Home Retrofit Designation does not constitute an endorsement nor guarantee any performance level. The sole purpose of the program is to provide tools for homeowners who wish to implement strategies that have the potential to make a home operate in a more efficient and healthy manner.

Florida Green Building Coalition recommends the following process:

1. Complete the home assessment. This will help you understand your energy and water consumption.
2. Choose to pursue a Level 1, 2 or 3 of the FGBC Green Home Retrofit.
3. To achieve each level, a minimum of 5 upgrades are required as described below (Second Step).
4. If desired, submit the required documentation to receive an acknowledgement indicating your retrofit accomplishments.

The FGBC Green Home Retrofit program is not a certification program. For homeowners wishing to pursue a green home certification, please see the FGBC Florida Green Home Standard. The FGBC Florida Green Home Standard is a certification program that includes both new construction and existing homes for those wishing to pursue a whole house green remodel.

First Step…Complete your home assessment:

There are two assessment options.

1. Printable worksheets for the 5 categories, which can be completed by a homeowner to determine their annual energy and water use as compared to the average energy and water use in Florida. These worksheets can help you decide where the greatest potential for improvements and savings are. In addition, the worksheet helps you evaluate the durability and health of your home.

2. An Excel based evaluation tool for your homes energy use, water use, health, and durability. This tool includes helpful hints and links to additional information on conservation.

Second Step…Choose which level of retrofit you wish to complete:

Level 1 Select a minimum of 3 Energy and 2 Water conserving retrofit options for a total of 5 upgrades.

Level 2 Select a minimum of 5 Energy, 3 Water, and 2 additional retrofit options from any of the 5 categories for a total of 10 upgrades.

Level 3 Select a minimum of 5 Energy, 3 Water, 1 Health, 1 Materials, 1 Durability and 4 additional retrofit options from any of the 5 categories for a total of 15 upgrades.

Third Step... (Optional)...To receive an FGBC acknowledgement of your retrofit upgrades, complete the application form and submit to FGBC.

Appendix

Florida Green Home Retrofit Guidelines
Version 1

Third Step (Optional) . . .

To receive an acknowledgement of your retrofit strategies, submit this application form, the documentation required as noted in the FGBC Green Home Retrofit Reference Guide, and the appropriate payment based on the fee schedule noted below.

APPLICATION

Level Requested:	

Homeowner Name: _____

Home Address: _____

City: _____

Zip Code: _____

County: _____

Development/Subdivision _____

If known

- Home Size (in square feet) _____
- Year Home was Built _____
- Number of Bedrooms _____
- Number of Bathrooms _____
- Does the Home Have a Pool? _____

Payment by Check Payable to "FGBC" or Credit Card Accepted *(Visa, AX, MC & Discover)*

Credit Card #: _____

Expiration Date _____

Name on Card: _____

Billing Zip Code: _____

Signature: _____

The following indicates the FGBC application fee and requirements for each level

All applications must include documentation for each upgrade claimed

Level	Fee	Total # of Upgrades	Requirements
Level 1	**$25**	5	Select a minimum of **3 Energy** and **2 Water** conserving retrofit options for a total of 5 upgrades.
Level 2	**$35**	10	Select a minimum of **5 Energy**, **3 Water**, and **2 additional retrofit option**s from any of the 5 categories for a total of 10 upgrades.
Level 3	**$50**	15	(1) Select a minimum of **5 Energy**, **3 Water**, **1 Health**, **1 Materials**, **1 Durability** and **4 additional retrofit options** from any of the 5 categories for a total of 15 upgrades. (2) Level 3 **requires** that an FGBC Certifying Agent verify the installed home improvements. The fee charged by a Certifying Agent is in addition to the FGBC Green Home Retrofit Application Process Fee. You may find a list of FGBC Certifying Agents at www.FloridaGreenBuilding.org. (3) Once the Certifying Agent has verified the installations, the Certifying Agent will submit the application, appropriate documentation, and the processing fee to the Florida Green Building Coalition.

Level 3 Only - Certifying Agent Authorization

CA ID#: _____ **Typed Name:** _____

Signature: _____

Submit application package to: FGBC ◆ 3389 Plowshare Rd ◆ Tallahassee, FL 32309 ◆ www.FloridaGreenBuilding.org

Appendix

Complete the home assessment for each category and then choose your upgrades on the Checklist

ENERGY HOME ASSESSMENT

INPUT

How much is your electric bill?

January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
Total	

Add 12 months of electric bills to see how much you spend on electricity each year.

COMPARE

Compare how much you spend on electricity to the Florida average. If you are spending more than the Florida average there may be opportunity to save money and energy.

Florida Average Home Size, Energy Use and Cost per year

House Size	Bedrooms	Bathrooms	average Florida energy use (kWh/year)	energy equivalent (gallons of gas/year)	cost per year
1001-1400 square feet	2	1	14,000	382	$ 1,680
1401-1800 square feet	3	2	16,500	450	$ 1,980
1801-2500 square feet	4	2	20,000	546	$ 2,400
Over 2500	4	3	25,000	682	$ 3,000

TIPS

Answer "Yes" or "No" to the questions below:

Do you….

	Turn off fans when you leave a room?
	Turn off the lights when you leave a room?
	Replace dead light bulbs with CFL bulbs?
	Turn off the TV when you leave a room?
	Unplug chargers when not being use?
	Turn off your computer when you go to sleep?
	Keep your doors and windows closed if your air conditioning is on?
	Adjust the thermostat when you leave the house?
	Replace old appliances with ENERGY STAR® appliances?

If you answered…

"Yes" to all of these, you may find more energy saving tips in the Green Retrofit Checklist

"Yes" to 7 or less of these, work on making all of your answers "yes" and see the Green Retrofit Guidelines for additional ways to save energy.

"Yes" to 2 or less of of these, you have some easy opportunities to save energy and money on your electric bills. Work on turning off electronics when not in use and see the Green Retrofit Guidelines for new ideas

Make it your goal to answer "Yes" to all of these questions!

Appendix

FGBC FLORIDA GREEN BUILDING COALITION

WATER HOME ASSESSMENT

INPUT

How much is your water bill?

January _____
February _____
March _____
April _____
May _____
June _____
July _____
August _____
September _____
October _____
November _____
December _____

Total _____

Add 12 months of water bills to see how much you spend on water each year.

ESTIMATE

How much water are you using in your home per day?

How many people are in your home?

number of people:	_____	x 12 =	_____	gallons of water used showering daily
number of people:	_____	x 18 =	_____	gallons of water used in the toilets daily
number of people:	_____	x 15 =	_____	gallons of water in washing machine daily
number of people:	_____	x 1 =	_____	gallons of water used in a dishwasher daily
number of people:	_____	x 11 =	_____	gallons of water used by faucets daily
minutes sprinklers are on each day:	_____	x 17 =	_____	gallons of water used by sprinklers daily
minutes the hose is on each day:	_____	x 18 =	_____	gallons of water used by the hose daily

Add gallons of water to find total use: _____ **Total** gallons of water used **daily**

Multiply total gallons of water use daily: to see how much water is used every year: x 365 = _____ **Total** gallons of water used each **year**

TIPS

Answer "Yes" or "No" to the questions below:

For indoor water use, do you….

_____ Turn off water while you brush your teeth?
_____ Turn off water while you wash your hands?
_____ Shower in under 5 minutes?
_____ Fix a leak as soon as it starts?
_____ Use low-flow faucets and shower heads?
_____ Replace old fixtures and appliances with WaterSense® fixtures and appliances?

For outdoor water use, do you….

_____ Only water plants and grass early in the morning?
_____ Turn off sprinklers if it rained the day before or will rain the next day?
_____ Point sprinkler heads at plants, not sidewalks or driveways?
_____ Only cut your grass to as low as 3 inches?
_____ Use slow-release nitrogen and no phosphorus for fertilizer?
_____ Only use pesticides where there are spots or bug problems?

If you answered…

"Yes" to all of these, you are a water saver! Check out the retrofit guidelines to find more water saving ideas.

"Yes" to 7 or less of these, work on making all of your answers "yes" and see the retrofit guidelines for additional ways to save water.

"Yes" to 2 or less of of these, you have some easy opportunities to save water and money on your water bills. Work on turning off water when not in use and see the retrofit guidelines for additional water saving ideas.

Make it your goal to answer "Yes" to all of the questions!

Appendix

FGBC FLORIDA GREEN BUILDING COALITION

HEALTH HOME ASSESSMENT

TIPS

Answer "Yes" or "No" to the questions below:

Do you….

_____ Change your air filter every month?

_____ Take batteries, paint, electronics, and chemicals to a hazardous waste disposal site?

_____ Bring only natural fabrics into your home?

_____ Leave your bath fan on for 20 minutes after showering?

_____ Use exhaust fans when cooking, dishwashing, and cleaning?

_____ Clean mold off hard surfaces with water and detergent (NOT bleach) and dry?

_____ Replace any moldy carpets, ceiling tiles, wallpaper, drywall, and furniture?

If you answered…

"Yes" to 6 or less of these, try doing a few more to improve your air quality!

"Yes" to 2 or less of of these, you can easily improve your indoor air quality by changing your habits to include these actions!

Make it your goal to answer "Yes" to all of these questions!

RESOURCES

To find low-VOC finishing products, such as paints, varnishes, and stains, look for labels by:

- GREENGUARD
- GREEN SEAL
- FloorScore

For safe, alternative cleaning products:

All-Purpose Disinfecting Cleaner

2 cups water (preferably distilled)
1.5-3 tsp liquid castile soap
1 tsp tea tree oil
(2 drops essential oil for scent)
Mix ingredients. Cleaner may be stored at room temperature.

Counter/Bathtub Cleaner

baking soda
soap

Toilet Bowl Cleaner

1 cup borax
Pour into toilet bowl, leave overnight. Scrub and flush.

Dusting (no chemicals needed)

microfiber cloth

Mold/Mildew/Germ Cleaner

hydrogen peroxide *OR* distilled white vinegar

Stain Removal (Countertop/Bathtub)

borax
OR hydrogen peroxide
OR distilled white vinegar

Glass Cleaner

1/4 cup white distilled vinegar
1 qt warm water
Mix ingredients. Apply with spray bottle or sponge, wipe dry.

Rust Removal

1 lime
salt
Sprinkle salt onto the rust, squeeze lime juice onto salt until it is well- soaked. Let sit for 2-3 hours. Scrub off rust with lime

Cleaner Additive for Scent/Air Freshener/Candle Replacement

essential oils (e.g., lavender, rose, vanilla, pine, chamomile, cinnamon, eucalyptus, grapefruit, lemon, orange)

Appendix

FGBC FLORIDA GREEN BUILDING COALITION

DURABILITY HOME ASSESSMENT

TIPS

Answer "Yes" or "No" to the questions below:

Do you....

_____ Have impact-resistant shutters or screens on windows, skylights, and glass doors?
_____ Have rain gutters that let water out at least 3 feet away from the house?
_____ Have secondary water protection on your roof, such as roofing underlayment?
_____ Have water and non-refrigerated food stored in your home for emergencies?
_____ Have local emergency phone number and evacuation zone information?
_____ Have a checklist for steps to take during a disaster?

If you answered... "Yes" to all of these, great job to provide a durable home.
"Yes" to 5 or less of these, review the above list and the retrofit guidelines for additional ways to improve your homes durability.
"Yes" to 2 or less of of these, try to complete the above items and review the retrofit guidelines for new durable ideas.

Make it your goal to answer "Yes" to all of these questions!

Appendix

Florida Green Home Retrofit Guidelines

Version 1

Checklist - Choose Your Upgrades!

ENERGY

Revised 2/13/12

____ E1 Weatherize home by doing ALL of the following:

1. Replace weather-stripping on exterior doors
2. Remove HVAC vent covers (diffusers) and install gaskets or caulk behind them, reinstall
3. Remove trim around recessed can lighting and install gaskets or caulk behind them, reinstall
4. Remove electrical outlet covers on exterior walls and install gaskets or caulk behind them, reinstall

____ E2 Replace a minimum of 75% of installed light bulbs with CFL or LED light bulbs

____ E3 Replace thermostat with a programmable thermostat

____ E4 Increase attic insulation to a minimum of R-38 at the ceiling

____ E5 Add a radiant barrier in the attic to the underside of the roof sheathing

____ E6 Add window tint film to decrease heat gain from the sun into your home

____ E7 Install/replace with motion/light sensors to all exterior lighting

____ E8 Replace an old refrigerator with a new ENERGY STAR® refrigerator

____ E9 Replace an old dishwasher with a new ENERGY STAR® dishwasher

____ E10 Replace an old clothes washer with a new ENERGY STAR® clothes washer

____ E11 Install new ENERGY STAR® ceiling fans in the main living area and 75% of bedrooms

____ E12 In all bathrooms without exhaust fans, install new ENERGY STAR® exhaust fans

____ E13 Install and set timer on water heater

____ E14 Replace hot water heater with state certified solar or ENERGY STAR® hot water heating system

____ E15 Replace HVAC system with new, properly sized per current or manual J calculations, air conditioning system with SEER 15 and 8.5 HSPF minimum efficiency

____ E16 Seal ductwork and joints with mastic to prevent leaks

____ E17 Have duct work smoke tested for leaks and sealed by a professional if necessary

____ E18 Spray foam, minimum R-19, to the bottom of the roof deck to create an unvented attic

____ E19 Re-roof: replace with roofing that is ENERGY STAR® labeled

____ E20 Repaint home exterior in a color with light reflective value of greater than 50

____ E21 Change existing pool heater to solar

____ E22 Replace pool pump with ENERGY STAR® pool pump

____ E23 Plant trees for shade East/West; in North Florida deciduous trees, based on coverage with 5 years in ground growth

____ TOTAL (Minimum 3 for Level 1, Minimum 5 for Level 2, Minimum 5 for Level 3)

Appendix

WATER

Interior Water Saving

____ W1 Change rubber hoses to reinforced hoses
____ W2 Replace showerheads with 2.0 gallons per minute (gpm) or lower flow rate showerheads
____ W3 Install aerators for bathroom faucets (1.5 gpm)
____ W4 Replace dishwasher with ENERGY STAR® appliance using less than or equal to 5.8 gallons per cycle (gpc)
(Note: if you claim this point in ENERGY, you cannot claim it again in WATER)
____ W5 Replace clothes washer with ENERGY STAR® labeled water saving clothes washer
(Note: if you claim this point in ENERGY, you cannot claim it again in WATER)
____ W6 Re-plumb residence with PEX manifold type system
____ W7 Add on demand (button or switch triggered) water recirculation pump to existing system
____ W8 Remove existing garbage disposal
____ W9 Replace toilets with WaterSense® or minimum MaP 350, dual flush or maximum 1.28 gpf toilets
____ W10 Install grey water collection on bathroom sinks to reuse for toilet flushing

Exterior Water Saving

____ W11 Install a rain gauge that will shut off irrigation during rain events
____ W12 Update irrigation controller to a programmable controller
____ W13 Install cistern(s), minimum 250 gallons total capacity, for irrigation
____ W14 Turf area less than 50% of landscaped area
____ W15 50% of all landscape plants are on the Florida Friendly Plants list
____ W16 Replace a minimum of 200 square feet of turf with Florida Friendly Plants
____ W17 Install rain barrels for rainwater harvesting
____ W18 Add a pool cover to an existing pool
____ W19 Have an irrigation professional perform a “check up” on existing irrigation system
____ W20 Permanently abandon existing irrigation system

____ TOTAL (Minimum 2 for Level 1, Minimum 3 for Level 2 and Minimum 3 for Level 3)

HEALTH

____ H1 Use green cleaning products
____ H2 Replace existing bathroom exhaust fans with ENERGY STAR® labeled exhaust fans that include a timer or humidistat
____ H3 Use low-VOC paints, stains, finishes, as defined in the Reference Guide, on all interior surfaces
____ H4 Replace at least 50% of existing carpet with healthy flooring, as defined in the Reference Guide
____ H5 Seal wall/openings between garage and conditioned residence
____ H6 Install fixed exhaust fan with motion sensor and timer in garage
____ H7 Install carbon monoxide alarms: Entrances to garage and to all sleeping areas
____ H8 Install dehumidifier in HVAC system
____ H9 Install make-up air source to laundry room located within the conditioned envelope
____ H10 Replace range hood with exterior ducted, ENERGY STAR® labeled range hood
____ H11 Tape and mastic any air handler located in unconditioned space
____ H12 Make or install a mud room or otherwise usable entry area

____ TOTAL (Minimum 0 for Level 1, Minimum 0 for Level 2, Minimum 1 for Level 3)

Appendix

MATERIALS

____ M1 Dedicated recycling bins in place
____ M2 Use locally sourced materials
____ M3 Use non-cypress mulch
____ M4 Develop a construction and demolition waste management plan
____ M5 Implement a recycle, reuse, repurpose plan for construction
____ M6 Engineered/alternative materials for outdoor living

____ TOTAL (Minimum 0 for Level 1, Minimum 0 for Level 2, Minimum 1 for Level 3)

DURABILITY

____ D1 Have a hurricane plan and a hurricane kit available
____ D2 Attic sealed to prevent water intrusion and to mitigate uplift
____ D3 Exterior structures properly anchored
____ D4 Improve tie-downs of house trusses and foundation
____ D5 Brace gable roofs
____ D6 Add a hurricane system, other than plywood or OSB, for window and door protection
____ D7 Replace garage door and tracks with hurricane resistant system
____ D8 Re-roofing: Install secondary water protection
____ D9 Install gutters and downspouts to divert water at least 3' away from foundation

____ TOTAL (Minimum 0 for Level 1, Minimum 0 for Level 2, Minimum 1 for Level 3)

Determine Your Project Retrofit Level

Level 1: 5 Upgrades Required		Level 2: 10 Upgrades Required		Level 3: 15 Upgrades Required	
Number of Upgrades Completed		Number of Upgrades Completed		Number of Upgrades Completed	
Energy Upgrades	_____ (3 Min.)	Energy Upgrades	_____ (5 Min.)	Energy Upgrades	_____ (5 Min.)
Water Upgrades	_____ (2 Min.)	Water Upgrades	_____ (3 Min.)	Water Upgrades	_____ (3 Min.)
Health Upgrades	_____ (0 Min.)	Health Upgrades	_____ (0 Min.)	Health Upgrades	_____ (1 Min.)
Materials Upgrades	_____ (0 Min.)	Materials Upgrades	_____ (0 Min.)	Materials Upgrades	_____ (1 Min.)
Durability Upgrades	_____ (0 Min.)	Durability Upgrades	_____ (0 Min.)	Durability Upgrades	_____ (1 Min.)
Additional Upgrades	_____ (0 Min.)	Additional Upgrades	_____ (2 Min.)	Additional Upgrades	_____ (4 Min.)
Total Upgrades	_____	**Total Upgrades**	_____	**Total Upgrades**	_____

FGBC Reviewer: _____

Signature: _____

Date Reviewed: _____

Appendix

ENERGY STAR® Portfolio Manager Data Collection Worksheet

This worksheet was designed to help building owners and managers collect data to benchmark buildings using EPA's ENERGY STAR Portfolio Manager. The information in this worksheet will be used to establish your building's profile in Portfolio Manager, which is critical to calculate benchmarks of key metrics such as energy intensity and costs, water use, and carbon emissions. **All building types can be entered into Portfolio Manager and receive energy and water benchmarks, as well as a comparison of performance against a national average for buildings of a similar type.**

Some buildings will also receive an ENERGY STAR score. The ENERGY STAR score is a benchmark that indicates how efficiently buildings use energy on a 1-100 scale. A score of 50 indicates that energy performance is average compared to similar buildings, while a score of 75 or better indicates top performance, and means your building may be eligible to earn the ENERGY STAR label. To receive an ENERGY STAR score, the gross floor area of the building must be comprised of more than 50% of one of the following space types: bank/financial institution, courthouse, data center, hospital (general medical and surgical), hotel, house of worship, K-12 school, medical office, office, residence hall/dormitory, retail store, senior care facility, supermarket/grocery store, warehouse (refrigerated and unrefrigerated), and wastewater treatment plant.

Use this worksheet to collect the data for all space types applicable to your facility.

Required Data for ENERGY STAR Benchmarking

- Portfolio Manager username and password.
- The building street address, year built, and contact information.
- The building gross floor area and key operating characteristics for each major space type. Use this worksheet to collect this information before logging in to Portfolio Manager.
- 12 consecutive months of utility bills for all fuel types used in the building. If you don't have this information readily available, contact your utility provider(s) as most will be able to easily supply this historical information.

General Building Information

Facility name _____ Year built_____

Building address _____

City _____ State _____ZIP _____

Space Use Attributes

Before compiling the information noted in the boxes below, review the following important information:

- Specific definitions and instructions for each of the data fields listed in the boxes below can be viewed by navigating to Portfolio Manager Help, selecting "Space Type Definitions," choosing the appropriate building type, and selecting "Space Use Information."
- Some buildings may contain multiple space types within a single building (e.g. office, data center, and parking OR K-12 school and swimming pool). Complete the fields below for each applicable major space types within the building.
- For buildings with multiple tenants with the same space type, these spaces should be entered separately only when the number of weekly operating hours among tenants differs by more than 10 hours. For example, in a 100,000 square foot (SF) office building where 75,000 SF operates 60 hours a week and 25,000 SF operates 80 hours a week, please list as two separate spaces – one 75,000 SF space and one 25,000 SF space. As this is most common in office buildings, multiple office space fields are provided below to capture data for multiple tenants if necessary.
- Default values supplied by Portfolio Manager can be used for all space use characteristics with the exception of gross floor area. Using default values will result in an approximate energy performance score which can be a beneficial metric for estimating energy performance. If defaults are used for an initial score, it is recommended that actual data be added later to more accurately measure a facility's energy performance. Facilities using default values are not eligible to apply for the ENERGY STAR label. Leave any of the requested information below blank (except gross floor area) to use a default value for the field.

Appendix

Bank/Financial Institution:

Required:

_____ **Gross floor area (SF)**

_____ Weekly operating hours

_____ # of workers on main shift

_____ # of personal computers

_____ Percent of floor area that is air conditioned (>=50%, <50%, or none)

_____ Percent of floor area that is heated (>=50%, <50%, or none)

Courthouse:

Required:

_____ **Gross floor area (SF)**

_____ Weekly operating hours

_____ # of workers on main shift

_____ # of personal computers

_____ Percent of floor area that is air conditioned (>=50%, <50%, or none)

_____ Percent of floor area that is heated (>=50%, <50%, or none)

Data Center:

Required:

_____ **Gross floor area (SF)**

_____ IT Energy Configuration – Select one from:

1. Uninterruptible Power Supply (UPS) Meter supports only IT Equipment. **(Preferred)**
2. UPS Meter includes non-IT load of 10% or less.
3. UPS Meter includes non-IT load greater than 10%. Non-IT load is sub-metered.
4. UPS Meter includes non-IT load greater than 10%. Non-IT load is **not** sub-metered.
5. Facility has no UPS Meter.
6. IT Energy is not current metered at this facility – Apply Estimates.

_____ IT Energy Data – 12 months of measured energy consumption data is required from either the UPS or PDU Meter, depending on IT Energy Configuration

Meter Type (select 1): UPS Output or PDU Input

Month	Start Date	End Date	Energy Consumption (kWh)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Optional:

_____ UPS System Redundancy (N, N+1, N+2, 2N, greater than 2N, none of the above)

_____ Cooling System Redundancy (N, N+1, N+2, 2N, greater than 2N, none of the above)

Appendix

Hospital (General Medical and Surgical): **Required:** _____ **Gross floor area** (>20,000 SF) _____ # of staffed beds _____ # of MRI machines _____ # FTE workers **Optional:** _____ Laboratory on-site – yes or no _____ Laundry facilities on site – yes or no _____ Number of Buildings _____ Maximum # of floors _____ Tertiary care facility – yes or no _____ Ownership Status (drop down of options)	**House of Worship:** **Required:** _____ **Gross floor area (SF)** _____ Maximum seating capacity _____ Weekdays of operation _____ Hours of operation per week _____ # of personal computers _____ Presence of cooking facilities - yes or no _____ # of commercial refrigeration/freezer units
Hotel: **Required:** _____ **Gross floor area (SF)** _____ # of rooms _____ # of workers on main shift _____ # of commercial refrigeration/freezer units _____ On-site cooking – yes or no _____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.) _____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) **Optional:** _____ Hours per day the guests are on-site _____ Number of guest meals served _____ Square footage of full-service spas _____ Square footage of gym/fitness center _____ Laundry processed at site (drop down of options) _____ Annual quantity of laundry processed on-site _____ Average Occupancy (%)	**K-12 School:** **Required:** _____ **Gross floor area (SF)** _____ # of personal computers _____ # of walk-in refrigeration/freezer units _____ High school – yes or no _____ Open weekends – yes or no _____ On-site cooking – yes or no _____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.) _____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) **Optional:** _____ Months of use _____ School District

Appendix

Medical Office: **Required:** _____ **Gross floor area (SF)** _____ # of workers on main shift _____ Weekly operating hours _____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.) _____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.)	**General Office 1:** **Required:** _____ **Gross floor area (SF)** _____ Weekly operating hours _____ # of workers on main shift _____ # of personal computers _____ Percent of floor area that is air conditioned (>=50%, <50%, or none) _____ Percent of floor area that is heated (>=50%, <50%, or none)
Multifamily Housing: **Required:** _____ **Gross floor area (SF)** **Optional:** _____ Total number of units _____ Total number of bedrooms _____ Maximum number of floors in the tallest building/ tower _____ Percent of square footage devoted to common area _____ Number of laundry hookups in individual apartment units _____ Number of laundry hookups in common areas _____ Total number of dishwashers in all units _____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.) _____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) _____ Primary hot water fuel type _____ Resident population type (No specific type, Dedicated Student, Dedicated Military, Dedicated Senior/Independent Living, Dedicated Special Accessibility Needs, Other Dedicated Housing) _____ Government subsidized housing (Yes or No)	**General Office 2:** **Required:** _____ **Gross floor area (SF)** _____ Weekly operating hours _____ # of workers on main shift _____ # of personal computers _____ Percent of floor area that is air conditioned (>=50%, <50%, or none) _____ Percent of floor area that is heated (>=50%, <50%, or none)

Appendix

Other: **Required:** _____ **Gross floor area (SF)** (must be less than 10% of gross building floor area in order for the building to be eligible for a rating) **Optional:** _____ # of personal computers _____ Weekly operating hours _____ # workers on main shift	**General Office 3:** **Required:** _____ **Gross floor area (SF)** _____ Weekly operating hours _____ # of workers on main shift _____ # of personal computers _____ Percent of floor area that is air conditioned (>=50%, <50%, or none) _____ Percent of floor area that is heated (>=50%, <50%, or none)
Parking: **Required:** _____ Gross floor area that is enclosed (SF) _____ Gross floor area that is not enclosed with a roof (SF) _____ Gross floor area that is open (SF) _____ Weekly hours of access	**Retail Store:** **Required:** _____ **Gross floor area (SF)** _____ Weekly operating hours _____ # of workers on main shift _____ # of personal computers _____ # of cash registers _____ # of walk-in refrigeration/freezer units _____ # of open & closed refrigeration/freezer cases _____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.) _____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) _____ Exterior entrance to the public – yes or no

Appendix

Residence Hall/Dormitory:

Required:

_____ Gross floor area (SF)

_____ # of rooms

_____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)

_____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.)

Optional:

_____ Computer lab on-site – yes or no

_____ Dining Hall on-site– yes or no

Senior Care Facility:

Required:

_____ Gross floor area (SF)

_____ # of units

_____ Average Number of Residents

_____ Total Resident Capacity

_____ # of workers on the main shift

_____ # of PCs owned by the community (does not include PCs owned by residents)

_____ # of commercial refrigeration/freezer units

_____ # of commercial washing machines

_____ # of residential washing machines

_____ # of residential electronic lift systems

_____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)

_____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.)

Supermarket/Grocery Stores:

Required:

_____ **Gross floor area (SF)**

_____ Weekly operating hours

_____ Workers on main shift

_____ On-site cooking – yes or no

_____ # of walk-in refrigeration/freezer units

_____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.)

_____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.)

Optional:

_____ # of open or closed refrigeration/freezer cases

_____ # of registers and/or personal computers

Swimming Pool:

Required:

_____ Swimming pool size, choose from:
Olympic (50 meters x 25 meters)
Recreational (20 yards x 15 yards)
Short Course (25 yards x 20 yards)

_____ Indoor or outdoor

Optional:

_____ Months of use

Appendix

Warehouse (refrigerated and unrefrigerated): **Warehouse (Unrefrigerated):** **Required:** _____ **Gross floor area (SF)** _____ Weekly operating hours _____ # of workers on main shift _____ # of walk-in refrigerators/freezer units _____ Percent of floor area that is cooled in 10% increments (10%, 20%, 30%, etc.) _____ Percent of floor area that is heated in 10% increments (10%, 20%, 30%, etc.) **Optional:** _____ Distribution Center – yes or no **Warehouse (Refrigerated):** _____ **Gross floor area (SF)** _____ Weekly operating hours _____ # of workers on main shift	**Wastewater Treatment Plant:** **Required:** _____ Average influent flow (mgd) _____ Average influent biological oxygen demand (BOD_5) _____ Average effluent biological oxygen demand (BOD_5) _____ Plant design flow rate (mgd) _____ Presence of fixed film trickle filtration process – yes or no _____ Presence of nutrient removal process – yes or no
	Water Treatment and Distribution Utility: **Required:** _____ Average flow (mgd)

Appendix

2003 CBECS[1] National Median Source Energy Use and Performance Comparisons by Building Type			
Building Use Description[2]	Median Source EUI[3] (kBtu/Sqft)	Average Percent (%) Electric Use	Median Site EUI (kBtu/Sqft)
Education	144	63%	58
K-12 School	*Use EPA's Target Finder / Portfolio Manager*		
College/University (campus level)	244	63%	104
Food Sales	570	86%	193
Grocery Store/Food Market	*Use EPA's Target Finder / Portfolio Manager*		
Convenience store (with or without gas station)	657	90%	228
Food Service	575	59%	267
Restaurant/Cafeteria	434	53%	207
Fast Food	1170	64%	418
Inpatient Health Care (Hospital)	*Use EPA's Target Finder / Portfolio Manager*		
Lodging	163	61%	72
Dormitory/Fraternity/Sorority	*Use EPA's Target Finder / Portfolio Manager*		
Hotel/Motel/Inn	*Use EPA's Target Finder / Portfolio Manager*		
Mall (Strip and Enclosed)	247	71%	94
Nursing/Assisted Living	*Use EPA's Target Finder / Portfolio Manager*		
Office	*Use EPA's Target Finder / Portfolio Manager*		
Outpatient and Health Care	163	72%	62
Clinic/Other Outpatient Health	194	76%	67
Medical Office	*Use EPA's Target Finder / Portfolio Manager*		
Public Assembly	89	57%	42
Entertainment/Culture	94	63%	46
Library	246	59%	92
Recreation	100	55%	39
Social/Meeting	71	57%	43
Public Order and Safety	161	57%	82
Fire/Police Station	146	56%	82
Service (Vehicle Repair/Service, Postal Service)	96	63%	45
Storage/Shipping/Non-Refrigerated Warehouse	28	56%	10
Non-Refrigerated Warehouse/Distribution Center	*Use EPA's Target Finder / Portfolio Manager*		
Refrigerated Warehouse	*Use EPA's Target Finder / Portfolio Manager*		
Religious Worship	*Use EPA's Target Finder / Portfolio Manager*		
Retail (non-Mall Stores, Vehicle Dealerships)	139	67%	53
Other[4]	127	56%	70

For instructions on how to use the table and footnotes, see page 2

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Appendix

2003 CBECS[1] National Median Source Energy Use and Performance Comparisons by Building Type

Instructions on how to use the table:
The building types listed in blue shaded rows define the broad building activity category; while the sub-categories (listed beneath the main headings) are delineated into more specific building activities.

To identify your building's **activity category from the table:**
1. Determine the building's general function within the broad activity category (blue shaded rows).
2. Determine if there is a more specific function of the building listed under the broader category heading (in the non-shaded rows).
3. Match your building's function with the most specific Building Use Description listing (under the broad activity category or sub-heading) to determine the most appropriate energy use performance target.

Footnotes
[1] **Commercial Building Energy Consumption Survey (CBECS)**, conducted in 2003, was used to calculate values presented in this table. The data is gathered from the Dept. of Energy's – Energy Information Administration (EIA). These are building types that are not currently available in EPA's Target Finder and Portfolio Manager.

[2] **Buildings Use Descriptions** are taken from valid building activities as defined by EIA in the 2003 CBECS data. The building type in the blue shaded rows is defined according to the CBECS variable for "Principal Building Activity" (PBA8) which is a broader defined category. The subset of building types listed below those broader categories is defined according to the CBECS variable for PBAPLUS8. These are defined as a more specific building activity within the broader PBA8 category. Note: All building type definitions can be found at: http://www.eia.doe.gov/emeu/cbecs/building_types.html

[3] **Median Energy Values** are computed by calculating the EUI for each individual building and then computing a median EUI for each category, applying the CBECS survey sample weights. The median represents the 50th percentile of a distribution (i.e. group or sample) of numbers. When the numbers in the group are ranked from smallest to largest, the median is the number in the middle. Half of the numbers in the group fall above the median and half of the numbers fall below the median. It is comparable to a score of 50 on the ENERGY STAR performance scale – where half of the buildings of a given type use more energy than the median and half of the buildings use less energy.

Source Energy is a measure that accounts for the energy consumed on site in addition to energy consumed during generation and transmission in supplying energy to the site.

Converting site to source energy: Source energy values are calculated using a conversion factor for electricity of 1 kBtu site energy = 3.34 kBtu source energy; a conversion factor for natural gas of 1 kBtu site energy = 1.047 kBtu source energy; a conversion factor for fuel oil of 1 kBtu site energy = 1.01for district heat consumption, a conversion factor of 1 kBtu site energy = 1.21 kBtu source energy for steam and a conversion factor of 1 kBtu site energy = 1.28 kBtu source energy for hot water. Note: More information on site-to-source energy conversions can be found at: http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_benchmark_comm_bldgs

Explanation of Source Energy: The source energy intensity target cannot simply be converted into an equivalent site energy value because different design strategies may yield different fuel mixes. Thus the different fuel mixes translate into the corresponding site to source ratios for a specific building. It is important to note that reducing source energy by 50% is not always mathematically equivalent to reducing site energy by 50%. For the most equitable peer comparison, the associated fuel mix should be used to convert the modeled site energy into the total source energy. The source energy use can then be compared to the values in this table.

[4] **Other:** For all building types not defined by the list above, these buildings may choose to use the performance benchmark categorized by "other". Note that this category is not well defined therefore source energy use varies greatly with source EUI ranging over 1500 kBtu/sqft. As categorized by EIA, "other" may include airplane hangers, laboratory, crematorium, data center, etc.

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Appendix

2020 Martin County Sustainable Communities Vision Plan – Guiding Principles

CATEGORY	NO.	PRINCIPLE
Environment	1	Conserve & recycle precious community resources
	2	Use resources efficiently
	3	Protect & enhance natural resources
Land Use	4	Foster community belonging, unique sense of community identity
	5	Encourage compact, mixed-use, residential, commercial, institutional pedestrian-oriented development
	6	Encourage redevelopment & infill development within the USB
	7	Protect & enhance existing neighborhoods
	8	Emphasize quality design, aesthetics of built environment
	9	Create walkable neighborhoods, including existing, with amenities
	10	Maintain an open space network with linkages to neighborhood parks, recreation areas, and natural areas
	11	Integrate open spaces, conservation areas, multi-modal transportation into neighborhoods
	12	Protect & celebrate community heritage & historically significant facilities
	13	Encourage traditional communities, integrate gated communities
	14	Preserve & promote agricultural areas
	15	Utilize advanced production systems
	16	Maintain a clearly defined edge between urban & rural areas
	17	Recognize and plan for potential natural disasters
Transportation	18	Provide a highly connected street network comprised of small narrow roads & redesign existing arterials, design new collectors to be grand public spaces
	19	Provide multi-modal transportation alternatives/ choices including transit, trails, bikeways & sidewalks
	20	Utilize advanced transportation systems

Appendix

Martin County Comprehensive Growth Management Plan – Related Policies

GOAL	OBJECTIVE	POLICY	TOPIC
4.3.			Mixed residential and nonresidential uses, including Traditional Neighborhood Development
	4.3A.		Mixed use in designated CRAs
4.8.			Energy conservation and energy-efficient land uses
		4.8A.1.	Encouragement of sustainable development principles
		4.13A.13.	Mixed Use Overlay
5.1.			Transportation Network
		5.1B.6.	Encouragement of mixed-use developments
		5.2A.14.	Promotion of 'Complete Streets'
		5.3A.3.	Promotion of safe roadway designs
		5.3A.13.	Working with East Coast Greenway Alliance for north-south and east-west trail system.
		5.3B.6.	Support of energy-efficient transportation
5.4.			Bicycle and pedestrian friendly community
	5.4A.		Bicycle and pedestrian facilities
		5.4A.1.	Bicycle and pedestrian collision reporting
		5.4A.2.	Bicycle and pedestrian facilities in state projects
		5.4A.3.	Bicycle facilities on new/resurfaced collectors and arterials
		5.4A.4.	Pedestrian facilities on collectors and arterials
		5.4A.5.	Bicycle and pedestrian facilities improvement program
		5.4A.6.	Prioritization of needed bicycle and pedestrian facilities
		5.4A.7	Identification of funding sources for bicycle and pedestrian facilities
		5.4A.8.	Pedestrian displays at traffic signals
		5.4A.9	Needs of bicyclists and pedestrians in developments
		5.4A.10.	Notification of bicycle and pedestrian standards
	5.4B.		Development of pedestrian and bicycle transportation system
		5.4B.1.	Bicycle and pedestrian facilities around schools
		5.4B.2.	Bicycle and pedestrian access to retirement and handicapped residence centers
		5.4B.3.	Bicycle and pedestrian facilities in public areas
		5.4B.4.	Bicycle and pedestrian facilities at County facilities
7.1			Provision of diverse recreational opportunities
	7.1B.		Provision of recreational facilities inventoried in the Parks and Recreation Master Plan
		14.1A.3.	LOS standards for category B facilities, including bicycle and pedestrian and other multimodal pathways.
		15.2C.8.	Identification of transportation corridors to connect tourism nodes, such as hotels, regional parks and environmental tourism attractions.
		15.2D.3	Coordination with FDOT to enhance overall transportation network to provide improved access to tourism and employment centers.

SWOT: Energy

SurveyMonkey

1. Please provide the following information:

	Response Percent	Response Count
Name:	**100.0%**	**16**
Title:	87.5%	14
Company Name:	**100.0%**	**16**
	answered question	**16**
	skipped question	**1**

2. Wind Power: County-wide Benefit

	Response Percent	Response Count
Low	**62.5%**	**10**
Medium	25.0%	4
High	12.5%	2
	answered question	**16**
	skipped question	**1**

Appendix

3. Wind Power: Return On Investment (ROI)

	Response Percent	Response Count
Low	**56.3%**	**9**
Medium	31.3%	5
High	12.5%	2
	answered question	**16**
	skipped question	**1**

4. Wind Power: Environmental Benefit

	Response Percent	Response Count
Low	25.0%	4
Medium	25.0%	4
High	**50.0%**	**8**
	answered question	**16**
	skipped question	**1**

5. Wind Power: Implementation Difficulty

	Response Percent	Response Count
Low	25.0%	4
Medium	25.0%	4
High	**50.0%**	**8**
	answered question	**16**
	skipped question	**1**

SWOT: Water

SurveyMonkey

1. Please provide the following information:

		Response Percent	Response Count
Name:		**100.0%**	**14**
Title:		85.7%	12
Company Name:		92.9%	13
		answered question	**14**
		skipped question	**0**

2. Wastewater Treatment Plants: County-wide Benefit

		Response Percent	Response Count
Low		7.1%	1
Medium		21.4%	3
High		**71.4%**	**10**
		answered question	**14**
		skipped question	**0**

Appendix

3. Wastewater Treatment Plants: Return On Investment (ROI)

	Response Percent	Response Count
Low	14.3%	2
Medium	**64.3%**	**9**
High	21.4%	3
	answered question	**14**
	skipped question	**0**

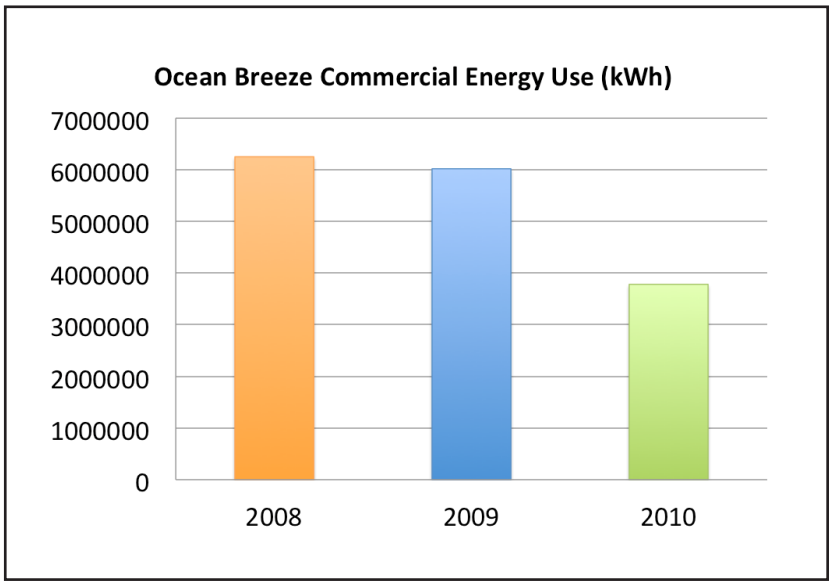
4. Wastewater Treatment Plants: Environmental Benefit

	Response Percent	Response Count
Low	7.1%	1
Medium	28.6%	4
High	**64.3%**	**9**
	answered question	**14**
	skipped question	**0**

5. Wastewater Treatment Plants: Implementation Difficulty

	Response Percent	Response Count
Low	14.3%	2
Medium	**64.3%**	**9**
High	21.4%	3
	answered question	**14**
	skipped question	**0**

Appendix


Ocean Breeze Commercial Energy Use (kWh)
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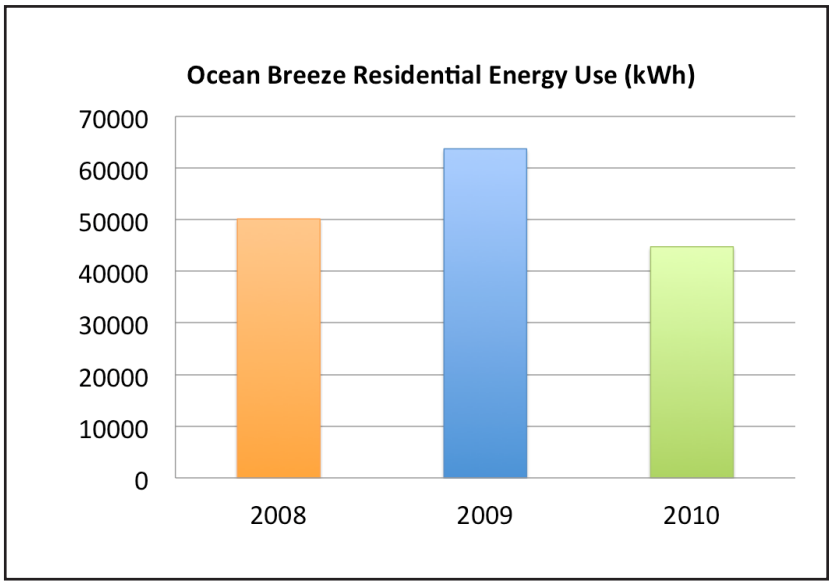
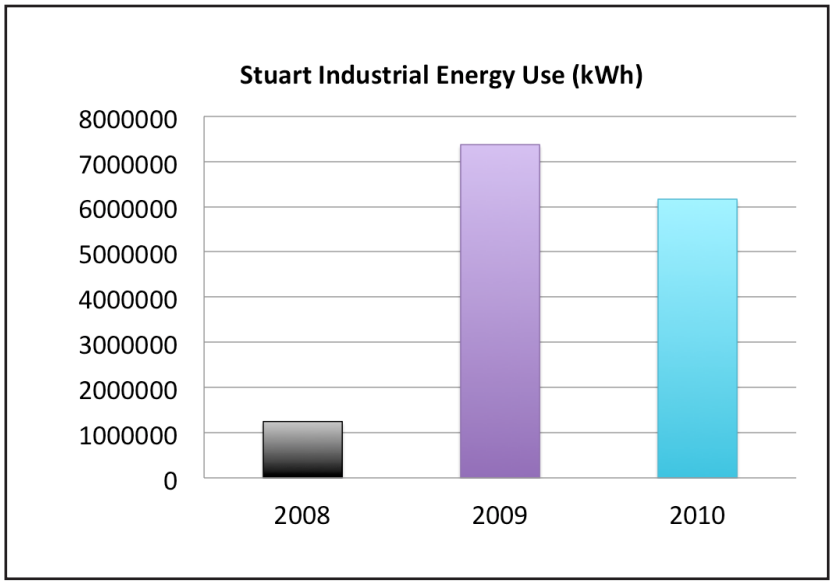
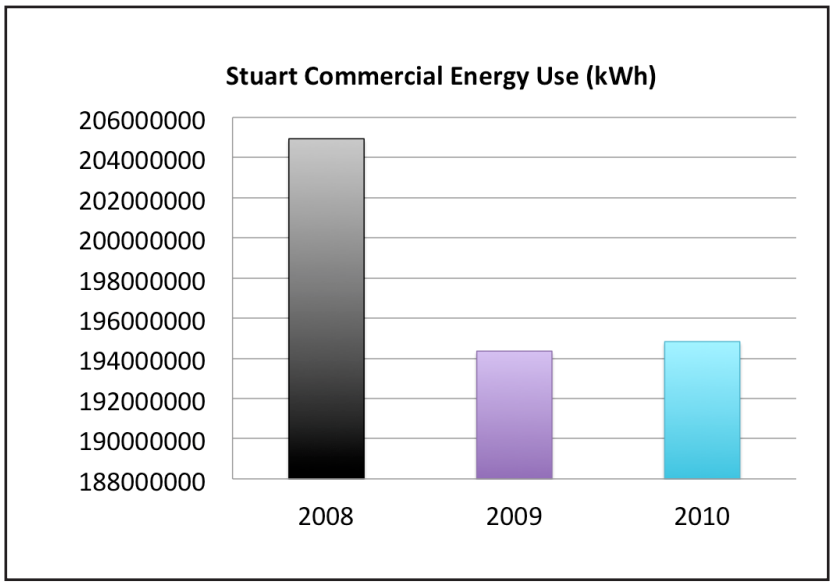
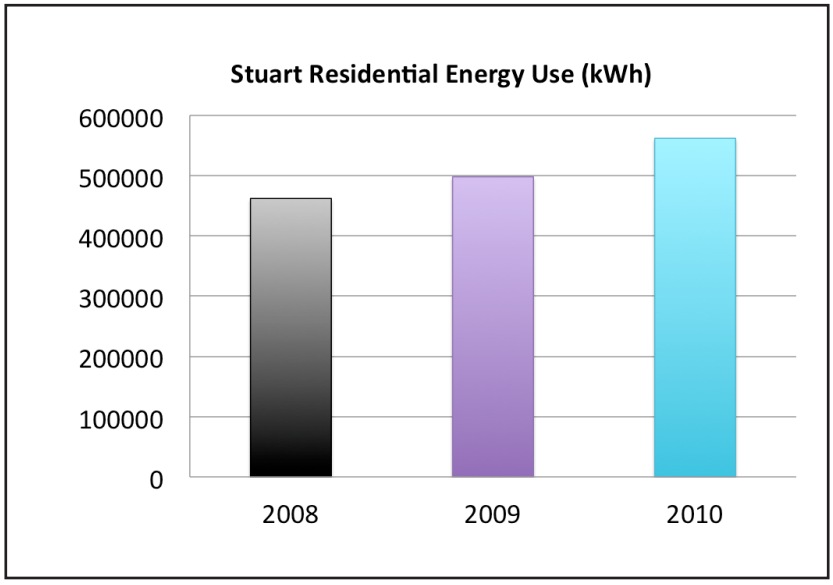
6000000
5000000
4000000
3000000
2000000
1000000
0
2008
2009
2010


Ocean Breeze Residential Energy Use (kWh)
70000
60000
50000
40000
30000
20000
10000
0
2008
2009
2010

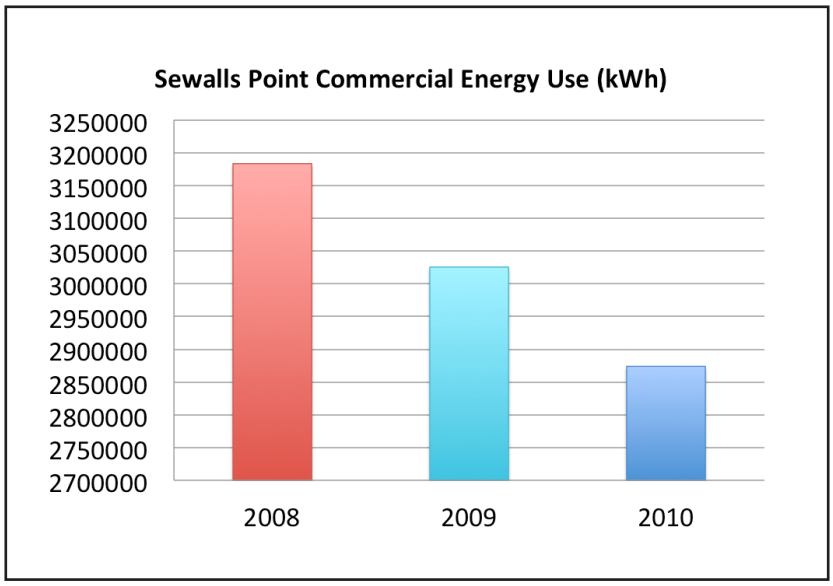
Appendix

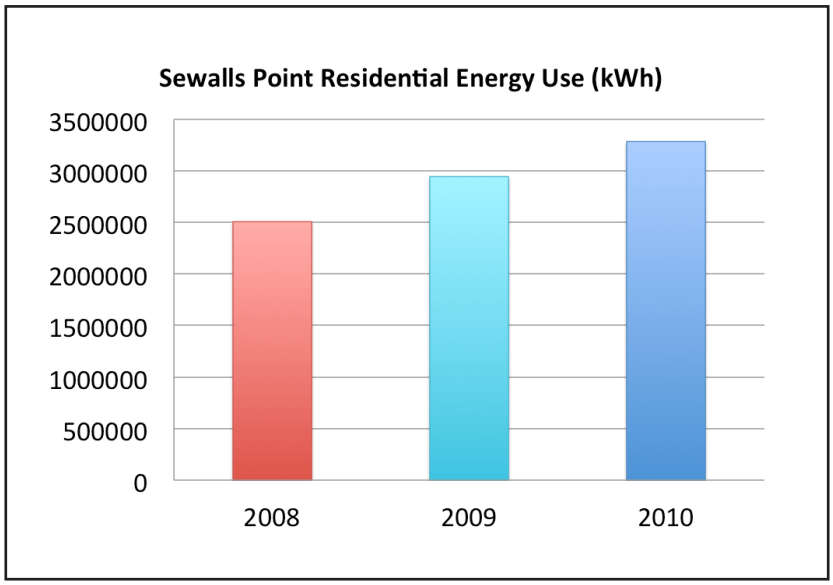

Stuart Industrial Energy Use (kWh)
8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
2008
2009
2010


Stuart Commercial Energy Use (kWh)
206000000
204000000
202000000
200000000
198000000
196000000
194000000
192000000
190000000
188000000
2008
2009
2010

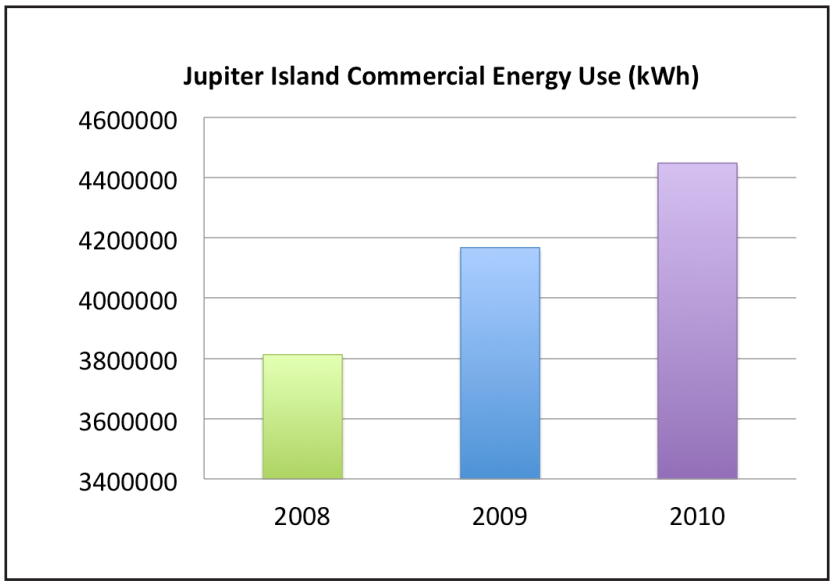

Stuart Residential Energy Use (kWh)
600000
500000
400000
300000
200000
100000
0
2008
2009
2010

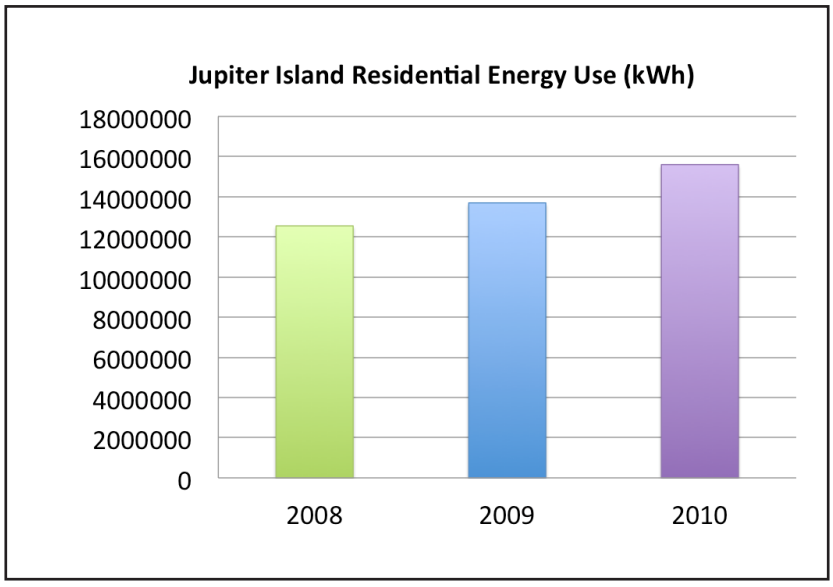
Appendix


Sewalls Point Commercial Energy Use (kWh)
3250000
3200000
3150000
3100000
3050000
3000000
2950000
2900000
2850000
2800000
2750000
2700000
2008
2009
2010

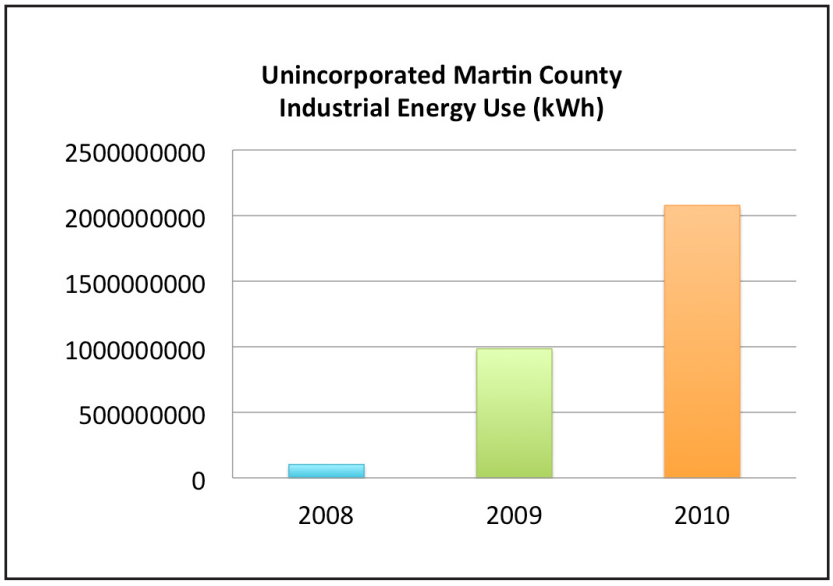

Sewalls Point Residential Energy Use (kWh)
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
2008
2009
2010

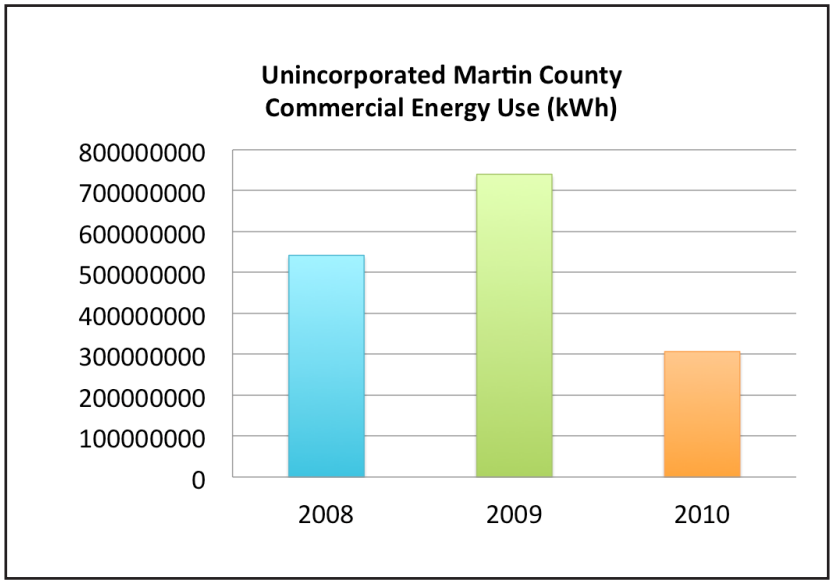
Appendix

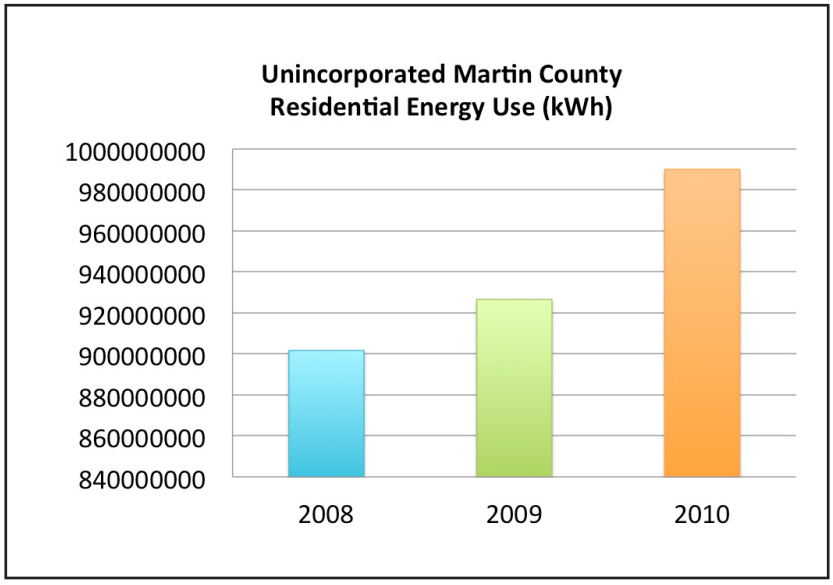

Jupiter Island Commercial Energy Use (kWh)
4600000
4400000
4200000
4000000
3800000
3600000
3400000
2008
2009
2010


Jupiter Island Residential Energy Use (kWh)
18000000
16000000
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
2008
2009
2010

Appendix


Unincorporated Martin County
Industrial Energy Use (kWh)
2500000000
2000000000
1500000000
1000000000
500000000
0
2008
2009
2010


Unincorporated Martin County
Commercial Energy Use (kWh)
800000000
700000000
600000000
500000000
400000000
300000000
200000000
100000000
0
2008
2009
2010


Unincorporated Martin County
Residential Energy Use (kWh)
1000000000
980000000
960000000
940000000
920000000
900000000
880000000
860000000
840000000
2008
2009
2010