AGENDA

SUSTAINABILITY BOARD

Regular Meeting No. 2018-07
Wednesday, October 24, 2018 – 6:30 P.M.
City Hall Council Chambers, 120 Malabar Road, SE

CALL TO ORDER:

ROLL CALL:

ADOPTION OF MINUTES:

1. Regular Meeting No. 2018-06; September 26, 2018.

PUBLIC COMMENTS: (Non-agenda items only)

Public Comments on Agenda Items – Individuals wishing to speak on specific agenda items can do so at the time the item is being considered by the Board. The Chairperson will ask if there are any public comments prior to the Board taking action on the item. All speakers will be limited to three (3) minutes each.

NEW BUSINESS:

1. Review of the City of Palm Bay Sustainability Master Plan (2010).
   a) Municipal Operations and Infrastructure:
      1) Section 1.1 – Greenhouse Gas Emissions Inventory
      2) Section 1.2 – FBGC Certification Upgrade
      3) Section 2.1 – Municipal Buildings Audits and Retrofits
      4) Section 2.2 – Emergency Generators
      5) Section 2.3 – Water Heaters in Fire Stations
      6) Section 2.4 – Policy to Turn Off Electronics After-Hours
      7) Section 2.5 – Fleet Facility Roof
      8) Section 2.6 – Carbon Sequestration
      9) Section 2.7 – Renewable Energy Projects at Municipal Facilities
      10) Section 2.8 – Energy Efficient Outdoor Lighting

OTHER BUSINESS:

ADJOURNMENT:

If an individual decides to appeal any decision made by the Sustainability Board with respect to any matter considered at this meeting, a record of the proceedings will be required and the individual will need to ensure that a verbatim transcript of the proceedings is made, which record includes the testimony and evidence upon which the appeal is based (FS 286.0105). Such person must provide a method for recording the proceedings verbatim.

In accordance with the Americans with Disabilities Act, persons needing special accommodations for this meeting shall, at least 48 hours prior to the meeting, contact the Legislative Department at (321) 952-3414 or Florida Relay System at 711.

CITY OF PALM BAY, FLORIDA

SUSTAINABILITY BOARD
REGULAR MEETING NO. 2018-06

Held on Wednesday, September 26, 2018, at the City Hall Council Chambers, 120 Malabar Road, SE, Palm Bay, Florida.

This meeting was properly noticed pursuant to law; the minutes are on file in the Office of the City Clerk, City Hall, Palm Bay, Florida. The minutes are not a verbatim transcript but a brief summary of the discussions and actions taken at the meeting.

The meeting was called to order at the hour of 6:31 P.M.

ROLL CALL:

CHAIRPERSON:	Lesley Byrd	Present
VICE CHAIRPERSON:	James Boothroyd	Present
MEMBER:	John Vogel	Present
MEMBER:	Kathy Hill	Present
MEMBER:	Vacant	--
MEMBER:	Wade Senti	Present
MEMBER:	Amy Ford	Present

CITY STAFF: Present was Councilman Brian Anderson; Terese Jones, City Clerk.

ADOPTION OF MINUTES:

1. **Regular Meeting No. 2018-05; August 29, 2018.**

Motion by Ms. Hill, seconded by Mr. Boothroyd, to adopt the minutes for Regular Meeting No. 2018-05. The motion carried unanimously.

PUBLIC COMMENTS:

There were no public comments.

NEW BUSINESS:

1. **Discussion of the Board's purpose, intent, duties and responsibilities.**

Councilman Anderson felt that the sustainability process should include the health of the Indian River Lagoon and Keep Palm Bay Beautiful. He said that areas of discussion should encompass clean-up efforts throughout the City; use of proper fertilizers, and native and non-invasive plans; updating the Sustainability Master Plan (Plan); and setting benchmarks. Councilman Anderson said that within the duties and

responsibilities of the Board, there were long-term goals, such as 100% clean energy by 2035. It would require an aggressive plan to achieve that goal. He had discussed with Ms. Byrd the idea of having energy efficient City vehicles and utilizing natural gas or electric instead of fossil fuels. He understood that none of the goals could be accomplished overnight, but benchmarks could be set for same.

Councilman Anderson said that the Board was required to provide an annual report to the City Council on its activities and implementation of the plan. He did not expect this to occur until next year. He added that his first task would be to get proper staff who could assist the Board and get answers right away.

Mr. Boothroyd said the Board's first priority should be to update the Plan. He said that it should be handled similar to the Charter Review Commission reviewing the City Charter. The Commission reviewed each section, recommended changes, and voted on the changes; then all changes were submitted to the Council for consideration.

Ms. Hill said that the City of Satellite Beach had full-time coordinators and asked if Palm Bay had any plans for same. Mr. Anderson said that Satellite Beach had the resources to tackle issues right away. Palm Bay was so large and spread out, and the budget was constrained. However, he said there were many projects in the process and would not rule out any options. He felt the focus was setting benchmarks which would show how much staff would be needed and dedicated to that project.

There was discussion as to how to begin making changes to the Plan. Ms. Hill suggested reviewing the Plan one section at a time and benchmarking as the Board went through the Plan. She said that staff assistance would be helpful. Mrs. Jones advised that the first sections of the Plan was related to Environment and the second section addressed Buildings and Facilities. Ms. Ford said that as far as energy efficiency and buildings, the Honeywell project was already in process. She felt that part could be left towards the end of the Plan review. She said the health of the Indian River Lagoon would fall under the Environment section.

Ms. Byrd advised of the structure of the Plan. There were four (4) organizational areas: Municipal Operations and Infrastructure; Planning and Land Use Development; Economic Development; and Education and Outreach. There were various focuses for each organizational area. She preferred that the Plan be reviewed in order. The Board agreed. Mr. Boothroyd asked how quickly it was expected for the Board to review the Plan and provide its recommendations to City Council. Councilman Anderson hoped for early next year.

Motion by Mr. Boothroyd, seconded by Ms. Hill, to review each section of the Plan in order and make changes if needed. The motion carried unanimously. Mrs. Jones asked for clarification as to which part of the Plan would be the starting point.

Mr. Boothroyd suggested starting with Pages 3-9 (Introduction, Executive Summary, Implementation Strategies and Process). Ms. Hill said the Executive Summary was typically done after the Plan was completed. Mrs. Jones advised that the Introduction was a letter from City Council about the Plan and should also be done after the Plan had been revised.

Motion by Ms. Byrd, seconded by Mr. Boothroyd, to review two (2) sections per meeting over the next six (6) months. The motion carried unanimously.

OTHER BUSINESS:

The Board concurred to schedule the next meeting for Wednesday, October 24, 2018, at 6:30 P.M.

ADJOURNMENT:

There being no further business, motion by Ms. Byrd, seconded by Mr. Boothroyd, to adjourn the meeting at the hour of 7:01 P.M.

_____
Lesley Byrd, Chairperson

ATTEST:

_____
Terese M. Jones, City Clerk

municipal

Palm Bay is located on Florida's east central coast in the southern portion of Brevard County, and has a population of approximately 107,000 across 100 square miles of land. Palm Bay has experienced rapid growth in the 1970s and over the last few decades, with several new residential areas being developed. This growth is expected to increase steadily in the next decade. As Palm Bay expands, there is a growing need for renovation of the existing infrastructure as well as for construction of new infrastructure to support the needs of future developments.

Palm Bay's building stock was constructed when energy efficiency and conservation were not a high priority construction criteria. As a result, most buildings lack those elements that make a building energy and water efficient, such as adequate air sealing and insulation, efficient HVAC systems and water heaters, and water-conserving fixtures. Recognizing this need for improvement, Palm Bay is committed to incorporate resource conservation across the community, as well as in its own operations.

This commitment is evident in the operation of the City's largest energy consumer, Palm Bay Utilities Department, which in 2008 became the first public or private utility in Florida to receive ISO 140001, an internationally recognized certification for its environmental management system. The City owns and operates the water and wastewater plants, which account for approximately two-thirds of the City's electricity consumption. Currently, Palm Bay has three water treatment facilities in operation: two facilities located at the Troutman Water Treatment Plant, and one located at the South Regional Water Treatment Plant. In addition, the City owns and operates the wastewater treatment plant and the water reclamation facility, both located at the Troutman Campus in the northeast section of Palm Bay. As the population grows in the next decades, especially in the southern section of Palm Bay, the City is planning and designing a new South Regional Water Reclamation Facility to serve the newly developed area.

operations & infrastructure

Palm Bay's Utilities Department has implemented "green" policies and procedures that reflect an environmentally-friendly approach to its day-to-day operations. Initiatives such as a recycling program and environmentally-preferred purchasing, combined with the successful execution of its own environmental management system called GreenWay, have resulted in improved performance, significant reductions in energy consumption and cost and increased employee awareness.

As demonstrated by Palm Bay's Utilities Department, incorporating sustainability in municipal operations leads to new business opportunities for the community and increased transparency of the City's environmental responsibilities. In an effort to build on the success of the Utilities Department and replicate "green" efforts in other departments, six areas were identified where Palm Bay can maximize sustainability efforts regarding resource conservation, energy use and environmental concerns, while offering improved services to the community:

1. **Environment**
2. **Buildings and Facilities**
3. **Utilities**
4. **Transportation**
5. **Waste Management**
6. **Procurement**

environment

1.1

ENERGY REDUCTION
CLEANER AIR

INCREASE GREEN DEMAND
LEAD BY EXAMPLE

PUBLIC EDUCATION
JOB OPPORTUNITIES
QUALITY OF LIFE

RECOMMENDED PERFORMANCE MEASURES

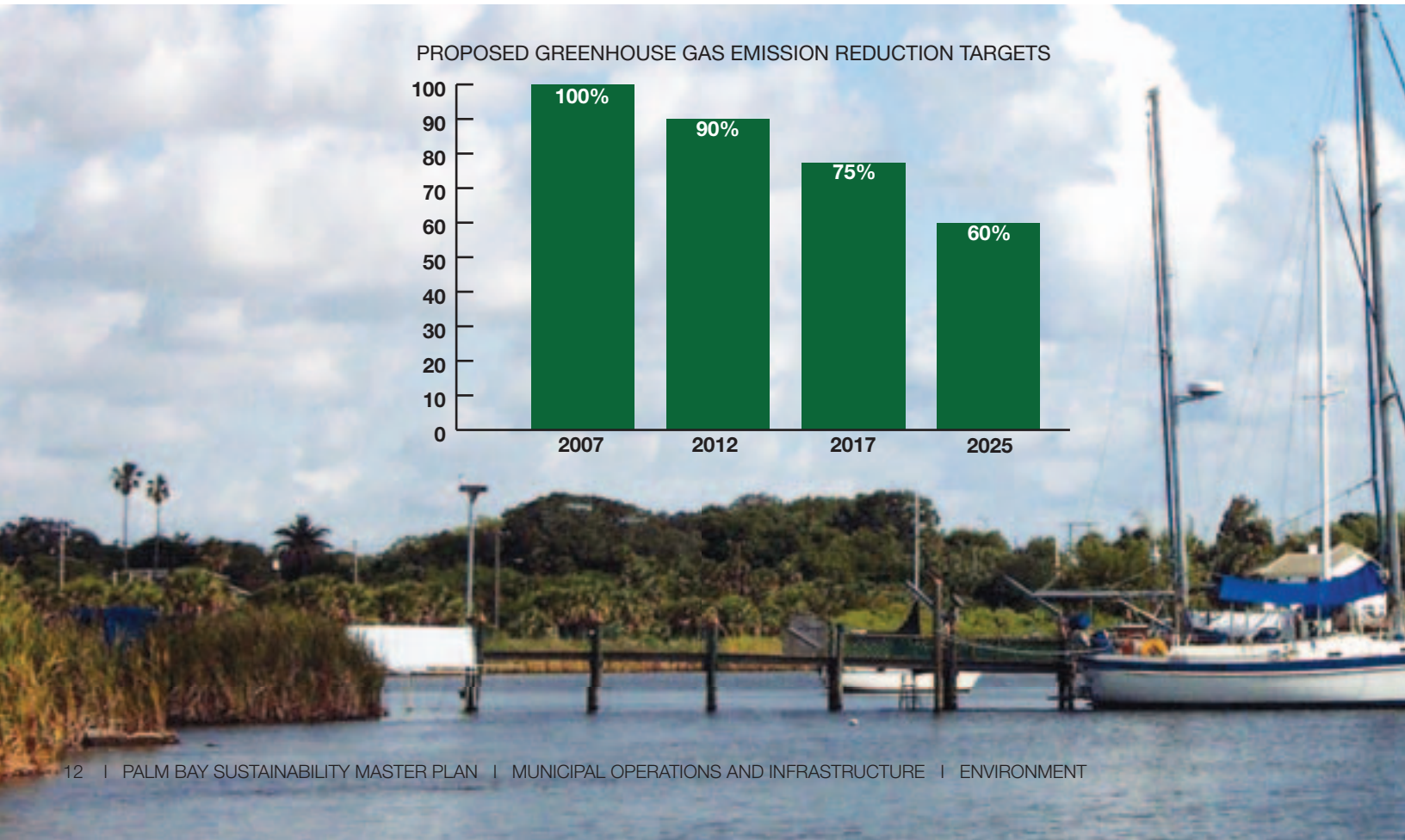
- **Number of initiatives to reduce greenhouse gas emissions**
- **Greenhouse gas emissions reduction**

GREENHOUSE GAS EMISSIONS INVENTORY

An essential tool in addressing global climate change is a greenhouse gas inventory that identifies and quantifies primary manmade sources and sinks of greenhouse gases. Palm Bay intends to conduct a greenhouse gas inventory; the information gathered will be used to measure the effectiveness of existing programs that lead to emissions and removals and develop additional projects to achieve greenhouse gas reductions. It will also provide background on the methods used in the calculations.

Upon evaluation of the inventory, Palm Bay will assess whether the proposal to target the State of Florida greenhouse gas emissions reduction goals as established by Executive Order 07-126 is feasible: 10 percent reduction from 2007 levels by 2012, 25 percent by 2017, and 40 percent by 2025. A long-term investment in a greenhouse gas tracking inventory will enable Palm Bay to track emission/reduction trends, monitor progress, and develop strategies and policies that will benefit the environment and the community.

In order to maximize the initial greenhouse gas inventory, Palm Bay will utilize an existing online energy management tool, ENERGY STAR® Portfolio Manager, to continue tracking energy consumption and greenhouse gas emissions. Other greenhouse gas inventory tools that may be used include the Clean Air & Climate Protection (CACP) software developed by ICLEI, an international organization of local governments dedicated to climate protection and sustainable development.



environment

1.2

FGBC CERTIFICATION UPGRADE

In recent years, Palm Bay has demonstrated significant commitment to energy efficiency and environmental sustainability and has achieved numerous environmental accomplishments.

One of the first significant steps in this direction was the creation of the *Going Green Initiative*, led by the *Going Green Group*, an interdepartmental team assembled in 2008, whose role is to promote and support initiatives to enhance the City's sustainability. Under the leadership of the *Going Green Group* and other key staff, Palm Bay has undertaken a number of sustainability efforts.

In 2009 Palm Bay earned certification under the FGBC Green Local Government Standard, which recognizes green cities and counties for outstanding environmental stewardship. Palm Bay is one of several certified Green Local Government municipalities in the State of Florida that are enacting innovative and sustainable policies and practices to benefit the local environment, economy and social fabric. To attain certification, Palm Bay demonstrated it had implemented several environmentally-friendly practices including, for example, traffic signals utilizing Light Emitting Diode (LED) technology and green cleaning and maintenance practices, per the Florida Department of Environmental Protection (FDEP).

Palm Bay is aiming to increase its certification level from Silver to Gold by undertaking several initiatives. Twenty-six activities described in the Sustainability Master Plan will help Palm Bay enhance its FGBC certification level. A list of activities that will contribute to FGBC certification can be found in the Project Activity Matrix in Appendix A.

ENERGY REDUCTION
CLEANER AIR
LAND PRESERVATION
WATER CONSERVATION
WASTE REDUCTION

LEAD BY EXAMPLE

PUBLIC EDUCATION
QUALITY OF LIFE

RECOMMENDED PERFORMANCE MEASURES

- **Number of FGBC credits achieved**
- **Certification level**

LEAD BY EXAMPLE

Palm Bay's *Going Green Group* was formed as a collaborative effort to support sustainability practices and policies in the City. The team is composed of staff from Public Works, Parks and Recreation, Finance and Utilities Department.

buildings &

2.1

ENERGY REDUCTION
CLEANER AIR
WATER CONSERVATION

COST SAVINGS
INCREASE GREEN DEMAND
LEVERAGE RESOURCES
LEAD BY EXAMPLE

AFFORDABILITY
JOB OPPORTUNITIES
QUALITY OF LIFE

RECOMMENDED PERFORMANCE MEASURES

- Number of energy audits performed
- Number of retrofits
- Energy savings
- Energy cost savings
- Water savings
- Greenhouse gas emissions reduction

Implementation of no-cost and low-cost recommendations could result in at least 5 percent annual energy savings and related greenhouse gas emissions reduction of 23.7 Mt CO_2 eq, the equivalent of taking 4.5 cars off the road every year.

Implementation of major energy audit recommendations could result in 20 percent annual energy savings and related greenhouse gas emissions reduction of 77.7 Mt CO_2 eq, the equivalent of taking 15 cars off the road every year.

These savings are estimated to take place following a twelve month period of implementation and will represent a savings over the energy consumption base year - FY 2009.

1 car = 10 cars

MUNICIPAL BUILDINGS AUDITS AND RETROFITS

Palm Bay is committed to reducing its energy consumption. For the existing municipal buildings and facilities in Palm Bay, energy consumption is a considerable expense. The production and consumption of energy – electricity, natural gas and heating oil – also depletes natural resources, impairs air quality and contributes to global warming. High energy consumption is due to a number of factors, such as the size of the conditioned area, hours of operation, characteristics of the HVAC systems, condition of the building envelope and age of equipment.

To understand its energy consumption and to identify potential improvements, Palm Bay intends to use funds from its EECBG allocation to perform energy audits at seven selected municipal buildings. Palm Bay will also implement selected energy efficiency retrofits that mitigate the environmental and financial impacts of energy use while also maintaining or improving indoor air quality, health and safety and productivity.

Energy audits will be performed at the following municipal buildings:

- City Hall Complex, including City Hall and Council Chambers
- Police Department Headquarters
- Public Works Complex
- Community Center
- Utilities Administration
- Utilities Facility Maintenance

Based on findings from the energy audits, Palm Bay will establish baseline criteria and track energy use trends to identify how to reduce the environmental impact of municipal energy consumption, reduce operating costs and improve strategic management of resources. Energy audits will be completed through interviews with building maintenance and operation personnel, review of building documents and on-site observations of energy-consuming equipment and fixtures.

Following the building audits and evaluation of the collected performance measures, recommendations for best management practices and building retrofits that produce the greatest energy and cost savings will be made and submitted to the City Manager's Office.

Typical retrofits in office buildings include development of a building operating plan, replacement of lighting fixtures, HVAC system upgrades, enhancing lighting systems and controls and improving the condition of the building envelope. Many standard building retrofit activities have lasting and real benefits that include lower energy usage and greenhouse gas emissions, reduced operational costs, improved air quality and increased productivity of occupants.

facilities

2.2

EMERGENCY GENERATORS

In 1994, the U.S. Environmental Protection Agency (EPA) collaborated with major diesel engine manufacturers and the California Air Research Board to develop a tiered regulatory program to reduce the volume of diesel engine emissions and improve air quality.

Diesel emissions are a major contributing source for nitrogen oxides, particulate matter, carbon monoxide and hydrocarbons in the atmosphere, which adversely affect human health. The regulations and implementation schedule were based on the type and use of engines, and in 1996 were amended to include newly manufactured stationary diesel generators. To meet emission regulations, the composition of diesel fuel can be changed to lower sulfur content and engine and emission control modifications can be installed.

Palm Bay utilizes diesel emergency standby power generators to supply emergency backup power in the event of a power outage at its municipal buildings. Palm Bay plans to establish a timeline for replacing or retiring generators for which retrofit technology is not available.

ENERGY REDUCTION
CLEANER AIR

COST SAVINGS
IMPROVE SERVICES

SAFETY
AFFORDABILITY

RECOMMENDED PERFORMANCE MEASURES

- **Number of generators replaced**
- **Number of generators retired**
- **Energy savings**
- **Energy cost savings**
- **Maintenance cost savings**
- **Greenhouse gas emissions reduction**

2.3

WATER HEATERS IN FIRE STATIONS

Palm Bay has identified a need to upgrade the water heaters in its fire stations. Numerous market technologies, including conventional, demand, heat pump, solar, and tankless coil and indirect water heaters, exist that can help Palm Bay balance the needs of the building occupants with the most cost- and energy-efficient solution.

Palm Bay plans to investigate solar technology to meet hot water needs for new and existing fire stations. By using solar energy, Palm Bay can save energy, and solar hot water systems can be modified to work with a variety of building sizes and configurations. Pipes are used to circulate water from a hot water storage tank to solar collectors installed on the roof. The sun heats the water on the roof and the solar-heated water is then returned to the storage tank. A separate, backup, heating element in the storage tank ensures that hot water is always available.

ENERGY REDUCTION
CLEANER AIR

COST SAVINGS
INCREASE GREEN DEMAND
LEVERAGE RESOURCES
LEAD BY EXAMPLE

PUBLIC EDUCATION
AFFORDABILITY
JOB OPPORTUNITIES

RECOMMENDED PERFORMANCE MEASURES

- **Number of water heaters replaced**
- **Number of solar collectors installed**
- **Capacity of solar collectors installed**
- **Energy savings**
- **Energy cost savings**
- **Greenhouse gas emissions reduction**

buildings &

2.4

ENERGY REDUCTION
CLEANER AIR

COST SAVINGS
IMPROVE SERVICES
LEAD BY EXAMPLE

PUBLIC EDUCATION
AFFORDABILITY

RECOMMENDED PERFORMANCE MEASURES

- **Number of best practices implemented**
- **Number of devices installed**
- **Energy savings**
- **Energy cost savings**
- **Occupant comfort survey**
- **Greenhouse gas emissions reduction**

POLICY TO TURN OFF ELECTRONICS AFTER-HOURS

Palm Bay proposes to develop a written policy to require turning off all non-essential electronics and light features after working hours.

Best practices related to lighting include using natural light features such as skylights, turning off lights upon exiting a room and after hours, designating responsible employees to turn lights off at the end of work day, installing motion detectors on light switches whenever possible and encouraging employee compliance by developing and publicly displaying written policies.

For office equipment such as computers, monitors, printers, copiers, and fax machines, best practices include turning off or switching non-essential equipment to hibernation mode after hours, utilizing multifunction devices in common areas as opposed to individual devices in offices, using ENERGY STAR® compliant devices with power saving features activated, designating responsible employees to turn off or hibernate any non-essential equipment at the end of the work day and encouraging employee compliance by developing and publicly displaying written policy.

2.5

ENERGY REDUCTION
CLEANER AIR

COST SAVINGS
INCREASE GREEN DEMAND

PUBLIC EDUCATION
SAFETY
AFFORDABILITY
JOB OPPORTUNITIES

RECOMMENDED PERFORMANCE MEASURES

- **Average roof surface temperature**
- **Energy savings**
- **Energy cost savings**
- **Greenhouse gas emissions reduction**

FLEET FACILITY ROOF

The “urban heat island” effect refers to an urban location that is hotter than the surrounding rural setting due to the thermal properties of surface materials such as roofs and pavements, which store heat during the day and radiate it over time.

Strategies to mitigate the urban heat island effect include installing roofing products with high reflectivity (cool roofs), and increasing tree and vegetation cover through vegetative or green roofs. Benefits include lower energy consumption, reduced air pollution and greenhouse gas emissions as well as carbon sequestration.

The roof on the Palm Bay Fleet Facility is in deteriorating condition and in need of repair. The City currently plans to install a reflective elastomeric coating, a cool roofing material, which will preserve the roof and act to reflect sunlight and heat away from the building, reducing the temperature on the roof. Only cool roofing materials with the ENERGY STAR® label will be used at the Palm Bay Fleet Facility and other municipal buildings to meet minimum solar reflectance and reliability criteria.

Green and cool roof costs vary depending on the building location and local conditions. The cost for cool roof materials is estimated at $0.75–$3.00 per square foot depending on the complexity of the material. In comparison to conventional roofing materials, the cost premium is approximately $0.00 to $0.20 per square foot.[2] For green roofs, the U.S. EPA estimates installation cost of $10 to $25 per square foot depending on the type of green roof (extensive or intensive respectively), and annual maintenance cost between $0.75 and $1.50 per square foot.[3] The higher initial cost for cool roof materials and green roofs can be offset by annual energy savings realized from lower energy consumption and longer lifespan as compared to conventional roofing materials.

facilities

2.6

CARBON SEQUESTRATION

Carbon sequestration provides for the long-term storage of carbon, specifically carbon dioxide gas and mitigates emissions of greenhouse gases resulting from fossil fuel consumption. There are several techniques for sequestration of carbon dioxide through biological, chemical or physical processes. Reforestation, or planting trees, uses a biological process to transfer carbon dioxide from the atmosphere to the trees.

In 2007 Palm Bay completed an initial tree survey of its parks and the Turkey Creek Sanctuary. City staff members conducted the inventory using a mobile mapping unit. The data collected was then incorporated into a Geographic Information System (GIS) for mapping and tracking purposes. Palm Bay intends to update the existing survey and extend it to other public and municipal areas to guide future tree planting in areas of most need. This inventory is key to identifying the potential for Palm Bay to create carbon credits and/or document greenhouse gas offsets for the City's carbon footprint.

As part of a larger plan, Palm Bay would like to evaluate and develop opportunities to expand the number of trees per acre at park sites and other city property, with the intent to qualify as a *Tree City USA*, a program established by the Arbor Day Foundation in cooperation with the USDA Forest Service and the National Association of State Foresters, that provides recognition for urban and community forestry programs in cities across the country. Planting additional trees will also contribute to reducing the "heat island" effect in Palm Bay. The plan will not be limited to reforestation activities but will take into account other opportunities to reduce or displace fossil fuel emissions and limit carbon accumulation in the atmosphere.

As part of its Strategic Plan, Palm Bay is also focusing on improving the appearance of major roadways, primarily through tree planting and associated landscaping. City staff is developing corridor-specific landscaping plans and will be pursuing funding through various sources.

CLEANER AIR
LAND PRESERVATION

INCREASE GREEN DEMAND
LEVERAGE RESOURCES
LEAD BY EXAMPLE

PUBLIC EDUCATION
JOB OPPORTUNITIES
QUALITY OF LIFE

RECOMMENDED PERFORMANCE MEASURES

- **Number of trees planted**
- **Progress towards qualification as a *Tree City USA***
- **Greenhouse gas emissions offset**
- **Completion of GIS existing tree inventory**
- **Development/implementation of corridor landscaping plans**

To sequester the carbon released in the air by one car over the course of one year, Palm Bay would need to plant approximately one acre of slash pines per year.[4]

buildings & 2.7

ENERGY REDUCTION
CLEANER AIR

COST SAVINGS
INCREASE GREEN DEMAND
LEVERAGE RESOURCES
LEAD BY EXAMPLE

PUBLIC EDUCATION
AFFORDABILITY
JOB OPPORTUNITIES

RECOMMENDED PERFORMANCE MEASURES

- Number of renewable energy projects
- Capacity installed
- Energy generated
- Energy cost savings
- Greenhouse gas emissions offset
- Estimated vs. actual payback period

RENEWABLE ENERGY PROJECTS AT MUNICIPAL FACILITIES

One of Palm Bay's goals is to stand out as a sustainability leader, to lead by example. To this end, Palm Bay would like to undertake renewable energy projects at its municipal facilities. An opportunity exists for the installation of wind turbines, solar thermal collectors, or solar photovoltaic panels on the land available at water and wastewater treatment facilities in the South Regional and Troutman Campuses or on the roofs of municipal buildings, fire or police stations.

These projects would offset a portion of Palm Bay's electricity consumption, and promote the development of a renewable energy technology market. By undertaking renewable energy projects, Palm Bay would also encourage its businesses and residents to undertake similar initiatives.

Small wind turbines, each rated between 1 and 5 kW, would be appropriate for an urban setting. These turbines are constructed so that the wind turbulence caused by the surrounding built environment is beneficial to the system. The installed cost of small wind turbines is between $8,000 and $25,000 per kW, depending on the technology and product.

Solar thermal systems collect solar-heated water and distribute it for use in the domestic hot water system or, at times, for space heating. Solar photovoltaic systems convert solar energy into electricity, which can then be used directly in buildings after being properly connected to the electrical system. Given the climate conditions in Palm Bay, the installation of solar collectors or solar photovoltaic systems at various municipal facilities should significantly reduce operating costs.

facilities

2.8

ENERGY EFFICIENT OUTDOOR LIGHTING

Palm Bay has over 4,000 streetlights installed on city roads and in parking lots and additional lighting fixtures at its recreation facilities. The lighting fixtures are conventional high pressure sodium (HPS) lamps, of varying wattage, from 70W to 400W, controlled by photo-sensors. They are usually spot-replaced as needed by the private electric utility Florida Power & Light (FPL).

The challenge is to provide street lighting desired by the City's residents while limiting light pollution and reducing energy consumption. To address these issues, Palm Bay is developing a Master Street Light Plan that will enable the City to be proactive in responding to its neighborhoods.

The franchise agreement between the City and FPL for street lighting does not leave much room for innovation. However, the City has considered other options, such as installing its own LED streetlights connected to meters to quantify the electric use. A current bridge and intersection improvement project will use LED lighting on the bridge and for the landscaping.

Palm Bay could undertake a pilot project to deploy advanced outdoor lighting technologies such as LED streetlights on City roads, in parking lots and recreation facilities, and then replicate the project if it meets the City's and the community's expectations. Scores of cities across the country, including Ann Arbor, Michigan and Raleigh, North Carolina, have used LED streetlights to reduce operating costs and extend the lifespan – by as much as five times – of outdoor lighting. The cost of LED streetlight fixtures has decreased steadily in the last few years as the technology advances and the supply increases, with an estimated cost ranging between $500 and $1,200 per fixture.[5]

To the extent possible, the City plans to employ lighting fixtures approved by the International Dark-Sky Association (IDA) for outdoor fixtures. The IDA certifies dark sky friendly fixtures that reduce the amount of light aimed into the night sky, and provides a directory of IDA-Approved™ fixtures and manufacturers.

ENERGY REDUCTION
CLEANER AIR
WASTE REDUCTION

COST SAVINGS
INCREASE GREEN DEMAND
IMPROVE SERVICES
LEAD BY EXAMPLE

PUBLIC EDUCATION
SAFETY
AFFORDABILITY
JOB OPPORTUNITIES
QUALITY OF LIFE

RECOMMENDED PERFORMANCE MEASURES

- **Number of lighting fixtures replaced**
- **Electrical demand savings**
- **Energy savings**
- **Energy cost savings**
- **Life cycle costs/benefits of pilot projects**
- **Resident surveys**
- **Greenhouse gas emissions reduction**