

City of Boynton Beach, Florida
Climate Action Plan













JULY 2010

The City of Boynton Beach

OFFICE OF THE CITY COMMISSION
Mayor Jose A. Rodriguez
Vice Mayor Marlene Ross
Commissioner William Orlove
Commissioner Steven Holzman
Commissioner Woodrow Hay
100 E. Boynton Beach Boulevard
P.O. Box 310
Boynton Beach, Florida 33425-0310
City Manager's Office: (561) 742-6010
FAX: (561) 742-6011
www.boynton-beach.org

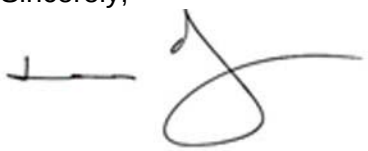
Dear City of Boynton Beach Residents,

The Climate Action Plan is a landmark document that acknowledges the foresight of the City of Boynton Beach in addressing the biggest challenges of this century – sustainability, energy and climate change. Being sustainable means meeting the needs of the present residents without compromising the ability of future citizenry to meet their needs while balancing environmental stewardship, social responsibility, and economic growth.

The pursuit of sustainability has governed the direction of the City of Boynton Beach since 2008 when the City Commission involved employees, citizens and local businesses in creating policies and programs to promote sustainability. Through the creation and work of the Green Task Force, Green Community Alliance, and Sustainability Team and the award of the City's Energy Efficiency and Conservation Block Grant (EECBG) by the Department of Energy, the City has made great strides towards envisioning the steps necessary to achieve a sustainable future.
The City's Climate Action Plan provides an integrated approach to the full spectrum of government services including buildings and facilities, water and wastewater, vehicle fleet, solid waste, procurement, land use and development, and community engagement. It is the first installment of the City's efforts in what will be an ongoing feedback loop of planning and adaptation efforts to effectively address sustainability issues, increase energy efficiency in the public, private and residential sectors, and reduce our overall carbon footprint.

The City will learn from residents what makes the most sense. Monitoring will quantify successes. The City will continue to demonstrate its leadership, and working together with our citizens and businesses, we can achieve our vision of a sustainable community in the face of our current climate, energy and economic challenges.

Sincerely,



Jose Rodriguez
Mayor

Acknowledgements

The Climate Action Plan is the result of the hard work and dedication of many people including our City Commission, Green Task Force, Community Alliance, City Sustainability Team, staff at the City of Boynton Beach, our Consultant CDM and sub-consultants, Lewis, Longman & Walker and Florida Atlantic University.

City Commission
Mayor Jose Rodriguez
Vice Mayor Marlene Ross
Commissioner Woodrow Hay
Commissioner Steven Holzman
Commissioner William Orlove

Green Task Force
Vice Mayor Marlene Ross
Carisse LeJeune
Nancy Byrne
Christine Roberts
Christopher Roschek
Debbie Majors
Jody Rivers
Michael Dauta
Michael Simon

CDM
Patrick J. Gleason, Ph.D
Ana Demelo, P.E.
Lauren Miller

Lewis, Longman & Walker
Erin Deady

Florida Atlantic University
Russell Ivy, Ph.D
Jason Collett
William Wright

Community Alliance
David Collins, P.E.
George Feldman
Yury Konnikov
Bradley Miller
Mary Jo Aagerstoun, Ph.D.
Matthew Barnes
Leo Urban
Ryan Wheeler
William Whiteford
Angela Budano
William D. Poist, Sr.
Steve Myott
Betsy Chavez
Matthew Ulch
William Wilsher
Erin Wright
Scott Brunner
James Barton
Allan Hendricks
Brian Terry

City Staff & Sustainability Team

Nancy Byrne
Debby Coles-Dobay
Michael Dauta
Steve Evans
Mike Fitzpatrick
Suzanne Gitto
Sharyn Goebelt
Glenda Hall
Kevin Hallahan
Eric Johnson
Alan Karjalainen
Paula Leblanc
Carisse LeJeune
Jeffrey Livergood
Andrew Mack
Debbie Majors
Hanna Matras
Jody Rivers
Christine Roberts
Vicki Robertson
Christopher Roschek
Michael Rumpf
Wayne Segal
Michael Simon
Indra Sweeney
Steven Weiser
Jamie Wooley

This report is printed on 100% post-recycled fiber paper

using wind-generated electricity and

is Forest Stewardship Council certified.

Contents

Tables

Figures

Appendices

Executive Summary

The Challenge

Climate change is the defining challenge for the 21st century. The burning of fossil fuels and the emission of greenhouse gases (GHG) has contributed to a steady rise in carbon dioxide levels in the atmosphere that have the potential to result in changes to the global climate, including long-term temperature increases, melting of glaciers, decrease in polar ice pack, changes in weather patterns resulting in droughts and flooding, and sea level rise. Sea level rise would have a direct impact on the City of Boynton Beach's (City) water supply, the ability of stormwater drainage infrastructure to function properly and the livability of real estate along the ocean and Intracoastal Waterway. The projected long-term effects of climate change would directly affect the City's operations in the absence of a strategic plan that actively moves the City forward using a sustainable approach. These many factors embody the basis for the City's pursuit of a Climate Action Plan (CAP) that reduces the City's GHG emissions as a first step towards a sustainable future.

The pursuit of sustainability has governed the direction of the City since 2008 when the City involved employees and citizens in creating policies and programs to promote sustainability. Sustainability is meeting the needs of the present without compromising the ability of future generations to meet their own needs[1]. Sustainability is comprised of three parts: environmental stewardship, economic growth, and social responsibility, all of which are interrelated and mutually reinforcing. Through the creation and work of the Green Task Force, Green Community Alliance (CA), Sustainability Team and the award to the City of an Energy Efficiency and Conservation Block Grant (EECBG) by the United States Department of Energy (DOE), the City has made great strides envisioning the steps necessary to achieve a sustainable future.

The City's CAP represents the implementation plan to achieve reduced GHG emissions and energy consumption in the future. The CAP is a key component in securing funds and participating in regional efforts both of which are necessary for greater effectiveness in achieving the City's emission reduction and energy efficiency goals. The CAP addresses the need to change direction with respect to City operations and policies, alternative energies and fuels, mass and individual transportation strategies, land use and development, landscaping, irrigation and very importantly, community engagement and education. These efforts will improve the overall sustainability of the City.

A significant benefit to having a CAP is that when grant funding opportunities become available, the City will be able to quantify the benefits of implementing projects and programs. Energy audits conducted pursuant to CAP recommendations can be used to prioritize actual projects that can be funded with grants. Further, many

[1] A United Nations Report, "Our Common Future," known as the Brundtland Report, 1987 (www.un-documents.net/ocf-02.htm)

funding programs require certain policies to already be in place before an applicant can qualify, such as green building provisions. Finally, when a new opportunity opens, the City will be able to apply quickly because it already has a CAP in place.

Energy Efficiency and Conservation Block Grant (EECBG)

The City obtained a $658,900 EECBG from the DOE that served as the catalyst to initiate the CAP's energy savings. These funds have been used for three components. Component 1 was to complete the application to the DOE to obtain the entire amount of funding; this was successfully concluded in March 2010. The application to DOE required the City to identify capital projects that would reduce GHG emissions and fossil fuel energy consumption of the City. For Component 1, the City has focused its efforts on the Ezell Hester Community Center (Hester Center) by proposing several energy efficiency measures, including replacing inefficient lighting, adding motion sensors, and several building integrated projects which will reduce the air conditioning load and electricity use.

Component 2 of the EECBG funding was for development of the GHG Emissions Inventory that was presented to the City Commission on April 6, 2010 and which is summarized in Section 3 of this report. Component 3 is for development of this CAP document which comprises the implementation mechanism for reducing GHG emissions identified in the inventory and energy consumption in general.

GHG Emissions Inventory

The City has taken the initiative in developing the first GHG emissions inventory within Palm Beach County. The 2006 GHG emissions inventory establishes a baseline to measure energy use and GHG emissions from both the City of Boynton Beach and the entire community. Understanding the major sources of direct and indirect GHG emissions allows for prioritized and informed decision-making regarding strategies to reduce emissions and achieve the City's goals.

Combined direct and indirect GHG emissions from City operations in FY 2006 were 29,334 metric tons of carbon dioxide equivalent ($MTCO_2e$) with the largest sources of emissions being water treatment (29 percent), wastewater treatment (24 percent), buildings and facilities (20 percent), and the City's vehicle fleet (15 percent). The City's community-wide GHG emissions (excluding City operations) in 2006 were 931,305 $MTCO_2e$ including emissions from electricity, natural gas, fuel oil (used in residential, commercial, and industrial buildings), transportation, and solid waste disposal. Transportation-related emissions (48 percent) were the largest sources of emissions from the community. The combined total of all GHG emissions (direct, indirect, and other/community) was 960,639 $MTCO_2e$. On average, this translates into

14 $MTCO_2e$ per capita which is less than the Florida (19)[2] and U.S. national average (24)[3].

To provide additional information on the development of the CAP, the GHG inventory was expanded to include three forecast scenarios with projections of GHG emissions in the future:

- Scenario 1 - "Business as Usual" (BAU) scenario based on population trends estimating emissions that can be expected if no additional actions are taken.
- Scenario 2 – Estimated future emissions assuming the City implements reduction targets in accordance with the U.S. Mayors' Climate Change Protection Agreement.
- Scenario 3 - Estimated future emissions assuming the City implements additional reduction measures including existing Florida policies on energy consumption and GHG reductions that are not legally binding.

Overall, this GHG Emissions Inventory report presents an operational scenario for a 3 percent reduction in GHG emissions for City Operations by 2012, a 13 percent reduction in emissions by 2025 and an 18 percent GHG emissions reduction by 2035 based upon the difference between business as usual (BAU) and Scenario 3. By concentrating its efforts on its largest emissions sectors, electricity use from utilities and building/facilities, the City will make the largest strides towards achieving its goals with the best monetary payback.

Cost of Inaction

Not taking action to reduce energy consumption and GHG emissions will cause the City to continue to bear excessive costs for inefficient energy usage associated with both electricity and fuel. Reducing GHG emissions overall also demonstrates the environmental stewardship needed in communities worldwide to reduce the potentially costly implementation of measures and infrastructure to combat the effects of global warming (adaptation).

The cost of both fuel and electricity are anticipated to rise in the future due to a range of direct and indirect climate change and adaptation measures and policies. Not implementing GHG and energy-consumption reduction measures may make the City ineligible for federal or state funding opportunities in the future. Continuing on an energy inefficient path will have a disproportionate impact on low income and senior living areas as costs continue to rise. A lack of regional coordination may result in lost opportunities for cost savings through intergovernmental coordination in planning, monitoring and purchasing of energy efficient products.

[2] http://www.flclimatechange.us/ewebeditpro/items/O12F20128.PDF

[3] http://epa.gov/climatechange/emissions/usinventoryreport.html

The Strategy

The community-wide GHG direct and indirect emissions are substantial, at almost one million $MTCO_2e$ on an annual basis and are due to indirect GHG emissions from electricity consumption and vehicle fuel combustion by both City-specific operations and the community. The City believes that there are substantial opportunities for reductions in these emission sources that will involve community engagement and education, enhancements in public transportation, and future development and redevelopment using sustainable construction practices as well as improvements to City operations.

Even though the City's direct and indirect operational GHG emissions are only 3 percent of the community-wide total, the approach to the CAP is to first focus on government operations and policies for a twofold purpose. First, the City recognizes the need to establish an achievable goal to reduce emissions within their control. Additionally, the City should lead by example and demonstrate to the community that specific targeted actions to reduce emissions can have quantifiable and cost-saving results.

To draft this CAP, CDM worked with City staff to identify the objectives and recommended actions most likely to foster the long-term changes necessary to achieve its goals. Key criteria in developing the actions were the magnitude of emissions reductions, the scale of economic and community benefits from achieving the goals and the feasibility of the actions along with the ability of the City to facilitate their implementation.

It is apparent that there is opportunity for reductions in GHG emissions in: 1) buildings and facilities, 2) water delivery facilities that include both the lime-softening and membrane treatment water treatment plants, and 3) wastewater treatment at the South Central Regional Wastewater Treatment Plant (SCRWWTP). Additionally significant GHG and energy reductions can be achieved through measures focusing on reducing fuel consumption from vehicles.

Modify City Operations, Policies and Procedures

CDM recommends that energy conservation measures be developed for a combination of direct emissions (City vehicle fleet fuel consumption), and indirect (electricity consumption) emission sources. Potential activities associated with each are indicated below.

Buildings and Facilities

Energy audits followed by retrofitting lights and appliances along with other improvements can result in significant financial savings and reduction in indirect GHG emissions. As noted above, energy consumption will be reduced by 25 percent with new ball field lighting at Hester Center. Replacing T-12 fixtures with T-8 fixtures within the community center will reduce lighting expenses by over 50 percent particularly with the addition of motion sensors that automatically turn lights off with no room occupancy. White reflective roof paint, window film, and changing out older

computer equipment and appliances with Energy Star appliances will also bring about further reductions in electrical usage. Heating Ventilation and Air Conditioning (HVAC) increases in efficiency are also potentially possible with higher Seasonal Energy Efficiency Ratio (SEER) ratings of air conditioning units.

Water Delivery Facilities

Water delivery facilities generate indirect GHG emissions primarily through using electricity to pump water. Thus, electricity consumption and pump efficiency is very important for these facilities. The Utilities Department has indicated that they will be conducting an energy audit to determine improvements that could reduce their electrical costs. Because water delivery is directly related to water demand, a reduction in demand will reduce energy usage. Consequently, water conservation is also key to reducing electrical consumption associated with pump operations.

Further actions could also include installation of water efficient fixtures and toilets in City facilities and generally throughout the community to reduce water consumption and energy consumption. Cisterns, stormwater tanks and rain barrels can assist in the capture of rainwater by homeowners that can be used to reduce irrigation demands on the City. EPA Water Sense, Energy Star and the Florida Water Star programs can all serve as standards and certifications to encourage water efficiency in buildings and residences. The water utility's rate structure should reflect the true cost of water in view of increased commodity costs while not adversely impacting the rates for customers with minimal use of water. Finally, it is recommended that the City plan for and ensure the protection and/or adaptation of new infrastructure against future sea level rise and associated saltwater intrusion.

Wastewater Treatment at the SCRWWTP

The SCRWWTP is managed by a board consisting of the city commissions from both the cities of Boynton Beach and Delray Beach. SCRWWTP is the second largest individual source of emissions within the baseline GHG inventory, comprising approximately 24 percent of the City's total. This percent only includes the City of Boynton Beach's portion of the emissions. This high percentage is due to primarily electrical usage and to a minor extent the emission of N_2O during wastewater treatment. A recommendation of the CAP is for the City to discuss with the City of Delray Beach the implementation of energy efficiencies at the plant based upon an energy audit. Often these reductions in energy use can be significant consisting of improvements in the operation of pumps, motors, blowers, aerators and lighting.

Vehicle Fleet Fuel Reductions

The City's vehicle fleet consisting primarily of solid waste, police, fire and water utilities departments produces about 15 percent of the GHG emissions of City operations. These all provide necessary services to the City. To achieve a 10 percent reduction in fuel usage, the City can implement many of the recommendations for direct emissions (city-owned fleets) and other emission sources (employee-owned vehicles) in the report, including development of a vehicle idling policy, fleet replacements with alternatively fueled and electric vehicles as well as high fuel-

efficient vehicles. Closely examining the fleet to determine if all vehicles are needed may result in a reduction in the number of fleet vehicles. One method to achieve reductions is to investigate the use of alternatively fueled and electric vehicles for administrative functions served by the City's vehicle fleet. While certain reductions in City vehicle fleet fuel consumption may not be feasible due to the nature of the services that must be provided, it is important for the City to investigate the potential for the most effective reductions that can be achieved.

Empower the Sustainability Team with Responsibility for Implementation of the Commission-Approved CAP

The City has created an inter-departmental Sustainability Team (Team). This Team should report directly to the City Manager and have responsibility for implementation of the initiatives of the CAP. The CAP should serve as the Work Plan for the Team. Measures to enhance energy efficiency and conservation should be coordinated by the Team in future budget cycles and through the capital and operations planning process.

Support a Regional Collaborative CAP

The City's voice will be louder if the City participates in regional climate change efforts. The City should attend the meetings, events and activities and coordinate with the Palm Beach County Climate Collaborative and the Compact. The City should share its collective knowledge with these entities as well as gain from them. Regional cooperation is beneficial and often a requirement for state and federal funding opportunities.

Collaborate with Regional Transportation Agencies

In the GHG emissions inventory, the City's vehicle fleet comprising police, fire, solid waste and water/wastewater vehicles contributed 15 percent of the City's emissions. Community-wide transportation contributed the largest portion of emissions released by the City amounting to 456,865 metric tons or 48 percent of all emissions in 2006. This is primarily due to the usage of gasoline powered vehicles. Improvements to the regional mass transportation system will reduce the current level of vehicle miles traveled (VMT) and collaboration with other agencies is essential to success. The City should collaborate with Palm Beach County, the Palm Beach Metropolitan Planning Organization and other regional transportation agencies, such as the South Florida Regional Transportation Authority (SFRTA commonly known as Tri-Rail), in the development of an effective regional intermodal transportation network that will remove vehicles from the road.

Develop Alternative Energy Programs and Facilities

Even though certain renewable energy policy decisions are not within the direct control of the City, creating incentives and encouraging the use of renewable/alternative energy sources through development and construction decisions can have an influence on the City's overall GHG emissions. The City should establish its own goals to increase the use of renewable energy sources. The City

should consider "leadership by example" through development of a demonstration solar photovoltaic (PV) system and/or solar hot water system to decrease electrical usage at City Hall and other City buildings. Additionally, the City can ensure its policies and processes create incentives for higher levels of energy efficiency in new construction and major renovations. The City can implement programs to reduce energy use in existing buildings and homes. The City should undertake permitting fee incentives as appropriate for the development of alternative energy programs such as solar hot water heating and PV electrical systems as well as retrofitting existing buildings with energy efficient HVAC and energy efficient lighting and the use of alternative fuels (biofuels and electricity).

Increase Recycling and Environmentally Preferred Procurement Policies

Within City operations, the City should move towards a reduction in paper and increased utilization of electronic forms and communications. The City should consider the adoption of environmentally-preferred procurement policies to purchase products made with recycled materials with reduced packaging and toxicity, Energy Star rated electronic equipment, sustainable wood furniture and other categories of purchases. To enhance recycling, the City should consider the implementation of special programs within City facilities, local businesses and community wide. The City should also consider the implementation of Construction and Demolition ("C&D") debris single stream recycling. The City can also establish appropriate recycling (including electronic waste) and composting targets and policies. Finally, this initiative could include standards for purchases prohibiting those that contain Chlorofluorocarbons (CFC) or Hydrochlorofluorocarbons (HCFC) and requiring vendors that work with the City to meet certain green standards for their products and services.

Provide Community Engagement and Education

In addition to leading by example, a way to secure long-term commitments to reduce community-wide emissions is through educating the community about the importance of their contribution to achieve the CAP goals. While the City has no direct control over the utilization of electricity and fuel or the driving habits of residents, it is apparent that education about the benefits, primarily cost, of reducing energy usage is necessary to reduce the community's production of GHGs. The City should provide community outreach and education about climate change and actions that can reduce in-home expenditures as well as mitigate future increases in GHG production that promote climate change.

Amend the City's Comprehensive Plan

A key to the success of the CAP is to ensure long-term and short-term policies are aligned to facilitate its implementation. Existing mechanisms should be used to implement these actions and evaluate progress towards achieving goals including adapting and revising its strategy as necessary. Because 2008 legislation required that local governments include GHG reduction strategies in four elements of their Comprehensive Plans already, CDM recommends that CAP implementation occur by

similarly incorporating its recommendations into the Comprehensive Plan and Code of Ordinances as appropriate and required. This serves a two-fold purpose in meeting the requirements of this legislation as well as providing an implementation mechanism that can be updated as the City's goals and priorities change.

Amend the City's Code of Ordinances

Existing residential and commercial electricity uses are the primary emitters of community-wide GHG emissions after transportation. With the City predominantly built out, the City will have limited influence on the ultimate placement of land uses throughout the community. For this reason the recommendation is that the City concentrates its efforts in conjunction with its transportation goals. Connecting existing land uses to reduce VMT will also be a key land use and development strategy. Coordination with community improvement and redevelopment initiatives, funding sources and programs could increase opportunities to achieve this goal. Code changes to consider are the development of a green building ordinance, appropriate incentives within permits, floor area ratios and other appropriate building and development incentives. Incentives should be tailored to result in projects that go "beyond Code" such as net zero energy buildings/homes or those that integrate a significant number of energy and water conservation measures.

Overcoming Challenges to Implementation

The changing regulatory landscape is one of the major challenges to implementing the CAP. With the evolution of increasing regulation comes the sometimes unintended effect of "competing" policy goals. One example is the state's effort to increase the amount of water a utility uses from alternative sources by diversifying to sources which require utilization of expensive treatment technology actually increasing energy use.

Funding is the main challenge to implementation. CDM recommends that the City fund its CAP efforts through a variety of different mechanisms. The Community Alliance has recommended the use of performance contracting through an Energy Services Company (ESCO). Performance contracting involves having energy savings pay for guaranteed energy reduction improvements. Improvements are paid for through the operating budget rather than the capital budget. There are also grant opportunities, a potential for private investment partnerships, and several bond programs including Clean Renewable Energy Bonds (CREBs) and Qualified Energy Conservation Bonds (QECBs). A new source of funding approved by the legislature this year is the Property Assessed Clean Energy or PACE program. PACE is a way for individual property owners to implement improvements on their property by voluntary assessments that show up on the tax bills once the program is approved by a local government.

Monitoring is the Key to Success

Monitoring of energy consumption and GHG emissions will be the key to achieving the City's goal of an 18 percent reduction in GHG emissions by 2035. CDM

recommends the use of Energy Star Portfolio Manager, a free software program from the (EPA). It is an interactive energy management tool that will allow the City to track and assess both water and energy usage across an entire portfolio of City buildings. It will calculate the GHG emissions from energy use of each building. The program will verify energy efficiency improvements and identify under-performing buildings. It is recommended that this monitoring be carried out in conjunction with the proposed Energy Management System with the latter system providing information for the former program.

The CAP as a Living Document

The approach to the CAP includes two major strategies to meet these challenges. First, the CAP includes policy recommendations and uses real data to prioritize projects that will make the City more competitive for funding. Second, the process of tracking the success of the CAP on an annual basis in conjunction with its capital planning process allows the City to constantly monitor its successes and setbacks in achieving its goals. With commitment and community education and outreach, the City can implement its CAP in a timely and cost effective manner resulting in significant cost savings and GHG reductions.

The City realizes that the CAP is the first installment of the City's efforts. There will be a multitude of changes ahead of the City between now and the year 2035. The document is a living document that will evolve with continued changes in technology, energy efficiency, policies, engineering, science, and the economy of the times. The City will continue to demonstrate its leadership and partnership with other communities in the efforts to achieve a sustainable future for its residents.

Section 1
Introduction

1.0 Introduction

"My interest is in the future because I am going to spend the rest of my life there." ***Charles Kettering***

Since 2008, the City of Boynton Beach ("the City") has involved City employees and citizens in creating policies and programs that will promote sustainability within the Boynton Beach Community. The definition of sustainability is to endure in the face of challenges. The desire to live sustainably originates from the realization that humanity is living unsustainably using far too many natural resources which is having environmental, social and financial impacts. The concept of sustainability in City planning is to correct to the greatest extent possible this imbalance and meet the needs of the present without compromising the ability of future generations of residents to meet their needs.

Planning for achieving sustainability is accomplished by actions that meet the needs of the three mutually reinforcing pillars of sustainability: environmental stewardship, economic growth, and social responsibility illustrated in **Figure 1-1**. Through the creation and work of the Green Task Force, Green Community Alliance, and Sustainability Team, and the award of the City's Energy Efficiency and Conservation Block Grant (EECBG), the City has made great strides in creating a cohesive approach to addressing the three pillars that are necessary to achieve a sustainable future.

Figure 1-1
The Three Pillars of Sustainability

Assessments by the National Academies of Science (2005)[1], the National Research Council (2006)[2], and the Intergovernmental Panel on Climate Change (IPCC, 2007)[3]

[1] National Academies of Science (2005) Joint academies statement on Global response to climate change (nationalacademies.org/onpi/06072005.pdf)

[2] National Research Council 2006. Surface temperature reconstructions for the last 2000 years: Washington, D.C., National Academy Press, 146 p.

indicate that global climate has warmed and that human activities are responsible for the warming trends since the mid 1900s. The year 2009 was the second warmest year in the modern global record, and for the Southern Hemisphere the year 2009 was the warmest year since modern records began in 1880.[4] Greenhouse gases (GHGs) are the major explanation for these changes. Climate change is symptomatic of the excessive use of resources, in particular, energy from fossil fuels that results in the emission of GHG, primarily carbon dioxide (CO_2)[5] as shown in **Figure 1-2**.

Projected changes include sea level rise, the continued shrinking of Arctic sea ice, disappearance of mountain glaciers, increased evaporation from soils and crops, increases in convective summer rainfall, increased drought potential (different regions may experience increased or decreased precipitation leading to potential drought or flooding conditions), mosquito and other insect outbreaks, ocean acidification, and biodiversity changes in ocean and land ecosystems.

The documented melting of mountain glaciers currently occurring and the potential melting of Greenland and West Antarctic ice caps (currently uncertain as to extent) may cause significant sea level rise. **Table 1-1** shows the current rate of sea level rise around Florida. Recently, the South Florida Water Management District (SFWMD) published a report planning for a 5-20 inch increase in sea level by 2060.[6] The SFWMD has indicated that sea level rise has already begun to interfere with the operation of some water control structures. [7] The U.S. Environmental Protection Agency (EPA) has also recently published a report focusing on potential climate change impacts on water and coastal resources.[8]

---

[3] IPCC (Intergovernmental Panel on Climate Change), 2007, Summary for policymakers, in Climate Change 2007: The physical science basis. Cambridge, United Kingdom, Cambridge University Press, 18 p.

[4] "Hansen, JE., R. Ruedy, M. Sato, and K. Lo. NASA GISS Surface Temperature (GISTEMP) Analysis. In Trends: A Compendium of Data on Global Change . Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn. U.S.A. doi: 10.3334/CDIAC/cli.001. 2010.

[5] Source: http://www.esrl.noaa.gov/gmd/ccgg/trends/

[6] "Climate Change and Water Management in South Florida", Interdepartmental Climate Change Group, SFWMD, November 12, 2009.

[7] South Florida Water Management District Strategic Plan 2010-2020, p.5.

[8] "Overview of Climate Change Adaptation in the Southeastern United States with a Focus on Water and Coastal Resources", Office of Air and Radiation, Climate Change Division, U.S. Environmental Protection Agency, January 26, 2010.

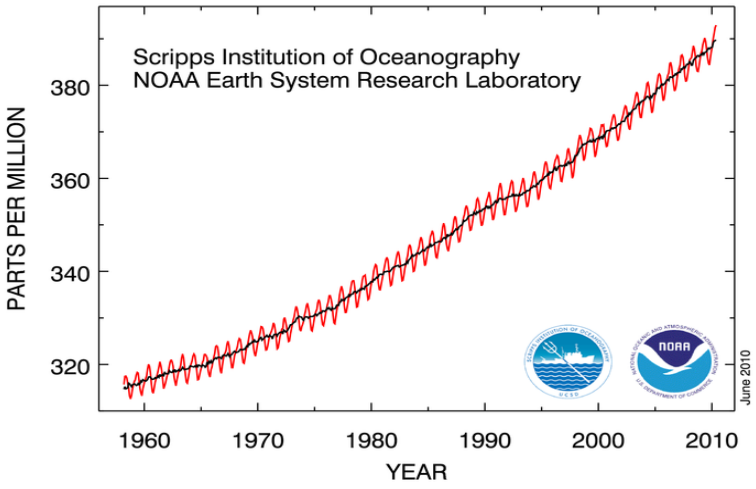


Figure 1-2
The Dramatic Rise in Atmospheric Carbon Dioxide

Table 1-1 Sea Level Rise[9]

Location	Rate (inches per century)
Key West	9.98
Miami Beach	9.4
Cedar Key	5.5
Fernandina Beach	8.7
Mayport	7.5
St. Pertersburg	11.8
Pensacola	9.5

The physical impacts of climate change will expand and intensify in the decades ahead, requiring communities worldwide to begin considering adaptation strategies. In July of 2009, the U.S. Army Corps of Engineers adopted new guidance for incorporating the direct and indirect physical effects of projected future sea-level change in managing, planning, engineering, designing, constructing, operating and maintaining their projects and systems of projects. It requires planning based on a

[9] Maul, G.A. and D. M. Martin, 1993. Sea Level Rise at Key West, Florida, 1846-1992, America's Longest Instrument Record, Geophysical Research Letters, Vol. 20 No. 18.

low, intermediate and high projection using the current estimate of 1.7 mm/year of an increase for global mean sea-level change.[10]

The physical impacts of a changing climate are matched and compounded by social challenges and economic consequences such as rising energy costs associated with conveying water, transportation and health care. Low-income and vulnerable citizens, such as our elderly communities, face disproportionate impacts of climate change including having fewer resources to respond to these changes.

Federal policy and regulations have included new principles to address energy security, and climate change. Our state policy direction has also evolved requiring local governments to incorporate energy efficient building policies and GHG reduction strategies into their requisite Comprehensive Plans and land development regulations. With these new policies and directions also come new opportunities for implementation and financial incentives. Based upon the inclusion of these new policies and regulations at the state and federal levels, it will be important to have clear goals and strategies when securing opportunities, including financial assistance, for implementation of energy and climate change objectives.

In the spring of 2010, Monroe, Miami-Dade, Broward and Palm Beach counties signed the Southeast Florida Regional Climate Change Compact supporting the development of a Regional Collaborative Climate Action Plan. Although the signatories to this Compact are county-level governments, the contribution of the municipalities towards the achievement of the Compact's goals is no less important. With a clear focus on regional collaboration, supported by both the Treasure Coast and South Florida Regional Planning Councils, the City of Boynton Beach will be prepared to do its part to reduce its GHG emissions.

An initial step in achieving a sustainable future, securing funds and opportunities to address these issues, and participating in these regional efforts, is for the City to create a CAP that identifies baseline GHG emissions and outlines projects and strategies to achieve reductions in emissions. The following sections of this CAP detail the sources of emissions, a recommended goal for emission reductions and an implementation plan to reduce both emissions by City operations and the Community.

[10] U.S. Army Corps of Engineers Circular No. 1165-2-211, "Water Resource Policies and Authorities Incorporating Sea-Level Change Considerations in Civil Works Programs" July 1, 2009.

Section 2
Energy Efficiency and Conservation Block Grant Funding

The City obtained a $658,900 Energy Efficiency and Conservation Block Grant (EECBG) from the Federal Department of Energy (DOE). These funds have been used for three components.

Component 1 was to complete the application to the DOE to obtain the entire amount of funding; this was successfully concluded in March 2010. The application to DOE required the City to identify capital projects that would reduce GHG emissions in the City. For Component 1, the City has focused its efforts on the Ezell Hester Community Center (Hester Center) by proposing the following activities:

- Replacement of the lighting at the Hester Center ballfields. Existing energy-inefficient lighting at the ballfields (football, baseball, basketball, handball, tennis) will be replaced with high efficiency "Green Generation Fixtures." The existing 112 - 1500W fixtures will be replaced with 84 - 1500W fixtures with an annual energy savings of 20 percent.

- Replacement of the existing T-12 fluorescent fixtures numbering about 224 with an equivalent number of T-8 fixtures inside the Hester Recreation Center; it is estimated that the lighting savings will be in excess of 50 percent. In addition, 29 - 400W metal halide high-bay lights in the gymnasium will be replaced with an equivalent number of T-5 fluorescents.

- Placement of motion sensors throughout Hester Center to capture further energy savings.

- Replacement of appliances inside of the Hester Center with new Energy Star appliances. Three refrigerator/freezers will be replaced with one Energy Star refrigerator and one Energy Star freezer. One industrial ice-maker will be replaced with one Energy Star ice-maker.

- Application of window tinting that will reduce AC usage.

- Coating of the roof of Hester Center with reflective paint will secure additional AC energy savings. Roof coating will be performed if funding is left after the implementation of the five activities above.

Component 2 was for development of the GHG Emissions Inventory that was presented to the City Commission on April 6, 2010.

Component 3 is for development of this CAP which comprises the implementation mechanism for reducing GHG emissions identified in the inventory.

Section 3
City of Boynton Beach – Greenhouse Gas Emissions Inventory

3.0 Greenhouse Gas Emissions Inventory Summary

The City conducted a comprehensive GHG Emissions Inventory as part of DOE's Energy Efficiency and Conservation Block Grant Program (EECBG). The GHG emissions inventory included sources from both city operations and the community of Boynton Beach in calendar year 2006, a normal or more representative year, with no major hurricanes or storms that would interrupt normal operations and skew emissions results.

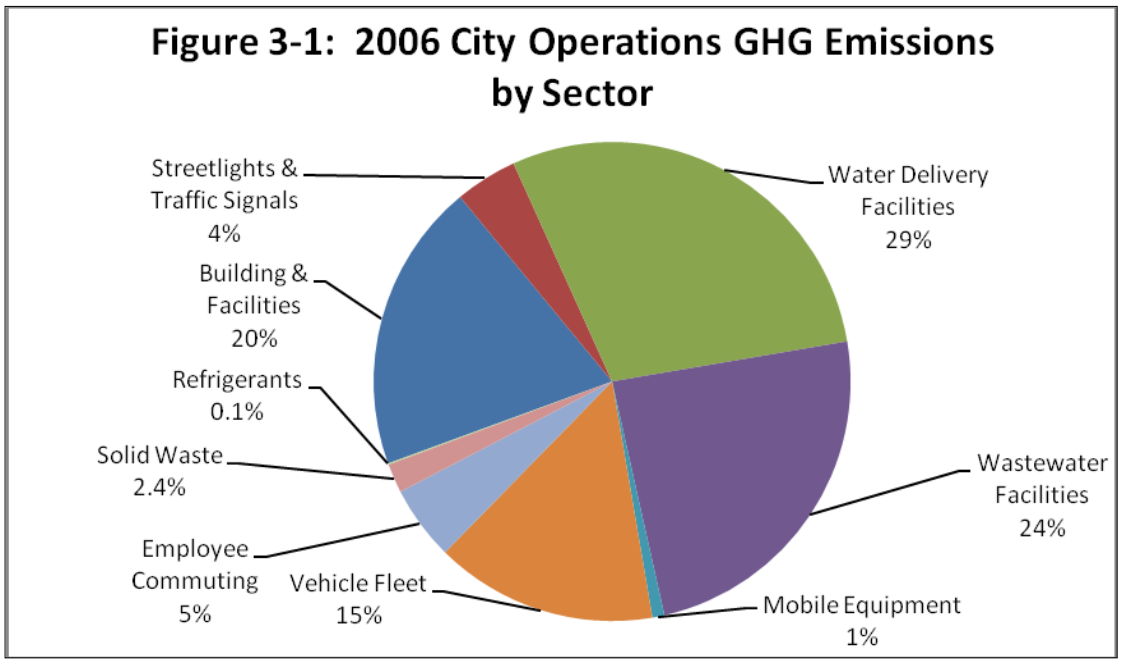
The Clean Air Climate Protection (CACP) Software from ICLEI (Local Governments for Sustainability) along with supplemental methods from the Local Governments Operations Protocol were used to calculate GHG emissions from city operations and the community (**Table 3- 1**). GHG emissions from the City are primarily carbon dioxide (CO_2), but also include methane (CH_4), nitrous oxide (N_2O), and a small amount of hydrofluorocarbons (HFC).

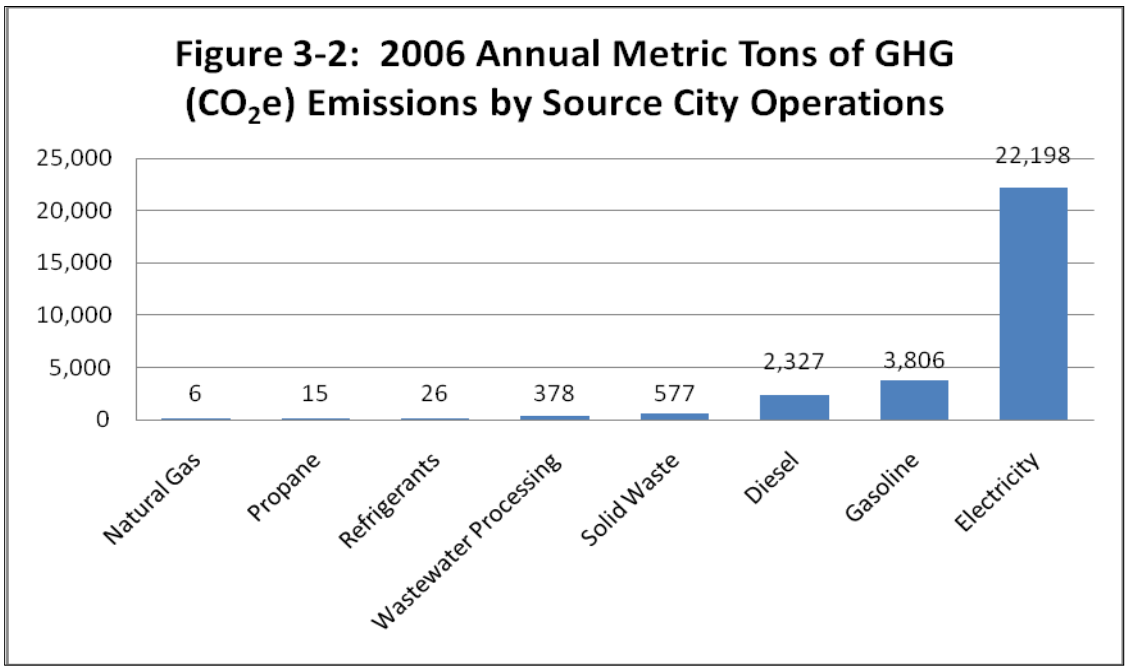
Table 3-1 Sources Included in the 2006 Boynton Beach GHG Emissions Inventory

City Operations	Community	GHG's From Each Source
Electricity	Electricity	**Primary: CO_2** Secondary: CH_4, N_2O
Natural gas - heating	Natural gas - heating	**Primary: CO_2** Secondary: CH_4, N_2O
Propane - heating	Fuel Oil - heating	**Primary: CO_2** Secondary: CH_4, N_2O
Diesel and gasoline – vehicles, equipment	Transportation - vehicle miles traveled within City limits	**Primary: CO_2** Secondary: CH_4, N_2O
City employee commuting – fuel combustion	Public transportation - Boynton Beach Trolley, Palm Tran and Tri-Rail	**Primary: CO_2** Secondary: CH_4, N_2O
Solid waste emissions	Solid waste emissions	**Primary: CH_4** Secondary: CO_2, N_2O
Refrigerant releases – ice machines, refrigeration equipment		HFCs
Wastewater treatment processes		N_2O

3.1 City Operations: Results

The total GHG emissions from city operations in 2006 are about 29,300 metric tons of carbon dioxide equivalents (CO_2e). Over half of the City's GHG emissions from city operations come from the indirect emissions associated with the water utilities sector (**Figure 3-1**). Overall, the largest source of emissions is from electricity use in buildings, facilities (including water delivery and wastewater facilities), streetlights and traffic lights, which is common in U.S. cities. Indirect emissions (electricity) make up over 75 percent of the total city operations GHG inventory with over 22,000 $MTCO_2e$ as shown in (**Figure 3-2**).





There are nine large GHG emission sources from city operations which contribute 80 percent of the total GHG emissions from city operations. These sources may be an appropriate starting point for considering energy efficient strategies as they may represent the greatest potential for GHG and energy savings (**Table 3-2**).

Table 3-2 Large Individual Sources of City Operations GHG Emissions

Highlighted Sources	Metric Tons CO_2e	Percent of Total
South Central Regional Wastewater Treatment Plant, 1801 North Congress Avenue	5,258	17.9%
Membrane Softening Water Treatment Plant, 5469 West Boynton Beach Boulevard	4,990	17.0%
Vehicle Fleet	4,416	15.1%
City Hall, 100 East Boynton Beach Boulevard	2,315	7.9%
Wastewater Pumping Stations	1,829	6.2%
Lime Softening Water Treatment Plant, 124 East Woolbright Road	1,536	5.2%
Employee Commuting	1,476	5.0%
Streetlights & Traffic Signals	1,237	4.2%
Hester Center, 1901 North Seacrest Boulevard	512	1.7%
Total	**23,569**	**80.3%**

3.2 Community-wide: Results

The overall community of Boynton Beach, including GHG emissions from residential, commercial, and industrial buildings, transportation, and solid waste disposal sources, emitted about 931,300 metric tons of CO_2e, not including emissions from city operations (**Figure 3-3**). With city operations included, the entire City emitted 960,600 metric tons of CO_2e (**Figure 3-4**). Overall, the largest source of emissions from the community-wide inventory is from vehicles traveling within the City.

Residents of Boynton Beach emitted 14 MT CO_2e per capita which is far fewer emissions on a per capita basis compared to residents of the state of Florida[1], the US[2], and Gainesville, Florida[3] but are higher than those of North Miami, Florida[4] (**Table 3-3**). The City may use this baseline to measure the progress of GHG reduction actions in the future.

[1] http://www.flclimatechange.us/ewebeditpro/items/O12F20128.PDF
[2] http://epa.gov/climatechange/emissions/usinventoryreport.html
[3] Gainesville, Florida, One community's strategy to reduce global warming. http://www.gru.com/Pdf/Final%20Climate%20Change.pdf
[4] City of North Miami Greenhouse Gas Emissions Inventory 2008

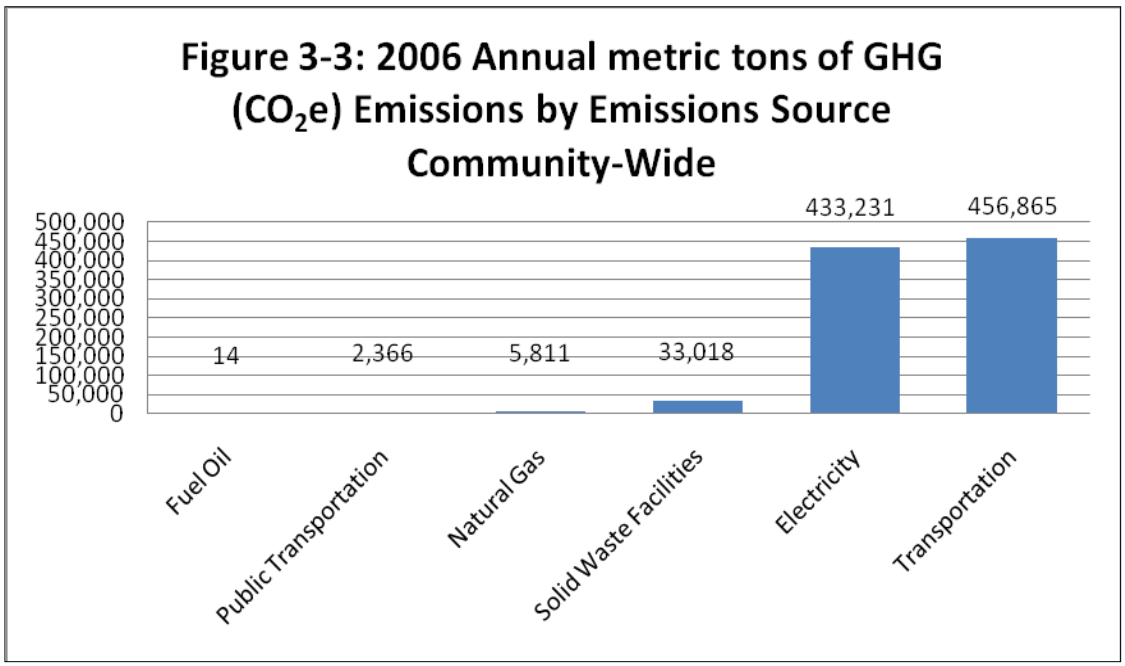


Figure 3-3: 2006 Annual metric tons of GHG (CO_2e) Emissions by Emissions Source Community-Wide
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
14
2,366
5,811
33,018
433,231
456,865
Fuel Oil
Public Transportation
Natural Gas
Solid Waste Facilities
Electricity
Transportation

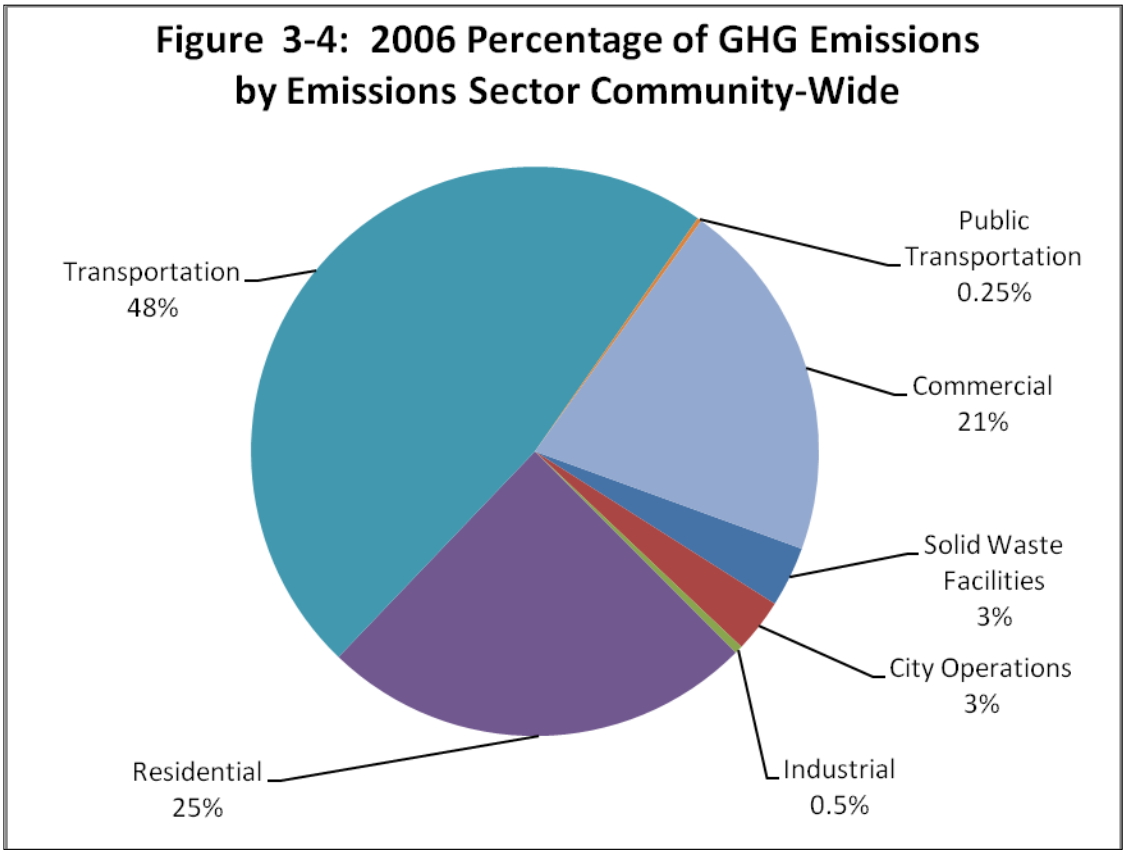


Figure 3-4: 2006 Percentage of GHG Emissions by Emissions Sector Community-Wide
Transportation 48%
Public Transportation 0.25%
Commercial 21%
Solid Waste Facilities 3%
City Operations 3%
Industrial 0.5%
Residential 25%

Table 3-3 Per Capita Metrics (metric tons of CO_2e)

	Per Capita Emissions	Population
City of Boynton Beach (2006)	14	67,644
Florida (2006)	19	18,088,505
U.S. (2007)	24	301,579,895
City of North Miami, FL (2006)	10	57,670
City of Gainesville, FL (2008)	16	124,491

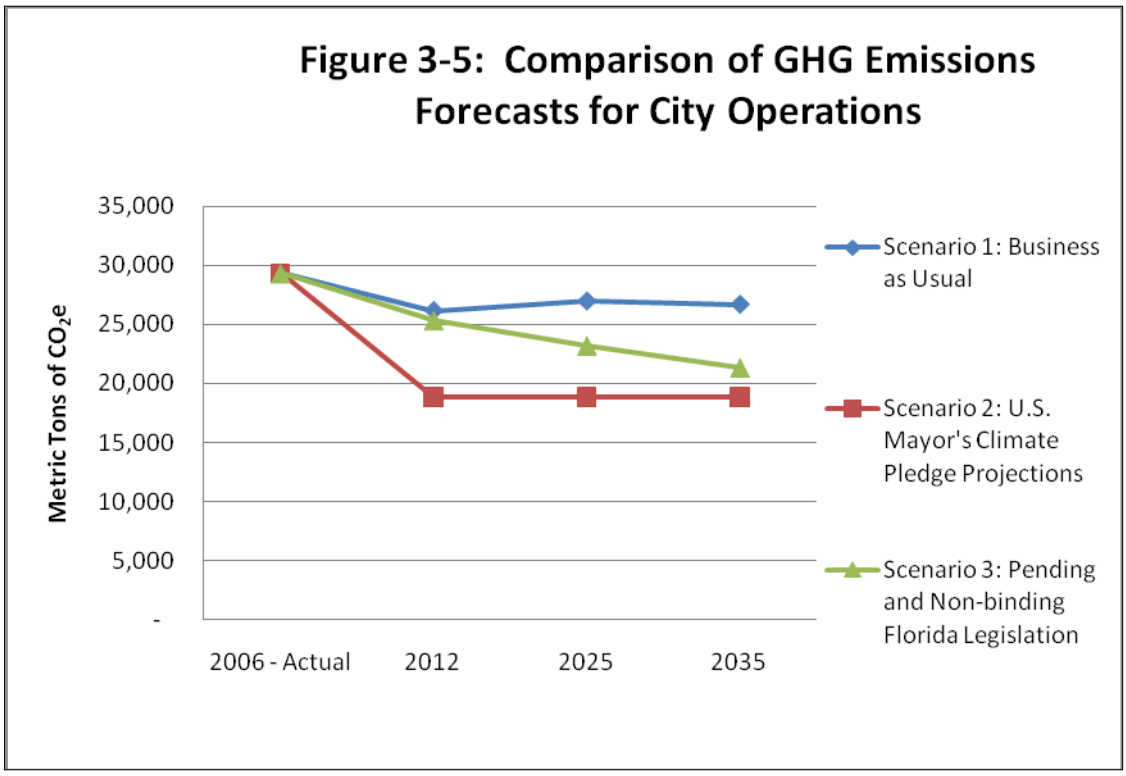
3.3 GHG Emission Forecasting: City Operations

In addition to creating a baseline GHG emissions inventory, three forecast scenarios were established based on the best information available to provide reasonable estimates for future emissions of city operations:

- Scenario 1: Business as Usual (BAU). BAU is based on population trends, adopted rules, legislation, and policy since 2006. Scenario 1 shows a decrease in GHG emissions by 2012 of 11 percent from the 2006 baseline, suggesting that both external factors and City action may result in lower GHG emissions from the baseline. These emission levels remain approximately constant through 2035, showing that the effect of the external factors and City action compensate for population growth through 2035.

- Scenario 2: The U.S. Mayor's Climate Protection Agreement. This agreement calls for cities to reduce their GHG emissions at least 7 percent from 1990 levels by 2012. Scenario 2 shows a 36 percent decrease in emissions from the 2006 baseline. This large decrease is a less achievable reduction goal than 7 percent below 1990 levels seems to indicate. This is largely due to increases in population and the building boom between 1990 and 2006.

- Scenario 3: Pending and Non-binding Florida administrative rules and legislation. These include the Governor's Executive Order 07-127, the proposed renewable portfolio standard, and the results of the City's employee transportation survey. Scenario 3 shows an initial decrease in GHG emissions by 2012 from 2006 levels of 14 percent, and continues on a nearly steady reduction path of 8 percent below 2012 by 2025, and 8 percent below 2025 by 2035. This results in a 27 percent total reduction from 2006 levels by 2035 (**Figure 3-5**).



The gap between the forecasted Scenario 1 and Scenario 3 GHG emission levels illustrate the reductions the City may expect to achieve should future regulation be adopted. The difference between these two scenarios is 3 percent in 2012, 13 percent in 2025, and 18 percent in 2035 (**Table 3-4**).

Table 3-4 Percent Change of GHG Emissions from 2006 Levels for City Operations

	2006 - 2012	2006 - 2025	2006 - 2035
Scenario 1: Business as Usual	-11%	-8%	-9%
Scenario 2: U.S. Mayor's Climate Pledge Projections	-36%	-36%	-36%
Scenario 3: Pending and Non-binding Florida Legislation	-14%	-21%	-27%
Total Reduction between Scenarios 1 and 3	**-3%**	**-13%**	**-18%**

The City may choose to achieve reductions in the electricity sector within its own facilities because lowering GHG emissions from electricity may have the best monetary payback. If the City chooses to achieve GHG reductions between Scenario 1 and Scenario 3 by reducing electricity use only, electricity would need to be reduced 3 percent by 2012, 17 percent by 2025 and 25 percent by 2035 **(Table 3-5)**. If the City chooses to make a 10 percent reduction in vehicle fuel use within the City fleet as well, electricity would then only need to be reduced 2 percent by 2012, 16 percent by 2025 and 23 percent by 2035 **(Table 3-6)**.

Table 3-5 Electricity GHG Emissions Decrease from BAU to Meet Goal of 18 percent GHG Reduction in 2035

	2012	2025	2035
Percent GHG Reduction of Electricity Emissions from BAU	**3%**	**17%**	**25%**
Percent Total GHG Reduction from BAU	**3%**	**13%**	**18%**

Table 3-6 Electricity GHG Emissions Decrease Assuming a 10 percent Reduction in Vehicle Fleet Fuel Use to Meet Goal of 18 percent GHG Reduction in 2035

	2012	2025	2035
Percent GHG Reduction of Electricity Emissions from BAU	**2%**	**16%**	**23%**
Percent Total GHG Reduction from BAU	**3%**	**13%**	**18%**

The 18 percent reduction in GHG emissions by 2035 is significant but feasible. The Climate Action Plan that will follow this GHG emissions inventory will detail the energy and emission reduction steps that will help the City to achieve this goal.

The full report can be found in **Appendix D**.

Section 4
The Climate Action Plan

4.0 Objectives and Recommendations

The challenge of climate change is urgent and the City's response has been timely. On February 19, 2008, the Boynton Beach City Commission approved and adopted Resolution R08-025 establishing a Green Task Force to oversee the process of improving and sustaining the environmental needs of the community.

The Commission's goal was to involve City employees and citizens in creating policies and programs that promote environmental sustainability within the Boynton Beach Community. The Green Task Force was created to focus on areas of Public Education; Water Conservation; Waste Reduction/Recycling and Sustainable Construction. Additionally, the Green Task Force was asked to provide recommendations to the City Commission regarding the development of a long-term environmental improvement plan to reduce GHG emissions and an assessment of the current environmental situation. This included:

- Researching successful programs implemented by other communities and providing recommendations for ways to improve the environmental sustainability of city programs, services, equipment and facilities.
- Proposing means to enhance water and energy conservation which would also provide a reduction in indirect GHG emissions.
- Creating incentives for residents, businesses, developers and organizations to practice environmental conservation and sustainable building.
- Incorporate green building standards into the City's Land Development Regulations.
- Create incentives for sustainable affordable housing developments which would also provide a reduction in direct and indirect GHG emissions.

The Green Task Force made substantial progress in inventorying best practices both in the City of Boynton Beach and in other local level governments and provided the City Commission with a comprehensive list of recommendations which was approved by the Commission on October 7, 2008. At that point, it became crucial to include community input into the process in order to begin the formulation of a Climate Action Plan (CAP) for the City.

The City Commission directed the City Manager to allow staff to continue working on the development of the CAP and to incorporate public participation in the process. These "alliances" would allow the City to interact with residents, businesses and organizations who wished to assist in prioritizing local efforts. Based on the Green

Task Force recommendations, the "Green Community Alliance" was formed comprised of key professionals from the Boynton Beach community including:

- Leadership in Energy and Environmental Design ("LEED") Professionals
- Architects
- Environmental Engineers
- Landscape Architects
- Transportation Specialists
- General Contractors
- Non-profit Environmentalists
- Utility/Energy Professionals
- Environmental Scientists

These professionals joined together, with other interested members of the community, and staff members from the City's own inter-departmental Sustainability Team, to create a Green Community Alliance that would continue the efforts of the Green Task Force and explore programs and implementation strategies for incorporation into a Boynton Beach CAP.

Five sub-teams were created. These five sub-teams met independently two to four times a month for a six-month period. The Green Community Alliance membership came together every two months to share their progress, participate in informational workshops and presentations, and collaborate with the other teams. The strategies created by these efforts have been incorporated into this Climate Action Plan.

This Plan incorporates strategies from the City of Boynton Beach Green Community Alliance Report, "S*trategies to Improve, Promote and Sustain the Environmental Needs of the Community*." References to the strategies from that Report are indicated with "CA".

4.1 Government Operations and Policies

GHG emissions from the City of Boynton Beach operations account for about three percent of total City emissions or 29,300 $MTCO_2e$ from the 2006 baseline. While this presents a modest opportunity to reduce emissions directly, it is an essential obligation to lead by example. Just as the City must provide enabling policies, technical assistance, education, incentives and other support to help the community achieve the objectives of this Climate Action Plan, the City must also lead the way in its own operations. Of the City's total emissions, the emissions by sector include the City's water delivery facilities and wastewater facilities constituting the largest

category of emissions (approximately 53 percent), followed by buildings and facilities (20 percent), and vehicle fleet (15 percent). The remaining 12 percent is almost equally distributed between streetlights & traffic signals, employee commuting, and solid waste facilities.

4.1.1 Buildings and Facilities

Buildings consume 74 percent of the electricity produced annually in the U.S. The City owns and operates numerous office buildings, streetlights and several large scale water and wastewater treatment plants. Given that the majority of the City's emissions are from the Water and Wastewater Facilities Sectors, there is significant overlap with the Water Conservation and Landscape Irrigation Section of the CAP. The City has already embarked on a project to retrofit lighting and electrical uses at the Ezell Hester Center ballfields and community center.

In conjunction with Florida Power and Light (FPL), CDM recommends that the City conduct further energy auditing of its buildings and facilities to benchmark existing energy usage and develop further energy conservation measures. FPL has offered to conduct these energy audits free of charge and offers rebates for many of the suggested energy saving improvements. Energy conservation measures may include the following: lighting, air cooling/Heating, ventilation and air conditioning (HVAC) systems, chiller/Thermal Energy storage systems, reflective roof surfaces, window treatments/replacements, insulation, energy recovery ventilation systems, demand control ventilation systems, refrigeration, back up generating systems, water heating and demand reduction control/load management devices.

CDM recommends the implementation of an Energy Management System (EMS) at the City to monitor and control HVAC, the largest controllable drain on energy, lighting and other systems at its facilities to reduce non-essential or variable costs. An EMS is a computer-aided tool used to control, monitor, schedule and optimize the performance of energy-using systems. Use of an EMS is a way to achieve energy efficiency and increase awareness of energy efficiency throughout City operations. EMS can be installed as part of an Energy Service Company (ESCO) agreement. An ESCO can provide the City with a broad range of options for implementing energy saving upgrades.

Objective:
Reduce GHG emissions from City operations 3 percent by 2012, 13 percent by 2025 and 18 percent by 2035 as compared to 2006 levels.

Actions to Achieve Objective:

- Develop an HVAC and lighting retrofitting strategy and timetable.
- Eliminate or reduce use of refrigerant gases (Hydrofluorocarbons (HFC), Hydrochlorofluorocarbons (HCFC), and Chlorofluorocarbon (CFC)), which have Global Warming Potentials (GWP) that are thousands of times greater than CO_2 in

HVAC systems and replace them with more ozone and climate-friendly refrigerant gases (such as propane, butane, and cyclopentane, water, ammonia and air).

- As older computer equipment and appliances must be replaced, ensure that new equipment meets Energy Star or equitable ratings.

- When planning public infrastructure investments, consider the physical, environmental and economic impacts of increasing the energy and water efficiency of the projects. Examine the Capital Improvements Element of the Comprehensive Plan to identify potential opportunities to increase the efficiency of these projects over their lifespan.

4.1.2 Water / Wastewater Facilities, Conservation and Landscape Irrigation

Three percent of national energy consumption is used for drinking water and wastewater services. Two of the top four largest single sources of emissions in the inventory resulted from membrane and lime softening treatment operations from the City's Water Treatment Plants. These operations account for 29 percent of the City's largest individual sources of emissions mostly from electricity consumption. Nationally, $4 billion dollars is spent annually for energy costs to run and operate drinking water and wastewater utilities and those costs are rising. Since 2001, water and wastewater costs have increased 1.45 times faster than electricity costs, according to the United States Consumer Price Index. Energy represents the largest controllable cost of providing water or wastewater services to the public (on average 1/3 of a municipalities total energy bill). The collection, distribution and treatment of drinking water and wastewater nationwide release approximately 116 billion pounds of CO_2 per year—as much global warming pollution each year as 10 million cars.[1] Reducing water consumption saves energy because less water needs to be treated and pumped to end users. Conserving energy also reduces the need for the significant amount of water in power plant operations. Investments in water and energy efficiency can produce multiple benefits such as conserving water supply, protecting water quality, and lowering energy demand, which also results in economic savings, greater sustainability of our water infrastructure and a reduction in global warming pollution.

Nationwide, irrigation equals 10-50 percent (approaching 80 percent in some areas) of the water use in a residence. Because of the relationship between water and energy use, aggressive outdoor water conservation can provide large benefits for reduction of the City's greenhouse gas emissions. Rain sensors -- also called rain shut-off devices -- are designed to interrupt the cycle of an automatic irrigation system controller when a specific amount of rainfall has occurred. They are small devices wired to the irrigation system controller and mounted in an open area where they are exposed to rainfall.

[1] EPA, National Water Program Strategy: Response to Climate Change (2008), at 24-25, at http://www.epa.gov/water/climatechange/strategy.html.

The 2009 Florida Legislature amended Section 373.62, F.S., to modify the provisions for automatic irrigation systems, including control systems and sensors to require contractors to perform certain tests and repairs; and to require the Florida Department of Environmental Protection (DEP) to create a model ordinance with certain provisions, including penalties.

The City of Boynton Beach has a multi-faceted Water Conservation Plan as a requirement of its existing South Florida Water Management District (SFWMD) issued Consumptive Use Permit (CUP) for water supply. Implementation of the Water Conservation Plan will reduce demand for water and also have the ancillary benefit of lessening the energy use from operations to deliver that water. The City's Water Conservation Plan includes the following eight attributes:

- An ordinance limiting landscape irrigation to, at minimum, the District's year-round landscape irrigation conservation measures as specified in Rule 40E-24.201 F.A. C. This rule allows irrigation three days per week in Palm Beach County.
- An ordinance requiring implementation of Florida-friendly landscaping.
- An ordinance requiring the installation of ultra-low volume plumbing fixtures in all new construction.
- An ordinance requiring a rain sensor device or automatic shut off with the purchase and installation of an automatic lawn sprinkler system
- Adoption of water conservation rate-based structures
- Implementation of a leak detection program when unaccounted for water losses are greater than 10 percent
- Determination of the feasibility for making reclaimed water available
- Implementation of water conservation public education programs

Pursuant to the City's most recently issued SFWMD consumptive use permit the City is required to reduce its per capita usage by 8 gallons per capita day (GPCD). This permit also requires the development of a long interconnection that unites the western wellfield with the eastern water treatment plant, along with development of an extensive reclaimed water system. The components of the Water Conservation Program most likely to reduce water usage and consequently energy usage are: reducing unaccounted-for water due to leakage from pipes, and decreasing outdoor irrigation.

An aggressive outdoor water conservation program will provide large benefits because about 50 percent of water used in the City is for outside irrigation. Reducing outdoor usage may be accomplished through further incentive programs, rain sensors, regulatory controls such as more aggressive watering restrictions, increased

tiers in water conservation rate structures, encouraging or requiring Florida Friendly landscaping, limits on the size of lawn area, and the types of grass and plants allowed. The SFWMD currently limits irrigation to three days a week although other communities such as Miami Dade County and the Town of Lantana have gone to two days per week. The City may elect by ordinance to further reduce the days or hours of irrigation use or encourage low-volume irrigation that may be used without restriction on days irrigated.

Objective:
Conduct energy audits to determine improvements to reduce electrical costs at the City's water and wastewater facilities.

Actions to Achieve Objective:

- Evaluate energy efficiency of high-service pumps. Develop an energy efficiency strategy for water utility operations to maximize efficiency of treatment, operations and equipment.
- Explore opportunities to incorporate renewable energy sources into the expansion or retrofit of water infrastructure.
- Increase use of aquifer storage and recovery of excess water that would ultimately be discharged to the ocean during the wet season.
- Maximize use of the East Lime Softening Plant and minimize use of the West Membrane Treatment Plant.
- As co-owner of the South County Regional Wastewater Treatment Facility, the City is increasing the use of wastewater by existing customers and working to expand the wastewater treatment capacity by 8 million gallons per day. Explore partnerships with the City of Delray Beach to complete energy audits at the Facility. Benchmark current energy usage and efficiencies. Evaluate the potential benefits of turbo blowers for wastewater aeration, as well as the use of variable frequency drives (VFD). Evaluate the treatment process to determine efficiency.
- Develop a rebate and incentive program for low-flow toilets and fixtures.
- Explore using an energy management program such as Energy Star's "Portfolio Manager" for water and wastewater plants to track, measure and reduce energy use. See section on Monitoring.

Objective:
Reduce GHG emissions from City operations 3 percent by 2012, 13 percent by 2025 and 18 percent by 2035 as compared to 2006 levels.

Actions to Achieve Objective:

- Use regulatory methods to limit water use. While the City is only required to limit outside landscape irrigation to 3 days per week, other communities within the 16 counties of the South Florida Water Management District are only allowing 2 day per week watering. CDM recommends exploring the feasibility of reducing the number of days or hours of landscape irrigation allowed under the City's water conservation ordinance as compared to the relevant requirements in Chapter 40E-24, F.A.C. The City may consider encouraging low-volume irrigation that may be used without restriction on days irrigated.

- Adopt Florida Friendly landscaping principles in the land development code including identification of permitted and prohibited species [CA]. Establish landscape requirements in the City's Land Development Regulations with a target of greater than 50 percent for new landscaping consisting of Florida Friendly species including lawn grass.

- Determine the effectiveness of reducing unaccounted-for water losses from system leaks.

- Consider adoption of the Model Ordinance for Installation, Maintenance, and Operation of Sensing Devices on Automatic Landscape Irrigation Systems created by DEP. Require irrigation systems to be designed and installed to prevent spray on structures.

- Enhance the City's water conservation education program and better utilize the City's website and social media to communicate the program.

- Promote partnerships and consistent conservation policies with all users within the City's water service area including homeowner's and condominium associations.

- Establish aggressive water efficiency standards for City and non-City new construction and major renovations which exceed the Florida Building Code[2] and based upon appropriate standards such as U.S. Environmental Protection Agency's (EPA) WaterSense or Energy Star. See further recommendations related to water efficiency standards in the Sustainable Construction section.

Nine principles of Florida Friendly Landscaping

1. Right plant, right place
2. Water efficiently
3. Fertilize appropriately
4. Mulch
5. Attract wildlife
6. Manage yard pests responsibly
7. Recycle
8. Reduce stormwater runoff
9. Protect the waterfront

[2] Chapter 553, F.S.

- Establish landscape requirements for single family infill that can support creation of an urban forest with energy conserving benefits

- Establish an urban forestry program to develop a city-wide tree canopy survey with the eventual goal of reducing the "heat island" effect due to dark or asphalt surfaces.

4.1.3 City's Vehicle Fleet and Employee Commuting

The primary fleet vehicle emissions include solid waste, police, fire, and water utilities departments which comprise approximately 15 percent of the GHG emissions of City operations. While certain reductions in City vehicle fleet fuel consumption are not feasible due to both the nature of the services that must be provided and vehicles required to provide those services, it is important for the City to investigate the potential for the most effective reductions that can be achieved. One method to achieve reductions is to investigate the use of alternatively fueled and electric vehicles when replacing or adding vehicles for the City's vehicle fleet.

EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) have finalized a joint rule to establish a national program consisting of new standards for model years 2012 through 2016 for light-duty vehicles to reduce GHG and improve fuel economy. [3] These new standards apply to new passenger cars, light-duty trucks and medium-duty passenger vehicles. The EPA standards require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile in model year 2016, equivalent to 35.5 miles per gallon (mpg) if the automotive industry were to meet this CO_2 level all through fuel economy improvements. This is yet another consideration in the City's fleet policy in terms of when vehicle replacement can and should occur to maximize fleet reductions.

Objective:
Identify opportunities to reduce the City's vehicle fleet emissions through decreasing the size of the fleet and/or increasing the fuel efficiency of the vehicles with a goal of 10 percent fleet emissions reductions by 2035.

Actions to Achieve Objective:

- Evaluate the need for each vehicle in the fleet and eliminate those vehicles that do not fulfill a specific purpose. Consider setting a goal of eliminating 5 to 10 percent of the fleet vehicles through implementation of recommendations listed below.

[3] Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule. 40 CFR Parts 85, 86, and 600; 49 CFR Parts 531, 533, 536, et al.

- Develop a fleet retrofit schedule to either hybrids, electric or conversions to compressed natural gas vehicles. Assure adequate recharge or plug in facilities to service fleet. Develop return on investment and cost comparison analysis of same. [CA] Determine the feasibility of only purchasing vehicles to meet new vehicle greenhouse gas emissions standards promulgated by EPA.

- Implement GIS-based employee rideshare program and electronic bulletin board. [CA]. Adopt a City rideshare policy manual. [CA]

- Develop and adopt a high-occupancy vehicle incentive program through preferred employee parking incentives. [CA]

- Adopt a City policy for all City operations to reduce miles traveled and hours traveled by considering efficiencies in scheduled meeting times and locations. [CA]

- Enhance a vehicle idling policy for all applicable City vehicles that furthers the objectives of the vehicle idling reduction requirements in Chapter 62-285, F.A.C. including the five minute limitation on idling from heavy-duty diesel engine powered motor vehicles. [CA].

- Evaluate (and implement if feasible) provision of alternate and/or fuel efficient vehicles (such as Segways, electric or hybrid vehicles) for short-distance trips made by City employees.

- Research and provide recommendations regarding bicycle amenities for City staff as part of facilities planning and capital budget processes. [CA]

- Further research and make a recommendation regarding a "fuel-efficient shuttle" between the Boynton Tri-Rail Station and City offices. [CA]

- Further research and provide future report on potential feasibility of workforce housing, on-site day-care, in-house cafes and other trip-saving/time-saving capital amenities. [CA]

- Adopt employee scheduling and other measures to reduce energy use

  - Adopt a City telecommuting policy manual including provisions [CA] such as those found in Section 110.171, F.S. for state agency employees. The provisions should include documenting measurable financial benefits associated with reduced office space requirements, reductions in energy consumption, VMT, and associated GHG resulting from telecommuting. [CA]

  - Implement compressed 4-day workweek for City employees (already implemented by City). [CA] This has resulted in a reduction in VMT and GHG emissions due to reduced vehicle usage as well as reduced electrical consumption by the City.

- Evaluate (and adopt if the Commission believes this to be a reasonable and financially prudent action) a furlough policy to close City offices for one full week a year as an energy cost and general cost reduction strategy consistent with the furlough policy in effect for state agencies (Section 100.1225, F.S.) identifying all affected positions and ensure that all affected employees are subject to the same reduction of hours for the same number of pay periods with a commensurate reduction in pay. [CA] This will result in associated reductions in VMT and GHG emissions. Due to Federal Labor Law limitations and to achieve maximum savings in both VMT and GHG emissions, it is recommended that the furlough occur over consecutive work days.

4.1.4 Emissions from Solid Waste

Solid waste comprised 2.4 percent of the City's total greenhouse gas emissions. All solid waste generated within the City is disposed of at the Solid Waste Authority's (SWA) North County Resource Recovery Facility (NCRRF) in West Palm Beach. The NCRRF consists of both a landfill with a landfill gas recovery system and a waste-to-energy facility. In relation to solid waste emissions, the City's largest vehicle fleet emissions were from solid waste at 32 percent.

Additionally, the 2010 Florida Legislature passed HB 7243 which created many state incentive programs and resources to increase recycling for local governments and businesses. The City should use the passage of this legislation as an opportunity to incorporate relevant policies into its own Code of Ordinances and Comprehensive Plan as appropriate. Many state agency initiatives can translate into effective City policies. The City can also incorporate new initiatives of the Recycling Business Assistance Center created by this bill. Partnerships with the business community and City specific policies on recycling could have a dual benefit of reducing actual emissions from solid waste and fleet emissions from solid waste service.

Objective:
Explore opportunities to meet and exceed the following recycling standards (for recyclable solid waste) required for counties: 40 percent recycled solid waste by December 31, 2012, 50 percent recycled solid waste by December 31, 2014, 60 percent recycled solid waste by December 31, 2016, 70 percent recycled solid waste by December 31, 2018 and 75 percent recycled solid waste by December 31, 2020.

Actions to Achieve the Objective:

- Maximize the City's E-government access and develop a paperwork reduction policy.

- Meet or exceed the State's recycling target for municipal solid waste of 75 percent by 2020. This would include meeting the annual reporting requirements pursuant to Section 403.7032, F.S.

- Adopt a similar voluntary reporting policy for businesses such as that found in Section 403.7032, F.S. encouraging reporting the materials they recycle to the county.

- Review and adopt as feasible, recycling procurement policies formulated by the new Recycling Business Assistance Center in DEP.

- Develop appropriate composting policies consistent with Section 403.706, F.S. for organic materials or mulching organic materials that would otherwise be disposed of in a landfill. Determine additional opportunities for composting in partnership with the private sector.

- Ensure new development projects, on or after July 1, 2012, for multifamily residential or commercial purposes provide adequate space and receptacles for recycling by tenants and owners consistent with HB 7243 amending Section 403.706, F.S. Determine system for monitoring and tracking compliance with building permit process.

- Publish the City's rate of recycling on its website.

4.1.5 Actions to Administer the City's Climate Action Plan

The City should formalize the membership and reporting process for the inter-departmental Sustainability Team. Primary responsibilities of the Team should include inter-departmental coordination to maximize funding opportunities, coordination to ensure implementation of Community-wide climate policy goals, coordination with other local government jurisdictions, monitoring of progress towards achieving the City's goals, and annual progress reporting.

The Sustainability Team should continue coordination with Palm Beach County, the Southeast Florida Regional Climate Change Compact (Compact), Treasure Coast Regional Planning Council (TCRPC), Palm Beach County Metropolitan Planning Organization (MPO) and SFWMD to achieve regional cooperation in reducing the costs of products and services and obtaining technical assistance and grant funding. Energy, climate change and sustainability related-legislation at the state and federal levels should be tracked for its impact on the City. Various state and federal rulemaking initiatives could have a future impact on the implementation of the CAP. The Team should make policy recommendations for energy and cost savings for consideration by the City Manager and the Commission through a quarterly update and annual summary process. This also provides an opportunity to educate the community on the progress made to date.

Regional cooperation may provide cost savings if cities, counties, and other governmental entities coordinate and share resources to achieve economies of scale. For example, the development of an alternative fuel or electric vehicle stations initiative among all four southeast Florida counties may result in fuel supply and infrastructure at reasonable costs as opposed to the City pursuing this initiative alone.

Collaboration with the County and the Compact on legislative policies will raise the awareness at state and federal levels on the vulnerabilities of South Florida and the need for assistance. Finally, such collaboration provides opportunities for partnerships on grants and other funding opportunities and should be a key role of the City's Sustainability Team.

Objective:
The City Sustainability Team should be responsible for implementing the Climate Action Plan, monitoring and tracking its success and developing consistent policy recommendations for the City to achieve its GHG reduction goals.

Actions to Achieve the Objective:

- The City should maintain its inter-departmental Sustainability Team to meet quarterly to evaluate the effectiveness of the City's operations and policies on energy conservation and sustainability.

- The Team should develop office and administrative procedures "green manual" with milestones, goals and timelines to meet the City's goals.

- The Team should coordinate with Palm Beach County, the Compact, TCRPC, MPO and SFWMD on grant funding and obtaining technical expertise on regional climate change that would otherwise not be available. The Team should also reach out to Florida Atlantic University as a source of scientific information on climate change and its projections.

- The Team should develop a template and data management system to monitor and track progress towards reaching GHG reduction goals. Monitoring of energy reductions should be coordinated by the City's Sustainability Team by use of free software such as EPA's Energy Star Portfolio Manager and through the implementation of an Energy Management System which provides real-time energy usage (see section on Monitoring). This could be used to produce the City's Annual Report, another area of responsibility for the Sustainability Team.

- Develop an Environmentally Preferred Procurement Policy Manual/Central Procurement System to be used by all appropriate departments and divisions. While this may not reduce GHG emissions for the City, there are benefits at the point of production. Preference should be given to products that have a lesser or reduced effect on human health and the environment as compared to other products such as low-toxicity, recycled content, low-waste and renewable materials (unless costs are prohibitive or other environmental considerations are more important). This preference should consider all phases of the product's life cycle, including raw materials acquisition, production, manufacturing, packaging, distribution, operation, maintenance, and disposal, including potential for reuse or ability to be recycled. The Manual/System would include the following types of products: [CA]

- Biobased, biodegradable, carcinogen-free, chlorofluorocarbon-free, compostable, durable, energy efficient, heavy metal free (e.g., no lead, mercury, cadmium), less hazardous, locally manufactured, low volatile organic compound content, low-toxicity, made from rapidly renewable materials, persistent/ bioaccumulative toxic free, recyclable, recycled content, reduced greenhouse gas emissions, reduced packaging, refurbished, resource efficiency, reusable, upgradeable and water efficient.

- Related to the Environmentally Preferred Procurement Policy as far as the GHG impact to the City, the Sustainability Team should complete a review of the City's purchases of commodities and based on anticipated purchasing needs and volumes, prioritize its efforts to integrate environmental considerations into their purchases. This should include determination of an appropriate and reputable standard to avoid concerns of greenwashing.[4] Such products could include the following:

  - The more than 50 recycled content products designated by the US Environmental Protection Agency (www.epa.gov/cpg).

  - The more than 35 energy-efficient products listed by the Energy Star program (www.energystar.gov).

  - The biobased products designated by the US Department of Agriculture (www.ars.usda.gov/bbcc).

  - Furniture purchases such as those with foam components that do not contain CFC's or HCFCs and/or wood products certified by the Forest Stewardship Council whenever possible.

  - Hybrid electric or alternative fuel vehicles.

  - Landscaping products and services that are energy efficient and do not utilize harmful pesticides.

  - Paint and painting services that utilize volatile organic compounds standards such as Green Seal.

  - Paper (beyond the initial recycled-content requirements) such as binders, flip charts, printer cartridges, envelopes, tissue/towel products, etc.

  - Pest management products and services.

[4] Jay Westerveld penned an essay in 1986 taking the hotel industry to task for its linen and towel re-use programs and coined the term as a double standard that a hotel should promote an environmental practice when the actual purpose was to reduce expenses. Today, 16 CFR Part 260, Guides for the Use of Environmental Marketing Claims, on implementation of Section 5 of the Federal Trade Commission Act, makes unlawful deceptive acts and practices in or affecting commerce relative to environmental advertising and marketing practices.

- Vehicle maintenance products and services.
- Ability or a policy to recycle electronic waste.
- Green Housekeeping policy that includes environmentally preferred cleaning products/services requirements for internal or contracted janitorial services.
- Require contractors to meet certain energy efficiency standards in their fleet where appropriate.
- Develop criteria for evaluation of governmental services contracts that provide points to "green certified" businesses with documented programs and criteria.
- Determine the feasibility of pursuing a "green" certification for City offices.
- Establish guidelines for businesses submitting proposals to do work with the City such as preferred off-peak travel drop-off times for responses.
- Develop a financial implementation strategy including grants, financing districts and revolving loan funds for commercial and residential properties.

4.2 Community Engagement

The City of Boynton Beach intends to position itself as a pre-eminent resource in South Florida for water and energy conservation, transportation efficiency, recycling and green building practices and to raise public awareness of the benefits of green living. First, to foster and build public commitment, the City will support a community-wide public engagement campaign to educate, inspire and offer some of the most cost-effective, healthy and easy solutions. The education effort will seek to engage diverse partners and sectors of the community; create a shared community vision, goals and progress indicators of a low-carbon future; connect individuals and organizations to education, tools and resources; and celebrate positive changes and successes. A fully engaged community is the key to success in dealing with climate change. The 2006 GHG inventory indicates that 25 percent of all GHG emissions result from residential energy, while non-industrial businesses account for another 21 percent. Of greater concern is the 48 percent is from transportation community-wide which includes all vehicles traveling within city limits, personal and commercial. Therefore, city residents and businesses are an essential part of the solution to reducing GHG emissions.

A second key aspect of implementing the City's CAP will be creating opportunities and events for the education of children, citizens and other communities to exchange ideas on new approaches to managing energy consumption and GHG. Applied education of citizens about steps they can take in their daily lives provides a simple linkage between greater sustainability goals and the average person.

A successful community engagement/education effort must tie together existing efforts, develop new initiatives and forge a partnership between government and the community. Reaching this objective requires cooperation among governments, neighborhoods, schools, non-profit organizations, faith communities, businesses, civic organizations and individual community members.

An annual update of the CAP's progress will ensure continued educational opportunities for the community. By actively educating the community about the existence of the CAP and providing resources for residents to educate themselves about the benefits from its implementation, the City is providing multiple avenues for the residents to engage.

Objective:
Motivate all Boynton Beach residents and businesses to adopt beneficial habits that reduce GHG emissions.

Actions to Achieve the Objective:

- Place the CAP, and highlight its adoption, on the City's website, BBTV and in the media. [CA]
- Design a marketing program to educate the public on the benefits of energy & water efficiency and improved air quality. (BBTV PSA-type message to be developed and aired.) [CA]
- Utilize existing programs such as "Commit2BFit" and "Bike to Work" week to highlight the relationships between these initiatives and goals of the CAP such as reduced greenhouse gas emissions related to less vehicle use.
- Use of City facilities, newsletters, the website, library programs, social media and providing information through utility bills should all be considered in the cost-effective development of the program.
- Demonstrations and signage in City Hall and partnerships with the library and schools district will disseminate the messages to a greater audience.
- Continue to support assistance programs to low income households such as the Federal Weatherization Assistance Program to increase educational opportunities such as energy conservation at existing homes.
- Analyze and increase utilization of existing communications opportunities such as newsletters, mailers, the City's marquee, utility bills, new resident packages, City Services Institute and flyers/posters to communicate the City's CAP concepts. [CA]. In particular, communicate the City's water conservation goals in its utility bills. In particular, use the City's buildings as a mechanism to increase awareness of the City's CAP and accomplishment of goals as well as an opportunity to educate home and business owners about the benefits of going green.

- Increase the information on the City's "Go Green Boynton!" portion of the website including educational materials about citizen and business led initiatives to incorporate sustainability principles into everyday decisions. Communicate the City's energy savings due to implementation of the CAP. Additional recommendations include:
  - Feature a "Green Home Makeover" once a month on the City's Green Section of its website.
  - Create links on website to information on tax and rebate incentives for homeowner and business energy retrofits.
  - Create a link to a personal GHG emissions calculator and include tips to personally reduce GHG emissions.
- Use press releases to highlight the City's accomplishments including retrofits at buildings, green events or renewable energy projects on buildings such as the retrofits being completed pursuant to the City's EECBG.
- Examine how to increase the visibility and reach of the City's CAP message, strategy and goals with its younger, older, minority and ethnic citizens.
- Develop an initiative to focus on increasing awareness of the City's recycling program and successes. This initiative should also focus on home and business owner tips and strategies for increasing recycling. [CA].
- Determine the feasibility of using transit facilities/stops to increase awareness related to transportation-related GHG reduction strategies.
- Promote state's recycling target of 75 percent. Expand the current recycling program through consideration of alternative methods and increasing public awareness.
- Publish monthly energy use in local City newsletter and on website.
- Energy and water efficiency strategies incorporated into monthly water utilities billing.

Objective:
The City should form partnerships between other local governments, Chambers of Commerce, the business community and engage all its citizens, from the very young to seniors, to assure it achieves a "cultural shift" embracing the concepts of sustainability.

<u>Actions to Achieve the Objective:</u>

- Consider organizing individually or in partnerships with other local governments, or the Greater Boynton Beach Chamber of Commerce, a "Green Event". [CA]

Models include the Florida Chamber of Commerce and the growth and climate related events that they hold each year or the Palms West Chamber of Commerce and their Florida Green, Energy & Climate Conference/Expo. This could increase awareness of the CAP's implementation, increase exposure for vendors of local green products and services and other common areas of interest.

- Develop a partnership with the Greater Boynton Beach Chamber of Commerce to formulate a "green" certification program or "leadership council" to promote the concepts of cost savings and reductions in GHG emissions from the business community. Examples include Manatee County and the Green Business Leadership Council or Green Business Partners programs in Sarasota County. Develop a training program for local businesses in conjunction with this initiative. [CA]

- Establish a local partnership to offer education, training and resources for contractors and design professionals.

4.3 Fuel and Energy Use

The City's total emissions from the community in 2006 were about 930,000 $MTCO_2e$, not including emissions from City operations. This includes GHG emissions from electricity, natural gas, and fuel oil used in residential, commercial, and industrial buildings, private vehicles traveling within City limits, and solid waste disposal. The next largest source of emissions is electricity used in residential, commercial, and industrial buildings.

To gather additional data to address City fuel and energy use, FPL has indicated their willingness to conduct free energy audits of the top building/facilities within City Operations to benchmark existing usage and to recommend additional conservation measures. City buildings can reduce their electrical costs by installing energy efficient lighting, motion sensors, heat reflective window film, reflective roof coatings, and upgrading HVAC systems and appliances to Energy Star. City water and wastewater facilities can consider improved energy efficient pumps, operations and waste treatment. In addition, FPL has offered rebates to the City for the implementation of new energy efficient equipment and fixtures such as direct expansion AC systems, ceiling or roof insulation, on-call AC, heat recovery unit or heat pump water heaters, energy efficient lighting, energy recovery ventilation, chiller incentives, demand control ventilation, high efficiency lighting and reflective roof paint. These retrofits promote additional educational opportunities with homes and businesses and should be highlighted on the City's website.

Many factors related to fuel and energy use are outside the control of the City. Two examples are the amount of energy produced from renewable sources[5] as well as

[5] In 2007, Executive Order 07-127 was signed requesting the Public Service Commission (PSC) to develop a renewable portfolio standard requiring utilities to produce 20 percent of their energy from renewable sources. During the 2008 Regular Session, the Florida Legislature amended Section 366.92, F.S., in HB 7135, Chapter 2008-227, Laws of Florida.

vehicle fuel standards.[6] Both are influenced at the national and state level through multiple levels of policy and regulation. For instance, for the last three legislative sessions, renewable energy standards have been proposed and failed to pass. While the City may not be able to influence these other policy and regulatory issues, the City can still formulate its own goals and implement policies and programs that conserve fuel and energy use. In fact, Chapter 163, F.S. now requires the housing element of the City's Comprehensive Plan to include standards, plans and principles to be followed in the "use of renewable energy resources".[7]

The City could provide incentives to reduce energy use such as through the formation of an energy financing district discussed in other sections. This tool allows home and business owners to overcome the single largest hurdle in completing renewable energy and energy efficiency projects which is the upfront costs. Many of the recommendations related to fuel and energy use overlap with the previous section on Community Engagement and the discussion of implementation tools for the CAP.

In March 2008, the Florida Public Service Commission (PSC) adopted rules for net metering and interconnection of renewable-energy systems up to two megawatts (MW) in capacity.[8] The net metering rule was intended to promote the development and interconnection of customer-owned renewable generation, and minimize costs for customers attempting to interconnect to their utility. It encourages the development of renewable generation by: (1) expanding the size of eligible systems from 10 kW to 2 MW; (2) expanding the type of eligible systems from solely photovoltaic to all renewable technologies; (3) expediting the interconnection of customer-owned renewable generation; and (4) allowing customers to offset consumption through net metering. The PSC rules apply only to the state's investor-owned utilities. Net metering is available to customers who generate electricity using solar energy, geothermal energy, wind energy, biomass energy, ocean energy, hydrogen, waste heat or hydroelectric power.

Footnote 5 continued - The PSC was required to adopt rules to establish a renewable portfolio standard (RPS), in consultation with the Florida Department of Environmental Protection (DEP) and the Florida Energy and Climate Commission. The Draft rule, Rule 17.400, F.A.C. remains unadopted and although numerous bills were filed in the 2010 legislative session, no bill related to a renewable portfolio standard passed.

[6] 40 CFR Parts 85, 86, and 600; 49 CFR Parts 531, 533, 536, et al.

[7] Ch. 2008-191, LOF.

[8] Rule 25-6.065, F.A.C. "Interconnection and Metering of Customer-Owned Renewable Generation".

Objective:
Reduce energy use in existing and new construction and incentivize the use of renewable/alternative energy sources. Develop a feasible target for renewable energy production within the City for City operations and facilities by a certain date.

Actions to Achieve the Objective:

- Develop financial, regulatory and policy incentives, and explore partnerships, for development of energy efficiency and renewable energy projects and programs, training and incentivizing green jobs and assisting local business through retention and expansion. [CA].

- Identify City buildings and facilities appropriate for renewable energy projects including street and parking lighting. Ensure involvement of the water and wastewater utilities facilities in this effort. Seek grants and other funding opportunities to implement renewable energy projects on City buildings or at City facilities. Use retrofitted City facility projects as "demonstrations" to increase awareness in the community.

- Assess vacant lands or other parcels appropriate to encourage the development of alternative energy projects. Verify that code provisions do not inadvertently discourage alternative energy projects. Seek partnerships with electric utilities for siting renewable energy projects. Identify opportunities, such as solar photovoltaic panels (PV), where a demand for manufacturing exists and develop an economic incentive program to attract green businesses.

- Create incentives for renewable energy use in new construction. Define City and Community standards for energy efficiency and renewable-energy criteria when assessing the housing, commercial and transportation sectors. [CA]. Determine the feasibility of achieving low or zero net GHG emissions in all new buildings and homes. Such standards could include a renewable energy target for homes and businesses or use of renewable energy in a certain amount of public facilities.

- Develop policies to ensure that new buildings and major remodels can adapt to the changing climate with concepts including building floor elevation or requiring electrical infrastructure is located at a higher level in the building.

- Explore an ESCO partnership as a possible opportunity for establishing a measurement and verification system for existing energy use management in the City and CRA buildings. [CA].

- Develop an ESCO energy performance contract (PC) request for proposal (RFP). [CA] to avoid allocating capital dollars for energy retrofits on buildings and facilities.

- Support initiatives to increase the amount of, and access to, alternatively fueled vehicle infrastructure such as fueling stations.

4.4 Transportation

The City has determined that it should take the lead on implementing many of the transportation initiatives and strategies, and use what is learned from those internal City activities to expand the programs into the general Boynton Beach Community. Reducing vehicle miles traveled by increasing active forms of transportation such as walking, bicycling and using transit produces significant community health and economic benefits as well as achieving the goal of reducing GHG emissions.

Land use planning and transportation funding decisions greatly influence transportation-related emissions. Similarly, commercial transportation is strongly influenced by the location and availability of inter-modal options. For that reason, transportation emissions reductions depend critically on coordinated land use policies and the development of infrastructure for low-carbon modes of transportation. Coordination with the Palm Beach County Metropolitan Planning Organization is also critical to success.[9]

Along with more available infrastructure, individuals will make daily choices to walk, bicycle, take transit or carpool whenever these options are practical. The CAP proposes an approach for targeting community-wide reductions in this emissions sector comprised of increasing the connectivity of existing transportation systems, increasing the energy efficiency of transportation infrastructure and facilitating greater use of alternatively fueled vehicles.

Through the use of improved bicycle and pedestrian modes of transportation, "greening" of transportation infrastructure such as increasing the facilities needed to serve alternatively fueled vehicles, the City is prioritizing quantifiable and visible transportation strategies. The objective measure of these programs is reduction in personal vehicle miles traveled (VMT), but achieving all the recommendations should be the ultimate measure of success.

Objective:
Reduce per capita daily VMT each year for the next 20 years. [CA].

[9] Palm Beach County is part of a regional planning effort titled the 2035 Southeast Florida Regional Long Range Transportation Plan. The three Metropolitan Planning Organizations (MPOs) in Palm Beach, Broward, and Miami-Dade are coordinating their planning efforts to obtain a combined tri-county 2035 planning forecast (www.seftc.org/tp/).

Actions to Achieve the Objective:

- The City should establish an integrated network of non-motorized transportation corridors by including and utilizing existing rights of way that connect parks, linear parks, greenways, canals and waterways to increase the non-motorized transportation network.
- Identify any missing links in the network to ensure all City streets have sidewalks.
- Improve pedestrian continuity on downtown streets to decrease short trip automobile use and iterative parking, increase transit viability and require less parking.
- Provide or require bicycle and pedestrian ways for connecting residential areas to recreational areas, schools, shopping areas and employment areas.
  - Promote bicycling and pedestrian facilities and incorporate the "complete streets" concepts to accommodate the needs of different transportation modes and users into the City's transportation plans. Accommodate automobiles, transit vehicles and non-motorized forms of transportation.
  - Ensure a safe and comfortable environment for diverse users.
  - Aesthetically pleasing.
- Place special emphasis on streets located in the downtown area and in single-family neighborhoods.
- Evaluate and Improve City-Wide Bicycle Facilities Network and adopt a pedestrian and bicycle master plan by (a commission-determined date). [CA]
- Require a minimum amount of long-term bicycle parking areas for multi-family housing and mixed use developments in areas other than the actual dwelling unit.
- Create Transportation Management Association (or Alliance) of Commercial Interests along the Corridor to Develop a Trip Linkage Strategy. [CA]
- Implement traffic engineering improvements or enhancements. Prioritize the area along Congress Avenue between Gateway Boulevard and Woolbright Road. [CA]
- Identify and create a GIS map of any existing locations for alternatively fueled vehicle charging stations. Determine future opportunities for expansion of the network.
- Include development approval incentives to encourage prioritized parking and charging stations for alternatively fueled vehicles in redevelopment projects.

Objective:
Determine current levels of citywide transit use and increase ridership.

Actions to Achieve the Objective:

- The City should monitor the South Florida East Coast Corridor Study[10] (Study) focusing on the eastern portions of the three counties, mainly along I-95, U.S. 1 and Old Dixie/Federal Highway. The Study objective is to relieve roadway congestion along the roadways while providing the needed freight transport to the area. The Study is also reviewing the potential for additional transit service along the corridor that would provide connectivity to existing and proposed transit (Tri-Rail, Metrorail, Miami streetcar, East-West Line in Broward).

- The City should create incentives to be implemented in the development approval process for commercial projects that link directly to public transit alternatives such as Tri-Rail.

- Develop City-Wide Multi-Modal Map that illustrates deficiencies and opportunities related to transportation and land use integration. The City should work with Palm Tran and private developers in increasing the transit modal split for all trips and also work trips in the City of Boynton Beach [CA]

- City should coordinate with Palm Tran and other transit providers on the provision and/or enhancement of transit services that connect the City's western communities with the downtown.

- City should increase opportunities for park and ride facilities as a means to encourage greater use of transit and to increase opportunities for ridesharing.

- Continue work with the MPO, TCRPC and Boynton Beach Community Redevelopment Agency on the Intracoastal Waterway (ICW) plan to expand all forms of water-based transportation.

4.5 Land Use and Development

4.5.1 Land Use

The Green Task Force and the Green Community Alliance, made very clear their desire that the entire City be governed by "green" and "sustainable" policies that support land use, landscaping, irrigation and sustainable construction and that these policies should be included in the Comprehensive Plan and Land Development Regulations (LDR). The City is largely built out and its best opportunities to impact land use and development stem from redevelopment projects. The City has identified two primary goals and objectives regarding land use and development. These are 1)

[10] www.sfeccstudy.com

the need for modification to the Comprehensive Plan; and 2) the need for Green/Sustainable land development, site design criteria and incentives.

Strategically, the City should concentrate its efforts on redevelopment opportunities and assuring that the land use pattern works effectively to reduce GHG emissions from transportation. Connecting land uses so that people can reduce VMT will be a key strategy to reduce community wide GHG emissions. Finally, the City will provide innovative approaches for redevelopment opportunities that maximize flexibility in land uses to achieve the CAP's goals.

The Florida Building Code is mandatory throughout the state and does not need to be adopted by a local government to be applicable at the local level. In 2008, HB 697 passed measures requiring increases in the energy efficiency of the Florida Building Code: 20 percent in 2010, 30 percent in 2013, 40 percent in 2016 and by 50 percent in 2019.[11] Unfortunately, "local technical amendments" to the Florida Building Code related to energy efficiency are prohibited under the "Florida Thermal Efficiency Code" (Part V of Chapter 553, F.S.).[12] This does not, however, prohibit voluntary participation in "above-code" incentive-based programs. It also does not prevent a local technical amendment from being adopted, requiring high water efficiency fixtures and given the relationship between water and energy efficiency this is something the City should consider.

Objective:
Develop and transmit Comprehensive Plan amendments to implement the CAP and meet new Chapter 163, F.S. requirements to incorporate greenhouse gas reduction strategies into specific elements.

Actions to Achieve the Objective:

Implementation of the CAP should include both a long-term and short-term implementation strategy. The City's Comprehensive Plan is the long-term vision of the community and can serve as a vehicle for implementing the CAP. Adoption of the CAP also comes after the Florida Legislature passed legislation (HB697) requiring GHG reduction strategies be incorporated into the Future Land Use, Transportation, Conservation and Housing elements of a local government's Comprehensive Plan.

[11] Section 553.9061 describes a schedule for increasing the thermal efficiency of buildings subject to the Florida Energy Efficiency Code for Buildings. The first increase is 20 percent over the 2007 version of the code (updated every 3 years); 2013 edition must be 30 percent more energy efficient; 2016 edition must be 40 percent more energy efficient and 2019 edition must be 50 percent more energy efficient.

[12] Sections 553.904, F.S. (Thermal Efficiency Standards for new nonresidential buildings), 553.905, F.S. (new residential buildings), and 553.906, F.S. (renovated buildings) each contain language that all buildings "shall not be required to meet standards more stringent than the provisions of the Florida Energy Efficiency Code for Building Construction."

These requirements are generally consistent with the intent of the CAP recommendations and include the following:

- The future land use plan shall be based upon surveys, studies and data regarding the area, including the discouragement of urban sprawl; energy efficient land use patterns accounting for existing and future electric power generation and transmission systems; and greenhouse gas reduction strategies. This will require some level of coordination with power providers on future facilities.

- Transportation strategies to address reduction in greenhouse gas emissions from the transportation sector, Section 163.3177(6)(b) F.S. There is no explicit requirement for supporting data and analysis regarding GHG emissions.

- In the Conservation Element of the Comprehensive Plan, Section 163.3177(6)(d), F.S. factors that affect energy conservation must be included and the Section requires the land use map or map series contained in the future land use element to generally identify and depict "energy conservation".

- The housing element shall consist of standards, plans, and principles to be followed in energy efficiency in the design and construction of new housing and the use of renewable energy sources. In Sections 163.3177(6)(f)h. and i., F.S. there are no definition of standards, and principles for energy efficiency in new construction or use of renewable energy sources.

While the City of Boynton Beach's Comprehensive Plan already includes goals, objectives and policies that address many of these requirements, the development of the CAP and GHG Inventory were completed subsequent to those amendments; therefore, other amendments could be included to further address the CAP's recommendations. Additionally, the Department of Community Affairs is in the rulemaking process revising Rule 9J-5, F.A.C. to address the requirements of HB 697 (Draft HB 697 Implementation Rule). Before final amendments to the Comprehensive Plan are developed, the status of the adoption of this rule should be determined to ensure the most current rule language is applied.

Recommendations to Comply with HB 697

Future Land Use Element:

- The land use map or map series contained in the future land use element should be amended to generally identify and depict energy conservation.

- Update the data and analysis discussion to include information from the GHG Inventory related to emissions data from various sectors.

- Include efficient use of energy conservation as one of the resources and services to address in Objective 1.8

- Update the Support Document to reflect additional aspects of strategies pertaining to compact, walkable neighborhoods, incentives for infill redevelopment, transit-oriented development and/or production and use of renewable energy sources from the CAP.

- In policies related to energy efficient land use patterns, reduction of greenhouse gas emissions and the efficient use and conservation of energy, required by HB 697, include provisions such as increasing connectivity with the master pedestrian-bikeway-greenway-blueway plan and implementation of "qualifying improvements" district or other incentives to promote retrofitting of commercial and/or residential properties as well as City facilities.

Transportation Element:

- Update the data and analysis in the Support Document to include data related to transportation sector GHG emissions data at the Communitywide and City fleet levels.

- Update the data and analysis in the Support Document to include the CAP recommendation pertaining to identification of missing links in sidewalk networks and establishing an integrated network of non-motorized transportation corridors such as rights of way, linear parks, greenways, canals and waterways.

- Include a policy to implement recommendations in the CAP related to increasing opportunities for park and ride facilities and alternatively fueled vehicle charging stations. For instance this policy could be added under Objective 2.8 relating to reduction of energy consumption.

Conservation Element:

- Include an Objective and Policies to address implementation of strategies for conserving natural-area features. This could be done be creating a new Objective and Policy section or updating Objectives 4.5 and 4.6 to address these strategies.

- Establish an urban forestry program to develop City-wide tree canopy survey with the eventual goal of reducing the "heat island" effect due to dark or asphalt surfaces.

Housing Element:

- Include discussion of the City's Green Building Program for energy efficiency in the design and construction of new housing and the use of renewable energy sources.

- Include a policy to promote partnerships with the City of Boynton Beach Community Redevelopment Agency (CRA) in programs to retrofit and upgrade properties.

- Include a policy pertaining to development of a residential energy retrofitting ("qualifying improvements") program.

Additional Potential Amendments to the Comprehensive Plan Based on the CAP

Because the Comprehensive Plan is long-term in nature, other recommendations of the CAP could be implemented by revising other Elements of the Plan that are not limited to those included in the HB 697 legislation. To assure principles and recommendations are included throughout the Comprehensive Plan, the following additional amendments could be considered (by requisite Element of the Comprehensive Plan):

Utilities Element:

- Amend the Sanitary Sewer Sub-Element to include concepts under Objective 3A.6 related to consideration of energy audits for wastewater facilities and integrating renewable energy resources where appropriate.

Coastal Element:

- Revise Policy 7.1.4 to require construction in accordance with the 2007 version of the Florida Building Code.

Intergovernmental Coordination Element:

- Add a policy promoting the City's partnerships with other municipalities, TCRPC, MPO, Palm Beach County and other local governments related to the CAP's recommendations.

- Add a policy that promotes coordination with the efforts of the Southeast Florida Regional Climate Change Compact.

- The City should continue and enhance partnerships with the TCRPC on regional land use plans incorporating climate change adaptation, VMT and increased energy efficiency. For instance, coordinate the City's Comprehensive Plan review and revision to incorporate the CAP consistent with the TCRPC's document "Energy Planning in the Twenty-First Century, A Guide for Florida Communities," December 2009 (www.tcrpc.org/departments/energy.html).

Capital Improvements Element:

- Add a policy that requires the City to coordinate the annual review of the CAP with the Capital Improvements planning process to capture new opportunities for funding the CAP's energy saving recommendations.

Optional Element of Comprehensive Plan

The City should consider adoption of a new element of the Comprehensive Plan, pursuant to Section 163.3177, F.S., an "Energy Conservation Element" to capture most

of the remaining CAP recommendations. Many local governments across the state are addressing energy conservation, including related issues pertaining to climate change and the resulting impacts, in an optional element of their respective Comprehensive Plans. The City's Sustainability Team will provide recommendations as to the scope of material to be covered in this optional element and its Support Document.

4.5.2 Sustainable Construction

Objective:
Revise the LDR as needed for policy and short term land development decision-making that supports the Climate Action Plan.

Actions to Achieve the Objective:

- Govern the City by "green" or "sustainable" Land Development Regulations with different "tiers" (for example, for single family, multi-family, commercial) of design criteria to provide a variety of incentives to landowners/developers. More "intense" incentives are reserved only for parts of the City that are designated for high density and intense redevelopment. [CA]

- Review its land development regulations to determine the feasibility of using land use and parking strategies that reduce reliance on automobiles including but not limited to strategic reductions in parking supply, encouraging short term over long term parking, promotion of park-and-ride and bike-and-ride areas and shared parking facilities.

- Identify land use categories and zoning districts where alternative energy projects are an allowable use. Ensure land development regulations comply with Section 163.04, F.S. in that property owners cannot be denied (nor can condominium associations restrictors prohibit) solar collectors, clotheslines or other energy devices from renewable resources. Similarly, Section 718.113(6) F.S. allows the board of administration of a condominium the authority to install upon or within the common elements or association property of a condominium solar collectors, clotheslines, or other energy efficient devices based on renewable resources for the benefit of owners.

- Create an incentive for projects that includes a "20-Minute Complete Neighborhoods" approach whereby residents can safely walk a relatively short distance from home to most of the destinations and services they use every day. This could require development applicants to submit a list of neighborhood services within a 20 Minute walking distance from their project such as:

  - Neighborhood oriented commercial
  - Restaurants
  - Drug stores

- Convenience stores
- Transit stops
- Schools
- Parks

- Develop process and land development standards:
  - Establish a recognition program for new construction and renovation, feature on website and social networking including signage for projects achieving rating.
  - Applications for buildings over a commission-determined square footage threshold shall include a building design and construction commissioning plan and shall be commissioned by a qualified commissioning agent to meet the owner's project requirements.
  - All new commercial and multi-family construction shall include recycling facilities for non-hazardous materials including paper, glass, metal and plastic products.
- The following design principles should be applied to residences of three stories or less, additions[13], and renovations[14] to existing residential buildings; new heating, cooling, and water heating systems in existing buildings; and site-added components of manufactured homes and buildings.
  - Include standard building code provisions in the land development regulations encouraging green roof or "white roof" incentives and targets, shading of parking lots with native vegetation, pervious pavement, flat roofing with reflective standards and providing more insulation than the minimum.
  - Ensure land development regulations facilitate and promote site design criteria allowing for the easy and cost-effective installation of solar energy systems with techniques such as:

[13] An extension or increase in conditioned floor area or height of a building or structure.

[14] Any structural repair, reconstruction or restoration to a structure, the costs of which equals or exceeds, over a one-year period, a cumulative total of 30 percent of the assessed value of the structure when that value is assessed, either:

Before the improvement or repair is started; or

Before the damage occurred, if the structure has been damaged.

For the purposes of this code, renovation occurs when the first alteration of any wall, ceiling, floor, or other structural part or mechanical system of the building commences, whether or not that alteration affects the external dimensions of the structure.

- Optimum roof orientation.
- Clear access without obstructions.
- Designing the roof framing to support the addition of solar projects.
- Installation of electrical conduits to accept solar electric system wiring.
- Installation of plumbing to support an energy efficient water heating systems (tankless or solar).
- Ensure new buildings incorporate passive solar design features such as daylighting.

– Review the development regulations and assess need to develop any special green building criteria for historic structures.

– Establish criteria for new construction or major renovations requiring hot water heating systems to achieve an Energy Factor >0.82 or a thermal efficiency of at least 90 percent (same target as Federal tax rebates).

– Certified wood products and bio-based materials (engineered wood, bamboo, cork, natural fiber or other bio-based materials with at least 50 percent bio-based content) shall be encouraged.

– Develop land development code criteria for composting as appropriate.

– Reused and recycled materials shall be encouraged in the construction process.

– As a building site permits, orient and shade buildings such that:

- Exterior shade is provided for south-facing windows during the peak cooling season.
- Provide shading against direct sun due to low sun angles for east and west facing windows.
- Protect the building from thermal loss, drafts and degradation of the building envelope caused by wind and wind-drive materials such as dust, sand, and leaves with building orientation and landscape features.
- Use landscaping to provide natural shading when feasible.

– Define Florida Friendly and native landscaping species and establish planting thresholds.

- Establish requirements for indoor-fixture water conservation. Select appropriate performance characteristics from the following programs: Water Sense®, Florida Building Code, Federal Energy Management Program (FEMP), Florida Water Star, and US Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED). A comparison chart of all the programs is contained in Appendix B.
- Review existing landscape provisions and revise with a goal of reducing heat island effects.
- Investigate the feasibility of building design guidelines and criteria to minimize the amount of non-roof pervious surfaces around buildings.
    - Investigate provisions and requirements for building energy efficiency improvements in leased spaces.
    - Coordinate with CRA to require energy efficiency to obtain funding.
    - Establish energy efficient outdoor lighting requirements.
    - Review the viability of an ordinance requiring certain upgrades that save energy and conserve water are completed at the time a property is sold.

■ Address sustainable construction principles on City facilities:

- Pursuant to Chapter 255, F.S. all City of Boynton Beach buildings shall be constructed to meet:
    - The USGBC LEED rating system.
    - The Green Building Initiative's Green Globes rating system.
    - The Florida Green Building Coalition standards, or
    - A nationally recognized, high-performance green building rating system as approved by the Florida Department of Management Services.

      Develop sustainable building criteria for capital improvements that are less than whole buildings.

      The City should track its own level of green house reductions at facilities and include these in the City's Annual Report on GHG emissions.

- Offer incentives to development applicants to meet or exceed the City's green building program (see Appendix B) as appropriate such as building height, density bonuses and flexible floor area ratios. Incentives should be based on the merits of the project. The incentives should be codified in the developer's agreement between the City and the Applicant.
  - Market projects that achieve "certification" to real estate industry.
  - Determine viability of reduced cost Energy Audit for existing buildings
  - Investigate low interest revolving loan funds or establishment of a Property Assessed Clean Energy ("PACE") to help finance retrofits. Ensure the program includes commercial, residential and industrial projects to maximize energy retrofit benefits among the highest energy consumers.
  - Research future grant opportunities to provide transportation, land use, or energy efficiency retrofit programs. In particular pursue low income weatherization assistance funds through the Department of Energy.
  - Enhance CRA Residential Improvement Program Grant ($20,000) to require energy efficient renovations.
  - Support legislative initiatives to formulate a uniform state tax credit for private green buildings that meet a minimum level of green certification through a recognized green building program.

Section 5
Overcoming Challenges to Implementation

While it is clear the State and Federal regulatory frameworks related to energy use, efficiency and climate change have evolved quickly, it is safe to assume that reporting requirements and reductions in emissions will be a reality. One of the challenges to implementing the CAP is this rapidly changing regulatory landscape. Additionally, with the evolution of increasing regulation comes the sometimes unintended effect of "competing" policy goals. One example is the state's effort to increase the amount of water a utility uses from alternative sources of supply such as withdrawals from the Floridan Aquifer. This requires utilization of reverse osmosis technology to treat potable water which is the most energy-intensive method of treatment currently in use. Another example is the use of reclaimed water. Current federal intentions to control the amount of nutrients discharged to surface water (Numerical Nutrient Criteria) may stifle future efforts to use reclaimed water even though water supply decisions have been made assuming its implementation.

Changing attitudes and habits will be critical because much of the reduction in GHG emissions must come from the community. Community engagement and education are essential to this effort by drawing the relationship between climate change, behavior changes, environmental benefits and cost savings. Changing engrained habits will take time. Achieving small measures of success through small actions like turning lights off, recycling, using compact fluorescent lights (CFL) rather than incandescent lights, reducing vehicle miles traveled, walking, taking the bus or Tri-Rail rather than driving, will require significant encouragement and reinforcement.

While these issues provide real challenges, the overriding challenge will be funding. For this reason, CDM recommends that the City fund its CAP efforts through the following sources:

- Energy Service Company (ESCO) and Performance Contracting (PC)
- Property Assessed Clean Energy (PACE)
- Private investment partnerships
- Clean renewable Energy Bonds (CREBs)
- Qualified Energy Conservation Bonds (QECBs)
- Renewal and Replacement Funds
- Grants

Energy Services Company (ESCO): An ESCO is a professional business that provides a broad range of comprehensive energy solutions including designs and implementation of energy savings projects, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management. There are ten ESCOs in Florida that have been approved by Florida Department of Management Services for work with the State of Florida. ESCOs in Florida are established by law under Chapter 489.145 F.S. (Guaranteed Energy Savings Contracting Act). An ESCO performs an in-depth analysis of property, designs an energy efficient solution, installs the required elements and maintains the system to ensure energy savings during the payback period. The contracting mechanism is called performance contracting (PC). The savings in energy costs are used to pay back the capital investment of the project over a five to twenty-year period, or reinvested into the building to allow for capital upgrades that may otherwise be unfeasible. If the project does not provide returns on the investment, the ESCO is responsible to pay the difference. Energy savings are guaranteed.

Property Assessed Clean Energy or "PACE": This approach voluntarily allows property owners and businesses to finance energy efficient retrofits, water efficient retrofits and/or renewable energy projects on private property. Known as House Bill 7179, this program allows any municipality or county in Florida to establish a PACE program that can stimulate local economies. PACE programs involve a local government raising capital by various means and providing funds to willing property owners secured by a non-ad valorem assessment on private property. The PACE program is intended for energy improvements such as Solar Photo Voltaic (PV) systems, high Seasonal Energy Efficiency Ratio (SEER) Heating, Ventilation and Air Conditioning (HVAC) systems, insulation, water conservation and wind resistance. There is wide latitude for local governments to form their own programs or partner through interlocal agreements. The loan is typically repaid by the property owner over a long term (e.g., 10-20 years) as an item on the property owner's tax bill. Property owners voluntarily enter into assessment agreements with the local government will be subject to the payment of assessments.

Private Investment Partnerships (PIP): A PIP with local banks may go hand-in-hand with PACE programs if a property owner selects bank financing as most desirable funding for a project. PIP may also be possible between local vendors who would like to offer rebate/discount programs and citizens who participate in the incentives for the Green Building Program.

Clean Renewable Energy Bonds (CREBs): CREBs may be used by public sector entities to finance renewable energy projects. CREBs are issued with a zero percent interest rate. The borrower pays back the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. CREBs differ from traditional tax-exempt bonds because CREB tax credits are treated as taxable income for the bondholder. The maximum term of a CREB is approximately 15 years. Government entities (states, cities, counties, territories, Indian tribal governments or any political subdivision) are able to issue CREBs.

The list of qualifying technologies includes:

- Wind (wind turbines)
- Closed-loop biomass
- Open-loop biomass
- Geothermal
- Solar (PV and passive hot water)
- Small Irrigation Power
- Municipal Solid Waste
- Qualified Hydropower Production
- Marine & Hydrokinetic Renewable Energy

Qualified Energy Conservation Bonds (QECBs): QECBs may be used by state and local governments to finance certain types of energy projects. QECBs are qualified tax credit bonds, and in this respect are similar to CREBs. QECBs must be issued for a "qualified conservation purpose" such as reducing energy consumption in publicly-owned buildings by at least 20 percent. They can also be used for implementing green community programs, wind facilities, closed-loop biomass facilities, open-loop biomass facilities, geothermal facilities, solar energy facilities, small irrigation power facilities, qualified hydropower facilities, landfill gas facilities, marine and hydrokinetic renewable energy facilities, and trash combustion facilities.

The advantage of QECBs is that they are theoretically issued with a zero percent interest rate. The borrower pays back only the principal of the bond. The bondholder receives federal tax credits in lieu of the traditional bond interest. The tax credit may be taken quarterly to offset the tax liability of the bondholder.

Renewal and Replacement (R&R) funds: R&R funds can be used to replace old equipment with newer energy efficient equipment. Old Air Conditioning (AC) equipment, lighting, pumps, motors and blowers can be replaced with high-energy efficiency ones. Low fuel efficiency vehicles can be replaced with high fuel efficiency, alternative fuel, or electric vehicles.

Grants: Many funding programs require certain policies to already be in place before an applicant can qualify, such as green building provisions. A significant benefit to having a CAP is that when grant funding opportunities become available, the City will be able to quantify the benefits of implementing projects and programs. Energy audits conducted pursuant to CAP recommendations can be used to prioritize actual projects that can be funded with grants. The City then will be able to apply quickly because it already has a CAP in place.

Section 6
Monitoring

Monitoring of energy savings is key to determining progress towards the City's goal of an 18 percent GHG emissions reduction. For monitoring CDM recommends the use of Energy Star Portfolio Manager, a free software program from the EPA. Portfolio Manager is an interactive energy management tool that will allow the City to track and assess both water and energy usage across an entire portfolio of City buildings. It is recommended that this monitoring program be carried out utilizing data from the proposed Energy Management System for buildings and facilities. The Portfolio Manager program will verify energy efficiency improvements and identify under-performing buildings. The U.S. Environmental Protection Agency (EPA) has designed the program to perform the following:

- Monitor energy and water costs
- Track multiple energy and water meters for each facility
- Customize meter names and key information
- Benchmark facilities relative to their past performance
- View percent improvement in weather-normalized source energy
- Share building data with others inside the City

Portfolio Manager calculates a building's GHG emissions (including CO_2, CH_4, and N_2O) from purchased electricity. The emissions calculations are based on the amount of energy a building consumes. The methodology for calculating GHG emissions in Portfolio Manager was designed to be consistent with the Greenhouse Gas Protocol developed by the World Resources Institute and World Business Council for Sustainable Development, and is compatible with the EPA's Climate Leaders program.

Energy performance on a scale of 1–100 relative to similar buildings nationwide can be determined using Portfolio Manager. A building is not compared to the other buildings in Portfolio Manager to determine an ENERGY STAR rating. Instead, statistically representative models are used to compare a City building against similar buildings from a national survey conducted by the Department of Energy's Energy Information Administration. This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), is conducted every four years by EPA. It gathers data on building characteristics and energy use from buildings across the United States. A building's peer group is a group of buildings in the CBECS survey that have similar operating characteristics. A rating of 50 indicates that the building performs better than 50 percent of all similar buildings nationwide from an energy

consumption standpoint. A rating of 75 indicates that the building performs better than 75 percent of all similar buildings nationally.

Portfolio Manager can be used to generate a Statement of Energy Performance for each building, summarizing important energy information and building characteristics such as site and source energy intensity, CO_2 emissions, gross floor area and number of personal computers.

Section 7
CAP as a Living Document

The CAP has been developed at a snapshot in time knowing that a multitude of changes is ahead of the City between now and the year 2035. This CAP is the first installment of the City's efforts in what will be an ongoing planning and adaptation effort to effectively address climate change and its affect on the City and its community. The City looks forward to continued conversation with and recommendations by the residents and businesses of the community about what measures may make the most sense. Technological change is occurring almost daily and alternative energy is rapidly evolving. Regional plans for water, Everglades restoration and regional transportation are still in the process of development. The goal of 18 percent reduction in GHG emissions for City operations will take place over the next 25 years on the palette of many global, national and regional changes.

For these reasons, the City staff sees the CAP as a living document that will evolve with the science, technology, policies, engineering and economy of the times. The State of Florida and the federal government will eventually become engaged. While we wait for this to happen, the City will continue to demonstrate its leadership and partnership with other communities in the efforts to adapt to our changing climate and achieve a sustainable future for its residents.

Appendix A

Glossary of Terms and Acronyms

Appendix A
Glossary of Terms and Acronyms

A.1 Terms and Definitions

Alternative energy: energy derived from non-traditional sources. These include solar, hydroelectric, wind and compressed natural gas. Differs from renewable energy in that it may include fossil fuels such as compressed natural gas which increases carbon emissions but produces fewer emissions than sources such as coal (see below).

Biofuel: liquid or gas fuel made from plant material. May include wood, ethanol, vegetable oils, municipal solid waste, and landfill gas.

Carbon footprint: a measure of the impact human activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide. Carbon footprints are typically lifecycle assessments focused on GHG (greenhouse gas) emissions, meaning they look at the GHG emissions from cradle to grave of product or service. It is meant to be useful for individuals and organizations to conceptualize their impact in contributing to climate change.

Carbon dioxide (CO_2): an odorless, colorless gas that is a normal component of ambient air. Carbon dioxide is a product of fossil fuel combustion. It traps infrared radiation and contributes to global warming.

Carbon dioxide equivalent (CO_2e): the conversion of all GHGs to equivalent carbon dioxide weights using global warming potentials. The equivalents are usually expressed in terms of metric tons.

Climate Action Plan (CAP): the evaluation of sources of GHGE and the actions planned to reduce those emissions.

Climate Change: while climate refers to an average weather pattern, climate change generally refers to all changes in climate patterns and inconsistencies (temperature, precipitation, wind, tropical disturbance) including both natural and anthropogenic changes that last for an extended period (decades or longer).

Commissioning: a systematic process of ensuring that all of a building's energy related systems are installed, calibrated, and perform according to the design intent and the owner's operational and project requirements.

Commissioning plan: identifies the scope, strategies, and responsibilities of all of the team members for each phase of a project. It includes the overall process, schedule, organization, responsibilities and documentation for the commissioning process.

Energy: the capacity for doing work. Electrical energy is measured in kilowatt hours (KWh). It differs from power in that power is the rate at which work is performed. Power is energy divided by time (KW).

Energy audit: an analysis of energy usage within a building/facility that will enable identification and development of modifications that will reduce the energy use and/or cost of operating a building or process. The results are presented in a format that will provide the information needed by an owner/operator to decide if any, some or all of the recommended modifications should be implemented.

Energy Services Company (ESCO): an energy service company (acronym: ESCO or ESCo) is a professional business providing a broad range of comprehensive energy solutions including designs and implementation of energy savings projects, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management. The ESCO performs an in-

depth analysis of the property, designs an energy efficient solution, installs the required elements, and maintains the system to ensure energy savings during the payback period. The savings in energy costs is often used to pay back the capital investment of the project over a five- to twenty-year period, or is reinvested into the building to allow for capital upgrades that may otherwise not be feasible. If the project does not provide returns on the investment, the ESCO is responsible for paying the difference.

Fossil fuel: combustible geologic deposits of organic materials formed from buried and decomposed plants and animals that have been converted to oil, coal, and natural gas.

Global Warming Potential (GWP): a relative measure of a GHG's potential to contribute to global warming. The GWP provides the ratios used in the calculation of carbon dioxide equivalents. By definition, the GWP of carbon dioxide is 1. The Intergovernmental Panel on Climate Change (IPCC) published the fourth assessment report including GWPs for various GHGs in 2007. For example, the GWP of methane is 23 which means that it is 23 times as powerful as carbon dioxide in causing global warming.

Greenhouse Gases (GHGs): gases present in the earth's atmosphere which reduce the loss of heat into space and therefore contribute to global temperatures through the greenhouse effect. Greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxide, hydrochlorofluorocarbons, ozone, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

Greenhouse Effect: The build-up of heat in the troposphere near the surface of the Earth where all weather occurs. The troposphere contains approximately 95 percent of the air in the Earth's atmosphere. Heat reflected back into space from the Earth's surface is absorbed by carbon dioxide and other greenhouse gases causing a rise in the temperature of the troposphere eventually resulting in global warming.

Green Roofs: rooftops planted with vegetation usually with a soil base.

Greenwashing: a deceptive practice of green marketing; the practice of companies falsely spinning their products and company policies as environmentally friendly when the primary objective is to save money, obscure environmentally-damaging practices and provide an advertising advantage.

Heat Island Effect: the heating of urban areas in comparison with rural areas due to a predominance of asphalt, concrete and waste heat.

LEED: Leadership in Energy and Environmental Design green-building rating system developed by the US Green Building Council (USGBC) that provides a suite of standards for environmentally sustainable construction.

Metric Tons (MT): also known as tonnes. Greenhouse gas regulations, emission factors, and reporting are done in units of metric tons as oppose to tons or "short tons." One metric ton equals 1.1023 tons or 2205 pounds.

Renewable energy: energy from sources that are not exhaustible such as wood, solid waste, geothermal, wind, and photovoltaic. Renewable fuel sources are defined on a state-by-state basis.

Sustainable development: development that meets the needs of the present without compromising the ability of future generations to meet their own needs

Sustainability: The traditional definition is meeting the needs of the present without compromising the ability of future generations to meet their own needs. The term was first used by the Brundtland Commission of the United Nations (www.un-documents.net/ocf-02.htm) in a document "Our Common Future, Chapter 2, Towards Sustainable Development" and expressed a truly global perspective on development. Sustainable development inherently requires meeting the basic needs of all and providing to all the opportunity to

satisfy their aspirations for a better life. Economic growth is required in places where essential needs are not being met provided growth meets the principles of sustainability. The use of non-renewable resources like fossil fuels and minerals should be calibrated to ensure that these resources do not run out before acceptable substitutes are found. Sustainable development means that the negative impacts on the quality of air, water and other natural systems are minimized in order to sustain the overall ecosystem's viability. The concept of sustainability also has come to be referred to as the "triple bottom line" (see definition below). The 1970 National Environmental Policy Act (NEPA) formally established sustainability as a national goal through the creation and maintenance of conditions through which society and nature can "exist in productive harmony, and fulfill the social, economic and other requirements of present and future generations of Americans" (www.epa.gov/sustainability/index.htm). Sustainability recognizes the need to support a growing economy while reducing the social and economic costs of economic growth. It reflects the trade-off between business and the environment and acknowledges the relationship between them. EPA has also developed a program called "People, Prosperity and the Planet (3P)" the title of which embodies the concept of sustainability.

Transit Modal Split: describes the percentage of travelers using a particular type of transportation such a walking, cycling, bus, private vehicle, etc.

Triple bottom line: The sustainability of any activity is influenced by the three inter-related and inter-dependent dimensions of the triple bottom line – economic growth, social responsibility and environmental stewardship. Although these include a vast array of diverse components, the "triple bottom line" sustainability framework is an organizing principle.

Vehicle miles traveled (VMT): one vehicle traveling the distance of one mile. Total vehicle miles are the total mileage traveled by vehicles within a designated area.

Water conservation: the reduction in the usage of water, increased efficiency in the use of water, and recycling of wastewater, thereby reducing water demand.

A.2 Acronyms

3P – People, Prosperity, and Planet

AC – Air conditioning

ASR – Aquifer Storage and Recovery

BAU – Business as Usual

C&D – Construction and Demolition

CA – Green Community Alliance

CACP – Clean Air Climate Protection

CAP – Climate Action Plan

CBECS – Commercial Building Energy Consumption Survey

CDM or CDM, Inc – Camp Dresser & McKee

CFC – Chlorofluorocarbon

CFL – Compact fluorescent lights

CH_4 - Methane

CO_2 – Carbon dioxide

CO_2e – Carbon dioxide equivalent

Compact – Southeast Florida Regional Climate Change Compact

CRA – Community Redevelopment Agency

CREB – Clean Renewable Energy Bond

CUP – Consumptive Use Permit

DEP – Florida Department of Environmental Protection

DOE – US Department of Energy

EECBG – Energy Efficiency and Conservation Block Grant

EMS – Energy Management System

EPA – US Environmental Protection Agency

ESCO – Energy Services Company

FEMP – Federal Energy Management Program

FPL – Florida Power and Light

GHG – Greenhouse gases

GHGE – Greenhouse gas emissions

GIS – Geographic Information System

GPCD – Gallons per capita day

GWP – Global warming potential

HB – House bill

HCFC - Hydrochlorofluorocarbons

HFC - Hydrofluorocarbons

HVAC – Heating Ventilation and Air Conditioning

ICLEI – Local Governments for Sustainability (International Council for Local Environmental Initiatives)

ICW – Intracoastal Waterway

IPCC – Intergovernmental Panel on Climate Change

kW – Kilowatts

kWh – Kilowatt hour

LDR – Land Development Regulations

LEED – Leadership in Energy and Environmental Design

MPG – Miles per gallon

MPO – Palm Beach County Metropolitan Planning Council

MT – Metric tons

$MTCO_2e$ – Metric tons of carbon dioxide equivalent

NEPA – National Environmental Policy Act

NCRRF – North County Resource Recovery Facility

NHTSA – National Highway Traffic Safety Administration

N_2O – Nitrous oxide (dinitrogen oxide)

PACE – Property Assessed Clean Energy

PC – Performance Contract

PIP – Private Investment Partnerships

PSC – Public Service Commission

PV – Photovoltaic

QECB – Qualified Energy Conservation Bond

R&R – Renewal and replacement

REC – Renewable Energy Credit

RFP – Request for Proposal

RGGI – Regional Greenhouse Gas Imitative

RO – Reverse Osmosis

RPS – Renewable Portfolio Standards

SCRWWTP – South Central Regional Wastewater Treatment Plant

SEER – Seasonal Energy Efficiency Ratio

SFRTA – South Florida Regional Transportation Authority (commonly known as Tri-Rail)

SFWMD – South Florida Water Management District

SWA – Solid Waste Authority

TCRPC – Treasure Coast Regional Planning Council

USGBC – US Green Building Council

VFD – Variable frequency drives

VMT – Vehicle Miles Traveled

Appendix B

Green Building Program

Appendix B
Green Building Program

Proposed Elements

1. ENERGY CONSERVATION, EFFICIENCY AND ATMOSPHERIC QUALITY – The purpose of this section will be to reduce energy consumption of building. It is recommended that this section provide options for compliance that are both prescriptive (defined direction) and performance based (verification that the intended outcome has been met). This will allow designers and contractors the greatest level of flexibility in determining the most cost efficient way to meet the intent of the program. Final certification of the overall Green House Gas Emissions (GHGE) reduction will be a requirement of compliance.

This section will encourage the use of renewable energy options as an effective way to reduce overall GHG emissions. It will require periodic monitoring and reporting of how effectively the systems are meeting the goal. It is recommended that the EnergyStar Portfolio software[1] be established as the standard for benchmarking and tracking.

The program will encompass several areas, including:

Total annual net energy use (TANEU): buildings of 25,000 square feet (sq ft) or greater will be required to document and verify energy usage annually, including CO2 emission reductions.

Building Energy Management and Control Systems (EMCS): for buildings of 25,000 sq ft for greater to assure peak efficiency in all operating modes.

Building Envelope Systems: to assure proper thermal envelope for greatest energy efficiency.

Building Electrical Power and Lighting Systems: to include energy efficient appliances and equipment (ENERGY STAR certified), occupancy and daylight sensors, as well as high efficiency lighting solutions that includes CFL, LED, T-8 and similar.

Building Renewable Energy Systems: will be encouraged to provide at least two percent or greater of the total estimated annual energy use of the building through the use of solar photovoltaic systems, wind energy systems, solar water heating equipment, geothermal heating/cooling systems, or other alternative renewable energy systems.

[1] The EnergyStar Portfolio Manager is free software provided by the US Environmental Protection Agency (EPA). See Section 6 of the full Climate Action Plan.

Elective Option: to utilize EcoArt, including application of the Art in Public Places fee toward EcoArt elements of the Building Energy systems.

2. WATER RESOURCES CONSERVATION AND EFFICIENCY – This section will establish the means of conserving water indoor and outdoor, and wastewater conveyance.

Fixtures, Fittings, Equipment, and Appliances: would be required to meet a maximum flow rate for reduced water consumption. A comparison of fixture flow rates under various water conservation programs is attached as **Table B-1** - Water Conserving Fixture Comparison. This table compares EPA Water Sense or Energy Star, Florida Water Star, the Florida Building Code and other standards for water conserving fixtures.

HVAC Systems and Equipment: would be prohibited from connection to potable water resources and condensate drainage would be encouraged for collection and discharge to irrigation or water features.

Non-potable Water Requirements: wherever feasible, systems utilizing non-potable water will be encouraged, including irrigation, ornamental water features, cooling towers, industrial processes, evaporative coolers, etc.

Rainwater Collection and Distribution Systems: through the use of rain barrels, cisterns or other storage tank devices, utilizing roof gutters, downspout, surface collection and other approved collection methods will be encouraged for use as irrigation.

Reclaimed Water systems: when available, access to the City's Reclaimed Water Systems would be encouraged for public, commercial and industrial uses.

Elective Option: to utilize EcoArt, including application of the Art in Public Places fee toward EcoArt elements of the building and site water systems.

3. EXISTING BUILDINGS - The provision of this section will control the alteration, repair, addition, maintenance, operation and change of occupancy of existing buildings and structures.

Additions: of a designated square footage would be required to meet or exceed the enhanced energy requirements of this code.

Alterations to Existing Buildings: would be required to meet the enhanced energy, HVAC and water conservation requirements.

Change of Occupancy: would trigger requirements to meet the enhanced energy, HVAC and water conservation requirements.

Historic Buildings: would need to be individually evaluated to determine where compliances do not conflict with the fundamental historic nature of the building.

Relocated Structures: would need to meet the requirements for enhanced energy, HVAC and water conservation.

Elective Option: to utilize EcoArt, including application of the Art in Public Places fee toward EcoArt elements of the existing building systems.

4. EXISITING BUILDING SITE DEVELOPENT

Additions, Alterations to Existing Building Sites and Changes in Occupancy: would need to meet the requirements for impervious surface, replacement or mitigation of hardscape, structures and vegetation, and parking/bicycle/pedestrian requirements.

Historic Building Sites: would be evaluated on and individual basis to assure that visible site improvements do not alter the configuration of the site in manner that is not in keeping with the building site's historic nature.

Elective Option: to utilize EcoArt, including application of the Art in Public Places fee toward EcoArt elements of site.

5. SITE DEVELOPMENT AND LAND USE – This section of the Green Building Program is intended to enhance existing Land Development Regulations for Site Development and Land Use, applying a more stringent development standard.

Preservation of Natural Resources: to include protected areas such as conservation lands, green fields, greenways, blueways, wetlands and floodplains.

Transportation Impact requirements: will assist the City in reducing the largest sector of GHGE in the community. Requirements would include incorporating pedestrian walkways, bicycle paths and mass transit connections as well as designating bicycle parking and storage, while limiting vehicle parking and encouraging designations for high occupancy vehicle parking and low emission hybrid and electric vehicles.

Heat Island Mitigation: to encourage greater use of solar reflective materials, shade trees, green roofs, open-grid pavers, and light color pervious paving materials

Site Lighting Levels: would be limited to control light pollution, preventing light trespass and glare, requiring high efficiency low wattage lighting controlled through an automated timing system.

Detailed Site Development Requirements: could include items such as subsurface irrigation, rainwater capture and distribution systems; soil reuse/restoration.

Elective Site Projects: could include preservation of natural resources areas, brownfield site incentives, transportation impact projects such as changing and shower facilities, upgraded covered bicycle parking or mass transit shelters; as well as light pollution reduction electives for alternative site lighting and EcoArt.

6. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY – Components of this section of the program will assist the City in meeting State mandated recycling and composting levels.

Material and Waste Management: not less than a specified percentage (40 percent) of non-hazardous construction waste will be diverted from the landfill, to be recycled or salvaged as construction material.

Material Selection: not less than a specified percentage of the total building materials used for the project, (based on mass or cost), should use recycled, bio-based or indigenous material.

Lamps: shall be low mercury content or LED.

Service Life: a building service life plan (BSLP) would be required with the construction documents. The design service life of the building shall be not less than 60 years. If the BSLP is less than 60 years, as in the case of temporary structure, a dismantling, de-mounting and re-use plan would need to be accepted by the Building Official.

Elective Option: to utilize/incorporate recovered/recycled material within an EcoArt project, including application of the Art in Public Places fee toward EcoArt elements.

7. COMMISSIONING, GREEN BUILDING CERTIFICATION will accommodate the opportunity to add State and nationally-recognized Green Certification opportunities, such as USGBC LEED, FGBC Green Building, ICC IGCC, Green Globes and other similar accredited or nationally recognized sustainability program.

Approved Agencies: will contain a listing, not limited to, those agencies listed above.

Commissioning: will define the required documentation submittals to quality for incentives.
Building Operations, Maintenance and Owner Education: would detail City specific requirements above and beyond those defined by the certifying agency.

8. GREENHOUSE GAS REDUCTIONS IN EXISTING BUILDINGS would be an optional section of the code requiring participants to track reductions in GHGE achieved through participation in the program. This would contribute to the City's overall tracking efforts.

9. SUSTAINABILITY MEASURES would be an optional section to outline sustainable development/construction methods eligible for incentives, not defined elsewhere in the program.

Table B-1 Water Conserving Fixture Comparison

WATER USING DEVICE	WaterSense® or ENERGY STAR®	Florida Water Star[SM]	Florida Building Code	Other Standards
Private Lavatory Faucets	**Maximum flow rate shall not exceed 1.5 gpm at 60 psi** http://www.epa.gov/WaterSense/partners/faucets_final.html	**Flow rates for all household faucets comply with current Florida Building Codes:** **• Lavatory faucets: 2.2 gpm** **http://www.sjrwmd.com/floridawaterstar/pdfs/Bronze_registration_form-points_list.pdf**	**2.2 gpm at 60 psi** http://ecodes.citation.com/cgi-exe/cpage.dll?sid=2010032313305767787&pg=x&rp=/nonindx/ST/fl/index.htm&CFID=956515&CFTOKEN=39643199	**FEMP requires 2.0 gpm or less at 60 psi for continuous flowrate** http://www1.eere.energy.gov/femp/technologies/eep_faucets.html **LEED 2009** **2.2 gpm at 60 psi** http://www.scienceinteractive.net/files/0906_PSD_LEED_v3_Fixtures_Process_Water.pdf
Public Lavatory Faucets		**All lavatory sink faucets have flow rates less than 1.6 gpm or WaterSense-labeled.** **All lavatory sink faucets have flow rates less than 1.0 gpm.**	**0.5 gpm at 60 psi** http://search.municode.com/html/10620/level3/PIII_C8_AIII.html **0.25 gallon per metering cycle** http://search.municode.com/html/10620/level3/PIII_C8_AIII.html	**LEED 2009** **0.5 gpm at 60 psi** http://www.scienceinteractive.net/files/0906_PSD_LEED_v3_Fixtures_Process_Water.pdf
Metering Lavatory Faucets, Standard			**0.25 gallon per metering cycle** http://search.municode.com/html/10620/level3/PIII_C8_AIII.html	**FEMP requires 0.25 gallons per cycle for metered/automatic faucets** **LEED 2009** **0.25 gallons per cycle** http://www.scienceinteractive.net/files/0906_PSD_LEED_v3_Fixtures_Process_Water.pdf

Table B-1 Water Conserving Fixture Comparison

WATER USING DEVICE	WaterSense® or ENERGY STAR®	Florida Water Star[SM]	Florida Building Code	Other Standards
Showerheads, Standard	**Maximum of 2.0 gpm** http://www.epa.gov/WaterSense/products/showerheads.html	**Flow rates for all residential showerheads comply with current Florida Building Codes:** **• 2.5 gpm** **Single public showerheads with flow rate less than 2.0 gpm, or WaterSense-labeled.** **Multiple showerheads in single shower stall used simultaneously act as negative points.**	**2.5 gpm at 80 psi** http://ecodes.citation.com/cgi-exe/cpage.dll?sid=2010032313305767787&pg=x&rp=/nonindx/ST/fl/index.htm&CFID=956515&CFTOKEN=39643199	
Pre-rinse Spray Valves, Standard	**1.6 gpm or lower** http://www.epa.gov/WaterSense/products/prsv.htm			**The Energy Policy Act of 2005 restricts pre-rinse spray valve sales in the United States to those with flow rates of 1.6 gpm or lower.** **In recent years, minimally researched, ultra-high-efficiency pre-rinse spray valve models have been introduced to the market with rated flow rates of 1.0 gpm or less.** http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/pre_rinse_spray_valves/PRSV_Study_Scope.pdf **LEED 2009** **1.6 gpm (no psi specified)** http://www.scienceinteractive.net/files/0906_PSD_LEED_v3_Fixtures_Process_Water.pdf

Table B-1 Water Conserving Fixture Comparison

WATER USING DEVICE	WaterSense® or ENERGY STAR®	Florida Water Star[SM]	Florida Building Code	Other Standards
Toilets, Standard	**The effective flush volume has been established as 1.28 gallons** http://www.epa.gov/WaterSense/docs/spec_het508.pdf	**Flow rates for all toilets comply with current Florida Building Codes:** **• 1.6 gallons per flush** **All toilets are high-efficiency, 1.28 gallons/flush, with a UNAR MaP rating above 350 grams per flush. WaterSenseSM-labeled toilets may comply.** **Dual-flush toilet (maximum 1.28 gallons/flush) with a UNAR MaP rating above 350 grams per flush. WaterSense-labeled toilets may comply.**		**LEED 2009** **1.6 gpf (3.5 gpf for blowouts)** http://www.scienceinteractive.net/files/0906_PSD_LEED_v3_Fixtures_Process_Water.pdf
Urinals, Standard	**WaterSense labeled flushing urinals use no more than 0.5 gpf and comply with existing standards for flushing urinals** http://www.epa.gov/WaterSense/products/urinals.html		**Waterless or 0.5 gallon per flushing cycle** http://search.municode.com/html/10620/level3/PIII_C8_AIII.html	**LEED 2009** **1.0 gpf** http://www.scienceinteractive.net/files/0906_PSD_LEED_v3_Fixtures_Process_Water.pdf
Residential clothes washer, Standard	**Starting 1/1/2011, Minimum Modified Energy Factor (MEF) of 2.0 and a maximum Water Factor (WF) of 6.0.** http://www.energystar.gov/index.cfm?c=clotheswash.pr_crit_clothes_washers	**Clothes washer has water factor of 6 gallons or less.**	**Water factor of 8 or lower (Energy Star/Water Sense Certified)[©]** http://search.municode.com/html/10620/level3/PIII_C8_AIII.html	**Federal Standard starting 1/1/2011** **MEF >= 1.26** **WF <= 9.5** http://www.energystar.gov/index.cfm?c=clotheswash.pr_crit_clothes_washers

Table B-1 Water Conserving Fixture Comparison

WATER USING DEVICE	WaterSense® or ENERGY STAR®	Florida Water Star[SM]	Florida Building Code	Other Standards
Commercial clothes washer(family size), Standard	**ENERGY STAR** **MEF: 1.80** **WF: 7.5** http://www.cee1.org/com/cwsh/comwash_specs.pdf			**Federal Standard** **MEF: 1.26** **WF: 9.5** **CEE hiefficient products** **MEF: 2.20** **WF: 4.5** http://www.cee1.org/com/cwsh/comwash_specs.pdf
Residential dish washer, Standard **(Standard Models)** **(Compact Models)**	**For Standard Models as of 1/1/2011: <= 307 kWh/year** **<= 5.0 gallons/cycle** **For Compact Models as of 1/1/2011** **<= 222 kWh/year** **<= 3.5 gallons/cycle** **Open Source link for current criteria levels** http://www.energystar.gov/index.cfm?c=dishwash.pr_crit_dishwashers	**Dishwasher uses less than 6.5 gallons per cycle (2010 ENERGY STAR® models qualify).** **A point-of-use or on-demand water heater supplies the dishwasher.**	**6.5 gallons per cycle or less (Energy Star/Water Sense Certified)[©]** http://search.municode.com/html/10620/level3/PIII_C8_AIII.html	**For Standard Models the Federal Standard as of 1/1/2010:** **<= 355 kWh/year** **<= 6.5 gallons/cycle** **For Compact models the federal standard as of 1/1/2010: <= 260 kWh/year** **<= 4.5 gallons/cycle** http://www.energystar.gov/index.cfm?c=dishwash.pr_crit_dishwashers

Appendix C

Recommendations for Revisions to the Code of Ordinances

Appendix C
Recommendations for Revisions to the Code of Ordinances

Implementation of the CAP is recommended on both a long-term and short-term implementation strategy. The Code of Ordinances and Land Development Regulations (collectively "Code") is the short-term mechanism for implementing the CAP. Appendix B of this CAP includes recommendations for a Green Building Ordinance to incorporate green building principles into the Land Development Regulations, but Appendix C contains potential Code revisions that implement non-building related and administrative recommendations of the CAP. By codifying the CAP's recommendations, the City can assure integration of the CAP concepts and principles into its day-to-day decision-making. Recommended areas for review and revision to the Code include the following:

Administration:

1. Revise Part 1, Chapter 2, Article I or II of the Code to include a description of the role, mission and purpose of the City's Sustainability Team. Revisions could include a description of the meeting structure and a process to recommend and evaluate policies and programs for City Commission consideration.

2. Potential revisions should be developed in Part II, Chapter 8 related to Economic Development to ensure coordination of the CAP recommendations with the Community Redevelopment Agency and business community. The goal would be to develop incentives for the location of green businesses within the City consistent with the CAP's recommendations.

3. City Advisory Boards, referenced in Part II, Chapter 12, should be coordinated to assure the City is maximizing public information and educational opportunities related to the CAP's awareness.

4. The City Advisory Boards should be briefed on the CAP recommendations and efforts by the City to integrate energy and water efficiency and/or renewable energy projects into City operations and facilities. Further, an energy efficiency section for operations and procurement could be added to the Code of Ordinances.

5. Review Part II, Chapter 2, Article V. of the Code regarding Code Compliance to determine if there are any opportunities to create incentives for the approval of, or retrofitting for, green building projects (such as use of the lien reduction procedure) as feasible and appropriate. Upon adoption of the Green Building Code, the Code Compliance Board should be briefed on the new provisions.

Operations:

1. Revise Part II, Chapter 2, Article IV to add the Environmentally Preferred Procurement recommendations developed by the City's Sustainability Team described under the "Actions to Administer the City's Climate Action Plan" Section of the CAP. There are several model ordinances establishing Environmentally Preferred Procurement policies that the Sustainability Team can review to develop its recommendations for any necessary Code revisions. The Sustainability Team should also make recommendations on language addressing energy efficiency operations and building management priorities to reduce energy costs. City fleet recommendations from the CAP should also be integrated into purchasing policies as well.

2. Part II, Chapter 10, Articles I-IV should be reviewed by the Sustainability Team to add recommendations from the CAP related to solid waste GHG reductions, composting, recycling and City operations for waste management. In particular, ensure maximum recycling by residential, multi-family and commercial sectors by adopting relevant targets in the City's Land Development Regulations. This section should also be reviewed for consistency with HB 7243 (2010 Session) amending Chapter 403, F.S. related to recycling.

3. The City should encourage Palm Beach County to improve traffic signalization and synchronization within the City to reduce vehicle idling time and reduce GHG emissions from its largest sector.

4. In Part II, Chapter 15, Article IX, the Sustainability Team should review this section to verify that Florida-Friendly landscaping and other CAP recommendations related to landscaping are encouraged and not inadvertently prohibited. This section should also be updated to reflect CAP recommendations related to landscape irrigation.

5. If the City pursues a "qualifying improvements" program pursuant to Section 163.08, F.S., Part II, Chapter 23 would then likely have to be revised with an enabling ordinance.

6. Part II, Chapter 26 related to Water, Sewer, and City Utilities should be reviewed by the Sustainability Team to integrate water conservation, water efficiency building standards, irrigation, energy efficiency and auditing recommendations from the CAP.

7. The appropriate Section of Part III, Land Development Regulations, should be updated to reflect new requirements of Chapter 255, F.S. which states that public buildings must be constructed according to a third party "green" building rating system such as the Florida Green Building Coalition.

Appendix D

City of Boynton Beach, Florida, Greenhouse Gas Emissions Inventory

CITY OF BOYNTON BEACH, FLORIDA

Greenhouse Gas Emissions Inventory

March 2010

CDM

Table of Contents

Executive Summary

CDM conducted a comprehensive greenhouse gas (GHG) inventory for the City of Boynton Beach, Florida (City) as part of the Department of Energy's (DOE) Energy Efficiency and Conservation Block Grant Program. The GHG inventory included sources from city operations and from the community of Boynton Beach in calendar year 2006.

CDM used the Clean Air Climate Protection Software from ICLEI: Local Governments for Sustainability which is compliant with the Local Governments Operations Protocol (LGOP). City operations data was collected with the help of City staff and community-wide data was collected directly from outside vendors such as Florida Power and Light (FPL), Florida Public Utilities (FPU), Boynton Beach Community Redevelopment Agency (CRA), Palm Tran, and Tri-Rail.

The total GHG emissions from city operations in 2006 is about 29,300 metric tons of carbon dioxide equivalent (CO_2e). Over half of the City's GHG emissions from city operations come from the water utilities sector, which includes electricity consumption and process emission from water and wastewater treatment. The overall community of Boynton Beach, including GHG emissions from residential, commercial, and industrial buildings, transportation, and solid waste disposal sources, emitted about 931,300 metric tons of CO_2e, not including emissions from city operations. With city operations included, the entire City emitted 960,600 metric tons of CO_2e. Overall, the largest source of emissions from the community-wide inventory is from vehicles traveling within the City. Residents of Boynton Beach emitted 14 metric tons of CO_2e per capita which is far fewer emissions on a per capita basis compared to others in Florida, and the US which emitted 19 and 24 metric tons of CO_2e respectively. The City may use this baseline to measure the progress of GHG reduction actions in the future.

In addition to creating a baseline GHG emissions inventory, three forecast scenarios were established based on the best information available to provide conservative, reasonable estimates for future emissions of city operations:

- Scenario 1: Business as Usual; based on population trends, adopted rules, legislation, and policy since 2006.
- Scenario 2: The U.S. Mayor's Climate Protection Agreement; which calls for cities to reduce their GHG emissions at least 7% from 1990 levels by 2012.
- Scenario 3: Pending and Non-binding Florida administrative rules and legislation; including the Governor's Executive Order 07-127, the proposed renewable portfolio standard, and the results of the City's employee transportation survey.

The gap between the forecasted Scenario 1 and Scenario 3 GHG emission levels illustrate what reductions the City may expect to be required to achieve should future

regulation be adopted. The difference between these two scenarios is 3% in 2012, 13% in 2025, and 18% in 2035.

The City may choose to achieve reductions in the electricity sector because lowering GHG emissions from electricity may have the best monetary payback. If the City choose to the achieve GHG reduction between Scenario 1 and Scenario 3 by reducing electricity use only, electricity would need to be reduced 3% by 2012, 17% by 2025, and 25% by 2035. If the City chose to make a 10% reduction in vehicle fuel use as well, electricity would then only need to be reduced 2% by 2012, 16% by 2025, and 23% by 2035.

Section 1
Introduction

CDM conducted a comprehensive greenhouse gas (GHG) inventory for the City of Boynton Beach, Florida (City) as part of the DOE's Energy Efficiency and Conservation Block Grant (EECBG) Program. The GHG inventory is for calendar year 2006 and included sources from both city operations and from the community of Boynton Beach. 2006 was chosen as a baseline year for the City because it was considered a normal, or more representative, year, with no major hurricanes or storms that would interrupt normal operations and skew emissions results. The community-wide inventory includes GHG emissions from within Boynton Beach city limits, such as from residential, commercial, and industrial buildings, public transportation, private vehicles, and solid waste disposal. **Table 1** outlines the full list of GHG sources included in the 2006 GHG inventory.

Table 1. Sources Included in the 2006 Boynton Beach GHG Inventory

City Operations	Community
Electricity	Electricity
Street Lighting	Natural Gas
Heating Fuel (Natural Gas, Propane)	Fuel Oil
Transportation Fuel (Diesel, Gasoline)	Transportation
Water Treatment	Public Transportation
Wastewater Treatment	Solid Waste disposal
Refrigerants	
Solid Waste disposal	
Employee Commuting	

The 2006 GHG inventory establishes a baseline to measure the energy use and GHG emissions from the City of Boynton Beach. This report outlines the major sources of GHG emissions from both city operations and the community of Boynton Beach, which may help inform decisions regarding future GHG reduction actions.

Section 2
2006 Baseline GHG Inventory Methodology

2.1 Protocols

The *Local Government Operations Protocol For Quantification and Reporting of Greenhouse Gas Inventories* (LGOP)[1] was created to provide a transparent and consistent structure for local governments to conduct GHG inventories. It advises on the typical sources of GHG emissions considering the structure of local governments, as opposed to corporations or industrial operations. The LGOP is published by The Climate Registry (TCR), a 501(c)(3) non-profit organization that was formed with the intent of improving the consistency and accuracy of GHG emissions reporting in North America. TCR is subscribed to by 41 U.S. states (including Florida), 11 Canadian provinces and six Mexican states, and currently provides the leading unifying GHG inventory guidance in North America. A partnership of TCR, the California Air Resources Board, the California Climate Action Registry, and ICLEI – Local Governments for Sustainability (ICLEI) developed the LGOP. CDM used the ICLEI Clean Air and Climate Protection (CACP) software to conduct the city operations 2006 GHG inventory. The most recent version of the CACP software is compliant with the LGOP.

The CACP software was also used for the community-wide 2006 GHG inventory; however there is not yet a nationally recognized protocol for conducting community-wide GHG inventories. This is important to keep in mind when comparing Boynton Beach's results to other communities (**see Section 3**). To conduct the community-wide GHG inventory, CDM followed the best practices, extensive experience, and recommendations from the LGOP to supplement the CACP software.

2.2 Greenhouse Gas Emissions and Sources

Figure 1 lists the six GHGs regulated under the Kyoto Protocol which are widely accepted as the main causes of climate change, along with example emissions sources. These GHGs are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). As shown in Figure 1, the primary sources of GHG emissions are the combustion of fossil fuels which release CO_2, CH_4, and N_2O; releases of CH_4 and N_2O from biological processes; releases of HFCs, PFCs from refrigeration and fire suppression equipment; and releases of SF_6 from high-voltage electrical equipment typically owned by utilities. GHG emissions from the City are primarily CO_2, but also include CH_4, N_2O, and a small amount of HFCs.

[1] California Air Resources Board, California Climate Action Registry, ICLEI-Local Governments for Sustainability, & The Climate Registry. *Local Government Operations Protocol*. The Climate Registry, September 2008.

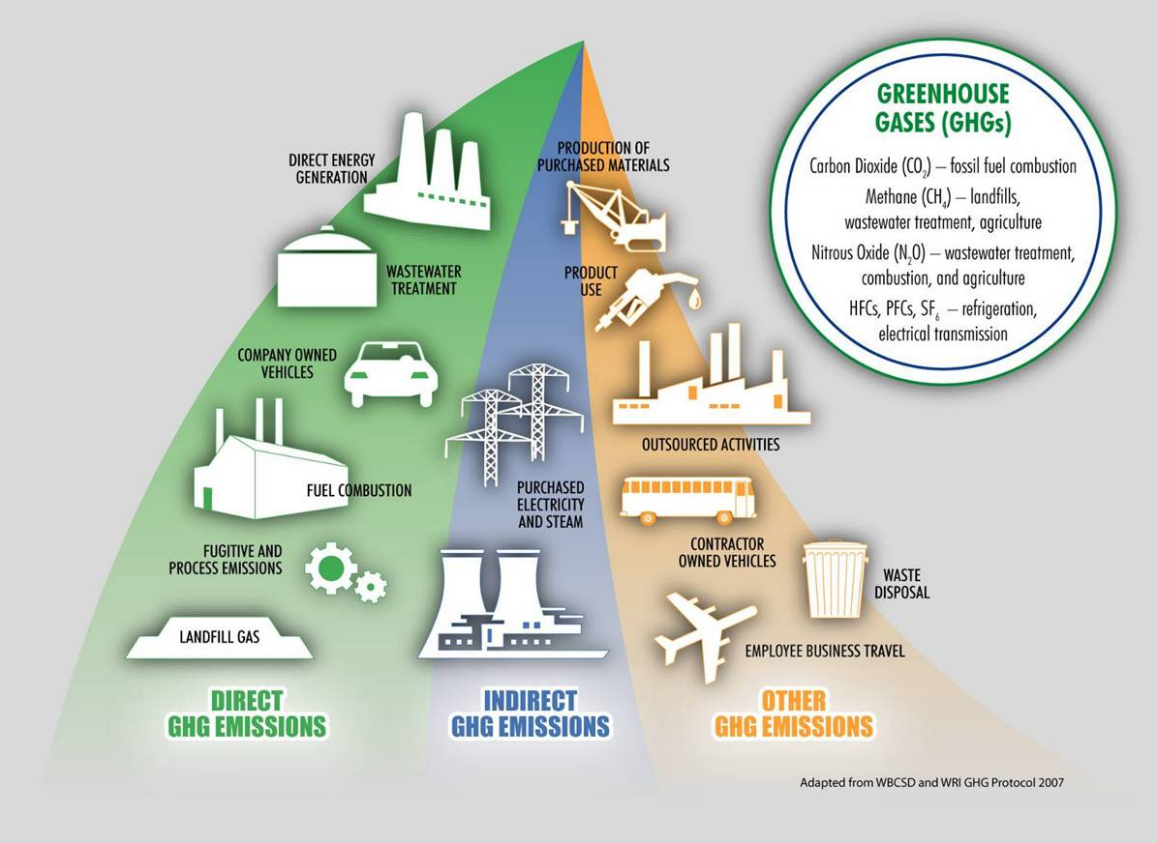


Figure 1. Direct and Indirect Emissions Sources

2.3 Data Collection

The basis of any GHG inventory is the activity data which is used to calculate GHG emissions. The LGOP provides emission factors which are applied to activity data in the CACP software to calculate the resulting GHG emissions. With the help of Boynton Beach staff, Florida Power and Light (FPL), Florida Public Utilities (FPU), Boynton Beach Community Redevelopment Agency (CRA), Palm Tran, Tri-Rail, and Florida Department of Transportation (DOT), CDM gathered the following annual and/or monthly activity data to conduct the 2006 GHG inventory.

2.3.1 City Operations Emission Sources

- Electricity purchased for City facilities, including buildings, street and traffic lights, water and wastewater treatment facilities;
- Natural gas and propane used for heating City facilities;
- Gasoline and diesel fuel use in City-owned vehicles and mobile equipment;

- Fugitive refrigerant releases from sources such as ice machines and refrigeration equipment;
- Fugitive N_2O emissions from wastewater treatment processes and effluent discharge;
- Solid waste emissions from the decomposition and combustion of municipal solid waste (MSW); and
- Fuel combustion from City employee commuting.

2.3.2 Community-wide Emission Sources

- Electricity purchased in the residential, commercial, and industrial sectors;
- Natural gas purchased in the residential, commercial, and industrial sectors;
- Estimated fuel oil consumption by the residential, commercial, and industrial sectors based on statewide data;
- Modeled vehicle miles traveled within City limits for all private vehicles;
- Public transportation within City limits from the Boynton Beach Trolley, Palm Tran and Tri-Rail; and
- Solid waste emissions from decomposition and combustion of MSW.

2.4 Data Assumptions and Calculations

In some cases, the data provided for the GHG inventory was for calendar years other than 2006 or was not specific to Boynton Beach but instead Palm Beach County or the state of Florida. In these cases, CDM made assumptions and/or calculations based on best practices and experience with other municipal GHG inventories. The data sectors which were modified are discussed further below with an explanation of how CDM calculated 2006 data.

2.4.1 City Operations

2.4.1.1 Water and Wastewater Treatment

The City of Boynton Beach provides over 100,000 people with potable water service. The incorporated population for Boynton Beach was 67,644 in 2006 while the remaining 30,000 or so people being served by the City water utilities live just beyond the City limits. Because the City solely owns and operates all the water treatment plants and facilities, all GHG emissions from electricity associated with water treatment are included in the city operations total.

The South Central Regional Wastewater Treatment Plant (SCRWWTP) is co-owned by Boynton Beach and Delray Beach, Florida. SCRWWTP serves approximately 200,000 people between the incorporated and unincorporated populations of Boynton Beach and Delray Beach. SCRWWTP tracks annual flow rates from the incorporated and unincorporated areas of both cities. Approximately 57% of SCRWWTP serves incorporated and unincorporated areas of Boynton Beach, therefore, 57% of the process and electricity use GHG emissions from SCRWWTP are attributable to the City.

2.4.1.2 Employee Commuting

The home addresses of 549 Boynton Beach employees were provided by the City. The distance from each unique zip code to Boynton Beach was estimated using Google Maps and geographic information systems (GIS) were used by Florida Atlantic University (FAU) student interns to calculate the actual distance for Boynton Beach employees who are also residents. The average one way commute of Boynton Beach employees was just over 8.5 miles. An additional 362 employees are covered by Chapter 119, F.S., Florida's Public Records law, and home addresses were not available; the average commute for other employees was used to determine the number of miles employees covered by Chapter 119 drove to work. To determine the total number of miles driven by employees annually, the one way mileage was doubled to account for round trips and multiplied by 235 working days per year. 235 working days per year assumes a five day work week, ten holidays, five sick days, and ten vacation days in 2006. These addresses were of employees as of September 2009, however it was assumed that the overall number of employees and distance traveled to work would not change from 2006 to 2009.

2.4.2 Community-wide

2.4.2.1 Fuel Oil

Fuel oil consumption within the City is not readily available through vendor information. To estimate fuel oil consumption, CDM used fuel oil consumption and sales data for the state of Florida, available from the U.S. Energy Information Administration (EIA) [2]. The EIA breaks fuel oil consumption data down into fuel oil type and sector consumption as shown in **Table 2**. Each sector consumption value was then scaled back based on the population of Boynton Beach as compared with the population of the state of Florida. While fuel oil consumption in the state of Florida is less than in other states due to climate, it is important to include for a complete GHG inventory.

[2] U.S. Energy Information Administration. *Petroleum Summary Data & Analysis: Distillate and Residual Fuel Oil by End Use.*< http://tonto.eia.doe.gov/dnav/pet/pet_sum_top.asp>

Table 2. Availability of Fuel Oil Sales and Consumption Sectors

Sector	Distillate Fuel Oil (#1, 2, 4)	Residual Fuel Oil (#5, 6)
Residential	available	not used
Commercial	available	available
Industrial	available	available

2.4.2.2 Palm Tran

Palm Tran is a public bus system that operates 35 bus routes in Palm Beach County. Palm Tran provided all diesel and gasoline consumption in 2006 from their buses, cars, and trucks. This fuel consumption needed to be scaled down to estimate the amount of fuel used within the borders of Boynton Beach. CDM determined that of the 35 bus routes there were 218 major stops listed on the Palm Tran schedules. Thirteen of those stops were within Boynton Beach on six different bus lines, meaning that nearly 6% of major Palm Tran stops were in Boynton Beach. In order to attribute some of Palm Tran's emissions to Boynton Beach, CDM estimated that 6% of the total fuel consumption provided by Palm Tran was combusted within Boynton Beach.

2.4.2.3 Tri-Rail

Tri-Rail is a commuter train that runs from Miami International Airport to Mangonia Park Station in West Palm Beach with a total of 22 stops and one stop in Boynton Beach. The CDM Team was able to provide Tri-Rail diesel fuel and B20 biodiesel usage for 2009. There was a significant jump in Tri-Rail ridership between 2006 and 2009. Rather than use 2009 activity data, which may skew GHG emission results, CDM estimated 2006 fuel usage based on the difference in Tri-Rail ridership between 2006 and 2009. The total estimated 2006 diesel and B20 fuel was divided by the total number of stops to determine the share of fuel attributable to Boynton Beach.

The CACP software allows for the input of B100 biodiesel, but not B20. B20 biodiesel is a mix that consists of 20% B100 and 80% conventional diesel fuel. CDM input 20% of the total B20 usage as B100 and 80% of the total B20 as diesel fuel in the CACP software.

2.4.2.4 Boynton Beach Trolley

The Boynton Beach Trolley began operation in 2005 and provides local transportation to major points in the City. Two trolleys operate five days a week; each trolley is driven on a 12 mile round trip loop 7.5 times per day. This results in a total of 46,800 miles annually. The CRA determined that the trolley has a fuel economy of about seven miles per gallon. This results in approximately 6,686 gallons of gasoline fuel

consumed annually. CDM entered this fuel total into the CACP software to calculate GHG emissions.

2.4.2.5 Community Vehicle Miles Traveled

Annual vehicle miles traveled (VMT) within the City of Boynton Beach for 2008 were compiled by the DOT. Isolated Boynton Beach VMT was not available for 2006; however DOT provided a ratio of VMT change for Palm Beach County from 2006 to 2008. DOT recommended applying this same ratio to the 2008 VMT for Boynton Beach to estimate 2006 VMT.

2.5 Community-wide Double Counting Avoidance

Some city operations data overlaps community-wide data since it is provided as an aggregate for the entire city. The city operations data is often more detailed and complete which allows the City to pinpoint emission sources; for this reason city operations data was subtracted from the community-wide totals to avoid double counting, rather than the other way around. In addition, community-wide VMT takes into account several other on-road vehicle categories. For the City of Boynton Beach, the following totals were adjusted before being entered into the CACP software:

2.5.1 Electricity

FPL provided electricity consumption within City limits separated into several categories. CDM clarified that all electricity usage from the "Other Sales to Public Authority" was from city operations and part of the "Public Street & Highway Lighting" was from city operations – the rest was from lights owned by the state of Florida. The remaining double counted electricity usage from city operations was in the "commercial" category. To avoid double counting, CDM subtracted the city operations totals from the categories list above to determine an accurate community-wide total electricity usage total.

2.5.2 Natural Gas

FPU provided natural gas consumption within City limits separated into multiple commercial categories. The "commercial" category referenced in this report includes "Large Volume (Commercial/Industrial)", "General Service Commercial", and Commercial generator only" categories as defined by FPU. In addition, the commercial category includes the "Public Authority (govt housing/buildings)" category, which includes city operations natural gas as well as Palm Beach county schools in Boynton Beach. CDM subtracted all city operations usage from the "commercial" category.

2.5.3 Vehicle Miles Traveled

The city vehicle fleet, employee commuting, the Boynton Beach Trolley and Palm Tran fuel usage was all double counted in the community VMT data provided by DOT since these vehicles are included in DOT's modeling estimates. The total GHG emissions in this category in the CACP software still contains emissions from the city vehicle fleet, employee commuting, the Boynton Beach Trolley and Palm Tran because the data was provided in different units and could not be separated until GHG emissions were calculated. CDM subtracted these double counted categories separately when calculating GHG emission totals for this report.

2.6 Greenhouse Gas Emissions Calculations

2.6.1 CACP Software

The activity data was in most cases input directly into the CACP software. The CACP software then uses emissions factors from the LGOP to calculate the resulting GHG emissions. Each GHG has a global warming potential (GWP) which represents the ability of each GHG to trap heat in the atmosphere and is the ratio of the heat trapping ability normalized to that for CO_2 (i.e., CO_2 has a GWP of 1). GWP are applied to the raw GHG emissions in the CACP software to report emissions in terms of carbon dioxide equivalents (CO_2e). GWP values from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report[3] were used, as shown in **Table 3** below. Although these are not the most up-to-date GWP values available according to the latest IPCC reports, they are currently used by the CACP software, the LGOP and other accounting protocols.

Table 3. Applicable Global Warming Potential

GHG Pollutant	GWP Values
CO_2	1
CH_4	21
N_2O	310
HFC-134A	1300
R402B	1064
R404A	3260

[3] Intergovernmental Panel on Climate Change. *IPCC Second Assessment Report: Climate Change*. 1995.

2.6.2 Electricity

The emission factors for grid-based electricity in the LGOP are based on the U.S. Environmental Protection Agency's (EPA) Emissions & Generation Resource Integrated Database (eGRID). eGRID is a compilation of electricity emission factors developed from the annual, actual emissions data from electricity generation nationwide. This data is aggregated by electric grid-region, creating regionally based electricity emission factors. All electricity used in Boynton Beach (both for city operations and community-wide) is from the Florida Reliability Coordinating Council (FRCC) eGRID region as shown in **Figure 2**.

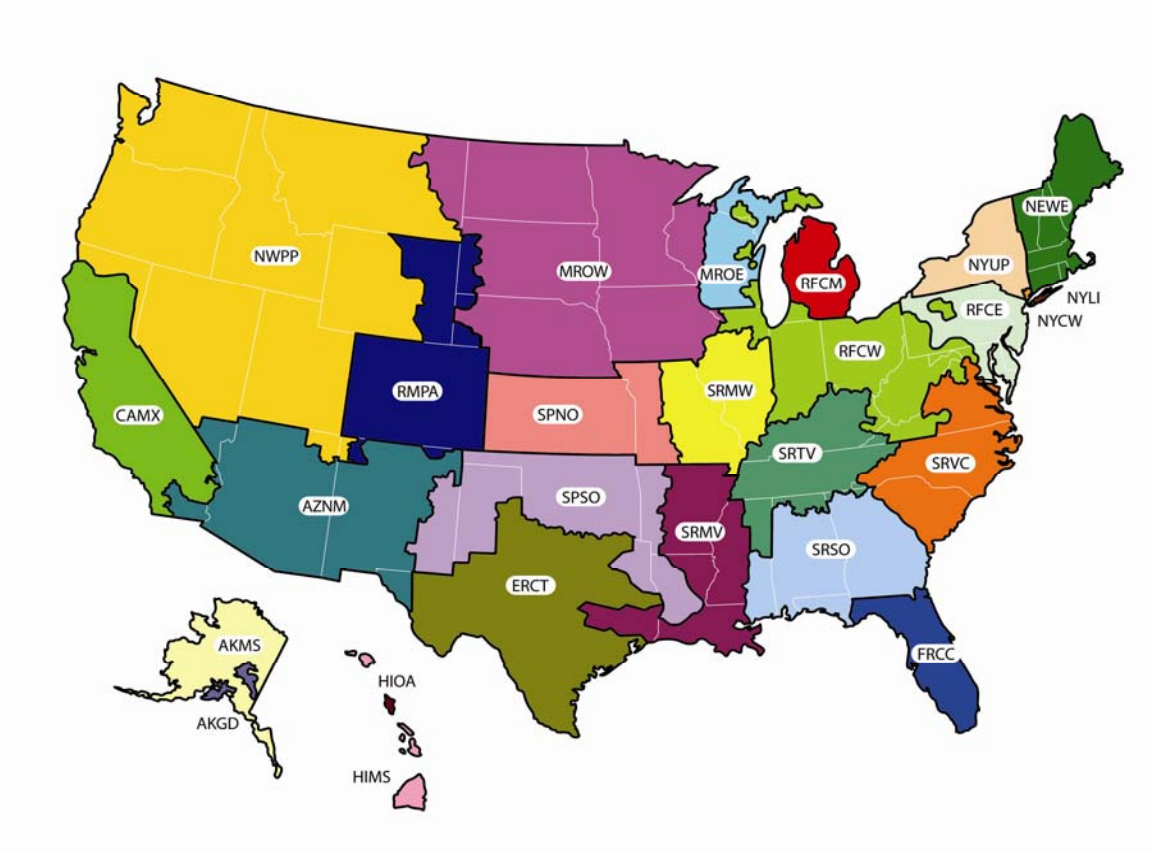


Figure 2. eGRID Subregions

2.6.3 Manual Calculations

Some GHG emissions calculations were best performed outside of the CACP software, due to the availability of more precise techniques. These calculations included wastewater treatment plant operations, residual fuel oil, and solid waste. Once the calculations were made, the GHG emissions were input directly into the CACP software. The process and methodology for calculating GHG emissions from each of these sources is described below:

2.6.3.1 Wastewater Treatment

As mentioned in section 2.4.1.1, SCRWWTP is co-owned by Boynton Beach and Delray Beach, Florida and serves approximately 200,000 people between the incorporated and unincorporated populations of Boynton Beach and Delray Beach. N_2O emissions from treatment processes were calculated based on the total population that is served by the plant and the emission factors from the LGOP for a wastewater treatment plant without nitrification[4]. Nitrous oxide emissions from effluent discharge were calculated using the measured average of total nitrogen discharged at SCRWWTP and the effluent emission factor provided by the LGOP[5]. Since the emissions from SCRWWTP are jointly those of Boynton Beach and Delray Beach, CDM took the ratio of the annual flow rates from both cities, and applied them to total GHG emissions to calculate GHG emissions from wastewater treatment for Boynton Beach. The N_2O emissions from treatment without nitrification and effluent discharge Boynton Beach were added and input into the CACP software.

2.6.3.2 Residual Fuel Oil

The CACP software automatically calculates GHG emissions from distillate fuel oil but not from residual fuel oil. According to the EIA, residual fuel oil was only used by commercial and industrial facilities. CDM applied the appropriate emission factors from the LGOP[6] to calculate GHG emissions from residual fuel oil and input the total kilograms of each GHG into the CACP software.

2.6.3.3 Solid Waste

All municipal solid waste (MSW) generated within the City is disposed of at the Solid Waste Authority (SWA)'s North County Resource Recovery Facility (NCRRF) in West Palm Beach, Florida. The NCRRF consists of both a landfill with a landfill gas recovery system and a waste-to-energy facility. As such, the GHG emissions from the NCRRF include fugitive and combusted CH_4 emissions from the landfill and CO_2, CH_4 and N_2O emissions from the combustion of MSW at the waste to energy facility.

The GHG emissions from the landfill were calculated based on the landfill gas flow rate using the equations and methods provided in the LGOP[7]. For the waste to energy facility, CDM used emission factors for CO_2, CH_4 and N_2O generated per ton of MSW combusted from the EPA Mandatory Greenhouse Gas Reporting Rule[8].

[4] LGOP, Chapter 10, Equation 10.8.
[5] LGOP, Chapter 10, Equation 10.9.
[6] LGOP, Tables G.1and G.3.
[7] LGOP, Chapter 9.
[8] U.S. Environmental Protection Agency. *Mandatory Reporting of Greenhouse Gases; Final Rule*. 40 C.F.R. Parts 86, 87, 89 et al. Table C-1 and C-2. October, 2009

To determine the GHG emissions from NCRRF attributable from MSW generated by Boynton Beach city operations, a ratio based on the annual 2006 MSW accepted by NCRRF to the annual 2006 MSW generation from city operations was applied to the total GHG emissions. The same method was used for annual 2006 MSW generation community-wide. City staff provided MSW generation from city operations and community-wide. CDM was able to provide information specific to NCRRF. GHG emissions were input directly into the CACP software. The calculation below details this method and is applicable for both city operations and community-wide solid waste calculations:

$$A \div B = C$$

$$C \times D = E$$

Where:

A = Total MSW generated by Boynton Beach (either city operations or community-wide)

B = Total MSW accepted at NCRRF

C= Percentage of MSW accepted at NCRRF that was generated by Boynton Beach (either city operations or community-wide)

D = Total GHG emissions from MSW at NCRRF

E = Total GHG emissions at NCRRF from MSW generated by Boynton Beach (either city operations or community-wide)

2.7 Operational Boundaries

The LGOP separates city operations GHG emissions into three categories, referred to as "operational boundaries" which allows for more effective GHG management and serves to minimize the potential double counting of emissions (see **Figure 1**). The categories, also called Scopes, include:

- Direct / Scope 1 Emissions associated with fuel combustion by stationary and mobile combustion sources, and fugitive emissions from refrigerant equipment directly owned and operated by the City;
- Indirect / Scope 2 Emissions from purchased electricity or steam generated by utilities or service providers for city-operations; and
- Optional / Scope 3 Other indirect emissions, such as those from employee commuting and solid waste. All emissions from the community-wide GHG

inventory are considered Optional / Scope 3 emissions because the City of Boynton Beach does not have direct control over these sources.

GHG emissions from city operations are split into operational boundaries in Section 3 (see **Table 6, Figure 6**) to assist the City in determining which emission sources the City has the most direct control over reducing.

Section 3
2006 Baseline GHG Inventory Results

3.1 City Operations Results

The City of Boynton Beach's total GHG emissions from city operations is broken out by sector and by source below. GHG emission sectors refer to local government sectors such as buildings and facilities or streetlighting. Categorizing GHG emissions in terms of sectors can make it easier to communicate GHG emissions to the public or internally for policy decision makers. GHG emission sources refer to the actual source of emissions, such as electricity or natural gas combustion.

3.1.1 Results By Sector

The City of Boynton Beach's total GHG emissions from city operations in 2006 is about 29,300 metric tons of CO_2e. **Figure 3** shows this breakdown by detailed sector. Over half of Boynton Beach's GHG emissions from city operations come from the water utilities sector, which includes electricity consumption and process emissions from water and wastewater treatment, which is a typical breakdown for U.S. cities.

Figure 3. 2006 City Operations GHG Emissions by Sector

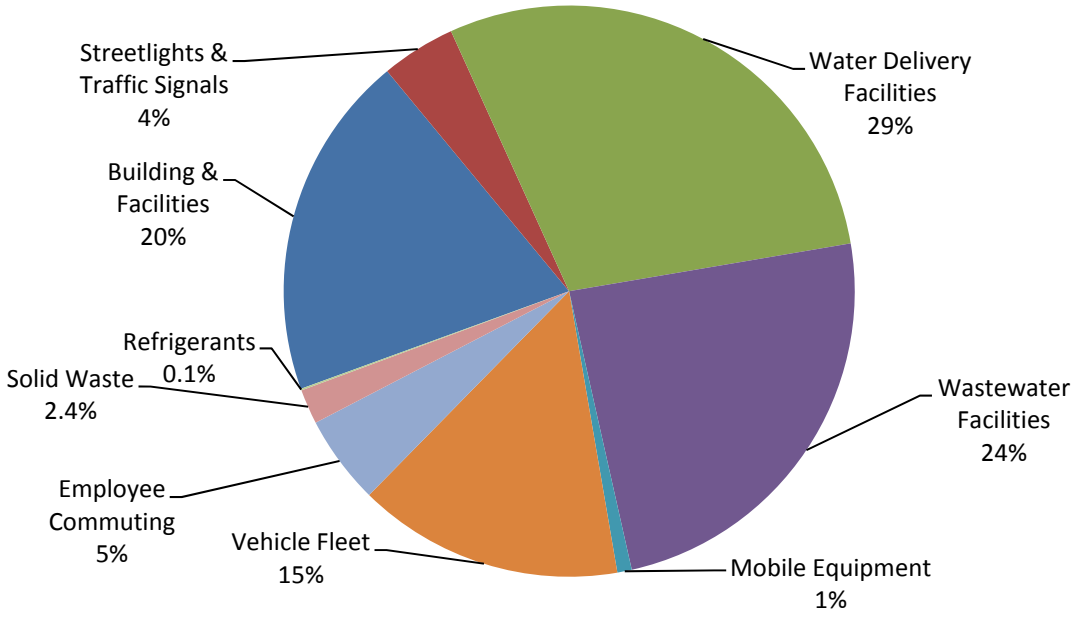
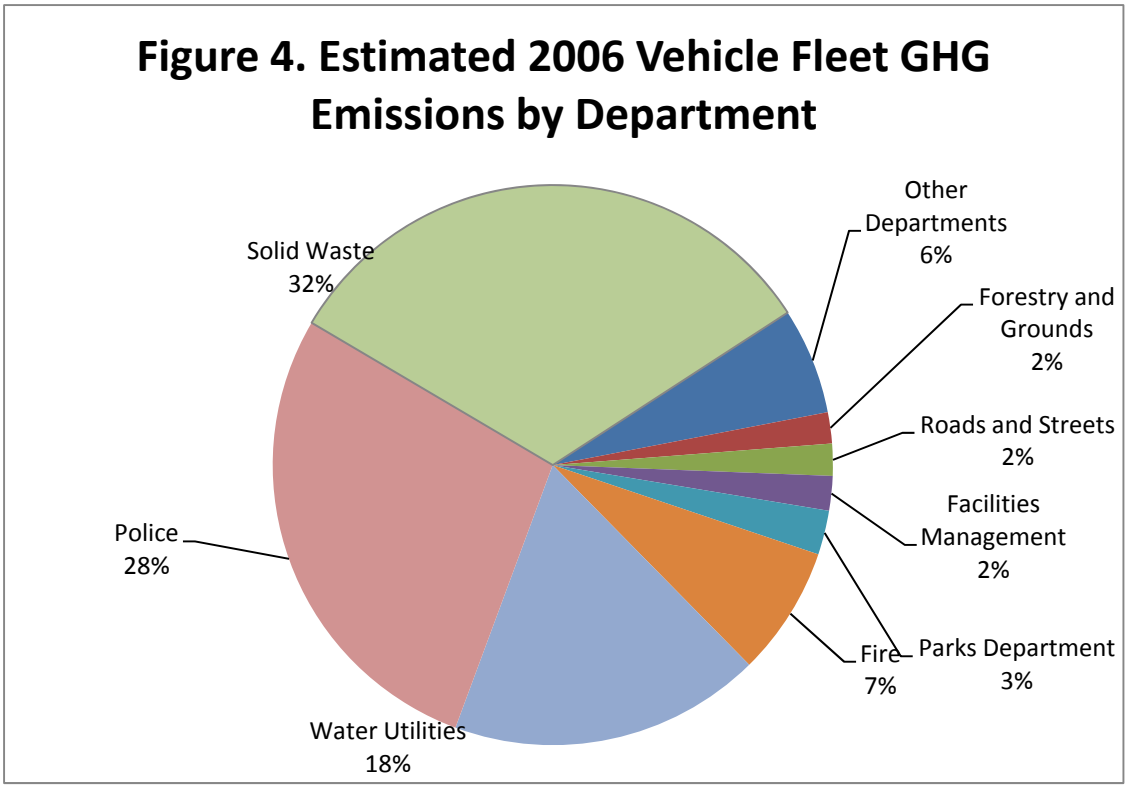


Figure 4 shows the 15% of GHG emissions from the City's vehicle fleet broken out by department, based on recent fuel sales. 85% of GHG emissions from the vehicle fleet are from the solid waste, police, water utilities and fire departments. The other category, consisting of 6% of vehicle fleet emissions is made up of 14 departments all of which emit 60 metric tons of CO_2e or fewer from the operation of their vehicles.



3.1.2 Results By Source

Overall, the largest source of emissions is from electricity use in buildings, facilities (including water delivery and wastewater facilities), streetlights and traffic lights, which common in U.S. cities. Electricity makes up over 75% of the total city operations GHG inventory with over 22,000 metric tons of CO_2e as shown in **Figure 5**.

Boynton Beach's city operations GHG profile is typical of other Florida cities including North Miami, Florida[9] and Clearwater, Florida[10] as shown in **Table 4**. GHG emissions from electricity typically make up the majority of GHG emissions for municipailities, despite being indirect emission sources that the City does not have direct control of reducing at the power plant level.

[9] City of North Miami, *Greenhouse Gas Emissions Inventory*. Prepared by CDM. August 2008.
[10] City of Clearwater, *Greenhouse Gas Inventory Report (2000 and 2007): City of Clearwater Government Operations*. Prepared by Sandra Kling, University of South Florida. June 2008.

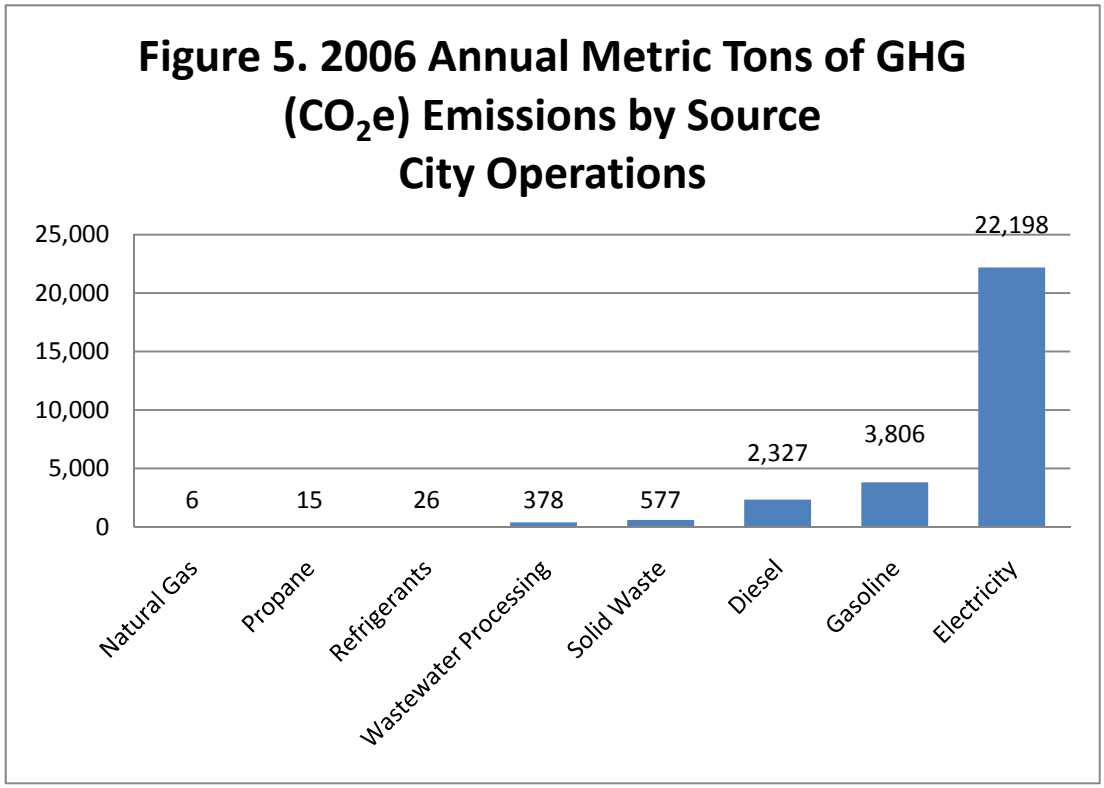


Table 4. Comparison of Municipal Emissions in other US Cities

Source	Boynton Beach, FL (2006)	N. Miami, FL (2006)	Clearwater, FL (2007)
Population[11]	67,644	57,670	108,787
Electricity	75.7%	80.0%	77.6%
Heating Fuel	0.1%	1.0%	1.7%
Wastewater Processing	1.3%	0.0%	0.0%
Vehicle Fleet and equipment	15.9%	19%	19.3%
Solid Waste	2.0%	0.0%	1.4%
Refrigerants	0.1%	0.0%	0.0%
Employee Commuting	5.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%

[11] As stated in Sections 2.4.1.1 and 2.6.3.1, the water and wastewater utilities serve unincorporated populations not included in these population totals. The city operations total accounts for the total emissions from water utilities because the city owns and operates the facilities, regardless of service area. For the purposes of this discussion, using the incorporated population only for per capita metrics accurate.

3.1.3 Analysis of Results

Table 5 highlights sources that individually contribute a significant portion of total GHG emissions for city operations. These eight large emission sources may be an appropriate starting point for considering how to spend other EECBG funding as they may represent the greatest potential for GHG and energy savings.

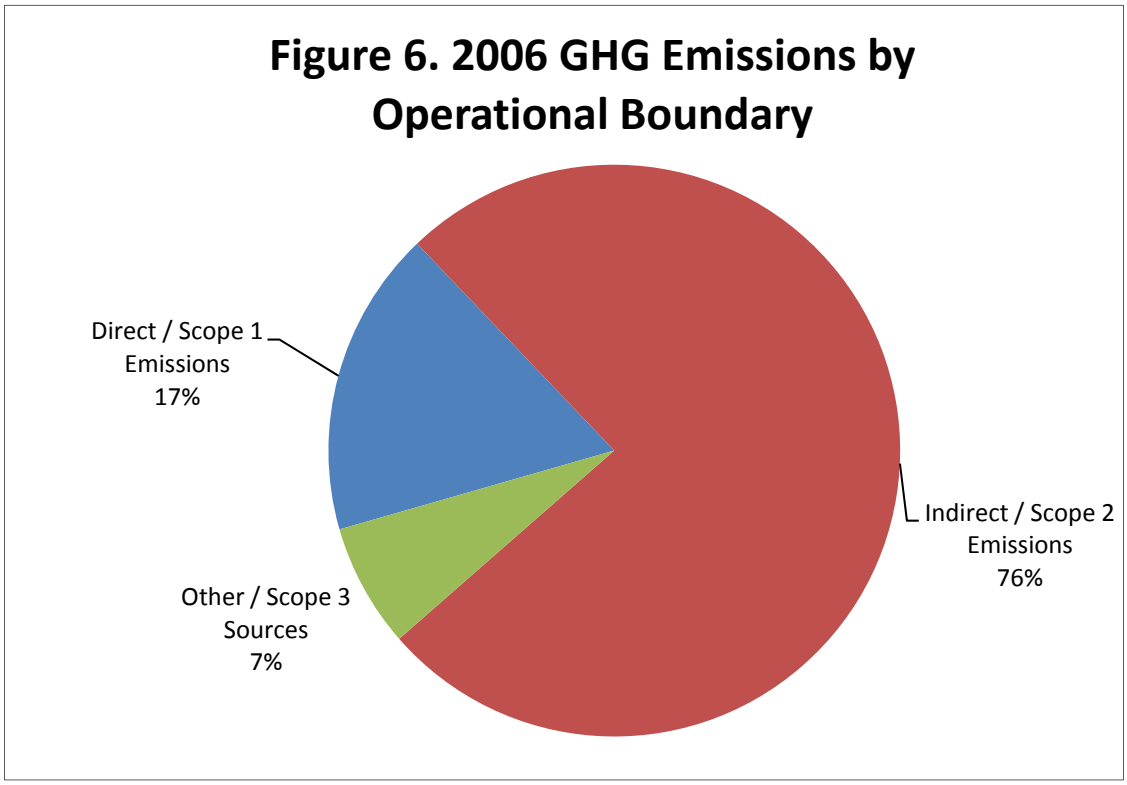
Table 5. Large Individual Sources of City Operations GHG Emissions

Highlighted Sources	Metric Tons CO_2e	Percent of Total
South Central Regional Wastewater Treatment Plant, 1801 North Congress Avenue	5,258	17.9%
Membrane Softening Water Treatment Plant, 5469 West Boynton Beach Boulevard	4,990	17.0%
Vehicle Fleet	4,416	15.1%
City Hall, 100 East Boynton Beach Boulevard	2,315	7.9%
Wastewater Pumping Stations	1,829	6.2%
Lime Softening Water Treatment Plant, 124 East Woolbright Road	1,536	5.2%
Employee Commuting	1,476	5.0%
Streetlights & Traffic Signals	1,237	4.2%
Hester Center, 1901 North Seacrest Boulevard	512	1.7%
Total	**23,569**	**80.3%**

When considering GHG emissions from city operations, it is also important to analyze emissions by the operational boundaries to determine where the City has the most direct control over reducing GHG emissions, as discussed in Section 2. Evaluating emissions in this way also assists the City to assess their GHG emissions in the context of emerging and existing GHG reporting and regulations as discussed below. **Table 6** and **Figure 6** shows that the City has direct control and regulatory responsibility over only 17% of total GHG emissions. The City also has indirect control over about 76% of the total GHG emissions that are from electricity consumption; the City may manage the electricity consumed, however the physical GHG emissions from electricity consumption occur at power plants generating electricity. This means that the power plant operators have regulatory responsibility for these emissions, not the City.

Table 6. 2006 GHG Emissions by Operational Boundary

Source	Metric Tons CO_2e
Natural Gas	6
Propane	15
Refrigerants	26
Mobile Equipment	241
Wastewater Processing	378
Vehicle Fleet	4416
Direct / Scope 1 Emissions	**17.3%**
Electricity	22,198
Indirect / Scope 2 Emissions	**75.7%**
Employee Commuting	1,476
Solid Waste	577
Other / Scope 3 Sources	**7.0%**



In October 2009, in response to the Consolidated Appropriations Act,[12] the EPA published mandatory GHG reporting requirements (MRR)[13] under its existing authority under the federal Clean Air Act[14]. Multiple Direct/Scope 1 sources such as stationary combustion will be required to report GHG emissions to the EPA if they trigger certain thresholds for reporting. Under the MRR, most direct (Scope 1) combustion emissions sources greater than 25,000 metric tons of CO_2e annually will be required to report GHG emissions on an annual basis beginning in 2011.

In addition to the finalized MRR, U.S. Congress may pass additional legislation that could potentially reduce this reporting threshold to 10,000 metric tons CO_2e. The House of Representatives passed the American Clean Energy and Security Act[15] in June 2009; the Senate is currently debating the Clean Energy Jobs and American Power Act[16] which is similar legislation that establishes the same reporting threshold. Finally, the Carbon Limits and Energy for America's Renewal (CLEAR) Act[17] was introduced in December 2009 proposing greenhouse gas emissions reduction standards which will require some level of accounting and reporting

It has been determined through this GHG inventory, the City of Boynton Beach does not have any sources that would trigger mandatory reporting to the EPA or the current legislation in Congress at this time. The State of Florida has established mandatory GHG reporting for electricity generation sources[18], but it is uncertain how this requirement may be implemented pending resolution of the State's approach on cap and trade legislation. While this does not impact the City of Boynton Beach at this time, other states have established economy-wide GHG emissions reporting requirements with much lower thresholds. CDM recommends that the City should continue to track GHG emissions as well as federal and state reporting requirements to ensure they remain in compliance with all GHG reporting requirements as they evolve at the state and federal levels.

3.2 Community-wide Results

The City of Boynton Beach's total community-wide GHG emissions from city operations is broken out by source and by sector below. GHG emission sources refer to the actual source of emissions, such as electricity or natural gas combustion, just as in the city operations GHG inventory. GHG emission sectors refer community area such as residential or commercial.

[12] H.R. 2764; Public Law 110–161.
[13] U.S. Environmental Protection Agency. *Mandatory Reporting of Greenhouse Gases; Final Rule*. 40 C.F.R. Parts 86, 87, 89 et al.
[14] Sections 114 and 208 of 42 U.S.C. §§ 7414 & 7542
[15] H.R. 2454, 111th Cong. (2009).
[16] S. 1733, 111th Cong. (2009).
[17] S.2877, 111th Cong. (2009).
[18] Section 403.44, F.S.

3.2.1 Results By Source

The City of Boynton Beach's total GHG emissions from the community in 2006 is about 931,300 metric tons of CO_2e, not including emissions from city operations. This includes GHG emissions from electricity, natural gas, and fuel oil used in residential, commercial, and industrial buildings, private vehicles traveling within city limits, public transportation and solid waste disposal. Overall, the largest source of emissions is transportation as shown in **Figure 7** and **Table 7**. The next largest source of GHG emissions is electricity used in residential, commercial, and industrial buildings.

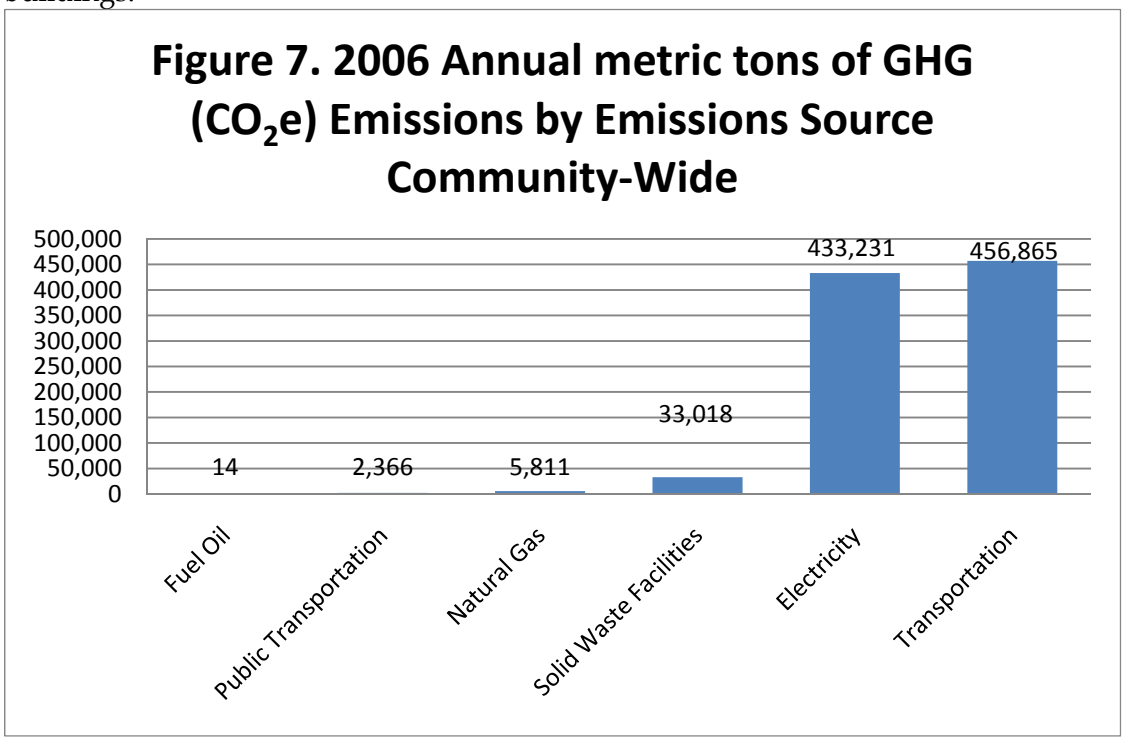


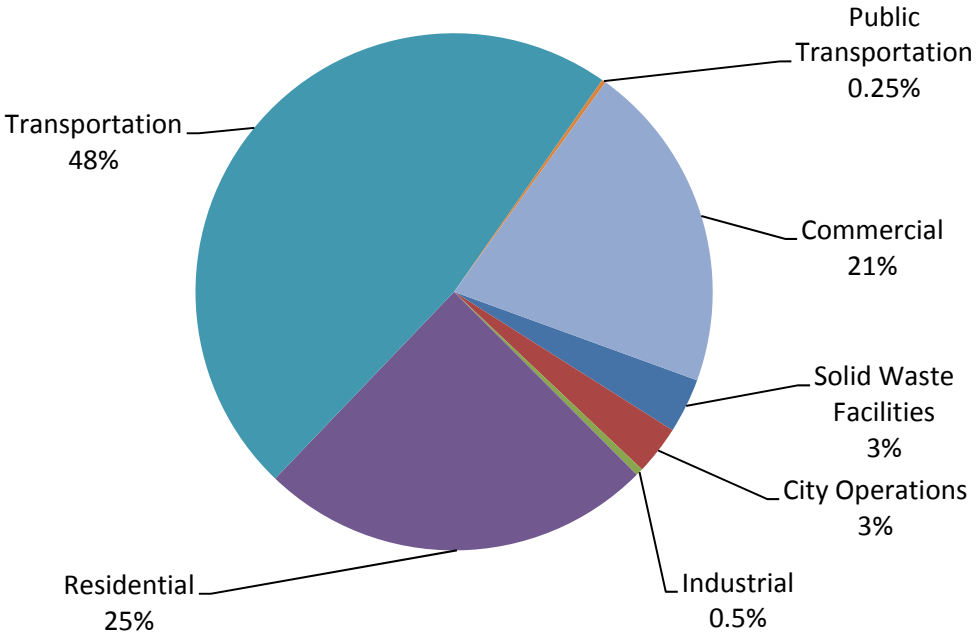
Table 7. City of Boynton Beach Community-wide 2006 GHG Emissions

Source	Metric Tons CO_2e	Percent of Total
Fuel Oil	14	0.0%
Public Transportation	2,366	0.3%
Natural Gas	5,811	0.6%
Solid Waste Facilities	33,018	3.5%
Electricity	433,231	46.5%
Transportation	456,865	49.1%
Total	**931,305**	

3.2.2 Results By Sector

When community-wide emissions are broken out by sector, transportation is still by far the largest sector making up nearly half of the City's emissions as shown in **Figure 8**. The residential and commercial sectors each make up nearly a quarter of the City's emissions profile. City operations emissions account for a very small part of total emissions at only 3%, which is typical of US cities. While the city operations emissions make up a small piece, the City has the opportunity to lead the rest of the community by example.

Figure 8. 2006 Percentage of GHG Emissions by Emissions Sector Community-Wide



3.2.3 Analysis of Results

The City of Boynton Beach had a population of 67,644 in 2006; in 2006 each Boynton Beach resident emitted 14 metric tons of CO_2e, used 11,000 kilowatt-hour (kwh) of electricity and 16 therms of natural gas, and drove about 11,500 miles as shown in **Table 8** compared with national per capita rates. Residents of Boynton Beach emitted far fewer emissions on a per capita basis compared to others in Florida[19], the US[20],

[19] Florida Action Team on Energy and Climate Change, *Florida's Energy and Climate Change Action Plan*. Prepared by the Center for Climate Strategies. October 2008.
[20] U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007*. April 2009.

and Gainseville, Florida[21] but are higher than those of North Miami, Florida[8] as shown in **Table 9**.

Table 8. Breakdown of Community-wide GHG statistics

	Boynton Beach	U.S. (2007)
Population	**67,644**	**301,579,895**
Metric tons of CO_2e per capita	**14**	**24**
Kwh per customer	**11,009**	**12,483**
Therm per customer	**16**	**785**
VMT per capita	**11,491**	**10,046**

Table 9. Per Capita Metrics (metric tons of CO2e)

	Per Capita Emissions	Population
City of Boynton Beach (2006)	**14**	**67,644**
Florida (2006)	**19**	**18,088,505**
U.S. (2007)	**24**	**301,579,895**
City of North Miami, FL (2006)	**10**	**57,670**
City of Gainesville, FL (2008)	**16**	**124,491**

The City has taken a significant step in GHG and energy management by establishing a GHG emissions baseline inventory for the entire City. The City may use this information to make informed GHG emissions and energy management decisions as well as focus funding towards high yielding projects for city operations. The City may also use this information to guide policy developments and decisions and prioritize broader projects that may reduce community-wide emissions. This GHG emissions inventory is a key step towards establishing a long-term Climate Action Plan (CAP) for the City of Boynton Beach.

[21] Gainsville, Florida, *One community's strategy to reduce global warming.* < http://www.gru.com/Pdf/Final%20Climate%20Change.pdf>

Section 4
City Operations Greenhouse Gas Emission Forecasts

4.1 Forecast Overview

The City of Boynton Beach is interested in establishing an aggressive, achievable, and informed GHG reduction goal for city operations GHG emissions. Forecasting GHG emissions assists the City in further analyzing the projected path of GHG emissions in the City and understanding what a set goal could mean.

GHG reduction goals that should be taken into account include an analysis of external factors such as population changes, electricity demand, adopted and proposed regulations, and other factors rather than an subjective percent reduction. Subjective reduction goals can result in difficulty towards making progress because they are not based on analysis and therefore may not be feasible. In order to begin to develop a goal for the City, CDM analyzed three different GHG emissions forecast scenarios for city operations. At this time, forecasts were created for city operations only because the City does not have direct control over the community-wide GHG emissions. While these forecasts do not necessarily translate into a GHG reduction goal that should be adopted by the City, they give the City a better understanding of what types of issues should be considered.

4.1.1 Forecast Scenarios

Forecast scenarios were established based on the best information available to provide conservative, reasonable estimates. Three GHG emissions forecast scenarios were chosen for city operations and based on the 2006 Baseline GHG Inventory for city operations:

- Scenario 1: Business as Usual; including population estimates, the City's newly adopted four day work week, the EIA's projected electricity sales and generation mix in the FRCC region, the City's 10-Year Water Supply Facilities Work Plan, and adopted Florida legislation such as the California (CA) motor vehicle standard.

- Scenario 2: The U.S. Mayor's Climate Protection Agreement; which calls for cities to reduce their GHG emissions at least 7% from 1990 levels by 2012 - in line with the U.S.'s Kyoto Protocol reduction target. Over 1,000 communities have signed the agreement.

- Scenario 3: Pending and Non-binding Florida legislation; including Florida Executive Order 07-127, the Florida Department of Environmental Protection's

proposed renewable portfolio standard rule, and the results of the City's employee transportation survey.

4.1.2 Forecast Years

Each of the three forecast scenarios were projected from the 2006 baseline year to 2012, 2025, and 2035. 2012 was chosen as a forecast year because it is the target year for Scenario 2's GHG reductions. From there, the mid-term year of 2025 and the long-term year of 2035 were chosen to provide more or less 10 year forecasts from the 2006 baseline.

4.1.3 Forecast Sectors

The considerations for each forecast scenario impact each of the GHG emissions sectors differently. For that reason, it is necessary to create GHG emission forecasts for each GHG emissions source and sector. In addition, sources were split by operational boundary as shown in **Table 10**.

4.2 Forecasting Methodology and Assumptions

Unlike city operations GHG inventories, there is not a published standard or protocol for creating GHG emissions forecasts. This is important to keep in mind when comparing Boynton Beach's emissions forecasts results to other communities, which may take into consideration more or less forecasting information. To conduct the GHG emissions forecasts, CDM followed the best practices and extensive experience using the data outlined below.

4.2.1 Scenario 1: Business as Usual

The BAU scenario takes into account the current projected path of GHG emissions based on population, City plans and operations, Florida regulations that have or will take effect since the 2006 baseline year, and national electricity projections.

4.2.1.1 Population Projections

The City provided population projections from the Bureau of Economic and Business Research (BEBR) at the University of Florida which had been adjusted from Palm Beach County's population. BEBR population projections are through 2030. CDM modeled population through 2035 assuming that growth would continue on a linear path.

Population growth from 2006 through 2012, 2025, and 2035 was assumed to impact several city operations GHG emissions sources, including natural gas and propane used in buildings and facilities, refrigerant releases, wastewater processes and electricity use, the City vehicle fleet and mobile equipment, employee commuting,

Table 10. City Operations Emission Forecasts Source and Sector Categories and Projection Basis

Operational Boundary	City Operations Emission Source	Projection Basis		
		Scenario 1: Business as Usual	**Scenario 2: U.S. Mayor's Climate Protection Agreement**	**Scenario 3: Pending and Non-binding Florida legislation**
Direct / Scope 1	Natural Gas - Buildings & Facilities	• Population • Four day work week	• 7% below 1990 levels • 1990 Population	• EO-07-127
	Propane - Buildings & Facilities			
	Refrigerants	• Population		
	Wastewater Processing			
	Mobile Equipment			
	Vehicle Fleet	• Population • CA motor vehicle standards		
Indirect / Scope 2	Electricity - Building & Facilities	• EIA FRCC Commercial Sales • 4 day work week		• BAU • Proposed Renewable Portfolio Standard
	Electricity - Streetlights & Traffic Signals	• EIA FRCC Commercial Sales		
	Electricity - Water Delivery Facilities	• Water Supply Plan		
	Electricity - Wastewater Facilities	• Population		
Optional/ Scope 3	Employee Commuting	• Population • 4 day work week • CA motor vehicle standards		• BAU • Employee Transportation Survey
	Solid Waste	• Population		• BAU

and solid waste. These are based on the assumption that as the population increases, City services will likely be in higher demand and need to increase. GHG emissions from these sources increase at the same rate as the population increase in this forecast scenario.

4.2.1.2 Boynton Beach Policies and Plans

Since the 2006 baseline GHG inventory, the City adopted a four day work week. It was assumed that this would cut several emission sectors by 20% in all forecast years including electricity, natural gas and propane used in buildings and facilities, and employee commuting.

The City created a 10-Year Water Supply Facilities Work Plan[22] in 2008 which outlines expected reductions in water use. The plan expects a 3.1% reduction in water use through 2026. The annual reduction was applied in all forecast years to the electricity use at water delivery facilities sector.

4.2.1.3 U.S. Energy Information Administration

The EIA projects electricity sales and generation mix[23] in the FRCC region through 2035. CDM used the commercial electricity sales growth rate from 2007 to each of the forecast years to project the increased electricity usage in the building and facilities and streetlights and traffic signals sectors. The rate from 2006 was not available but assumed to not have changed significantly. This commercial sales growth rate was not used for electricity used in water delivery because the City provided expected usage in the Water Supply Plan. For wastewater facilities, electricity usage is more directly tied to population than commercial sales; therefore, forecasted GHG emissions are tied to population growth.

The generation mix for the electric grid is expected to change over time and affects the emission factor in all four electricity usage sectors. To calculate electricity emission factors for 2012, 2025, and 2035, total projected CO_2 emissions from the FRCC region were divided by the total projected electricity generation to create an emission factor in metric tons of CO_2/kwh. CH_4 and N_2O emission factors were assumed to change at the same rate as the CO_2 emission factor and allowed CDM to estimate GHG emissions in CO_2e, consistent with the 2006 GHG baseline inventory. It should be noted that unlike eGRID, these emission factors do not take into account transmission losses; as such, they are conservative emission factors and may be slightly high.

[22] City of Boynton Beach, *10-Year Water Supply Facilities Work Plan.* April 2008.
[23] U.S. Energy Information Administration, *Annual Energy Outlook 2010*. December 2009.

4.2.1.4 Adopted Florida Legislation

In February 2009, Florida adopted the California motor vehicle standards[24], also known as the "Pavley rules". These rules contain GHG exhaust emission standards for 2009 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles sold in the state. The fleet average GHG emission rate steadily decreases for 2009 through 2016 model year vehicles. The California Air Resources Board (CARB) published a report[25] in 2008 that analyzed the impact the Pavley rules would have in other states in terms of annual metric tons of CO_2e reduced by 2016 and 2020. The annual impact of these rules for each forecast year was applied to GHG emissions for the City's vehicle fleet and employee commuting.

4.2.2 Scenario 2: The U.S. Mayor's Climate Protection Agreement

The U.S. Mayor's Climate Protection Agreement calls signatory municipalities to reduce their GHG emissions at least 7% from 1990 levels by 2012 - in line with the U.S.'s Kyoto Protocol reduction target. Over 1,000 communities have signed the agreement since its inception.

To forecast GHG emissions for this scenario, CDM scaled the 2006 baseline GHG emissions back to 1990 levels using the City census data. CDM then applied a 7% reduction to the estimated 1990 levels to forecast 2012 GHG emissions. Since the Mayor's Agreement only mentions reductions through 2012, it is assumed that 2025 and 2035 GHG emission levels are constant from that point.

4.2.3 Scenario 3: Pending and Non-binding Florida Legislation

The last scenario forecasts GHG emissions for city operations based on specific expected and possible legislation and rules outside of the City's control. GHG emissions targets and mandates are the subject of multiple state and federal legislative proposals which make this scenario perhaps the most difficult to predict. There are several other sources that could have been taken into account, such as additional draft EPA rules, however for our purposes, it was decided to focus on select Florida-based possibilities only to create a reasonable GHG emissions forecasts which may directly impact the City's GHG emissions.

[24] Department of Environmental Protection, *Florida Low Emission Vehicle Program.* Rule 62-285.400, F.A.C. February 2009.
[25] California Air Resources Board, *Comparison of Greenhouse Gas Reductions for the United States and Canada Under U.S. CAFE Standards and California Air Resources Board Greenhouse Gas Regulations.* February 2008.

4.2.3.1 Florida Executive Order 07-127

The Florida Executive Order 07-127[26] (EO) was signed by Governor Crist in July 2007. While the EO is currently not codified in the Florida Statutes or Florida Administrative Code it is non-binding, but it is reasonable to assume that this may serve as a basis for future required GHG emissions reductions. The EO establishes GHG emissions reduction targets as follows:

- By 2017, reduce GHG emissions to 2000 levels
- By 2025, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions by 80% of 1990 levels

It is assumed that this EO is focused on GHG reductions by the above percentages for all emission sectors. As **Table 6** and **Figure 6** show, the City only has direct control of 17% of GHG emissions; the EO goals were applied to the direct GHG emissions sources only including natural gas and propane used in buildings and facilities, refrigerants, process emissions from wastewater treatment, mobile equipment, and the vehicle fleet.

CDM scaled the 2006 baseline GHG emissions back to 2000 levels using the City census data and applied the annual GHG reduction rate for 2006 through 2017 (i.e., the next reduction goal in the EO) for 2012. 2025 GHG emissions were equal to the 1990 levels determined in Scenario 2. The annual GHG reduction rate between 2025 and 2050 was used to determine 2035 levels.

4.2.3.2 Proposed Renewable Portfolio Standard

The EO also directed the Florida Public Service Commission (FPSC) to establish a renewable portfolio standard[27] (RPS) which would require a certain percentage of renewable energy to be generated in the state. In January 2009, FPSC presented a draft RPS[28] to the Florida House of Representatives and Senate. The RPS would establish the following targets:

- 7% by January 1, 2013
- 12% by January 1, 2016
- 18% by January 1, 2019

[26] State of Florida Office of the Governor, *Executive Order Number 07-127 Establishing Immediate Actions to Reduce Greenhouse Gas Emissions within Florida*. July 2007. <http://www.flclimatechange.us/ewebeditpro/items/O12F15074.pdf>
[27] Draft proposed Section 25-17.400(3), Florida Administrative Code (F.A.C.),
[28] Florida Public Service Commission, Section 25-17.400, F.A.C. January 2009.

- 20% by January 1, 2021

These targets include a 25% carve out for solar photovoltaic (PV) and wind renewable energy sources, meaning that 25% of 7% (1.8%) of electricity needs to be generated by either solar PV or wind by January 1, 2013. At this time, the RPS has not been passed, however 35 other states in the U.S. have a RPS, so it is reasonable that a RPS or similar rules may become law in Florida in the future. Additionally, several legislative proposals have been made in the 2010 session ranging from adopting the proposed Rule into the Florida Statutes to completely striking the requirement for the Department of Environmental Protection to promulgate the Rule. Therefore, a RPS is unclear at this time.

Using the EIA generation mix[18], CDM determined that the FRCC region is on track to meet the RPS in 2012 and 2015 with the exception of the solar PV and wind carve out, meaning that the adjusted RPS needed to achieve the desired GHG reductions are 1.8% and 3.0% respectively. In 2018 and 2020, the FRCC region is expected to meet approximately half of the RPS standard, meaning that the reductions needed to be achieved are 7.6% and 9.9% respectively.

CDM applied the 2012 adjusted RPS standard to the BAU GHG emissions forecast for all electricity sectors to determine Scenario 3's expected GHG emissions in 2012. The same method was used for 2025 and 2035 emissions by applying the adjusted 2020 RPS standard to the BAU GHG emissions forecast.

4.2.3.3 Boynton Beach Employee Transportation Survey Results

The City conducted an employee transportation survey which was included in the Green Community Alliance report[29]. The survey indicated that 91% of employees currently travel to work alone. Of the 91%, 39% would consider carpooling and 60% would consider using Palm Tran. CDM assumed that 50% of those who would consider alternative transportation would actually use it, meaning that 27.5% of all employees would change their transportation mode. To account for the survey results, forecasted GHG emissions were reduced 27.5% from BAU in each forecast year.

4.2.3.4 Solid Waste Greenhouse Gas Emission Forecasting

GHG emissions from solid waste disposal were kept constant with the BAU because at this time, there are no pending regulations which may impact these emissions that CDM could readily use with confidence.

[29] The City of Boynton Beach Green Community Alliance, *Strategies to Improve, Promote and Sustain the Environmental Needs of the Community*.

4.2.3.5 Issues Regarding Pending Legislation

Given the uncertainty surrounding certain legislative proposals, the City should consider how the changing regulatory landscape may impact its efforts toward achieving GHG emissions goals. A fundamental aspect of complying with any of these evolving regulations will be an understanding of the City's 2006 baseline and how the strategies contained within the Climate Action Plan may need to evolve over time to accomplish the City's goals.

4.3 Results

Scenario 1 shows a decrease in GHG emissions by 2012 of 11% from the 2006 baseline, suggesting that both external factors and City action may result in lower GHG emissions from the baseline. These results are despite expected moderate population growth, because the external factors of the CA motor vehicle standards and a cleaner electricity grid contribute to a long term decline in GHG emissions. In addition, the City's four day work week and expected reductions in potable water use contribute to lower GHG emissions than the 2006 baseline. These emission levels remain approximately constant through 2035, showing that the effect of the external factors and City action compensate for population growth through 2035.

Scenario 2 shows a 36% decrease in emissions from the 2006 baseline. Municipalities which sign the Mayor's Agreement often find that reductions from current levels are in the range of Boynton Beach's and results in a less achievable reduction goal than 7% below 1990 levels seems to indicate. This is largely due to increases in population and the building boom between 1990 and 2006.

Scenario 3 shows an initial decrease in GHG emissions by 2012 from 2006 levels of 14%, and continues on a nearly steady reduction path, of 8% below 2012 by 2025 and 8% below 2025 by 2035. This is results in a total reduction by 2035 from 2006 levels of 27%.

The results of each GHG emission forecast scenario is outlined in **Table 11, Table 12** and **Figure 9**.

Table 11. Comparison of GHG Emissions Forecast Scenarios ($MTCO_2e$)

	2006 - Actual	2012	2025	2035
Scenario 1: Business as Usual	29,333	26,147	26,961	26,680
Scenario 2: U.S. Mayor's Climate Pledge Projections	29,333	18,825	18,825	18,825
Scenario 3: Pending and Non-binding Florida Legislation	29,333	25,320	23,173	21,292

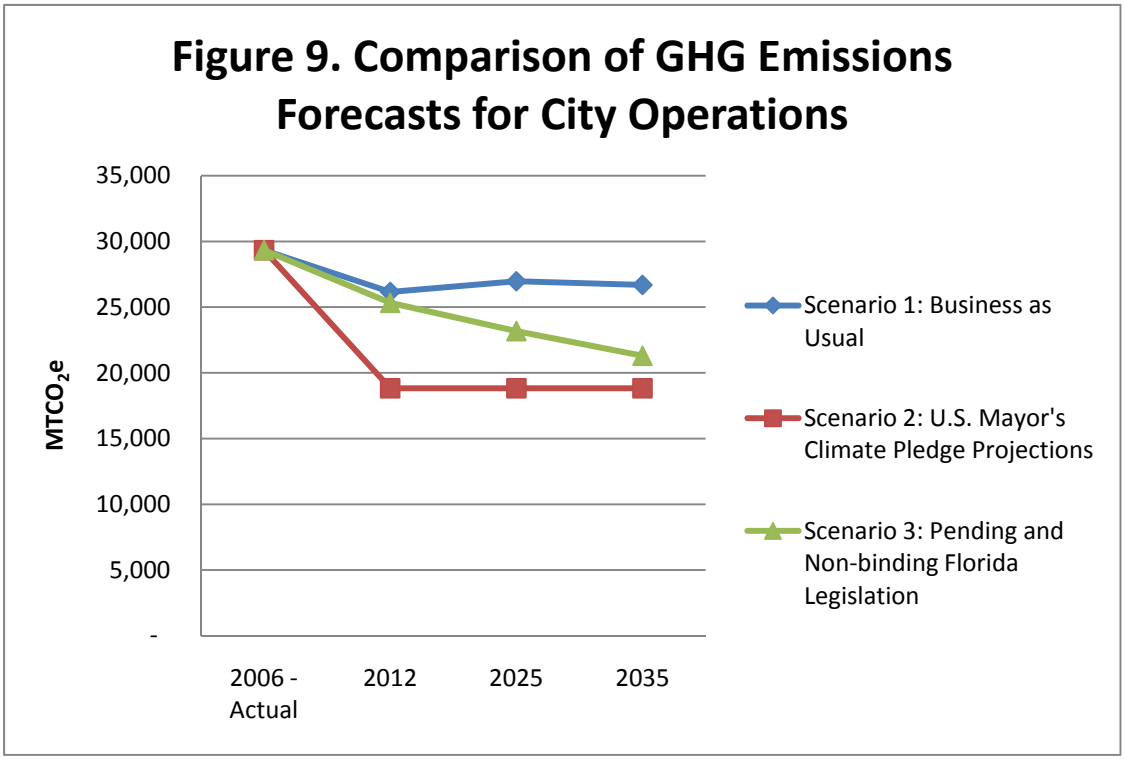


Table 12. Percent Change of GHG Emissions from 2006 Levels for City Operations

	2006 - 2012	2006 - 2025	2006 - 2035
Scenario 1: Business as Usual	-11%	-8%	-9%
Scenario 2: U.S. Mayor's Climate Pledge Projections	-36%	-36%	-36%
Scenario 3: Pending and Non-binding Florida Legislation	-14%	-21%	-27%
Total Reduction between Scenarios 1 and 3	-3%	-13%	-18%

4.4 Analysis of Forecasting Results

CDM recommends evaluating the difference between the BAU GHG emission levels (Scenario 1) and Scenario 3 because Scenario 3 is in anticipation of state GHG reduction goals and initiatives. Should the EO or RPS become binding, the gap between these scenarios represent the emission reductions the City may be expected to achieve. The difference between Scenario 1 and Scenario 2 is not further evaluated due to the fact that it would be financially and technically infeasible to reduce city operations GHG emissions by 36% from the 2006 baseline in two years (See **Table 12**). Scenario 3 achieves a 27% reduction by 2035 and gives the City 25 years to achieve these GHG reductions, allowing the City to plan and allocate necessary funding over

time. The total difference between Scenario 1 and Scenario 3 is 3% in 2012, 13% in 2025, and 18% in 2035.

The 2006 baseline GHG inventory shows that the City has direct control over only 17% of GHG emissions (see **Table 6**, **Figure 6**). These are the sources that may be impacted by the EO. The largest of these sources is the vehicle fleet, making up over 86% of direct emissions sources. The City may consider initiatives or policies that may reduce GHG emissions from vehicle fleets in order to meet the EO, including reducing VMT, idling, and purchasing fuel efficient vehicles as needed.

GHG emissions from electricity, if regulated, will likely be regulated at the source, meaning at the power generation facility rather than by the consumer (the City). However, the RPS or other regulations will increase costs initially for the electric generators which will likely be passed on to the City. Given that most of the City's GHG emissions are from electricity, the City should consider initiatives to reduce electricity use which will reduce GHG emissions and costs.

Other emissions, including City employee commuting and solid waste, are optional to include in GHG inventories. The City may consider waste reduction strategies and encouraging alternative modes of transportation for employees to reduce this sector of GHG emissions.

Since lowering GHG emissions from electricity may have the best monetary payback of various GHG reduction projects, the City may choose to achieve reductions in the electricity sector. **Table 13** outlines GHG reductions scenarios to achieve reductions from BAU of 3% in 2012, 13% in 2025, and 18% in 2035 respectively, largely from electricity use only. The manner in which these GHG reductions may be achieved is explored further in the Climate Action Plan.

4.5 Expanding on Greenhouse Gas Emissions Forecasting

The City may consider updating and expanding their GHG emissions forecasting as more information becomes available. The City may consider including more regulations, legislation, and statutes as they become adopted or estimate emissions based on actual or expected capital improvement projects. In addition, the City may consider forecasting GHG emissions from the Community if they were to be considered in City GHG reduction goals.

Table 13. Percent Change in GHG Emissions from BAU Depending on Different GHG Emission Reduction Goals ($MTCO_2e$)

Operational Boundary	BAU			Reductions in Electricity Usage Only to Achieve GHG Reductions between Scenarios 1 and 3			10% Reduction in BAU Vehicle Fleet Fuel Use, Reductions in Electricity Usage to Achieve GHG Reductions between Scenarios 1 and 3		
	2012	**2025**	**2035**	**2012**	**2025**	**2035**	**2012**	**2025**	**2035**
Direct / Scope 1 (Natural gas, Propane, Refrigerants, Wastewater Processing, Mobile Equipment Fuel)	686	803	891	686	803	891	686	803	891
Direct / Scope 1 (Vehicle fleet fuel)	4,293	4,190	4,648	4,293	4,190	4,648	3,864	3,771	4,184
Indirect / Scope 2 (Electricity)	19,421	20,147	19,121	18,750	16,750	14,250	19,000	17,000	14,750
Optional / Scope 3 (Solid Waste and Employee Commuting)	1,746	1,821	2,020	1,746	1,821	2,020	1,746	1,821	2,020
Percent GHG Reduction of Electricity Emissions from BAU				**3%**	**17%**	**25%**	**2%**	**16%**	**23%**
Percent of Total GHG Reduction from BAU				**3%**	**13%**	**18%**	**3%**	**13%**	**18%**

Appendix A
Support File Listing

The City of Boynton Beach 2006 GHG Inventory included many support files. Below is a description of each backup file provided to the City by CDM sorted by either city operations or community-wide inventory and emission source.

2006 Greenhouse Gas Baseline Inventory

A.1 City Operations

A.1.1 Electricity

- "fpl 0607 green request_sorted.xls"
  Electricity usage from all Boynton Beach accounts; this has been broken out by sector (building and facilities, lighting, water deliver, and wastewater treatment) for input into the ICLEI software. Provided by Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach, modified and sorted by Lauren Miller, CDM.

- "RE_Data request_Boynton Beach GHG inventory_electricity.pdf"
  Email from Christopher J. Roschek, PE, Engineering Division Manager, Utilities Department, City of Boynton Beach, explaining the original "fpl 0607 green request.xls"spreadsheet.

- "FW_Boynton Beach Data_electricity followup.pdf"
  Email from Claudia (Thompson) Daniels, clarifying why some accounts have only partial year data.

- "Boynton Beach WWTP electricity calcs.xls"
  Electricity usage from the South Central Regional Wastewater Treatment Plant. Spreadsheet created by Lauren Miller, CDM.

- See also "SCRWWTP data_SCAN0439_000.pdf" in the Wastewater Treatment folder.

A.1.2 Heating Fuel

- "Boynton Beach Heating Fuel summary 2006.xls"
  Summary sheet of natural gas and propane usage; compiled from the pdf files below. Spreadsheet created by Lauren Miller, CDM. Data from this spreadsheet was input into the ICLEI software.

- "FPU_Natural Gas.pdf", "FPU_Natural Gas_Dec06.pdf"
  Scanned natural gas invoices from Florida Public Utilities. Hard copies provided by Christopher J. Roschek, PE, Engineering Division Manager, Utilities Department, City of Boynton Beach and Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach.

- "Amerigas_Propane.pdf"
  Scanned propane invoices from Amerigas. Hard copies provided by Christopher J. Roschek, PE, Engineering Division Manager, Utilities Department, City of Boynton Beach and Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach.

- "RE_2006 fuel data follow-up.pdf"
  Email from Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach, clarifying gasoline, diesel, and propane fuel units.

A.1.3 Refrigerants

- "Boynton Beach Refrigerant calcs.xls"
  Summary sheet of refrigerants; compiled from the pdf files below. Spreadsheet created by Lauren Miller, CDM. Data from this spreadsheet was input into the ICLEI software.

- "Refrigerant inventory_Vic Wooten.pdf"
  Inventory of refrigerants from Victor F. Wooten, Crew Supervisor, Facilities Management Public Works Department, City of Boynton Beach.

A.1.4 Transportation Fuel

- "Boynton Beach Transportation Fuel summary 2006.xls"
  Summary sheet of diesel and gasoline usage; compiled from the pdf files below. Spreadsheet created by Lauren Miller, CDM. Data from this spreadsheet was input into the ICLEI software.

- "Amerigas_Gasoline_1 Diesel.pdf"
  Scanned diesel and gasoline invoices from Amerigas. Hard copies provided by Christopher J. Roschek, PE, Engineering Division Manager, Utilities Department, City of Boynton Beach and Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach.

- "BV Oil_Diesel_Gasoline.pdf"
  Scanned diesel and gasoline invoices from BV Oil. Also includes several invoiced for motor oil which are not a source of GHG emissions and therefore not included in the inventory. Hard copies provided by Christopher J. Roschek, PE, Engineering Division Manager, Utilities Department, City of Boynton Beach and Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach.

- "RE_Boynton Beach data clarification.pdf"
  Email exchange between Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach, Christopher J. Roschek, PE, Engineering Division Manager, Utilities Department, City of Boynton Beach and Lauren Miller, CDM, clarifying how the fuel was used and some delivery locations.

- "Budget Maint Fuel 05-06 JRL.xls"
  Vehicle fuel use by department, used to estimate the GHG emissions from each department's fuel usage for the report. Provided by Jeffrey R. Livergood, PE, Director of Public Works and Engineering, City of Boynton Beach.

- "RE_City follow up items from 3-4 meeting.pdf"
  Email from Jeffrey R. Livergood, PE, Director of Public Works and Engineering, City of Boynton Beach providing fuel usage by department.

A.1.5 Wastewater Treatment

- "Boynton Beach WWTP calcs_020410.xls"
  Emissions calculations from wastewater treatment processes at the South Central Regional Wastewater Treatment Plant; data used in this file is from the pdf files below. Emissions from this spreadsheet were directly input into the CACP software. Spreadsheet created by Lauren Miller, CDM.

- "SCRWWTP data_SCAN0439_000.pdf"
  Data from the South Central Regional Wastewater Treatment Plant (SCRWWTP) including electricity use, treatment type, population served, nitrogen load, and flow breakdown. Provided by Dennis Coates, South Central Regional Wastewater Treatment and Disposal Board.

- "RE_Data request_Boynton Beach GHG inventory_WWTP.pdf"
  Email from Christopher J. Roschek, PE, Engineering Division Manager, Utilities Department, City of Boynton Beach, explaining "SCRWWTP data_SCAN0439_000.pdf"

A.1.6 Employee Commuting

- "EE Address List for Green Team -10-09_with commute.xls"
  Addresses for all Boynton Beach employees; Contains estimated distance to city hall and calculated vehicle miles traveled annually which was input directly into the CACP software. Provided by Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach and modified by Lauren Miller, CDM and Florida Atlantic University student interns.

- "RE_Data request_Boynton Beach GHG inventory_employee commuting.pdf"
  Email from Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach, discussing the mode of transportation to work for Boynton Beach employees.

- "RE_Response to Follow-Up Item.pdf"
  Email from Sue Moroney, Revenue Manager, Finance Department, City of Boynton Beach, with the number of City employees covered under Florida Statute 119.

A.2 Community-wide

A.2.1 Electricity

- "Boynton_Beach_elect.xls"
  Electricity usage for the entire city of Boynton Beach, broken down by account category. Provided by Claudia (Thompson) Daniels, FPL. This spreadsheet was modified by Lauren Miller, CDM to take out electricity usage by city operations. Data from this spreadsheet was directly input into the CACP software.

A.2.2 Natural Gas

- "Boynton Beach Community NG usage.xls"
  Natural gas usage for the entire city of Boynton Beach, broken down by account category. This spreadsheet was created by Lauren Miller, CDM using the pdf files below. Data from this spreadsheet was directly input into the CACP software.

- "RE_2006 Natural Gas Usage for the City of Boynton Beach.pdf"
  Email from Bill McGoldrick, FPU with Natural gas usage for the entire city of Boynton Beach.

- "RE_2006 Natural Gas Usage for the City of Boynton Beach.pdf_2"
  Email from Bill McGoldrick, FPU confirming natural gas totals.

- "RE_2006 Natural Gas Usage for the City of Boynton Beach.pdf_3"
  Email from Bill McGoldrick, FPU clarifying the "Public Authority" account.

A.2.3 Fuel Oil

- "Boynton Beach – Fuel Use Calcs.xls"
  Fuel oil usage estimates based on state-wide sales totals from the U.S. Energy Information Administration. Consumption was estimated using population estimates. Spreadsheet created by Lauren Miller, CDM. Data from this spreadsheet was directly input into the CACP software.

- "FL city population_US Census_Copy of SUB-EST2008-04-12.xls"
  Florida city populations from the U.S. Census Bureau.

- "State population_US Census_NST-EST 2009-01(1).xls"
  U.S. State populations from the U.S. Census Bureau.

A.2.4 Transportation

- "Boynton Beach Community VMT.xls"
  Vehicle miles traveled within the City of Boynton Beach in 2006; estimated from files below. Spreadsheet created by Lauren Miller, CDM. Data from this spreadsheet was input directly into CACP software.

- "AVMT in Boynton Beach.xlsx"
  Vehicle miles traveled within the City of Boynton Beach in 2008; Provided by Gordon Morgan, Florida DOT.

- "FW_VMT for City of Boynton Beach, FL year 2006.pdf"
  Email from Gordon Morgan, Florida DOT giving the ratio of VMT from 2006 to 2008 for Palm Beach County.

A.2.5 Public Transit

A.2.5.1 Palm Tran

- "CY2006FuelConsumed_Palm Tran_BB.xls"
  Diesel and gasoline usage for the Palm Tran fleet, including vehicle make, model, and type. Provided by Lorraine Szyms, Palm Tran. This spreadsheet was modified by Lauren Miller, CDM, to determine the percentage of total usage was within Boynton Beach. Data from this spreadsheet was directly input into the CACP software.

A.2.5.2 Tri-Rail

- "Boynton Beach Community Tri-Rail calcs.xls"
  Diesel and biodiesel usage from Tri-Rail. Spreadsheet was created by Lauren Miller, CDM, using files below. Data from this spreadsheet was directly input into the CACP software.

- "SFRTA 2009.pdf"
  Diesel and biodiesel Tri-Rail deliveries in 2009. Provided by Michelle M'Sadoques, consultant to CDM.

- "FY 2009 Rail Fuel Usage MG OPS.pdf"
  Email from Marcin Gadek, 2009 Commuter Rail diesel and biodiesel usage. Provided by Michelle M'Sadoques, consultant to CDM.

- "SunRail sank Tri-Rail – South Florida Sun-Sentinel_com.htm"
  Article from the Sun Sentinel with 2009 Tri-Rail ridership estimates. Accessed January 28, 2010.

- "Tri-Rail breaks ridership records in 2006 – South Florida Business Journal.htm"
  Article from the South Florida Business Journal with 2006 Tri-Rail ridership estimates. Accessed January 28, 2010.

A.2.5.3 Boynton Beach Trolley

- "Boynton Beach Trolley calcs.xls"
  Estimated gasoline usage from the Boynton Beach trolley. Spreadsheet was created by Lauren Miller, CDM, using files below. Data from this spreadsheet was directly input into the CACP software.

- "FW_carbon footprint.pdf"
  Email from Molly Stahlman, contractor for the Boynton Beach Community Redevelopment Agency. Estimates Boynton Beach trolley mileage and fuel economy.

A.3 Solid Waste

- "Boynton Beach Solid Waste calcs.xls"
  Emissions calculations from solid waste disposal from city operations and community wide; data used in this file is from the pdf files below. Emissions from this spreadsheet were directly input into the CACP software. Spreadsheet created by Lauren Miller, CDM.

- "RE_Data request_Boynton Beach GHG inventory_Solid Waste_SWA facility.pdf"
  Email from Ravi Kadambala, CDM with the total municipal solid waste disposed of at the North County Resource Recovery Facility landfill and waste-to-energy facility as well as the landfill gas collection rate.

- "RE_Data request_Boynton Beach GHG inventory_Solid Waste_tonnage.pdf"
  Email from Jeffrey R. Livergood, PE, Director of Public Works and Engineering, City of Boynton Beach, with the amount of municipal solid waste collected from city operations and community wide; data provided by Larry Quinn, Solid Waste Manager, Public Works Department, City of Boynton Beach.

A.4 2006 GHG Baseline Inventory Report Files

- "Boynton Beach GHG Report Charts.xlsx"
  Contains all data analyses for the 2006 GHG Baseline Inventory Results (Section 3) using output reports from the ICLEI CACP Reports (Appendix B). Spreadsheet created by Lauren Miller, CDM.

- "BoyntonBeach032510.zip"
  Contains the backup files for the CACP Software. These files may be uploaded into the City's copy of the CACP software to modify the 2006 GHG Baseline Inventory as needed.

City Operations Greenhouse Gas Emission Forecasts

A.5 GHG Forecasting Report Files

- "Boynton Beach GHG emissions forecasts_City Operations.xlsx"
  Contains all calculations and data analyses for the GHG Forecasting Results (Section 4). This sheet pulls from several resources outlined below, including "Boynton Beach GHG Report Charts.xlsx". Spreadsheet created by Lauren Miller, CDM.

A.5.1 Population

- "Boynton Population.xlsx"
  Actual and estimate population of the City, Hanna Matras, Senior Planner, Planning and Zoning Department, City of Boynton Beach.

- "FW_Boynton's population projections.pdf"
  Email from Hanna Matras, Senior Planner, Planning and Zoning Department, City of Boynton Beach, explaining the population projections.

A.5.2 Electricity

- "EIA-Copy of sup_elect.xls"
  Support file from the U.S. Energy Information Administration's Energy Outlook 2010. Provides electric power projections for the Florida Reliability Coordinating Council (FRCC) region including fuel mix, generation, and commercial sales.

A.5.3 Florida Rules

- "2007.07.13_eo_07-127.pdf"
  State of Florida Office of the Governor, *Executive Order Number 07-127 Establishing Immediate Actions to Reduce Greenhouse Gas Emissions within Florida*. July 2007. Used to estimate GHG reductions from direct emission sources.

- "2009_FPSC_Draft_RPS_Rule.pdf"
  Florida Public Service Commission, Section 25-17.400, F.A.C. January 2009. Used to estimate reductions in GHG emissions from the electricity sector.

- "pavleycafe_reportfeb25_08.pdf"
  California Air Resources Board, *Comparison of Greenhouse Gas Reductions for the United States and Canada Under U.S. CAFE Standards and California Air Resources Board Greenhouse Gas Regulations.* February 2008. Used to determine reductions of GHG emissions from new vehicle standards.

A.5.4 City Publications

- "SCRWRF 10 year plan.pdf"
  City of Boynton Beach 10-Year Water Supply Facilities Work Plan, April 2008, used to estimate electricity from water utilities, provided by Jeffrey R. Livergood, PE, Director of Public Works and Engineering, City of Boynton Beach.

- "Community Alliance Report - FINAL.pdf"
  City of Boynton Beach Green Community Alliance Report, October 2008, used the Employee Transportation Survey Results to estimate future alternative transportation use.

Appendix B
ICLEI CACP Reports

The ICLEI: Local Governments for Sustainability (ICLEI) Clean Air Climate Protection Software (CACP) provides summary reports which were used by CDM to further analyze the greenhouse gas (GHG) emission results. The following is a summary of the reports:

- **Government Greenhouse Gas Emissions in 2006: Summary Report**: Summary of city operations GHG emissions government by sector.
- **Government Greenhouse Gas Emissions in 2006: Report by Source:** Summary of city operations GHG emissions by fuel or GHG emission source.
- **Government Greenhouse Gas Emissions in 2006: Detailed Report:** Detailed GHG emissions from government sectors, by fuel or GHG emissions source and location where possible.
- **Community Greenhouse Gas Emissions in 2006: Summary Report**: Summary of community wide GHG emissions government by sector.
- **Community Greenhouse Gas Emissions in 2006: Report by Source:** Summary of community wide GHG emissions by fuel or GHG emission source.
- **Community Greenhouse Gas Emissions in 2006: Detailed Report:** Detailed GHG emissions from community wide sectors, by fuel or GHG emissions source.

Boynton Beach

Government Greenhouse Gas Emissions in 2006

Summary Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Buildings and Facilities	5,710	69	234	5,736	19.6	32,582	0
Streetlights & Traffic Signals	1,231	15	50	1,237	4.2	6,978	0
Water Delivery Facilities	8,498	102	346	8,537	29.1	48,161	0
Wastewater Facilities	6,678	1,300	272	7,087	24.2	37,848	0
Vehicle Fleet	4,605	159	115	4,657	15.9	63,953	0
Employee Commute	1,446	91	86	1,476	5.0	20,402	0
Other Process Fugitive	534	20	1,780	578	2.0		
Refrigerants All Sectors	0	0	0	26	0.1		
Total	28,703	1,756	2,882	29,334	100.0	209,924	0

Boynton Beach

Government Greenhouse Gas Emissions in 2006

Report by Source

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Carbon Dioxide	534	0	0	534	1.8		0
Diesel	2,115	6	4	2,117	7.2	28,909	0
Electricity	22,097	266	899	22,198	75.7	125,226	0
Gasoline	3,696	243	197	3,775	12.9	52,139	0
HFC-134a 236cb 43-10mee	0	0	0	2	0.0		0
Methane	0	0	1,780	37	0.1		0
Natural Gas	6	0	1	6	0.0	108	0
Nitrous Oxide	0	1,240	0	384	1.3		0
OFF ROAD Diesel	210	0	0	210	0.7	2,872	0
OFF ROAD Gasoline	31	0	0	31	0.1	435	0
Propane	15	0	3	15	0.1	235	0
R-402B Blend	0	0	0	1	0.0		0
R-404A Blend	0	0	0	23	0.1		0
Total	28,703	1,756	2,882	29,334	100.0	209,924	0

Fuel costs include Buildings, Vehicle Fleet, Streetlights and Water/Sewage sectors only.
This report has been generated for Boynton Beach, Florida using ICLEI's Clean Air and Climate Protection 2009 Software.

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Buildings and Facilities							
Boynton Beach, Florida							
100 E BOYNTON BEACH BLVD # CH							
Electricity	2,228	27	91	2,238	7.6	12,626	0
Propane	0	0	0	0	0.0	4	0
Subtotal 100 E BOYNTON BE	2,228	27	91	2,238	7.6	12,630	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Propane use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in:
"Boynton Beach Heating Fuel Summary 2006.xls"

1021 S FEDERAL HWY

Electricity	157	2	6	158	0.5	890	0
Subtotal 1021 S FEDERAL HW	157	2	6	158	0.5	890	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

108 GATEWAY BLVD # IRR

Electricity	0	0	0	0	0.0	0	0
Subtotal 108 GATEWAY BLVD	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

123 E OCEAN AVE # TRLR

Electricity	22	0	1	22	0.1	126	0
Subtotal 123 E OCEAN AVE #	22	0	1	22	0.1	126	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

125 SE 2ND AVE #ART CTR

Electricity	64	1	3	64	0.2	363	0
Subtotal 125 SE 2ND AVE #AR	64	1	3	64	0.2	363	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
128 E OCEAN AVE # CIVIC-LIB							
Electricity	57	1	2	58	0.2	326	0
Subtotal 128 E OCEAN AVE #	57	1	2	58	0.2	326	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

129 E OCEAN AVE # 1913							
Electricity	180	2	7	181	0.6	1,022	0
Subtotal 129 E OCEAN AVE #	180	2	7	181	0.6	1,022	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1301 W BOYNTON BEACH BLVD # IRR							
Electricity	0	0	0	0	0.0	0	0
Subtotal 1301 W BOYNTON B	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

141 E OCEAN AVE # BBE-0801							
Electricity	207	2	8	208	0.7	1,171	0
Subtotal 141 E OCEAN AVE #	207	2	8	208	0.7	1,171	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

145 SE 2ND AVE # MADSEN CTR							
Electricity	25	0	1	25	0.1	144	0
Subtotal 145 SE 2ND AVE # M	25	0	1	25	0.1	144	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1490 SW 8TH ST # PUMP							
Electricity	0	0	0	0	0.0	0	0
Subtotal 1490 SW 8TH ST # P	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
150 E Boynton Beach Blvd							
Natural Gas	2	0	0	2	0.0	40	0
Subtotal 150 E Boynton Beach	2	0	0	2	0.0	40	0

Natural Gas use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Heating Fuel Summary 2006.xls"

1550 N FEDERAL HWY # SIGN							
Electricity	0	0	0	0	0.0	1	0
Subtotal 1550 N FEDERAL HV	0	0	0	0	0.0	1	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1611 S SEACREST BLVD # CEMETARY PMP							
Electricity	29	0	1	30	0.1	167	0
Subtotal 1611 S SEACREST B	29	0	1	30	0.1	167	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1611 S SEACREST BLVD # MAUSOLM							
Electricity	23	0	1	23	0.1	132	0
Subtotal 1611 S SEACREST B	23	0	1	23	0.1	132	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1901 N SEACREST BLVD # LGT							
Electricity	32	0	1	32	0.1	179	0
Subtotal 1901 N SEACREST E	32	0	1	32	0.1	179	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1901 N SEACREST BLVD # REC							
Electricity	470	6	19	472	1.6	2,665	0
Subtotal 1901 N SEACREST E	470	6	19	472	1.6	2,665	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
1901 N SEACREST BLVD #PRSS BOX							
Electricity	8	0	0	8	0.0	47	0
Subtotal 1901 N SEACREST E	8	0	0	8	0.0	47	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1919 S FEDERAL HWY #FIRESTATIO							
Electricity	117	1	5	118	0.4	664	0
Natural Gas	4	0	0	4	0.0	68	0
Subtotal 1919 S FEDERAL HV	121	1	5	121	0.4	732	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Natural Gas use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in:
"Boynton Beach Heating Fuel Summary 2006.xls"

200 S SEACREST BLVD # LIBR							
Electricity	809	10	33	813	2.8	4,587	0
Subtotal 200 S SEACREST BL	809	10	33	813	2.8	4,587	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

201 NW 9TH CT # SIMS PK CTS							
Electricity	24	0	1	24	0.1	137	0
Subtotal 201 NW 9TH CT # SII	24	0	1	24	0.1	137	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2010 N FEDERAL HWY # BAIT SHOP2							
Electricity	31	0	1	32	0.1	178	0
Subtotal 2010 N FEDERAL HV	31	0	1	32	0.1	178	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2010 N FEDERAL HWY # BOAT							
Electricity	19	0	1	19	0.1	107	0
Subtotal 2010 N FEDERAL HV	19	0	1	19	0.1	107	0

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2201 HIGH RIDGE RD # IRR

Electricity	0	0	0	0	0.0	0	0
Subtotal 2201 HIGH RIDGE RI	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2210 South Congress Ave (Fire Department #2)

Propane	3	0	1	3	0.0	48	0
Subtotal 2210 South Congress	3	0	1	3	0.0	48	0

Propane use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in:
"Boynton Beach Heating Fuel Summary 2006.xls"

222 NE 9TH AVE # PUBLIC WORKS FACILITY

Electricity	5	0	0	5	0.0	30	0
Subtotal 222 NE 9TH AVE # P	5	0	0	5	0.0	30	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

222 NE 9TH AVE # PW-1

Electricity	92	1	4	92	0.3	520	0
Subtotal 222 NE 9TH AVE # P	92	1	4	92	0.3	520	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

222 NE 9TH AVE # PW-3

Electricity	54	1	2	55	0.2	308	0
Subtotal 222 NE 9TH AVE # P	54	1	2	55	0.2	308	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

222 NE 9TH AVE # PW-6

Electricity	6	0	0	6	0.0	34	0
Subtotal 222 NE 9TH AVE # P	6	0	0	6	0.0	34	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)

column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

222 NE 9TH AVE # TEMP2

Electricity	7	0	0	7	0.0	38	0
Subtotal 222 NE 9TH AVE # TI	7	0	0	7	0.0	38	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2221 NW 1ST ST # IRR

Electricity	0	0	0	0	0.0	0	0
Subtotal 2221 NW 1ST ST # IF	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2221 S CONGRESS AVE

Electricity	50	1	2	51	0.2	285	0
Subtotal 2221 S CONGRESS A	50	1	2	51	0.2	285	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2240 N FEDERAL HWY # IRR

Electricity	3	0	0	3	0.0	14	0
Subtotal 2240 N FEDERAL HW	3	0	0	3	0.0	14	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

227 NE 13TH AVE #PMP

Electricity	3	0	0	3	0.0	16	0
Subtotal 227 NE 13TH AVE #P	3	0	0	3	0.0	16	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2500 SW 8TH ST # PARK

Electricity	1	0	0	1	0.0	5	0
Subtotal 2500 SW 8TH ST # P.	1	0	0	1	0.0	5	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)

column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2615 W WOOLBRIGHT RD # NEW FIRE STA 2

Electricity	48	1	2	48	0.2	273	0
Subtotal 2615 W WOOLBRIGH	48	1	2	48	0.2	273	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2850 OCEAN PKWY # IRR

Electricity	0	0	0	0	0.0	0	0
Subtotal 2850 OCEAN PKWY	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2910 S FEDERAL HWY # COAST

Electricity	8	0	0	8	0.0	48	0
Subtotal 2910 S FEDERAL HW	8	0	0	8	0.0	48	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

300 BOYNTON LAKES BLVD # PARK

Electricity	3	0	0	3	0.0	16	0
Subtotal 300 BOYNTON LAKE	3	0	0	3	0.0	16	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

300 SW 15TH AVE # BALL PRK & #LS499

Electricity	17	0	1	17	0.1	95	0
Subtotal 300 SW 15TH AVE #	17	0	1	17	0.1	95	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

300 SW 15TH AVE # RESTROOMS

Electricity	2	0	0	2	0.0	11	0
Subtotal 300 SW 15TH AVE #	2	0	0	2	0.0	11	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)

column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

300 W WOOLBRIGHT RD #IRR

Electricity	0	0	0	0	0.0	0	0
Subtotal 300 W WOOLBRIGHT	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3111 S CONGRESS AVE # TENNISCT

Electricity	43	1	2	43	0.1	243	0
Subtotal 3111 S CONGRESS A	43	1	2	43	0.1	243	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3501 N CONGRESS AVE #SIGN

Electricity	2	0	0	2	0.0	9	0
Subtotal 3501 N CONGRESS A	2	0	0	2	0.0	9	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3501 S CONGRESS AVE # FIRE STA

Electricity	282	3	11	283	1.0	1,595	0
Propane	0	0	0	0	0.0	6	0
Subtotal 3501 S CONGRESS A	282	3	12	283	1.0	1,601	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Propane use provided by Chris Roschek and Sue Moroney, City of Boynton Beach (Propane bills list address as 3501 North Congress Ave - Fire Station #3). Hard copy bills summarized in:
"Boynton Beach Heating Fuel Summary 2006.xls"

400 SE 5TH AVE # PENCE PK LTS

Electricity	12	0	0	12	0.0	68	0
Subtotal 400 SE 5TH AVE # PI	12	0	0	12	0.0	68	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
400 SE 6TH AVE # PENCE PK PMP							
Electricity	3	0	0	3	0.0	14	0
Subtotal 400 SE 6TH AVE # PI	3	0	0	3	0.0	14	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

415 NE 4TH ST # ANIMAL POUND							
Electricity	13	0	1	13	0.0	72	0
Subtotal 415 NE 4TH ST # AN	13	0	1	13	0.0	72	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

421 NE 13TH AVE #PARK							
Electricity	8	0	0	8	0.0	45	0
Subtotal 421 NE 13TH AVE #F	8	0	0	8	0.0	45	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4305 N CONGRESS AVE #PARK							
Electricity	31	0	1	31	0.1	175	0
Subtotal 4305 N CONGRESS A	31	0	1	31	0.1	175	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

511 E OCEAN AVE #IRR							
Electricity	1	0	0	1	0.0	5	0
Subtotal 511 E OCEAN AVE #	1	0	0	1	0.0	5	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

511 S CONGRESS AVE # PMP							
Electricity	0	0	0	0	0.0	0	0
Subtotal 511 S CONGRESS A	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
515 NW 15TH AVE # TWR/CITY							
Electricity	22	0	1	22	0.1	124	0
Subtotal 515 NW 15TH AVE #	22	0	1	22	0.1	124	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

520 GATEWAY BLVD # IRR							
Electricity	0	0	0	0	0.0	0	0
Subtotal 520 GATEWAY BLVD	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

551 NE 26TH AVE PAVILLIAN							
Electricity	1	0	0	1	0.0	8	0
Subtotal 551 NE 26TH AVE PA	1	0	0	1	0.0	8	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

620 NE 6TH AVE							
Electricity	0	0	0	0	0.0	0	0
Subtotal 620 NE 6TH AVE	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

639 E OCEAN AVE STE 103							
Electricity	12	0	0	12	0.0	68	0
Subtotal 639 E OCEAN AVE S	12	0	0	12	0.0	68	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

639 E OCEAN AVE STE 107							
Electricity	7	0	0	7	0.0	40	0
Subtotal 639 E OCEAN AVE S	7	0	0	7	0.0	40	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
6635 N OCEAN BLVD # BCH PK							
Electricity	30	0	1	30	0.1	170	0
Subtotal 6635 N OCEAN BLVD	30	0	1	30	0.1	170	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

6635 N OCEAN BLVD # CONC							
Electricity	19	0	1	19	0.1	108	0
Subtotal 6635 N OCEAN BLVD	19	0	1	19	0.1	108	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

700 CASA LOMA BLVD # DOCK							
Electricity	13	0	1	13	0.0	73	0
Subtotal 700 CASA LOMA BLV	13	0	1	13	0.0	73	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

700 CASA LOMA BLVD # OL							
Electricity	2	0	0	2	0.0	13	0
Subtotal 700 CASA LOMA BLV	2	0	0	2	0.0	13	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

700 CASA LOMA BLVD # STORE							
Electricity	20	0	1	20	0.1	114	0
Subtotal 700 CASA LOMA BLV	20	0	1	20	0.1	114	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

700 NE 4TH AVE # PARK							
Electricity	2	0	0	2	0.0	10	0
Subtotal 700 NE 4TH AVE # PA	2	0	0	2	0.0	10	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
737 E OCEAN AVE IRRIGATIO #IRRIGATION							
Electricity	0	0	0	0	0.0	0	0
Subtotal 737 E OCEAN AVE IF	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

801 N CONGRESS AVE STE 111							
Electricity	13	0	1	13	0.0	75	0
Subtotal 801 N CONGRESS A	13	0	1	13	0.0	75	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8020 JOG RD # GCCLUBHSE&LS999							
Electricity	92	1	4	92	0.3	520	0
Propane	11	0	2	11	0.0	172	0
Subtotal 8020 JOG RD # GCC	103	1	6	103	0.4	693	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Propane use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in:
"Boynton Beach Heating Fuel Summary 2006.xls"

8020 JOG RD # SIGN							
Electricity	5	0	0	5	0.0	28	0
Subtotal 8020 JOG RD # SIGN	5	0	0	5	0.0	28	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8020 JOG RD #GC CART SHED							
Electricity	50	1	2	50	0.2	282	0
Subtotal 8020 JOG RD #GC C	50	1	2	50	0.2	282	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8020 JOG RD #GC MNT BDG							
Electricity	19	0	1	19	0.1	107	0
Subtotal 8020 JOG RD #GC M	19	0	1	19	0.1	107	0

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8020 JOG RD #GC-IRR PMPS

Electricity	129	2	5	129	0.4	729	0
Subtotal 8020 JOG RD #GC-IF	129	2	5	129	0.4	729	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

848 NW 13TH AVE

Electricity	1	0	0	1	0.0	5	0
Subtotal 848 NW 13TH AVE	1	0	0	1	0.0	5	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

915 S FEDERAL HWY

Electricity	6	0	0	6	0.0	33	0
Subtotal 915 S FEDERAL HW	6	0	0	6	0.0	33	0

EElectricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

915 S FEDERAL HWY # REAR

Electricity	10	0	0	10	0.0	58	0
Subtotal 915 S FEDERAL HW	10	0	0	10	0.0	58	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

NW 12TH AVE # WILSON PK POOL

Electricity	2	0	0	2	0.0	9	0
Subtotal NW 12TH AVE # WIL	2	0	0	2	0.0	9	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

NW 13TH AVE # WILSON PK LTS

Electricity	6	0	0	6	0.0	36	0
Subtotal NW 13TH AVE # WIL	6	0	0	6	0.0	36	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)

column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

NW 17TH AVE # NW 3RD LN # IRR

Electricity	0	0	0	0	0.0	0	0
Subtotal NW 17TH AVE # NW	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

S FEDERAL HWY # JAYCEE PK LTS

Electricity	0	0	0	0	0.0	0	0
Subtotal S FEDERAL HWY # J	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

SW 15TH AVE # BALL PARK LTS

Electricity	17	0	1	17	0.1	96	0
Subtotal SW 15TH AVE # BAL	17	0	1	17	0.1	96	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

W BOYNTON BEACH BLVD # GALAXY CTS

Electricity	3	0	0	3	0.0	20	0
Subtotal W BOYNTON BEACH	3	0	0	3	0.0	20	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

W BOYNTON BEACH BLVD # GALAXY FLD

Electricity	11	0	0	11	0.0	60	0
Subtotal W BOYNTON BEACH	11	0	0	11	0.0	60	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

W OCEAN DR # HIBISCUS PK

Electricity	0	0	0	0	0.0	0	0
Subtotal W OCEAN DR # HIBI	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Building or Facilities Group from excel spreadsheet

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
Subtotal Buildings and Facilities	5,710	69	234	5,736	19.6	32,582	0
Streetlights & Traffic Signals							
Boynton Beach, Florida							
141 E OCEAN AVE # BBE-0801-OL							
Electricity	1	0	0	1	0.0	7	0
Subtotal 141 E OCEAN AVE #	1	0	0	1	0.0	7	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Name of Street Light or Traffic Signal Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
141 E OCEAN AVE # E PARKLTS							
Electricity	4	0	0	4	0.0	22	0
Subtotal 141 E OCEAN AVE #	4	0	0	4	0.0	22	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Name of Street Light or Traffic Signal Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
215 E OCEAN AVE # LIGHTING							
Electricity	26	0	1	27	0.1	150	0
Subtotal 215 E OCEAN AVE #	26	0	1	27	0.1	150	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Name of Street Light or Traffic Signal Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
222 NE 9TH AVE # PW-2							
Electricity	28	0	1	28	0.1	158	0
Subtotal 222 NE 9TH AVE # P	28	0	1	28	0.1	158	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Name of Street Light or Traffic Signal Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
STREET LIGHTS # BOYNTON							
Electricity	1,172	14	48	1,177	4.0	6,641	0
Subtotal STREET LIGHTS # B	1,172	14	48	1,177	4.0	6,641	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Name of Street Light or Traffic Signal Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Subtotal Streetlights & Traffic Si	1,231	15	50	1,237	4.2	6,978	0
Water Delivery Facilities							
Boynton Beach, Florida							
1201 SW 3RD ST # WL 12 & 14							
Electricity	22	0	1	22	0.1	127	0
Subtotal 1201 SW 3RD ST # W	22	0	1	22	0.1	127	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

124 E WOOLBRIGHT RD # E WTR PLNT

Electricity	1,491	18	61	1,498	5.1	8,449	0
Propane	0	0	0	0	0.0	5	0
Subtotal 124 E WOOLBRIGHT	1,491	18	61	1,498	5.1	8,454	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Propane use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in:
"Boynton Beach Heating Fuel Summary 2006.xls"

160 N CONGRESS AVE # PN100

Electricity	0	0	0	0	0.0	0	0
Subtotal 160 N CONGRESS A	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

160 N CONGRESS AVE # PN99

Electricity	0	0	0	0	0.0	0	0
Subtotal 160 N CONGRESS A	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1900 CORPORATE DR # WLS-19-22

Electricity	294	4	12	295	1.0	1,665	0
Subtotal 1900 CORPORATE D	294	4	12	295	1.0	1,665	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
2611 SW 15TH AVE # WATER TANK							
Electricity	66	1	3	67	0.2	375	0
Subtotal 2611 SW 15TH AVE #	66	1	3	67	0.2	375	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

300 W WOOLBRIGHT RD # WELLS							
Electricity	222	3	9	223	0.8	1,261	0
Subtotal 300 W WOOLBRIGHT	222	3	9	223	0.8	1,261	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

300 W WOOLBRIGHT RD # WLS-6-7							
Electricity	216	3	9	217	0.7	1,226	0
Subtotal 300 W WOOLBRIGHT	216	3	9	217	0.7	1,226	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

345 SW 14TH AVE # WL13							
Electricity	29	0	1	29	0.1	164	0
Subtotal 345 SW 14TH AVE #	29	0	1	29	0.1	164	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3600 MINER RD # STORE TANK							
Electricity	137	2	6	138	0.5	778	0
Subtotal 3600 MINER RD # ST	137	2	6	138	0.5	778	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4693 W BOYNTON BEACH BLVD # W1							
Electricity	134	2	5	134	0.5	757	0
Subtotal 4693 W BOYNTON B	134	2	5	134	0.5	757	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
5469 W BOYNTON BEACH BLVD # W WTR PLT							
Electricity	4,929	59	200	4,952	16.9	27,933	0
Subtotal 5469 W BOYNTON B	4,929	59	200	4,952	16.9	27,933	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

600 E BOYNTON BEACH BLVD #LTS							
Electricity	15	0	1	15	0.1	87	0
Subtotal 600 E BOYNTON BE	15	0	1	15	0.1	87	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

6058 SUNBERRY CIR # WELL 4W							
Electricity	141	2	6	141	0.5	797	0
Subtotal 6058 SUNBERRY CIF	141	2	6	141	0.5	797	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7262 S MILITARY TRL #LS929							
Electricity	2	0	0	2	0.0	9	0
Subtotal 7262 S MILITARY TR	2	0	0	2	0.0	9	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9730 SILLS DR E # LFT 11							
Electricity	109	1	4	110	0.4	620	0
Subtotal 9730 SILLS DR E # LI	109	1	4	110	0.4	620	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9815 S MILITARY TRL # PN101							
Electricity	0	0	0	0	0.0	0	0
Subtotal 9815 S MILITARY TR	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
9941 MAJESTIC WAY # WELL 6W							
Electricity	274	3	11	275	0.9	1,550	0
Subtotal 9941 MAJESTIC WA	274	3	11	275	0.9	1,550	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
SW 17TH LN # WLS 15-18							
Electricity	416	5	17	418	1.4	2,357	0
Subtotal SW 17TH LN # WLS	416	5	17	418	1.4	2,357	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Water Delivery Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
Subtotal Water Delivery Facilities	8,498	102	346	8,537	29.1	48,161	0
Wastewater Facilities							
Boynton Beach, Florida							
1 NW 36 TER #LS 707							
Electricity	10	0	0	10	0.0	57	0
Subtotal 1 NW 36 TER #LS 70	10	0	0	10	0.0	57	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
1 SANDALWOOD DR # LS516							
Electricity	20	0	1	20	0.1	111	0
Subtotal 1 SANDALWOOD DR	20	0	1	20	0.1	111	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
10 E TARA LKS DR # LS 612							
Electricity	14	0	1	14	0.0	82	0
Subtotal 10 E TARA LKS DR #	14	0	1	14	0.0	82	0
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
10 MEADOWS BLVD # LS 615							
Electricity	9	0	0	9	0.0	52	0
Subtotal 10 MEADOWS BLVD	9	0	0	9	0.0	52	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

10002 GRANADA BAY # LS917							
Electricity	2	0	0	2	0.0	11	0
Subtotal 10002 GRANADA BA	2	0	0	2	0.0	11	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

10355 S MILITARY TRL #LS901A							
Electricity	20	0	1	20	0.1	113	0
Subtotal 10355 S MILITARY Tl	20	0	1	20	0.1	113	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

10626 LAWRENCE RD # LS801							
Electricity	113	1	5	113	0.4	640	0
Subtotal 10626 LAWRENCE R	113	1	5	113	0.4	640	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

10650 S MILITARY TRL # 910							
Electricity	2	0	0	2	0.0	9	0
Subtotal 10650 S MILITARY Tl	2	0	0	2	0.0	9	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

10773 QUAIL COVEY RD # LS703							
Electricity	3	0	0	3	0.0	17	0
Subtotal 10773 QUAIL COVEY	3	0	0	3	0.0	17	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
10808 GREENTRAIL DR S # LS814							
Electricity	5	0	0	5	0.0	26	0
Subtotal 10808 GREENTRAIL	5	0	0	5	0.0	26	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1090 SW 24TH AVE # LS608							
Electricity	2	0	0	2	0.0	9	0
Subtotal 1090 SW 24TH AVE #	2	0	0	2	0.0	9	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1100 NW 9TH WAY # LS 507							
Electricity	3	0	0	3	0.0	18	0
Subtotal 1100 NW 9TH WAY #	3	0	0	3	0.0	18	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

11390 QUAIL COVEY # LS702							
Electricity	3	0	0	3	0.0	17	0
Subtotal 11390 QUAIL COVEY	3	0	0	3	0.0	17	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1145 MENTONE RD # LS302							
Electricity	3	0	0	3	0.0	17	0
Subtotal 1145 MENTONE RD #	3	0	0	3	0.0	17	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1155 QUANTUM LAKES DR # LS 510							
Electricity	8	0	0	8	0.0	45	0
Subtotal 1155 QUANTUM LAK	8	0	0	8	0.0	45	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
11601 CASCADE LAKES BLVD #LS925							
Electricity	4	0	0	4	0.0	24	0
Subtotal 11601 CASCADE LAI	4	0	0	4	0.0	24	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

12120 LAVITA WAY # LS927							
Electricity	3	0	0	3	0.0	19	0
Subtotal 12120 LAVITA WAY #	3	0	0	3	0.0	19	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1219 S CONGRESS AVE # PMP							
Electricity	0	0	0	0	0.0	0	0
Subtotal 1219 S CONGRESS A	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1246 SUSSEX ST # LS913							
Electricity	9	0	0	9	0.0	52	0
Subtotal 1246 SUSSEX ST # L	9	0	0	9	0.0	52	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

12550 S MILITARY TRL # LS923							
Electricity	6	0	0	6	0.0	32	0
Subtotal 12550 S MILITARY TI	6	0	0	6	0.0	32	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1304 SW 16TH ST # LS605							
Electricity	2	0	0	2	0.0	10	0
Subtotal 1304 SW 16TH ST # L	2	0	0	2	0.0	10	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
1340 SW 27TH AVE # LS609							
Electricity	26	0	1	26	0.1	146	0
Subtotal 1340 SW 27TH AVE #	26	0	1	26	0.1	146	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1359 NW 22ND AVE # LS 708							
Electricity	35	0	1	35	0.1	196	0
Subtotal 1359 NW 22ND AVE	35	0	1	35	0.1	196	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1401 N CONGRESS AVE # LS 719							
Electricity	9	0	0	9	0.0	51	0
Subtotal 1401 N CONGRESS A	9	0	0	9	0.0	51	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

145 N PALM DR # LS304							
Electricity	1	0	0	1	0.0	5	0
Subtotal 145 N PALM DR # LS	1	0	0	1	0.0	5	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1488 HYPOLUXO RD # LS303							
Electricity	11	0	0	11	0.0	63	0
Subtotal 1488 HYPOLUXO RD	11	0	0	11	0.0	63	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1500 NW 22ND AVE # LS 706							
Electricity	3	0	0	3	0.0	18	0
Subtotal 1500 NW 22ND AVE	3	0	0	3	0.0	18	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
1527 NW 2ND AVE # LS317M							
Electricity	194	2	8	195	0.7	1,099	0
Subtotal 1527 NW 2ND AVE #	194	2	8	195	0.7	1,099	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1530 W BOYNTON BEACH BLVD # LS508							
Electricity	0	0	0	0	0.0	0	0
Subtotal 1530 W BOYNTON B	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1599 SW 30TH AVE # LS-611							
Electricity	6	0	0	6	0.0	36	0
Subtotal 1599 SW 30TH AVE #	6	0	0	6	0.0	36	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1721 STONEHAVEN DR # LS614							
Electricity	4	0	0	4	0.0	25	0
Subtotal 1721 STONEHAVEN	4	0	0	4	0.0	25	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

18 BRENTWOOD DR # LS 716							
Electricity	5	0	0	5	0.0	28	0
Subtotal 18 BRENTWOOD DR	5	0	0	5	0.0	28	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1800 SW CONGRESS BLVD # LS604							
Electricity	7	0	0	7	0.0	38	0
Subtotal 1800 SW CONGRES	7	0	0	7	0.0	38	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
1801 OCEAN DR # LS601							
Electricity	9	0	0	9	0.0	52	0
Subtotal 1801 OCEAN DR # LS	9	0	0	9	0.0	52	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1810 NEW PALM WAY # LS202							
Electricity	7	0	0	7	0.0	40	0
Subtotal 1810 NEW PALM WA	7	0	0	7	0.0	40	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1900 CORPORATE BLVD # LS613							
Electricity	1	0	0	1	0.0	6	0
Subtotal 1900 CORPORATE B	1	0	0	1	0.0	6	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1900 S CONGRESS AVE # LS 705							
Electricity	5	0	0	5	0.0	31	0
Subtotal 1900 S CONGRESS A	5	0	0	5	0.0	31	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1909 SW 18TH ST # LS606							
Electricity	15	0	1	15	0.1	87	0
Subtotal 1909 SW 18TH ST # L	15	0	1	15	0.1	87	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

1931 N SEACREST BLVD # LS309							
Electricity	125	2	5	126	0.4	711	0
Subtotal 1931 N SEACREST B	125	2	5	126	0.4	711	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
195 SE 27TH WAY # LS410							
Electricity	4	0	0	4	0.0	25	0
Subtotal 195 SE 27TH WAY #	4	0	0	4	0.0	25	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2015 S FEDERAL HWY # LS414							
Electricity	5	0	0	5	0.0	26	0
Subtotal 2015 S FEDERAL HV	5	0	0	5	0.0	26	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

21 WOODS LN # LS803							
Electricity	3	0	0	3	0.0	18	0
Subtotal 21 WOODS LN # LS8	3	0	0	3	0.0	18	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

220 BAYVIEW AVE # LS305							
Electricity	1	0	0	1	0.0	7	0
Subtotal 220 BAYVIEW AVE #	1	0	0	1	0.0	7	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2203 1/2 SW ROMA WAY # LS607							
Electricity	1	0	0	1	0.0	6	0
Subtotal 2203 1/2 SW ROMA V	1	0	0	1	0.0	6	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2240 N FEDERAL HWY							
Electricity	41	0	2	41	0.1	231	0
Subtotal 2240 N FEDERAL HV	41	0	2	41	0.1	231	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
2399 QUANTUM BLVD # LS 512							
Electricity	7	0	0	7	0.0	38	0
Subtotal 2399 QUANTUM BLV	7	0	0	7	0.0	38	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

24 SOUTHPORT LN # LS812							
Electricity	5	0	0	5	0.0	27	0
Subtotal 24 SOUTHPORT LN	5	0	0	5	0.0	27	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2590 N SEACREST BLVD # LS307							
Electricity	6	0	0	6	0.0	35	0
Subtotal 2590 N SEACREST B	6	0	0	6	0.0	35	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2612 SW 23RD CIRCLE DR # LS807							
Electricity	22	0	1	22	0.1	123	0
Subtotal 2612 SW 23RD CIRC	22	0	1	22	0.1	123	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2709 SW 6TH ST # LS405							
Electricity	15	0	1	15	0.1	86	0
Subtotal 2709 SW 6TH ST # L	15	0	1	15	0.1	86	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

28 STRATFORD LN W # LS813							
Electricity	6	0	0	6	0.0	33	0
Subtotal 28 STRATFORD LN W	6	0	0	6	0.0	33	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
2800 SW GOLF RD # LS518							
Electricity	2	0	0	2	0.0	11	0
Subtotal 2800 SW GOLF RD #	2	0	0	2	0.0	11	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

2870 S FEDERAL HWY # LS207							
Electricity	6	0	0	6	0.0	32	0
Subtotal 2870 S FEDERAL HV	6	0	0	6	0.0	32	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3000 NW COMMERCE PARK DR #LS718							
Electricity	5	0	0	5	0.0	29	0
Subtotal 3000 NW COMMERC	5	0	0	5	0.0	29	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3010 S SEACREST BLVD # LS306							
Electricity	5	0	0	5	0.0	29	0
Subtotal 3010 S SEACREST B	5	0	0	5	0.0	29	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3111 S CONGRESS AVE # IRRIG							
Electricity	17	0	1	18	0.1	99	0
Subtotal 3111 S CONGRESS A	17	0	1	18	0.1	99	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3285 QUANTUM BLVD # LS 511							
Electricity	5	0	0	5	0.0	27	0
Subtotal 3285 QUANTUM BLV	5	0	0	5	0.0	27	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
3401 S CONGRESS AVE # LS816							
Electricity	1	0	0	1	0.0	8	0
Subtotal 3401 S CONGRESS A	1	0	0	1	0.0	8	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

344 SW 6TH AVE # LS402							
Electricity	3	0	0	3	0.0	15	0
Subtotal 344 SW 6TH AVE # L	3	0	0	3	0.0	15	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3445 N FEDERAL HWY # LS-208							
Electricity	1	0	0	1	0.0	3	0
Subtotal 3445 N FEDERAL HW	1	0	0	1	0.0	3	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3506 SE 2ND CT # LS409							
Electricity	1	0	0	1	0.0	6	0
Subtotal 3506 SE 2ND CT # LS	1	0	0	1	0.0	6	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

360 MAIN BLVD # LS404							
Electricity	1	0	0	1	0.0	7	0
Subtotal 360 MAIN BLVD # LS	1	0	0	1	0.0	7	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3609 S FEDERAL HWY # LS413							
Electricity	2	0	0	2	0.0	9	0
Subtotal 3609 S FEDERAL HW	2	0	0	2	0.0	9	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
3625 S CONGRESS AVE # LS806							
Electricity	15	0	1	16	0.1	87	0
Subtotal 3625 S CONGRESS A	15	0	1	16	0.1	87	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

37 COCOA PINE DR # LS 915							
Electricity	3	0	0	3	0.0	15	0
Subtotal 37 COCOA PINE DR	3	0	0	3	0.0	15	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3769 SILVER LACE LN # LS811							
Electricity	7	0	0	7	0.0	42	0
Subtotal 3769 SILVER LACE L	7	0	0	7	0.0	42	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3800 S CONGRESS AVE # LS610							
Electricity	3	0	0	3	0.0	19	0
Subtotal 3800 S CONGRESS A	3	0	0	3	0.0	19	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3883 WINFIELD RD # LS701							
Electricity	2	0	0	2	0.0	10	0
Subtotal 3883 WINFIELD RD #	2	0	0	2	0.0	10	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

3951 N OCEAN BLVD # LS104							
Electricity	0	0	0	0	0.0	2	0
Subtotal 3951 N OCEAN BLVD	0	0	0	0	0.0	2	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
4030 PALO VERDE DR # LS810							
Electricity	4	0	0	4	0.0	24	0
Subtotal 4030 PALO VERDE D	4	0	0	4	0.0	24	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4100 NW 7TH CT # LS717							
Electricity	7	0	0	7	0.0	39	0
Subtotal 4100 NW 7TH CT # L	7	0	0	7	0.0	39	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4101 MAHOGANY BAY DR # LS720							
Electricity	9	0	0	9	0.0	53	0
Subtotal 4101 MAHOGANY BA	9	0	0	9	0.0	53	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4290 ROYAL MANOR BLVD # LS918							
Electricity	5	0	0	5	0.0	29	0
Subtotal 4290 ROYAL MANOR	5	0	0	5	0.0	29	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4455 CARYOTA DR # LS809							
Electricity	2	0	0	2	0.0	12	0
Subtotal 4455 CARYOTA DR #	2	0	0	2	0.0	12	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4512 N OCEAN BLVD # LS102							
Electricity	6	0	0	6	0.0	37	0
Subtotal 4512 N OCEAN BLVD	6	0	0	6	0.0	37	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
4600 N OCEAN BLVD # LS101							
Electricity	1	0	0	1	0.0	3	0
Subtotal 4600 N OCEAN BLVD	1	0	0	1	0.0	3	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4722 BUCIDA RD # LS 911							
Electricity	2	0	0	2	0.0	10	0
Subtotal 4722 BUCIDA RD # L	2	0	0	2	0.0	10	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4755 STORKWOOD TER # LS805							
Electricity	2	0	0	2	0.0	10	0
Subtotal 4755 STORKWOOD T	2	0	0	2	0.0	10	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4802 N OCEAN BLVD # LFT 103							
Electricity	5	0	0	5	0.0	28	0
Subtotal 4802 N OCEAN BLVD	5	0	0	5	0.0	28	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4901 GOLF RD # LS 316							
Electricity	51	1	2	51	0.2	289	0
Subtotal 4901 GOLF RD # LS	51	1	2	51	0.2	289	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

4945 PALO VERDE DR # LS808							
Electricity	1	0	0	1	0.0	7	0
Subtotal 4945 PALO VERDE D	1	0	0	1	0.0	7	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
502 VENICE DR # LS505							
Electricity	0	0	0	0	0.0	2	0
Subtotal 502 VENICE DR # LS	0	0	0	0	0.0	2	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

5199 TARTAN LAKES BLVD # LS903							
Electricity	4	0	0	4	0.0	24	0
Subtotal 5199 TARTAN LAKES	4	0	0	4	0.0	24	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

522 INDUSTRIAL AVE # LS 501							
Electricity	3	0	0	3	0.0	18	0
Subtotal 522 INDUSTRIAL AVI	3	0	0	3	0.0	18	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

5230 FLAVOR PICT RD # LS 924							
Electricity	6	0	0	6	0.0	35	0
Subtotal 5230 FLAVOR PICT F	6	0	0	6	0.0	35	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

5317 MIRROR LAKES BLVD # LS902							
Electricity	3	0	0	3	0.0	19	0
Subtotal 5317 MIRROR LAKES	3	0	0	3	0.0	19	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

5333 BRIAN BLVD # LS 906							
Electricity	4	0	0	4	0.0	22	0
Subtotal 5333 BRIAN BLVD # L	4	0	0	4	0.0	22	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
5351 PALM CHASE DR # LS 907							
Electricity	4	0	0	4	0.0	25	0
Subtotal 5351 PALM CHASE D	4	0	0	4	0.0	25	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

5469 BOYNTON BEACH BLVD # LS804							
Electricity	0	0	0	0	0.0	2	0
Subtotal 5469 BOYNTON BEA	0	0	0	0	0.0	2	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

550 SW 3RD ST #LS#415							
Electricity	0	0	0	0	0.0	0	0
Subtotal 550 SW 3RD ST #LS#	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

5501 PARK RIDGE BLVD # LS509							
Electricity	6	0	0	6	0.0	33	0
Subtotal 5501 PARK RIDGE B	6	0	0	6	0.0	33	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

600 SW 6TH AVE # LS603							
Electricity	7	0	0	7	0.0	38	0
Subtotal 600 SW 6TH AVE # L	7	0	0	7	0.0	38	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

615 POTTER RD # LS201							
Electricity	8	0	0	8	0.0	46	0
Subtotal 615 POTTER RD # LS	8	0	0	8	0.0	46	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
635 E BOYNTON BEACH BLVD # SVC PT 1							
Electricity	24	0	1	25	0.1	139	0
Subtotal 635 E BOYNTON BE	24	0	1	25	0.1	139	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

635 E BOYNTON BEACH BLVD # SVC PT 2							
Electricity	3	0	0	3	0.0	15	0
Subtotal 635 E BOYNTON BE	3	0	0	3	0.0	15	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

649 SUNNY SOUTH AVE # LS-704							
Electricity	1	0	0	1	0.0	5	0
Subtotal 649 SUNNY SOUTH A	1	0	0	1	0.0	5	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

6880 LAWRENCE RD # LS711							
Electricity	3	0	0	3	0.0	15	0
Subtotal 6880 LAWRENCE RD	3	0	0	3	0.0	15	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

6999 NAUTICA SOUND BLVD # LS922							
Electricity	5	0	0	5	0.0	27	0
Subtotal 6999 NAUTICA SOUI	5	0	0	5	0.0	27	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

705 E BOYNTON BEACH BLVD # LS356M							
Electricity	225	3	9	226	0.8	1,273	0
Subtotal 705 E BOYNTON BE	225	3	9	226	0.8	1,273	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
7050 S FEDERAL HWY # LS 205							
Electricity	6	0	0	6	0.0	32	0
Subtotal 7050 S FEDERAL HW	6	0	0	6	0.0	32	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7182 OLD ORCHARD WAY #LS928							
Electricity	3	0	0	3	0.0	16	0
Subtotal 7182 OLD ORCHARD	3	0	0	3	0.0	16	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7200 E OAKRIDGE CIR # LS301							
Electricity	0	0	0	0	0.0	3	0
Subtotal 7200 E OAKRIDGE C	0	0	0	0	0.0	3	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7200 LAWRENCE RD #LS 920							
Electricity	1	0	0	1	0.0	3	0
Subtotal 7200 LAWRENCE RD	1	0	0	1	0.0	3	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7255 S MILITARY TRL # LS909							
Electricity	2	0	0	2	0.0	9	0
Subtotal 7255 S MILITARY TR	2	0	0	2	0.0	9	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7280 PALMDALE DR # LS714							
Electricity	8	0	0	8	0.0	47	0
Subtotal 7280 PALMDALE DR	8	0	0	8	0.0	47	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
7296 S FEDERAL HWY # LS							
Electricity	3	0	0	3	0.0	18	0
Subtotal 7296 S FEDERAL HW	3	0	0	3	0.0	18	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7362 S FEDERAL HWY # LS 210							
Electricity	5	0	0	5	0.0	28	0
Subtotal 7362 S FEDERAL HW	5	0	0	5	0.0	28	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7501 LAWRENCE RD # LS 713							
Electricity	4	0	0	4	0.0	22	0
Subtotal 7501 LAWRENCE RD	4	0	0	4	0.0	22	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7580 S FEDERAL HWY # LS 209							
Electricity	0	0	0	0	0.0	3	0
Subtotal 7580 S FEDERAL HW	0	0	0	0	0.0	3	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

7830 S MILITARY TRL # LS 926							
Electricity	2	0	0	2	0.0	10	0
Subtotal 7830 S MILITARY TR	2	0	0	2	0.0	10	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

800 OCEAN DR # LS602							
Electricity	32	0	1	32	0.1	183	0
Subtotal 800 OCEAN DR # LS	32	0	1	32	0.1	183	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
8004 US HIGHWAY 1 # LS312							
Electricity	4	0	0	4	0.0	23	0
Subtotal 8004 US HIGHWAY 1	4	0	0	4	0.0	23	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

801 N CONGRESS AVE # LS712							
Electricity	1	0	0	1	0.0	4	0
Subtotal 801 N CONGRESS A	1	0	0	1	0.0	4	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8020 LAWRENCE RD # LS319							
Electricity	64	1	3	64	0.2	362	0
Subtotal 8020 LAWRENCE RD	64	1	3	64	0.2	362	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

815 W BOYNTON BEACH BLVD # IRR							
Electricity	0	0	0	0	0.0	0	0
Subtotal 815 W BOYNTON BE	0	0	0	0	0.0	0	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

815 W BOYNTON BEACH BLVD # LS513							
Electricity	2	0	0	2	0.0	12	0
Subtotal 815 W BOYNTON BE	2	0	0	2	0.0	12	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8150 S FEDERAL HWY # LS 314							
Electricity	2	0	0	2	0.0	12	0
Subtotal 8150 S FEDERAL HW	2	0	0	2	0.0	12	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
8194 SUN UP TRL # LS919							
Electricity	1	0	0	1	0.0	5	0
Subtotal 8194 SUN UP TRL #	1	0	0	1	0.0	5	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8207 AMBACH WAY # LS311							
Electricity	2	0	0	2	0.0	9	0
Subtotal 8207 AMBACH WAY	2	0	0	2	0.0	9	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8265 BERMUDA SOUND WAY #LS 921							
Electricity	2	0	0	2	0.0	13	0
Subtotal 8265 BERMUDA SOU	2	0	0	2	0.0	13	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

848 NW 13TH AVE # LS503							
Electricity	4	0	0	4	0.0	21	0
Subtotal 848 NW 13TH AVE #	4	0	0	4	0.0	21	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

8484 NORTHSTAR AVE # LS912							
Electricity	10	0	0	10	0.0	55	0
Subtotal 8484 NORTHSTAR A	10	0	0	10	0.0	55	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

900 MISSION HILL RD # LS408B							
Electricity	7	0	0	7	0.0	37	0
Subtotal 900 MISSION HILL R	7	0	0	7	0.0	37	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
906 S FEDERAL HWY # LS206							
Electricity	1	0	0	1	0.0	7	0
Subtotal 906 S FEDERAL HW	1	0	0	1	0.0	7	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9135 LAWRENCE RD #LIFT STA 721							
Electricity	1	0	0	1	0.0	4	0
Subtotal 9135 LAWRENCE RD	1	0	0	1	0.0	4	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9507 CYPRESS PARK WAY # LS908							
Electricity	1	0	0	1	0.0	6	0
Subtotal 9507 CYPRESS PAR	1	0	0	1	0.0	6	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9656 SILLS DR E # LFT 9							
Electricity	204	2	8	205	0.7	1,156	0
Subtotal 9656 SILLS DR E # L	204	2	8	205	0.7	1,156	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9667 CALLIANDRA DR # LS715							
Electricity	2	0	0	2	0.0	12	0
Subtotal 9667 CALLIANDRA D	2	0	0	2	0.0	12	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9760 S MILITARY TRL # LS905							
Electricity	1	0	0	1	0.0	7	0
Subtotal 9760 S MILITARY TR	1	0	0	1	0.0	7	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
9779 PLATINA AVE # LS914							
Electricity	18	0	1	18	0.1	100	0
Subtotal 9779 PLATINA AVE #	18	0	1	18	0.1	100	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9870 PINEAPPLE TREE DR # LS 802							
Electricity	7	0	0	7	0.0	42	0
Subtotal 9870 PINEAPPLE TR	7	0	0	7	0.0	42	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

9903 S MILITARY TRL # LS 904							
Electricity	1	0	0	1	0.0	7	0
Subtotal 9903 S MILITARY TR	1	0	0	1	0.0	7	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

BOYNTON LAKES BLVD #LS 517							
Electricity	9	0	0	9	0.0	50	0
Subtotal BOYNTON LAKES BL	9	0	0	9	0.0	50	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

BOYNTON LAKES BLVD #LS 520							
Electricity	3	0	0	3	0.0	16	0
Subtotal BOYNTON LAKES BL	3	0	0	3	0.0	16	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

CHAPEL HILL BLVD # LS406							
Electricity	8	0	0	8	0.0	43	0
Subtotal CHAPEL HILL BLVD #	8	0	0	8	0.0	43	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
CHURCHILL RD # LS407							
Electricity	1	0	0	1	0.0	8	0
Subtotal CHURCHILL RD # LS	1	0	0	1	0.0	8	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

CONGRESS AVE # LS 709							
Electricity	3	0	0	3	0.0	16	0
Subtotal CONGRESS AVE # L	3	0	0	3	0.0	16	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

CORAL DR # LS506							
Electricity	0	0	0	0	0.0	2	0
Subtotal CORAL DR # LS506	0	0	0	0	0.0	2	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

HIGH POINT BLVD # LS403							
Electricity	4	0	0	4	0.0	23	0
Subtotal HIGH POINT BLVD #	4	0	0	4	0.0	23	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

MEADOWS BLVD # LS710							
Electricity	12	0	1	13	0.0	71	0
Subtotal MEADOWS BLVD # L	12	0	1	13	0.0	71	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

N FEDERAL HWY # LS203							
Electricity	4	0	0	4	0.0	22	0
Subtotal N FEDERAL HWY # L	4	0	0	4	0.0	22	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
N SWINTON AVE # LS411							
Electricity	2	0	0	2	0.0	14	0
Subtotal N SWINTON AVE # L	2	0	0	2	0.0	14	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

NE 12TH AVE # LS204							
Electricity	3	0	0	3	0.0	14	0
Subtotal NE 12TH AVE # LS2(	3	0	0	3	0.0	14	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

NE 22ND AVE AND 4 ST # LS308							
Electricity	7	0	0	7	0.0	42	0
Subtotal NE 22ND AVE AND 4	7	0	0	7	0.0	42	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

NE 4TH ST AND 16 AVE # LS 310							
Electricity	22	0	1	23	0.1	127	0
Subtotal NE 4TH ST AND 16 A	22	0	1	23	0.1	127	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

NE 4TH ST AND 26 AVE # LS 315							
Electricity	7	0	0	7	0.0	39	0
Subtotal NE 4TH ST AND 26 A	7	0	0	7	0.0	39	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

NW 3RD ST AND CANAL # LS313							
Electricity	15	0	1	15	0.1	84	0
Subtotal NW 3RD ST AND CA	15	0	1	15	0.1	84	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
NW 8TH AVE AND 10 ST # LS502							
Electricity	9	0	0	9	0.0	51	0
Subtotal NW 8TH AVE AND 1(	9	0	0	9	0.0	51	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

PINETREE DR # LS815							
Electricity	1	0	0	1	0.0	8	0
Subtotal PINETREE DR # LS8	1	0	0	1	0.0	8	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

SE 23RD AVE AND US 1 # LS412							
Electricity	3	0	0	3	0.0	17	0
Subtotal SE 23RD AVE AND U	3	0	0	3	0.0	17	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

South Central Regional Wastewater Treatment Plant							
Electricity	4,857	59	198	4,879	16.6	27,526	0
Nitrous Oxide	0	1,220	0	378	1.3	0	0
Subtotal South Central Region	4,857	1,279	198	5,258	17.9	27,526	0

Data provided by Dennis Coates, Executive Director of the South Central Regional Wastewater Treatment and Disposal Board. N2O from nitrification and and effluent discharge. Calculated using equations 10.8 and 10.9 from the Local Government Operations Protocol.
"Boynton Beach WWTP calcs_020410.xls"
"Boynton Beach WWTP electricity calcs.xls"

SW 3RD ST AND 1ST AVE # LS401							
Electricity	2	0	0	2	0.0	10	0
Subtotal SW 3RD ST AND 1ST	2	0	0	2	0.0	10	0

Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE.
"fpl 0607 green request_sorted.xls"

W BOYNTON BEACH BLVD # LS504							
Electricity	4	0	0	4	0.0	25	0
Subtotal W BOYNTON BEACH	4	0	0	4	0.0	25	0

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Electricity use compiled by Sue Moroney, City of Boynton Beach Finance Department. Name of Wastewater Group from excel spreadsheet column labeled PREM_ADDR_COMPLETE. "fpl 0607 green request_sorted.xls"							
Subtotal Wastewater Facilities	6,678	1,300	272	7,087	24.2	37,848	0
Vehicle Fleet							
Boynton Beach, Florida							
100 E Boynton Beach Blvd							
OFF ROAD Diesel	77	0	0	77	0.3	1,047	0
Subtotal 100 E Boynton Beach	77	0	0	77	0.3	1,047	0
Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"							
Total diesel use entered as off-road construction equipment.							
1155 Quamtum Dr (Lift Station #510)							
OFF ROAD Diesel	5	0	0	5	0.0	71	0
Subtotal 1155 Quamtum Dr (Li	5	0	0	5	0.0	71	0
Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"							
Total diesel use entered as off-road construction equipment.							
124 E Woolbrite Road							
OFF ROAD Diesel	38	0	0	38	0.1	524	0
Subtotal 124 E Woolbrite Roac	38	0	0	38	0.1	524	0
Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"							
Total diesel use entered as off-road construction equipment.							
222 NE 9th Ave (Vehicle Parts Warehouse)							
Diesel	2,115	6	4	2,117	7.2	28,909	0
Gasoline	2,250	153	111	2,299	7.8	31,737	0
Subtotal 222 NE 9th Ave (Vehi	4,364	159	115	4,416	15.1	60,646	0
Gasoline and diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"							
Total fuel quantities entered in the "Light Trucks Alt. Method" category							

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
5469 W Boynton Beach Blvd.							
OFF ROAD Diesel	38	0	0	38	0.1	523	0
Subtotal 5469 W Boynton Beac	38	0	0	38	0.1	523	0

Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"

Total diesel use entered as off-road construction equipment.

5501 Park Ridge Blvd (Lift Station #509)							
OFF ROAD Diesel	5	0	0	5	0.0	68	0
Subtotal 5501 Park Ridge Blvd	5	0	0	5	0.0	68	0

Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"

Total diesel use entered as off-road construction equipment.

8020 Jog Road (Golf Course)							
OFF ROAD Diesel	30	0	0	30	0.1	405	0
OFF ROAD Gasoline	31	0	0	31	0.1	435	0
Subtotal 8020 Jog Road (Golf C	60	0	0	60	0.2	840	0

Gasoline and diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"

Total fuel use entered as off-road construction equipment.

Congress St (lift station)							
OFF ROAD Diesel	7	0	0	7	0.0	94	0
Subtotal Congress St (lift statio	7	0	0	7	0.0	94	0

Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"

Total diesel use entered as off-road construction equipment.

Station #309							
OFF ROAD Diesel	1	0	0	1	0.0	13	0
Subtotal Station #309	1	0	0	1	0.0	13	0

Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"

Total diesel use entered as off-road construction equipment.

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Station #316							
OFF ROAD Diesel	3	0	0	3	0.0	41	0
Subtotal Station #316	3	0	0	3	0.0	41	0
Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"							
Total diesel use entered as off-road construction equipment.							
Station #3356							
OFF ROAD Diesel	5	0	0	5	0.0	70	0
Subtotal Station #3356	5	0	0	5	0.0	70	0
Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"							
Total diesel use entered as off-road construction equipment.							
Station #801							
OFF ROAD Diesel	1	0	0	1	0.0	16	0
Subtotal Station #801	1	0	0	1	0.0	16	0
Diesel use provided by Chris Roschek and Sue Moroney, City of Boynton Beach. Hard copy bills summarized in: "Boynton Beach Transportation Fuel Summary 2006.xls"							
Total diesel use entered as off-road construction equipment.							
Subtotal Vehicle Fleet	4,605	159	115	4,657	15.9	63,953	0
Employee Commute							
Boynton Beach, Florida							
Employee Commuting							
Gasoline	1,446	91	86	1,476	5.0	20,402	0
Subtotal Employee Commuting	1,446	91	86	1,476	5.0	20,402	0
Employee home zip codes provided by Sharyn Goebelt, City of Boynton Beach.							
Distance to City Hall was estimated based on employee home zip codes and using GIS. Assumes single occupancy vehicles driving round-trip 235 days per year (5 day work week - 10 holidays, 10 vacation days, 5 sick days). For employees covered by FL Statute 119, the average distance for other employees was applied. "EE Address list for Green Team 9-10-09_with commute.xls"							
Subtotal Employee Commute	1,446	91	86	1,476	5.0	20,402	0

Government Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	(%)	Energy (MMBtu)	Cost ($)
Other Process Fugitive							
Boynton Beach, Florida							
Municipal Solid Waste							
Carbon Dioxide	534	0	0	534	1.8		
Methane	0	0	1,780	37	0.1		
Nitrous Oxide	0	20	0	6	0.0		
Subtotal Municipal Solid Waste	534	20	1,780	578	2.0		

Emissions from the Solid Waste Authority North County Resource Recovery Facility (NCRRF). NCRRF includes a municipal solid waste (MSW) landfill and waste to energy facility (WTE). Emissions were calculated using LGOP Chapter 9.3.2 Landfills with Comprehensive LFG Collection Systems and the EPA Mandatory GHG Reporting Rule Subpart C (Stationary Combustion). NCRRF data provided by Ravi Kadambala, CDM. Emissions are relative to the City Operations contribution to the total MSW received at NCRRF.

CO2 emissions are from the combustion of MSW at the WTE.

CH4 emissions mostly from landfill, small portion are from the combustion of MSW at the WTE.

N2O emissions are from the combustion of MSW at the WTE.

"Boynton Beach Solid Waste calcs.xls"

Subtotal Other Process Fugitive	534	20	1,780	578	2.0		
Refrigerants All Sectors							
Boynton Beach, Florida							
Refrigerants							
HFC-134a 236cb 43-10me	0	0	0	2	0.0		
R-402B Blend	0	0	0	1	0.0		
R-404A Blend	0	0	0	23	0.1		
Subtotal Refrigerants	0	0	0	26	0.1		

Provided by Vic Wooten, City of Boynton Beach; from 12/09 - prior year information not available.
"Boynton Beach Refrigerant calcs.xls"

Subtotal Refrigerants All Sectors	0	0	0	26	0.1		
Total	28,703	1,756	2,882	29,334	100.0	209,924	0

Boynton Beach

Community Greenhouse Gas Emissions in 2006

Summary Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)
Residential	235,741	2,832	9,633	236,821	25.2	1,347,138
Commercial	196,930	2,323	8,275	197,824	21.1	1,181,256
Industrial	4,391	53	179	4,411	0.5	24,961
Transportation	458,039	25,015	21,351	466,242	49.7	6,429,631
Other	30,456	1,410	101,180	33,018	3.5	
Total	925,557	31,633	140,618	938,316	100.0	8,982,987

Boynton Beach

Community Greenhouse Gas Emissions in 2006

Report by Source

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)
Biodiesel (B100)	0	0	0	0	0.0	957
Carbon Dioxide	30,461	0	0	30,461	3.2	
Diesel	75,237	222	228	75,311	8.0	1,028,530
Electricity	431,251	5,197	17,540	433,231	46.2	2,443,977
Fuel Oil (#1 2 4)	9	0	1	9	0.0	127
Gasoline	381,543	24,761	21,023	389,660	41.5	5,382,942
Methane	0	0	101,181	2,125	0.2	
Natural Gas	5,797	11	546	5,812	0.6	109,251
Nitrous Oxide	0	1,410	0	437	0.0	
OFF ROAD Diesel	1,259	0	0	1,259	0.1	17,202
Total	925,557	31,601	140,519	938,304	100.0	8,982,987

Fuel costs include Buildings, Vehicle Fleet, Streetlights and Water/Sewage sectors only.
This report has been generated for Boynton Beach, Florida using ICLEI's Clean Air and Climate Protection 2009 Software.

Community Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)
Residential						
Boynton Beach, Florida						
Residential						
Electricity	234,895	2,831	9,554	235,973	25.1	1,331,189
Fuel Oil (#1 2 4)	0	0	0	0	0.0	2
Natural Gas	846	2	80	848	0.1	15,947
Subtotal Residential	235,741	2,832	9,633	236,821	25.2	1,347,138

Electricity provided by Claudia M Thompson, Account Specialist, FPL
"Boynton_Beach_elect.xls"

Natural Gas provided by Bill McGoldrick, FPU.
Email 1/5/2010 "2006 Natural Gas Usage for the City of Boynton Beach.pdf"
"Boynton Beach Community NG usage.xls"

Fuel oil calculated using EIA state consumption rates, per sector. Extrapolated using Boynton Beach v. Florida population:
http://tonto.eia.doe.gov/dnav/pet/pet_sum_top.asp --> Consumption and Sales --> Sales of Fuel Oil and Kerosene
"Boynton Beach - Fuel Use Calcs.xls"

Subtotal Residential	235,741	2,832	9,633	236,821	25.2	1,347,138
Commercial						
Boynton Beach, Florida						
Commerical						
Electricity	191,979	2,314	7,808	192,860	20.6	1,087,976
Fuel Oil (#1 2 4)	6	0	1	6	0.0	79
Natural Gas	4,945	9	466	4,958	0.5	93,201
Carbon Dioxide	1	0	0	1	0.0	0
Methane	0	0	0	0	0.0	0
Nitrous Oxide	0	0	0	0	0.0	0
Subtotal Commerical	196,930	2,323	8,275	197,824	21.1	1,181,256

Electricity provided by Claudia M Thompson, Account Specialist, FPL. Actual City operations usage subtracted from the Commercial Sector. Also includes county and state accounts.
"Boynton_Beach_elect.xls"

Natural Gas provided by Bill McGoldrick, FPU. Email 1/5/2010, 1/28/2010. Commercial includes Public Authority category minus actual City Operations usage to avoid double counting. Public Authority category includes City Operations and County Schools.
"2006 Natural Gas Usage for the City of Boynton Beach.pdf"
"Boynton Beach Community NG usage.xls"

Fuel oil calculated using EIA state consumption rates, per sector. Extrapolated using Boynton Beach v. Florida population:
http://tonto.eia.doe.gov/dnav/pet/pet_sum_top.asp --> Consumption and Sales --> Sales of Fuel Oil and Kerosene

Community Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)
Residual Fuel Oil (#5, 6) emissions calculated using factors from the LGOP and added into the appropriate GHG totals. "Boynton Beach - Fuel Use Calcs.xls"						
Subtotal Commercial	196,930	2,323	8,275	197,824	21.1	1,181,256
Industrial						
Boynton Beach, Florida						
Industrial						
Electricity	4,378	53	178	4,398	0.5	24,812
Fuel Oil (#1 2 4)	3	0	0	3	0.0	47
Natural Gas	5	0	0	5	0.0	103
Carbon Dioxide	4	0	0	4	0.0	0
Methane	0	0	1	0	0.0	0
Nitrous Oxide	0	0	0	0	0.0	0
Subtotal Industrial	4,391	53	179	4,411	0.5	24,961
Electricity provided by Claudia M Thompson, Account Specialist, FPL "Boynton_Beach_elect.xls"						
Natural Gas provided by Bill McGoldrick, FPU. Email 1/5/2010 "2006 Natural Gas Usage for the City of Boynton Beach.pdf" "Boynton Beach Community NG usage.xls"						
Fuel oil calculated using EIA state consumption rates, per sector. Extrapolated using Boynton Beach v. Florida population: http://tonto.eia.doe.gov/dnav/pet/pet_sum_top.asp --> Consumption and Sales --> Sales of Fuel Oil and Kerosene						
Residual Fuel Oil (#5, 6) emissions calculated using factors from the LGOP and added into the appropriate GHG totals. "Boynton Beach - Fuel Use Calcs.xls"						
Subtotal Industrial	4,391	53	179	4,411	0.5	24,961
Transportation						
Boynton Beach, Florida						
Boynton Beach Trolley						
Gasoline	59	3	4	60	0.0	831
Subtotal Boynton Beach Trolley	59	3	4	60	0.0	831
All data/assumptions provided by Molly Stahlman, contractor for the Boynton Beach Trolley, run by the Community Redevelopment Authority (CRA).						
Email 3/8/2010 "FW_carbon footprint.pdf" "Boynton Beach Trolley calcs.xls"						

Community Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)
Community-wide VMT						
Diesel	74,214	219	225	74,286	7.9	1,014,539
Gasoline	381,462	24,756	21,018	389,578	41.5	5,381,795
Subtotal Community-wide VMT	455,675	24,975	21,244	463,864	49.4	6,396,334

Provided by Gordon Morgan, Florida DOT.

The city vehicle fleet, employee commuting, Boynton Beach trolley and Palm Tran fuel usage was all double counted in the community VMT data provided by DOT. The total GHG emissions in this field still contain emissions from those sources because the data was provided in different units and could not be separated before being entered into the software. CDM subtracted these double counted categories separately outside of CACP when calculating GHG emission totals for the final report.

Palm Tran emissions - 1,047 MTCO2e
City on-road fleet - 4,416 MTCO2e
Employee Commuting - 1,215 MTCO2e
Actual emissions from community VMT - 457,186 MTCO2e

Palm Tran						
Diesel	1,023	3	3	1,024	0.1	13,990
Gasoline	22	1	1	23	0.0	317
Subtotal Palm Tran	1,046	4	4	1,047	0.1	14,307

Fuel usage provided by Mike Cassidy, Palm Tran. Diesel usage is from buses and light trucks; Gasoline from cars/trucks/vans; Model years past 2005 were added as an MY2005 line item. Fuel usage was scaled down by number of major stops as highlighted in the Palm Tran schedule in Boynton Beach vs. all of Palm Tran.
Email 12/2/2009 "Greenhouse Gas Inventory of Boynton beach_Palm Tran.pdf"
"CY2006FuelConsumed_Palm Tran_BB.xls"

Tri-Rail: B20						
Biodiesel (B100)	0	0	0	0	0.0	957
OFF ROAD Diesel	425	0	0	425	0.0	5,811
Subtotal Tri-Rail: B20	425	0	0	425	0.0	6,768

Fuel usage provided by Michelle M'Sadoques, originally from the South Florida Regional Transportation Authority.
2006 Data not available, 2009 data was scaled based on the increased ridership from 2006 to provided estimated 2006 fuel usage. Total fuel usage was split by number of stations.
B20 is 20% biofuel and 80% Diesel. 20% of total B20 fuel use was added to the B100 category (Heavy Duty Vehicles Alt. Method) and 80% of total B20 fuel use was added to the OFF ROAD Diesel category (locomotive).
"Boynton Beach Tri-Rail calcs.xls"

Tri-Rail: Diesel						
OFF ROAD Diesel	834	0	0	834	0.1	11,391
Subtotal Tri-Rail: Diesel	834	0	0	834	0.1	11,391

Fuel usage provided by Michelle M'Sadoques, originally from the South Florida Regional Transportation Authority.
2006 Data not available, 2009 data was scaled based on the increased ridership from 2006 to provided estimated 2006 fuel usage. Total fuel usage was split by number of stations.
"Boynton Beach Tri-Rail calcs.xls"

Community Greenhouse Gas Emissions in 2006
Detailed Report

	CO_2 (tonnes)	N_2O (kg)	CH_4 (kg)	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy (MMBtu)
Subtotal Transportation	458,039	24,983	21,252	466,230	49.7	6,429,631
Other						
Boynton Beach, Florida						
Municipal Solid Waste						
Carbon Dioxide	30,456	0	0	30,456	3.2	
Methane	0	0	101,180	2,125	0.2	
Nitrous Oxide	0	1,410	0	437	0.0	
Subtotal Municipal Solid Waste	30,456	1,410	101,180	33,018	3.5	

Emissions from the Solid Waste Authority North County Resource Recovery Facility (NCRRF). NCRRF includes a municipal solid waste (MSW) landfill and waste to energy facility (WTE). Emissions were calculated using LGOP Chapter 9.3.2 Landfills with Comprehensive LFG Collection Systems and the EPA Mandatory GHG Reporting Rule Subpart C (Stationary Combustion). Ravi Kadambala, CDM. Emissions are relative to the City of Boynton Beach's contribution to the total MSW received at NCRRF.

CO2 emissions are from the combustion of MSW at the WTE.

CH4 emissions mostly from landfill, small portion are from the combustion of MSW at the WTE.

N2O emissions are from the combustion of MSW at the WTE.

"Boynton Beach Solid Waste calcs.xls"

Subtotal Other	30,456	1,410	101,180	33,018	3.5	
Total	925,557	31,601	140,519	938,304	100.0	8,982,987