

City of Key West Energy Plan

Goal: Reduction of 15% of Bills and GHGs

In 2008, the City Commissioners voted to reach a goal of 15% Greenhouse Gas reduction across the island by Dec 2015.

Why Energy?

Fifty five percent (55.3%) of the City of Key Wests emissions come from electricity, based on the City's Greenhouse Gas Study in 2008. It is the singular sector we can make the most difference in.

Saving energy will save taxpayer money. The City of Key West spends >\$900,000 a year on energy bills across 165 meters.

Where Do We Start?

Actions with the highest Return On Investment (ROI) are the smartest first steps. In considering actions needed for our largest sub-uses (water/sewage, buildings, waste and streetlights), buildings offered the most no to low cost options with high ROI.

Studies have shown that in buildings that have seen little to no energy efficiency attention over time, reductions of 15% in energy use are possible with little to no cost. If re-invested wisely, money saved from addressing the low hanging fruit can be set aside for further investment in fast ROI efficiencies for an additional 15% gain.

The City's 5 Year Plan, therefore, is to summarize the lowest cost, highest ROI options, and apply them to the lowest performing buildings, using EPA's free Portfolio Manager benchmarking/tracking software and prioritizing based on the City's use of the building.

Year 1 Action Summary

Year 1 will focus on both technological changes and behavioral changes that will bring the greatest savings for least effort.

Programmable thermostats, lighting retrofits, occupancy sensors and computer power management will be the primary technology upgrades in our worst performing building.

Behavioral energy goals will be set and met by the employees of that building, utilizing on the Green Business Leadership monthly workshops and enforcing existing policies.

Savings at the end of that year will be summarized and figured into Year 2 actions.

Figure 9
FY05 Municipal Emissions by Energy Source

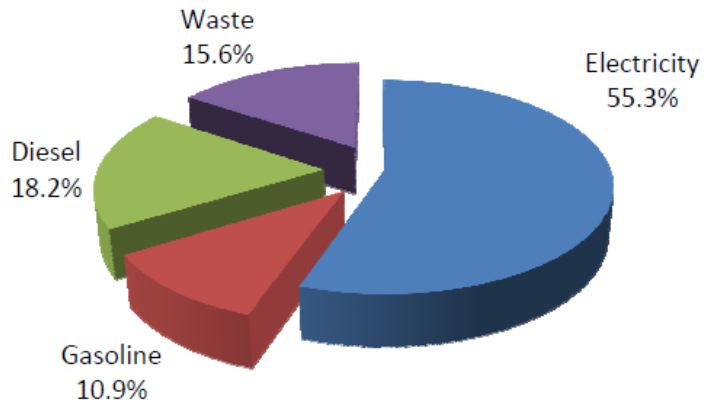
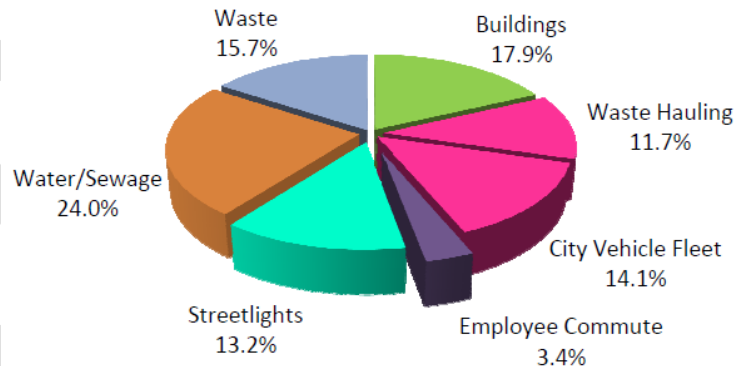


Figure 9.1
FY05 Municipal Profile by Sector



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Building Energy - Year 1 – Highest Return on Investment

Part A – Building Specific Action & Automation (Technological Changes)

Action	Difficulty (1-5)	Time/ Labor (1-5)	Capital Cost (0 - \$\$\$\$)	Point Person(s)	Status
Benchmark / Update all buildings in Portfolio Manager	2	4	0	Alison Summer HS interns	80% complete
Consider opportunities (Police Roof?)	2	1	0	ACM / Engineering	
Inventory worst performing building	2	2	0	FMT	
Create cost benefit ratio for Part A retrofits below	2	2	0	Alison FMT	
Programmable Thermostats (A/C and water heater)	2	2	\$	FMT	
Lighting Retrofits (T5's, CFLs and LEDs)	2	2	\$\$	FMT	
Occupancy Sensors (conf rooms, restrooms, storage)	2	2	\$	FMT	
Computer Power Mgmt (Printers / Copiers / Plugs)	2	2	\$	IT	
Summarize actions / successes at end of year	2	2	0	Alison	

Part B - Green Business Challenge (Behavioral Changes)

Action	Difficulty (1-5)	Time/ Labor (1-5)	Capital Cost (0 - \$\$\$\$)	Point Person(s)	Status
Review and Recommit to Existing Policies (2008)	1	1	0	ACM / CM	
Review and Set Goals for Green Business Challenge	1	1	0	ACM / CM	
Department level Outreach / Education for Green Business Challenge	2	2	0	Alison	20% complete
Green Business Leadership Meetings for Green Business Challenge (bimonthly)	2	3	0	Alison	20% complete
Track Successes with monthly bills	1	2	0	Finance?	
Summarize successes at end of year and Announce Winners.	1	2	0	Alison ACM/CM	

Building Energy - Year 2

Part D – Building Specific Action & Automation (Technological Changes)

Action	Difficulty (1-5)	Time/ Labor (1-5)	Capital Cost (0 - \$\$\$\$)	Point Person(s)	Status
	Same as in Part A				

Part E – Capacity Investment (Research)

Action	Difficulty (1-5)	Time/ Labor (1-5)	Capital Cost (0 - \$\$\$\$)	Point Person(s)	Status
Calculate money saved in Phase 1	1	1	0	Alison	
Identify age and condition of all HVACs and chillers	2	3	0	FMT	
Analyze options for employee vs contracted staff vs contractor vs ESCO	2	2	0	ACM/ CM	
Include Energy Audits / Retrofits in FY 15-16 budget	1	1	0	Engineering	
Consider New Policies	1	2	0	Planning ACM / CM	

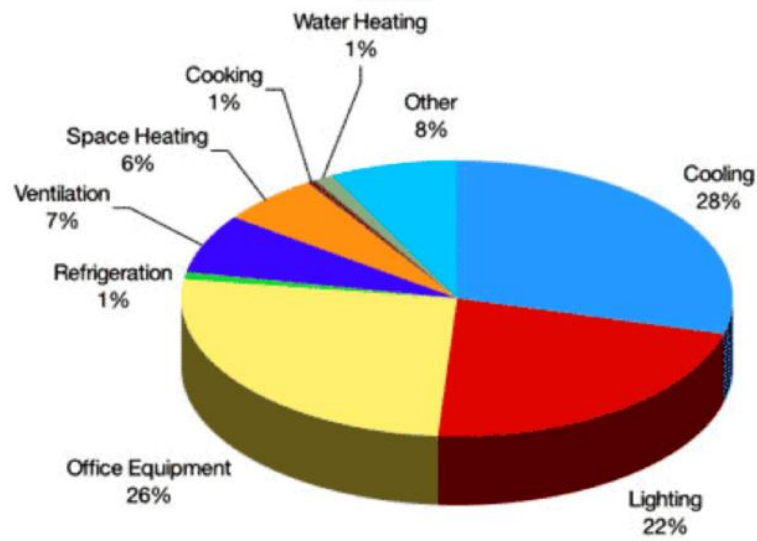
Part E – Capital Investment (Manage Energy)

Action	Difficulty (1-5)	Time/ Labor (1-5)	Capital Cost (0 - \$\$\$\$)	Point Person(s)	Status
Commercial Energy Audits	3	TBD	\$\$\$	Engineering	
Retrofit Buildings	3	TBD	\$\$\$	Engineering	

- Monroe County ReCommissioned their Jackson Square and Gato buildings in _____

Appendix A – Greenhouse Gas Graphics

Figure 1: Energy consumption in typical U.S. office building.



Appendix X – Methodology / Tools

Tools/Methodology: EPA Portfolio Manager is a free tool to manage commercial building energy and water. It provides benchmarks for normalized energy use intensities (EUI) which allow us to compare our buildings to each other as well as a national sample of similar buildings. A building's EUI is calculated by taking the total energy consumed in one year and dividing it by the total floor space of the building. A low EUI signifies better energy performance.

Besides energy use, Portfolio Manager also allows us to monitor water consumption, greenhouse gas emissions, and cost savings. A three phase system will be the smartest way for the City to

- Phase 1: Buildings that the City pays utilities for and have City staff working in them (City Hall in Habana Plaza)
- Phase 2: Buildings that the City pays utilities for (Bayview Park Recreation Center)
- Phase 3: Buildings that we lease to tenants (Bight, Wildlife Rescue Center)\

Appendix B – Background Year 1

A. Justification

B. Benchmarking

- Portfolio Manager
- How old is everything?
- Start on worst performing building
- Opportunities?
 - Police Roof?

C. Policy

- Existing Policies (2008)
- 74-78* in day, 80 at night
- Change air filters monthly
- Check a/c coils monthly
- A/C thermostat as “fan on”
- No a/c in winter if outside air intake is possible
- Repair ductwork leaks immediately
- Lights off at night
- Computers / Printers off at night
- Energy efficient bulbs
- Water heaters 120
- Pay attention to new energy mgmt. strategies / technologies

D. Lighting:

- Lighting Audit
- If either of the below is on for more than 8 hours, use LED's (security lights)
- All incandescent bulbs to compact florescents
- Overhead Fluorescents:
 - Get counts and wattage on T8's and T5's
 - Encourage taking some out?
 - Daylighting options
 - Task lighting options?

E. Behavioral (Green Business Challenge)

- Set Goals
- Outreach
- Contest / Reporting (With Green Leadership Council)

F. Automation :

- Occupancy Sensors (restrooms, conf rooms, storage)
- Programmable Thermostats (A/C and water heater)
- Computer Power Mgmt
 - Printers / Copiers
 - Plug loads

Table 2: Typical range of savings from occupancy sensors

Savings vary by a factor of two or three in most applications, with the exception of open-plan offices and classrooms. Actual savings may differ.

Space type	Savings potential (%)
Restroom	60
Conference room	50
Private office	38
Break room	29
Classroom	58

Courtesy: Platts; data from D. Maniccia et al. [3]

Appendix C – Background, Year 2

A. Energy Manager Feasibility

- Analyze options for employee vs contracted staff vs contractor vs ESCO
 - Monroe County spent \$100K on a Commercial Energy Audit at Jackson Square, just to find out what could/should be done.
- Calculate money saved in Phase 1

B. HVACs / Chillers

- Evaluate all HVACs for age and efficiency
- Inspect for envelope leakage
- Inspect for Duct leakage
- Insulation?
- Replace roof top A/C's & Chillers
- Install economizers
- Commission/ Optimize existing systems

C. Manage Energy

- Commercial Energy Audits
- Retrofit Buildings
- New Policies
 - LEED Operations and Maintenance standards

Footnotes

<http://seedengr.com/Energy%20Efficiency%20Potential%20in%20Existing%20Commercial%20Buildings.pdf>
http://newpartners.org/2013/presentations/Thursday/8.30-10am/Thursday%207th%20%20%20%20%20%20%20%20%20%208.30-10am%20%20%20%20%20DoD%20Clients/NP13_Imel.pdf

Appendix D - Keys Energy Strategic Plan (Highlights)

- Provide reasonable rates to our customers
 - Reduce our FMPA power supply bill
 - Control internal operating costs
 - Educate our customers how they can lower their own bills
- Build relationships that earn trust and motivate mutually supportive behavior with key stakeholders
 - Work proactively with the City of Key West on at least one project that is mutually important and mutually beneficial

Appendix E - Climate Action Plan

Program Recommendations - Energy

6.1: Key West will reduce annual greenhouse emissions by 10,731 tons by using renewable energy, conservation, and more efficient power

#	Action	% Complete
1.	Replace standard street lights with Solar LED lighting (986 tons GHG)	30% Planning
2.	Replace old fashioned lights with LED lighting. (540 tons GHG)	100% Complete
3.	Install LED lighting and solar generation system at City Park N Ride Garage (130 tons)	45% LED contracted No Solar planned
4a.	Install alternative energy systems: Wind energy generator at Waste Water Treatment Plant and land fill (500 tons)	10% Researching
4b.	KES/FMPA/NOAA solar project, (37kw)	100% Complete
4c.	KES/FMPA/NOAA wind project (6kW capacity)	0% (Cudjoe?)
5a.	City Commission to Partner with Utility Board of the City of Key West to develop goals, timelines and benchmarks to reduce emissions by 6,814 tons CO ₂ e through: Enhanced program of purchasing electric power generated by low co ₂ emission fuels and non-combustible energy.	0 - 100% ? Discontinued?
5b.	Energy demand or tiered/inverted rate incentive program to encourage conservation and fund improved energy audits or utility “green energy improvements”.	10% Discussions
5c.	Encourage Keys Energy Services to continue to consider “smart grid” and “smart meter” systems.	10% Discussions
5d.	Encourage continued improvement of transmission and distribution systems to reduce line losses.	100% Ongoing
5e.	Partner in rebate and marketing program to promote conservation as cost effective “climate action”.	100% Ongoing
6a.	Consider the advantage of taxing electric utility and propane use to encourage conservation; Dedicate funding for a revolving loan fund for weatherizing and renewable energy projects. Tax at a level that simple conservation at the desired level will not increase current/expected rates. (*Note: Similar to 5b) (900 tons).	10% Researching
7.	The City of Key West will monthly publish in a local newspaper the current and previous 24 month electric consumption by the City of Key West government in order for the citizens to judge the progress towards reducing consumption.	0% Have Not Done
8.	The Utility Board shall monthly publish in a local newspaper the current and previous 24 months the total and per customer electric consumption by all	0% Have Not Done

	residences and businesses in order to for the citizens to evaluate progress towards the goal of reducing consumption.	
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