20% Reduction by 2020

Alachua County Fleet 20 Percent Fuel Reduction By FY 2020

Alachua County Fleet Management

02/2011
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OVERVIEW

The 20% by FY 2020 Reduction Plan illustrates a continuation of four strategies, use of fuel efficiency improvements and six possible decision points to invest in new technologies that will reduce current fleet fuel consumption by 185,853 gallons of fossil fuel. Concurrent with meeting energy reduction goals these measures will also cut back fleet greenhouse gas emissions by an estimated 3,200 Tons of CO$_2$e/year.

Fossil fuels are a finite and ever more expensive to reach resource. They underpin the current economy and make possible the material wealth of the developed world. A global crisis is approaching as the rate of discovery of new conventional oil supplies fails to keep up with global consumption\(^1\). Complicating matters for industrial society, currently, there are no simple substitutions for the concentrated energy of liquid fossils fuels. Even most alternative energy solutions are supported by fossil fuel energy. A best near term strategy remains first with conservation and efficiency solutions and as technology improves a flexible portfolio of alternative energy vehicles.

Over the near term, unrest in oil producing regions and the market instability of fossil fuels will continue to threaten the reviving economy\(^2,3\). If fuel costs do sharply rise, such as was seen in 2008, it will add to the fiscal challenges of Alachua County. In the past, conservation and efficiency policies put into place by the Board have helped to buffer previous price spikes. Regardless of disruptive events Energy Information Administration records show that over the past 10 years the cost of a barrel of oil has risen 258% to $96 per barrel since 2001.\(^4\) And over the same time period, gasoline has increased 115% to an average of $3.14 per gallon as of February 2011.\(^5\)

Looking at these global dilemmas of supply, demand and cost, Alachua County is preparing further strategies to improve fleet performance and ameliorate anticipated price jumps in liquid fuels.\(^6\) As the decade progresses, Alachua County as a community, is expected to struggle with the implications of $4, $6 and possibly $10 gallon gasoline.

It should be noted that many countries, including the United States, subsidize the cost of fossil fuels. In the US at the Federal level alone, fossil fuels in general are subsidized by direct and indirect supports of over $70.2 Billion, while only $12.2 Billion is used to support renewable energy between 2002 - 2008.\(^7\) Looking specifically at gasoline, some estimates place the actual cost of unsubsidized gasoline as high as $15 per gallon.\(^8\)

\(^1\) Energy Bulletin, “IEA:’Cheap oil is over’ as demand approaches new record”, Aug 16, 2010; http://www.energybulletin.net/53805


\(^3\) Foreign Policy, “Why Saudi is now in play”, Feb 21, 2011; http://oilandglory.foreignpolicy.com/posts/2011/02/21/why_saudi_is_now_in_play


\(^7\) Environmental Law Institute, Energy Subsidies Favor Fossil Fuels Over Renewables, Accessed January 11, 2011; http://www.eli.org/Program_Areas/innovation_governance_energy.cfm


20 BY 2020 Reduction Plan
As the United States becomes increasingly embroiled by the national debt debate; these price supports may become unsustainable. Though overshadowed by the economic downturn, society’s dependence on relatively cheap fossil fuels is emerging as the most underappreciated national security threat by the general population.

However, the US Military's Joint Forces Command does recognize the threat of Peak Oil\(^9\) and estimates that, “By 2012, surplus oil production capacity could entirely disappear, and as early as 2015, the shortfall in output could reach nearly 10 MBD.”\(^{10}\)

Seeing these trends, this plan represents a part of a broader effort to innovatively rethink our relationship to energy and our economy such that both become more efficient, sustainable and resilient. While applicable only to Alachua County’s fleet of vehicles it is hoped that these ideas may be of use to the private sector and to other local governments.

**SUMMARY OF FUEL REDUCTION PLAN**

This plan was written to illustrate strategies to achieve a 20% reduction in fossil fuel use by Alachua County’s Fleet by year 2020. A fuel consumption baseline from FY 07/08 is used as a starting point in measuring estimated annual reductions through 2020. The first section of the report references four strategies that are currently in use and will be expanded to yield further results by FY 2020. Costs to implement these strategies are currently budgeted. The second section has a selection of six different options that have fiscal impacts and require direction from the Board. These strategies have an estimated cost and brief analysis. Any option selected for possible implementation will require a more detailed analysis to determine the exact costs and predicted savings.

The 20 by 2020 Report is in alignment with the Board’s Guiding Vision, Comprehensive Plan, Energy Conservation Strategies Commission Report, Greenhouse Gas Report, and Alachua County Fleet Management best practices. For reference, these documents are listed in the appendix. In total, these documents support reductions in fuel usage, lower carbon footprint, and prudent use of resources.

Innovative alternative fuels and vehicles technologies are in development across the world. Though they may never come close to matching fossil fuels for embodied energy, this constant evolution within the energy and transportation industry will necessitate regular updates to this plan. The different types of fuels and vehicles shown here are the ones that have the most immediate application to our organization.

The objective of the report aims to reduce fuel consumption without affecting the delivery of services to the residents of Alachua County. Providing expected service levels all while being prepared for unforeseen events requires a fleet of many types of vehicles and equipment. Alachua County’s fleet is depended upon 24 hours a day, year round. A selection of alternative fuels, vehicles or equipment must be analyzed as to how it will fit these performance requirements. Driving range, time to refuel or charge, serviceability and cargo room loss due to large tanks are all issues to be considered in the selection process, as well as the role they would be required to perform during emergency events. And as with any long range plan, changes in services delivered due to natural disaster or emergency events can impact the success of this fuel reduction plan.

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\(^9\) Peak Oil is defined here as not the end of oil, but the end of cheap oil. Non-conventional sources and enhanced recovery are not projected to meet growing global demand.


20 BY 2020 Reduction Plan
BREAKDOWN OF FY 07/08 FUEL USAGE (BASELINE)

To show how the reductions will affect fleet fuel usage, a baseline to measure from must be established. The year that was selected as the baseline to measure fuel usage from will be FY 07/08. This was a typical year, without impacts on fuel usage from storms, hurricanes, fires or in “house construction projects.”

This chart represents a breakdown of 2008 fuel usage and the various types of fuel and where it was purchased from. The bulk fuel is dispensed from the county owned bulk fuel tanks at the Public Works Compound and the solid Waste Transfer station. The card lock is fuel purchased from an independent vendor owned sites.

<table>
<thead>
<tr>
<th></th>
<th>BULK USAGE</th>
<th>CARDLOCK USAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIESEL</td>
<td>232,389</td>
<td>85,796</td>
</tr>
<tr>
<td>BIODIESEL</td>
<td>53,079</td>
<td>N/A</td>
</tr>
<tr>
<td>UNLEADED</td>
<td>65,617</td>
<td>80,449</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td>351,085</td>
<td>166,245</td>
</tr>
</tbody>
</table>

517,330 TOTAL GALLONS

The figures above illustrate the usage of the different types of fuel Alachua County’s fleet utilizes. It is approximately 40% gas to 60% diesel.
## TABLE 1 SUMMARY OF STRATEGIES, REDUCTIONS AND COSTS BASE F4 GALLONS-REDUCTION

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Project Name</th>
<th>Gallons of Diesel and Gasoline (Base FY Gal. - Reduction Gal.)*</th>
<th>Reduction in Gallons</th>
<th>% Reduction</th>
<th>Cost to Implement</th>
</tr>
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<tr>
<td><strong>Continuation Strategies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy 1</td>
<td>Continue B20 *</td>
<td>475,330</td>
<td>42,000</td>
<td>8.8%</td>
<td>0</td>
</tr>
<tr>
<td>Strategy 2</td>
<td>Continue 5-5-5 *</td>
<td>511,730</td>
<td>5,600</td>
<td>1.1%</td>
<td>0</td>
</tr>
<tr>
<td>Strategy 3</td>
<td>2010 Diesel Engines *</td>
<td>509,830</td>
<td>7,500</td>
<td>1.5%</td>
<td>0</td>
</tr>
<tr>
<td>Strategy 4</td>
<td>Reduce Waste Hauling *</td>
<td>491,330</td>
<td>26,000</td>
<td>5.1%</td>
<td>0</td>
</tr>
<tr>
<td>Technologic Improvements</td>
<td></td>
<td>496,637</td>
<td>20,693</td>
<td>4.0%</td>
<td>0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td></td>
<td><strong>101,793 Gals</strong>*</td>
<td><strong>20.5%</strong></td>
<td></td>
</tr>
</tbody>
</table>

* These are current strategies in use that are predicted to yield a 20.5% reduction in fossil fuel use. BY 2020

| Decision Points |                           |                                                               |                      |             |                   |
|-----------------|---------------------------|                                                               |                      |             |                   |
| Strategy 5      | Additional Hybrids        | 513,122                                                       | 4,208                | 1.0%        | $ 32,000          |
| Strategy 6      | Electric Vehicles         | 510,748                                                       | 6,852                | 1.4%        | $ 400,000         |
| Strategy 7      | CNG Vehicles              | 481,330                                                       | 36,000               | 7.0%        | $ 590,000         |
| Strategy 8      | Manufacture Biodiesel     |                                                               |                      |             | $ 690,000         |
| Strategy 9      | Hybrid Drive Med/Hvy Trucks | 510,330                                                       | 7,000                | 1.4%        | $ 550,000         |
| Strategy 10     | E85 Vehicles              | 487,330                                                       | 30,000               | 5.8%        | $ 202,000         |
| **Totals**      |                           |                                                               | **84,060 Gal**       | **16.3%**   | **$ 2,464,000**   |
20% BY FY2020 FUEL REDUCTION PLAN OUTLINE

Baseline

↓

517,330 gallons of fuel were consumed in FY07/08 for county operations.

**Strategy 1. - In Progress** - continue to use B20 biodiesel blend in county owned bulk tanks located at Public works compound and at Leveda Brown Environmental Park Transfer Station. The annual average use is 42,000 gallons a year. This is a 42,000 gallons reduction of fossil fuel use.

42,000 Gallons

Annual

Savings

↓

**Strategy 2. - In Progress** - 5-5-5 Plan started in FY09. The goal of the plan is to reduce fleet size by 5%, and to reduce fleet fuel consumption by 5%, over 5 years. This will reduce fleet fuel usage by 5,600 gallons per year.

5,600 Gallons

Annual

Savings

↓

**Strategy 3. - In Progress** - In 2007 and 2010 new federal emissions standards were enacted to lower emissions for “On Road” diesel engines. The new 2010 compliant diesel engines being produced are achieving a 2% increase in fuel mileage. As the current fleet of “on Road” diesel engines are replaced, approximately 7,500 gals. Of fuel will be saved annually, by FY2020.

7,500 Gallons

Annual

Savings
Strategy 4. - In Progress- The Waste Hauling Operation is utilizing approximately 25% less fuel. Considering that this is a B20 biodiesel blend the calculation of fuel savings is for diesel only. Also in step 1, the average annual use of B20 biodiesel will be increased to compensate over time. It is anticipated that more recycling will maintain this reduction, or possibly lower it even more. 26,000 gals of diesel fuel will be saved annually.

26,000 Gallons

Annual

Savings

Technologic Improvements — Projected advancements in vehicle and equipment technology to increase fuel mileages to meet future standard will further reduce fossil fuel consumption. Future fleet replacements by these more efficient units will yield an additional 4.0% fuel savings.

20,693 Gallons

Annual

Savings

Predicted Annual savings of 101,793 Gallons by year 2020

By the year 2020 it is projected those 81,000 gals of fuel will be saved annually as a result of programs currently in use. Some of the programs will incrementally increase fuel saving as in step 3, and technologic improvements while, others are producing fuel savings now. By continuing on this track the fuel consumption will be reduced as follows.

517,330 Gallons Baseline FY 07/08

-101,793 Gallons total fuel saved

415,537 Gallons of projected Annual Fleet Fuel Consumption by 2020

20% Reduction

The steps that are currently in use will save approximately 101,793 gallons of fuel annually by FY 2020. This is a reduction of 20%. New emission compliant diesel engines will represent a new but unavoidable cost ranging from $5,000 to $10,000 more per unit. It is anticipated that the mark up in the vehicle replacement fund and the 2% savings in fuel will absorb the higher price of the 2010 compliant diesel engines.
Advances in automotive and truck technology occur every year. Fleet Management predicts that in the next 10 years, fuel mileage “of on road” and “off road vehicles” will increase another 4% by technologic improvements. For example, currently, there are Federal mandates enacted to lower emissions on “off road” diesel engines. These engines are utilized in construction equipment, generators, and farming equipment. It is anticipated that these lower emission engines will also have an incremental increase in fuel efficiency. There are also other mandates pending to set fuel efficiency standards on heavy trucks, similar to the one utilized for autos and light trucks.

As the Board has taken leadership positions on new technology, (being one of the first in Florida to purchase hybrid vehicles in 2001,) Fleet Management has prepared several stretch strategies for consideration by the B.O.C.C. These would provide deeper reductions in fossil fuel usage and would require a larger capital costs for additional infrastructure and or equipment.
Strategy 5 - Additional Hybrids- Add 16 additional hybrids to the fleet. Hybrid vehicles have lower operating costs in addition to higher fuel savings as compared to their standard fuel counterparts. Estimates of these savings currently offset their additional upfront cost, but that is changing. The anticipated fuel saving will be approximately 4,208 gallons annually. The projected cost would be $32,000. The reasoning of this cost is as the used car market becomes saturated with hybrids, the resale will go down as well. Another factor that will affect this will be the increasing fuel mileage of conventional cars. Both of these will affect the life cycle costs.

4,200 Gallons Fuel savings annually

$32,000 Investment

Return on investment

will take approximately 3 years

using $3.50 per gallon fuel price.

HYBRID VEHICLE DESIGN
Strategy 6 - Electric Vehicles: Replace conventional vehicles with 12 electric vehicles. Considering the range, payload, charging time, and available areas for charging infrastructure, 12 vehicles could be replaced by all electric vehicles. Purchase price is approximately twice as much as a conventional vehicle, not including charging stations. Annual anticipated fuel savings would be 6,852 gallons per year. Additional costs for electric vehicles and infrastructure would be approximately $400,000.

**ELECTRIC VEHICLES**

**Pros**

— Lower Maintenance costs  
— Lower emissions levels  
— (Possible) lower life cycle costs  
— (Possible) higher resale

**Cons**

— Driving Range  
— Recharge time (4 hours min.)  
— Higher initial purchase price  
— (Possible) battery life

6,852 Gals Fuel Saving  
$400,000 Investment  

Return on investment will take approximately 10 years depending on cost of fuel and electricity.

2011 Ford Transit Connect Electric
Strategy 7 - Compressed National Gas (CNG)- Replace 10 light trucks and 10 medium trucks with CNG vehicles. A grant or investment will be needed for a CNG fueling station at the Public Works Compound. This fueling station must be the “Fast Fill type” so as to not impact usage of vehicles “Slo Fill” fuel stations requires several hours to fill a vehicle, vs “Fast Fill” which dispenses fuel at a rate similar to a conventional fuel station. Projected fuel savings would be 36,000 gallons annually. Additional costs of vehicles would be $240,000. Fueling infrastructure will cost $500,000. If a matching grant can be achieved, the cost would be $250,000. Modification to the fleet maintenance shop will be needed to safely service these vehicles. Estimated modification cost of $100,000 for Fleet Shop.

COMPRESSED NATURAL GAS

PROS

— Less expensive than any other fuel
— Availability
— Lower maintenance
— Lower emissions

CONS

— Lower resale value of vehicle
— Higher initial purchase price
— Less Driving range
— Cargo space loss due to tank size
— Not a renewable fuel

36,000 Gallons Fuel Saving Annually

$590,000 Initial Investment

Return on investment

Will take approximately 10 years

Using $3.50 a gallon fuel price.
How a Natural Gas Vehicle Works

1.) Natural gas is compressed to 3800 psi and enters the vehicle through the natural gas fill valve (receptacle).
2.) It flows into high-pressure cylinders located in or under the vehicle.
3.) In a bi-fuel NGV, a fuel selector on the dash permits selection of natural gas or gasoline. A dedicated NGV operates solely on natural gas.
4.) When natural gas is needed by the engine, it leaves the cylinders and passes through the electric solenoid shut-off valve located in the cylinder. This shut-off valve stops the flow of natural gas when the engine is not running or in the case of a bi-fuel vehicle, gasoline is selected and PRD pressure relief device.
5.) The natural gas travels through a short high-pressure fuel line and enters a (10 micron) coalescent filter, which removes aerosol compressor oil, oil droplets and other contaminates from the natural gas.
6.) The natural gas now enters the pressure regulator, which reduces pressure from up to 3,600 psi to 125 psi working pressure.
7.) The natural gas flows through a low pressure fuel line and enters the fuel rail which supplies pressurized fuel to all of the specially designed natural gas fuel injectors.
8.) The natural gas injectors inject the natural gas into the engine’s intake manifold near the intake valve.
9.) The ECM (electronic control module) controls the sequential multi-port fuel injection pulse widths or amount of fuel the injectors inject into the engine. This system allows each injector to open just before the intake valve opens, instead of all injectors opening at once.

Example of CNG Alternative Fuel Vehicle
Strategy 8 - Manufacture Biodiesel in House - Purchase or construct a biodiesel manufacturing system, to produce biodiesel from used cooking oils collected from county business. This will require a distillation system capable of producing approximately 1000 gals per week, Cost $450,000. Building to house the system $100,000, two additional F.T.E. will be needed to run the program. Currently Alachua County is using biodiesel purchased from a vendor. Therefore no fuel savings will be realized; however we can produce biodiesel at a lower cost per gallon, which saves money.

**Pros**

- Recycling of used cooking oil
- Lower Cost
- Renewable Fuel

**Cons**

- (Possible) unavailability of feed stock
- Interruption of feed stock going to biodiesel producers could start a bidding war

No Fuel Savings

$690,000 Initial Investment

Return on investment will take approximately

8 years depending on cost of fuel

Manufacture in House Biodiesel
Bio-diesel Processing

How biodiesel is made

**MIXING OF METHANOL AND CATALYST**
A catalyst, typically sodium hydroxide, is dissolved in methanol (wood alcohol).

**REACTION**
The methanol/catalyst mix and oil or fat are added together and heated, producing a reaction called "transesterification," which results in two major products: glycerin and biodiesel. Technically, biodiesel is methyl esters.

**SETTLING**
Glycerin is much more dense than biodiesel, and the two can be gravity-separated, with glycerin simply drawn off the bottom of the settling vessel.

**WASH**
Biodiesel must be washed with water to remove contaminants. Water is heavier than biodiesel and absorbs the excess methanol, sodium hydroxide and soap suspended in it. After washing and settling, the water can be drained from the bottom of the container. Several wash cycles are generally needed.

**METHANOL RECOVERY**
Excess methanol remaining in the biodiesel and glycerin are removed through distillation and recycled for reuse.

**DISTILLATION COLUMNS**

**GLYCERIN NEUTRALIZATION**
The glycerin byproduct contains unused catalyst and soaps that are neutralized with an acid. Water and methanol are removed to produce 80 percent to 88 percent pure glycerin, which is ready to be sold as crude glycerin or further refined to pharmaceutical grade.

**GLYCERIN USES**
Glycerin has numerous uses: preserving food; as an emulsifier in butter, margarine and mayonnaise; as a base for lotions, in some printing inks; in cake and candy making; as antifreeze; and making clear soaps.

**Sources:** National Biodiesel Board, Iowa Renewable Fuels Association, Western Iowa Energy

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**FINAL PRODUCT**
The finished biodiesel is shipped to fuel distributors by rail or truck, to be sold as pure biodiesel or blended with petroleum diesel.

**PRODUCT QUALITY AND REGISTRATION**
Prior to use as a commercial fuel, the finished biodiesel must be analyzed using sophisticated equipment to ensure it meets ASTM specifications. ASTM was founded as the American Society for Testing and Materials.
**Strategy 9** - Hybrid drive medium and heavy duty trucks. Replace 12 conventional medium and heavy duty trucks in the fleet with trucks equipped with hybrid drive systems. Projected fuel savings annually of 7,000 gallons per year at an additional cost of $550,000.

**HYBRID DRIVE TRUCKS**

**Pros**
- 2% to 5% Fuel Saving
- (Possible) Rebate to help offset costs
- (Possible) Higher Resale

**Cons**
- Higher Initial Purchase Price
- (Possible) Higher Maintenance and repair costs

**7,000 Gals Fuel Saving Annually**
**$550,000 Initial Investment**

**Return on investment**
Will take approximately 22 years,

**Using $3.50 a gallon fuel price.**

Hybrid Heavy Truck Design
**Strategy 10  E85 Vehicles**- Replacement of 46 vehicles with flex fuel vehicles that utilize E85 fuel. A grant or investment will be needed to add an E85 fuel station to the existing fuel facility at the public works compound. Additional costs to county for vehicles will be $46,000. Most grants for this are matching, so estimated cost to add E85 tanks and pump to fuel station would be approximately $175,000 with the County’s match at $87,500 for a total investment by the County of $133,500. This strategy would save approximately 46,000 gallons of gas. E85 is an alternative fuel, however it is less efficient as compared to gas, therefore it will take more E85 to do the same work.

So if the fuel costs $3.00 per gallon, and it takes 22,830 more gallons it will cost the county $68,490 more in fuel. Add this to the fuel station matching grant cost and additional cost of vehicles of $133,500 The total cost to utilize E85 would be $202,000.

**E85 (ETHANOL)**

**PROS**

— Renewable Alternative Fuel  
— Low cost vehicles  
— If ethanol fuel supply is interrupted, fueling infrastructure can be utilized for gas  
— Flex fuel vehicles can utilize either gas or E85

**CONS**

— Without Tax rebate, cost is not competitive  
— Requires 1/3 more fuel to do same amount of work as gasoline  
— Production of ethanol utilizes more energy to produce than gasoline  
— Production of ethanol can interrupt food crops  
— Lower cost per gallon dependence on a subsidy to be cost competitive

30,000 Gallons Fuel saving Annually

$202,000 Initial investment

No return on investment

Using $3.50 a gallon fuel price.
CONCLUSION

There are many reasons to ramp up fleet strategies for conservation, efficiency and alternative energy systems. Some may be controversial in fiscally constrained times. There are several facts surrounding the continued overdependence on fossil fuels that are definitive:

- The U.S. is dependent on fossil fuels and the majority of it comes from sources other than our own. This dependence continues to be a major threat to the U.S. national security.

- The costs of fuel are very volatile and unpredictable. Any hint of a possible problem causes fuel prices to rapidly escalate.

- Other countries are rapidly increasing their use of fossil fuels which will drive up the market price to the highest bidder.

These facts alone show that a change is needed. The 20% by 2020 is a plan for change.

Listed below are the steps that Fleet Management recommends to achieve the 20% reduction in fossil fuel usage by FY2020.

Step 1. Continue on the track with continuation strategies #1-4 as listed in the outline.

Step 2. In 2014 The 5-5-5 Fuel Conservation Plan will expire. Recreate another plan to replace it, to continue monitoring fuel usage and fleet size.

Step 3. Monitor technology closely as new fuels and vehicles are developed. Maintain the 20% by 2020 Plan with updated information annually or more often if required.

Step 4. Monitor grant opportunities for possible implementation of alternative fuel infrastructure or vehicles.

Step 5. Purchase new types of vehicles for testing and collection of real world data.

Step 6. As future fuels develop and are supported by a consistent supply, advise County Leadership and B.O.C.C. as to correct timing and implementation to minimize risk. These are steps 5-10 of the outline.
EXCERPT FROM THE ALACHUA COUNTY BOCC GUIDING VISION ADOPTED FY 09/10

The county will work to reduce its’ contribution to global climate change through it’s’ policies which promotes energy conservation and use of alternative energy sources in county operations and in the community.
EXEMPLARY FROM THE AMENDMENT TO THE ALACHUA COUNTY COMPREHENSIVE PLAN

ENERGY ELEMENT

GOALS, OBJECTIVES AND POLICIES

GOAL
Reduce greenhouse gas emission and fossil fuel consumption; mitigate the effects of rising energy cost; and promote the long-term economic security of Alachua County through energy conservation, energy efficiency and renewable energy production.

STRATEGY

PRIORITY 1
Practice energy conservation.

PRIORITY 2
Maximize energy efficiency.

PRIORITY 3
Promote and invest in renewable energy production.

SECTION 1 – REDUCTION GOALS

OBJECTIVE 1.1
Reduce countywide greenhouse gas (GHG) emissions by 80% from 2009 baseline emissions by 2050 with an intermediate goal of a 40% reduction by 2020 and a short term goal of 5% annual reduction.

Policy 1.1.1 The County shall implement a plan to reduce GHG emission per Objective 1.1. To accurately monitor progress the County shall measure GHG emissions for County operations and implement a method for estimating countywide emissions. Findings shall be released in an annual status report for County operations with an estimate of community emissions reported biennially (i.e. every two years). In addition to changes in total GHG emissions, reports shall include indicators of improvements in efficiency such as reductions in emissions per person, per employee or per square foot, improvements in building performance ratings, or similar measures.

SECTION 5 – COUNTY GOVERNMENT INITIATIVES

OBJECTIVE 5.1

20 BY 2020 Reduction Plan
Adopt and implement practices within Alachua County Government that contribute to the energy conservation goals of the Comprehensive Plan.

Policy 5.1.4  The County shall develop and implement a plan to reduce fossil fuel use in the County fleet by 20% from 2010 levels by the year 2020.

OBJECTIVE 5.2
Increase the use of renewable energy in County Government.

Policy 5.2.1  Alachua County shall purchase or produce renewable energy for at least 10% of total County Government (cumulative) consumption by 2015, and 20% by 2020.
Policy 5.2.2  The County shall incorporate renewable energy production into County facilities where appropriate.
Policy 5.2.3  Pursue funding to develop alternative energy facilities that would be capable of producing energy from anaerobic digestion, solar energy, biodiesel or other forms of sustainable energy resources.
EXEMPLARY FROM THE ENERGY CONSERVATION STRATEGIES COMMISSION (ECSC) 2008 REPORT

PG 70 MAJOR STRATEGIC POLICIES: REDUCE FOSSIL FUEL USE ESTABLISH TIMELINE:
Establish a timeline for County Government to reduce fossil fuel use, consistent With the goal of a 50% greenhouse gas reduction by 2030 and 80% greenhouse Gas reduction by 2050. Use 1998 as the base year (2001 Alachua County Greenhouse Gas Report.) Encourage others within the community to meet the same or similar targets.

PG 74 MAJOR STRATEGIC POLICIES: TRANSPORTATION AND ENERGY GOALS:
Reduce use of, and dependence on liquid fuel by 2020. Double at least, the fuel consumption efficiency (MPG) of the Alachua County Government Fleet. Move to non fossil fuel fleets as soon as possible.

PG 74 MAJOR STRATEGIC POLICIES: LIFECYCLE ANALYSIS OF GREEN HOUSE GAS EMISSIONS:
Lifecycle analysis of greenhouse gas emissions should form the basis of any decision on use or generation of fuel sources. Equal consideration should be given to minimizing toxic pollutants and strict enforcement of U.S. EPA guidelines.

PG 76 MAJOR STRATEGIC POLICIES AMEND COMPREHENSNSIVE PLAN: ADD MAJOR ENERGY STRATEGIS.
Amend the Alachua County comprehensive plan to include, in the appropriate locations the goals, objectives and policies included in this chart. Amend the comprehensive plan to add an energy element.

PG 86 PUBLIC AND COMMUNITIES: PROMOTE COMMUNITY NO IDLE POLICY:
Introduce and encourage the use of “no idle” policies for all public and private fleet vehicles.

PG 88 COUNTY GOVERNMENTS: REDUCE FOSSIL FUEL USE. Establish a timeline for reduction of fossil fuel use, consistent with the goal of a 50% greenhouse gas reduction by 2030 and an 80% greenhouse gas reduction by 2050.

PG 96 COUNTY GOVERNMENT: ALTERNATIVE VEHICLE FUEL
Develop a partnership with the U.S. Dept. of Energy and other local partners to help jumpstart local development and use of alternative fuels, vehicles for blends, and fueling infrastructure.

PG 96 COUNTY GOVERNMENT ALTERNATIVE FUEL USE-LOW CARBON INTENSITY ETHANOL.
Where possible the county will endeavor to use ethanol produced by a means that minimizes the life cycle carbon emissions of its production, distribution and consumption until such time as this fuel source provides a 50% reduction in life cycle greenhouse gas emission relative to petroleum.

PG 96 COUNTY GOVERNMENT: CONVERSION OF FLEET AND EQUIPMENT Develop a timeline by which to implement conversion of government fleet to plug in hybrid, electric vehicles, biodiesel and biogas and development of supporting infrastructure. Consider same for new vehicular machinery.
DETAIL OF CURRENT STRATEGIES TO REDUCE COST, CONSERVE FUEL AND LOWER EMISSIONS.

BIODIESEL
Alachua County has utilized biodiesel over the last 6 years. Between the years of 2003 to 2006 biodiesel could not be purchased from vendors located close enough to prevent paying a very high transport charge, and the production of biodiesel was very sporadic. In 2006 biodiesel supplies were more available, and Alachua County has utilized a B-20 blend in the bulk tanks located at the Public Works compound in Hague and the Leveda Brown Environmental Park, since.

ULTRA LOW SULFUR DIESEL
All on road diesel vehicles are mandated by the federal government to utilize ultra low sulfur diesel. Alachua County utilizes ultra low sulfur diesel in all diesel equipment on road and off road.

RIGHTSIZING PROGRAM
Before the replacement of vehicles or equipment, an analysis of the past performances of this unit is conducted by Fleet Management. In this analysis several factors are considered before ordering the replacement. Maintenance cost, fuel cost, reliability, and ability to perform intended function, are a few of the major areas that are analyzed, this will assist in determining the purchase of the most efficient and, economical unit, as well as a lower emissions.

5-5-5
Fuel Reduction Plan was started in Feb 2009. The goals of this plan are to reduce fleet size by 5%, fleet fuel by 5% over 5 years. The baseline of the plan was Feb 2008. So far this plan has reduced fleet size by 21 vehicles and saved 16,887 gallons of fuel in 2 years.

REDUCTION OF TAKE HOME VEHICLES
A committee was organized to examine the vehicles that were taken home. The take home committee approves/or disapproved the take home vehicle requests. This has resulted in an over 50% reduction in take home vehicles.

FUEL CONSERVATION
A Fuel Conservation policy was created in 2009 to reduce fuel usage and lower emissions, from Alachua County Fleet Vehicles and Equipment. This plan outlines fuel conservation through better driving habits.
DEFINITIONS

**BIOMASS** – A variety of renewable fuel sources derived from organic plant and animal material, such as wood, crops, landfill gas, solid waste, and alcohol fuels. These resources can be used to generate, electricity, heat, and develop alternative transportation fuels.

**BIOGAS** – Is produced from the anaerobic digestion of organic matter such as animal manure, sewage, and solid waste. After it is processed to a required standard of purity, biogas is a renewable substitute for natural gas.

**GGE (GASOLINE GALLON EQUIVALENT)** – Is the amount of alternative fuel it takes to equal the energy content of one liquid gallon of gasoline.

**FFV (FLEXIBLE FUEL VEHICLES)** – Vehicles produced to utilize E85, gasoline or any blend of the two different fuels.

**LNG** (Liquefied Natural Gas) – To provide more driving range than compressed natural gas, the gas is cooled to -260 and condensed into a liquid and stored in insulated tanks.

**CNG** (Compressed Natural Gas) – To provide adequate driving range natural gas is compressed into a high pressure tank.

**LPG** (Liquefied Petroleum Gas) – Otherwise known as “propane.”

**E85** (Ethanol 85% conventional gas 15%)

**NGV** (Natural Gas Vehicles) Vehicles that are constructed to utilize CNG or LNG exclusively

**GHG** (Greenhouse Gas Emissions) – Scientific evidence suggests that the buildup of greenhouse gases in the atmosphere is raising the earth temperature and changing the earth’s climate. Transportation specifically, the combustion of fossil fuels in our vehicles, is the single largest source of human made green house gases, being emitted.
DIFFERENT TYPES OF ALTERNATIVE FUEL

BIODIESEL
Biodiesel is a renewable alternative fuel produced from a wide range of vegetable oils and animal fats. Pure biodiesel or biodiesel blended with petroleum diesel is a cleaner burning replacement for petroleum diesel.

Biodiesel is blended with conventional diesel fuel. The “B” designation stands for biodiesel and the number after it is the percentage. For example: B20 is biodiesel 20%, conventional diesel 80%. B100 is pure biodiesel. B5 is 5% biodiesel blended with 95% conventional diesel. Most diesel engines currently manufactured are capable of utilizing a B20 blend.

Pure biodiesel B100 has 93% of the energy content as diesel fuel. B20 has 99% of the energy content of diesel fuel.

ELECTRICITY
Electricity can be used to power and charge electric and plug in electric vehicles directly from the power grid. Vehicles that run on electricity produce no tailpipe emissions. The only emissions that can be attributed to electricity are those generated in the production process of electricity at the power generating station.

ETHANOL (E85)
Ethanol (E85) is 85% ethanol blended with 15% gasoline. Ethanol is a renewable fuel made from various plant materials or feed stocks. Ethanol has about 77% the energy content of gasoline. To go the same distances, it will take about 1/3 more in ethanol.

HYDROGEN
Hydrogen is the simplest and most abundant element in the universe. Hydrogen can be produced from fossil fuels, biomass or even by electrolyzing water. Hydrogen can be produced by renewable energy technologies, qualifying at as a renewable fuel.

METHANOL
Methanol is also known as wood alcohol. Most methanol are produced by a process using natural gas as a feedstock.

Methanol has 50% of the energy content of gasoline. To go the same distance a car will burn double in methanol as compared to gasoline.

NATURAL GAS
CNG AND LNG
Natural gas is a domestically produced fuel. Compressed natural gas (CNG) is natural gas compressed into a high pressure tank, to provide adequate driving range of a vehicle. Liquefied natural gas (LNG) is natural gas purified and condensed into a liquid form by cooling to -260 F, to further reduce the volume, so driving range is further extended. LNG requires a special insulated tank to keep the gas at a low temperature. Natural gas is plentiful; however it is not a renewable fuel.
LIQUIFIED PETROLEUM GAS

“PROPANE”
Propane also known as liquefied petroleum gas (LPG). It is produced as a by product of natural gas processing. Propane is not renewable fuel. Propane has approximately 70% of the energy content of gasoline, so to go the same distance; it will require about 1/3 more in propane.

OTHER LESS KNOWN FUELS UNDER DEVELOPMENT

BIOBUTANOL
Biobutanol is an alcohol produced through processing of domestically grown crops, such as corn or sugar, beets, or from petroleum.

BIOGAS
Biogas is produced from the anaerobic digestion of organic matter such as manure, sewage, or solid waste. After purification biogas is a renewable substitute for natural gas.

BIOMASS TO LIQUIDS
Biomass to liquids is a term describing processes for conversion of biomass into a liquid fuel. Biomass is converted into a gas, and then into a liquid.

COAL TO LIQUIDS
Coal to liquid is a process of converting coal into a liquid fuel.

FISCHER- TROPSCHE DIESEL
Fischer-Tropsch Diesel is produced by converting GAS (i.e. natural gas, biomass, or gasified coal into a liquid fuel.

GAS TO LIQUIDS
Gas to liquids is a process for converting natural gas into a liquid fuel.

HYDROGENATION DERIVED

RENEWABLE DIESEL
Hydrogenation derived renewable diesel is the product of fats or vegetable oils, alone or blended with petroleum that have been refined in an oil refinery. This fuel is also known as second generation biodiesel.

“P” SERIES FUEL
“P” series fuel is a blend of natural gas liquids, ethanol and biomass derived co solvents. “P” series fuels can be used in flexible fuel vehicles.
### Fuel Equivalency Chart: Energy Contained in Various Alternatives Fuels as Compared to 1 Gallon of Gasoline

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Equivalent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>1 GAL</td>
<td>100%</td>
</tr>
<tr>
<td>Diesel</td>
<td>1 GAL</td>
<td>113%</td>
</tr>
<tr>
<td>Biodiesel (B100)</td>
<td>1 GAL</td>
<td>103%</td>
</tr>
<tr>
<td>Biodiesel (B20)</td>
<td>1 GAL</td>
<td>109%</td>
</tr>
<tr>
<td>CNG</td>
<td>5.66LBS</td>
<td>100%</td>
</tr>
<tr>
<td>LNG</td>
<td>1 GAL</td>
<td>64%</td>
</tr>
<tr>
<td>Electricity</td>
<td>33.40KWH</td>
<td>100%</td>
</tr>
<tr>
<td>Ethanol (E85)</td>
<td>1 GAL</td>
<td>77%</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>2.198LBS</td>
<td>100%</td>
</tr>
<tr>
<td>LPG (Propane)</td>
<td>1 GAL</td>
<td>73%</td>
</tr>
<tr>
<td>Methanol</td>
<td>1 GAL</td>
<td>49%</td>
</tr>
</tbody>
</table>

**Chart 1** This chart shows the energy contained in various types of alternative fuels as compared to gasoline.

### 1 Gallon of Diesel Fuel as Compared to Different Blends of Biodiesel

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Equivalent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel</td>
<td>1 GAL</td>
<td>100%</td>
</tr>
<tr>
<td>Biodiesel (B100)</td>
<td>1 GAL</td>
<td>93%</td>
</tr>
<tr>
<td>Biodiesel (B20)</td>
<td>1 GAL</td>
<td>99%</td>
</tr>
</tbody>
</table>

**Chart 2** This chart shows the energy contained in various biodiesel blends as compared to pure diesel fuel.
ALTERNATIVE FUEL VEHICLES

There are many different types of alternative fuel vehicles. The vehicles listed are the more popular types that the automotive industries are pursuing.

FLEXIBLE FUEL VEHICLES (E85) Vehicles are gasoline engines vehicles capable of operating on E85 or gasoline or a mixture of both. They require no special fuel tanks or equipment, and get 1/3 less M.P.G. than gasoline. They require specialized fuel infrastructure. The driving range is less than a gasoline vehicle.

NATURAL GAS VEHICLES (CNG OR LNG) – are gasoline engines or converted diesel engines fueled exclusively with CNG or LNG and are also capable of utilizing a blend of natural gas and gasoline bi-fuel. One of the drawbacks is the size of the tanks, and the range. Another issue with CNG and LNG is the special fueling infrastructure required.

HYBRID VEHICLES – are powered by a conventional engine and or electric power stored in a battery. The battery is charged by the conventional engine, and by a regenerative braking system. Driving range is the same or more than a conventional vehicle.

PLUG IN HYBRIDS – are similar as a hybrid. The difference is the plug in hybrid battery is larger in capacity, and is able to be plugged in the electrical grid to be charged. Also plug in hybrids have a very small gas engine to recharge the batteries during operation, but this engine cannot transmit power to the drive train like hybrid. The plug in hybrid is capable of being driven farther than the hybrid on electrical power only. These vehicles can be charged from outlets which take 6-8 hours, in most applications.

ELECTRIC VEHICLES- Utilize a battery and electric motor for propulsion. The battery is charged by plugging into the electrical grid, typically the range is 100 miles or less, and requires 6-8 hours to slow charge, or 15 to 30 minutes to fast charge, with special equipment.

FUEL CELL VEHICLES- Are similar to electric vehicles. The electric power is provided by a fuel cell powered by hydrogen. Hydrogen powered vehicles have a good driving range.
Chart showing the fossil fuel and Alternative Fuel subsidies, ELI (Environmental Law Institute) report on federal fuel subsidies.
Chart showing fuel subsidies on different types of fuels, and where the Subsidies came from taxes or direct contributions taken from The ELI (Environmental Law Institute) Report on fuel subsidies.
2.4 Carbon Dioxide Emissions by Vehicle Type

Figure 4 depicts the carbon dioxide emissions based on the breakdown of fuel used by vehicle type (Gasoline Passenger Car, Diesel Light Truck, Gasoline Light Truck, etc.) as reported by Alachua County’s Fleet Management and Constitutional Officers. Total vehicle fleet emissions amounted to 8,586 tons of CO₂ for the year 2009. This does not include the biogenic emissions from renewable biodiesel fuel use (519 tons CO₂). Gasoline Passenger Cars were the largest contributor (40 percent), followed by Diesel Heavy Duty Vehicle (37 percent), Gasoline Heavy Duty Vehicle (8 percent), Gasoline Light Truck (7 percent), Diesel Construction Equipment (7 percent), Diesel Agriculture Equipment (1 percent), Diesel Large Utility Vehicle (<1 percent), Diesel Light Truck (<1 percent), Gasoline Agricultural Equipment (<1 percent) and Gasoline Small Utility Vehicle (<1 percent). The Diesel Heavy Duty Vehicle category includes the emissions from the waste hauling diesel trucks taking waste from the County’s Transfer Station to the out-of-county New River Landfill and emissions from the Public Safety’s Fire/Rescue trucks and ambulances. Because data was not available on the types of vehicles in use by Alachua County’s Sheriff’s Office, all of the gasoline fuel consumed by this entity was assigned
to the “Gasoline Passenger Car” category as per standard ICLEI protocol. As indicated in Appendix C, Figure C-4, 2008 breakdowns by vehicle type are not significantly different than those shown in Figure 4.

**Figure 4: 2009 CO₂ (tons) Emissions by Vehicle Type**

*Alachua County Government*

- Diesel Light Truck: <1%
- Diesel Agriculture Equipment: 1%
- Diesel Large Utility Vehicle: <1%
- Diesel Heavy Duty Vehicle: 37%
- Gasoline Passenger Car: 46%
- Gasoline Light Truck: 7%
- Gasoline Heavy Duty Vehicle: 3%
- Gasoline Small Utility Vehicle: <1%
- Diesel Construction Equipment: 7%

*Total Emissions: 8,586 tons (Excludes biogenic biodiesel emissions)*

### 2.5 GHG Emissions by Solid Waste Type

**Figure 5** shows the breakdown of the CO₂e emissions generated from the estimated tons of solid waste generated from Alachua County government’s operations. The total GHG emissions of 223 tons CO₂e shown in Figure 5 is calculated from the estimated solid waste tonnage from County government operations only. The specific composition of County government’s waste stream was not available. For the purpose of this inventory the specific composition was based on the available data for the entire Alachua County solid waste stream. The paper products category in Figure 5 was the largest contributor (74 percent), followed by food waste (21 percent), plant debris (1 percent), and wood/furniture/textiles (4 percent). Other waste, such as metal, plastic, glass, etc. was not included in the inventory. As indicated in Appendix C, Figure C-5, 2008 breakdowns by Solid Waste are not significantly different than those shown in Figure 5.
3.0 Inventory Comparison
In 2001, the BoCC established a goal for Alachua County to reduce GHG emissions by 20 percent from 1990 levels by the year 2010. Also in 2001, ACEPD completed a GHG Inventory for Alachua County governmental operations and the entire Alachua County Community, for the year 1998 including an estimated 1990 inventory.

To assess the progress that Alachua County government operations have made toward reducing GHG emissions and achieving the 20 percent reduction goal from 1990 levels, 2008 and 2009 GHG emissions from the Building/Facilities sector and the Vehicle Fleet Sector were compared to the equivalent sector emission values from the 1998 and estimated 1990 inventories. Emissions from the Solid Waste sector are small and could not be accurately compared from 2008 and 2009 inventories to earlier inventories due to differences in data procedures with the earlier inventories. Adjustments were necessary in the 2008 and 2009 inventories to allow a more accurate comparison to the earlier inventories due to differences related to what buildings/facilities and energy sectors were or were not included in each inventory. The adjustments and assumptions made for this comparison are summarized in Appendix D. The comparison of total GHG inventories from 1990 estimated, 1998, 2008 adjusted, and 2009 adjusted is provided in Table 1 and depicted graphically in Figure 6.
Table 1: Comparison of Alachua County Government GHG Inventory for Building and Vehicle Fleet Sectors (Estimated 1990, 1998, 2008 and Estimated 2009)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Building/Facility</td>
<td>15,818</td>
<td>14,422</td>
<td>15,928</td>
<td>14,769</td>
<td>0.7%</td>
<td>-6.6%</td>
<td>10%</td>
<td>2%</td>
<td>-7%</td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td>2,470</td>
<td>3,088</td>
<td>5,197</td>
<td>5,240</td>
<td>110%</td>
<td>112%</td>
<td>68%</td>
<td>70%</td>
<td>1%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>18,288</td>
<td>17,510</td>
<td>21,125</td>
<td>20,009</td>
<td>15.5%</td>
<td>9.4%</td>
<td>20.6%</td>
<td>14.3%</td>
<td>-5%</td>
</tr>
</tbody>
</table>

* 2008 and 2009 data adjusted for comparison with 1998 data.

Figure 6: Comparison of Alachua County Government GHG Inventories - Building and Vehicle Fleet Sectors

As indicated in Table 1, there is a 9.4 percent increase in overall GHG Emissions in the combined Building/Facility and Fleet sectors between 1990 and 2009. Comparing the estimated 1990 and the 2008 inventories, there appears to be a 15.5 percent increase in emissions. The lower percent increase associated with the 2009 data appears to be a result of energy reduction improvements implemented in County facilities during the 2008 and 2009 time period. The comparison of the Building/Facility sector emissions between 2008 and 2009 shows an overall 7 percent decrease in GHG emissions. Table 1 and Figure 6 indicate that the greatest contributing sector to the increased GHG emissions in the 1990 to 2009 time period is the Vehicle Fleet sector.
3.1 Buildings and Facilities Sector
As indicated in Table 1 and Figure 7 below, GHG emissions associated with the Building/Facility sector decreased by 6.6 percent from 1990 to 2009. When compared to the 1998 inventory, the adjusted 2009 inventory shows a 2 percent increase in the Building/Facility sector. Using the adjusted 2008 data for comparison with 1998 shows a 10 percent increase in GHG emissions for this same sector. There was an increase in the number of buildings/facilities between 1998 and 2009. The adjusted 2009 inventory includes 52 buildings/facilities while the 1998 inventory includes 42 buildings/facilities. Several significant county facilities were added during the decade from 1998 to 2008 including the Criminal Court House, the new Community Support Services and Health Department Building, and the Consolidated Communication Center. Other smaller facilities and leased facilities were added and facility modifications/expansions were also implemented in this decade. The fact that there is only a modest increase in GHG emissions from the Building/Facilities sector during the period from 1998 to 2009 while several significant new buildings have been added to the County inventory indicates that the energy reduction efforts implemented in county operations have reduced the rate of increase in GHG emissions. This is demonstrated by the 24 percent decrease in emissions from existing buildings during this time period.
**Table 2** provides a comparison of 2008 and 2009 GHG emissions with emissions data from 1998 for those buildings/facilities that contributed greater than 200 tons CO₂e in 2008. (Individual building information from 1990 was not available.) The Corrections/Jail facility shows a 26 percent decrease in CO₂e emissions for the 1998 to 2008 time interval and a 31 percent decrease for 1998 to 2009. Public Safety Headquarters shows a 52 percent reduction in emissions from 1998 to 2008 and a 62 percent reduction from 1998 to 2009. Additional significant reductions in the 1998 to 2009 time period include the County Administration Building (28 percent), State Attorney building (24 percent), Sheriffs Headquarters (21 percent) and Wilson Building (18 percent). These reductions are attributed to the major energy efficiency efforts that have taken place over the last decade at these facilities. The 183 percent and 124 percent increases in emissions from 1998 to 2008 and 2009 respectively for the Community Support Services/Health Department are likely due to the consolidation of several smaller offices into a new, larger facility since 1998.

**Table 2: Comparison of County Buildings/Facilities emissions for 1998, 2008, 2009**

<table>
<thead>
<tr>
<th>Building/Facility Name</th>
<th>Emissions Tons CO₂e</th>
<th>% change 1998-2008*</th>
<th>% change 1998-2009*</th>
<th>% change 2008-2009*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 1998</td>
<td>Year 2008</td>
<td>Year 2009</td>
<td></td>
</tr>
<tr>
<td>Corrections/Jail</td>
<td>7152</td>
<td>5260</td>
<td>4,963</td>
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</tr>
<tr>
<td>Civil Court House</td>
<td>1155</td>
<td>1349</td>
<td>1,130</td>
<td>17</td>
</tr>
<tr>
<td>Criminal Court House</td>
<td>na</td>
<td>1651</td>
<td>1,545</td>
<td>na</td>
</tr>
<tr>
<td>Community Supp./Health Dept.</td>
<td>542</td>
<td>1533</td>
<td>1,215</td>
<td>183</td>
</tr>
<tr>
<td>County Admin</td>
<td>1105</td>
<td>1010</td>
<td>787</td>
<td>-9</td>
</tr>
<tr>
<td>Consolidated Comm. Center</td>
<td>na</td>
<td>933</td>
<td>957</td>
<td>na</td>
</tr>
<tr>
<td>Sheriff Headquarters</td>
<td>1031</td>
<td>787</td>
<td>818</td>
<td>-24</td>
</tr>
<tr>
<td>Wilson Building</td>
<td>746</td>
<td>617</td>
<td>610</td>
<td>-17</td>
</tr>
<tr>
<td>State Attorney</td>
<td>546</td>
<td>432</td>
<td>417</td>
<td>-21</td>
</tr>
<tr>
<td>Public Works</td>
<td>385</td>
<td>416</td>
<td>392</td>
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<tr>
<td>Animal Control</td>
<td>194</td>
<td>274</td>
<td>268</td>
<td>41</td>
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<tr>
<td>Public Safety Headquarters</td>
<td>458</td>
<td>221</td>
<td>173</td>
<td>-52</td>
</tr>
</tbody>
</table>

*negative % change indicates reduction in GHG emissions

na = not available for this time period due to new building

The comparison of inventories has indicated progress in the building/facilities sector in implementing energy efficiency improvements that have reduced GHG emissions for certain buildings/facilities. However, the comparison also indicates that overcoming the increased emissions associated with growth will continue to be a challenge in this sector and illustrates the importance of continuing to apply aggressive energy reduction strategies in the future. The Alachua County Energy Conservation Strategies Commission in their December 2008 report made numerous recommendations for reducing the carbon footprint of the Alachua County community and government. It is apparent that Alachua County has already implemented a
significant program for reducing energy in its buildings and facilities sector. A few suggested strategies for continued improvement in this building sector include:

- Continue emphasis on building energy reductions through energy efficiency upgrades, and improved energy systems controls;
- Implement improved tracking of energy usage in the building and facilities sector through automation and use of tools such as Utility Manager Software;
- Adopt rigorous energy efficiency standards for new County buildings and facilities;
- Evaluate possible reductions in County building space to reduce energy demand;
- Take into account GHG impacts when planning for capital improvements in the building sector.

3.2 Vehicle Fleet Sector
The Vehicle Fleet sector has seen a considerable overall increase in CO₂e emissions since 1998. A 70 percent increase in Total Fleet CO₂e emissions between 1998 and 2009 is indicated in Table 1 and Figure 8 below. Table 1 shows a 112 percent increase in vehicle fleet emissions between 1990 and 2009. Some of this increase may be attributable to differences in vehicle fleet emission calculation procedures between those used in the 1990 and 1998 inventories as compared to the 2008 and 2009 inventories (see Appendix D), however, discussions with County Fleet management have indicated that the observed increase is likely due to actual increased fuel consumption during this period. It is possible that the increase in overall GHG emissions is due to an increase in the number of county fleet vehicles during the 1998 to 2009 period. It was not possible to accurately quantify the exact increase in the number of fleet vehicles and equipment. Recent changes to County Fleet and Vehicle policies have emphasized a reduction in the number of County vehicles, and recent data has indicated that this reduction has occurred. Discussions with County Fleet management have indicated that one likely major contributor to the increase in fuel usage from 1998 to 2009 is the addition of the County waste hauling heavy diesel vehicles (tractor trailers) in 1999. During that year, Alachua County began hauling solid waste in as many as 10 trucks per day for 3-4 trips each from the Leveda Brown Environmental Park and Transfer Station to a landfill in Union County. Previous waste hauling was handled by private companies to the Archer Landfill with little impact on County fuel usage. Additionally, during this time period, the County has undertaken road re-paving activities that have increased the use of heavy trucks and diesel construction equipment and resulted in an increase in diesel fuel usage. It is estimated that 64 percent of the total increase in GHG emissions between 1998 and 2009 is attributable to the increased fuel used for waste hauling and road construction vehicles.
The comparison of inventories has indicated that a significant increase in fuel usage (especially diesel fuel) has occurred during the 1990 to 2009 time period due to the additional tractor trailer vehicle miles associated with the County’s decision to haul garbage to New River Landfill in Union County from the Leveda Brown Transfer Station located on Waldo Road. Continued emphasis on reducing fuel usage should be a priority for County operations if progress is to be made toward achieving GHG reduction goals. The Alachua County Energy Conservation Strategies Commission in their December 2008 report made several recommendations directed toward reducing the carbon footprint from vehicles of the Alachua County community and government. Alachua County Fleet management has implemented programs to reduce the size of the County’s fleet, improve the energy efficiency of vehicles purchased and the use of hybrid vehicles. A few suggested strategies for continued improvement in this vehicle sector include:

- Continue energy reduction and efficiency improvements in current county fleet vehicles;
- Increase use of alternate fuels such as natural gas and biofuels and hybrid vehicles;
- Continue to regularly evaluate and right-size the number of County fleet vehicles;
- Increase use of teleconferencing, telecommuting and ride sharing to reduce vehicle trips;
- Consider GHG impacts as well as costs when planning for future vehicles and fuel strategies;
- Reduce the amount of out-of-county solid waste disposal.
### FLEET EQUIPMENT CLASS 01/11

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Description</th>
<th>Quantity</th>
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<tr>
<td>Autos</td>
<td>13</td>
<td>Dump Trailer</td>
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<tr>
<td>Autos, Hybrid</td>
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<td>Waste Trailers</td>
<td>16</td>
</tr>
<tr>
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<td>Boat Trailers</td>
<td>2</td>
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<tr>
<td>Utility Vehicle Hybrid</td>
<td>24</td>
<td>Radio Tower Trailer</td>
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<td>Van</td>
<td>28</td>
<td>Utility Trailers</td>
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<tr>
<td>Pickup</td>
<td>85</td>
<td>Arrow Boards</td>
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<td>Pickup Hybrid</td>
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<td>Message Board</td>
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<td>Gradall Excavators</td>
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<td>Fleet Service Truck</td>
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<td>Hydraulic Excavator</td>
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| Total                        | 293      | Total                        | 207      |

<p>| Subtotal Page 1              | 500      |                              |          |</p>
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SUMMARY OF ALACHUA COUNTY FLEET 01/11

Autos, utility vehicles, vans, pickups 200
Medium and heavy trucks 93
Heavy equipment 75
Small Engine Equipment 356
Trailers 78
Misc. Attachments 43
Total 845

* Out of the 200 Auto, Utility Vehicles Vans and Pickups

Hybrid Cars 15
Hybrid Utility Vehicles 24
Compact Utility Vehicles 3
Compact Pickup 32
Total 74

37% of this category is low emissions/energy savings vehicles.