

Gainesville, Florida

**One community's strategy to
reduce global warming**



Four key strategies to meet the carbon reduction goal:

- Improve energy and water efficiency
- Improve efficiency of power generation
- Increase use of renewable and domestic fuels to generate electricity
- Improve transportation and land use initiatives

Reducing Greenhouse Gas Emissions

What is the goal?

Gainesville is one of more than 1,000 cities in the United States now committed through the U.S. Conference of Mayors to taking action to protect our climate.

From improving the synchronization of traffic signals to installing new solar panels at local businesses, a number of projects to reduce greenhouse gas emissions and slow global warming are underway in Gainesville, Florida. This report provides details on Gainesville's plan to reduce carbon emissions – the largest contributor to global climate change.

Local governments have a unique responsibility in the fight against global warming as elected officials make decisions on behalf of citizens regarding issues such as transportation, power generation, infrastructure improvements, land use and zoning, building codes, landscaping, waste management and land conservation.

In 2005, along with cities across the nation, City of Gainesville leaders pledged to reduce carbon. As part of this progressive leadership, Mayor Pegeen Hanrahan signed the U.S. Mayors Climate Protection Agreement on behalf of the Gainesville City Commission. The Climate Protection Agreement and the Kyoto Protocol call for reducing carbon emissions to seven percent below 1990 levels by 2012, a target Gainesville will hit in 2013. This is an aggressive goal considering that about 60 percent of the electricity used to serve Gainesville's homes and businesses comes from coal generation.

Through its municipally-owned utility, GRU, the city has made many strategic investments to reduce carbon emissions. For example, GRU purchased a natural gas distribution system in 1990 and has purchased electricity generated from wind and landfill gas. Most recently, GRU began purchasing additional landfill gas and signed a contract with Gainesville Renewable Energy Center, LLC to purchase and own 100 percent of the energy produced by a new 100-megawatt (MW) biomass-fueled power plant.

Improve Energy and Water Efficiency

GRU's energy supply strategy is to improve the efficiency of its power generating units and increase the use of renewable energy.

The cheapest energy is the energy that is never produced.

GRU has sponsored energy efficiency programs since the late 1970s but stepped up its efforts in 2006. That year, the Gainesville City Commission directed the utility to pursue additional programs to help customers modify their use of electricity and achieve maximum energy efficiency. Figure 1 demonstrates the range and depth of the available energy and water efficiency programs, including a program designed to offer low-income customers assistance making upgrades that can lower their electric bill, improve comfort and reduce energy use.

A key component of several GRU efficiency programs has been and continues to be providing substantial financial incentives to encourage customers to use natural gas for water heating, space heating and clothes drying. The direct use of natural gas for these activities is twice as efficient as electricity when the losses involved in converting fuel to electricity are considered. GRU has set very aggressive goals to help customers reduce electricity consumption, which ultimately will reduce GRU's retail electric sales by more than 10 percent by 2015.

Improve Efficiency of Power Generation

In 2000, GRU converted the downtown J.R. Kelly Generating Station Unit 8 to a combined cycle unit, resulting in a 75-MW increase in capacity and a 50 percent increase in the generation efficiency. In addition, the South Energy Center is now serving the new Shands Cancer Hospital at the University of Florida. The South Energy Center uses advanced technology to simultaneously produce electricity, chilled water, and steam for the hospital at double the efficiency of a traditional, centralized power plant.



GRU's South Energy Center was dedicated in late 2009.

Figure 1

CASH BACK ENERGY AND WATER EFFICIENCY PROGRAMS

	RESIDENTIAL	BUSINESS
SOLAR		
Solar Electric (PV) System	\$1.50/watt up to \$7,500	Solar FIT*
Solar Water Heater	\$500	up to \$500
NATURAL GAS		
Natural Gas Water Heater	up to \$500 (2x \$250)	\$500
Tankless Natural Gas Water Heater	up to \$700 (2x \$350)	
Natural Gas Central Heater	up to \$400 (2x \$200)	
Natural Gas Range and Dryer	\$75	
Cooling/Dehumidification		up to \$50,000
HEATING AND AC REBATES		
High Efficiency Central Air Conditioner	\$300 or \$550	\$300 or \$550
High Efficiency Room Air Conditioner	Exchange	
Central Air Conditioner Maintenance	up to \$40 when combined with duct repair or added insulation	
Duct Leak Repair	50% of the cost of repairs, up to \$375	
OTHER PROGRAMS		
Customized Business Rebate		50% of the project cost up to \$100,000, restrictions apply
Smart Vendor for Drink Machines		free equipment
ENERGY STAR® for Affordable Housing	up to \$300	
Added Insulation	\$0.125 per sq. ft., up to \$375	
Refrigerator Buyback and Recycling	\$75	
3% APR Energy Efficiency Loan	up to \$10,000	
Home Performance with ENERGY STAR®	up to \$1,435	
LEEP (Low Income Energy Efficiency Program)	up to \$2,900	
Pool Pump	up to \$350	
In-ground Irrigation System Maintenance and Rain Sensor	\$50 and \$25	

* Participants in the solar feed-in tariff (FIT) invest in their own PV systems and sell energy directly to GRU under a long-term contract with a guaranteed price.

Increase Use of Renewable and Domestic Fuels to Generate Electricity

Solar

GRU has been providing rebates for solar water heating since 1997 and solar photovoltaic (PV) systems since 2007. The solar programs have been so successful that in March 2009, Gainesville implemented a solar feed-in-tariff program offering GRU electric customers a chance to invest in PV and sell the electricity directly to the utility under a contract for 20 years at a fixed price. Based on highly-successful models in Europe, this program is expected to add 20 MW of solar electricity to GRU's power supply within five years. The utility has already received enough completed applications to reach the annual target of 4 MW through 2016.

Gainesville was the first utility in the nation to implement a solar feed-in-tariff to promote the production of distributed solar PV.

Biomass

Biomass, or organic materials made from plants and animals, can be burned or converted to produce energy in a method that is carbon neutral. GRU has signed a contract to purchase the energy from a biomass-fueled 100-MW power plant to be known as the Gainesville Renewable Energy Center (GREC). The fuel for the plant will come from logging residues, forest thinnings and similar urban waste vegetation, most of which is currently burned in the field without any pollution control. GREC will provide renewable energy for Gainesville at a reasonable cost, as well as contribute to the reliability and integrity of GRU's electric system. With \$5.5 million per year expected in local tax revenues, and the creation of many new jobs in the region, the economic development aspects are an additional benefit for the community.

Landfill Gas

Landfill gas (mostly methane gas) is produced by the natural degradation of organic matter in a landfill – in the past this gas typically went to waste. The methane emitted is a harmful greenhouse gas with a potential global warming effect greater than carbon. To help reduce the effects, GRU is now purchasing energy from G2 Energy, LLC, which is collecting methane at the Marion County Baseline Landfill and using it as fuel for electric generators. This effort builds on the landfill gas to energy project between GRU and Alachua County at the Southwest Landfill. This project ended in 2007 when all the useful gas was converted to electricity. Figure 2 compares the current usage of fuel by GRU with 2013 projections.

Figure 2

GRU FUEL MIX

Planned Improvements in GRU's Fuel Diversity (Percentage of Electric Energy [MWh] by Fuel Type)

Fuel Type	Current (% by MWh)	Future circa 2013 (% by MWh)
Coal	59.1%	62.6%
Natural Gas	19.3%	10.4%
Fuel Oil #2 & #6	0.3%	0.0%
Purchased Power	15.5%	0.0%
Subtotal Fossil	94.2%	73%
Nuclear	4.9%	5.2%
Biomass ¹	0.0%	18.5%
Solar PV	0.03%	1.7%
Landfill Gas	0.9%	1.6%
Subtotal Renewable	0.9%	21.8%
Total All Fuels	100.0%	100.0%

This table represents current contractual commitments, 4 MW of solar installed per year starting 2009 (FIT is fully subscribed through 2016, a potential for 32 MW of PV if all contracts are completed), and successful completion of ongoing biomass projects.

(1) Assumes that for the period 2014 through 2023, half of the capacity (50 MW) of the biomass unit will be sold off system.



More than 69 percent of Gainesville's standard traffic lights have been replaced with energy efficient LED lights.

Improve Transportation and Land Use Initiatives

There are many cost-effective ways to reduce carbon emissions. Two of the largest efforts in Gainesville include traffic management and land protection.

Traffic Synchronization

Gainesville is installing a county-wide state-of-the-art Traffic Management System. The new system involves replacement of outdated traffic signal controllers, traffic monitoring cameras, system-wide signal retiming, public access to real time conditions, and a Traffic Management Center. The Traffic Management Center will allow engineers to monitor traffic and provide real time signal timing modifications in response to travel conditions. The new system is expected to reduce travel time delays thus resulting in reduced fuel consumption and carbon emissions.

Development Rights and Land Conservation

The City of Gainesville currently either owns or controls the development rights on more than 10,000 acres of land. By keeping these lands out of development, the storage of carbon in the soil and the capture of carbon by appropriate land management is preserved for substantial carbon offset credits. And more than \$20 million will be invested for additional land conservation efforts in Gainesville and Alachua County over the next several years through the “Wild Spaces and Public Places” one-half cent sales tax initiative that voters passed in November 2008. Figure 3 lists the programs or projects that are taking place citywide to reduce carbon.

Figure 3

CURRENT AND FUTURE OFFSETS (metric tons of CO₂ equivalents per year)

Source of Carbon Offsets	Current Reductions (thru 2008)	Projected Annual Reductions (by end of 2013)
Repowering J. R. Kelly Unit 8	36,134	31,801
GRU Energy Conservation Programs	131,031	177,650
Acquiring Land Development Rights	31,824	31,824
Landfill Gas to Energy Project	3	19,678
LED Traffic Signals	1,036	2,967
Combined Heat and Power (South Energy Center)	0	22,557
Solar Photovoltaic Electricity	435	7,682
Biomass Power Plant ¹	0	334,219
Traffic Light Synchronization	0	82,701
Totals	205,685	711,079

¹ Assumes that in 2013, half of the capacity of the biomass unit will be sold off system.

Advantages for Citizens of Gainesville

The smart investments being made by the City of Gainesville to reduce greenhouse gases, improve energy efficiency and increase renewable energy sources will more than pay for themselves in years to come. The benefits include reduced overall expenditures for electricity and fuels, a cleaner atmosphere, protection against pending carbon constraint legislation, the creation of jobs, new economic opportunities, a higher quality of life and enhanced energy independence for the community.

Figure 4 shows CO₂ equivalents emissions from 1990, 2008, and a projection for 2013. Total carbon emissions in relation to the goal of the Kyoto Protocol are shown in Figure 5.



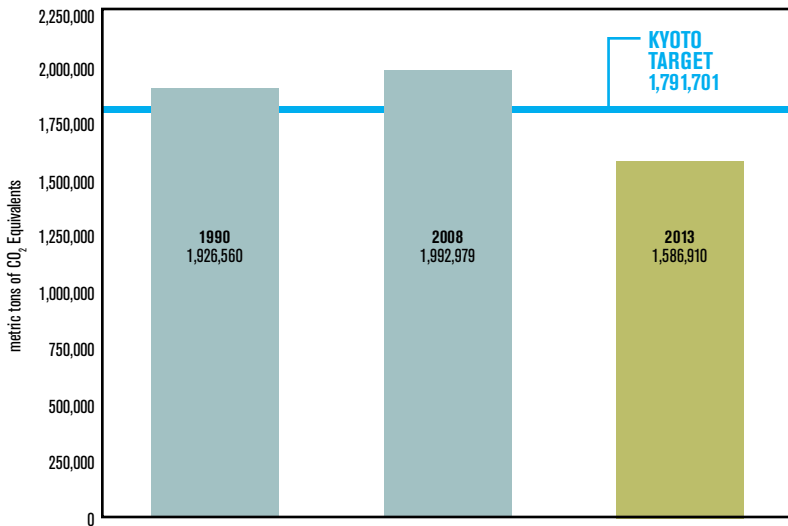
Figure 4

HISTORY AND TREND IN CARBON EMISSIONS (Equivalent Metric Tons of CO₂ per Year)

Energy End Use	Calendar Year		
	1990	2008	2013
Electrical Production or Purchase	1,662,079	1,863,570	1,440,824
Non-Electric Generating Unit (W/WW, Nat Gas, Vehicles, etc.)	264,481	129,408	146,086
Total City of Gainesville Operations	1,926,560	1,992,979	1,586,910

Figure 5

TOTAL CITY OF GAINESVILLE CARBON EMISSIONS



For more information, visit www.cityofgainesville.org. Find tips for reducing your energy and water use at www.gru.com. Visit <http://gainesville-green.com> to view your carbon footprint.



301 S.E. 4th Avenue
Gainesville, FL 32614
(352) 334-3434

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