

## APPENDIX A BACKGROUND AND PROPOSED ELECTRICAL SUPPLY PLAN

The City of Gainesville, Florida is the county seat and population center of Alachua County. The unique physical resources and climate of Gainesville affect the energy needs and renewable energy opportunities for the community. Protecting the environmental benefits and recreational aspects of these features is also key concern for the City Commission.

### PHYSICAL RESOURCES AND CLIMATE

Gainesville is an inland community located in north central Florida with an estimated urban population of 179,000 (117,000 in the incorporated city limits). Located about 110 miles north of Orlando and 75 miles southwest of the Jacksonville, Gainesville is roughly midway between the Atlantic Ocean to the east and the Gulf of Mexico to the west. The climate is semi-tropical and humid, with an average temperature of 69°F, 2700 cooling degree days and 1100 heating degree days. Rainfall averages 48 inches per year with a pronounced dry period in early spring and during winter months. As is true for Florida in general, more energy is consumed for cooling and humidity control than for space heating in Gainesville, and the average wind speed is too low to generate electric power.

The convective storms that sweep across Florida from the north in winter cause relatively brief periods of sharp cold weather, and as a result Florida is actually winter peaking in terms of electrical demand. Although Gainesville is further north than most of Florida, it differs from most of the rest of the state in that it does not have peak electrical demands during the winter. This is due to the large market penetration of natural gas to meet heating needs.

The community straddles a major geological divide in Florida. The community transitions from the central highlands plateau in the north and east (elevation 160-180 feet m.s.l.), to the emergent coastal zone to the west and south (elevation 70-80 feet m.s.l.). The central highlands overlay confined aquifers and are dominated by impermeable soils, pine flat woods and cypress stands. The emergent coastal zone consists of unconfined aquifers and is dominated by droughty soils and sand hill vegetative communities. The transition zone has been named the Cody Scarp, and is characterized by surface streams cutting into the clay overburden creating a gently rolling landscape of mesic hammock vegetative communities. Gainesville is bordered to the east with a large, perched water table lake (Newnans' Lake) and to the south and west with karstic

formations that alternate between being a wet prairie and a shallow lake (Paynes' Prairie and Lake Kanapaha). The phosphatic nature of the clays underlying the central highlands results in the eutrophic character of these surface water features.

The underlying limestone formations of Florida, combined with the changing elevation and aquifer types across the Cody Scarp results in a region characterized by sinkholes, disappearing streams and rivers as well as many cool, clear springs. The small changes in elevation, porous geological formations, and urbanization of stream and river valleys results in an inability to develop hydroelectric power. The deep limestone formations and a lack of magma presence result in geothermal energy for electric generation also not being available.

North central Florida supports major forestry industries that leave behind substantial quantities of biomass as a result of their harvesting activities that is typically burned. Central highland and sand hill natural ecosystems, prevalent in north central Florida are fire adapted, and encroaching urbanization has reduced the frequency with which these systems are burned. Unfortunately, the consequent buildup of fuel creates hot fires that kill rather than maintain the forests. As a result, there is a growing campaign to mechanically remove biomass in order to preserve natural systems. The forest waste and harvested biomass present an opportunity to utilize renewable energy while reducing particulate emissions.

Known as the "Sunshine State", Florida actually has less solar energy than many dryer, less humid areas of the country. Studies by the Florida Solar Energy Center and the Governor's Energy Office have found passive solar design and thermal water heating to be the most cost-effective forms of solar energy to use in Florida.

## COMMUNITY VALUES

The Gainesville community has a diverse population with a variety of sub-sections and with a variety of values. Among those values are environmental purity and beauty, productive work, prosperous economy, high quality education, high quality public services, outdoor recreation, creative arts, social justice, neighborliness, personal rights, health care, democratic participation, outdoor recreation, creative arts, and integrity and competence in service of the public good.

## GAINESVILLE'S ECONOMY

Gainesville's economy is dominated by service sector employment in the educational and medical industries, with associated retail support services. As a result, the community has a substantial portion of low income households. Gainesville is the home of the University of Florida with 48,000 students and Santa Fe Community College with 10,000 students. Both of these are major state educational institutes. As a result, a substantial fraction of dwelling units (45.1%) in the area are rental units, nearly twice the state average. The Shands teaching hospital at the University of Florida, combined with the local Veterans Administration hospital as well as private sector facilities has made Gainesville into a major catchment area for health care in north central Florida. Ideas and concerns from both faculty and students have infused all aspects of municipal government, and the City Commission has often entered into partnerships that support University as well as local initiatives.

Because of the preponderance of publicly owned and tax exempt facilities, over half the property in the City of Gainesville is exempt from ad valorem property taxes. A substantial portion of the City of Gainesville's operating revenues are obtained from transfers from utility operations (approximately 32%).

## GAINESVILLE REGIONAL UTILITIES

Gainesville Regional Utilities (GRU) is a municipal electric, natural gas, water, wastewater and telecommunications utility owned and operated by the City of Gainesville Florida. GRU provides retail utility services to approximately 132 square miles of both incorporated and unincorporated areas of the Gainesville Urban Area, as well as retail gas services to the adjacent City of Alachua. GRU provides wholesale electric power to a contiguous portion of the Gainesville urban area as well as to the City of Alachua. Table 1 below summarizes the number of electrical customers and electrical sales to the major customer groups served by GRU. The electrical system is self generating with a portfolio of steam, combustion turbine, and combined cycle units using coal, natural gas, oil, and nuclear fuels. Details concerning GRU's customer base, electric generating facilities, fuel supplies, and long range plans may be found on [www.GRU.com](http://www.GRU.com), under "future power needs".

The City Commission, through its utility operations, supports the use of renewable energy and energy conservation. The local utility provides information, energy surveys, and rebates for energy efficient appliances and solar water heating to promote energy efficiency and renewable energy. Rebates are also available to customers for the conversion of electrical appliances to natural gas. A "green power" program is available for customers

who wish to support renewable energy, and funds from this program have been used for a number of solar electric demonstration projects as well is for a facility to convert landfill gas (methane) to electricity. The average electrical use of Gainesville's residential customers is the lowest of any urban area in Florida (11,000 kilowatt-hours per year vs. the state average of 14,000 kilowatt-hours per year). Extensive community outreach conducted as part of developing the proposed plan described in Appendix A identified the following core community values surrounding energy supplies:

- Reliable and affordable energy supplies
- A healthy environment
- Conservation of natural resources
- Economic development

Forecasts of electrical load and energy, the planned retirement schedule for older generating units, and integrated resource planning studies indicate the need additional base load electrical generation capacity by 2011. Appendix A summarizes the status of planning studies and proposals, with a detailed listing of the fundamental planning objectives and assumptions that have been applied. The long term plan developed under these assumptions is summarized in Appendix A.

Table 1  
GRU Electric System Sales and Customers<sup>1</sup>

<u>Customer Type</u>	<u>Customers</u>	<u>Energy (MW/Yr)</u>	<u>% Energy</u>
<u>Retail</u>			
Residential	78,219	872,934	43.7%
Non-Residential	9,388	942,039	47.2%
Street & Outdoor Lighting	=	25,177	1.2%
<b>Total Retail</b>	<b>87,607</b>	<b>1,840,150</b>	<b>92.1%</b>
<u>Firm Wholesale</u>			
Alachua		95,894	4.8%
Clay (SEC)		61,239	3.1%
<b>Total Wholesale</b>		<b>157,133</b>	<b>7.9%</b>
<u>Total System</u>		<b>1,997,283</b>	<b>100.0%</b>

1. Fiscal Year 2005 Projections with Actual-to-Date through March

## FUTURE ELECTRICAL REQUIREMENTS

GRU's electrical system self generating with a portfolio of steam, combustion turbine, and combined cycle units using coal, natural gas, oil, and nuclear fuels. Details concerning GRU's customer base, electric generating facilities, fuel supplies, and long range plans may be found on www.GRU.com, under "future power needs". Of particular relevance to this Scope of Services are the documents to be found under "future power needs- index of articles" on this web site entitled:

1. Alternatives for Meeting Gainesville's Electrical Requirements Through 2022;
2. Planning Study of the Effects of Gainesville's Long Term Electrical Energy Supply Plans on Ambient Air Quality and Greenhouse Gas Emissions;
3. Staff Response to Long Term Electrical Supply Plan Questions, Issues, and Recommendations;
4. Gainesville Regional Utilities 2005 Ten Year Site Plan Filed with the Florida Public Service Commission.

Forecasts of load and energy and the planned retirement schedule of older generating units have lead staff to conclude the need for additional base load electrical capacity by 2011. GRU staff, working with a number of environmental and engineering consultants, and after considerable public input from workshops and meetings, has developed an integrated resource plan to meet Gainesville's needs through 2023. The staff's planning objective was to minimize long term revenue requirements while balancing the use of: demand side management, renewable energy and fossil fuels with community interests in environmental protection, affordability, local control and concern over climate change. Staff has developed and proposed a plan based upon the following fundamental planning objectives and assumptions:

1. Meet Gainesville's needs as forecasted through 2023;
2. Minimize long term electrical revenue requirements;
3. Assure reliable and adequate supplies with a minimum of a 15% capacity reserve margin;
4. With the exception of information and low-income assistance programs, demand side management and energy efficiency programs should meet the rate impact measure test with a benefit to cost ratio of at least 1.0;

5. Reduce emissions of regulated air pollutants;
6. Minimize the consumption of potable water;
7. Reduce the carbon intensity of electrical production through a combination of generation efficiency improvements, the use of renewable sources of energy, and carbon offsets;
8. Nuclear capacity would not be available in the planning horizon;
9. Municipal solid waste combustion would not be acceptable to the community;
10. Initially it was assumed that the Deerhaven power plant site would be available for additional generation capacity that would be either: 1) solely owned by GRU or 2) a facility jointly owned with other utilities. In early 2004 the City Commission voted to no longer pursue a jointly owned unit at the Deerhaven plant site;
11. Initially it was assumed that one option for obtaining additional generation capacity was to participate in a facility jointly owned with other utilities located at some distance from the GRU service territory. In early 2004 the City Commission voted to no longer pursue ownership of facilities at a site other than Deerhaven;
12. Evaluate commercially available technologies for producing electricity, including technologies based on fossil fuel as well as renewable energy;
13. Evaluate commercially available technologies for demand side management and consumer energy efficiency;
14. The most abundant, affordable, and benign supplies of renewable energy in the north central Florida region are forest waste products (biomass) and thermal solar water heating;
15. Any recommended plan had to be robust under a wide range of fuel price and load growth scenarios, including up to \$100/ton of carbon dioxide, either as a fuel tax or an opportunity cost;

The proposed plan resulting from these objectives and assumptions includes the following inter-related elements:

1. Meeting an additional 10% of electrical demand through energy conservation and renewable energy;
2. A Greenhouse Gas fund to promote local reductions of greenhouse gases;
3. Additional ambient air quality monitoring;
4. Retrofitting GRU's existing coal fired 220 MW power plant with additional emission controls;
5. Additional solid fuel generation capacity able to use a wide range of fuels, including biomass, coal, and petroleum coke, while reducing overall levels of regulated emissions; and
6. The use of reclaimed water.

~~Staff based its economic and environmental studies on a nominal 220 net MW circulating fluidized bed plant design, generating up to 30 MW of capacity from forest waste products, and able to utilize up to 50% petroleum coke. Staff based its economic and environmental studies on a nominal 220 net MW circulating fluidized bed plant design, generating up to 30 MW of capacity from forest waste products, and able to utilize up to 50% petroleum coke. Cooling water would be supplied with reclaimed water from the utilities wastewater system. Staff is open to using a higher percentage of biomass, but is concerned about the sustainability of supply and fuel cost impacts of committing to a greater use of biomass at this time. Staff has requested authorization to develop a conceptual design for this facility as a 'self build" option. If authorized, staff intends to solicit proposals from the power market for evaluation against this "self build" option.~~

## APPENDIX B CONCERNS AND QUESTIONS

The proposed long term energy plan represents a major financial commitment by the community, and has generated a number of concerns and questions from Commissioners as well as members of the local community. These concern and questions are to be considered and addressed in the alternative plans to be prepared by the Consultant. These concerns and questions address a wide range of topics that may be summarized as:

1. The potential for demand side management and energy efficiency to offset the size of the proposed increment of new generation included in the proposed plan;
2. The potential for greater uses of renewable energy than the commitments included in the proposed plan;
3. More comprehensive consideration of environmental externalities;
4. Concerns that continued and increased use of coal is detrimental to human health in Alachua County;
5. The potential for greenhouse gas reductions greater than those included in the proposed plan;
6. Desire to incrementalize investment to hedge financial risk in case forecasts of load growth do not materialize; and
7. Customer Affordability.

Exhibit 1 contains a list of documents and materials that further illustrate the issues and questions that the Commission has been asked to consider. These will be provided prior to the consultant's notice to proceed.



## Exhibit 1

Documentation that has been provided to the City Commission will be made available to the consultants. The following list is an example of the type of documents that will be provided. All documents will be sorted and indexed.

1. Letters, e-mails and handouts that were presented to the City Commission.

Examples:

- May 25, 2005 e-mail from Commissioner Craig Lowe re: Points of inquiry for independent review of Gainesville energy policy (points presented to the Commission on May 12, 2005).
- Letter to the Commission from Commissioner Jack Donovan presented June 14, 2005.
- David Harlos handout from February 9, 2004 City Commission Meeting
- December 22, 2004 letter from Bill and Rae Marie Gilbert
- February 8, 2004 e-mail from Ceasar Gomez

2. Presentations from, staff, consultants, outside agencies and citizens.

Examples:

- Preliminary Integrated Resource Plan to Meet Gainesville's Electrical Needs Through 2022 (Gainesville Regional Utilities, December 15, 2003).
- New Air Quality Regulations (Gainesville Regional Utilities, April 25, 2005).
- Conservation and Climate Change (Dian Deevey, April 19, 2004)
- A Review of Cost-Benefit Tests for Energy Conservation, Efficiency, and Demand-side Management (Paul M. Sotkiewicz, Director of Energy Studies, Public Utility Research Center, University of Florida, April 19, 2004).

3. Reports and studies from staff, consultants, outside agencies and citizens.

Examples:

- Alternatives For Meeting Gainesville's Electrical Requirements Through 2022 (Gainesville Regional Utilities, December 2003).
- Gainesville Regional Utilities Air Quality Impact Study (Black & Veatch, February 2004).
- Technical Review of Gainesville Regional Utilities Integrated Resource Plan (Alachua County Environmental Protection Department, November 15, 2004).

4. City Commission Meeting Minutes related to Gainesville's Future Energy Needs.

Section 1

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