

2.0 NEED FOR THE PROPOSED FACILITY

This Chapter 2 of the SCA discusses the schedule for obtaining FPSC's approval of a petition filed

by GRU and GREC LLC for a FPSC determination of need for the proposed GREC (Petition). This chapter also explains how and why GRU concluded that the proposed GREC is the best alternative for meeting the electricity supply needs of its customers.

2.1 FPSC SCHEDULE FOR DETERMINATION OF NEED

Pursuant to Section 403.519, F.S., FPSC is the exclusive forum for a determination of need proceeding for a proposed electrical generating facility. When making its determination concerning the need for a proposed electrical generating facility, FPSC must take into account the following factors: (a) the need for electric system reliability and integrity; (b) the need for fuel diversity and supply reliability; (c) whether the proposed plant is the most cost-effective alternative available; (d) the need for adequate electricity at a reasonable cost; (e) whether renewable energy sources and technologies, as well as conservation measures, are used to the extent reasonably available; and (f) the conservation measures taken or reasonably available to the applicant or its members which might mitigate the need for the proposed plant (Rule 403.519[4], F.S.).

On September 18, 2009, GREC LLC and GRU jointly filed a Petition for GREC with FPSC (FPSC Docket No. 090451-EM). The Petition and supporting documents can be found on FPSC's Web site at <http://www.psc.state.fl.us/dockets/cms/docketFilings2.aspx?docket=090451>.

At this time (November 2009), the Petition is under review by FPSC. The FPSC hearing for consideration of the Petition is scheduled to be held on December 16, 2009. The FPSC docket indicates FPSC will issue its order concerning the Petition on March 1, 2010.

2.2 BACKGROUND AND EXECUTIVE SUMMARY

In October 2007, GRU issued a request for biomass proposals (RFP) to address Gainesville's need for additional generating capacity. This RFP was the culmination of an extensive integrated resource planning (IRP) process, including 43 public workshops and 27 separate Gainesville City Commission meetings and several dozen presentations to civic and community groups over the course of 7 years. From this IRP process, the decision was made by the Gainesville City Commission to only pursue renewable energy for its supply side alternatives. The justification for GREC is based on: (a) the need for electricity at a reasonable cost, (b) the need for fuel diversity and supply reliability, and (c) the need for electric system reliability.

GRU has aggressively pursued demand-side management (DSM) and renewable energy alternatives. GRU has also aggressively pursued the most cost-effective biomass generation project through an open and transparent competitive bidding process, which resulted in selection of GREC. Compared to natural gas combined-cycle technology, GREC will have a lower net present value (NPV) levelized cost per MWh under most of the scenarios and sensitivity cases evaluated, as well as much more stable and predictable costs for GRU's ratepayers.

Furthermore, GREC will provide a hedge for GRU against the cost of potential renewable portfolio standards and/or carbon constraint legislation. Despite aggressive conservation programs, as well as the effect of recent economic downturns on slowing the demand for electrical power in Gainesville, GRU will still need additional baseload capacity by 2023, a need that GREC will meet. Until that date, GREC will be displacing the cost and hedging the volatility of natural gas prices, reducing GRU's reliance on an aging generation fleet and hence improving reliability and meeting Gainesville's policy objectives in a cost-effective manner.

2.3 GRU'S PLANNING AND PUBLIC OUTREACH PROCESS

Load and energy forecasts developed early in 2003 indicated that GRU would need additional base load capacity by 2011. Based on this demand forecast, GRU began the

process of evaluating generation alternatives with long lead times, especially solid fuel alternatives. The ensuing community discussion was extensive and in-depth. GRU and the public evaluated nearly every demand and supply resource alternative, and, for many of the alternatives, they considered the potential impacts on local air quality, as well as any related climate change issues.

Gainesville's IRP process led to at least eight major policy decisions by the Gainesville City Commission and ultimately resulted in the decision to proceed with GREC. The City's major policy decisions included the following:

- Adoption of electric rates that are designed to promote energy conservation.
- Adoption of the total resource cost (TRC) test for DSM planning.
- Adoption of a DSM plan that will reduce load growth by 60 percent.
- Commitment to the goal of meeting the Kyoto Protocol for reducing GHG emissions.
- Elimination of coal, petroleum coke, and municipal solid waste as fuel sources for Gainesville's new generating capacity.
- Acceptance of PPAs as a means of acquiring additional electricity, rather than having GRU build its own new generation facilities in every case.
- Preference given to the use of energy efficient combined heat and power (CHP) distributed generation.
- Implementation of the first utility European-style solar feed-in tariff (FIT) in the United States.

These decisions by the City have been beneficial. The combined effect of the DSM programs, the addition of 7.5 MW of generation from CHP and landfill gas-to-energy projects, the ongoing addition of 4 MW per year of solar photovoltaic (PV) capacity through the solar FIT, and the effects of the recent economic downturn have delayed until 2023 the need for additional generation capacity to meet Gainesville's minimum reserve margin criteria (15 percent). Nonetheless, the City still needs to move forward now with GREC.

The reserve margin was not the only criterion that was used when deciding whether additional generating capacity is needed. The cost to produce electricity, the age and reliability of the electrical generating units, and other economic and environmental factors are additional criteria that were considered. GRU's largest and most economical unit is DGS Unit 2, but Unit 2 is coal-fired and 28 years old. Any unplanned outage at Unit 2 causes GRU to incur significant replacement power costs. One third of GRU's other generating resources, including its other intermediate load steam plant, are gas-fired units with relatively poor heat rates with an average age of 38 years. Consequently, GREC will provide GRU with a long-term, economical baseload generating resource, which will help minimize the cost of DGS Unit 2 outages and minimize the risk of volatile fuel prices. Furthermore, GREC will help Gainesville meet its policy objectives for reducing GHGs. GREC will protect or hedge against the costs of any future state or federal regulations mandating renewable portfolio standards or carbon constraints.

As noted previously, the Gainesville City Commission's decisions were based on a comprehensive planning process. The IRP process was launched in 2002, when the Gainesville City Commission authorized GRU to participate in a joint planning study with consumer-owned utilities in Florida to investigate solid fuel alternatives. A wide-ranging public participation program was a critical element in the IRP process. A public participation program was sponsored by the Gainesville Energy Advisory Committee (GEAC) in the summer and fall of 2003. The GEAC is created by city ordinance, and it is a standing citizens' advisory committee, whose members are appointed by the Gainesville City Commission. The public participation continued through May 2009, when the PPA with GREC LLC, was approved unanimously by the Gainesville City Commission. To date, there have been more than 43 community workshops and formal presentations to policymakers, including the GEAC, the Gainesville City Commission's Regional Utilities Committee (RUC), and the Alachua County Board of County Commissioners. There have been 27 televised Gainesville City Commission meetings dedicated to Gainesville's long-term energy supply strategy. In addition, there have been several dozen less formal meetings with civic groups throughout the community.

2.4 FORECAST CAPACITY REQUIREMENTS

GRU is a summer peaking system. The firm summer peak demand is projected to increase from 441 MW in 2009 to 503 MW in 2043. GRU's current generating facilities have a total summer net capacity of 608 MW. In addition, GRU's summer net capability of 608 MW has a megawatt-weighted average age of more than 25 years (two-thirds of GRU's generating capacity is 28 years or older). For the summer of 2009, GRU purchased power resources of approximately 102 MW.

2.5 RELIABILITY CRITERIA

GRU plans for sufficient capacity resources to meet its peak demand and maintain an additional margin of capacity should unforeseen events result in higher system demand or lower than anticipated availability of capacity. GRU uses a minimum 15-percent reserve margin for both the summer and winter seasons. Due to load growth as well as the retirement of older units, GRU is expected to encounter a capacity shortfall in 2023.

2.6 ALTERNATIVES ANALYZED

Before making the decision in May 2008 to move forward with GREC, GRU considered a wide variety of supply-side technologies, including renewable, conventional, emerging, and advanced technologies. The renewable technologies considered included geothermal, solar energy conversion (solar thermal and solar PV), biogas (anaerobic digestion and landfill gas), waste-to-energy (WTE) (mass burn and refuse-derived fuel [RDF]), wind turbines, and biomass (direct-fired, cofiring, and gasification).

The conventional technologies considered included natural gas-fired simple- and combined-cycle combustion turbines, pulverized coal (PC), and coal-fired fluidized bed combustion (FBC) units. The emerging technologies considered included coal gasification (integrated gasification combined-cycle [IGCC] and non-IGCC units) and nuclear generation. The advanced technologies considered included advanced combustion turbines, fuel cells (phosphoric acid and molten carbonate), and advanced coal units.

The IRP studies undertaken by GRU ranged from screening studies of technology feasibility and busbar comparisons to full-blown generation optimization studies using the

Electric Power Research Institute (EPRI) Electrical Generation Expansion Analysis System (EGEAS). Many of these alternatives were eliminated from further consideration because of concerns about their feasibility, levelized cost, overall reliability, and ability to meet GRU's capacity and energy needs as well as the City of Gainesville's policy goals. The supply-side alternatives evaluated in Gainesville's detailed economic analysis included an emerging simple-cycle combustion turbine (General Electric [GE] LMS100), a conventional combined-cycle combustion turbine (GE 7EA), a 125-MW (net) PC unit, and a 125-MW (net) PC unit with carbon capture and sequestration (CCS).

2.7 REQUEST FOR PROPOSALS PROCESS

Independent studies and reviews of GRU's EGEAS work were conducted by R.W. Beck, ICF Consulting (ICF), and GDS Associates (GDS). As a result of the input from these consultants and the ongoing discussion about the relative merits of various technologies to manage air emissions, such as gasification, IGCC) and plasma arc, an all-source solicitation was issued in 2006 as a way to garner additional information about state-of-the-art power generation technologies.

The all-source solicitation did not require the potential vendors to submit any binding proposals. Consequently, a wide range of technologies and contractual arrangements were proposed. Lessons learned from evaluating the responses and engaging in discovery with each bidder were primarily of a financial and risk-management nature. Some of the proposals indicated that the tax-exempt financing available to municipal utilities did not offer as strong a financial incentive for renewable and innovative technologies as incentives available to the private sector. This was partially due to reduced spreads between taxable and tax-exempt debt interest rates, but mostly due to the ability of private developers to obtain production tax credits and take advantage of depreciation (for entities with sufficient tax liabilities). The all-source solicitation demonstrated that there were no commercially viable technologies to remove carbon (although one proposal included an oxygen-blown boiler with extensive vapor compression).

In May 2007, the Gainesville City Commission decided it would not consider any additional generating capacity that was based on the use of coal or petroleum coke as fuel.

This decision was driven largely by environmental concerns about climate change. These environmental concerns prevailed even though coal and petroleum coke-fueled facilities were among the least costly energy supply options available to Gainesville. As a practical matter, Governor Crist's Executive Orders in 2007 made it clear that coal and petroleum coke facilities were not likely to be approved by the Governor and Cabinet, sitting as the PPSA Siting Board. The fuel source that the GRU staff was instructed to pursue by the Gainesville City Commission was biomass.

In October 2007, GRU issued an RFP that established a two-step process for procuring biomass-fueled electric generation capacity. The first step allowed nonbinding proposals to be submitted. This approach was designed to ensure the greatest participation by vendors and the widest range of technologies and business plans. The proposals were ranked on various factors, including price, risk control, environmental emissions, applicant qualification, and technical merit. Many biomass-fired alternatives were evaluated during the RFP process, including stoker grate combustion, BFB combustion, circulating fluidized bed (CFB) combustion, combustion-based cogeneration, gasification, pyrolysis, and anaerobic digestion.

On January 28, 2008, the Gainesville City Commission invited the three top-ranked respondents to submit binding proposals for the second step of the RFP process. These three respondents were Nacogdoches Power, LLC (now American Renewables), Covanta Energy, and Sterling Planet, Inc.

On March 24, 2008, the GRU evaluation team presented a proposed evaluation methodology to the Gainesville City Commission. The Commission decided to use 14 factors in the evaluation of the binding proposals received in Step 2 of the RFP process. The 14 factors were grouped into three broad categories, which were given the following weights:

- Environmental: 30 percent.
- Economics: 37 percent.
- Risk and reliability: 33 percent.

The GRU evaluation team finalized the details of how the factors were to be evaluated prior to the submission of the binding proposals. The methodology was different for each factor, but typically several subfactors were evaluated before assigning a score to a factor. The RFP and associated addenda requested the data needed to evaluate each subfactor.

Three binding proposals were received on April 11, 2008. The three proposals presented a total of eight options, all of which were fueled 100 percent with biomass. These eight options consisted of the following:

- Covanta Energy (all facilities at the DGS site):
 1. PPA for 50-MW (net) facility owned by Covanta.
 2. 50-MW (net) facility, which would be financed and owned by GRU. Covanta would engineer, procure, and construct (EPC) for GRU.
 3. PPA for 58-MW (gross) facility owned by Covanta with auxiliary power purchase.
 4. 58-MW (gross) facility with auxiliary power purchase, which would be financed and owned by GRU. Covanta would be the EPC contractor.
- Nacogdoches Power (now American Renewables):
 5. PPA for 50 percent of a 100-MW (net) facility owned by Nacogdoches Power that would be located at the DGS site.
 6. PPA for 100 percent of a 100-MW (net) facility owned by Nacogdoches Power that would be located at an alternative site (undisclosed).
 7. PPA for 100 percent of a 100-MW (net) facility owned by Nacogdoches Power that would be located at the DGS site
- Sterling Planet, Inc.:
 8. PPA for a 30-MW (net) facility owned by Sterling Planet that would be located at DGS site.

The GRU evaluation team scored the proposed options and determined that the 100-MW PPA with GREC LLC for 100 percent of the output from a biomass-fueled facility at the

DGS site was the best long-term option for GRU. The evaluation team's scores and recommendations were presented to the Gainesville City Commission at public meetings on April 28 and May 12, 2008. At the May 12 meeting, the Commission voted unanimously to authorize GRU to negotiate a PPA with GREC LLC for 100 percent of the output of a 100-MW (net) biomass-fueled facility to be constructed and operated by GREC LLC at the DGS site.

2.8 DETAILED ECONOMIC ANALYSIS

Levelized cost of energy (LCOE) analyses were performed by GRU to compare the economics of the PPA with GREC LLC and the economics of other alternatives. Numerous evaluations were conducted, including: (a) various fuel price projections, (b) the potential impact of possible future regulations of CO₂ emissions, (c) the capital costs of the generating units, and (d) the economics of a PC unit that included the necessary equipment for CCS.

The alternative cases that were considered in the economic analysis needed to be viewed in the context of the proposed GREC. The price terms of the PPA with GREC LLC are primarily fixed. Consequently, the price terms are not subject to the fluctuations in fuel prices and capital costs that affect the LCOE analyses of the other generating unit alternatives. Further, the proposed GREC biomass unit will have no net CO₂ emissions. For this reason, the economic analyses that considered potential regulations of CO₂ emissions did not affect the LCOE of the PPA for GREC.

The levelized cost analyses indicated that the GREC PPA was the most cost-effective alternative when compared to natural gas generating units or a coal alternative that includes CCS technology. Specifically, the LCOE analyses indicated:

- The LCOE for the GREC PPA was lower than the LCOE of the natural gas alternatives in all cases.
- The LCOE of the natural gas alternatives ranged from approximately 5 to 210 percent higher than the LCOE for the GREC PPA.
- The LCOE of the GREC PPA was lower than the PC alternative without CCS for cases reflecting the cost of future regulations of CO₂ emissions.

The LCOE of the PC alternatives in these cases ranged from 56 to 196 percent higher than the LCOE of the GREC PPA.

- The LCOE of the PC unit with CCS was higher than the LCOE of the GREC PPA by 31 to 104 percent.

Overall, the LCOE of GREC was the lowest among the natural gas and coal alternatives in 23 of the 28 cases considered.

2.9 BENEFITS OF GREC

GREC will provide numerous benefits to GRU from an economic, environmental, and regulatory perspective. These benefits include, but are not limited to, the following:

- GREC will help maintain generating system reliability and integrity.
- GREC will provide electricity at a reasonable cost.
- GREC will provide fuel diversity and increase fuel supply reliability.
- GREC will be immune to the fluctuations and volatility in the price of fossil fuels.
- GREC will improve GRU's generation portfolio by materially reducing the age of GRU's generation fleet.
- The renewable energy from GREC will allow GRU to meet any of the renewable energy portfolio standards that have been seriously considered at a state or federal level to date.
- The carbon credits from GREC will provide a valuable hedge against future carbon constraint legislation.
- GREC will support Gainesville's policies and public demand for recycling and GHG reduction.
- Some of the additional tangible benefits associated with the GREC facility include:
 - Less exposure to construction and operating risk.
 - Creation of 450 to 500 new jobs in the region.
 - Substantial reduction in open burning of woody biomass generated by forestry and timber operations.
 - Zero surface water discharge of industrial wastewater.

- Reduction in the use of landfills for the disposal of woody biomass.
- Promotion of forestry and ecosystem management by removing undesirable vegetation.
- Promotion of the removal of woody biomass in forested areas adjacent to urban development, thus reducing the build-up of fuel and the risk of forest fires near populated areas.
- Support for a major regional industry—silviculture.