Here Comes the Sun

A strategic approach to solar energy

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Abstract

As GRU issues an Invitation to Negotiate (ITN) for a solar PV facility that would move the utility closer to the city's goal of 100% renewable by 2045, General Manager Ed Bielarski addresses the opportunities and threats associated with solar energy.

Introduction

This past year, the Gainesville City Commission agreed on a resolution setting the goal for GRU to achieve 100% renewable electric power generation by 2045 (see Addendum 1). GRU has long been a pioneer in renewable energy, first through the European-style solar feed-in-tariff program established in 2006 and then with the approval of the biomass power purchase agreement (PPA) in 2010. Gainesville's biomass plant — now known as the Deerhaven Renewable Generating Station — is one the of world's largest biomass facilities.

By economizing these efforts with the buyout of the biomass PPA in 2017, GRU has achieved state-leading renewable generation. In the second quarter of FY2019 (January through March), 42% of GRU's electric generation came from renewable resources (see Addendum 2). This is an incredible accomplishment for a small, municipally-owned utility in a state whose utilities average 4% renewable electric generation.

However, in order to continue progressing toward 100% renewable electric power generation by 2045, GRU must take a well-planned, strategic approach to increasing its opportunities for additional renewable generation.

For almost 30 years, since my days with Constellation Energy, a Baltimore-based energy company, non-fossil sources of electric power revolved around nuclear, solar, geothermal, wind, biomass and hydro. Today, nuclear power still has no answer to the storage risks of the radioactive lifespan of its waste product, as well as the overwhelming cost of construction. Geothermal energy has been difficult to construct commercially, while wind and hydropower are geographically non-existent for a majority of customers in the U.S. While these are not viable options for GRU, we do have a biomass facility that provides our primary source of renewable energy.

Solar power has emerged as the industry's most promising solution, as evidenced by the increase in installations across the country, along with the continued reduction in capital and operating costs of each of those installations. In addition, solar power is inherently the cleanest source of power and viewed by the public as the ultimate answer to climate change and to cutting escalating power costs around the world.

Nonetheless, numerous risks are associated with installing high levels of solar power within a small utility's electric grid. The most significant risks include: 1) solar power's inherent inconsistent production due to intermittent cloud cover; 2) the requirement for affordable storage capacity, which is currently unavailable; 3) regulatory constraints that won't allow the

purchase of emergency power to cover the intermittency of solar power; and 4) the operational impact of balancing solar output with our other generation.

Acknowledging both the opportunities and threats associated with solar, I have decided to write this white paper, *Here Comes the Sun*, through which I will explore the technical and financial issues associated with building solar capacity and what possible roadmaps exist for GRU to continue its role as the state's leader in renewable power generation.

Background

The evolution of the electric utility

The dawning of the U.S. power industry started with a technological war between Nikola Tesla and Thomas Edison on whether alternating current (AC) or direct current (DC) would become the industry standard. Interestingly, Tesla's discovery of AC won the day, but Edison adapted and went on to become an American icon while Tesla died penniless. It's not always how you start the race but how you finish.

Key point: *Beginning with Tesla, the stage was set for the use of AC power generated by centralized power plants and delivered over high voltage electric wires to people's homes as early as the 1900s. The model for today's electric grid was designed with four components: 1) electric generation of high voltage power; 2) transmission of high voltage power over high towers; and 3) the step-down of that power for delivery over distribution lines; 4) the use of synchronous generators to convert mechanical energy to AC power. The model was simple and, yet, revolutionary.*

AC vs. DC

The fundamental advantages of AC over DC were from a commercial perspective: 1) AC could transform voltage either up or down through the use of low cost transformers; 2) AC had the ability to break open electric contacts at switches and other devices attached to the system without producing a destructive electric arc, or discharge; and 3) the 60 cycle per second of AC current is far safer in the event of accidental human contact. AC tends to pass over the surface on the skin, while DC will pass straight through the body. Many people are not aware that DC current from a battery, such as a car battery, carries enough amperage to stop or start your heart.

The disadvantage of AC is that it creates a magnetic-induced resistance called inductance while being transported down a wire. This leads to higher resistance losses over longer transmission, which utilities mitigate through the use of higher voltage transmission lines.

The traditional electric utility model – Version 1.0

Today, GRU provides customers with approximately 240/120 volts of electric power delivered at 60 hertz. Power is available 99.999% of the time and only occasionally interrupted by storms, unfortunate squirrel incidents, trees on wires or mechanical failures. GRU customers know the lights will go on when they flip the switch because GRU's electrical infrastructure is one of the most reliable in the state.

Multiple reasons exist for GRU's strong reliability, but it's mostly due to the robust network of generation, transmission and distribution assets built and operated right here in Gainesville. All of GRU's generating assets benefit from the efficiency, affordability and accessibility of natural gas, coal and biomass fuels, as well as our interconnection ties to both Duke's and FP&L's portfolio of generating assets.

GRU's electric grid works because our main control room communicates with control rooms at our power plants and control rooms at other utilities to make sure we meet customer demand. Because GRU is what's known as a Balancing Authority, we are required by the Federal Energy Regulatory Commission (FERC), the North American Electric Reliability Corporation (NERC) and the Florida Reliability Coordinating Council (FRCC) to maintain the balance of supply and demand. As a result, GRU must control the amount of power we deliver to customers or we may damage any device attached to the electric system, including household appliances.

Fossil Fuels

For all of its pros and cons, fossil fuel should be credited for the electrification of the world, when no other viable options existed. Prior to the use of refined crude oil and coal, people around the world utilized whale oil for light and timber for heat, which virtually decimated the Atlantic whale population and adversely impacted forests. Fossil fuels forged their way throughout the globe because of its energy storage efficiency per pound. Whether the fuel is natural gas, gasoline, nuclear fuel, wood or a battery, the amount of energy stored and the ability to release that energy is the critical factor in determining the value of the energy source.

This traditional electric utility model was built and operated on safe, reliable electric power with the utility responsible for anticipating future customer demand, designing and building the system and fairly and equitably recovering the costs.

Key point: *The traditional utility generated, transmitted and distributed all of its power because it was the most efficient and safe delivery system from an energy usage and cost perspective.*

Introduction of a hybrid electric utility model - Version 2.0

The traditional electric utility model remained largely unchanged until the presidential administration of Jimmy Carter, which enacted into law the Public Utility Regulatory Policy Act of 1978 (PURPA). PURPA required utilities such as GRU to accept the electric generation of Non-Utility Generators (NUGS). PURPA was a response to the worldwide oil supply crisis and the concept was predicated on opening the market to new energy efficient power sources, making the U.S. less reliant on foreign sources of oil and assisting these alternate sources to find a marketplace.

Initially, PURPA was simply a slight shift in the model. However, through the years, NUGS gained a foothold in the marketplace and have expanded to include net metered and solar feed-in-tariff customers. In addition, deregulation has occurred in multiple states, allowing electric customers to select from newly formed electric generation providers (but not transmission and distribution providers). For a time, merchant energy companies expanded and prospered, such as Enron and Dynergy, who built and operated power plants in an attempt to profit from the favorable economic conditions created under the transition in the electric utility marketplace.

In the two decades post-PURPA, the electric utility industry slowly transitioned from a traditional model of build, operate and recover costs to a hybrid model of build, operate, enter into PPAs, recover costs and sometimes compete.

This new hybrid model has forced electric utilities to absorb non-traditional sources of electric power generation, whether through customer solar panels or a non-utility generator of geothermal energy. Many of the merchant energy companies, who so quickly prospered from the changing marketplace, eventually declared bankruptcy, scaled down, were sold or transitioned into other businesses.

Key point: *The hybrid utility model shifted the traditional utility model to one that included purchased power, which utilities had to match with the power demand of their owned generation.*

The climate change electric utility model – Version 3.0

Nearly four decades post-PURPA, the hybrid utility model has changed once again, spurred largely by the global crisis of climate change. As far back as the days of Bill Clinton's presidential administration, the U.S. Environmental Protection Agency (EPA) enforced stricter regulations on previously grandfathered coal plants, requiring in many cases upgrades to emission control systems. Plants who didn't comply lost operating permits, called Title V air permits. Major utilities throughout the country performed financial cost benefit analyses, deciding whether to build massive new emission control systems or simply shut down their coal plants.

GRU decided to embark on a $150 million upgrade to its Deerhaven coal generating facility. This expansion included a state of the art continuous emission control system, which now captured particulate matter, fugitive dust and CO2. Other utilities systematically mothballed, decommissioned or sold their coal assets, so the overall electric power generated from coal has fallen from over 50% more than a decade ago to 23% in 2018 (see Addendum 3).

This coal-fired power generation was largely replaced with natural gas, which generated a mini-boom in the construction of combined-cycle gas units (which operated at substantially lower heat rates and benefited from an oversupply of natural gas). Today, Florida's overall electric power generation is fueled with approximately three quarters of natural gas as its source, one of the highest percentages in the country.

Natural Gas Price Drop

Ultimately, the nation's power generation has been transformed more by the dramatic drop in natural gas prices, both currently and on the long-term horizon, than by EPA regulations and other environmental pressures. The combustion of natural gas produces one half of the CO2 that is emitted per comparable million British thermal unit (MMBtu) of coal energy. Low cost and lower emissions have combined to make natural gas the fuel of choice by electric utilities.

The idea that solar power could become as ubiquitous as the industry model of fossil fuel generating assets supporting massive electric grids went unrealized over these periods of substantial change (also Addendum 3). Although some utilities built commercial-grade solar arrays, most electric utilities remained content with and committed to the low-cost alternative, natural gas.

This period was also marked by a public shift in the perception of the electric utility industry, brought about by an inability to effectively utilize solar power as a generating asset and the public's desire for more power from solar sources.

Key point*: The climate change utility model spurred a shift to natural gas more than renewables because of its low cost, high efficiency, base load ability and low CO2 emissions.*

Dawning of the AC/DC utility – Version 4.0

The reality for an electric system operator such as GRU is that the electric grid, which supports the 24/7 delivery of high-quality electric power, is a victim of its own success. The ability to transport 240/120 volts of electric power over GRU's 120-square-mile territory, seamlessly and with 99.999% reliability is simply unquestioned by its customers.

Most will never witness the behind-the-scenes work conducted by an orchestra of skilled employees who ramp generating units up and down and modulate against the signal from our main control room, all while preparing the fleet for contingent events, such as losing a generating unit because of a trip.

Although GRU already effectively manages instantaneous swings of up to 26 megawatts of solar feed-in-tariff and net metering production from customers, the impact of introducing additional solar power is challenging, unless that solar power is stored within a battery.

Realistically, solar power is a square peg in a round hole for the electric utility industry, largely because its intermittency of power delivery places the reliability and stability of the grid at risk. “Intermittency” is an industry term that defines the unreliable nature of solar, not only from dusk to dawn, but throughout the day, when solar panel production may be diminished by storms and cloud cover. During any event that interrupts the instantaneous flow of electrons from solar panels to our distribution network, GRU must have that same instantaneous power to replace the lost power (see Addendum 4).

As a result, when customer demand is low, say at 120 megawatts in the morning on a mild fall day, GRU’s ability to accept solar power is much different than its ability to accept solar power at 2 p.m. on a July day, when the peak demand is well above 400 megawatts. With battery backup, GRU could store the additional power to use as needed instead of ramping down or shutting off other generating assets to use it.

Ultimately, I believe the 21st century utility will return to its genetic roots of both Tesla and Edison and combine the strengths of AC and DC power to take the utility model to the next level. However, our community must be patient as GRU develops the knowledge to move forward without falling into the same economic traps it did with the original solar feed-in-tariff and the biomass PPA.

Challenges

Costs of being an early adopter

The state of solar technology today is still emerging, developing and being researched. The production costs of solar panels have dropped tenfold over the last decade, and market pricing has dropped low enough to trigger a flurry of activity within the power industry. But the economics of solar combined with its lack of storage capabilities continue to make it a supplemental form of power generation rather than a reliable 24/7 source of energy.

Battery technology will continue to develop, largely because the EV market is driving advancements. Although Lithium Ion batteries are at the forefront of the industry and battery costs have come down, the present market for large-scale utility batteries costs on the order of $1.2 million dollars per megawatt hour of storage capacity.

By way of some financial context: Assuming GRU simply phased in solar by adding the industry standard 75 megawatt facility with storage, it would cost $398 million in capital, simply to produce solar energy 13% to 17% of the time. In order to approach a 100% renewable plan today, it’s possible GRU would require four 75 megawatt facilities with storage and five 75 megawatt facilities without storage, coupled with our biomass plant and other fossil fuel units for backup. This would cost up to $4.1 billion in today’s dollars and require the acquisition of over 7,000 acres of land dedicated to the facilities

Intermittency

Intermittency is interrupted delivery of expected power. It is inherent to solar power, and unless a utility has protocols in place to manage the uncontrollable delivery or loss of that power, it is dangerous to the utility's electric grid.

GRU maintains a portfolio of over 600 megawatts of generating capacity, 438 megawatts of which come from the Deerhaven Renewable Generating Station (DHR), Deerhaven Coal Plant (DH2) and the Kelly Plant (Kelly). The generating capacities of these three plants are:

- DHR – 102 megawatts
- DH2 – 228 megawatts
- Kelly – 108 megawatts

Additionally, the FRCC requires GRU to maintain 42 megawatts of reserve power to account for the possible loss of its largest generating unit (called an N-1 contingency). This is one of several FRCC reliability standards GRU must meet. The bottom line is GRU must be able to balance its generation load within 30 minutes of losing generation. The following requirements further complicate matters:

- DHR can operate as low as 30 megawatts and DH2 and Kelly can operate as low as 60 megawatts, all without having to shut down.
- GRU must have conventional assets running as "spinning reserves," meaning the power plant can ramp up immediately, creating additional electricity to cover reserve margins and the loss of solar power, since variations in solar production cannot be replaced with energy purchased off the grid.

This complex algorithm is best understood by looking back to that mild-fall morning when system load is 120 megawatts and the sun is shining. Without any additional solar power, GRU could run DHR at 60 megawatts and DH2 at 65 megawatts or Kelly at 65 megawatts. If GRU added 75 megawatts of solar power (an amount based on economic best practices), GRU would be unable to maintain its generation mix. In fact, under these conditions, no mix of generation would allow us to have a 42 megawatt reserve and the capacity to cover the failure of our largest generating asset. Hence this potential introduction of 75 megawatts into GRU's system would result in violations of NERC and FRCC standards, jeopardizing GRU's ability to remain a balancing authority and placing the community at risk of brownouts and blackouts.

While many proponents of solar power focus on its ability to reduce the level of on-peak megawatts the utility has to produce, they rarely focus on the unintended consequences of such a benefit. For example, during high demand summer days, 75 megawatts of solar would, indeed, reduce the level to which some of our fossil-fuel burning generating assets would be

required to ramp up. However, this reduction in on-peak load results in what's known as the "Duck Curve" (see Addendum 5).

The Duck Curve demonstrates how energy demand (after sunset) usually does not coincide with solar at its peak (midday). Operationally, the electric utility may need to dramatically ramp up and down based on the time of day and may be forced to run generation assets at uneconomical levels to sustain higher levels of solar power.

Due to intermittency, the utility has to assume, by regulation that a solar facility will produce zero generation at some point during the day. At best this will be at dusk when the sun diminishes. At worst, it can occur throughout the day as clouds pass over the solar facility. Without substantial battery backup, the utility has to keep assets online and generating power to operate with or without solar. So although even a small amount of solar may save the utility incremental generation costs, a point exists at which the beneficial financial impact of solar will be lost and actually increase the utility's overall costs per megawatt produced.

***Key point**: Intermittency is a real operational challenge for a utility. Intermittency sets in motion a host of conditions which adversely impact a utility's ability to maintain system reliability.*

Electric power storage

Electric vehicles are becoming more common around the country, even here in Gainesville and the surrounding area. Take a quick trip to the nation's oldest city, Saint Augustine, and you'll notice hotels there provide anything but ancient charging stations. Consider that without an effective battery, there would be no charging stations, because EVs would still be on the drawing board.

EVs are functional precisely because the driver can depend on charging their batteries to capacity and driving them without intermittency for an extended period. EV performance is largely uninterruptable during their use

Instead of an EV with a battery, imagine an EV equipped with a solar cell that provided power directly to the engine. You would only be able to drive the EV while the sun was shining. If cloud cover rolled in, you'd be stuck. You'd certainly not be able to drive at night.

Bringing this analogy home to GRU, if every day's delivery of power was a road trip in an EV without a battery, GRU would never arrive at its destination or deliver the required power to its customers. Electric power storage, specifically battery storage, will be the answer to the challenges Intermittency creates. However, the

Electric Vehicles

The typical EV uses approximately 30 kilowatt hours per 100 miles. So if you drive at 50 mph, you would utilize 15 kilowatts. The typical solar panel is 1 meter square and produces approximately 1 kilowatt per hour. Therefore, an EV would need 15 square meters on top of the hood to progress at 50 mph during the sunny daytime.

battery industry is not yet delivering the right battery storage solution to complete the solar panel, battery storage powerhouse to which the world is patiently waiting.

Hope, though, has been spurred by Tesla Founder Elon Musk, as the automobile industry is now driving technological innovations in battery storage. EV growth is projected to result in EVs accounting for 35% of new vehicle sales by 2040, driving battery storage costs down by 90% by 2030 (see Addendum 6). This is great news, but we aren't there yet. As a result, the solar panel, battery storage powerhouse is not there either.

***Key point**: Solar power without a battery component is a throwback to the original electricity war between Tesla and Edison. AC won the war because it was produced from a centralized, efficient plant 24 hours, seven days a week, whereas DC batteries could not be re-charged efficiently over that same consistency. Solar power needs cost effective battery backup to compete with AC.*

Non-utility solar installations

Every incremental GRU customer who builds a rooftop or ground-based solar installation will be reducing the efficiency and reliability of GRU's electric grid during non-peak hours of operation, as well as assisting in lowering the demand during on-peak hours. This is the yin and yang of solar installations. The impact during *non-peak* hours of operation is critical, given GRU's requirement to adhere to regulatory compliance on reliability standards.

In the majority of cases, customer solar power installations in GRU's territory are using the electric grid as a quasi-battery backup system. For net metering or solar feed-in-tariff customers, GRU's grid is there to support them from dusk to dawn or during daily intermittency. Each of these customers reduces GRU's variable revenue collection, leaving the majority of GRU's costs to be spread over the remaining customers who don't have access to capital-intensive solar installations.

Although net metering and solar feed-in-tariff customers pay GRU's fixed service charge of $15 a month, each of our previous cost of service studies shows that this fixed service charge doesn't fully recover GRU's corresponding high percentage of fixed costs. Almost 90% of GRU's costs are fixed and are only recovered through a matrix of both fixed and variable charges. In other words, GRU electric customers pay a substantial portion of GRU's fixed costs in their kilowatt charge. However, customers who build solar installations "net" their usage and pay little for variable usage, if anything.

That's why GRU is considering other billing methods to assist its recovery of overall costs from both regular and solar customers. A fixed service charge that recovers more of GRU's fixed costs would end the economic subsidy solar customers now enjoy.

In order to gain equity between solar and traditional customers, GRU will research and recommend potential new rate structures to the Utility Advisory Board and City Commission.

GRU is not alone in its quest to resolve this issue, as many utilities are grappling with these same concerns.

***Key point**: Customer-installed solar power systems are a transitional phenomenon, created by the technological and economic gap between the utility industry and the customer, as well as between the more affluent and the less affluent. Ultimately, these solutions destabilize the very electric grid that supports the community. GRU's formula for recovering its costs is based on a monthly fixed charge and variable charge for usage, which under recovers from solar customers on the backs of GRU's traditional customers.*

Next Steps

My team and I have researched the aforementioned challenges confronting the community over the past year. We have met with experts in the solar industry and consultants such as the National Environmental Research Laboratories (NERL) who are working with major cities to reach their renewable goals. We have conducted evaluations of our electric system through an Integrated Resource Plan with our partners at The Energy Authority.

As a result, GRU decided to confront the issues head-on by issuing an Invitation to Negotiate (ITN) on May 31, 2019, through which we believe we will receive proposals from qualified vendors who can provide the following (see Addendum 7):

- Construction and delivery of energy from a "turn-key" Solar Photovoltaic (PV) facility with a total rated electrical capacity of 40 megawatts to 50 megawatts (which may be divided between up to four sites).
- Sale of the electrical output and associated credits to GRU through a Renewable Energy Power Purchase Agreement (PPA).
- The PV Facility shall be within, or in the proximity of the GRU electric service territory or within the proximity to one of GRU's 138 kV transmission switchyard facilities.
- GRU will purchase the PV facility's power output for a term up to 20 years, with an option to renew for up to two additional five-year periods.
- GRU will only pay for the actual energy delivered.
- GRU will be granted an option to buy out the PV Facility at every 12-month anniversary of the PPA execution date and the seller will provide a good-faith indicative value of the PV Facility for the end of years 5, 10, 15 and 20 in the response to the bid.

In addition, GRU has addressed the challenges outlined in the aforementioned background section such as:

- Although GRU will serve as the Balancing Authority, there will be times when it is not technically feasible to accept 100% of the PV facility's output and requests the respondent to address the options. In particular, the seller is asked to be responsible for

the design and implementation of a properly engineered solution consisting of one or more of the following:

- Grid storage capacity
- Oversizing of the solar array
- "Clipping" or otherwise artificially regulating the output of the facilities' inverters to less than full capacity
- Other technologies that will contribute to the regulation of increases and decreases in facility output
- Exporting power that cannot be accepted as part of GRU's load

***Key point**: GRU places responsibility on respondent to provide solutions to the challenge of intermittency, within the confines of only paying for energy delivered to GRU's interconnection. The PPA requested will in no way resemble the biomass PPA.*

Caveats: This ITN is not a Request for Proposal (RFP) and does not lock the utility into a contract. My team and I view this as an opportunity to challenge the marketplace to develop an alternative for GRU in the solar arena. However, if the price isn't right, or the solution acceptable, GRU won't enter a contract.

Solar PPAs are much less complex and risky than GRU's previous biomass PPA. Solar panels are a proven technology, easily financed and have low operational risk. GRU is requesting a schedule of future buy-out pricing, if we should choose to own the project.

This ITN is the next logical step in GRU's process of moving toward 100% renewable energy generation.

Key point: *The ITN doesn't obligate GRU, but it provides an opportunity to buy if the price is right.*

Conclusion

The 21st century utility will be a new AC/DC utility that shifts between power sources on a minute-by-minute basis, extending all types of real-time services to customers. Electric vehicles, smart meters and battery storage devices will all serve as important cogs in the wheel.

However, as we learned from being early adopters of the solar feed-in-tariff and a biomass PPA, cutting-edge technology can come with a high price tag if not approached wisely.

It is critical for GRU to complete the process of the current ITN, through which we will receive today's market solutions to GRU's quest to reach the next level in renewable generation for the community.

I am pleased that GRU staff has crafted the ITN to include the lessons learned from our year-long research. The timeline for responses to the ITN is as follows:

ITN Issued	5/31/19
Deadline to submit questions	6/17/19
Posting of final answers	6/21/19
ITN response due	7/9/19
Evaluation of proposals	week of 7/15/19
Recommendation to & direction from CCOM	8/08/19
Negotiations begin	week of 8/05/19
Contract start date	11/1/19
Commercial operations of facility	Q3 2021 - Q1 2022

ADDENDUM 1

RESOLUTION NO. 180442

A Resolution of the City Commission of the City of Gainesville, Florida, establishing a goal of providing 100 percent of the city's energy from renewable resources by 2045.

WHEREAS, the City of Gainesville is committed to protecting the long-term health and viability of our community through strategies designed to reduce greenhouse gas emissions; and

WHEREAS, greenhouse gas emissions produced through energy generation by the City of Gainesville have been reduced from 1,749,000 in 2009 down to 1 million tons of CO2 in 2018; and

WHEREAS, as of 2018, the City of Gainesville owns and operates a 102 megawatt, carbon-neutral biomass facility northwest of Gainesville; and

WHEREAS, as of 2018, the City of Gainesville has 26 megawatts of purchased solar capacity; and

WHEREAS, GRU staff is actively conducting studies to determine the feasibility of further solar integration into our electric distribution system and current energy storage technologies; and

WHEREAS, as of 2018, the City of Gainesville received 27 percent on average of its electrical energy from renewable resources as compared to the national average of 17.9 percent and the Florida average of 3%;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF GAINESVILLE, FLORIDA:

Section 1. The City Commission establishes a goal of reaching net zero community-wide greenhouse gas emissions by 2045 and prefers to achieve this goal as soon as feasible. The City Commission also recognizes that emission reductions accomplished sooner are more important and valuable for our city's climate protection efforts.

Section 2. The GRU General Manager and the City Manager shall work with the Utility Advisory Board to create a city-wide energy policy to include:

- Utility efficiency programs

- Conversion to electric fleet vehicles when practical
- A balanced approach between fiscal responsibility and emissions reduction
- A commitment to green purchasing
- Ongoing evaluation of available green technologies
- Establishment of measurable targets for further greenhouse gas emission reductions
- An annual report of progress toward goals to the City Commission

PASSED AND ADOPTED this 18th day of October, 2018.

LAUREN B. POE, MAYOR

ATTEST:

OMICHELE D. GAINEY
CLERK OF THE COMMISSION

Approved as to form and legality:

NICOLLE M. SHALLEY
CITY ATTORNEY

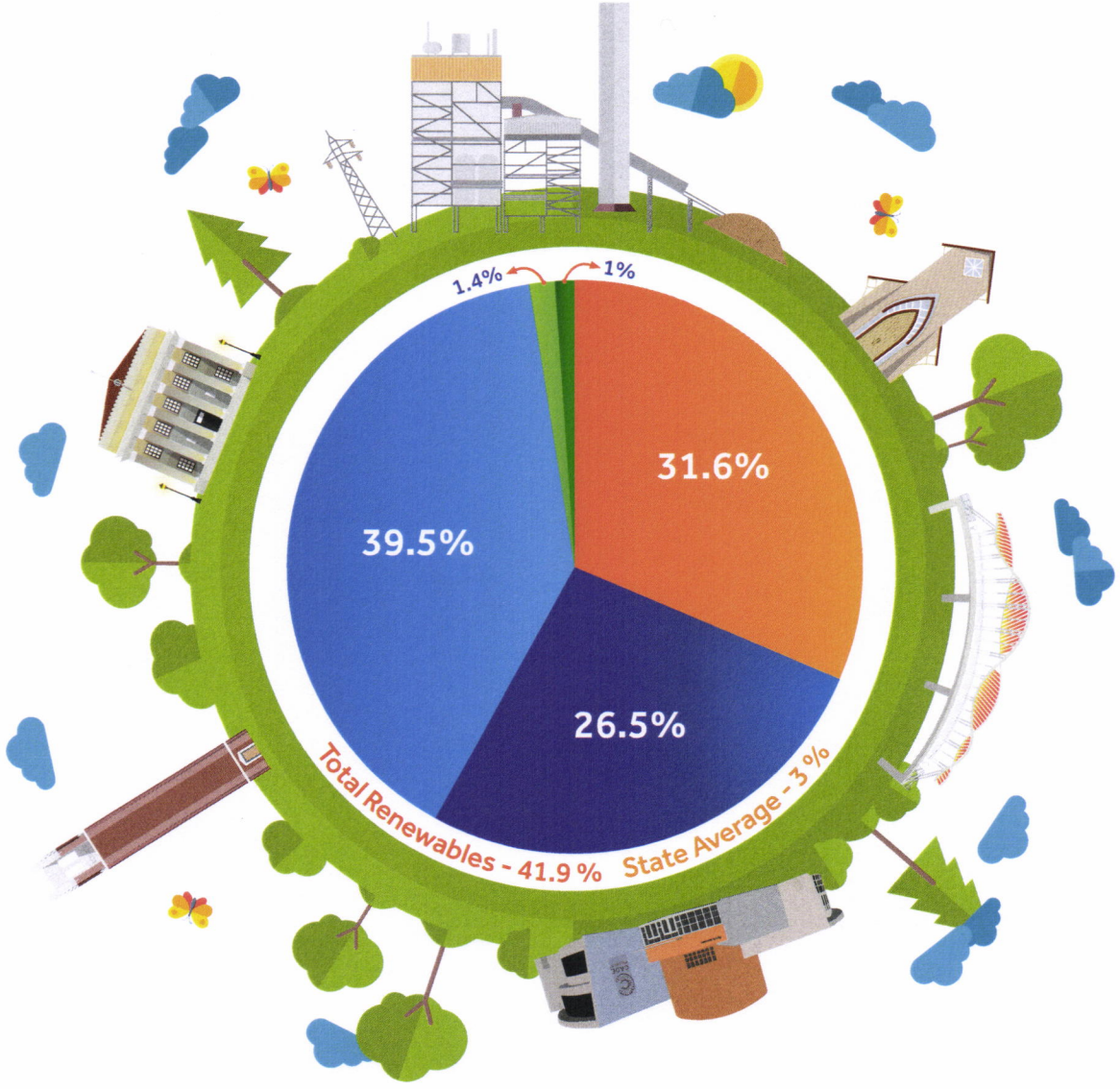
ADDENDUM 2

GRU
More than Energy

Renewable Energy Report

GRU is a state leader in renewable resources and committed to achieving the Gainesville City Commision's goal of using 100 percent renewables by 2045.

The graphic below shows how GRU powered your homes and businesses during the second quarter of fiscal year 2019.



OUR PLANTS

Deerhaven Generating Station - coal and natural gas
Kelly Plant - natural gas
Deerhaven Renewable - biomass
South Energy Center - natural gas

Solar FIT
Landfill Gas
Biomass
Gas
Coal

ADDENDUM 3

SECTION 1

Current Generation Capacity

Table 1.1 shows the sources from which electricity is currently generated in America. Current nameplate capacity includes capacity labeled as standby, but not mothballed or out of service.

Table 1.1
2018 Current Electricity Generation Capacity, by Fuel

Primary Fuel Type	Capacity (MW)	Share
Natural Gas	517,154.35	43.23%
Coal	276,701.17	23.13%
Nuclear	108,175.43	9.04%
Hydro	100,884.28	8.43%
Wind	89,763.98	7.50%
Solar	30,639.61	2.56%
Distillate Fuel Oil	23,391.55	1.96%
Residual Fuel Oil	18,511.40	1.55%
Wood/Wood Waste Solids	5,194.16	0.43%
Wood Waste Liquids	4,823.05	0.40%
Geothermal	3,832.33	0.32%
Waste	2,797.75	0.23%
Petroleum Coke	2,777.20	0.23%
Landfill Gas	2,667.42	0.22%
Other Gas	2,039.30	0.17%
Kerosene	1,888.40	0.16%
Waste Heat	1,263.73	0.11%
Blast Furnace Gas	929.60	0.08%
Jet Fuel	538.24	0.04%
Biomass Gases	480.63	0.04%
Purchased Steam	449.40	0.04%
Agriculture Byproduct	370.60	0.03%
Other	333.04	0.03%
Biomass Solids	288.36	0.02%
Biomass Liquids	139.29	0.01%
Waste Oil and Other Oil	119.91	0.01%
Biomass Other	26.56	0.00%
Refuse	15.40	0.00%
Propane	1.63	0.00%
Total	**1,196,197.73**	**100.00%**

Table 1.2 shows how America's current generation capacity is distributed through the various regions defined by the North American Electric Reliability Corporation. United States territories are not included in these regions nor in the data in this report.

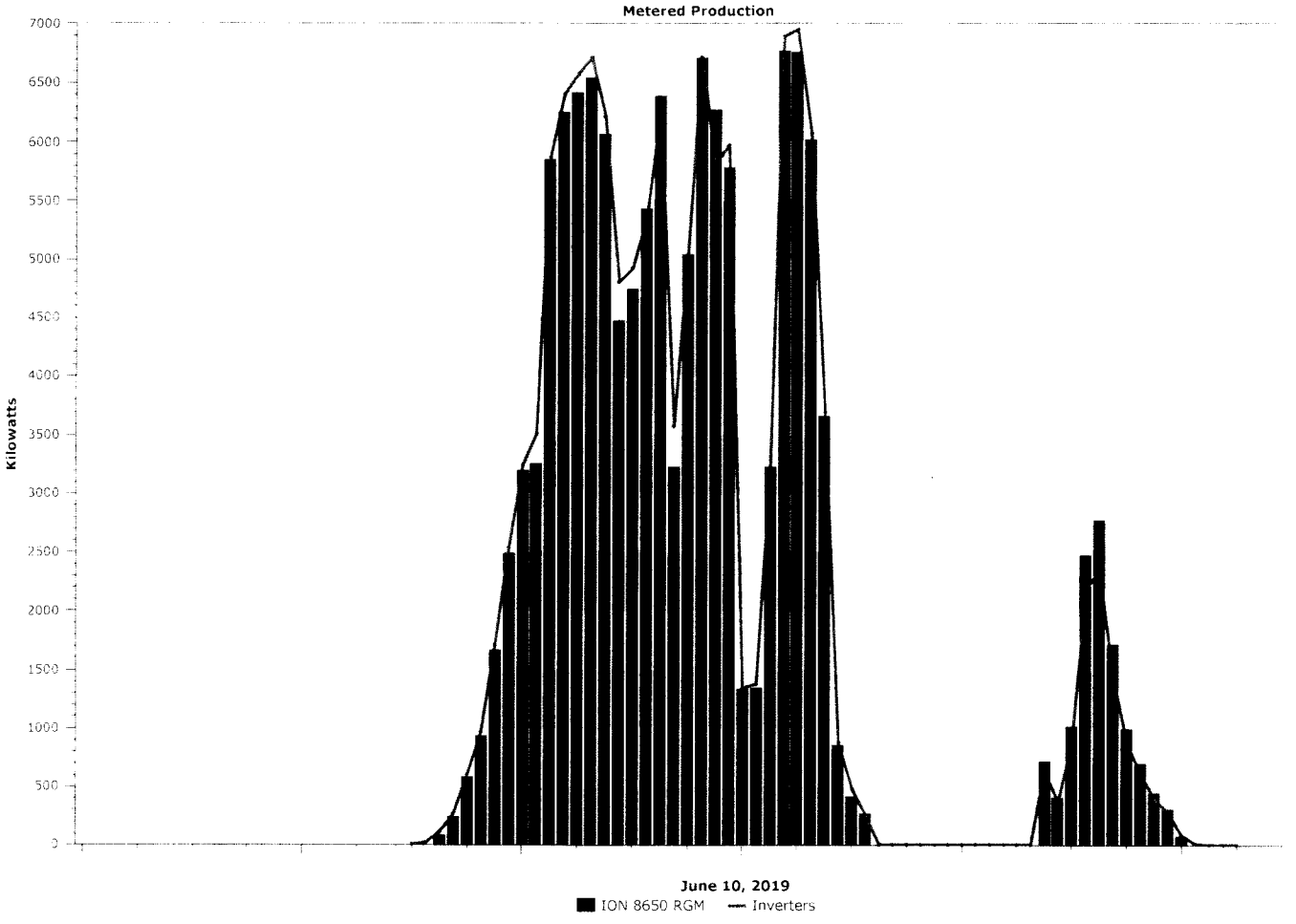
Table 1.2
2018 Current Electricity Generation Capacity, by Region

Region	Capacity (MW)	Share
SERC	297,527.21	24.87%
RFC	245,885.61	20.56%
WECC	235,553.14	19.69%
ERCOT	114,119.31	9.54%
NPCC	82,722.52	6.92%
SPP	79,666.93	6.66%
MRO	70,456.04	5.89%
FRCC	63,950.58	5.35%
ASCC	3,214.89	0.27%
HCC	3,101.51	0.26%
Total	**1,196,197.73**	**100.00%**

Regions Defined by NERC (see map in Appendix 1)

ASCC: Alaska Systems Coordinating Council (not shown on map)
ERCOT: Electric Reliability Council of Texas
FRCC: Florida Reliability Coordinating Council
HCC: Hawaii Coordinating Council (not shown on map)
NPCC: Northeast Power Coordinating Council
MRO: Midwest Reliability Organization
RFC: Reliability First Corporation
SERC: Southeastern Electric Reliability Council
SPP: Southwest Power Pool
WECC: Western Electricity Coordinating Council

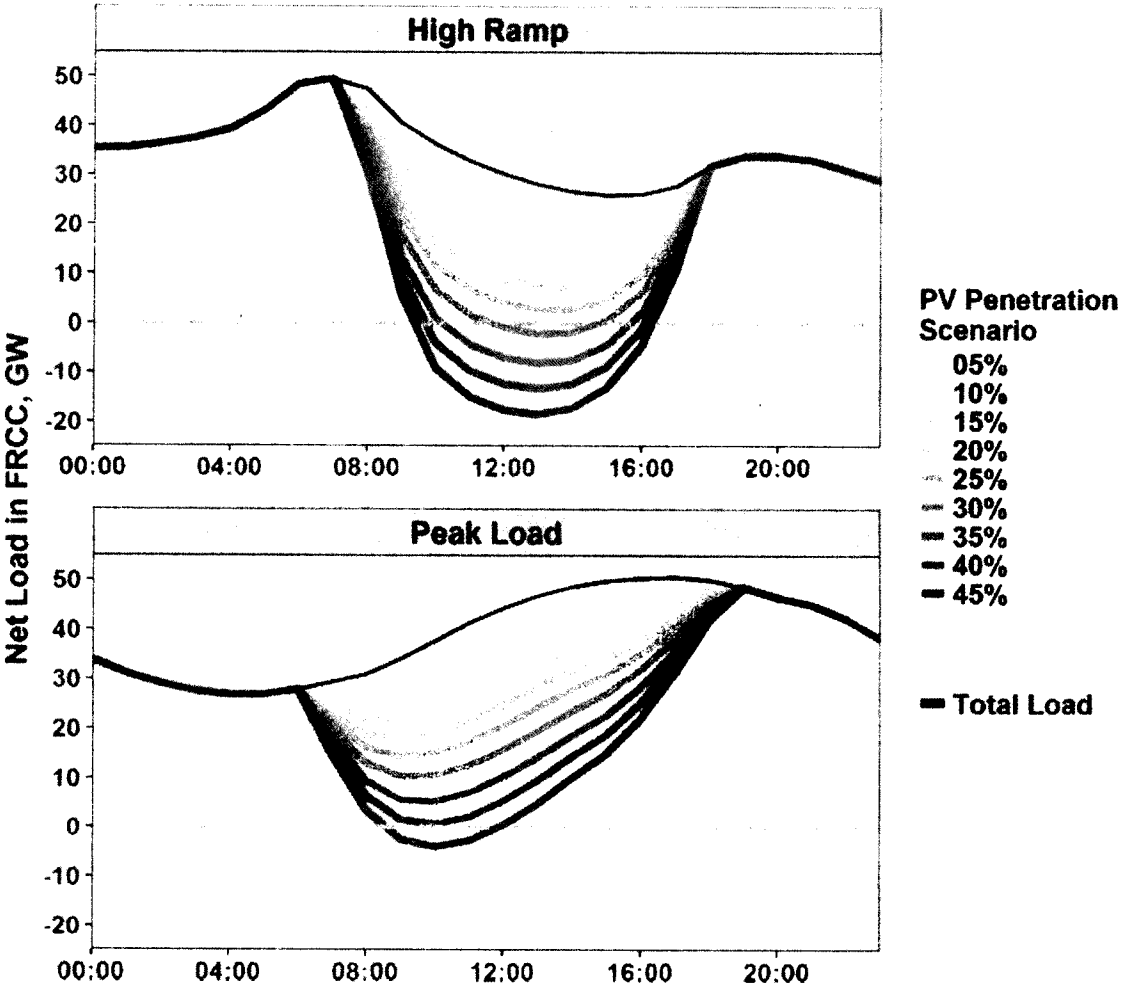
ADDENDUM 4



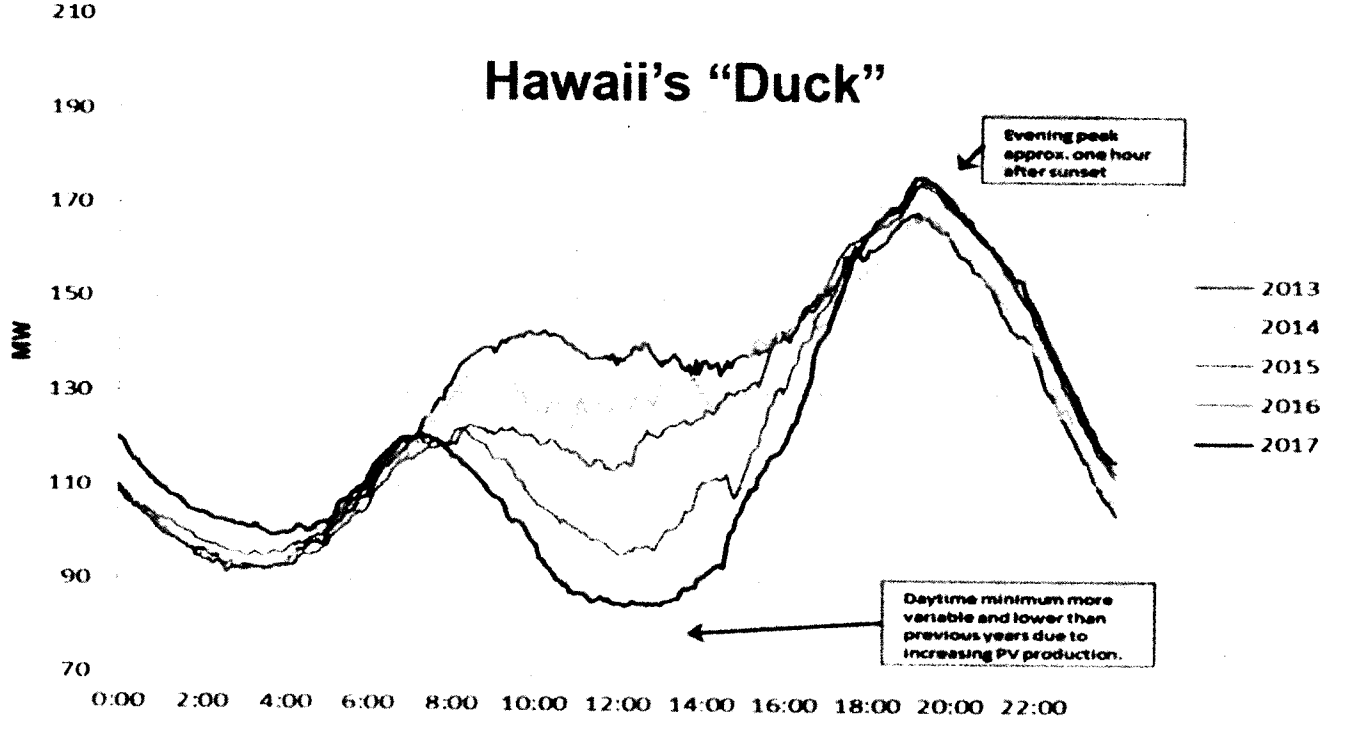
Intermittency as reflected on JEA's Northwest Jacksonville Solar Partners 12 megawatt facility.

ADDENDUM 5

Duck Curve

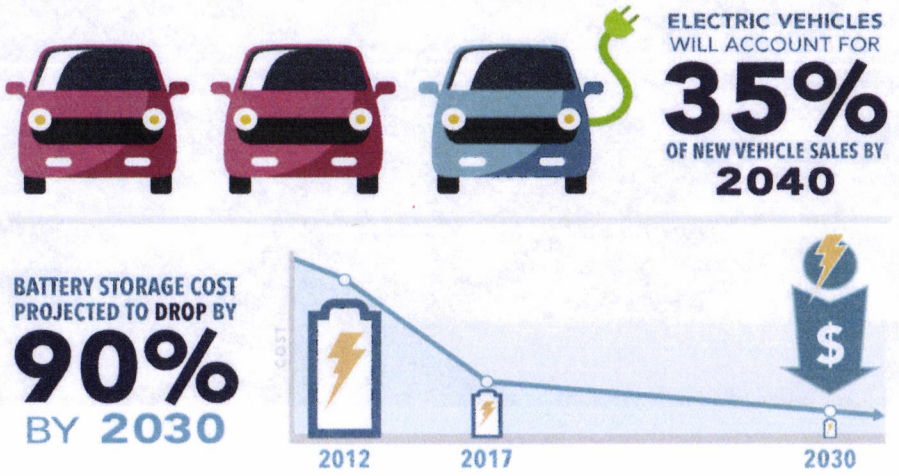

High Ramp
Peak Load
Net Load in FRCC, GW
50
40
30
20
10
0
-10
-20
00:00
04:00
08:00
12:00
16:00
20:00
PV Penetration Scenario
05%
10%
15%
20%
25%
30%
35%
40%
45%
Total Load

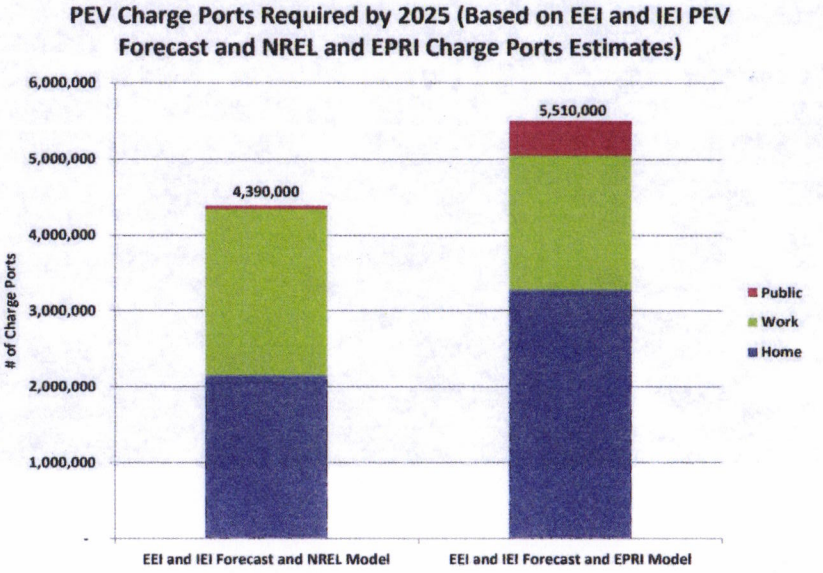
Impact of Solar on Conventional Generation in Hawaii



ADDENDUM 6

EV Growth and Consumer Expectations





EC - Electric Vehicle PEV - Plug-in Electric Vehicle EEI - Edison Electric Institute IEI - Institute for Electric Innovation
NREL - National Renewable Energy Laboratory EPRI - Electric Power Research Institute

ADDENDUM 7

CITY OF GAINESVILLE, FLORIDA

Solicitation No. 2019-070

Issue Date: 05/31/2019

Due Date @ 2:00 p.m. 07/09/2019

Invitation to Negotiate (ITN) For Procurement of Solar Photovoltaic (PV) Renewable Energy

Purchasing Representative:
Name: Clint Lockhart
Title: Procurement Specialist III
Phone: (352) 393-1250
Email: LockhartCM@GRU.com

Gainesville Regional Utilities
301 S.E. 4th Avenue
Gainesville, FL 32601

1.0 CITY OF GAINESVILLE INTRODUCTION

The City of Gainesville is the largest city and county seat of Alachua County. Gainesville's municipal utility, Gainesville Regional Utilities (herein referred to as GRU), has a service area of approximately 125 square miles and provides services to more than 185,000 people. The University of Florida and UF Health are the leading employers in Gainesville and provide jobs for many residents of surrounding counties. Known for its preservation of historic buildings and the beauty of its natural surroundings, Gainesville's numerous parks, museums and lakes provide entertainment to thousands of visitors. The City of Gainesville is governed by a seven-member city commission, members of which are elected by Gainesville city residents to three-year terms. Gainesville is one of the most attractive cities in Florida. GRU's mission is to provide safe, reliable, and competitively priced utility services in an environmentally responsible manner to enhance the quality of life in our community.

2.0 GRU BACKGROUND

GRU, the fifth largest municipal electric utility in Florida, is a combined utility system operating electric, water, and wastewater, natural gas, and telecommunications systems. It employs approximately 850 employees. GRU is a utility enterprise of the City of Gainesville and is reported as an enterprise fund in the annual financial report of the City.

The electric utility is vertically integrated and is comprised of 626 MW (summer capacity) of natural gas, biomass and coal-fired generation, and 117 miles of 138 kV and 2.5 miles of 230 kV transmission lines. GRU's system load typically varies between 120 and 430 MW. GRU holds several NERC registrations including, but not limited to, Transmission Owner, Transmission Operator, Planning Authority and Balancing Authority.

Presently, GRU has approximately 26 MW of existing PV capacity on its distribution system which is not modeled or scheduled in sum as a generation resource at this time. GRU has the goal of increasing the amount of solar energy into its system via the installation of solar capacity through direct connection to its transmission facilities, and recognizes that careful design of the facilities will be required to properly integrate with existing generation assets within a small balancing authority without adverse impacts on system operation, inertial assets, and regulatory compliance.

3.0 INVITATION

The City of Gainesville, d/b/a GRU, through this Invitation to Negotiate (ITN), wishes to solicit qualified firms (herein referred to as "Seller" or "Respondent" or "Firm") to submit a combined Proposal for the:

3.0.1 Construction of and delivery of energy from a "turn-key" Solar PV facility (PV Facility) with a total rated electrical capacity of 40 MW_{AC} to 50 MW_{AC} (total, which may be divided between up to four sites) and

3.0.2 Sale of the electrical output and associated attributes (Renewable Energy Credits (RECs), etc.) to GRU through a Renewable Energy Power Purchase Agreement (PPA).

3.0.3 The PV Facility should be within or in the proximity of the GRU electric service territory and in the proximity to one of the GRU 138kV transmission switchyard facilities and shall be directly connected in accordance with an interconnection agreement. GRU intends to contract with a single Seller for 40 MW_{AC} to 50 MW_{AC} capacity on property owned by or under the control of the Seller.

3.0.4 The PV Facility is expected to maintain the nameplate output for the duration of the PPA by methods acceptable to GRU and the regulatory community. Enough total system generation capacity should be provided such that the PV Facility can adjust for system output degradation during the term of the PPA.

3.0.5 To meet minimum qualifications, the respondent must have been the lead party responsible for the financing, design, construction, and commissioning of at least three utility connected solar projects of at least 30 MW within the past three years.

3.1 BASE PROPOSAL

GRU will purchase the PV Facility's power output measured at the 138kV interconnection point in megawatt-hours (MWh) for a term of 20 years, with an option to renew for up to two additional five-year periods. GRU will pay only for the actual energy delivered to the interconnection point and not the daily projected or nameplate rating of the PV facility.

3.2 BUYOUT PROVISION (To be exercised at GRU's sole discretion)

GRU will purchase the PV Facility's power output measured at the 138 kV interconnection point in megawatt-hours (MWh) for the duration of the contract or a minimum term of five years after which GRU may exercise an option to purchase the PV Facility from the Seller and terminate any and all PPA obligations with the Seller at that time ("the Option"). The Option is available at every 12-month anniversary thereafter of the contract execution date.

Seller should provide an estimated good-faith indicative value of the PV Facility for buy-out purposes in a buy-out schedule/table for the end of years 5, 10, 15, and 20.

3.3 TYPE OF PPA AGREEMENT

GRU wishes to enter into a long-term energy supply Agreement with a Seller for an "As Available" net-solar energy produced and delivered product. This Power Purchase Agreement (PPA) will provide a fixed cost structure (i.e. no escalation) over the Term of the PPA. GRU does not desire to split the cost of the facility into an installed capacity and energy segment. All monies recovered by the Seller from GRU will be through the energy payment received for actual net energy produced and delivered into the GRU system. Under normal system operating conditions, GRU would accept and take 100% of all the solar output from the PV Facility. System Operating Conditions where it isn't possible or

practical to take 100% of the energy produced are described in Section 3.4 Load Balancing.

GRU shall also have the "right of first refusal" (ROFR) on any sale, lease, sub-contract to or other financial transaction associated with the ownership of the PV Facility. Interest in the project may not be transferred to another entity without prior approval from GRU.

A sample framework for terms and conditions for a PPA agreement are provided in Attachments 1 and 2, which reflect GRU's desired business framework and applicable statutory requirements. Please provide any "high-level" comments about approach and items that you feel should be addressed if your organization is identified as a short-list respondent to this Invitation to Negotiate. This document should not be considered the final PPA form and substance. Comments and level-of-effort on review of the document should reflect this.

3.4 LOAD BALANCING AND REGULATION

GRU is a load balancing entity and is responsible for matching generation resources with load within GRU's service territory. GRU is also responsible for operating the system utilizing internal and external generation resources to minimize the operating costs of the system while maintaining system reliability. GRU system reliability is subject to governance by the FRCC (Florida Reliability Coordinating Council) and associated NERC (North American Reliability Council) requirements.

3.4.1 It is GRU's desire and expectation to accept 100% of the PV Facility's output. However, there may be times when this is not technically feasible or practical. While these times will be minimal in nature, it's important to address the options. To be clear, it is GRU's intent to only pay for net solar energy actually accepted and delivered into the GRU system.

3.4.2 The rate of change of the facility at the interconnection point shall be controlled or regulated during operation, and shall be limited to a maximum of 0.060 MW / minute per MW of rated system capacity when increasing or decreasing load (e.g., 3.0 MW / minute for a 50 MW facility). The Seller shall be responsible for the design and implementation of a properly engineered solution consisting of one or more of the following: (1) grid scale storage; (2) oversizing of the solar array; (3) "clipping" or otherwise artificially regulating the output of the facilities' inverters to less than full capacity; (4) other technologies which will contribute to the regulation of increases and decreases in facility output.

Systems that meet the minimum specification of 0.060 MW/minute per MW of capacity will be awarded one evaluation point; systems with a maximum ramp rate of 0.050 MW/min per MW of capacity will receive three points; and systems with a maximum ramp rate of 0.040 MW/min per MW of capacity will receive five points.

3.4.3 The Power plant controller shall be capable of receiving dispatch signals from the GRU BA System Operator via SCADA control to regulate solar facility output to the interconnection point.

3.4.4 Facility shall support the voltage at the point of interconnection bus (POI) up to +/- 5% per unit scheduled voltage unless instructed otherwise by the GRU BA System Operator.

3.4.5 The following conditions identify when GRU Grid System may not accept the power produced by the PV Facility:

- Under a system emergency when the transmission is physically incapable of accepting or transporting the power. The Transmission System becomes unavailable due to a mechanical component failure regardless of cause.

- The System Load is low and other online GRU generation units have been reduced to their minimum operating load points. It is not acceptable to cycle GRU baseload units on- and off- line to accommodate the PV Facility production. It is expected that generation assets put on line, including the PV Facility, would be planned to match the expected load.

- There may be short periods of time during the spring and fall shoulder months where early morning system loads do not rise quickly enough to match the combination of available PV Facility production and the minimized fossil units that are online to meet the dusk- to dawn-load requirements. The hours between say 7:00 AM and 11:00 AM are the times in question. To be clear, this may never become an issue.

- To the extent the GRU load cannot accommodate the solar production, GRU shall have the right to the following options:
    - Clip the excess power to the extent necessary. Under extreme system emergency conditions, this may require turning the PV Facility offline.
        - It is recognized that from an economic perspective, clipping power is not desirable to the Seller.
    - In lieu of clipping power, to the extent the transmission system can accommodate, the excess PV Facility power generated will be delivered through one of GRU's grid ties per Seller's direction into the non-GRU grid. Seller will be responsible for the obtaining and reconciling any economic transaction for the excess power delivered into the non-GRU grid on their behalf. As part of the PPA, when the transmission system is capable, GRU will transport the power to the non-GRU grid tie at no charge.

3.5 CAPACITY AND ENERGY FORECASTING

3.5.1 Seller shall provide annual and quarterly estimates of MWh output at the interconnection point for energy supply planning and budgeting purposes.

3.5.2 Seller shall provide day ahead and in-day forecast meeting the following... Seller shall provide forecast for the 15 minute MW output for the next four hours updated at top of the hour, along with the day-ahead hourly forecast output forecast.

4.0 STATEMENT OF WORK SCOPE

4.1 The Seller will be responsible for all facility and energy delivery permitting

requirements; the site preparation; the facility and interconnection design packages; the construction and installation of all generation equipment and subsystems and the required control/communication systems to meet NERC and GRU System requirements; and delivery of the generated power output; the ongoing operation, maintenance and security of the facility; federal, state and local (city/county) taxes including real estate, property taxes and any miscellaneous assessments that may be imposed; and the ownership of the PV systems. The Seller (and its sub-contractors) will utilize "Good Utility Standards and Practices" in all phases of this Statement of Work. The Seller shall comply with the document ***GRU Facility Interconnection Requirements*** (Approved 5/13/2019), provided herein as Attachment 6.

4.2 The PV Facility should be in the immediate proximity of and accessible to GRU's 138 kV transmission switchyard facilities. The Seller is responsible for providing an easement that is a minimum of 100 feet wide should transmission line construction be required to transmit power from the Facility's site to the GRU interconnection point. All associated buses, breakers, switchgear, transformers and other auxiliary equipment necessary to connect to GRU's transmission system shall be at the expense of the Seller.

4.3 The Seller must agree to provide facility data and any other information that may be required for GRU to comply with all applicable NERC reliability standards. NERC reliability standards are also likely applicable for the interconnections to GRU's 138 kV transmission system.

4.4 Prior to Facility energization, the Seller shall develop an inspection, test and energization plan for pre-energization and energization testing. This plan shall include provisions for testing protective equipment that complies with NERC and FRCC Standards. GRU will review and must approve the test plan prior to testing. GRU may require additional tests. The testing shall be at the Seller's expense.

4.5 Prior to the Facility's Commercial Operation, the Seller shall develop a test plan for stability model validation per NERC and FRCC requirements. GRU will review and must approve the validation plan prior to implementation. GRU may require additional tests. The testing shall be at the Seller's expense.

4.6 Periodic testing of real and reactive power shall be conducted in accordance with applicable NERC reliability standards and reported to GRU.

4.7 The Seller will bear all risks, financial and otherwise, associated with the Facility's eligibility to receive tax credits, and other grants or incentives that are in the Seller's submittal upon such time as the PV Facility and the associated PPA is awarded.

4.8 The obligation of the successful Seller to perform under any PPA executed as a result of this ITN shall be effective and binding regardless of whether the sale of the output from the successful Seller's facility under such agreement is eligible for, or receives production credits, investment tax credits, or other identified tax credits/incentives during the term of the PPA. In the event there are tax incentives signed into local, state and/or federal law, GRU reserves the right to realize or share said benefits as they relate to the PV Facility.

4.9 The Seller is responsible for all costs of connecting the PV Facility to GRU's 138 kV transmission system including a 138 kV transmission line and associated line terminus at the substation(s) as required. Additionally, the Seller will be responsible for all costs incurred by GRU associated with the interconnection point including any interconnection studies (conducted by GRU), any required facilities, equipment, maintenance, ancillary services, and other necessary interconnection-related costs and arrangements throughout the term of the PPA.

4.10 GRU has preferred connection locations within its transmission system. These locations have been identified as transmission line numbers as identified in Attachment 3. The transmission line connections have been grouped into three tiers. Solar arrays with connections to Tier I transmission lines will receive five points in GRU's evaluation; Tier II transmission lines will receive three points; and Tier III transmission lines will receive one point. Connections to the transmission system outside the lines identified in Attachment 3 are not permitted.

4.11 GRU will accept projects whose capacity is split into up to four sites. The total output of these sites must stay within the 40 to 50 MW AC project requirements. If the SELLER provides two sites and these two sites are at least five miles apart, the SELLER will be awarded three evaluation points. If the SELLER provides three sites and these sites are at least five miles apart, the SELLER will be awarded four evaluation points. If the SELLER provides four sites and these sites are at least five miles apart, the SELLER will be awarded five evaluation points.

5.0 PROPOSED TIMELINE

ITN Issue Date	5/31/2019
Deadline to submit questions	6/17//2019
Anticipated Posting of Final Answers to Submitted Questions	6/21/2019
ITN Response Due	**7/9/2019 @ 2:00 p.m. EST**
Evaluation of Proposals Team Meeting	(Week of) 7/15/2019
Anticipated Negotiations Commence	(Week of) 7/30/2019
Anticipated Contract start date	11/1/2019
Commercial Operation of Facility	1Q2023 (not later than)

*__ALL__ dates reflected are projections only. GRU reserves the right to change dates given without warning or notice.

6.0 EXAMINATION OF SOLICITATION DOCUMENTS AND WORK SITE

6.1 Prior to responding to the Solicitation, Respondents are responsible for the following: (a) examining the Solicitation thoroughly, (b) selection and visiting the project site to become familiar with local conditions that may affect the cost, schedule, progress, performance of developing the PV Facility, (c) considering federal, state and local Laws Codes and Regulations that may impact or affect cost, schedule, progress, performance or furnishing of the PV Facility, (d) studying and carefully correlating Respondent's observations with the Solicitation, and (e) notifying the Purchasing Representative of all conflicts, errors or discrepancies in the Solicitation.

6.2 A system one-line drawing is available after execution and submission of the Non-disclosure Agreement contained in Attachment 7.

6.2 Respondents are expected to become fully informed as to the requirements of the Specifications and failure to do so will be at their own risk. Respondents cannot expect to secure relief on the plea of error.

6.3 A Respondent who is aggrieved in connection with the specifications of this Solicitation may protest in writing to Utilities Purchasing at least seven (7) business days prior to the Response due date.

7.0 RESPONSE PREPARATION

7.1 All blanks on the Respondent's Certification Form must be legibly completed in ink (computer printed, typed or handwritten).

7.2 A Response submitted by a corporation must be executed in the corporate name by the president, a vice-president, or other corporate representative and accompanied by a document showing authorization of such person's authority. Include the physical address and state of incorporation. A Response submitted by a partnership must be executed in the partnership's name and signed by a partner, whose title must appear under the signature, and the physical address of the partnership must be shown below the signature.

7.3 The names of individuals included on the Respondent's Certification Form must be legibly printed below signatures (computer printed, typed or handwritten).

7.4 Respondent must acknowledge receipt of all addenda using the space provided on the Respondent's Certification Form.

7.5 Costs for developing a response to the Solicitation are the sole obligation of the Respondent.

7.6 Respondent's pricing must include applicable taxes on items purchased or manufactured by Respondent for the project. GRU is exempt from Florida sales taxes for certain purchases. A "Consumer's Certificate of Exemption" is available at www.gru.com .

7.7 Respondents are encouraged to use environmentally sustainable practices in response to the Solicitation when possible. This may include providing double-sided copies, minimal use of plastic covers, binders, tabs or dividers, etc.

7.8 Respondents with more than one potential location and tie point may submit separate responses for each site.

8.0 INTERPRETATIONS AND ADDENDA

8.1 All questions about the meaning or intent of the Solicitation are to be directed to the Procurement Representative. Interpretations or clarifications considered necessary in response to such questions will be issued by Addenda sent to all parties recorded as having received the Solicitation. Questions received less than seven (7) business days prior to the Response due date/time may not be answered by the Purchasing Representative. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications that are not memorized by formal written Addenda will be without legal effect. Questions will be answered as they are received in multiple addendums if necessary. Therefore, early submission of questions is encouraged. More than one submission of questions may be submitted by each respondent as required. Submissions shall be by e-mail to procurement representative, LockhartCM@GRU.com.

8.2 Addenda may also be issued to modify the Solicitation as deemed advisable by the Purchasing Representative.

8.3 Addenda issued by GRU prior to the Solicitation due date/time are considered binding as if written into the original Solicitation. Respondents are responsible for ensuring that all addenda have been received prior to submitting their Response.

9.0 SOLICITATION RESPONSE

9.1 **Response must be in the possession of Utilities Procurement by 2:00 p.m. on the due date**. Possession is defined as being uploaded into DemandStar prior to the 2:00 p.m. deadline. Late submissions shall not be accepted.

9.2 It will be the sole responsibility of the Respondent to retrieve all documents, tab sheets, addenda, or other related documents from DemandStar relating to this solicitation

9.3 Responses will be publicly opened at the time and place indicated in the Solicitation and will be available for inspection upon notice of award or intended Award, or within thirty (30) calendar days after the opening of Responses, whichever occurs first. Prices *shall not* be read at the public Solicitation opening at the sole discretion of Utilities Procurement.

9.4 The Respondent's Certification Form must be submitted with the Response. If required, a Bid Bond and other documents must be provided with the Response. If a Bid Bond is required by the Solicitation and not included the response will be deemed non-responsive.

9.5 A "Non-Submittal" form has been provided for those who choose not to participate in the Solicitation. This form can be submitted in DemandStar or emailed to the Purchasing Representative

10.0 MODIFICATION OR WITHDRAWAL OF A RESPONSE TO A SOLICITATION

10.1 A Response may be modified or withdrawn if a written request is submitted and physically received by GRU Purchasing before the Response due date and time.

10.2 After Responses have been opened, corrections to the Response are permitted only to the extent that (1) Respondent can show by clear and convincing evidence that there was a material and substantial mistake in the preparation of its Response; (2) the nature of the mistake is evident; and (3) the intended pricing is evident.

11.0 COSTS IN DEVELOPMENT OF RESPONSE

Costs for developing a response to this ITN are entirely the obligation of the Respondent and shall not be charged in any manner to GRU or the City of Gainesville.

12.0 PROPOSAL RESPONSE REQUIREMENTS

12.1 Proposer shall construct their proposal in the following format and a tab must separate each section. **Do not submit BINDERS 1 and BINDERS 2 together. Submit electronic files into DemandStar with the appropriate title.**

Submit Binder 1 with the naming convention "BINDER1 - Respondent Name – Proposal Title." For example, *BINDER1 – Florida Solar Enterprises – 45 MW at Two Sites* would be appropriate.

Submit Binder 2 with the naming convention "BINDER2 – Respondent Name – Proposal Title.' For example, *BINDER2 - Florida Solar Enterprises – 45 MW at Two Sites* would be appropriate.

12.2 Proposals must be tabbed as follows and must include the information/documents specified in the applicable tab. Please note that the proposal should address the requirements in a clear and concise manner in the order stated herein. Proposals that do not adhere to the following format or include the requested information/documents may be considered incomplete and therefore unresponsive by GRU.

12.3 GRU reserves the right to seek additional/supplemental representation on specific issues as needed.

BINDER 1 - PROPOSAL

DO NOT INCLUDE ANY PRICING OF ANY FORM IN BINDER 1.

TAB 1 – COVER LETTER/EXECUTIVE SUMMARY

A cover letter, signed by an authorized representative of the Proposer, must be included and shall contain the name and address of the business submitting the proposal as well as the name(s), title(s), address(s), telephone number(s) and email(s) of the person(s) authorized to represent the Respondent.

Present in brief, concise terms, a summary level description of the contents of the proposal and your firm and/or joint venture's organizational/resource capabilities. The summary must be limited to a maximum of two (2) pages and the signer of the proposal must declare that the proposal is in all respects fair and in good faith without collusion or fraud.

TAB 2 –EXPERIENCE AND ABILITY

GRU seeks information on the relative experience and ability of the Respondent, its financing partner, its contract/legal counsel, and other key personnel and subcontractors proposed for use on the planning, design, construction, administration, and operations/maintenance of the PV Facility. Information should include but not be limited to the following:

A. Company Profile and Project Experience

i. The minimum requirement for this solicitation is three projects of at least 30 MW AC in size. List your three most recent projects of that meet this threshold and give a description of each project (include information such as did it meet its required schedule and performance expectations, etc.).
ii. List how many projects greater than or equal to 30 MW AC the company has completed, and its role in each project.
iii. List of projects the firm has completed in Florida.
iv. Describe the firm's experience with limiting solar output ramp rates and in employing the technologies proposed for doing so in this proposal. If applicable, provide a brief description of the firm's last three projects involving limiting solar output ramp rates and the firm's role in the project.

B. Relationship of any Joint Ventures Proposed for this Project

i. Provide a detailed description of any joint ventures or partnerships

involved with the proposed project. Discuss the firm's intent to own the project for the first five years of operation.

C. Project Financing Experience

i. Provide a background on the firm's creditworthiness and ability to financially execute this project. Explain how the firm's past five projects (if applicable) have been financed and how the proposed project will be financed.

NOTE: Firm should have an investment-grade rating or have sufficient equity to cover their anticipated obligations. If the firm is unable to satisfy the foregoing credit standards, they may designate a Credit Support Provider/Guarantor, and if the Credit Support Provider/Guarantor is satisfactory to GRU, the firm will be deemed to have satisfied GRU's credit requirement.

D. Key Personnel Qualifications

i. Provide resumes for Key personnel providing the qualifications of the key personnel that will be involved with the proposed project, including engineering, construction, operations and maintenance, environmental, and/or ownership qualifications, as applicable.

E. Operations and Maintenance Experience

i. Provide details on the firm's experience with operating and maintaining solar facilities.

F. Safety Record

i. Describe the firm's health and safety history for the past five years. Provide the firm's Experience Modification Rate (EMR).

TAB 3 – TECHNICAL AND COMMERCIAL CONFORMANCE

Provide a detailed description of the proposed solar array. Information should include, but not be limited to, the following:

A. Project Site(s)

i. Provide associated USGS (or equivalent) coordinates delineating the scope of the physical project including the solar field array, project switchyard, right-of-way/corridor to interconnection point, maintenance area, and construction/marshaling area (either temporary or permanent). Clearly show which transmission line the project site intends to connect (see Sections 4.10 and 4.11).

ii. Identify which areas the SELLER presently controls (and method of control) along with additional areas that are required for successful completion of the project.

iii. Identify any hazardous areas that are part of or adjacent to the Project lands as well as any environmentally sensitive lands (wetlands, etc.) that are adjacent or included in the project.

iv. Identify the point of interconnection, the delivery point, and the metering point.

v. Delineate the Point of Transfer between BUYER and SELLER.

B. System Components and Operation

i. Provide conceptual drawing for the grid interconnection showing key equipment and design details to provide an overview of the grid connection, including the connection point and voltage.
ii. Explain in detail how the system will meet the projects specified ramp rate limits (up and down). Provide the system's maximum ramp rate (up and down).
iii. If the project contains energy storage, provide details on the type of storage, storage capacity that will be included, and how the control system will operate in tandem with the PV array, batteries, and inverters.

C. Project Execution Plan (2 page maximum)

i. Provide a description of the project execution plan detailing the process to be employed for this project showing key milestones (land acquisition, design, permitting, procurement, construction and commissioning) to ensure a successful and timely entry into commercial operation. The description should include both a narrative and Gantt format schedule.
ii. Explain the project's plan for connection to GRU's transmission system.

D. Operations Plan

i. Discuss the project's proposed vegetation management and maintenance plan. Describe expected planned outages and their durations.
ii. Explain how the system's output will be forecasted and provided to GRU.

E. Attachment 4 - Project Information Form

i. Fill out and provide Attachment 4.

F. Exclusions and Exceptions

i. Fully explain all exclusions and exceptions the proposed project has to the specifications. Note that exclusions and exceptions may negatively impact the project's rating to GRU.

TAB 4 - GRU DOCUMENTS

Complete and attach the forms contained in the attachments:

- **Small Business Enterprise (SBE) (if applicable) check-off on Respondents Certification**
- **Local Preference (if applicable)**
- **Respondent's Certification**
- **Drug-Free Workplace Certification Form**
- **Subcontractor Information Form**

Incomplete information may be grounds to deem a proposal as non-responsive. If there are questions regarding these forms, please contact GRU's procurement specialist at LockhartCM@gru.com.

BINDER 2 – COST/FEE PROPOSAL

Upload a separate file in the DemandStar system containing the proposed fee for services defined herein for the term of the contract. An Adobe PDF file format is preferred. Include Attachment 5. Also include the good faith buyout as described in Section 3.2. Upload the file with the naming convention described in Section 12.1.

13.0 ALTERNATE APPROACHES

Respondent may submit alternative solutions within a single Response provided that each alternative solution must independently and completely satisfy the requirements of this ITN on its own merits. The intention of allowing alternative solutions is to consider all business solutions for evaluation and award based solely upon the best interest of GRU.

14.0 REDACTED SUBMISSIONS

14.1 If Respondent considers any portion of the documents, data or records submitted in response to this solicitation to be confidential, proprietary, trade secret or otherwise not subject to disclosure pursuant to Chapter 119, Florida Statutes, the Florida Constitution or other authority, Respondent must mark the document as "Confidential" and simultaneously provide GRU with a separate redacted copy of its response and briefly describe in writing the grounds for claiming exemption from the public records law, including the specific statutory citation for such exemption. This redacted copy shall contain GRU's solicitation name, number, and the name of the Respondent on the cover, and shall be clearly titled "Redacted Copy". The Redacted Copy should only redact those portions of material that the Contractor claims is confidential, proprietary, trade secret or otherwise not subject to disclosure.

14.2 In the event of a request for public records pursuant to Chapter 119, Florida Statutes, the Florida Constitution or other authority, to which documents that are marked as confidential are responsive, GRU will provide the Redacted Copy to the requestor. If a requestor asserts a right to the Confidential Information, GRU will notify the Respondent such an assertion has been made. It is the Respondent's responsibility to assert that the information in question is exempt from disclosure under Chapter 119 or other applicable law. If GRU becomes subject to a demand for discovery or disclosure of the Confidential Information of the Respondent in a legal proceeding, GRU shall give the Respondent prompt notice of the demand prior to releasing the information (unless otherwise prohibited by applicable law). The Respondent shall be responsible for defending its determination that the redacted portions of its response are confidential, proprietary, trade secret, or otherwise not subject to disclosure.

14.3 By submitting a response, the Respondent agrees to protect, defend, and indemnify GRU for any and all claims arising from or relating to the Respondent's determination that the redacted portions of its reply are confidential, proprietary, trade secret, or otherwise not subject to disclosure. If Respondent fails to submit a redacted copy of information it claims is confidential, GRU is authorized to produce the entire documents, data, or records submitted to GRU in answer to a public records request for these records.

15.0 ADDITIONAL INFORMATION

By submitting a response, Respondent certifies that it agrees to and satisfies all criteria specified in the ITN. GRU may request, and Respondent shall provide, additional supporting information or documentation. Failure to supply such information or documentation as required and requested will result in disqualification of the reply.

16.0 EVALUATION PROCESS

16.1 Response Evaluation

16.1.1 Short Listing of Responses

The evaluation team members will meet and evaluate the Responses using the criteria and weighted point system described below.

After ranking of the vendors, GRU will negotiate a Purchased Power Agreement with one or more vendors. While the business terms for the Purchased Power Agreement are negotiable, GRU requires that certain standard terms and conditions be included in the Purchased Power Agreement. These terms and conditions reflect state and local law and GRU's policies. Attachment 1 to this Invitation to Negotiate are the General Terms and Conditions and Supplemental Terms that will be included in the Purchased Power Agreement.

GRU will post a notice of negotiations identifying the Respondents with whom GRU will negotiate.

16.2 Negotiations

Ranked Shortlisted Respondent(s) will be invited to provide more detailed clarifications of their Response, to provide interactive presentations of the Response, and/or to enter into negotiations with GRU. Based on the clarifications, presentations and negotiations, GRU will either recommend award of the contract to the Respondent(s) who provides the best value for GRU or reject all responses. GRU reserves the right to negotiate concurrently or separately with competing Respondent(s). After negotiations are conducted, GRU shall recommend award of the contract to the responsible and responsive Respondent that GRU determines will provide the best value and terms.

Negotiation meetings will be conducted in Gainesville, Florida. GRU will distribute instructions and/or agendas in advance of each negotiation session. Representatives for each Respondent should plan to be available, without interruptions, for the entirety of the Respondent's scheduled negotiation meeting.

Negotiations will include discussions of the scope of work and related services to be provided by the Respondent until acceptable contract terms are agreed upon, or it is determined that an acceptable agreement cannot be reached. This process will continue until GRU receives best and final offers from the participating Respondent(s). GRU reserves the option to resume negotiations that were previously suspended.

Negotiations shall not be open to the public.

Criteria	Rating Points
Executive Summary	0
Experience and Ability	0 – 16
Technical and Commercial Conformance	0 – 24

Subtotal	**40**
Cost/Fee Proposal	*60*
Maximum Points Allowed	**100**

17.0 TERMS OF AWARD

17.1 Award will be made to the best evaluated Respondent(s) for Response(s) based on the above criteria as GRU determines to be in its best interest.

17.2 GRU reserves the right to reject any and all Responses, or any part thereof, to waive any and all informalities or irregularities, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Responses. A responsible Respondent and any selected subcontractors, suppliers, other persons, and/or organizations proposed to perform or furnish the PV Facility, have the capacity in all respects to fully perform the Renewable Energy PPA requirements and the experience, integrity, reliability, capacity, facilities, equipment, and credit to ensure good faith performance, such capacity and responsibility to be determined solely by GRU. GRU may conduct such investigation as GRU deems necessary to establish the responsibility, qualifications and financial ability of Respondent(s), proposed subcontractors, material suppliers, individuals, or entities to perform the activities in accordance with the Renewable Energy PPA. Such information may include, but shall not be limited to, current financial statements, bank records, verifications of availability of equipment and personnel and past performance records.

17.3 If the Renewable Energy PPA is awarded, GRU will give the successful Respondent a Notice of Intent to Award within one hundred eighty (180) calendar days after the Solicitation due date. All Responses must remain valid for one hundred eighty (180) calendar days from the Solicitation due date.

17.4 When GRU gives a Notice of Award to the successful Respondent, it will be accompanied by the required number of unsigned counterparts of the Renewable Energy PPA (or Purchase Order, as applicable) with all attachments. Within thirty (30) calendar days thereafter, Respondent must sign and deliver the required number of counterparts of the Renewable Energy PPA, attachments, and required Bonds, if applicable. GRU will ultimately provide a fully signed counterpart to the Respondent.

17.5 Failure on the part of the successful Respondent to execute a Contract within fifteen (15) calendar days after the notice of acceptance may be just cause for annulment of award.

17.6 GRU may then begin negotiations with the next highest ranked, shortlisted Respondent, or reject all proposals at its sole discretion.

17.7 Protests in respect to the intended award must be filed within three (3) calendar days of notice for purchases that do not require prior approval of the City Commission, and within

seven (7) calendar days for purchases that require prior approval of the City Commission. It is the Respondent's duty to be informed of the intended award and GRU's protest procedures.

18.0 PUBLIC ENTITY CRIMES/DEBARMENT/SUSPENSION/TERMINATION

18.1 Pursuant to Chapter 287.133(2)(a) of the Florida Statutes, "A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in sec. 287.017, for Category Two for a period of 36 months following the date of being placed on the convicted vendor list."

18.2 Respondent is responsible for compliance with current policies regarding debarment / suspension / termination which have been issued by the Utilities Purchasing Division.

18.3 The Respondent certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this Solicitation by any governmental department or agency.

19.0 DISCLOSURE, CONFIDENTIALITY AND PUBLIC RECORDS

19.1 Florida has a very broad public records law. By entering into an agreement with GRU, the Respondent acknowledges that it will comply with the Florida Public Records Act (*Chapter 119, Florida Statutes*) Failure to comply with the Florida Public Records Act, including failure to provide a public record upon request, is a breach of the Contract between GRU and Respondent. GRU may pursue all remedies for breach of this agreement. Responses to this Solicitation upon receipt by GRU become public records subject to the provisions of *Chapter 119, Florida Statutes*. Should the Respondent believe that any portion or all of its response is exempt from the Florida Public Records Act; the Response should clearly assert such exemption and the specific legal authority for the asserted exemption. In complying with the Florida Public Records Act the Respondent must:

19.2 Responses to this Solicitation are public records and will be available for inspection after such time as an award is recommended or within thirty (30) calendar days after the Solicitation due date, whichever occurs first in time. Responses exempt from public record requests under Florida State Statute §119.0713 will be released in accordance with Florida State Statute.

20.0 CONFIDENTIAL INFORMATION

Upon receipt by GRU, responses to this Solicitation become public records subject to the provisions of Chapter 119 of the Florida Statutes, Florida's Public Records Law. If Respondent believes that any portion of the Response constitutes a trade secret pursuant to the Florida

Statutes or is otherwise exempt from Florida's Public Records Law, Respondent should clearly identify the specific sections of the response for which confidentiality is claimed, and provide specific legal authority of the asserted exemption. Any portion of the Response that Respondent asserts qualify for exemption from Chapter 119, must be submitted in a separate envelope and clearly identified as "trade secret" or otherwise "exempt from the Florida Public Records Law with Respondent's firm name and the Response number marked on the outside of the envelope. In the event that GRU determines that any portion of the Response (initially claimed by the Respondent to be exempt) do not qualify as such, the Respondent will be contacted and will have the opportunity to waive their claim to confidentiality. Please be aware that the designation of an item as "exempt" or a "trade secret" by Respondent, and the refusal to disclose any materials submitted to GRU, may be challenged in court. By your designation of material in your Response as "exempt" or a "trade secret", Respondent agrees to indemnify and hold harmless the City, GRU, its elected officials, and employees for any award to a plaintiff for damages, costs or attorneys' fees and for costs attorneys' fees incurred by GRU by reason of any legal action challenging Respondent's designation of "exempt" or "trade secret" and GRU's refusal to disclose.

21.0 LOBBYING

To ensure fair consideration and consistent and accurate dissemination of information for all proposers, the City prohibits communication to or with any department, employee, or agent evaluating or considering the proposals during the submission process, except as authorized by the GRU Purchasing Representative. During the blackout period as defined herein, except as pursuant to an authorized appeal, no person may lobby, as defined herein, on behalf of a competing party in a particular procurement process, City officials or employees except the purchasing designated staff contact in the purchasing division. Violation of this provision shall result in disqualification of the party on whose behalf the lobbying occurred. The blackout period means the period between the time the solicitation response is received by GRU Purchasing and the time City officials and employees award the contract. Lobbying means when any natural person, for compensation, seeks to influence the governmental decision-making, to encourage the passage, defeat or modification of any proposal, recommendation or decision by City officials and employees, except as authorized by procurement documents.

23.0 COLLUSION

23.1 Only one (1) response from any individual, firm, corporation, organization or agency under the same or different name will be considered for this Solicitation. Submission of more than one (1) response may result in the rejection of all responses from the Respondent.

23.2 Respondent, by signing the Respondent's Certification Form, declares that the Response is made without any previous understanding, agreement, or connections with any persons, firms, or corporations responding on the same items and that it is in all respects fair and in good faith without any outside control, collusion or fraud. A non-exclusive manufacturer/distributor relationship does not, in and of itself, constitute a prior understanding, agreement, connection or collusion between Responders.

23.3 By responding to the Solicitation, the Respondent acknowledges that it has not offered or given any gift or compensation to any GRU officer or employee to secure favorable treatment with respect to being awarded this Contract.

24.0 SMALL BUSINESS ENTERPRISE (SBE)

24.1 Independently owned with a net worth of not more than five million dollars and employs 200 or fewer permanent full-time employees.

24.2 A small or service-disabled veteran business, as certified by the City of Gainesville Equal Opportunity Department http://www.cityofgainesville.org/OfficeofEqualOpportunity.aspx, will be given a preference of 5% of the total price not to exceed $25,000, when all of the following apply:

(a) Purchase is anticipated to be greater than $50,000;

(b) Award is based on evaluation criteria other than to the lowest responsive and responsible bidder;

(c) The certified small or service-disabled veteran business being evaluated did not receive a Local Preference; and

(d) The preference is not prohibited by law.

24.3 The preference will be applied as an adjustment in scoring for the cost element in each Response scoring, as applicable.

25.0 LOCAL PREFERENCE

The Local Preference Ordinance applies to Solicitations for goods or services estimated to exceed $50,000.

In solicitation of, or letting contracts for procurement of, supplies, materials, equipment and services, as described in the purchasing policies, the City Commission, or other purchasing authority, may give a preference to local businesses in making such purchase or awarding such contract in an amount not to exceed five percent of the local business' total price, and in any event the cost differential should not exceed $25,000.

A "local business" means the Respondent has a valid business tax receipt, issued by the City of Gainesville at least six months prior to Response due date, to do business in said locality that authorizes the business to provide the goods, services, or construction services to be purchased, and a physical business address located within the limits of said locality, in an area zoned for the conduct of such business, from which the business operates or performs business on a day-to-day basis. Post office boxes are not verifiable and cannot be used for the purpose of establishing said physical address. In order to be eligible for local preference, the Respondent must provide a copy of the business tax receipt. The ordinance can be found at www.cityofgainesville.org. A Local Preference Decision Tree is attached.

The preference will be applied as an adjustment in scoring for the cost element in each Response scoring, as applicable.

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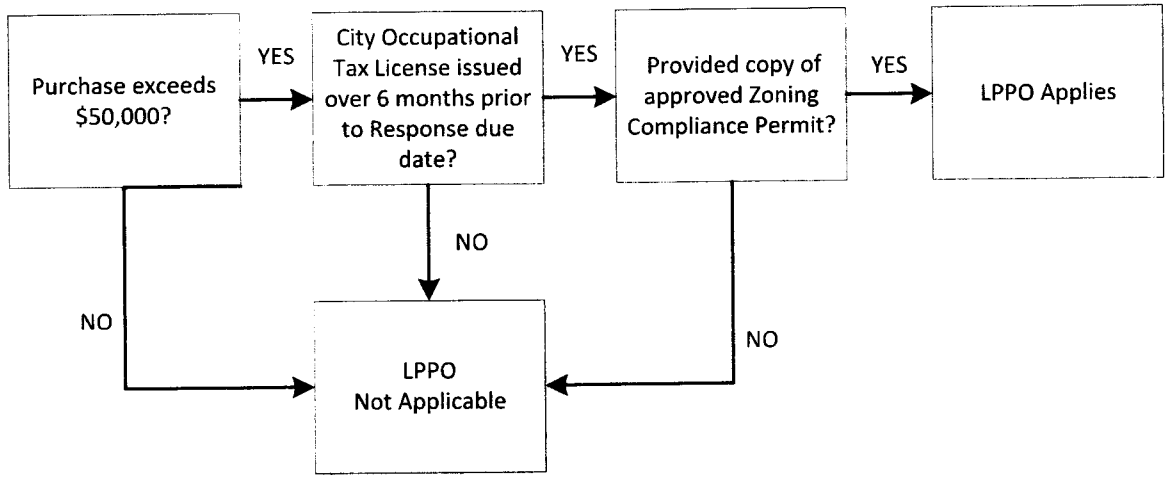
SOLICITATION NUMBER: 2019-070 TITLE: SOLAR PHOTOVOLTAIC PPA

LOCAL PREFERENCE POLICY ORDINANCE DECISION TREE

While not all encompassing, the following is provided as a guideline for determining whether the City of Gainesville Local Preference Policy Ordinance (LPPO) applies to solicitation responses submitted to the City. LPPO applies only to new solicitations. Respondents are advised to review the entire text of the Local Preference Policy Ordinance. Respondent is advised to review the entire text of the LPPO at www.cityofgainesville.org.



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