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May 1, 2017

Ms. Carlotta Stauffer, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

RE: Docket No. 170002-EG

Dear Ms. Stauffer:

Attached for electronic filing is the Final True-up Testimony and Exhibit for the period January – December 2016 of John N. Floyd in the above-referenced docket.

Pursuant to the Order Establishing Procedure, an electronic copy will be provided to the parties under separate cover.

Sincerely,

Robert L. McGee, Jr.
Regulatory and Pricing Manager

md

Attachments

cc: Florida Public Service Commission
Kelley Corbari, Senior Attorney, Office of the General Counsel (5 copies)
Beggs & Lane
Jeffrey A. Stone, Esq.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

**ENERGY CONSERVATION COST
RECOVERY CLAUSE**

Docket No. 170002-EG

**PREPARED DIRECT TESTIMONY AND
EXHIBIT OF
JOHN N. FLOYD**

**FINAL TRUE-UP FOR THE PERIOD:
JANUARY – DECEMBER 2016**

DATE OF FILING: May 1, 2017



1 GULF POWER COMPANY

2 Before the Florida Public Service Commission
3 Prepared Direct Testimony and Exhibit of
4 John N. Floyd
5 Docket No. 170002-EG
6 Date of Filing: May 1, 2017

7 Q. Please state your name, business address, employer and position.

8 A. My name is John N. Floyd, and my business address is One Energy
9 Place, Pensacola, Florida 32520. I am employed by Gulf Power
10 Company (Gulf or the Company) as the Energy Efficiency and
11 Renewables Manager.

12 Q. Mr. Floyd, please describe your educational background and business
13 experience.

14 A. I received a Bachelor Degree in Electrical Engineering from Auburn
15 University in 1985. After serving four years in the U.S. Air Force, I began
16 my career in the electric utility industry at Gulf Power in 1990 and have
17 held various positions with the Company in Power Generation, Metering,
18 Power Delivery and Marketing. In my present position, I am responsible
19 for the development and implementation of Gulf's customer program
20 offerings associated with the Company's Demand-Side Management
21 (DSM) Plan.

22
23 Q. Have you previously testified before this Commission in connection with
24 the Energy Conservation Cost Recovery Clause?

25 A. Yes.

1 Q. Mr. Floyd, what is the purpose of your testimony?

2 A. The purpose of my testimony is to present the results of the approved
3 Energy Conservation Cost Recovery Clause programs and related
4 expenses for January 2016 through December 2016.

5

6 Q. Are you sponsoring any exhibits to your testimony?

7 A. Yes, I sponsor Exhibit JNF-1, Schedules CT-1 through CT-6.

8

9 Q. Have you verified that the information contained in Exhibit JNF-1 is
10 correct?

11 A. Yes, I have. This exhibit was prepared under my direction and control,
12 and the information contained therein is true and correct to the best of my
13 knowledge.

14 Counsel: We ask that Mr. Floyd's exhibit consisting of 6 Schedules,
15 CT-1 through CT-6, be marked for identification as:
16 Exhibit No. ____ (JNF-1)

17

18 Q. Please summarize for this Commission the deviations between the actual
19 expenses for this recovery period and the amount of estimated/actual
20 expenses previously filed with this Commission.

21 A. The estimated/actual true-up net expenses for the entire recovery period
22 January 2016 through December 2016, previously filed, were
23 \$12,579,743. The actual expenses incurred in 2016 were \$11,915,459,
24 which resulted in a variance of \$664,284 or 5.3% under the projection.
25 See Schedule CT-2, Line 10.

1 Q. Mr. Floyd, would you explain the January 2016 through December 2016
2 variance?

3 A. Yes. The variance was a result of actual expenses being less than
4 estimated in the majority of the programs. These variances were partially
5 offset by the following programs which experienced more actual expenses
6 than estimated: Community Energy Saver, Residential Building Efficiency,
7 Commercial/Industrial Energy Audit and Commercial Building Efficiency.
8 Overall, these variances mean that actual program expenses for the 12
9 month period through December 2016 were \$664,284 less than the level
10 of estimated/actual program expenses filed on August 19, 2016. A more
11 detailed description of the deviations is contained in Schedule CT-3, Page
12 1 and Schedule CT-6.

13

14 Q. Mr. Floyd, what was Gulf's adjusted net true-up for the period January
15 2016 through December 2016?

16 A. There was a \$270,410 under-recovery as shown on Schedule CT-1.

17

18 Q. Please describe your program participation levels during the recovery
19 period.

20 A. A more detailed review of each of the programs is included in my
21 Schedule CT-6. The following is a synopsis of program participation
22 levels during this recovery period.

23 (A) Residential Energy Surveys - During the 2016 recovery period, the
24 Company completed 6,696 surveys compared to the projection of
25 6,116.

- 1 (B) Community Energy Saver – During the 2016 recovery period, the
2 Company served a total of 2,500 eligible participants compared to a
3 projection of 2,500.
- 4 (C) Residential Custom Incentive – During the 2016 recovery period,
5 no participants enrolled in this program compared to a projection of
6 0 participants.
- 7 (D) HVAC Efficiency – During the 2016 recovery period, there were a
8 total of 5,780 participants in this program compared to a projection
9 of 5,979.
- 10 (E) Residential Building Efficiency – During the 2016 recovery period,
11 there were a total of 596 participants in this program compared to a
12 projection of 643.
- 13 (F) Energy Select - During the 2016 recovery period, there was a net
14 increase of 1,473 customers with a total of 17,720 customers
15 on-line as of December 31, 2016. Gulf projected 1,600 net new
16 customer additions during 2016.
- 17 (G) Commercial/Industrial (C/I) Energy Analysis - During the 2016
18 recovery period, a total of 342 C/I Energy Analyses were completed
19 compared to a projection of 356.
- 20 (H) Commercial HVAC Retrocommissioning – During the 2016
21 recovery period, there were 41 participants in this program
22 compared to a projection of 60.
- 23 (I) Commercial Building Efficiency - During the 2016 recovery period,
24 Gulf Power customers completed the qualifying installation of 50
25 tons of Commercial Geothermal HVAC; 20,806 sq. ft. of

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Ceiling/Roof Insulation; and 269,196 sq. ft. of Commercial Reflective Roof. Comparisons to 2016 projections can be found in Schedule CT-6.

(J) Commercial/Industrial Custom Incentive – During the 2016 recovery period, no participants enrolled in this program compared to a projection of 0 participants.

(K) Residential Time of Use Rate Pilot – Further description of the Residential Time of Use Rate pilot program can be found in Schedule CT-6.

(L) Conservation Demonstration and Development – Further description of the 2016 Conservation Demonstration and Development projects can be found in Schedule CT-6.

Q. Should Gulf's recoverable energy conservation cost for the period be accepted as reasonable and prudent?

A. Yes.

Q. Mr. Floyd, does this conclude your testimony?

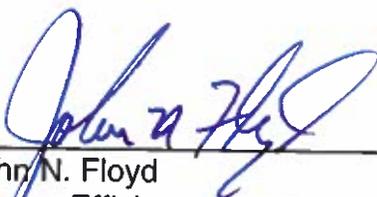
A. Yes, it does.

AFFIDAVIT

STATE OF FLORIDA)
)
COUNTY OF ESCAMBIA)

Docket No. 170002-EG

Before me the undersigned authority, personally appeared John N. Floyd, who being first duly sworn, deposes, and says that he is the Energy Efficiency and Renewables Manager of Gulf Power Company, a Florida corporation, that the foregoing is true and correct to the best of his knowledge, information, and belief. He is personally known to me.



John N. Floyd
Energy Efficiency and Renewables Manager

Sworn to and subscribed before me this 28th day of April, 2017.



Notary Public, State of Florida at Large

 **MELISSA DARNES**
MY COMMISSION # FF 912698
EXPIRES: December 17, 2019
Bonded Thru Budget Notary Services

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GULF POWER COMPANY

Reconciliation and Explanation of
Differences Between Filing and FPSC Audit
Report for Months, January, 2016 through December, 2016

The audit has not been completed as of the date of this Filing.

Program Description and Progress

Program Title: Residential Energy Audit and Education

Program Description: This program is the primary educational program to help customers improve the energy efficiency of their new or existing home by providing energy conservation advice and information that encourages the implementation of efficiency measures and behaviors resulting in energy and utility bill savings.

Program Accomplishments:

- Energy Audit – During 2016, Gulf performed 6,696 energy audits. These included 2,142 online audits, 1,436 in home audits, and 3,118 pre-construction audits.
- School-based Awareness and Education
 - Gulf provided professional development in energy-related science and math for 118 elementary, middle, and high school teachers who reach an estimated 7,500 students. These teachers received continuing education credits as well as hands-on energy, efficiency and renewable energy classroom materials and curriculum.
 - Gulf provided workshops for instructors of student summer camps in STEM (Science Technology Engineering Math) in two partnerships:
 - FSU Panama City STEM institute's Summer Camp program that reached approximately 300 8th – 12th grade students;
 - Bay County School District middle school STEM initiative that reached 60 6th – 8th grade students.
 - The estimated reach through these energy education programs is nearly 8,000 students.
 - Gulf coordinated monthly activities with student energy teams at two schools, measuring energy use at the school and created a plan to use energy wisely at school and home.
 - Gulf continued to provide classroom demonstrations and hands-on energy-related activities in schools on a monthly basis. Also, Gulf continued to provide energy-related onsite and material support for two hands-on interactive science museums which each average 100 attendees daily throughout the year.

Program Fiscal Expenditures: For 2016, Gulf projected \$2,261,720 of expenses compared to actual expenses of \$2,244,715 resulting in a variance of \$17,005 or 0.8% under the projection.

Program Progress Summary: Since the approval of this program, Gulf Power Company has performed 229,491 residential energy surveys.

Program Description and Progress

Program Title: Community Energy Saver Program

Program Description: This program assists low-income families with managing their energy costs. Through this program, qualifying customers receive the direct installation of conservation measures at no cost to them. The program also educates families on energy efficiency techniques and behavioral changes to help control their energy use and reduce their electricity expenses.

Program Accomplishments: During 2016, 2,500 of Gulf's customers received the measures included in this program compared to a projection of 2,500 participants, a difference of zero to the projection.

Program Fiscal Expenditures: For 2016, Gulf projected expenses for this program of \$722,830 compared to actual expenses of \$742,175 resulting in a variance of \$19,345 or 2.7% over the projection.

Program Progress Summary: A total of 15,005 customers have received the efficiency measures included in the Community Energy Saver program since the program's launch in 2011.

Program Description and Progress

Program Title: Residential Custom Incentive Program

Program Description: This program is designed to increase energy efficiency in the residential rental property sector. This program promotes the installation of various energy efficiency measures available through other programs, such as HVAC maintenance and quality installation, high performance windows, reflective roofing and Energy Star window A/Cs. Additional incentives will be included, as appropriate, to overcome the split-incentive barrier which exists in a landlord/renter situation. Moreover, this program promotes the installation of measures included in the Community Energy Saver Program by the landlord of multi-family properties.

Program Accomplishments: During 2016, no participants enrolled in this program. While there are no participants recorded in this year, Gulf continues to work with customers in the rental property sector.

Program Fiscal Expenditures: During 2016, \$98,946 in expenses were projected, compared to actual expenses of \$57,909 resulting in a variance of \$41,037 or 41.5% under the projection.

Program Progress Summary: Since its launch in 2011, one customer has participated in the Landlord/Renter Custom Incentive program.

Program Description and Progress

Program Title: HVAC Efficiency Improvement Program

Program Description: This program is designed to increase energy efficiency and improve HVAC cooling system performance for new and existing homes. These efficiencies are realized through:

- HVAC maintenance
- Duct repair
- HVAC Quality Installation

Program Accomplishments: During 2016, compared to the projection for 2016, the following participation was achieved:

Measure	2016 Year End Projection	2016 Actual Participation	Variance
HVAC maintenance	3,874	3,742	(132)
Duct repair	1,503	1,471	(32)
HVAC Quality Installation	602	567	(35)

Program Fiscal Expenditures: – For 2016, Gulf projected \$1,344,777 in expenses compared to actual expenses of \$1,255,782 resulting in a variance of \$88,995 or 6.6% under the projection.

Program Progress Summary: Since its launch in 2013, the following participation has been achieved:

Measure	Program to Date Actual Participation
HVAC maintenance	36,515
Duct repair	21,363
HVAC Quality Installation	567

Program Description and Progress

Program Title: Residential Building Efficiency Program

Program Description: The Residential Building Efficiency Program is designed as an umbrella efficiency program for existing and new residential customers to encourage the installation of eligible equipment and materials as a means of reducing energy and demand. The goals of the program are to increase awareness and customer demand for energy saving measures; to increase availability and market penetration; and to contribute toward long-term energy savings and peak demand reductions.

- High Performance Windows
- Reflective Roof
- ENERGY STAR Window A/C

Program Accomplishments: During 2016, compared to the projection for 2016, the following participation was achieved:

Measure	2016 Year End Projection	2016 Actual Participation	Variance
High Performance Windows	307	266	(41)
Reflective Roof	308	310	2
ENERGY STAR Window A/C	28	20	(8)

Program Fiscal Expenditures: For 2016, Gulf projected \$461,411 in expenses compared to actual expenses of \$477,689 resulting in a variance of \$16,278 or 3.5% over the projection.

Program Progress Summary: Since its launch in 2011, the following participation has been achieved:

Measure	Program to Date Actual Participation
High Performance Windows	4,714
Reflective Roof	1,398
ENERGY STAR Window A/C	814

Program Description and Progress

Program Title: Energy *Select*

Program Description: The overall program is designed to provide customers with a means of controlling their energy purchases by conveniently programming their heating and cooling systems and major appliances, such as electric water heaters and pool pumps, to respond automatically to prices that vary during the day and by season in relation to the Company's cost of producing or purchasing energy.

Program Accomplishments: During 2016, the Energy *Select* program experienced a net addition of 1,473 participants compared to a projection of 1,600 or 127 under the projection.

Program Fiscal Expenditures: During 2016, there were projected expenses of \$5,986,028 compared with actual expenses of \$5,668,916. This results in a deviation of \$317,112 or 5.3% under the projection.

Program Progress Summary: As of December 2016, there were 17,720 participating customers.

Program Description and Progress

Program Title: Commercial/Industrial Audit

Program Description: This program is designed to provide professional advice to Gulf's existing commercial and industrial customers on how to reduce and make the most efficient use of energy. This program covers from the smallest commercial customer, requiring only a walk-through survey, to the use of computer programs which will simulate several design options for very large, energy-intensive customers. Customers may participate by requesting a basic Energy Analysis Audit (EAA) provided through either an on-site survey or an on-line survey. A more comprehensive analysis can be provided by conducting a Technical Assistance Audit (TAA).

Program Accomplishments: During 2016, the Company performed 342 commercial/industrial audits. The total projection for 2016 was 356 audits for a variance of 14 fewer participants than projected.

Program Fiscal Expenditures: For 2016, Gulf projected expenses of \$683,436 compared to actual expenses of \$704,690 for a deviation of \$21,254 or 3.1% over budget.

Program Progress Summary: Since this program was launched, 22,714 commercial/industrial audits have been performed.

Program Description and Progress

Program Title: Commercial HVAC Retrocommissioning Program

Program Description: This program offers basic retrocommissioning at a reduced cost for qualifying installations of existing commercial and industrial customers. It is designed to diagnose the performance of the HVAC cooling unit(s) operating in commercial buildings with the support of an independent computerized quality control process and to make improvements to the system to bring it to full efficiency. This program includes air cooled and water cooled equipment – identified as A/C, heat pump, direct expansion (DX) or geothermal cooling and heating.

Program Accomplishments: During 2016, 41 customers participated in this program compared to a projection of 60 participants resulting in a variance of 19 fewer participants than projected.

Program Fiscal Expenditures: For 2016, the Company projected \$65,832 in program expenses compared to actual expenses of \$62,553 resulting in a variance of \$3,279 or 5.0% under the projection.

Program Progress Summary: Since its launch in 2011, 1,012 customers have participated in this program.

Program Description and Progress

Program Title: Commercial Building Efficiency Program

Program Description: This program is designed as an umbrella efficiency program for existing commercial and industrial customers to encourage the installation of eligible high-efficiency equipment as a means of reducing energy and demand. The goals of the program are to increase awareness and customer demand for high-efficiency, energy-saving equipment; increase availability and market penetration of energy efficient equipment; and contribute toward long-term energy savings and peak demand reductions. These goals will be accomplished through commercial geothermal heat pumps, ceiling/roof insulation, and reflective roofs.

Program Accomplishments: During 2016, compared to the 2016 projection, the measures in this program have had the following participation:

Program	Annual Projections (2016)	Actual Participation (2016)	Variance
Commercial Geothermal Heat Pump (tons of installed HVAC)	92	50	(42)
Ceiling/Roof Insulation (square feet)	13,500	20,806	7,306
Commercial Reflective Roof (square feet)	97,572	269,196	171,624

Program Fiscal Expenditures: During 2016, the Company projected \$376,508 in expenses compared to actual expenses of \$392,968 for a variance of \$16,460 or 4.4% over the projection.

Program Progress Summary: Since its launch in 2011, customer participation is shown in the table below.

Program	Program to Date Participation
Commercial Geothermal Heat Pump (tons of installed HVAC)	578
Ceiling/Roof Insulation (square feet)	348,258
Commercial Reflective Roof (square feet)	3,274,354

Program Description and Progress

Program Title: Commercial/Industrial Custom Incentive

Program Description: This program is designed to establish the capability and process to offer advanced energy services and energy efficient end-user equipment to Commercial/Industrial customers. These energy services include comprehensive audits, design, and construction of energy conservation projects. Specifically, projects covered under this program would be demand reduction or efficiency improvement retrofits that are beyond the scope of other programs.

Program Accomplishments: During 2016, no customers participated in this program.

Program Fiscal Expenditures: During the reporting period, the Company projected expenses of \$97,496 compared to actual expenses of \$53,813 resulting in a variance of \$43,683, or 44.8% under the projection.

Program Progress Summary: Since its launch in 2011, 15 customers have participated in the Commercial/Industrial Custom Incentive program resulting in at the meter reductions of 7,070,333 kWh (energy), 741 winter kW (demand) and 1,151 summer kW (demand).

Program Description and Progress

Program Title: Residential Service Time of Use Pilot Program

Program Description: The Residential Service Time of Use (RSTOU) rate pilot will provide residential customers the opportunity to use customer-owned equipment to respond automatically and take advantage of a variable pricing structure with a critical peak credit component. In order to control program expenses and facilitate monitoring and evaluation, the pilot will be offered to a group of approximately 400 residential customers who meet the program standards. In order to further encourage customers to utilize a qualifying Wi-Fi enabled thermostat, the RSTOU pilot will offer customers a per event credit for allowing their thermostat to automatically adjust the HVAC equipment settings during a critical event period. This option puts the customer in complete control of their energy purchase without utility owned equipment. The objective of this pilot is to measure customer's response to a variable price rate with customer owned equipment. Customers will have an opportunity for additional savings by shifting energy purchases to the lower priced periods, while providing peak demand reduction during the high and critical periods.

Program Accomplishments: During 2016, 441 customers enrolled with 375 customers completing installation and participating in the RSTOU rate. The total projection for 2016 was approximately 400 participants by year end. This program was projected to start in the fall of 2015; however, due to program development delays, the program launch was shifted to February 2016.

Program Fiscal Expenditures: During 2016, the Company projected expenses of \$340,750 compared to actual expenses of \$169,832 resulting in a variance of \$170,918 or 50.2% under the projection.

Program Progress Summary: Since its launch in February 2016, 375 customers have participated in the Residential Service Time of Use Pilot Program.

Program Description and Progress

Program Title: Conservation Demonstration and Development

Program Description: A package of conservation programs was approved by the FPSC in Order No. 23561 for Gulf Power Company to explore and to pursue research, development, and demonstration projects designed to promote energy efficiency and conservation. This program serves as an umbrella program for the identification, development, demonstration and evaluation of new or emerging end-use technologies.

Program Accomplishments:

UWF BEST House

Gulf Power entered into a partnership, along with a number of other donors, with the University of West Florida, located in Pensacola, Florida, to help build a facility to be used as an educational tool and resource for Northwest Florida.

The project, now known as The Community Outreach, Research and Education (C.O.R.E.) Initiative, is a center to explain and demonstrate the advantages of retrofitting existing homes for energy efficiency. The C.O.R.E facility is a multipurpose laboratory; a research lab, a trade demonstration area, a construction yard, and an interactive, energy efficiency and demonstration showcase. The C.O.R.E. facility promotes energy efficient construction through the innovative display of cutting-edge technology, and through community outreach and participation. The lab is available to students, industry professionals and the general public.

The facility accommodates a research initiative in an effort to measure the efficacy of different building technologies and installations. The C.O.R.E initiative is particularly interested in the metering and measurement of sealed attic spaces, roof types, walls forms, windows, water heaters, Heating, Ventilation and Air Conditioning (HVAC) equipment, renewable energy and controls systems. The construction yard and demonstration area provides a similar opportunity for materials research and community seminars.

A final report was issued December 2016 on this project. Gulf Power will remain involved with C.O.R.E. as the primary energy consultant and may initiate future CDD projects as new technologies are introduced at the facility.

Azalea Trace Project

The purpose of this project was to test the application of a Heat Pump Water Heater (HPWH) in an assisted living facility. The project included the installation of a commercial size Heat Pump Water Heater (4-ton heating capacity), two 119 gallon storage tanks and distribution duct work. The HPWH unit provides preheated water (140 degrees F) to the existing natural gas boilers. In turn, the boilers feed the existing 350 gallon storage tank supplying hot water to the washers.

The project has provided a database for the application of the HPWH in this type facility. No data was on record within Gulf Power for the HPWH application in an assisted living facility. The laundry operated 24-hours a day, 7-days a week. The data was used to promote energy efficient production of hot water, off-set the installation of additional air conditioning units and provide a better climatic working environment for the employees.

The values of the data recorded will be used to calculate the system amount of “free” A/C cooling, the effect on the amount of natural gas used by the boilers, the electrical usage of the HPWH and the overall energy efficiency of the system.

The data will illustrate the efficient use of a dual fuel application in a large commercial, 24-hour operating facility for the first time in Gulf’s service area.

The project was monitored for one year, and a full report was submitted December 2016 to the Commission.

10th Ave North Hair Salon Heat Pump Water Heater Project (HPWH)

This project was used to determine if a residential HPWH can be used successfully in small commercial applications with high usage. As part of this project, a residential HPWH was installed and metered in a high water use commercial facility to determine the performance, reliability and economic return on investment. Gulf partnered with General Electric (GE) for this project. Two 50 gallon HPWH’s were installed with an Energy Factor of 2.4, which GE agreed to warranty as part of this project.

The project was monitored to the last quarter of 2016 and a full report was submitted to the Commission March 28, 2017.

Tesla Powerwall Demand Response (DR)

Modern-day battery storage provided by Tesla may be able to improve the effectiveness of current “Demand Response” programs. Demand response not only refers to *load shedding* but now also includes *load shifting*.

The Powerwall DR CDD Project will discover the possibilities and impact of:

1. *Load Shifting*: Battery storage's ability to maximize the impact of TOU rates by charging during off-peak/low periods and discharging during on-peak/medium-high periods
2. *Peak Reduction*: Battery storage's ability to be dispatched at specific times (critical peak events) to supplement the demand response capability of Energy Select.

Data monitoring will be used to assess the impact of battery storage in terms of performance, reliability, economic return on investment, from the perspective of the customer and the utility.

Tesla's daily cycle 6.4kWh Powerwall will be interconnected to a SolarEdge StorEdge inverter and existing Energy Select equipment. TOU times and critical peak dispatches will be accessed through the inverter's internal controls. Third parties have been contracted to install the equipment, monitor the various outputs of the system, compile the data for further analysis and provide a final report on the project.

Tesla Powerwall Demand Photovoltaic (PV)

Modern-day battery storage provided by Tesla may be able to overcome two of the typical shortcomings of grid-tied solar photovoltaics: the limited "daytime" periods of generation and the intermittency of output (due to shade or cloud cover).

The Powerwall PV CDD Project will discover the possibilities and impact of:

1. *Solar Shifting*: Battery storage's impact on peak demand by charging during the normal PV generation period and discharging during on-peak/medium-high periods.
2. *Solar Smoothing*: Battery storage's ability to stabilize the PV output during adverse weather conditions / cloud cover or shading caused by obstructions.

Data monitoring will be used to assess the impact of battery storage in terms of performance, reliability, economic return on investment, from the perspective of the customer and the utility.

Tesla's daily cycle 6.4kWh Powerwall will be interconnected to a SolarEdge StorEdge inverter and a retrofitted/existing 5kW photovoltaic installation. Charge and discharge time periods will be programmed within the inverter's internal controls. Third parties have been contracted to install the equipment, monitor the various

outputs of the system, compile the data for further analysis and provide a final report on the project.

Domestic Hot Water Analysis

This project aims to address an underserved area of the heat pump water heating market: small commercial buildings. Specific focus will be paid to the food service industry due to their potential for large domestic hot water usage. These building types are too small and cannot handle the capital intensity of large, engineered heat pump water heating systems; and it is unknown if their usage patterns could be supported by an integrated, residential-sized heat pump water heater. Thus, this project's objectives are as follows:

- Identify customers for participation in this study: Fast food, sandwich shops, cafeteria-style eateries, convenience stores, small laundries, and salons
- Obtain permission from each site owner to install monitoring systems.
- Collect number of and type of hot water end uses at each site.
- Install field monitoring on 20 small commercial building types .
- Collect up to two months of hot water usage data at each site.
- Analyze the collected data to develop usage patterns for each site.
- Produce a final report including recommendations to manufacturers on optimal approaches to the small commercial heat pump water heater market.

Collected data will be used to produce daily water consumption load shapes for each site type. This data will then be analyzed to make recommendations on ideal heat pump water heater technology needs to serve this market. The data will be shared with interested manufacturers to inform their product development planning processes with the intention of influencing the production of applicable heat pump water heaters for the small commercial market.

Program Fiscal Expenditures: Program expenses were forecasted at \$135,116 for the period January through December 2016 compared to actual expenses of \$79,525 for a deviation of \$55,591 or 41.1% under the projection. Project expenses were as follows: UWF BEST House, \$0; Azalea Trace Heat Pump Water Heater, \$2,102; Hair Salon Heat Pump Water Heater Project, \$15,329; Tesla Powerwall Demand Response, \$31,515; Tesla Powerwall Demand Photovoltaic, \$26,680; and Domestic Hot Water Analysis, \$3,899.

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Schedule CT-1

Gulf Power Company

ENERGY CONSERVATION COST RECOVERY (ECCR)

Calculation of the Final True-Up Amount

For the Period: January 2016 - December 2016

	<u>\$</u>	<u>\$</u>
Actual		
1. Principal	(3,581,955)	
2. Interest	<u>(1,858)</u>	
3. Actual Over/(Under) Recovery Ending Balance		(3,583,813)
Estimated/Actual as filed August 19, 2016		
4. Principal	(3,313,580)	
5. Interest	<u>177</u>	
6. Total Estimated/Actual Over/(Under) Recovery		<u>(3,313,403)</u>
7. Adjusted Net True-up Over/(Under) Recovery (Line 3 - 6)		<u><u>(270,410)</u></u>

Schedule CT-2

Gulf Power Company

ENERGY CONSERVATION COST RECOVERY (ECCR)

Calculation of the Final True-Up Amount

For the Period: January 2016 - December 2016

Analysis of Energy Conservation Program Costs

Actual Compared to Estimated/Actual

	<u>Actual</u>	<u>Est/Actual</u>	<u>Difference</u>
	\$	\$	\$
1. Depreciation, Return & Property Tax	2,362,505.87	2,356,605.50	5,900.37
2. Payroll & Benefits	4,430,444.46	4,279,362.46	151,082.00
3. Materials & Supplies	4,179,233.13	4,540,986.51	(361,753.38)
4. Advertising	480,700.65	650,262.50	(169,561.85)
5. Incentives	462,574.95	752,526.20	(289,951.25)
6. Adjustments	0.00	0.00	0.00
7. Other	0.00	0.00	0.00
8. Subtotal	11,915,459.06	12,579,743.17	(664,284.11)
9. Program Revenues	0.00	0.00	0.00
10. Total Program Costs	11,915,459.06	12,579,743.17	(664,284.11)
11. Less: Payroll Adjustment	0.00	0.00	0.00
12. Amounts Inc. in Base Rate	0.00	0.00	0.00
13. Conservation Adjustment Revenues	4,726,231.28	5,658,890.30	(932,659.02)
14. Rounding Adjustment	4,726,230.00	5,658,889.00	(932,659.00)
15. True-up Before Adjustment Over/(Under) Recovery	(7,189,229)	(6,920,854)	(268,375)
16. Interest Provision	(1,858)	177	(2,035)
17. Prior Period True-up	3,607,274	3,607,274	0
18. Other	0	0	0
19. End of Period True-up	(3,583,813)	(3,313,403)	(270,410)

Gulf Power Company
ENERGY CONSERVATION COST RECOVERY (ECCR)
Calculation of the Final True-Up Amount
For the Period: January 2016 - December 2016

Conservation Costs By Program
Variance Actual Vs. Estimated/Actual

Program	Capital Return, Property Taxes & Depreciation	Payroll & Benefits	Material & Expenses	Other	Advertising	Incentives	Sub-Total	Program Revenues	Total
Residential Conservation Programs:									
1. Residential Energy Audit and Education	0.49	46,392.15	38,098.35	0.00	(101,495.53)	0.00	(17,004.54)	0.00	(17,004.54)
2. Community Energy Saver	0.00	6,218.93	13,126.02	0.00	0.00	0.00	19,344.95	0.00	19,344.95
3. Residential Custom Incentive	0.00	9,585.11	(622.32)	0.00	0.00	(50,000.00)	(41,037.21)	0.00	(41,037.21)
4. HVAC Efficiency	0.00	11,169.65	57,771.05	0.00	5,000.02	(162,936.00)	(88,995.28)	0.00	(88,995.28)
5. Residential Building Efficiency	0.00	6,511.09	19,494.16	0.00	0.00	(9,727.50)	16,277.75	0.00	16,277.75
6. Energy Select	5,899.88	20,279.26	(270,225.03)	0.00	(73,066.34)	0.00	(317,112.23)	0.00	(317,112.23)
Commercial / Industrial Conservation Programs:									
7. Commercial / Industrial Energy Audit	0.00	21,728.87	(474.63)	0.00	0.00	0.00	21,254.24	0.00	21,254.24
8. HVAC Retrocommissioning	0.00	8,113.19	(8,238.00)	0.00	0.00	(3,155.00)	(3,279.81)	0.00	(3,279.81)
9. Commercial Building Efficiency	0.00	14,545.40	16,046.66	0.00	0.00	(14,132.75)	16,459.31	0.00	16,459.31
10. Commercial / Industrial Custom Incentive	0.00	5,963.68	353.67	0.00	0.00	(50,000.00)	(43,682.65)	0.00	(43,682.65)
11. Residential Time of Use Rate Pilot	0.00	214.81	(171,132.55)	0.00	0.00	0.00	(170,917.74)	0.00	(170,917.74)
12. Conservation Demonstration and Developme	0.00	359.86	(55,950.76)	0.00	0.00	0.00	(55,590.90)	0.00	(55,590.90)
13. Solar Thermal Water Heating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14. Ceiling Insulation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15. Less Base Rate Recovery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16. Total All Programs	5,900.37	151,082.00	(361,753.38)	0.00	(169,561.85)	(289,951.25)	(664,284.11)	0.00	(664,284.11)

Gulf Power Company

ENERGY CONSERVATION COST RECOVERY (ECCR)

Calculation of the Final True-Up Amount

For the Period: January 2016 - December 2016

Conservation Costs By Program

Actual Expenses

Program	Capital Return, Property Taxes & Depreciation	Payroll & Benefits	Material & Expenses	Other	Advertising	Incentives	Sub-Total	Program Revenues	Total
Residential Conservation Programs:									
1. Residential Energy Audit and Education	9,311.71	1,557,046.46	429,852.67	0.00	248,504.47	0.00	2,244,715.31	0.00	2,244,715.31
2. Community Energy Saver	0.00	80,978.60	661,196.54	0.00	0.00	0.00	742,175.14	0.00	742,175.14
3. Residential Custom Incentive	0.00	55,188.67	2,720.11	0.00	0.00	0.00	57,908.78	0.00	57,908.78
4. HVAC Efficiency	0.00	298,685.26	629,712.95	0.00	5,262.52	322,121.00	1,255,781.73	0.00	1,255,781.73
5. Residential Building Efficiency	0.00	287,509.04	59,590.24	0.00	0.00	130,589.50	477,688.78	0.00	477,688.78
6. Energy Select	2,353,194.16	1,054,791.15	2,033,996.75	0.00	226,933.66	0.00	5,668,915.72	0.00	5,668,915.72
Commercial / Industrial Conservation Programs:									
7. Commercial / Industrial Energy Audit	0.00	624,466.58	80,223.78	0.00	0.00	0.00	704,690.36	0.00	704,690.36
8. HVAC Retrocommissioning	0.00	58,172.88	3,839.78	0.00	0.00	540.00	62,552.66	0.00	62,552.66
9. Commercial Building Efficiency	0.00	323,965.23	59,678.05	0.00	0.00	9,324.45	392,967.73	0.00	392,967.73
10. Commercial / Industrial Custom Incentive	0.00	50,519.32	3,293.89	0.00	0.00	0.00	53,813.21	0.00	53,813.21
11. Residential Time of Use Rate Pilot	0.00	19,633.22	150,199.04	0.00	0.00	0.00	169,832.26	0.00	169,832.26
12. Conservation Demonstration and Development:									
a. UWF Best House	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
b. Azalea Trace Heat Pump Water Heater	0.00	1,948.79	153.65	0.00	0.00	0.00	2,102.44	0.00	2,102.44
c. 10th Ave Hair Salon Heat Pump Water Htr	0.00	5,846.42	9,482.41	0.00	0.00	0.00	15,328.83	0.00	15,328.83
d. Tesla Powerwall Demand Response	0.00	5,846.42	25,668.65	0.00	0.00	0.00	31,515.07	0.00	31,515.07
e. Tesla Powerwall Demand Photovoltaic	0.00	5,846.42	20,833.13	0.00	0.00	0.00	26,679.55	0.00	26,679.55
f. Domestic Hot Water Analysis	0.00	0.00	3,898.89	0.00	0.00	0.00	3,898.89	0.00	3,898.89
g. Total	0.00	19,488.05	60,036.73	0.00	0.00	0.00	79,524.78	0.00	79,524.78
13. Solar Thermal Water Heating	0.00	0.00	5,000.00	0.00	0.00	0.00	5,000.00	0.00	5,000.00
14. Ceiling Insulation	0.00	0.00	(107.40)	0.00	0.00	0.00	(107.40)	0.00	(107.40)
15. Total All Programs	2,362,505.87	4,430,444.46	4,179,233.13	0.00	480,700.65	462,574.95	11,915,459.06	0.00	11,915,459.06

Gulf Power Company
ENERGY CONSERVATION COST RECOVERY (ECCR)
Calculation of the Final True-Up Amount
For the Period: January 2016 - December 2016

Conservation Costs By Program
Summary of Actual Expenses By Program By Month

Program	January	February	March	April	May	June	July	August	September	October	November	December	Total
Residential Conservation Programs:													
1. Residential Energy Audit and Education	136,717.43	167,941.80	142,381.33	176,241.71	275,681.34	161,182.61	157,573.18	258,041.20	211,701.18	226,901.75	149,636.79	171,403.28	2,235,403.60
Amortization & Return on Investment	802.69	797.86	793.04	788.21	783.38	778.56	773.11	768.40	763.68	758.97	754.25	749.56	9,311.71
Total	137,520.12	168,739.66	143,174.37	177,029.92	276,464.72	161,961.17	158,346.29	258,809.60	212,464.86	227,660.72	150,391.04	172,152.84	2,244,715.31
2. Community Energy Saver	59,069.73	53,316.71	58,687.33	68,531.38	118,632.95	109,962.09	16,380.09	59,342.59	80,025.16	47,795.11	59,838.72	10,593.28	742,175.14
3. Residential Custom Incentive	1,548.09	3,353.52	3,912.47	5,440.97	5,067.53	5,150.41	4,949.80	6,248.89	5,029.71	6,550.51	5,173.24	5,483.64	57,908.78
4. HVAC Efficiency	67,717.10	63,756.18	124,781.92	153,914.86	344,533.11	95,430.84	42,913.79	87,973.40	89,729.02	63,537.73	68,634.31	52,859.47	1,255,781.73
5. Residential Building Efficiency	22,541.37	39,619.61	46,125.85	33,371.86	35,784.27	45,839.07	47,864.12	34,352.76	40,828.26	38,131.20	46,905.72	46,324.69	477,688.78
6. Energy Select	(12,757.53)	336,925.46	306,160.81	343,675.36	344,101.45	295,305.62	313,184.58	490,167.94	253,216.93	254,587.72	8,995.11	382,158.11	3,315,721.56
Amortization & Return on Investment	194,999.78	195,118.24	195,375.42	195,659.10	195,823.19	195,868.91	194,243.35	195,731.22	196,017.56	196,519.74	197,613.88	200,223.77	2,353,194.16
Total	182,242.25	532,043.70	501,536.23	539,334.46	539,924.64	491,174.53	507,427.93	685,899.16	449,234.49	451,107.46	206,608.99	582,381.88	5,668,915.72
Commercial / Industrial Conservation Programs:													
7. Commercial / Industrial Energy Audit	55,200.34	57,426.89	56,962.15	65,203.68	53,261.13	53,663.93	62,286.45	59,326.73	53,265.54	66,672.24	61,609.13	59,812.15	704,690.36
8. HVAC Retrocommissioning	3,690.06	4,117.39	4,924.10	4,734.07	6,039.38	9,688.47	40,232.24	(7,337.47)	(22,391.79)	7,367.24	5,671.12	5,817.85	62,552.66
9. Commercial Building Efficiency	26,339.22	32,831.71	35,162.49	30,324.16	28,363.55	28,657.29	34,438.29	26,546.77	29,581.63	33,504.96	39,626.60	47,591.06	392,967.73
10. Commercial / Industrial Custom Incentive	967.95	3,616.02	5,733.89	4,326.33	4,661.34	4,442.33	4,366.26	4,996.35	4,414.06	6,381.85	4,895.83	5,011.00	53,813.21
11. Residential Time of Use Rate Pilot	2,313.08	3,673.18	4,967.11	19,232.88	(10,995.98)	127,805.92	13,602.00	8,179.01	(7,505.53)	19,860.13	(1,105.26)	(10,194.28)	169,832.26
12. Conservation Demonstration and Development:													
a. UWF Best House	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
b. Azalea Trace Heat Pump Water Heater	166.91	163.86	174.81	176.43	185.94	167.10	167.12	181.37	172.07	191.77	171.44	183.62	2,102.44
c. 10th Ave Hair Salon Heat Pump Water Htr	500.73	1,986.59	524.45	2,024.30	3,547.83	501.31	501.38	3,568.43	516.21	592.44	514.30	550.86	15,328.83
d. Tesla Powerwall Demand Response	500.73	491.59	524.45	9,529.30	557.83	6,151.31	501.38	8,713.55	552.93	1,486.44	654.70	1,850.86	31,515.07
e. Tesla Powerwall Demand Photovoltaic	500.73	491.59	524.45	529.30	557.83	8,051.31	501.38	10,921.69	569.67	2,966.44	514.30	550.86	26,679.55
f. Domestic Hot Water Analysis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.97	0.00	3,870.92	3,898.89
g. Total	1,669.10	3,133.63	1,748.16	12,259.33	4,849.43	14,871.03	1,671.26	23,385.04	1,810.88	5,265.06	1,854.74	7,007.12	79,524.78
13. Solar Thermal Water Heating	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5,000.00
14. Ceiling Insulation	0.00	0.00	0.00	0.00	(107.40)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(107.40)
15. Total All Programs	560,818.41	970,628.20	987,716.07	1,113,703.90	1,406,478.67	1,148,647.08	934,478.52	1,247,722.83	936,486.29	973,834.21	650,104.18	984,840.70	11,915,459.06

Gulf Power Company
ENERGY CONSERVATION COST RECOVERY (ECCR)
Calculation of the Final True-Up Amount
For the Period: January 2016 - December 2016

Conservation Costs By Program
Calculation of Over/Under Recovery

Conservation Revenues	January	February	March	April	May	June	July	August	September	October	November	December	Total
1. EnergySelect RSVP Fees	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Over/(Under) Recovery	285,648.99	266,572.60	283,670.52	265,061.96	368,424.41	509,863.93	520,522.40	502,918.43	437,632.12	419,501.86	255,090.81	611,323.25	4,726,231.28
3. Total Revenues	285,648.99	266,572.60	283,670.52	265,061.96	368,424.41	509,863.93	520,522.40	502,918.43	437,632.12	419,501.86	255,090.81	611,323.25	4,726,231.28
4. Adjustment not Applicable to Period - Prior True Up	486,099.00	486,098.00	486,098.00	486,098.00	486,098.00	486,098.00	486,098.00	486,098.00	486,098.00	486,098.00	486,098.00	486,098.00	5,833,177.00
5. Conservation Revenues Applicable to Period	771,747.99	752,670.60	769,768.52	751,159.96	854,522.41	995,961.93	1,006,620.40	989,016.43	923,730.12	905,599.86	741,188.81	1,097,421.25	10,559,408.28
6. Conservation Expenses (CT-3, Page 3, Line 27)	560,818.41	970,628.20	987,716.07	1,113,703.90	1,406,478.67	1,148,647.08	934,478.52	1,247,722.83	936,486.29	973,834.21	650,104.18	984,840.70	11,915,459.06
7. True Up this Period (Line 5 - 6)	210,929.58	(217,957.60)	(217,947.55)	(362,543.94)	(551,956.26)	(152,685.15)	72,141.88	(258,706.40)	(12,756.17)	(68,234.35)	91,084.63	112,580.55	(1,356,050.78)
8. Interest Provision this Period (CT-3, Page 5, Line 11)	1,156.56	1,018.59	816.36	488.37	163.28	(85.85)	(271.65)	(484.59)	(744.21)	(1,013.68)	(1,203.95)	(1,697.68)	(1,858.45)
9. True Up & Interest Provision Beginning of Month	3,607,273.57	3,333,260.71	2,630,223.70	1,926,994.51	1,078,840.94	40,949.96	(597,919.04)	(1,012,146.81)	(1,757,435.80)	(2,257,034.18)	(2,812,380.21)	(3,208,597.53)	3,607,273.57
10. Prior True Up Collected or Refunded	(486,099.00)	(486,098.00)	(486,098.00)	(486,098.00)	(486,098.00)	(486,098.00)	(486,098.00)	(486,098.00)	(486,098.00)	(486,098.00)	(486,098.00)	(486,098.00)	(5,833,177.00)
11. End of Period- Net True Up	3,333,260.71	2,630,223.70	1,926,994.51	1,078,840.94	40,949.96	(597,919.04)	(1,012,146.81)	(1,757,435.80)	(2,257,034.18)	(2,812,380.21)	(3,208,597.53)	(3,583,812.66)	(3,583,812.66)

Gulf Power Company
 ENERGY CONSERVATION COST RECOVERY (ECCR)
 Calculation of the Final True-Up Amount
 For the Period: January 2016 - December 2016

**Computation of Interest Expense
 Energy Conservation Adjustment**

Interest Provision	January	February	March	April	May	June	July	August	September	October	November	December	Total
1. Beginning True up Amount	3,607,273.57	3,333,260.71	2,630,223.70	1,926,994.51	1,078,840.94	40,949.96	(597,919.04)	(1,012,146.81)	(1,757,435.80)	(2,257,034.18)	(2,812,380.21)	(3,208,597.53)	
2. Ending True up before Interest	3,332,104.15	2,629,205.11	1,926,178.15	1,078,352.57	40,786.68	(597,833.19)	(1,011,875.16)	(1,756,951.21)	(2,256,289.97)	(2,811,366.53)	(3,207,393.58)	(3,582,114.98)	
3. Total beginning & ending	6,939,377.72	5,962,465.82	4,556,401.85	3,005,347.08	1,119,627.62	(556,883.23)	(1,609,794.20)	(2,769,098.02)	(4,013,725.77)	(5,068,400.71)	(6,019,773.79)	(6,790,712.51)	
4. Average True up Amount	3,469,688.86	2,981,232.91	2,278,200.93	1,502,673.54	559,813.81	(278,441.62)	(804,897.10)	(1,384,549.01)	(2,006,862.89)	(2,534,200.36)	(3,009,886.90)	(3,395,356.26)	
5. Interest Rate First Day Reporting Business Month	0.4000	0.4000	0.4200	0.4400	0.3400	0.3600	0.3800	0.4300	0.4100	0.4800	0.4800	0.4800	
6. Interest Rate First Day Subsequent Business Month	0.4000	0.4200	0.4400	0.3400	0.3600	0.3800	0.4300	0.4100	0.4800	0.4800	0.4800	0.7200	
7. Total of Lines 5 and 6	0.8000	0.8200	0.8600	0.7800	0.7000	0.7400	0.8100	0.8400	0.8900	0.9600	0.9600	1.2000	
8. Average Interest rate (50% of Line 7)	0.4000	0.4100	0.4300	0.3900	0.3500	0.3700	0.4050	0.4200	0.4450	0.4800	0.4800	0.6000	
9. Monthly Average Interest Rate Line 8 \ 12	0.000333	0.000342	0.000358	0.000325	0.000292	0.000308	0.000338	0.000350	0.000371	0.000400	0.000400	0.000500	
10. Interest Adjustment													
11. Interest Provision (Line 4 X 9)	1,156.56	1,018.59	816.36	488.37	163.28	(85.85)	(271.65)	(484.59)	(744.21)	(1,013.68)	(1,203.95)	(1,697.68)	(1,858.45)

Gulf Power Company
ENERGY CONSERVATION COST RECOVERY (ECCR)
Calculation of the Final True-Up Amount
For the Period: January 2016 - December 2016

**Schedule of Capital Investment, Depreciation and Return
Energy Select**

Line No. Description	Beginning of Period	January	February	March	April	May	June	July	August	September	October	November	December	Total
1 Investments Added to Plant In Service (Net of Retirements)		(59,635.14)	18,316.17	89,375.67	78,795.96	17,430.54	141,211.40	66,496.71	152,402.17	172,697.83	22,014.53	387,368.84	155,356.26	
2 Depreciable Base (Cumulative Plant Additions PM Ln 2 + CM Ln 1)	13,556,278.60	13,496,643.46	13,514,959.63	13,604,335.30	13,683,131.26	13,700,561.80	13,841,773.20	13,908,269.91	14,060,672.08	14,233,369.91	14,255,384.44	14,642,753.28	14,798,109.54	
3 Depreciation Expense (Note A)		31,179.44	31,042.28	31,084.41	31,289.97	31,471.20	31,511.29	31,836.08	31,989.02	32,339.55	32,736.75	32,787.38	33,678.33	382,945.70
4 Salvage, Cost of Removal and Retirement		(199,086.44)	(94,552.94)	(79,164.01)	3,083.83	(58,026.16)	16,277.28	(24,198.35)	(573,452.13)	13,314.05	(4,298.71)	(38,655.85)	(21,730.58)	
5 Less: Accum. Depr, COR and Sal. (PM Ln 5 + CM Ln 3 + 4)	(7,420,751.60)	(7,588,658.60)	(7,652,169.26)	(7,700,248.86)	(7,665,875.06)	(7,692,430.02)	(7,644,641.45)	(7,637,003.72)	(8,178,466.83)	(8,132,813.23)	(8,104,375.19)	(8,110,243.66)	(8,098,295.91)	
6 Net Plant In Service (CM Ln 2 - CM Ln 5)	20,977,030.20	21,085,302.06	21,167,128.89	21,304,584.16	21,349,006.32	21,392,991.82	21,486,414.65	21,545,273.63	22,239,138.91	22,366,183.14	22,359,759.63	22,752,996.94	22,896,405.45	
7 Net Additions/Reductions to CWIP	0.00	17,559.34	39,020.00	(56,579.34)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8 CWIP Balance (PM Ln 8 + CM Ln 7)	0.00	17,559.34	56,579.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9 Inventory	1,452,475.81	1,368,781.44	1,280,771.60	1,230,131.69	1,178,387.59	1,136,694.73	1,042,630.80	1,467,611.91	690,726.84	627,426.99	601,627.32	553,931.99	581,105.07	
10 Net Investment (CM Ln 6 + CM Ln 8 + CM Ln 9)	22,429,506.01	22,471,642.84	22,504,479.83	22,534,715.85	22,527,393.91	22,529,686.55	22,529,045.45	23,012,885.54	22,929,865.75	22,993,610.13	22,961,386.95	23,306,928.93	23,477,510.52	
11 Average Net Investment (PM Ln 10 + CM Ln 10)/2		22,450,574.43	22,488,061.34	22,519,597.84	22,531,054.88	22,528,540.23	22,529,366.00	22,770,965.50	22,971,375.65	22,961,737.94	22,977,498.54	23,134,157.94	23,392,219.73	
12 Rate of Return / 12 (Note B)		0.006819	0.006819	0.006819	0.006819	0.006819	0.006819	0.006661	0.006661	0.006661	0.006661	0.006661	0.006661	
13 Return Requirement on Average Net Investment (CM Ln 11 * CM Ln 12)		153,090.47	153,346.09	153,561.14	153,639.26	153,622.12	153,627.75	151,677.40	153,012.33	152,948.14	153,053.12	154,096.63	155,815.58	1,841,490.03
14 Property Tax		10,729.87	10,729.87	10,729.87	10,729.87	10,729.87	10,729.87	10,729.87	10,729.87	10,729.87	10,729.87	10,729.87	10,729.86	128,758.43
15 Total Depreciation, Prop Taxes & Return (CM Ln 3 + CM Ln 13 + CM Ln 14)		194,999.78	195,118.24	195,375.42	195,659.10	195,823.19	195,868.91	194,243.35	195,731.22	196,017.56	196,519.74	197,613.88	200,223.77	2,353,194.16

Notes:

- (A) Energy *Select* Property Additions Depreciated at 2.8% per year
(B) Revenue Requirement Return (includes Income Taxes) is: Jan - Jun 8.1828%; Jul - Dec 7.9932%.

Gulf Power Company
ENERGY CONSERVATION COST RECOVERY (ECCR)
Calculation of the Final True-Up Amount
For the Period: January 2016 - December 2016

**Schedule of Capital Investment, Depreciation and Return
Residential Energy Survey Displays**

Line No.	Description	Beginning of Period	January	February	March	April	May	June	July	August	September	October	November	December	Total
1	Investments Added to Plant In Service (Net of Retirements)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	Depreciable Base (Cumulative Plant Additions PM Ln 2 + CM Ln 1)	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	13,814.37	
3	Depreciation Expense (Note A)		164.46	164.46	164.46	164.46	164.46	164.46	164.46	164.46	164.46	164.46	164.46	164.19	1,973.25
4	Retirements		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5	Salvage		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6	Less: Accum. Depr. COR and Sal. (PM Ln 6 + CM Ln 3 + 4 + 5)	11,841.12	12,005.58	12,170.04	12,334.50	12,498.96	12,663.42	12,827.88	12,992.34	13,156.80	13,321.26	13,485.72	13,650.18	13,814.37	
7	Net Plant In Service (CM Ln 2 - CM Ln 6)	1,973.25	1,808.79	1,644.33	1,479.87	1,315.41	1,150.95	986.49	822.03	657.57	493.11	328.65	164.19	0.00	
8	Net Additions/Reductions to CWIP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9	CWIP Balance (PM Ln 9 + CM Ln 8)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10	Inventory														
11	Net Investment (CM Ln 7 + CM Ln 9 + CM Ln 10)	1,973.25	1,808.79	1,644.33	1,479.87	1,315.41	1,150.95	986.49	822.03	657.57	493.11	328.65	164.19	0.00	
12	Average Net Investment (PM Ln 11 + CM Ln 11)/2		1,891.02	1,726.56	1,562.10	1,397.64	1,233.18	1,068.72	904.26	739.80	575.34	410.88	246.42	82.10	
13	Rate of Return / 12 (Note B)		0.006819	0.006819	0.006819	0.006819	0.006819	0.006819	0.006661	0.006661	0.006661	0.006661	0.006661	0.006661	
14	Return Requirement on Average Net Investment (CM Ln 12 * CM Ln 13)		12.89	11.77	10.65	9.53	8.41	7.29	6.02	4.93	3.83	2.74	1.64	0.55	80.25
15	Property Tax		9.11	9.11	9.11	9.11	9.11	9.11	9.11	9.11	9.11	9.11	9.11	9.15	109.36
16	Adjustment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27
17	Total Depreciation, Prop Taxes & Return (CM Ln 3 + CM Ln 14 + CM Ln 15)		186.46	185.34	184.22	183.10	181.98	180.86	179.59	178.50	177.40	176.31	175.21	174.16	2,163.13

Notes:
(A) Displays are Seven year Property 1.1905% per month.
(B) Revenue Requirement Return (includes Income Taxes) is: Jan - Jun 8.1828%; Jul - Dec 7.9932%.

Gulf Power Company
ENERGY CONSERVATION COST RECOVERY (ECCR)
Calculation of the Final True-Up Amount
For the Period: January 2016 - December 2016

Schedule of Capital Investment, Depreciation and Return
Thermal Imaging Tools

Line No.	Description	Beginning of Period	January	February	March	April	May	June	July	August	September	October	November	December	Total
1	Investments Added to Plant In Service (Net of Retirements)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	Depreciable Base (Cumulative Plant Additions PM Ln 2 + CM Ln 1)	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	45,652.70	
3	Depreciation Expense (Note A)		543.49	543.49	543.49	543.49	543.49	543.49	543.49	543.49	543.49	543.49	543.49	543.27	6,521.66
4	Retirements		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5	Salvage		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6	Less: Accum. Depr, COR and Sal. (PM Ln 6 + CM Ln 3 + 4 + 5)	39,131.04	39,674.53	40,218.02	40,761.51	41,305.00	41,848.49	42,391.98	42,935.47	43,478.96	44,022.45	44,565.94	45,109.43	45,652.70	
7	Net Plant In Service (CM Ln 2 - CM Ln 6)	6,521.66	5,978.17	5,434.68	4,891.19	4,347.70	3,804.21	3,260.72	2,717.23	2,173.74	1,630.25	1,086.76	543.27	0.00	
8	Net Additions/Reductions to CWIP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9	CWIP Balance (PM Ln 9 + CM Ln 8)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10	Inventory														
11	Net Investment (CM Ln 7 + CM Ln 9 + CM Ln 10)	6,521.66	5,978.17	5,434.68	4,891.19	4,347.70	3,804.21	3,260.72	2,717.23	2,173.74	1,630.25	1,086.76	543.27	0.00	
12	Average Net Investment (PM Ln 11 + CM Ln 11)/2		6,249.92	5,706.43	5,162.94	4,619.45	4,075.96	3,532.47	2,988.98	2,445.49	1,902.00	1,358.51	815.02	271.64	
13	Rate of Return / 12 (Note B)		0.006819	0.006819	0.006819	0.006819	0.006819	0.006819	0.006661	0.006661	0.006661	0.006661	0.006661	0.006661	
14	Return Requirement on Average Net Investment (CM Ln 12 * CM Ln 13)		42.62	38.91	35.21	31.50	27.79	24.09	19.91	16.29	12.67	9.05	5.43	1.81	265.28
15	Property Tax		30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.12	30.10	361.42
16	Adjustment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.22
17	Total Depreciation, Prop Taxes & Return (CM Ln 3 + CM Ln 14 + CM Ln 15)		616.23	612.52	608.82	605.11	601.40	597.70	593.52	589.90	586.28	582.66	579.04	575.40	7,148.58

Notes:
(A) Thermal Imaging Tools are Seven year Property 1.1905% per month.
(B) Revenue Requirement Return (includes Income Taxes) is: Jan - Jun 8.1828%; Jul - Dec 7.9932%.

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GULF POWER COMPANY

Reconciliation and Explanation of
Differences Between Filing and FPSC Audit
Report for Months, January, 2016 through December, 2016

The audit has not been completed as of the date of this Filing.

Program Description and Progress

Program Title: Residential Energy Audit and Education

Program Description: This program is the primary educational program to help customers improve the energy efficiency of their new or existing home by providing energy conservation advice and information that encourages the implementation of efficiency measures and behaviors resulting in energy and utility bill savings.

Program Accomplishments:

- Energy Audit – During 2016, Gulf performed 6,696 energy audits. These included 2,142 online audits, 1,436 in home audits, and 3,118 pre-construction audits.
- School-based Awareness and Education
 - Gulf provided professional development in energy-related science and math for 118 elementary, middle, and high school teachers who reach an estimated 7,500 students. These teachers received continuing education credits as well as hands-on energy, efficiency and renewable energy classroom materials and curriculum.
 - Gulf provided workshops for instructors of student summer camps in STEM (Science Technology Engineering Math) in two partnerships:
 - FSU Panama City STEM institute's Summer Camp program that reached approximately 300 8th – 12th grade students;
 - Bay County School District middle school STEM initiative that reached 60 6th – 8th grade students.
 - The estimated reach through these energy education programs is nearly 8,000 students.
 - Gulf coordinated monthly activities with student energy teams at two schools, measuring energy use at the school and created a plan to use energy wisely at school and home.
 - Gulf continued to provide classroom demonstrations and hands-on energy-related activities in schools on a monthly basis. Also, Gulf continued to provide energy-related onsite and material support for two hands-on interactive science museums which each average 100 attendees daily throughout the year.

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Program Fiscal Expenditures: For 2016, Gulf projected \$2,261,720 of expenses compared to actual expenses of \$2,244,715 resulting in a variance of \$17,005 or 0.8% under the projection.

Program Progress Summary: Since the approval of this program, Gulf Power Company has performed 229,491 residential energy surveys.

Program Description and Progress

Program Title: Community Energy Saver Program

Program Description: This program assists low-income families with managing their energy costs. Through this program, qualifying customers receive the direct installation of conservation measures at no cost to them. The program also educates families on energy efficiency techniques and behavioral changes to help control their energy use and reduce their electricity expenses.

Program Accomplishments: During 2016, 2,500 of Gulf's customers received the measures included in this program compared to a projection of 2,500 participants, a difference of zero to the projection.

Program Fiscal Expenditures: For 2016, Gulf projected expenses for this program of \$722,830 compared to actual expenses of \$742,175 resulting in a variance of \$19,345 or 2.7% over the projection.

Program Progress Summary: A total of 15,005 customers have received the efficiency measures included in the Community Energy Saver program since the program's launch in 2011.

Program Description and Progress

Program Title: Residential Custom Incentive Program

Program Description: This program is designed to increase energy efficiency in the residential rental property sector. This program promotes the installation of various energy efficiency measures available through other programs, such as HVAC maintenance and quality installation, high performance windows, reflective roofing and Energy Star window A/Cs. Additional incentives will be included, as appropriate, to overcome the split-incentive barrier which exists in a landlord/renter situation. Moreover, this program promotes the installation of measures included in the Community Energy Saver Program by the landlord of multi-family properties.

Program Accomplishments: During 2016, no participants enrolled in this program. While there are no participants recorded in this year, Gulf continues to work with customers in the rental property sector.

Program Fiscal Expenditures: During 2016, \$98,946 in expenses were projected, compared to actual expenses of \$57,909 resulting in a variance of \$41,037 or 41.5% under the projection.

Program Progress Summary: Since its launch in 2011, one customer has participated in the Landlord/Renter Custom Incentive program.

Program Description and Progress

Program Title: HVAC Efficiency Improvement Program

Program Description: This program is designed to increase energy efficiency and improve HVAC cooling system performance for new and existing homes. These efficiencies are realized through:

- HVAC maintenance
- Duct repair
- HVAC Quality Installation

Program Accomplishments: During 2016, compared to the projection for 2016, the following participation was achieved:

Measure	2016 Year End Projection	2016 Actual Participation	Variance
HVAC maintenance	3,874	3,742	(132)
Duct repair	1,503	1,471	(32)
HVAC Quality Installation	602	567	(35)

Program Fiscal Expenditures: – For 2016, Gulf projected \$1,344,777 in expenses compared to actual expenses of \$1,255,782 resulting in a variance of \$88,995 or 6.6% under the projection.

Program Progress Summary: Since its launch in 2013, the following participation has been achieved:

Measure	Program to Date Actual Participation
HVAC maintenance	36,515
Duct repair	21,363
HVAC Quality Installation	567

Program Description and Progress

Program Title: Residential Building Efficiency Program

Program Description: The Residential Building Efficiency Program is designed as an umbrella efficiency program for existing and new residential customers to encourage the installation of eligible equipment and materials as a means of reducing energy and demand. The goals of the program are to increase awareness and customer demand for energy saving measures; to increase availability and market penetration; and to contribute toward long-term energy savings and peak demand reductions.

- High Performance Windows
- Reflective Roof
- ENERGY STAR Window A/C

Program Accomplishments: During 2016, compared to the projection for 2016, the following participation was achieved:

Measure	2016 Year End Projection	2016 Actual Participation	Variance
High Performance Windows	307	266	(41)
Reflective Roof	308	310	2
ENERGY STAR Window A/C	28	20	(8)

Program Fiscal Expenditures: For 2016, Gulf projected \$461,411 in expenses compared to actual expenses of \$477,689 resulting in a variance of \$16,278 or 3.5% over the projection.

Program Progress Summary: Since its launch in 2011, the following participation has been achieved:

Measure	Program to Date Actual Participation
High Performance Windows	4,714
Reflective Roof	1,398
ENERGY STAR Window A/C	814

Program Description and Progress

Program Title: Energy *Select*

Program Description: The overall program is designed to provide customers with a means of controlling their energy purchases by conveniently programming their heating and cooling systems and major appliances, such as electric water heaters and pool pumps, to respond automatically to prices that vary during the day and by season in relation to the Company's cost of producing or purchasing energy.

Program Accomplishments: During 2016, the Energy *Select* program experienced a net addition of 1,473 participants compared to a projection of 1,600 or 127 under the projection.

Program Fiscal Expenditures: During 2016, there were projected expenses of \$5,986,028 compared with actual expenses of \$5,668,916. This results in a deviation of \$317,112 or 5.3% under the projection.

Program Progress Summary: As of December 2016, there were 17,720 participating customers.

Program Description and Progress

Program Title: Commercial/Industrial Audit

Program Description: This program is designed to provide professional advice to Gulf's existing commercial and industrial customers on how to reduce and make the most efficient use of energy. This program covers from the smallest commercial customer, requiring only a walk-through survey, to the use of computer programs which will simulate several design options for very large, energy-intensive customers. Customers may participate by requesting a basic Energy Analysis Audit (EAA) provided through either an on-site survey or an on-line survey. A more comprehensive analysis can be provided by conducting a Technical Assistance Audit (TAA).

Program Accomplishments: During 2016, the Company performed 342 commercial/industrial audits. The total projection for 2016 was 356 audits for a variance of 14 fewer participants than projected.

Program Fiscal Expenditures: For 2016, Gulf projected expenses of \$683,436 compared to actual expenses of \$704,690 for a deviation of \$21,254 or 3.1% over budget.

Program Progress Summary: Since this program was launched, 22,714 commercial/industrial audits have been performed.

Program Description and Progress

Program Title: Commercial HVAC Retrocommissioning Program

Program Description: This program offers basic retrocommissioning at a reduced cost for qualifying installations of existing commercial and industrial customers. It is designed to diagnose the performance of the HVAC cooling unit(s) operating in commercial buildings with the support of an independent computerized quality control process and to make improvements to the system to bring it to full efficiency. This program includes air cooled and water cooled equipment – identified as A/C, heat pump, direct expansion (DX) or geothermal cooling and heating.

Program Accomplishments: During 2016, 41 customers participated in this program compared to a projection of 60 participants resulting in a variance of 19 fewer participants than projected.

Program Fiscal Expenditures: For 2016, the Company projected \$65,832 in program expenses compared to actual expenses of \$62,553 resulting in a variance of \$3,279 or 5.0% under the projection.

Program Progress Summary: Since its launch in 2011, 1,012 customers have participated in this program.

Program Description and Progress

Program Title: Commercial Building Efficiency Program

Program Description: This program is designed as an umbrella efficiency program for existing commercial and industrial customers to encourage the installation of eligible high-efficiency equipment as a means of reducing energy and demand. The goals of the program are to increase awareness and customer demand for high-efficiency, energy-saving equipment; increase availability and market penetration of energy efficient equipment; and contribute toward long-term energy savings and peak demand reductions. These goals will be accomplished through commercial geothermal heat pumps, ceiling/roof insulation, and reflective roofs.

Program Accomplishments: During 2016, compared to the 2016 projection, the measures in this program have had the following participation:

Program	Annual Projections (2016)	Actual Participation (2016)	Variance
Commercial Geothermal Heat Pump (tons of installed HVAC)	92	50	(42)
Ceiling/Roof Insulation (square feet)	13,500	20,806	7,306
Commercial Reflective Roof (square feet)	97,572	269,196	171,624

Program Fiscal Expenditures: During 2016, the Company projected \$376,508 in expenses compared to actual expenses of \$392,968 for a variance of \$16,460 or 4.4% over the projection.

Program Progress Summary: Since its launch in 2011, customer participation is shown in the table below.

Program	Program to Date Participation
Commercial Geothermal Heat Pump (tons of installed HVAC)	578
Ceiling/Roof Insulation (square feet)	348,258
Commercial Reflective Roof (square feet)	3,274,354

Program Description and Progress

Program Title: Commercial/Industrial Custom Incentive

Program Description: This program is designed to establish the capability and process to offer advanced energy services and energy efficient end-user equipment to Commercial/Industrial customers. These energy services include comprehensive audits, design, and construction of energy conservation projects. Specifically, projects covered under this program would be demand reduction or efficiency improvement retrofits that are beyond the scope of other programs.

Program Accomplishments: During 2016, no customers participated in this program.

Program Fiscal Expenditures: During the reporting period, the Company projected expenses of \$97,496 compared to actual expenses of \$53,813 resulting in a variance of \$43,683, or 44.8% under the projection.

Program Progress Summary: Since its launch in 2011, 15 customers have participated in the Commercial/Industrial Custom Incentive program resulting in at the meter reductions of 7,070,333 kWh (energy), 741 winter kW (demand) and 1,151 summer kW (demand).

Program Description and Progress

Program Title: Residential Service Time of Use Pilot Program

Program Description: The Residential Service Time of Use (RSTOU) rate pilot will provide residential customers the opportunity to use customer-owned equipment to respond automatically and take advantage of a variable pricing structure with a critical peak credit component. In order to control program expenses and facilitate monitoring and evaluation, the pilot will be offered to a group of approximately 400 residential customers who meet the program standards. In order to further encourage customers to utilize a qualifying Wi-Fi enabled thermostat, the RSTOU pilot will offer customers a per event credit for allowing their thermostat to automatically adjust the HVAC equipment settings during a critical event period. This option puts the customer in complete control of their energy purchase without utility owned equipment. The objective of this pilot is to measure customer's response to a variable price rate with customer owned equipment. Customers will have an opportunity for additional savings by shifting energy purchases to the lower priced periods, while providing peak demand reduction during the high and critical periods.

Program Accomplishments: During 2016, 441 customers enrolled with 375 customers completing installation and participating in the RSTOU rate. The total projection for 2016 was approximately 400 participants by year end. This program was projected to start in the fall of 2015; however, due to program development delays, the program launch was shifted to February 2016.

Program Fiscal Expenditures: During 2016, the Company projected expenses of \$340,750 compared to actual expenses of \$169,832 resulting in a variance of \$170,918 or 50.2% under the projection.

Program Progress Summary: Since its launch in February 2016, 375 customers have participated in the Residential Service Time of Use Pilot Program.

Program Description and Progress

Program Title: Conservation Demonstration and Development

Program Description: A package of conservation programs was approved by the FPSC in Order No. 23561 for Gulf Power Company to explore and to pursue research, development, and demonstration projects designed to promote energy efficiency and conservation. This program serves as an umbrella program for the identification, development, demonstration and evaluation of new or emerging end-use technologies.

Program Accomplishments:

UWF BEST House

Gulf Power entered into a partnership, along with a number of other donors, with the University of West Florida, located in Pensacola, Florida, to help build a facility to be used as an educational tool and resource for Northwest Florida.

The project, now known as The Community Outreach, Research and Education (C.O.R.E.) Initiative, is a center to explain and demonstrate the advantages of retrofitting existing homes for energy efficiency. The C.O.R.E facility is a multipurpose laboratory; a research lab, a trade demonstration area, a construction yard, and an interactive, energy efficiency and demonstration showcase. The C.O.R.E. facility promotes energy efficient construction through the innovative display of cutting-edge technology, and through community outreach and participation. The lab is available to students, industry professionals and the general public.

The facility accommodates a research initiative in an effort to measure the efficacy of different building technologies and installations. The C.O.R.E initiative is particularly interested in the metering and measurement of sealed attic spaces, roof types, walls forms, windows, water heaters, Heating, Ventilation and Air Conditioning (HVAC) equipment, renewable energy and controls systems. The construction yard and demonstration area provides a similar opportunity for materials research and community seminars.

A final report was issued December 2016 on this project. Gulf Power will remain involved with C.O.R.E. as the primary energy consultant and may initiate future CDD projects as new technologies are introduced at the facility.

Azalea Trace Project

The purpose of this project was to test the application of a Heat Pump Water Heater (HPWH) in an assisted living facility. The project included the installation of a commercial size Heat Pump Water Heater (4-ton heating capacity), two 119 gallon storage tanks and distribution duct work. The HPWH unit provides preheated water (140 degrees F) to the existing natural gas boilers. In turn, the boilers feed the existing 350 gallon storage tank supplying hot water to the washers.

The project has provided a database for the application of the HPWH in this type facility. No data was on record within Gulf Power for the HPWH application in an assisted living facility. The laundry operated 24-hours a day, 7-days a week. The data was used to promote energy efficient production of hot water, off-set the installation of additional air conditioning units and provide a better climatic working environment for the employees.

The values of the data recorded will be used to calculate the system amount of “free” A/C cooling, the effect on the amount of natural gas used by the boilers, the electrical usage of the HPWH and the overall energy efficiency of the system.

The data will illustrate the efficient use of a dual fuel application in a large commercial, 24-hour operating facility for the first time in Gulf’s service area.

The project was monitored for one year, and a full report was submitted December 2016 to the Commission.

10th Ave North Hair Salon Heat Pump Water Heater Project (HPWH)

This project was used to determine if a residential HPWH can be used successfully in small commercial applications with high usage. As part of this project, a residential HPWH was installed and metered in a high water use commercial facility to determine the performance, reliability and economic return on investment. Gulf partnered with General Electric (GE) for this project. Two 50 gallon HPWH’s were installed with an Energy Factor of 2.4, which GE agreed to warranty as part of this project.

The project was monitored to the last quarter of 2016 and a full report was submitted to the Commission March 28, 2017.

Tesla Powerwall Demand Response (DR)

Modern-day battery storage provided by Tesla may be able to improve the effectiveness of current “Demand Response” programs. Demand response not only refers to *load shedding* but now also includes *load shifting*.

The Powerwall DR CDD Project will discover the possibilities and impact of:

1. *Load Shifting*: Battery storage's ability to maximize the impact of TOU rates by charging during off-peak/low periods and discharging during on-peak/medium-high periods
2. *Peak Reduction*: Battery storage's ability to be dispatched at specific times (critical peak events) to supplement the demand response capability of Energy Select.

Data monitoring will be used to assess the impact of battery storage in terms of performance, reliability, economic return on investment, from the perspective of the customer and the utility.

Tesla's daily cycle 6.4kWh Powerwall will be interconnected to a SolarEdge StorEdge inverter and existing Energy Select equipment. TOU times and critical peak dispatches will be accessed through the inverter's internal controls. Third parties have been contracted to install the equipment, monitor the various outputs of the system, compile the data for further analysis and provide a final report on the project.

Tesla Powerwall Demand Photovoltaic (PV)

Modern-day battery storage provided by Tesla may be able to overcome two of the typical shortcomings of grid-tied solar photovoltaics: the limited "daytime" periods of generation and the intermittency of output (due to shade or cloud cover).

The Powerwall PV CDD Project will discover the possibilities and impact of:

1. *Solar Shifting*: Battery storage's impact on peak demand by charging during the normal PV generation period and discharging during on-peak/medium-high periods.
2. *Solar Smoothing*: Battery storage's ability to stabilize the PV output during adverse weather conditions / cloud cover or shading caused by obstructions.

Data monitoring will be used to assess the impact of battery storage in terms of performance, reliability, economic return on investment, from the perspective of the customer and the utility.

Tesla's daily cycle 6.4kWh Powerwall will be interconnected to a SolarEdge StorEdge inverter and a retrofitted/existing 5kW photovoltaic installation. Charge and discharge time periods will be programmed within the inverter's internal controls. Third parties have been contracted to install the equipment, monitor the various

outputs of the system, compile the data for further analysis and provide a final report on the project.

Domestic Hot Water Analysis

This project aims to address an underserved area of the heat pump water heating market: small commercial buildings. Specific focus will be paid to the food service industry due to their potential for large domestic hot water usage. These building types are too small and cannot handle the capital intensity of large, engineered heat pump water heating systems; and it is unknown if their usage patterns could be supported by an integrated, residential-sized heat pump water heater. Thus, this project's objectives are as follows:

- Identify customers for participation in this study: Fast food, sandwich shops, cafeteria-style eateries, convenience stores, small laundries, and salons
- Obtain permission from each site owner to install monitoring systems.
- Collect number of and type of hot water end uses at each site.
- Install field monitoring on 20 small commercial building types .
- Collect up to two months of hot water usage data at each site.
- Analyze the collected data to develop usage patterns for each site.
- Produce a final report including recommendations to manufacturers on optimal approaches to the small commercial heat pump water heater market.

Collected data will be used to produce daily water consumption load shapes for each site type. This data will then be analyzed to make recommendations on ideal heat pump water heater technology needs to serve this market. The data will be shared with interested manufacturers to inform their product development planning processes with the intention of influencing the production of applicable heat pump water heaters for the small commercial market.

Program Fiscal Expenditures: Program expenses were forecasted at \$135,116 for the period January through December 2016 compared to actual expenses of \$79,525 for a deviation of \$55,591 or 41.1% under the projection. Project expenses were as follows: UWF BEST House, \$0; Azalea Trace Heat Pump Water Heater, \$2,102; Hair Salon Heat Pump Water Heater Project, \$15,329; Tesla Powerwall Demand Response, \$31,515; Tesla Powerwall Demand Photovoltaic, \$26,680; and Domestic Hot Water Analysis, \$3,899.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Energy Conservation Cost Recovery Clause)
)

Docket No.: 170002-EG

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true copy of the foregoing was furnished by electronic mail this 1st day of May, 2017 to the following:

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