One Energy Place
Pensacola, Florida 32520

850.444.6111

GULF POWER
A SOUTHERN COMPANY

July 21, 1999

ORIGINAL

Ms. Blanca S. Bayo, Director
Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee FL 32399-0870

Dear Ms. Bayo:

RE: Docket No. 981591-EG

Attached is an original and fifteen copies of the testimony of T. S. Spangenberg filed on behalf of Gulf Power Company in the above docket.

Sincerely,

Susan D. Ritenour

Susan D. Ritenour
Assistant Secretary and Assistant Treasurer

lw

Attachment

cc: Beggs and Lane
Jeffrey A. Stone, Esquire

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for authority to implement)
Good Cents Conversion Program by) Docket No. 981591-EG
Gulf Power Company)
)

Certificate of Service

I HEREBY CERTIFY that a copy of the foregoing has been furnished this 22nd day of July 1999 by U.S. Mail or hand delivery to the following:

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FL Public Service Commission
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THE FLORIDA PUBLIC SERVICE COMMISSION

GOODCENTS CONVERSION PROGRAM

GULF POWER COMPANY

DOCKET NO: 981591-EG

TESTIMONY AND EXHIBIT OF

TED S. SPANGENBERG

JULY 22, 1999

GULF POWER COMPANY

Before the Florida Public Service Commission
Direct Testimony of
T. S. Spangenberg, Jr.
Docket No. 981591-EG
Date of Filing: July 22, 1999

Q. Please state your name, business address, and occupation.

A. My name is T. S. (Ted) Spangenberg, Jr. My business address is One Energy Place, Pensacola, Florida 32520. I am employed by Gulf Power Company as its Residential Marketing Manager.

Q. Please summarize your educational and professional background.

A. I hold Bachelor's and Master's degrees in Electrical Engineering from Auburn University. I have worked for Gulf Power Company and its affiliates within the Southern Company for the past 23 years. My experience during that time frame includes positions and direct work involvement in the areas of load research, market research, demand forecasting, cogeneration, customer service, line service, distribution field engineering, transmission, executive administration, substation engineering, and residential marketing. I am licensed in several states, including Florida, as a Professional Engineer.

Q. Do you have an exhibit to which you will refer in your testimony?

A. Yes, I have an exhibit consisting of one schedule, (TSS-1) which is a written description of the GoodCents Conversion Program as filed with the Florida Public Service Commission (the Commission) for approval. This exhibit was prepared under my supervision and direction.

Counsel: We ask that Mr. Spangenberg's Schedule TSS-1 be marked as Exhibit _____.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to provide information about Gulf Power Company's proposed GoodCents Conversion Program (the Program) and to encourage the Commission to approve it as a conservation program eligible for cost recovery under the Energy Conservation Cost Recovery (ECCR) mechanism as provided by the Florida Energy Efficiency and Conservation Act (FEECA).

Q. What are the key elements of the GoodCents Conversion Program?

A. The GoodCents Conversion program proposes the use of cash incentives to encourage Gulf Power's residential customers to replace old and inefficient electric air conditioners and fossil-fueled combustion home heating devices with new, efficient, electric heat pumps. Customer participation in the Program will result in reduced annual electrical energy consumption and significantly reduced summer peak electric demand. Further, participating customers will also benefit as a result of significantly reducing the total energy requirements of their home. Customers who make this replacement under the Program would receive a $200 cash incentive, with their heating, ventilation and air conditioning (HVAC) dealer receiving a $50 cash incentive. The GoodCents Conversion name reflects the nature of the program, which is intended to encourage customers to convert from older, less efficient equipment to new, more efficient equipment. A more complete description of the elements of the GoodCents Conversion Program is contained in Schedule TSS-1. As noted in that exhibit, the expected change in peak kilowatt demand at the meter is a reduction of 1.90 kW per participant and the expected change in

annual electrical energy consumption is a reduction of 1,030 kWh at the meter. When the reduction in the participant's natural gas requirements are included, the typical impact is the conservation of 33.7 million Btu's of energy per year per participant at the meter.

Q. Were any recognized methodologies used to assess the cost effectiveness of the GoodCents Conversion Program?

A. Yes. The Commission has an established, approved methodology for assessing the cost effectiveness of energy conservation programs. This approved methodology is described in the publication "Florida Public Service Commission Cost Effectiveness Manual for Demand Side Management Programs and Self-Service Wheeling Proposals" adopted by the Commission in Rule 25-17.008, Florida Administrative Code. The approved methodology was used in performing the assessments of the Program. The manual sets forth three critical cost-effectiveness tests, the Ratepayer Impact Measure (RIM) Test, the Participant's Test, and the Total Resource Cost (TRC) Test. In order to be cost-effective under any of these tests, a program must have a benefits to cost ratio greater than 1.0.

Q. Using the approved methodology just described, is the GoodCents Conversion Program cost effective?

A. Yes. As depicted in Schedule TSS-1, all three key measures were at least 1.00. In other words, the GoodCents Conversion Program passes all three tests of cost-effectiveness specified in the Commission's manual on cost effectiveness of conservation programs.

Q. Please describe the assumptions that have been incorporated in the cost-effectiveness analysis for the GoodCents Conversion Program.

A. The base home for modeling purposes is a 1680 square foot home with an inefficient central air conditioning unit having an effective Seasonal Energy Efficiency Ratio (SEER) of 7.0 and a central gas furnace with a 68% Annual Fuel Utilization Efficiency (AFUE). In Gulf's assumptions, the entire existing heating and cooling system has been removed and replaced with a heat pump having a SEER of 11.0 and a Heating Season Performance Factor (HSPF) of 7.4.

Q. Are the assumptions incorporated in the cost-effectiveness analysis regarding summer peak demand,

A. Yes. These cost effectiveness evaluations are the result of the aforementioned system assumptions input

into the Residential Building Energy Program (RBEP), which is an engineering model developed by the Southern Company and used by Gulf Power on many occasions for regulatory filings. Results from the RBEP program have been previously accepted by the Commission.

Q. How is it that the GoodCents Conversion Program projects a reduction in annual kWh per participant when a non-electric heating source is being replaced by an electric one?

A. The typical efficiency rating of the equipment to be replaced under this proposed program is 7.0 SEER. In order to qualify for the Program incentive, the participant must install a heat pump with a rating of at least 11.0 SEER. For the typical home, this yields a reduction of 2,933 kWh for the cooling season, with an addition of 1,903 kWh for the home's heating needs. The net result is an expected reduction in annual electricity use of 1,030 kWh. This is in addition to the conservation of 302 therms of natural gas that is also achieved.

Q. What does FEECA require in terms of energy or demand impact and cost effectiveness in order for a program to be considered a qualifying conservation program?

A. Chapter 366.81, in its opening sentence, pronounces a legislative finding that "it is critical to utilize the most efficient and cost-effective energy conservation systems. . .". It is obvious from the electrical kWh and natural gas therm reductions just cited that encouraging the conversion of existing furnace and air conditioner combinations to new heat pumps promotes "the most efficient and cost-effective conservation systems." Further, Chapter 366.81 states that FEECA is to be "liberally construed" in order to increase the "efficiency and cost-effectiveness of electricity and natural gas use." There are two specific requirements in FEECA to which our Program applies. These are (1) reducing and controlling the growth rate of electric consumption; and (2) reducing the growth rate of weather-sensitive peak demand. An electrical program that achieves either one of these would qualify. The GoodCents Conversion Program reduces annual kWh consumption and qualifies on that count. It also reduces summer peak electric demand, which is when Gulf Power's annual peak demand occurs, so it would also qualify on that count. The proposed

program also has the added benefit of reducing the growth rate of the weather-sensitive peak demand for natural gas, which in Northwest Florida is the winter peak demand for gas, hence, it would also qualify on that count.

Q. If this program did not produce a reduction in winter electrical demand, a reduction in peak natural gas demand, or a reduction in annual kWh but did cause a reduction in Gulf's peak electrical demand, would it qualify as a conservation program?

A. Absolutely. Any impact of this or any other Gulf Power program on winter electrical demand is irrelevant as far as FEECA is concerned so long as the summer demand is Gulf Power's weather-sensitive system peak demand. Gulf Power plans additional generating resources on the basis of reserves at the time of summer peak demand. While any program that can help reduce the growth rate of annual energy consumption, reduce weather-sensitive peak electrical demand or reduce weather sensitive natural gas peak demand brings added appeal, as long as one of these three criteria is addressed, it satisfies the requirements of FEECA.

Q. Is there any precedent before the Commission in which a program has been approved for cost recovery under the ECCR clause when there was not a reduction in more than one criterion e.g. weather-sensitive peak electrical demand and annual kWh?

A. Yes, there is. Several utilities have received approval for ECCR recovery load management programs that reduce peak demand with no reduction in annual energy consumption.

Q. Was this program designed simply as a sales tool for competing against natural gas?

A. No, it was not. Gulf Power Company has a long history of pioneering efforts to help customers conserve energy, dating at least as far back as the initiation of our nationally acclaimed GoodCents Home program in the 1970s. Continuing that tradition, we are constantly pursuing ideas for new programs to enhance energy efficiency. The HVAC system is the single largest energy user in a typical home. As the company went about planning a program to increase the energy efficiency of HVAC systems, thereby reducing summer

electrical demand, the use of promotional incentives were considered because those seem to be one of the most effective tools in today's marketplace for encouraging consumer action. However, the company wanted to ensure that all promotional offerings to customers were cost-effective. In all our considerations for potential HVAC upgrade programs, with the natural exception of our geothermal initiatives, we assumed that the cooling aspect of existing and replacement systems would be the traditional refrigerant cycle with air-to-air heat exchange. For the heating cycle we analyzed electric resistance heat, gas furnaces, and air-to-air heat pumps. While knowing that 7.0 SEER was a good average for existing systems, we also considered higher SEER's, i.e. newer equipment, for the system being replaced, realizing that the higher SEER's would make the cost-effectiveness tests more difficult to pass. The company did everything reasonable to ensure rigor in its analyses. The cost effectiveness tests results for these other variations are shown in Schedule TSS-1 and indicate that the only combination that passed the necessary cost-effectiveness tests was going from a gas furnace, regardless of equipment vintage, to a heat pump. In short, an attempt was made to include the

cooling-only upgrade with a gas furnace, as well as the change-out of an older heat pump, but these failed the cost-effectiveness tests. Leaving a gas furnace in place and replacing just the 7.0 SEER cooling equipment with 11.0 SEER equipment only achieves a savings of 10.0 million Btu's, or only 30% of the 33.7 million Btu's conserved with this proposed Program.

Q. Is there any precedent for the Commission approving a program for cost recovery under the ECCR clause when the program benefits the requesting company's product sales in lieu of a competing product?

A. Yes. In fact the Commission has approved electric replacement programs for ECCR treatment for natural gas distributors that provide significant cash rebates to participants only if they are replacing electric heating equipment with natural gas equipment. Given this established practice of the Commission, the company sees no reason why the GoodCents Conversion program should not also be approved. The Program as proposed results in cost-effective conservation by reducing the growth rates of weather-sensitive peak electrical demand and electric consumption.

Q. Why does Gulf Power believe it is necessary to use incentives to encourage its customers to install energy-efficient, electric heat pumps?

A. The decision to install a high-efficiency heat pump, either as a replacement to an older heat pump or as a replacement to a gas furnace, has been impeded by false and/or deceptive advertising about the benefits of natural gas use in Northwest Florida. This use of advertising and promotional materials has confused consumers by portraying the operating costs of heat pumps using national average heat pump efficiencies, national average electricity costs and national average natural gas costs. Typically, the above mentioned advertising and promotional materials falsely portray resistance heating efficiencies as typical electrical heating efficiencies, and/or base cost comparisons on Btu's entering the home without consideration for heat transfer equipment efficiencies, which must be considered in determining what customers will actually pay. In addition to the presence of such false and/or deceptive advertising in the marketplace, most gas distributors in Northwest Florida have been providing cash incentives to consumers to replace heat pumps with gas furnaces. The costs of these incentives and the associated advertising are passed directly through to

the general body of customers either through the ECCR mechanism or through rates that are not subject to review and approval by the Florida Public Service Commission. I feel the $200 customer incentive that is an element of the GoodCents Conversion Program is needed in order to help get the individual consumer's attention long enough for them to understand the energy saving and household budget benefits of installing a highly efficient heat pump.

Q. As a rule, are customers likely to replace existing inefficient HVAC equipment only when it fails?

A. No. The best quantitative data available for Northwest Florida on this issue is from a mid-1980's study of over 400 consumers who changed out their HVAC systems to heat pumps. Only 27.3% of those consumers gave "needed major repairs" as the reason for replacing their system. Other predominant reasons given included "operating cost too high"-18.2% and "rebate"-19.9%. Regardless of how likely consumers are to replace their equipment only when it fails absent a rebate or other promotional incentive, they are much less likely to replace it only for that reason when an effective incentive is available, such as the one included in our proposed Program. I believe the earlier 73.7% finding

for replacing a system for reasons other than failure is generally representative of what could be expected with our proposed Program.

Q. Do you believe the Commission should approve this program for ECCR treatment?

A. Yes. Since this program, as demonstrated through the RIM test, provides benefits to all ratepayers, the ECCR funding mechanism provides a means for those ratepayers to financially contribute to its success. Absent ECCR, while it might remain cost-effective from a ratepayer perspective, the delay in a positive impact on the company's financial earnings and stockholder benefits make the program a difficult proposition for moving ahead under normal cost recovery mechanisms.

This Program reduces peak summer electrical demand, reduces annual kWh consumption, and is cost-effective under the RIM Test, Participant Test, and TRC Test. The GoodCents Conversion Program promotes energy-efficiency and reduces Florida's dependence on outside energy sources, all consistent with FEECA and good public policy. As an unintended benefit, it also reduces weather-sensitive peak natural gas demand. Because of the intended, expected results and the

consistency with past practice, I believe the Commission should approve this Program.

Q. Does this conclude your testimony?

A. Yes.

AFFIDAVIT

STATE OF FLORIDA)
)
COUNTY OF ESCAMBIA)

Docket No. 981591-EG

Before me the undersigned authority, personally appeared T. S. Spangenberg, Jr., who being first duly sworn, deposes and says that he is the Residential Marketing Manager of Gulf Power Company, a Maine Corporation, that the foregoing is true and correct to the best of his knowledge, information and belief. He is personally known to me.

T. S. Spangenberg, Jr.
Residential Marketing Manager

Sworn to and subscribed before me this 9th day of July, 1999.

Notary Public, State of Florida at Large

Jessica L. Pfeiffer
MY COMMISSION EXPIRES
FEBRUARY 7, 2001
#CC 619321
Bonded thru
Troy Fain-Insurance
NOTARY PUBLIC, STATE OF FLORIDA

GoodCents® *Conversion Program*

Program Description

The objective of the **GoodCents®** *Conversion Program* is to provide Gulf Power Company's residential customers and equipment contractors an incentive to replace inefficient gas furnace and air conditioning systems with high efficiency heat pump systems. This program will encourage earlier replacement of these equipment types resulting in immediate energy savings for the customer, an increase in ground source efficiency, and energy and peak demand reductions benefiting Gulf Power Company and its general body of customers.

Gulf Power will identify potential program participants through the Residential Energy Audit Program as well as through educational and promotional activities.

Program Guidelines

In order to qualify for participation in the **GoodCents®** *Conversion Program*, customers must have an On-site Energy Audit performed by a Gulf Power Residential Energy Consultant. Each Energy Audit will result in written recommendations to the customer, which may include lifestyle factors, improvements to the home's thermal envelope, and mechanical equipment upgrades/modifications. In addition, the Energy Consultant may provide detailed computer analysis of the customer's home in order to determine proper equipment sizing and demonstrate potential savings to the customer.

All heat pump installations must meet mechanical code requirements and have a minimum Seasonal Energy Efficiency Rating (SEER) of 11.0. Described heat pump installations replacing primary heating systems fueled by gas, propane, or fuel oil will qualify the customer for a rebate of $200 and the installing heating and cooling contractor or salesperson an incentive of $50 per system. Installations occurring without the necessary Gulf Power Energy Audit will not qualify for any incentive.

Qualifying installations will be reported by the Gulf Power Residential Energy Consultant to the appropriate support personnel located in Gulf Power's Corporate Office Residential Marketing Department in order to facilitate payment. A sample rebate form is included on page 4 of this exhibit.

Participation Standards

The **GoodCents®** *Conversion Program* is available to all residential customers within Gulf Power's service territory with an existing combustion furnace as the primary source of heating for the home and to cooling and heating equipment contractors performing work for these customers.

Benefits and Costs

Participating customers will benefit from reduced energy consumption in their homes resulting in lower energy bills. Energy calculations indicate an expected or average annual reduction of 1,030 kWh and 302 therms of natural gas. Additional benefits related to cost of maintenance and repair of customers' cooling and heating systems will be realized by early retirement of this equipment and replacement with new heat pump systems. Our environment will benefit by these customer actions because of a 39% reduction in ground source BTU consumption.

For Gulf Power Company, benefits include kWh reduction, kW demand savings, consumer education, and customer satisfaction. The kWh and kW demand savings are based on Residential Building Energy Program (RBEP) computer simulations. This analysis assumes that a customer in an average home of 1,680 square feet replaces a three ton air conditioner with a Seasonal Energy Efficiency Rating (SEER) of 7.0 and a 68% Annual Fuel Utilization Efficiency (AFUE) gas furnace with a heat pump having a SEER of 11.0 and a Heating Season Performance Factor (HSPF) of 7.4. RBEP comparisons based on these assumptions indicate that these installations will result in an annual energy reduction of 1,030 kWh and a summer demand reduction of 1.9 kW.

Monitoring and Evaluation

Gulf Power will monitor this program through its existing Gulf Account Reporting System (GARS) which will enable the tracking of homes making this equipment change. Gulf Power will validate engineering analysis of energy and demand savings with billing data and sample metering of customer equipment.

Cost Effectiveness

This program is cost effective using the Commission's approved methodology (Rule 25-17.008). The cost-effectiveness calculation is included on pages 5 – 8.

While the assumptions used in calculating the cost effectiveness of the program as filed were the most logical and most probable, other scenarios were analyzed as a matter of interest and rigor. The results of those analyses are shown on page 9.

GoodCents® *Conversion Program*

$200 Customer Rebate

Customer Name

Installation Address

Gulf Power Account Number

Social Security Number

Mailing Address

City, State & Zip Code

$50 Salesman Rebate

HVAC Dealer Name

Salesman/Rebate Payee

Social Security Number

Mailing Address

City, State & Zip Code

Equipment Installation Date

Equipment Model Number (Outdoor Unit)

Efficiency Rating (SEER)

Gulf Power Energy Consultant

Date

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INPUT DATA – PART 1

Cost-Effectiveness Analysis per Rule 25-17.008 Florida Administrative Code

I. Program Demand Impacts and Line Losses

(1) Change in Peak kW Customer at meter	-1.90	kW/Cus
(2) Change in Peak kW per Customer at generator	-2.46	kW Gen/Cus
(3) kW Line Loss Percentage	12.60%	
(4) Change in KWh per Customer at generator	(1,109)	kWh/Cus/Yr
(5) kWh Line Loss Percentage	7.70%	
(6) Group Line Loss Multiplier	1.0014	
(7) Annual Change in Customer kWh at Meter	(1,030)	kWh/Cus/Yr
* (8) Change in Winter kW per Cust at meter	4.40	kW/Cus

II. Economic Life and K-Factors

(1) DSM Program Study Period	30	Years
(2) Economic Life of Incremental Generation	40	Years
(3) Economic Life of Incremental T&D	30	Years
(4) K-Factor for Generation	1.4493	
(5) K-Factor for T&D	1.4394	
* (6) Switch: Rev Req (0) or Val-of-Def (1)	0	

III. Utility & Customer Costs

(1) Utility Nonrecurring Cost Per Customer	$150.00	$/Cus
(2) Utility Recurring Cost Per Customer	$0.00	$/Cus/Year
(3) Utility Cost Escalation Rate	3.06%	
(4) Customer Equipment Cost	$3,000.00	$/Cus
(5) Customer Equipment Cost Escalation Rate	3.06%	
(6) Customer O&M Cost	($287.00)	$/Cus/Year
(7) Customer O&M Cost Escalation Rate	3.06%	
* (8) Customer Tax Credit Per Installation	$0.00	$/Cus
* (9) Customer Tax Credit Escalation Rate	3.06%	
* (10) Change in Supply Costs	$0.00	$/Cus/Year
* (11) Supply Costs Escalation Rate	3.06%	
* (12) Utility Discount Rate	8.97%	
* (13) Utility AFUDC Rate	10.30%	
* (14) Utility Nonrecurring Rebate/Incentive	$200.00	$/Cus
* (15) Utility Recurring Rebate/Incentive	$0.00	$/Cus/Year
* (16) Utility Rebate/Incentive Escalation Rate	0.00%	

IV. Incremental Generation, Transmission, & Distribution Costs

(1) Base Year	1999	
(2) In-Service Year For Incremental Generation	2001	**
(3) In-Service Year For Incremental T & D	2000	
(4) Base Year Incremental Generation Cost	$234.85	$/kW
(5) Base Year Incremental Transmission Cost	$58.75	$/kW
(6) Base Year Incremental Distribution Cost	$33.00	$/kW
(7) Gen, Tran, & Dist Cost Escalation Rate	2.56%	
(8) Generator Fixed O & M Cost	$2.77	$/kW/Yr
(9) Generator Fixed O&M Escalation Rate	2.99%	
(10) Transmission Fixed O & M Cost	$0.73	$/kW/Yr
(11) Distribution Fixed O & M Cost	$0.84	$/kW/Yr
(12) T&D Fixed O&M Escalation Rate	2.56%	
(13) Incremental Gen Variable O & M Costs	$0.433	$/kW/Yr
(14) Incre Gen Variable O&M Cost Esc Rate	3.84%	
(15) Incremental Gen Capacity Factor	3.40%	
(16) Incremental Generating Unit Fuel Cost	$0.0356	$/kWh
(17) Incremental Gen Unit Fuel Esc Rate	3.00%	
* (18) Incremental Purchased Capacity Cost	$20.70	$/KW/YR
* (19) Incremental Capacity Cost Esc Rate	2.56%	
Stop Revenue Loss at In-Service Year? (Y=1, N=0)	0	

V. (1) Non-Fuel Cost In Customer Bill (Base Year)

(1) Non-Fuel Cost In Customer Bill (Base Year)	$0.0352	$/kWh
(2) Non-Fuel Escalation Rate	Per Table	
(3) Customer Demand Charge Per kW (Base Year)	$0.0000	$/kW/Mo
(4) Demand Charge Escalation Rate	Per Table	
* (5)Average Annual Change in Monthly Billing kW	0	kW/Mo.

Summary Results for This Analysis

	RIM	Participants'
NPV Benefits($000s)	$7,153	$21,592
NPV Costs ($000s)	$4,114	$13,094
NPV Net Benefits ($000s)	$3,039	$8,498
Benefit:Cost Ratio	1.739	1.649

* Supplemental Information Not Specifically Specified in Cost Effectiveness Manual
** The relevant avoidable generation unit is a combustion turbine peaking unit. Since the kilowatt savings occur at the time of the system peak, this is the appropriate unit against which to measure cost savings.

Florida Public Service Commission
Docket No. 981591-EG
Gulf Power Company
Witness: T.S.Spangenberg
Exhibit No. _____ (TSS-1)
Page 5 of 9

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Total Resource Cost-Effectiveness Measure

Cost-Effectiveness Analysis per Rule 25-17.008 Florida Administrative Code

(1) Year	(2) Change in Electric Supply Costs ($000s)	(3) Utility's Program Costs ($000s)	(4) Participants' Program Costs ($000s)	(5) Other Costs ($000s)	(6) Other Benefits ($000s)	(7) Incremental Generation Cap Costs ($000s)	(8) Incremental T&D Cap Costs ($000s)	(9) Incremental Prog Induced Fuel Costs ($000s)	(10) Total Costs ($000s)	(11) Total Benefits ($000s)	(12) Total Net Benefits ($000s)	(13) Cumulative Discounted Net Benefits ($000s)
1999	$0	$75	$1,357	$0	$0	($35)	$0	($11)	$1,432	$46	($1,385)	($1,385)
2000	$0	$155	$2,648	$0	$0	($106)	($79)	($36)	$2,803	$221	($2,582)	($3,755)
2001	$0	$159	$2,424	$0	$0	($185)	($126)	($60)	$2,584	$371	($2,212)	($5,618)
2002	$0	$164	$2,184	$0	$0	($263)	($169)	($86)	$2,349	$518	($1,830)	($7,032)
2003	$0	$169	$1,928	$0	$0	($348)	($209)	($112)	$2,097	$669	($1,428)	($8,045)
2004	$0	$87	$76	$0	$0	($400)	($222)	($126)	$163	$748	$585	($7,664)
2005	$0	$0	($1,720)	$0	$0	($413)	($214)	($129)	$0	$2,475	$2,475	($6,186)
2006	$0	$0	($1,772)	$0	$0	($422)	($205)	($130)	$0	$2,530	$2,530	($4,799)
2007	$0	$0	($1,827)	$0	$0	($431)	($197)	($135)	$0	$2,590	$2,590	($3,497)
2008	$0	$0	($1,883)	$0	$0	($441)	($189)	($139)	$0	$2,652	$2,652	($2,273)
2009	$0	$0	($1,940)	$0	$0	($454)	($181)	($141)	$0	$2,717	$2,717	($1,122)
2010	$0	$0	($2,000)	$0	$0	($467)	($173)	($144)	$0	$2,783	$2,783	($40)
2011	$0	$0	($2,061)	$0	$0	($480)	($165)	($149)	$0	$2,854	$2,854	$978
2012	$0	$0	($2,124)	$0	$0	($494)	($157)	($154)	$0	$2,928	$2,928	$1,936
2013	$0	$0	($2,189)	$0	$0	($507)	($148)	($156)	$0	$3,000	$3,000	$2,837
2014	$0	$0	($2,256)	$0	$0	($521)	($140)	($153)	$0	$3,071	$3,071	$3,684
2015	$0	$0	($2,325)	$0	$0	($535)	($133)	($154)	$0	$3,147	$3,147	$4,480
2016	$0	$0	($2,396)	$0	$0	($549)	($129)	($151)	$0	$3,225	$3,225	$5,228
2017	$0	$0	($2,470)	$0	$0	($564)	($126)	($150)	$0	$3,309	$3,309	$5,933
2018	$0	$0	($2,545)	$0	$0	($580)	($122)	($159)	$0	$3,406	$3,406	$6,599
2019	$0	$0	($2,623)	$0	$0	($603)	($119)	($163)	$0	$3,508	$3,508	$7,228
2020	$0	$0	($2,703)	$0	$0	($627)	($115)	($168)	$0	$3,614	$3,614	$7,823
2021	$0	$0	($2,786)	$0	$0	($652)	($112)	($174)	$0	$3,724	$3,724	$8,386
2022	$0	$0	($2,872)	$0	$0	($672)	($109)	($179)	$0	$3,831	$3,831	$8,917
2023	$0	$0	($2,959)	$0	$0	($692)	($106)	($184)	$0	$3,942	$3,942	$9,418
2024	$0	$0	($3,050)	$0	$0	($713)	($102)	($190)	$0	$4,056	$4,056	$9,892
2025	$0	$0	($3,144)	$0	$0	($735)	($99)	($196)	$0	$4,173	$4,173	$10,339
2026	$0	$0	($3,240)	$0	$0	($757)	($96)	($202)	$0	$4,294	$4,294	$10,761
2027	$0	$0	($3,339)	$0	$0	($780)	($93)	($208)	$0	$4,420	$4,420	$11,160
2028	$0	$0	($3,441)	$0	$0	($803)	($90)	($214)	$0	$4,549	$4,549	$11,536
Nominal		$810	($49,047)			($15,228)	($4,124)	($4,355)	$11,426	$83,371	$71,945	
NPV		$655	($5,038)			($4,260)	($1,613)	($1,280)	$9,587	$21,124	$11,536	

Discount Rate =	8.97%
Benefit/Cost Ratio =	2.20

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Participants' Cost-Effectiveness Measure
Cost-Effectiveness Analysis per Rule 25-17.008 Florida Administrative Code

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Year	Customer Equip Costs ($000s)	Customer O&M Costs ($000s)	Other Costs ($000s)	Other Benefits ($000s)	Change in Participants' Electric Bills ($000s)	Tax Credits ($000s)	Utility Paid Rebates & Incentives ($000s)	Total Costs ($000s)	Total Benefits ($000s)	Total Net Benefits ($000s)	Cumulative Discounted Net Benefits ($000s)
1999	$1,500	($144)	$0	$0	($29)	$0	$100	$1,500	$272	($1,228)	($1,228)
2000	$3,092	($444)	$0	$0	($85)	$0	$200	$3,092	$728	($2,364)	($3,397)
2001	$3,187	($762)	$0	$0	($135)	$0	$200	$3,187	$1,097	($2,089)	($5,156)
2002	$3,284	($1,100)	$0	$0	($195)	$0	$200	$3,284	$1,495	($1,789)	($6,539)
2003	$3,385	($1,457)	$0	$0	($244)	$0	$200	$3,385	$1,901	($1,484)	($7,591)
2004	$1,744	($1,669)	$0	$0	($278)	$0	$100	$1,744	$2,047	$303	($7,394)
2005	$0	($1,720)	$0	$0	($278)	$0	$0	$0	$1,998	$1,998	($6,201)
2006	$0	($1,772)	$0	$0	($281)	$0	$0	$0	$2,053	$2,053	($5,076)
2007	$0	($1,827)	$0	$0	($288)	$0	$0	$0	$2,114	$2,114	($4,013)
2008	$0	($1,883)	$0	$0	($287)	$0	$0	$0	$2,169	$2,169	($3,011)
2009	$0	($1,940)	$0	$0	($290)	$0	$0	$0	$2,230	$2,230	($2,067)
2010	$0	($2,000)	$0	$0	($293)	$0	$0	$0	$2,292	$2,292	($1,176)
2011	$0	($2,061)	$0	$0	($296)	$0	$0	$0	$2,357	$2,357	($335)
2012	$0	($2,124)	$0	$0	($299)	$0	$0	$0	$2,423	$2,423	$458
2013	$0	($2,189)	$0	$0	($302)	$0	$0	$0	$2,491	$2,491	$1,206
2014	$0	($2,256)	$0	$0	($306)	$0	$0	$0	$2,562	$2,562	$1,912
2015	$0	($2,325)	$0	$0	($309)	$0	$0	$0	$2,634	$2,634	$2,579
2016	$0	($2,396)	$0	$0	($313)	$0	$0	$0	$2,709	$2,709	$3,207
2017	$0	($2,470)	$0	$0	($316)	$0	$0	$0	$2,786	$2,786	$3,801
2018	$0	($2,545)	$0	$0	($320)	$0	$0	$0	$2,865	$2,865	$4,361
2019	$0	($2,623)	$0	$0	($324)	$0	$0	$0	$2,947	$2,947	$4,890
2020	$0	($2,703)	$0	$0	($328)	$0	$0	$0	$3,031	$3,031	$5,389
2021	$0	($2,786)	$0	$0	($332)	$0	$0	$0	$3,118	$3,118	$5,860
2022	$0	($2,872)	$0	$0	($336)	$0	$0	$0	$3,208	$3,208	$6,304
2023	$0	($2,959)	$0	$0	($341)	$0	$0	$0	$3,300	$3,300	$6,724
2024	$0	($3,050)	$0	$0	($346)	$0	$0	$0	$3,396	$3,396	$7,121
2025	$0	($3,144)	$0	$0	($351)	$0	$0	$0	$3,494	$3,494	$7,495
2026	$0	($3,240)	$0	$0	($356)	$0	$0	$0	$3,596	$3,596	$7,848
2027	$0	($3,339)	$0	$0	($361)	$0	$0	$0	$3,700	$3,700	$8,182
2028	$0	($3,441)	$0	$0	($367)	$0	$0	$0	$3,808	$3,808	$8,498
Nominal	$16,191	($65,239)			($8,584)		$1,000	$16,191	$74,822	$58,631	
NPV	$13,094	($18,132)			($2,646)		$813	$13,094	$21,592	$8,498	
Discount Rate =		8.97%									
Benefit/Cost Ratio =		1.65									

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Ratepayers' Impact Cost-Effectiveness Measure

Cost-Effectiveness Analysis per Rule 25-17.008 Florida Administrative Code

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Year	Change in Electric Supply Costs ($000s)	Utility's Program Costs ($000s)	Utility Paid Rebates & Incentives ($000s)	Change in Electric Revenues ($000)	Incremental Generation Cap Costs ($000s)	Incremental T&D Cap Costs ($000s)	Incremental Prog Induced Fuel Costs ($000s)	Other Costs ($000s)	Other Benefits ($000s)	Total Costs ($000s)	Total Benefits ($000s)	Total Net Benefits to All Customers ($000s)	Cumulative Discounted Net Benefits ($000s)
1999	$0	$75	$100	($29)	($35)	$0	($11)	$0	$0	$204	$46	($158)	($158)
2000	$0	$155	$200	($85)	($106)	($79)	($36)	$0	$0	$439	$221	($218)	($358)
2001	$0	$159	$200	($135)	($185)	($126)	($60)	$0	$0	$495	$371	($123)	($462)
2002	$0	$164	$200	($195)	($263)	($169)	($86)	$0	$0	$559	$518	($41)	($493)
2003	$0	$169	$200	($244)	($348)	($209)	($112)	$0	$0	$613	$669	$56	($454)
2004	$0	$87	$100	($278)	($400)	($222)	($126)	$0	$0	$466	$748	$282	($270)
2005	$0	$0	$0	($278)	($413)	($214)	($129)	$0	$0	$278	$756	$478	$15
2006	$0	$0	$0	($281)	($422)	($205)	($130)	$0	$0	$281	$758	$477	$277
2007	$0	$0	$0	($288)	($431)	($197)	($135)	$0	$0	$288	$763	$476	$516
2008	$0	$0	$0	($287)	($441)	($189)	($139)	$0	$0	$287	$770	$483	$739
2009	$0	$0	$0	($290)	($454)	($181)	($141)	$0	$0	$290	$777	$487	$945
2010	$0	$0	$0	($293)	($467)	($173)	($144)	$0	$0	$293	$784	$491	$1,136
2011	$0	$0	$0	($296)	($480)	($165)	($149)	$0	$0	$296	$793	$497	$1,313
2012	$0	$0	$0	($299)	($494)	($157)	($154)	$0	$0	$299	$804	$505	$1,478
2013	$0	$0	$0	($302)	($507)	($148)	($156)	$0	$0	$302	$812	$509	$1,631
2014	$0	$0	$0	($306)	($521)	($140)	($153)	$0	$0	$306	$815	$509	$1,771
2015	$0	$0	$0	($309)	($535)	($133)	($154)	$0	$0	$309	$822	$512	$1,901
2016	$0	$0	$0	($313)	($549)	($129)	($151)	$0	$0	$313	$829	$516	$2,021
2017	$0	$0	$0	($316)	($564)	($126)	($150)	$0	$0	$316	$840	$523	$2,132
2018	$0	$0	$0	($320)	($580)	($122)	($159)	$0	$0	$320	$861	$541	$2,238
2019	$0	$0	$0	($324)	($603)	($119)	($163)	$0	$0	$324	$885	$561	$2,339
2020	$0	$0	$0	($328)	($627)	($115)	($168)	$0	$0	$328	$911	$583	$2,435
2021	$0	$0	$0	($332)	($652)	($112)	($174)	$0	$0	$332	$937	$606	$2,526
2022	$0	$0	$0	($336)	($672)	($109)	($179)	$0	$0	$336	$960	$624	$2,613
2023	$0	$0	$0	($341)	($692)	($106)	($184)	$0	$0	$341	$982	$641	$2,694
2024	$0	$0	$0	($346)	($713)	($102)	($190)	$0	$0	$346	$1,005	$660	$2,771
2025	$0	$0	$0	($351)	($735)	($99)	($196)	$0	$0	$351	$1,030	$679	$2,844
2026	$0	$0	$0	($356)	($757)	($96)	($202)	$0	$0	$356	$1,055	$699	$2,913
2027	$0	$0	$0	($361)	($780)	($93)	($208)	$0	$0	$361	$1,081	$719	$2,978
2028	$0	$0	$0	($367)	($803)	($90)	($214)	$0	$0	$367	$1,107	$741	$3,039
Nominal		$810	$1,000	($8,584)	($15,228)	($4,124)	($4,355)			$10,383	$23,707	$13,314	
NPV		$855	$813	($2,648)	($4,260)	($1,613)	($1,280)			$4,114	$7,153	$3,039	

Discount Rate =	8.97%
Benefit/Cost Ratio =	1.74

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Cost Effectiveness Analysis
Cooling and Heating Efficiency Enhancement Program

Existing System			New System		Cost Effectiveness		
Heating	Cooling		Heating	Cooling	RIM	PART	TRC
68% AFUE Gas Furnace	**7 SEER A/C**		**7.4 HSPF Heat Pump**	**11 SEER Heat Pump**	**1.74**	**1.65**	**2.20**
68% AFUE Gas Furnace	7 SEER A/C	25% Free Riders	7.4 HSPF Heat Pump	11 SEER Heat Pump	1.59	1.60	2.12
68% AFUE Gas Furnace	7 SEER A/C	15 Yr. Program Life	7.4 HSPF Heat Pump	11 SEER Heat Pump	1.49	1.09	1.30
68% AFUE Gas Furnace	8 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	2.45	1.45	1.85
68% AFUE Gas Furnace	10 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	1.41	1.14	1.32
68% AFUE Gas Furnace	10 SEER A/C	15 Yr. Program Life	7.4 HSPF Heat Pump	11 SEER Heat Pump	1.19	0.80	0.75
Gas or Resistance Heat	7 SEER A/C		Gas or Resistance Heat	11 SEER A/C	1.06	0.87	0.93
Gas or Resistance Heat	8 SEER A/C		Gas or Resistance Heat	11 SEER A/C	0.95	0.60	0.60
Resistance Heat	7 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	0.75	1.46	1.07
Resistance Heat	8 SEER A/C		7.4 HSPF Heat Pump	11 SEER Heat Pump	0.66	1.26	0.82