



Progress Energy

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Clerk's Office
N.C. Utilities Commission

February 24, 2009

Ms. Renné Vance
Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4325

Re: Residential Home Energy Improvement Program;
Docket No. E-2, Sub 936

Dear Ms. Vance:

On October 31, 2008, Progress Energy Carolinas, Inc ("PEC") filed its proposed Residential Home Energy Improvement Program in accordance with the North Carolina Utilities Commission's ("the Commission") Rule R8-68 and the Commission's Orders dated February 29, 2008 and March 13, 2008 in Docket No. E-100, Sub 113, Rulemaking Proceeding to Implement Session Law 2007-397 (Senate Bill 3). PEC now re-files its proposed Residential Home Energy Improvement Program to incorporate revisions based on comments received from the NCUC Public Staff and others. Also included, for information only, is a "red-lined" copy to show the revisions made to the October 31, 2008 filing. Enclosed for filing with and approval by the Commission are an original and fifteen (15) copies of this proposed energy efficiency program.

The proposed Residential Home Energy Improvement Program offers prescriptive rebates (as well as financing opportunities) to owners of existing homes to encourage them to tune up and maintain their equipment and install a broad range of energy efficiency measures, including:

- High efficiency central air conditioning, air-to-air heat pumps, and geothermal heat pumps;
- Duct testing and repair;
- Heating and cooling system tune-up;
- Insulation upgrades and attic sealing; and
- Window replacement

Progress Energy Service Company, LLC
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Clerk's
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K.iby *Acctg*
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Sessions
Ericson
Jones

All program costs associated with the Residential Home Energy Improvement Program will be funded from PEC's general funds, consisting of all sources of capital. These costs will also be subject to cost recovery through the DSM/EE annual cost-recovery rider consistent with the Commission's rule R8-69(b).

PEC requests that the Commission:

1. Approve the Residential Home Energy Improvement Program by March 31, 2009.
2. Find that the Residential Home Energy Improvement Program meets the requirements of a "new" DSM/EE program consistent with Rule R8-69.
3. Find that all costs incurred by PEC associated with the Residential Home Energy Improvement Program will be eligible for consideration for cost recovery through the annual DSM/EE rider in accordance with Rule R8-69.
4. Find that the program will be eligible for utility incentives through the annual DSM/EE rider in accordance with Rule R8-69.

The attached filing package contains more detailed descriptions of the Residential Home Energy Improvement Program, prepared in accordance with Rule R8-68(c)(2) and (3).

The Commission's prompt attention to this matter is appreciated.

Very truly yours,



Len S. Anthony, General Counsel
Progress Energy Carolinas, Inc.

LSA:gac

Enclosures

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. E-2, SUB 936

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of:

Request For Approval of Residential Home
Energy Improvement Program

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**CERTIFICATE OF
SERVICE**

I, Len S. Anthony, hereby certify that the filing of Progress Energy Carolinas, Inc.'s Request for Approval of the Residential Home Energy Improvement Program in the above referenced docket has been served on all parties of record either by e-mail, hand delivery or by depositing said copy in the United States mail, postage prepaid, addressed as follows, this the 24th day of February, 2009:

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Len S. Anthony, General Counsel
Progress Energy Carolinas, Inc.

PEC DSM/EE Program Approval Request

Cover Page

Docket No. E-2, Sub 936

Program Name: Residential Home Energy Improvement Program

Program Type: Energy Efficiency

Target Class: PEC Residential Customers

Target End-uses: HVAC, Duct Testing and Repair, Attic Insulation and Air Sealing, Window Replacement & Building Envelope

Duration: Ongoing

In accordance with North Carolina Utilities Commission Rule R8-68 and the Commission's Orders dated February 29, 2008 and March 13, 2008 in Docket No. E-100, Sub 113, Rulemaking Proceeding to Implement Session Law 2007-397 Senate Bill 3, Progress Energy Carolinas, Inc. (PEC) respectfully submits the attached request for approval of the Energy Efficiency Program Residential Home Energy Improvement.

Program Description

Under the Residential Home Energy Improvement Program, Progress Energy Carolinas, Inc. (PEC) offers customers a variety of energy conservation measures designed to increase energy efficiency for existing residential dwellings that can no longer be considered new construction. This program will utilize a network of pre-qualified contractors to install energy efficiency measures.

The program will utilize a prescriptive menu of measures for each participant depending on the needs and characteristics of the individual homes. The program will be available to all residential customers that meet the Home Energy Improvement Program eligibility criteria.

Consideration to be Offered

Prescriptive Approach (Single-family)

Home Energy Improvement will be implemented using a prescriptive approach for each participant and will utilize various energy education and awareness initiatives such as Custom

Energy Reports (CER) (via mail, phone or the Progress Energy website) to identify and solicit installation of energy efficiency measures. Customers do not need to participate in any of the CER types in order to participate in the program.

Energy Conservation Measures (ECMs):

- **High-Efficiency Heat Pumps and Central A/C** – encourages residential customers to upgrade HVAC equipment to higher energy-efficient SEER rating standards. Incentives will be available to customers that purchase new equipment with at least a 15 SEER rating. The HVAC incentive will be provided to the customer. All incentives paid must be in a home at least a year old, the system must be new and not refurbished, and must be installed by a licensed participating contractor.
- **Duct Testing & Repair** – encourages residential customers to improve the efficiency of their existing HVAC systems by testing and sealing leaks in the duct system. Incentives will be paid as a check to the customer. All incentives paid must be in a home at least one year old, the system must be a central ducted system, and must be installed by a licensed participating contractor.
- **HVAC Tune-up** – encourages residential customers to improve the efficiency of their existing central HVAC system by performing tune-up maintenance on heat pumps or central A/C. Incentives will be paid as a check to the customer. All incentives paid must be in a home at least one year old, the system must be a central ducted system, and must be installed by a licensed participating contractor.
- **Insulation Upgrades/Attic Sealing** – encourages residential customers to improve the efficiency of their home by upgrading the attic insulation to R-30 and sealing air leaks in the attic. Incentives will be available to residential customers interested in improving attic insulation levels in their homes. The incentive will be paid as a check to the customer. All incentives paid must be in a home at least one year old, and the insulation must be installed by a licensed participating contractor.
- **Window Replacement** – encourages residential customers to improve the efficiency of their home by replacing old, inefficient windows. Incentives will be paid as a check to the customer. Windows must be installed by a licensed participating contractor.
- **Energy Efficiency Financing** – financing will also be offered to customers to install the recommended energy-saving home improvements.

Financial incentives will be provided to participants for each of the conservation measures promoted within this program. The incentive amounts vary by the type of measure. PEC will

provide incentives based on ECMs completed as outlined in the table below:

Table – Residential Prescriptive Single-Family Incentives

ECM	Prescriptive Rebate \$ per Dwelling	Comment
Duct Testing and Duct Leakage Repair	up to \$60 for the first unit tested up to \$30 for each additional unit at same address Maximum of \$120 per unit (central A/C and heat pumps)	50% of test cost up to \$60 for the first unit tested. 50% of test cost up to \$30 for each additional unit at same address 50% of the repair cost up to a maximum of \$120 per unit
Attic Insulation/Air Sealing	\$375	\$375 to bring insulation level up to a minimum of R-30 (from a minimum of R19 or less) and reduce attic infiltration. \$0.375/Sq Ft up to maximum of \$375 per home
HVAC Maintenance – Level I*	\$45	\$45 to tune-up centrally ducted heat pumps and central AC with condenser coil cleaning.
HVAC Maintenance – Level II*	\$100	\$100 Level I plus correcting refrigerant charge and adjusting air flow.

ECM	Prescriptive Rebate \$ per Dwelling	Comment
HVAC <ul style="list-style-type: none"> - High Efficiency Heat Pump/Central Air Conditioning* - Geothermal Heat Pump 	<p>\$300</p> <p>\$300</p>	<p>\$300 from a 13 SEER to a 15 SEER or higher</p> <p>\$300 from a 17 EER to a 19 EER or higher Geothermal Heat Pump</p>
Window Replacement	Up to \$450 (\$30 per window)	Up to \$450 (\$30 per window) replaced with low E glass, .4/.4 U-Value and SCHG

* Notes: A home is eligible to receive an incentive for each central air conditioner or heat pump installed based on the efficiency level. Maximum of 2 units per dwelling.

Total Program Cost

Year	Amounts
2009	\$ 1,847,509
2010	3,388,651
2011	4,380,807
2012	4,943,509
2013	5,469,907
Total	\$ 20,030,383

Proposed Funding

All program costs will be funded from PEC's general funds, consisting of all sources of capital. These costs will also be subject to cost recovery through a DSM/EE annual cost-recovery rider consistent with the Commission's Rule R8-69(b).

Residential Home Energy Improvement Program

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R8-68(c)(2)(ii) Program Description

Under the Residential Home Energy Improvement Program, Progress Energy Carolinas, Inc. (PEC) offers customers a variety of energy conservation measures designed to increase energy efficiency for existing residential dwellings that can no longer be considered new construction. This program will utilize a network of pre-qualified contractors to install the energy efficiency measures.

The program will utilize a prescriptive menu of measures for each participant depending on the needs and characteristics of the individual homes. The program will be available to all residential customers that meet the Home Energy Improvement Program eligibility criteria.

R8-68(c)(2)(ii) Program Duration

The program is expected to be ongoing with no planned end date.

R8-68(c)(2)(ii) Purpose of Program

This program is being developed in response to higher fuel costs, concern for customer satisfaction and the need for future electric generation. This plan provides PEC's residential customers with a comprehensive portfolio of services to improve their energy efficiency and to encourage their implementation of additional ECMs, thereby reducing peak demand on our system. The Home Energy Improvement Program also seeks to meet the following objectives:

- Improve customer comfort levels through installing energy efficiency measures
- Obtain energy and demand reductions that are significant, permanent and measurable
- Educate customers about opportunities to upgrade their home's energy efficiency
- Enhance contractor awareness of the capabilities of energy-efficient technologies
- Obtain cost-effective demand-side management resources from the marketplace
- Minimize "lost opportunities" in the existing residential market
- Minimize the rate impacts on all PEC customers
- Reach as many customers as possible at minimal cost
- Minimize free ridership (i.e. incentives paid for "non-influenced" home energy improvement)

R8-68(c)(2)(ii) Eligibility Requirements

The residence must be a single family home, at least one year old and must be a residential metered customer of PEC.

The total program participation projections and potential markets for these programs are provided on the following table:

Year	Participation Projection	Eligible Market Potential	% of Eligible Market
2009	5,005	679,048	1%
2010	16,215	694,199	2%
2011	32,576	709,613	5%
2012	51,148	723,795	7%
2013	71,492	738,251	10%

R8-68(c)(2)(ii) Program Impacts

Year	At the Meter		At the Generator	
	Coincident Peak MW Savings	MWh Energy Savings	Coincident Peak MW Savings	MWh Energy Savings
2009	1.2	1,572	1.3	1,666
2010	4.0	5,071	4.2	5,374
2011	8.0	10,049	8.5	10,650
2012	12.2	15,200	12.9	16,109
2013	16.3	20,303	17.2	21,516

Note: Coincident Peak MW Savings are based on year-end participation levels.

R8-68(c)(2)(iii) Costs and Benefits

R8-68(c)(2)(iii)(a) Program Costs

The Company proposes that costs associated with the Home Energy Improvement Program be deferred in account 182.3 "Other Regulatory Assets", until recovered. These costs will include, but are not limited to, all capital costs, including cost of capital and depreciation expenses, administrative costs, implementation costs, incentive payments to program participants, and operating costs. Since this program will produce ongoing benefits, PEC intends to capitalize all related DSM/EE costs incurred, pursuant to G.S. § 62-133.9(d)(1).

Total Program Cost Projections – 5-year Summary

Year	Amounts
2009	\$ 1,847,509
2010	3,388,651
2011	4,380,807
2012	4,943,509
2013	5,469,907
Total	\$ 20,030,383

Program Cost Projections by Type

Year	Program Administration	Communications	Participant Incentives	M&V
2009	\$ 829,489	\$ 297,792	\$ 632,250	\$ 87,977
2010	1,377,274	425,513	1,424,500	161,364
2011	1,796,935	436,212	1,939,050	208,610
2012	2,059,593	446,911	2,201,600	235,405
2013	2,313,975	457,611	2,437,850	260,472
Total	\$ 8,377,266	\$ 2,064,039	\$ 8,635,250	\$ 953,828

The following table contains a summary of total categorized program costs and unitized costs reported on the basis of program benefits.

Cost Element	Cost	Cost/Participant
Program Administration	\$ 8,377,266	\$ 117
Communications	2,064,039	29
Participant Incentives	8,635,250	121
M&V	953,828	13
Total	\$ 20,030,383	\$ 280

R8-68(c)(2)(iii)(b) Consideration to be Offered

Prescriptive Approach (Single-family)

Home Energy Improvement will be implemented using a prescriptive approach for each participant and will utilize various energy education and awareness initiatives such as Custom Energy Reports (CER) (via mail, phone or the Progress Energy website) to identify and solicit installation of energy efficiency measures. Customers do not need to participate in any of the CER types in order to participate in the program.

Energy Conservation Measures (ECMs):

- High-Efficiency Heat Pumps and Central A/C – encourages residential customers to upgrade HVAC equipment to higher energy-efficient SEER rating standards. Incentives will be available to customers that purchase new equipment with at least a 15 SEER rating. The HVAC incentive will be provided to the customer. All incentives paid must be in a home at least a year old, the system must be new and not refurbished, and must be installed by a licensed participating contractor.
- Duct Testing & Repair – encourages residential customers to improve the efficiency of their existing HVAC systems by testing and sealing leaks in the duct system. Incentives will be paid as a check to the customer. All incentives paid must be in a home at least one year old, the system must be a central ducted system, and must be installed by a licensed participating contractor.
- HVAC Tune-up – encourages residential customers to improve the efficiency of their existing central HVAC system by performing tune-up maintenance on heat pumps or central A/C. Incentives will be paid as a check to the customer. All incentives paid must be in a home at least one year old, the system must be a central ducted system, and must be installed by a licensed participating contractor.
- Insulation Upgrades/Attic Sealing – encourages residential customers to improve the

efficiency of their home by upgrading the attic insulation to R-30 and sealing air leaks in the attic. Incentives will be available to residential customers interested in improving attic insulation levels in their homes. The incentive will be paid as a check to the customer. All incentives paid must be in a home at least one year old, and the insulation must be installed by a licensed participating contractor.

- Window Replacement – encourages residential customers to improve the efficiency of their home by replacing old, inefficient windows. Incentives will be paid as a check to the customer. Windows must be installed by a licensed participating contractor.
- Energy Efficiency Financing – financing will also be offered to customers to install the recommended energy-saving home improvements.

Financial incentives will be provided to participants for each of the conservation measures promoted within this program. The incentive amounts vary by the type of measure. PEC will provide incentives based on ECMs completed as outlined in the table below:

Table – Residential Prescriptive Single-Family Incentives

ECM	Prescriptive Rebate \$ per Dwelling	Comment
Duct Testing and	up to \$60 for the first unit tested	50% of test cost up to \$60 for the first unit tested. 50% of test cost
	up to \$30 for each additional unit at same address	up to \$30 for each additional unit at same address
Duct Leakage Repair	Maximum of \$120 per unit (central A/C and heat pumps)	50% of the repair cost up to a maximum of \$120 per unit

ECM	Prescriptive Rebate \$ per Dwelling	Comment
Attic Insulation/Air Sealing	\$375	\$375 to bring insulation level up to a minimum of R-30 (from a minimum of R19 or less) and reduce attic infiltration. \$0.375/Sq Ft up to maximum of \$375 per home
HVAC Maintenance ~ Level I*	\$45	\$45 to tune-up centrally ducted heat pumps and central AC with condenser coil cleaning.
HVAC Maintenance ~ Level II*	\$100	\$100 Level I plus correcting refrigerant charge and adjusting air flow.
HVAC - High Efficiency Heat Pump/Central Air Conditioning* - Geothermal Heat Pump	\$300 \$300	\$300 from a 13 SEER to a 15 SEER or higher \$300 from a 17 EER to a 19 EER or higher Geothermal Heat Pump
Window Replacement	Up to \$450 (\$30 per window)	Up to \$450 (\$30 per window) replaced with low E glass, .4/.4 U-Value and SCHG

* Notes: A home is eligible to receive an incentive for each central air conditioner or heat pump installed based on the efficiency level. Maximum of 2 units per dwelling.

Additional Costs and Benefits

Home Energy Improvement

Year	Total Avoided Costs (\$000)	Participation Incentives (\$000)
2009	\$305	\$632
2010	1,027	\$1,425
2011	1,883	\$1,939
2012	3,143	\$2,202
2013	4,291	\$2,438

R8-68(c)(2)(iii)(c) Service Limitations or Conditions Imposed on non-Participating Customers

The Company has not proposed any conditions or limitations for customers that do not wish to participate in the Residential Home Energy Improvement Program. Participation in the Residential Home Energy Improvement Program is strictly voluntary.

R8-68(c)(2)(iv) Cost Effectiveness Evaluation

The following tables provide a summary of test results for the Residential Home Energy Improvement Program.

PEC has employed four cost effectiveness tests in its evaluation of this program. These examinations consist of the Rate Impact Measure (RIM) test, the Total Resource Cost (TRC) test, the Utility Cost (UC) test, and the Participant test.

Cost-Effectiveness Test	Benefit/Cost Ratio	NPV of Net Benefits (\$000)
RIM	0.919	- \$ 2,189
TRC	1.141	3,086
UC	1.647	9,822
Participant	1.300	4,969

R8-68(c)(2)(v) Communications Costs

PEC will also provide the following types of marketing support for the program:

- Brochures explaining the advantages of participating in PEC's Residential Home Energy Improvement Program
- Direct mail to targeted customers
- Actively participating in various associations, conferences, trade shows, etc
- Recognition for contractors, etc that participate in the program
- Other marketing opportunities that move the retrofit market to higher levels of energy efficiency

Cost of Communications Materials

Year	Brochures & Tradeshow	Printing, data mining, labor	Direct Mail
2009	\$ 27,000	\$ 115,000	\$ 157,000
2010	28,000	272,600	122,000
2011	28,000	282,200	122,000
2012	28,000	301,800	122,000
2013	28,000	308,439	122,000
Total	\$ 139,000	\$ 1,280,039	\$ 645,000

R8-68(c)(2)(vi) Commission Guidelines Regarding Incentive Programs

The Residential Home Energy Improvement Program does not provide any inducement or incentive affecting a residential or other customer's decision to install or adopt natural gas or electric service.

R8-68(c)(2)(vii) Integrated Resource Plan

PEC's Integrated Resource Plan clearly demonstrated a need for peaking and intermediate resources over the next 5-10 years and baseload resources in 10-15 years. Thus, the Residential Home Energy Improvement Program which provides intermediate and baseload benefits is consistent with PEC's Integrated Resource Plan. Given the time required to achieve the results of this program, it must be implemented now in order for the benefits to be realized in the timeframe required. PEC's Integrated Resource Plan noted that PEC is actively pursuing expansion of its demand side management programs as one of the most effective ways to reduce energy costs, offset the need for new power plants, and protect the environment. As part of this

expansion, the PEC Integrated Resource Plan included an aggressive goal to acquire 1,000 MW of additional new demand-side management (DSM) resources within the next ten years. As a part of the residential energy efficiency efforts, the Residential Home Energy Improvement Program is one of the new DSM/EE programs PEC has identified to help meet that goal.

R8-68(c)(2)(viii) Other Information

Not Applicable

R8-68(c)(3) Additional Filing Requirements

R8-68(c)(3)(i)(a) Measure Objectives

This program is being developed in response to higher fuel costs, concern for customer satisfaction and the need for future electric generation. This plan provides PEC's single family residential customers with a comprehensive portfolio of services to improve their energy efficiency and to encourage their implementation of additional ECMs, thereby reducing peak demand on our system. This will be accomplished by reducing the energy requirements of existing homes through fostering the use of installation of higher efficiency HVAC systems, attic insulation and air sealing, duct testing and repair, HVAC tune ups, and providing incentives for window replacements.

R8-68(c)(3)(i)(b) Total Market Potential

Year	Participation Projection	Eligible Market Potential	% of Eligible Market
2009	5,005	679,048	1%
2010	16,215	694,199	2%
2011	32,576	709,613	5%
2012	51,148	723,795	7%
2013	71,492	738,251	10%

R8-68(c)(3)(i)(c) Proposed Marketing Plan

PEC will also provide the following marketing:

- Brochures explaining the advantages of participating in PEC's Residential Home Energy Improvement Program.
- Direct mail to targeted customers.
- Actively participating in various associations, conferences, trade shows, etc.
- Recognition for contractors, etc that participate in the program.
- Other marketing opportunities that move the retrofit market to higher levels of energy efficiency.

R8-68(c)(3)(i)(d) Targeted Market Sector

The Company is targeting residential customers in single family homes.

R8-68(c)(3)(i)(e) Estimated Market Growth Throughout Life of Measure

The market growth relative to this measure is dependent on three factors. The first factor is incremental cost to the customer, the second is the extent of available program funding, and the third is the level of governmental mandates involving building codes and appliance/device efficiencies.

R8-68(c)(3)(i)(f) Estimated Summer and Winter Peak Demand Reductions

The following table provides the estimated coincident summer peak demand reduction by participant and for the system as a whole. These values are generation based.

Year	Summer Load		Winter Load*	
	Per Participant (KW)	Total System (MW)	Per Participant (KW)	Total System (MW)
2009	0.259766	1.3	NA	NA
2010	0.261185	4.2	NA	NA
2011	0.261237	8.5	NA	NA
2012	0.252383	12.9	NA	NA
2013	0.240927	17.2	NA	NA

**To be determined through M&V process*

R8-68(c)(3)(i)(g) Estimated Energy Reductions

The following table provides the estimated annual energy reduction by participant and for the system as a whole. These values are generation based.

Year	Energy Reductions	
	Per Participant (KWH)	System Wide (MWH)
2009	333	1,666
2010	331	5,374
2011	327	10,650
2012	315	16,109
2013	301	21,516

R8-68(c)(3)(i)(h) Estimated Lost Energy Sales

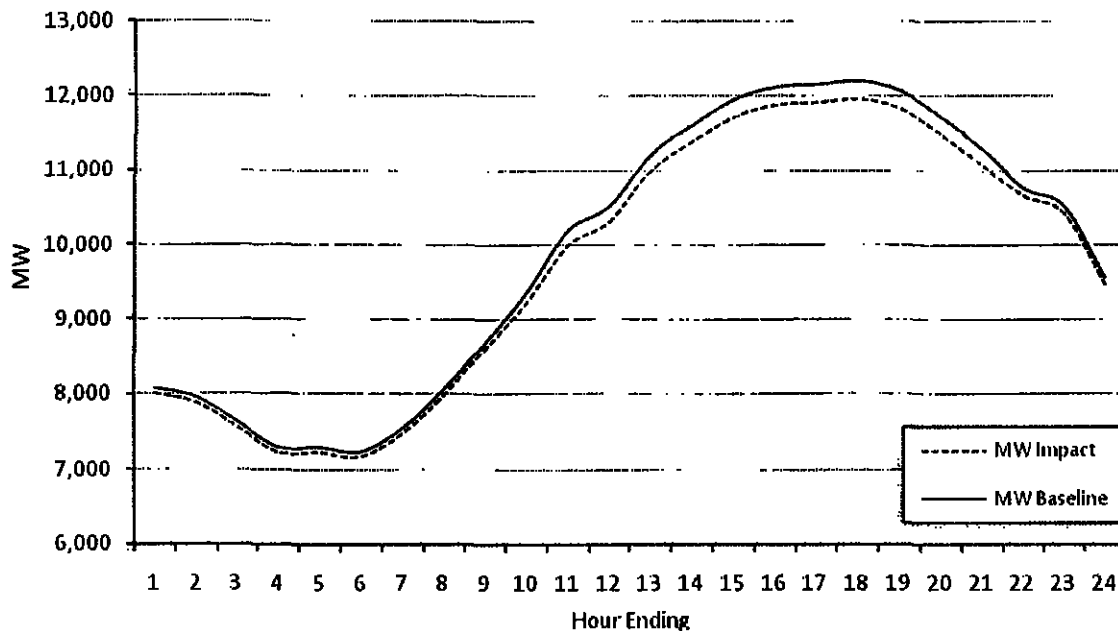
The following table provides the estimated value of annual lost energy sales by participant and for the system as a whole. These values are based at the customers' meters.

Year	Lost Energy Sales	
	\$/Participant	System Wide (\$000)
2009	\$ 32	\$ 159
2010	33	542
2011	32	1,043
2012	32	1,621
2013	31	2,212

R8-68(c)(3)(i)(i) Estimated Load Shape Impacts

The focus of this program is on reducing energy consumption year-round and through decreasing system peak demands. This program is targeted system-wide and emphasizes the summer demand peak.

Illustrative Example of System Summer Peak



R8-68(c)(3)(i)(j) Market Barriers to the Program Proposal and Mitigation Efforts

Based on past experience some of the largest barriers to implementing high efficiency in Residential Home Energy Improvement are the following:

- First cost to customer – use of financial incentives and low cost financing will be offered to offset this barrier.
- Awareness of the program – mass and targeted advertising will be used to create awareness around the program. Many of the messages will communicate the environmental benefits of demand side management programs and the potential for energy savings
- Timing – Lost opportunity

R8-68(c)(3)(i)(k) Description of Program Evaluation, Measurement, and Verification

PEC plans to use an independent, third-party consultant specializing in the measurement and verification of energy efficiency program impacts to provide the appropriate M&V support. An RFP process will be used to identify and select the consultant, who will then be responsible for developing and implementing an evaluation plan designed to measure the program's impact. Once developed, PEC will provide a copy the final evaluation plan and subsequent reports to the Commission.

R8-68(c)(3)(i)(I) Description of the Methods Used to Produce Program Impact Estimates

To determine its estimated program impacts, the Company has relied upon experience gathered through the deployment of past and pilot programs, from the program experience of other utilities and from the preliminary NC DSM joint measures database.

R8-68(c)(3)(ii) Costs and Benefits

R8-68(c)(3)(ii)(a) Description of Actual and Estimated Program Costs to be Recovered Through DSM/EE Rider

PEC's estimated program costs for the Residential Home Energy Improvement Program are provided in the table below:

Estimate of Program Costs to be Recovered through DSM/EE Rider

Year	Program Administration	Communications	Participant Incentives	M&V	Total
2009	\$829,489	\$297,792	\$632,250	\$87,977	\$1,847,508
2010	1,377,274	425,513	1,424,500	161,364	3,388,651
2011	1,796,935	436,212	1,939,050	208,610	4,380,807
2012	2,059,593	446,911	2,201,600	235,405	4,943,509
2013	2,313,975	457,611	2,437,850	260,472	5,469,908
Total	\$8,377,266	\$2,064,039	\$8,635,250	\$953,828	\$20,030,383

In addition to these amounts, PEC will also recover a return on and of the outstanding deferred balance [R8-69(b)(6)] and an appropriate incentive described later in this filing.

R8-68(c)(3)(ii)(b) Estimate of Avoided Capacity and Energy Costs

Year	Avoided Capacity Costs (\$000)	Avoided Capacity Cost / kW	Avoided Energy Costs (\$000)	Avoided Energy Costs / MWH	Total Avoided Costs (\$000)
2009	\$ 146	\$ 113	\$ 159	\$ 95	\$ 305
2010	495	117	533	99	1,027
2011	1,031	121	852	80	1,883
2012	1,623	126	1,520	94	3,143
2013	2,246	130	2,045	95	4,291

R8-68(c)(3)(ii)(c) Estimate of Participation Incentives

Home Energy Improvement Program	Participant Incentives	Incentive / Participant
2009	\$ 632,250	\$ 126
2010	1,424,500	127
2011	1,939,050	119
2012	2,201,600	119
2013	2,437,850	120
Total	\$ 8,635,250	\$121

R8-68(c)(3)(ii)(d) Cost Allocation

The appropriate selection of cost allocation methodology is currently being addressed in Commission Docket No. E-2, Sub 931. The Company will employ the cost allocation methodology approved as a part of that proceeding.

R8-68(c)(3)(ii)(e) Proposed Capitalization Period for Long Lived Program Costs

PEC has determined that a ten-year capitalization period is appropriate for costs associated with the Residential Home Energy Improvement Program.

R8-68(c)(3)(iii) Measurement and Verification (M&V) Reporting Plan

PEC plans to use an independent, third-party consultant specializing in the measurement and verification of DSM/EE program impacts to provide the appropriate M&V support. An RFP process will be used to identify and select the consultant, who will then be responsible for developing and implementing an evaluation plan designed to measure the demand and energy impacts of the program. Once developed, PEC will provide a copy of the final evaluation plan and subsequent reports to the Commission.

An overview of the anticipated M&V process is as follows.

Objectives

M&V activities will provide independent, third-party validation of energy and peak demand savings estimates developed from program records. Specific objectives include the following:

- Ensure that program databases are supported by paper or electronic records of transactions and reflect actual installations of energy efficient equipment and designs.
- Determine to what degree program-supported equipment, measures, and designs are being employed.
- Support program planning, verify pre-program estimates, and update cost-effectiveness evaluations.

PEC and its consultant will apply industry-accepted methods and be guided by the M&V section of the California evaluation protocols¹ and by the International Performance Measurement and Verification Protocol (IPMVP)². These guidelines describe how field measurements and data collection can be conducted to support impact evaluations in a manner that is accurate, consistent, and transparent.

¹ *California Energy Efficiency Evaluation Protocols: Technical, Methodological and Reporting Requirements for Evaluation Professionals*, California Public Utilities Commission, April 2006.

² *International Performance Measurement and Verification Protocol: Concepts and Options for Determining Energy and Water Savings, Volume I*, Efficiency Valuation Organization, April 2007.

Data Collection and Analysis

Data utilized for M&V will include program databases; paper and electronic records of program-related applications, approvals, and transactions; and telephone survey results and field data collected onsite at participating homes. Since the Residential Home Energy Improvement program promotes prescriptive measures for which PEC plans to use Commission-approved energy and demand savings values, the initial M&V tasks will consist of verification of program records and validation of participation and equipment installation. Savings values and calculations will then be confirmed, and a sample of participants will be surveyed via telephone and onsite visits to verify measure installations and adjust program records as appropriate.

The M&V process is expected to include the following activities³:

1. **Verification that program databases support reported savings.** Program databases account for energy savings by recording customer participation and tracking measure installations. The program database should document these savings in a transparent manner that indicates which homes participated, which measures and equipment were installed, and where the savings came from.
2. **Validation of program data with participant documentation.** Program data must accurately reflect program activity, which will be documented via a variety of mechanisms, possibly including customer/contractor program applications, receipts for equipment purchases, and proof of incentive payments. A sample of participating homes may be selected for which this documentation will be reviewed in order to validate the information contained in program databases.
3. **Confirmation of prescriptive measure savings.** Demand and energy savings for prescriptive measures are calculated primarily as a function of the measure installed (as verified in Step 2). The M&V process will ensure that only valid measures were installed in eligible homes (e.g., duct testing and repair is only eligible for homes with electric heating or cooling). This validation will be performed by reviewing program records, verifying installations through sampling (see Step 4), and confirming that approved savings values are correctly applied to each project.

³ Steps 1 and 2 of this M&V audit process were employed in studies for the Commissions in both California and Texas to review utility energy savings claims. See *Review of AEAP Milestone Incentive Awards, Program Years 1999-2002*, SERA, Inc. and Summit Blue Consulting for the California Public Utilities Commission, September 2004; and *Independent Audit of Texas Energy Efficiency Programs in 2003 and 2004*, Summit Blue Consulting for the Public Utility Commission of Texas, September 2006.

4. **Participant sampling and verification of installations.** Measure performance and equipment installations will be verified through telephone surveys and onsite visits for a sample of participants representing all eligible measure types. The proposed approach is to utilize a “nested” sample in which brief and relatively low-cost telephone surveys are conducted with as many as 100 or more participants, followed by onsite visits with a sub-sample of telephone survey respondents. The telephone surveys provide participant verification that measures were performed and equipment was installed. The highly reliable onsite data can be used to adjust and improve the accuracy of telephone survey data, which can then be used to verify and/or adjust program records and associated savings estimates. Additional verification can also be performed onsite, such as performing blower-door tests to ensure the quality of the attic sealing and the persistence of the measures’ effectiveness over time. This nested approach is an economical way to sample a large number of participants while obtaining reliable data for M&V purposes.

PEC intends to review program records for all participants to identify outlier data and ensure data quality. PEC will oversee the M&V effort to ensure its timely and comprehensive completion. However, the M&V work will be conducted by the independent consultant.

Schedule

PEC intends to file annual reports to update the Commission on program activity, including the number of participating customers and the estimated kW and kWh impact of the program. An RFP will be issued within three months of program implementation to select a qualified, independent contractor to perform the M&V services. The Residential Home Energy Improvement program is expected to have a lag time between program start-up and the performance of energy efficiency measures. Therefore, M&V work on a significant number of homes may not be completed until the second year of the program. Consequently, the first M&V report on the program’s project portfolio is expected approximately 24 to 36 months after startup.

R8-68(c)(3)(iv) Cost Recovery Mechanism

The allocated cost associated with the Residential Home Energy Improvement Program will be recovered in the annual cost-recovery rider on a uniform cents per kWh basis applicable to the benefited rate classes.

R8-68(c)(3)(v) Tariffs or Rates

Not Applicable

R8-68(c)(3)(vi) Utility Incentives

The appropriate method of determining utility incentives and the appropriate levels of utility incentives are currently being addressed in Commission Docket No. E-2, Sub 931. The Company will employ the utility incentive methodology and utility incentive levels approved as a part of that proceeding.

PEC DSM/EE Program Approval Request

Cover Page

Docket No. E-2, Sub 936
Program Name: Residential Home Energy Improvement Program
Program Type: Energy Efficiency
Target Class: PEC Residential Customers
Target End-uses: HVAC, Duct Testing and Repair, Attic Insulation and Air Sealing,
Window Replacement & Building Envelope
Duration: Ongoing

In accordance with North Carolina Utilities Commission Rule R8-68 and the Commission's Orders dated February 29, 2008 and March 13, 2008 in Docket No. E-100, Sub 113, Rulemaking Proceeding to Implement Session Law 2007-397 Senate Bill 3, Progress Energy Carolinas, Inc. (PEC) respectfully submits the attached request for approval of the Energy Efficiency Program Residential Home Energy Improvement.

Program Description

Under the Residential Home Energy Improvement Program, Progress Energy Carolinas, Inc. (PEC) offers customers a variety of energy conservation measures designed to increase energy efficiency for existing residential dwellings that can no longer be considered new construction. This program will utilize a network of pre-qualified contractors to install energy efficiency measures.

The program will utilize a prescriptive menu of measures for each participant depending on the needs and characteristics of the individual homes. The program will be available to all residential customers that meet the Home Energy Improvement Program eligibility criteria.

Consideration to be Offered

Prescriptive Approach (Single-family)

Home Energy Improvement will be implemented using a prescriptive approach for each participant and will utilize various energy education and awareness initiatives such as Custom

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Energy Reports (CER) (via mail, phone or the Progress Energy website) to identify and solicit installation of energy efficiency measures. Customers do not need to participate in any of the CER types in order to participate in the program.

Energy Conservation Measures (ECMs):

- **High-Efficiency Heat Pumps and Central A/C** – encourages residential customers to upgrade HVAC equipment to higher energy-efficient SEER rating standards. Incentives will be available to customers that purchase new equipment with at least a 15 SEER rating. The HVAC incentive will be provided to the customer. All incentives paid must be in a home at least a year old, the system must be new and not refurbished, and must be installed by a licensed participating contractor.
- **Duct Testing & Repair** – encourages residential customers to improve the efficiency of their existing HVAC systems by testing and sealing leaks in the duct system. Incentives will be paid as a check to the customer. All incentives paid must be in a home at least one year old, the system must be a central ducted system, and must be installed by a licensed participating contractor.
- **HVAC Tune-up** – encourages residential customers to improve the efficiency of their existing central HVAC system by performing tune-up maintenance on heat pumps or central A/C. Incentives will be paid as a check to the customer. All incentives paid must be in a home at least one year old, the system must be a central ducted system, and must be installed by a licensed participating contractor.
- **Insulation Upgrades/Attic Sealing** – encourages residential customers to improve the efficiency of their home by upgrading the attic insulation to R-30 and sealing air leaks in the attic. Incentives will be available to residential customers interested in improving attic insulation levels in their homes. The incentive will be paid as a check to the customer. All incentives paid must be in a home at least one year old, and the insulation must be installed by a licensed participating contractor.
- **Window Replacement** – encourages residential customers to improve the efficiency of their home by replacing old, inefficient windows. Incentives will be paid as a check to the customer. Windows must be installed by a licensed participating contractor.
- **Energy Efficiency Financing** – financing will also be offered to customers to install the recommended energy-saving home improvements.

Financial incentives will be provided to participants for each of the conservation measures promoted within this program. The incentive amounts vary by the type of measure. PEC will

provide incentives based on ECMs completed as outlined in the table below:

Table – Residential Prescriptive Single-Family Incentives

ECM	Prescriptive Rebate \$ per Dwelling	Comment
Duct Testing and Duct Leakage Repair	up to \$60 for the first unit tested up to \$30 for each additional unit at same address Maximum of \$120 per unit (central A/C and heat pumps)	50% of test cost up to \$60 for the first unit tested. 50% of test cost up to \$30 for each additional unit at same address 50% of the repair cost up to a maximum of \$120 per unit for homes with ducted electric heat
Attic Insulation/Air Sealing	\$375	\$375 to bring insulation level up to a minimum of R-30 (from a minimum of R19 or less) and reduce attic infiltration. <u>\$0.375/Sq Ft up to maximum of \$375 per home</u>
HVAC Maintenance – Level I*	\$45	\$30 45 to tune-up centrally ducted heat pumps and central AC with condenser coil cleaning.
HVAC Maintenance – Level II*	\$100	\$60 100 Level I plus correcting refrigerant charge and adjusting air flow.

ECM	Prescriptive Rebate \$ per Dwelling	Comment
HVAC		
- High Efficiency Heat Pump/Central Air Conditioning*	\$300	\$300 from a 13 SEER to a 15 SEER or higher
- Geothermal Heat Pump	\$300	\$300 from a 17 EER to a 19 EER or higher Geothermal Heat Pump
Window Replacement	Up to \$450 (\$30 per window)	Up to \$450 (\$30 per window) replaced with low E glass, .4/.4 U-Value and SCHG

* Notes: A home is eligible to receive an incentive for each central air conditioner or heat pump installed based on the efficiency level. Maximum of 2 units per dwelling.

Total Program Cost

Year	Amounts
2009	\$ 1,847,509
2010	3,388,651
2011	4,380,807
2012	4,943,509
2013	5,469,907
Total	\$ 20,030,383

Proposed Funding

All program costs will be funded from PEC's general funds, consisting of all sources of capital. These costs will also be subject to cost recovery through a DSM/EE annual cost-recovery rider consistent with the Commission's Rule R8-69(b).

Residential Home Energy Improvement Program

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R8-68(c)(2)(ii) Program Description

Under the Residential Home Energy Improvement Program, Progress Energy Carolinas, Inc. (PEC) offers customers a variety of energy conservation measures designed to increase energy efficiency for existing residential dwellings that can no longer be considered new construction. This program will utilize a network of pre-qualified contractors to install the energy efficiency measures.

The program will utilize a prescriptive menu of measures for each participant depending on the needs and characteristics of the individual homes. The program will be available to all residential customers that meet the Home Energy Improvement Program eligibility criteria.

R8-68(c)(2)(ii) Program Duration

The program is expected to be ongoing with no planned end date.

R8-68(c)(2)(ii) Purpose of Program

This program is being developed in response to higher fuel costs, concern for customer satisfaction and the need for future electric generation. This plan provides PEC's residential customers with a comprehensive portfolio of services to improve their energy efficiency and to encourage their implementation of additional ECMs, thereby reducing peak demand on our system. The Home Energy Improvement Program also seeks to meet the following objectives:

- Improve customer comfort levels through installing energy efficiency measures
- Obtain energy and demand reductions that are significant, permanent and measurable
- Educate customers about opportunities to upgrade their home's energy efficiency
- Enhance contractor awareness of the capabilities of energy-efficient technologies
- Obtain cost-effective demand-side management resources from the marketplace
- Minimize "lost opportunities" in the existing residential market
- Minimize the rate impacts on all PEC customers
- Reach as many customers as possible at minimal cost
- Minimize free ridership (i.e. incentives paid for "non-influenced" home energy improvement)

R8-68(c)(2)(ii) Eligibility Requirements

The residence must be a single family home, at least one year old and must be a residential metered customer of PEC.

The total program participation projections and potential markets for these programs are provided on the following table:

Year	Participation Projection	Eligible Market Potential	% of Eligible Market
2009	5,005	679,048	1%
2010	16,215	694,199	2%
2011	32,576	709,613	5%
2012	51,148	723,795	7%
2013	71,492	738,251	10%

R8-68(c)(2)(ii) Program Impacts

Year	At the Meter		At the Generator	
	Coincident Peak MW Savings	MWh Energy Savings	Coincident Peak MW Savings	MWh Energy Savings
2009	1.2	1,572	1.3	1,666
2010	4.0	5,071	4.2	5,374
2011	8.0	10,049	8.5	10,650
2012	12.2	15,200	12.9	16,109
2013	16.3	20,303	17.2	21,516

Note: Coincident Peak MW Savings are based on year-end participation levels.

R8-68(c)(2)(iii) Costs and Benefits**R8-68(c)(2)(iii)(a) Program Costs**

The Company proposes that costs associated with the Home Energy Improvement Program be deferred in account 182.3 "Other Regulatory Assets", until recovered. These costs will include, but are not limited to, all capital costs, including cost of capital and depreciation expenses, administrative costs, implementation costs, incentive payments to program participants, and operating costs. Since this program will produce ongoing benefits, PEC intends to capitalize all related DSM/EE costs incurred, pursuant to G.S. § 62-133.9(d)(1).

Total Program Cost Projections – 5-year Summary

Year	Amounts
2009	\$ 1,847,509
2010	3,388,651
2011	4,380,807
2012	4,943,509
2013	5,469,907
Total	\$ 20,030,383

Program Cost Projections by Type

Year	Program Administration	Communications	Participant Incentives	M&V
2009	\$ 829,489	\$ 297,792	\$ 632,250	\$ 87,977
2010	1,377,274	425,513	1,424,500	161,364
2011	1,796,935	436,212	1,939,050	208,610
2012	2,059,593	446,911	2,201,600	235,405
2013	2,313,975	457,611	2,437,850	260,472
Total	\$ 8,377,266	\$ 2,064,039	\$ 8,635,250	\$ 953,828

The following table contains a summary of total categorized program costs and unitized costs reported on the basis of program benefits.

Cost Element	Cost	Cost/Participant
Program Administration	\$ 8,377,266	\$ 117
Communications	2,064,039	29
Participant Incentives	8,635,250	121
M&V	953,828	13
Total	\$ 20,030,383	\$ 280

R8-68(c)(2)(iii)(b) Consideration to be Offered

Prescriptive Approach (Single-family)

Home Energy Improvement will be implemented using a prescriptive approach for each participant and will utilize various energy education and awareness initiatives such as Custom Energy Reports (CER) (via mail, phone or the Progress Energy website) to identify and solicit installation of energy efficiency measures. Customers do not need to participate in any of the CER types in order to participate in the program.

Energy Conservation Measures (ECMs):

- High-Efficiency Heat Pumps and Central A/C – encourages residential customers to upgrade HVAC equipment to higher energy-efficient SEER rating standards. Incentives will be available to customers that purchase new equipment with at least a 15 SEER rating. The HVAC incentive will be provided to the customer. All incentives paid must be in a home at least a year old, the system must be new and not refurbished, and must be installed by a licensed participating contractor.
- Duct Testing & Repair – encourages residential customers to improve the efficiency of their existing HVAC systems by testing and sealing leaks in the duct system. Incentives will be paid as a check to the customer. All incentives paid must be in a home at least one year old, the system must be a central ducted system, and must be installed by a licensed participating contractor.
- HVAC Tune-up – encourages residential customers to improve the efficiency of their existing central HVAC system by performing tune-up maintenance on heat pumps or central A/C. Incentives will be paid as a check to the customer. All incentives paid must be in a home at least one year old, the system must be a central ducted system, and must be installed by a licensed participating contractor.
- Insulation Upgrades/Attic Sealing – encourages residential customers to improve the

efficiency of their home by upgrading the attic insulation to R-30 and sealing air leaks in the attic. Incentives will be available to residential customers interested in improving attic insulation levels in their homes. The incentive will be paid as a check to the customer. All incentives paid must be in a home at least one year old, and the insulation must be installed by a licensed participating contractor.

- Window Replacement – encourages residential customers to improve the efficiency of their home by replacing old, inefficient windows. Incentives will be paid as a check to the customer. Windows must be installed by a licensed participating contractor.
- Energy Efficiency Financing – financing will also be offered to customers to install the recommended energy-saving home improvements.

Financial incentives will be provided to participants for each of the conservation measures promoted within this program. The incentive amounts vary by the type of measure. PEC will provide incentives based on ECMs completed as outlined in the table below:

Table – Residential Prescriptive Single-Family Incentives

ECM	Prescriptive Rebate \$ per Dwelling	Comment
Duct Testing and	up to \$60 for the first unit tested	50% of test cost up to \$60 for the first unit tested. 50% of test cost up to \$30 for each additional unit at same address
Duct Leakage Repair	up to \$30 for each additional unit at same address	
	Maximum of \$120 per unit (central A/C and heat pumps)	50% of the repair cost up to a maximum of \$120 per unit for homes with ducted electric heat

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ECM	Prescriptive Rebate \$ per Dwelling	Comment
Attic Insulation/Air Sealing	\$375	\$375 to bring insulation level up to a minimum of R-30 (from a minimum of R19 or less) and reduce attic infiltration. \$0.375/Sq Ft up to maximum of \$375 per home
HVAC Maintenance – Level I*	\$45	\$30 45 to tune-up centrally ducted heat pumps and central AC with condenser coil cleaning.
HVAC Maintenance – Level II*	\$100	\$60 100 Level I plus correcting refrigerant charge and adjusting air flow.
HVAC		
- High Efficiency Heat Pump/Central Air Conditioning*	\$300	\$300 from a 13 SEER to a 15 SEER or higher
- Geothermal Heat Pump	\$300	\$300 from a 17 EER to a 19 EER or higher Geothermal Heat Pump
Window Replacement	Up to \$450 (\$30 per window)	Up to \$450 (\$30 per window) replaced with low E glass, .4/.4 U-Value and SCHG

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* Notes: A home is eligible to receive an incentive for each central air conditioner or heat pump installed based on the efficiency level. Maximum of 2 units per dwelling.

Additional Costs and Benefits

Home Energy Improvement

Year	Total Avoided Costs (S000)	Participation Incentives (S000)
2009	\$305	\$632
2010	1,027	\$1,425
2011	1,883	\$1,939
2012	3,143	\$2,202
2013	4,291	\$2,438

R8-68(c)(2)(iii)(c) Service Limitations or Conditions Imposed on non-Participating Customers

The Company has not proposed any conditions or limitations for customers that do not wish to participate in the Residential Home Energy Improvement Program. Participation in the Residential Home Energy Improvement Program is strictly voluntary.

R8-68(c)(2)(iv) Cost Effectiveness Evaluation

The following tables provide a summary of test results for the Residential Home Energy Improvement Program.

PEC has employed four cost effectiveness tests in its evaluation of this program. These examinations consist of the Rate Impact Measure (RIM) test, the Total Resource Cost (TRC) test, the Utility Cost (UC) test, and the Participant test.

Cost-Effectiveness Test	Benefit/Cost Ratio	NPV of Net Benefits (S000)
RIM	0.919	- \$ 2,189
TRC	1.141	3,086
UC	1.647	9,822
Participant	1.300	4,969

R8-68(c)(2)(v) Communications Costs

PEC will also provide the following types of marketing support for the program:

- Brochures explaining the advantages of participating in PEC's Residential Home Energy Improvement Program
- Direct mail to targeted customers
- Actively participating in various associations, conferences, trade shows, etc
- Recognition for contractors, etc that participate in the program
- Other marketing opportunities that move the retrofit market to higher levels of energy efficiency

Cost of Communications Materials

Year	Brochures & Tradeshows	Printing, data mining, labor	Direct Mail
2009	\$ 27,000	\$ 115,000	\$ 157,000
2010	28,000	272,600	122,000
2011	28,000	282,200	122,000
2012	28,000	301,800	122,000
2013	28,000	308,439	122,000
Total	\$ 139,000	\$ 1,280,039	\$ 645,000

R8-68(c)(2)(vi) Commission Guidelines Regarding Incentive Programs

The Residential Home Energy Improvement Program does not provide any inducement or incentive affecting a residential or other customer's decision to install or adopt natural gas or electric service. ~~While this is a residential retrofit program, participation is not conditioned on fuel source. The program seeks to increase the efficiency of structures independent of fuel choice. These incentives do not cover the entire differential cost; they only assist the customer in making a more efficient decision if an electric appliance or HVAC system is already selected.~~

R8-68(c)(2)(vii) Integrated Resource Plan

PEC's Integrated Resource Plan clearly demonstrated a need for peaking and intermediate resources over the next 5-10 years and baseload resources in 10-15 years. Thus, the Residential Home Energy Improvement Program which provides intermediate and baseload benefits is consistent with PEC's Integrated Resource Plan. Given the time required to achieve the results of this program, it must be implemented now in order for the benefits to be realized in the

timeframe required. PEC's Integrated Resource Plan noted that PEC is actively pursuing expansion of its demand side management programs as one of the most effective ways to reduce energy costs, offset the need for new power plants, and protect the environment. As part of this expansion, the PEC Integrated Resource Plan included an aggressive goal to acquire 1,000 MW of additional new demand-side management (DSM) resources within the next ten years. As a part of the residential energy efficiency efforts, the Residential Home Energy Improvement Program is one of the new DSM/EE programs PEC has identified to help meet that goal.

R8-68(c)(2)(viii) Other Information

Not Applicable

R8-68(c)(3) Additional Filing Requirements

R8-68(c)(3)(i)(a) Measure Objectives

This program is being developed in response to higher fuel costs, concern for customer satisfaction and the need for future electric generation. This plan provides PEC's single family residential customers with a comprehensive portfolio of services to improve their energy efficiency and to encourage their implementation of additional ECMs, thereby reducing peak demand on our system. This will be accomplished by reducing the energy requirements of existing homes through fostering the use of installation of higher efficiency HVAC systems, attic insulation and air sealing, duct testing and repair, HVAC tune ups, and providing incentives for window replacements.

R8-68(c)(3)(i)(b) Total Market Potential

Year	Participation Projection	Eligible Market Potential	% of Eligible Market
2009	5,005	679,048	1%
2010	16,215	694,199	2%
2011	32,576	709,613	5%
2012	51,148	723,795	7%
2013	71,492	738,251	10%

R8-68(c)(3)(i)(c) Proposed Marketing Plan

PEC will also provide the following marketing:

- Brochures explaining the advantages of participating in PEC's Residential Home Energy Improvement Program.
- Direct mail to targeted customers.
- Actively participating in various associations, conferences, trade shows, etc.
- Recognition for contractors, etc that participate in the program.
- Other marketing opportunities that move the retrofit market to higher levels of energy efficiency.

R8-68(c)(3)(i)(d) Targeted Market Sector

The Company is targeting residential customers in single family homes.

R8-68(c)(3)(i)(e) Estimated Market Growth Throughout Life of Measure

The market growth relative to this measure is dependent on three factors. The first factor is incremental cost to the customer, the second is the extent of available program funding, and the third is the level of governmental mandates involving building codes and appliance/device efficiencies.

R8-68(c)(3)(i)(f) Estimated Summer and Winter Peak Demand Reductions

The following table provides the estimated coincident summer peak demand reduction by participant and for the system as a whole. These values are generation based.

Year	Summer Load		Winter Load*	
	Per Participant (KW)	Total System (MW)	Per Participant (KW)	Total System (MW)
2009	0.259766	1.3	NA	NA
2010	0.261185	4.2	NA	NA
2011	0.261237	8.5	NA	NA
2012	0.252383	12.9	NA	NA
2013	0.240927	17.2	NA	NA

**To be determined through M&V process*

R8-68(c)(3)(i)(g) Estimated Energy Reductions

The following table provides the estimated annual energy reduction by participant and for the system as a whole. These values are generation based.

Year	Energy Reductions	
	Per Participant (KWH)	System Wide (MWH)
2009	333	1,666
2010	331	5,374
2011	327	10,650
2012	315	16,109
2013	301	21,516

R8-68(c)(3)(i)(h) Estimated Lost Energy Sales

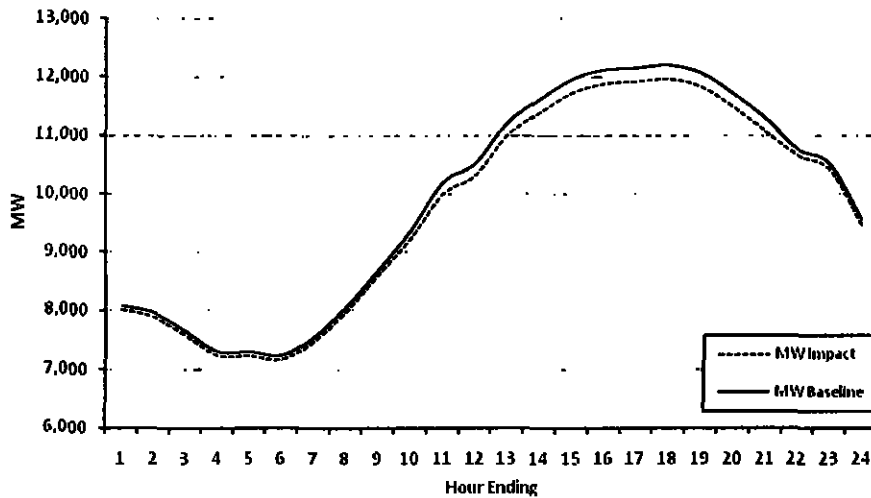
The following table provides the estimated value of annual lost energy sales by participant and for the system as a whole. These values are based at the customers' meters.

Year	Lost Energy Sales	
	\$/Participant	System Wide (\$000)
2009	\$ 32	\$ 159
2010	33	542
2011	32	1,043
2012	32	1,621
2013	31	2,212

R8-68(c)(3)(i)(i) Estimated Load Shape Impacts

The focus of this program is on reducing energy consumption year-round and through decreasing system peak demands. This program is targeted system-wide and emphasizes the summer demand peak.

Illustrative Example of System Summer Peak



R8-68(c)(3)(i)(j) Market Barriers to the Program Proposal and Mitigation Efforts

Based on past experience some of the largest barriers to implementing high efficiency in Residential Home Energy Improvement are the following:

- First cost to customer – use of financial incentives and low cost financing will be offered to offset this barrier.
- Awareness of the program – mass and targeted advertising will be used to create awareness around the program. Many of the messages will communicate the environmental benefits of demand side management programs and the potential for energy savings
- Timing – Lost opportunity

R8-68(c)(3)(i)(k) Description of Program Evaluation, Measurement, and Verification

PEC plans to use an independent, third-party consultant specializing in the measurement and verification of energy efficiency program impacts to provide the appropriate M&V support. An RFP process will be used to identify and select the consultant, who will then be responsible for

developing and implementing an evaluation plan designed to measure the program's impact. Once developed, PEC will provide a copy the final evaluation plan and subsequent reports to the Commission.

R8-68(c)(3)(i)(I) Description of the Methods Used to Produce Program Impact Estimates

To determine its estimated program impacts, the Company has relied upon experience gathered through the deployment of past and pilot programs, from the program experience of other utilities and from the preliminary NC DSM joint measures database.

R8-68(c)(3)(ii) Costs and Benefits

R8-68(c)(3)(ii)(a) Description of Actual and Estimated Program Costs to be Recovered Through DSM/EE Rider

PEC's estimated program costs for the Residential Home Energy Improvement Program are provided in the table below:

Estimate of Program Costs to be Recovered through DSM/EE Rider

<u>Year</u>	<u>Program Administration</u>	<u>Communications</u>	<u>Participant Incentives</u>	<u>M&V</u>	<u>Total</u>
<u>2009</u>	<u>\$829,489</u>	<u>\$297,792</u>	<u>\$632,250</u>	<u>\$87,977</u>	<u>\$1,847,508</u>
<u>2010</u>	<u>1,377,274</u>	<u>425,513</u>	<u>1,424,500</u>	<u>161,364</u>	<u>3,388,651</u>
<u>2011</u>	<u>1,796,935</u>	<u>436,212</u>	<u>1,939,050</u>	<u>208,610</u>	<u>4,380,807</u>
<u>2012</u>	<u>2,059,593</u>	<u>446,911</u>	<u>2,201,600</u>	<u>235,405</u>	<u>4,943,509</u>
<u>2013</u>	<u>2,313,975</u>	<u>457,611</u>	<u>2,437,850</u>	<u>260,472</u>	<u>5,469,908</u>
<u>Total</u>	<u>\$8,377,266</u>	<u>\$2,064,039</u>	<u>\$8,635,250</u>	<u>\$953,828</u>	<u>\$20,030,383</u>

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In addition to these amounts, PEC will also recover a return on and of the outstanding deferred balance [R8-69(b)(6)] and an appropriate incentive described later in this filing.

R8-68(c)(3)(ii)(b) Estimate of Avoided Capacity and Energy Costs

Year	Avoided Capacity Costs (\$000)	Avoided Capacity Cost / kW	Avoided Energy Costs (\$000)	Avoided Energy Costs / MWH	Total Avoided Costs (\$000)
2009	\$ 146	\$ 113	\$ 159	\$ 95	\$ 305
2010	495	117	533	99	1,027
2011	1,031	121	852	80	1,883
2012	1,623	126	1,520	94	3,143
2013	2,246	130	2,045	95	4,291

R8-68(c)(3)(ii)(c) Estimate of Participation Incentives

Home Energy Improvement Program	Participant Incentives	Incentive / Participant
2009	\$ 632,250	\$ 126
2010	1,424,500	127
2011	1,939,050	119
2012	2,201,600	119
2013	2,437,850	120
Total	\$ 8,635,250	\$121

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R8-68(c)(3)(ii)(d) Cost Allocation

The appropriate selection of cost allocation methodology is currently being addressed in Commission Docket No. E-2, Sub 931. The Company will employ the cost allocation methodology approved as a part of that proceeding.

R8-68(c)(3)(ii)(e) Proposed Capitalization Period for Long Lived Program Costs

PEC has determined that a ten-year capitalization period is appropriate for costs associated with the Residential Home Energy Improvement Program.

R8-68(c)(3)(iii) Measurement and Verification (M&V) Reporting Plan

PEC plans to use an independent, third-party consultant specializing in the measurement and verification of DSM/EE program impacts to provide the appropriate M&V support. An RFP process will be used to identify and select the consultant, who will then be responsible for developing and implementing an evaluation plan designed to measure the demand and energy impacts of the program. Once developed, PEC will provide a copy of the final evaluation plan and subsequent reports to the Commission.

An overview of the anticipated M&V process is as follows.

Objectives

M&V activities will provide independent, third-party validation of energy and peak demand savings estimates developed from program records. Specific objectives include the following:

- Ensure that program databases are supported by paper or electronic records of transactions and reflect actual installations of energy efficient equipment and designs.
- Determine to what degree program-supported equipment, measures, and designs are being employed.
- Support program planning, verify pre-program estimates, and update cost-effectiveness evaluations.

PEC and its consultant will apply industry-accepted methods and be guided by the M&V section of the California evaluation protocols¹ and by the International Performance Measurement and Verification Protocol (IPMVP)². These guidelines describe how field measurements and data collection can be conducted to support impact evaluations in a manner that is accurate, consistent, and transparent.

¹ *California Energy Efficiency Evaluation Protocols: Technical, Methodological and Reporting Requirements for Evaluation Professionals*. California Public Utilities Commission, April 2006.

² *International Performance Measurement and Verification Protocol: Concepts and Options for Determining Energy and Water Savings. Volume 1*. Efficiency Valuation Organization, April 2007.

Data Collection and Analysis

Data utilized for M&V will include program databases; paper and electronic records of program-related applications, approvals, and transactions; and telephone survey results and field data collected onsite at participating homes. Since the Residential Home Energy Improvement program promotes prescriptive measures for which PEC plans to use Commission-approved energy and demand savings values, the initial M&V tasks will consist of verification of program records and validation of participation and equipment installation. Savings values and calculations will then be confirmed, and a sample of participants will be surveyed via telephone and onsite visits to verify measure installations and adjust program records as appropriate.

The M&V process is expected to include the following activities³:

1. **Verification that program databases support reported savings.** Program databases account for energy savings by recording customer participation and tracking measure installations. The program database should document these savings in a transparent manner that indicates which homes participated, which measures and equipment were installed, and where the savings came from.
2. **Validation of program data with participant documentation.** Program data must accurately reflect program activity, which will be documented via a variety of mechanisms, possibly including customer/contractor program applications, receipts for equipment purchases, and proof of incentive payments. A sample of participating homes may be selected for which this documentation will be reviewed in order to validate the information contained in program databases.
3. **Confirmation of prescriptive measure savings.** Demand and energy savings for prescriptive measures are calculated primarily as a function of the measure installed (as verified in Step 2). The M&V process will ensure that only valid measures were installed in eligible homes (*e.g.*, duct testing and repair is only eligible for homes with electric heating or cooling). This validation will be performed by reviewing program records, verifying installations through sampling (see Step 4), and confirming that approved savings values are correctly applied to each project.

³ Steps 1 and 2 of this M&V audit process were employed in studies for the Commissions in both California and Texas to review utility energy savings claims. See *Review of AEAP Milestone Incentive Awards, Program Years 1999-2002*, SERA, Inc. and Summit Blue Consulting for the California Public Utilities Commission, September 2004; and *Independent Audit of Texas Energy Efficiency Programs in 2003 and 2004*, Summit Blue Consulting for the Public Utility Commission of Texas, September 2006.

4. **Participant sampling and verification of installations.** Measure performance and equipment installations will be verified through telephone surveys and onsite visits for a sample of participants representing all eligible measure types. The proposed approach is to utilize a “nested” sample in which brief and relatively low-cost telephone surveys are conducted with as many as 100 or more participants, followed by onsite visits with a sub-sample of telephone survey respondents. The telephone surveys provide participant verification that measures were performed and equipment was installed. The highly reliable onsite data can be used to adjust and improve the accuracy of telephone survey data, which can then be used to verify and/or adjust program records and associated savings estimates. Additional verification can also be performed onsite, such as performing blower-door tests to ensure the quality of the attic sealing and the persistence of the measures’ effectiveness over time. This nested approach is an economical way to sample a large number of participants while obtaining reliable data for M&V purposes.

PEC intends to review program records for all participants to identify outlier data and ensure data quality. PEC will oversee the M&V effort to ensure its timely and comprehensive completion. However, the M&V work will be conducted by the independent consultant.

Schedule

PEC intends to file annual reports to update the Commission on program activity, including the number of participating customers and the estimated kW and kWh impact of the program. An RFP will be issued within three months of program implementation to select a qualified, independent contractor to perform the M&V services. The Residential Home Energy Improvement program is expected to have a lag time between program start-up and the performance of energy efficiency measures. Therefore, M&V work on a significant number of homes may not be completed until the second year of the program. Consequently, the first M&V report on the program’s project portfolio is expected approximately 24 to 36 months after startup.

R8-68(c)(3)(iv) Cost Recovery Mechanism

The allocated cost associated with the Residential Home Energy Improvement Program will be recovered in the annual cost-recovery rider on a uniform cents per kWh basis applicable to the benefited rate classes.

R8-68(c)(3)(v) Tariffs or Rates

Not Applicable

R8-68(c)(3)(vi) Utility Incentives

The appropriate method of determining utility incentives and the appropriate levels of utility incentives are currently being addressed in Commission Docket No. E-2, Sub 931. The Company will employ the utility incentive methodology and utility incentive levels approved as a part of that proceeding.