Attachment B Evaluation Plans for Home Energy Savings Refrigerator Recycling FinAnswer Express Energy FinAnswer





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825 NE Multnomah, Suite 2000 Portland, Oregon 97232



August 11, 2006

VIA ELECTRONIC FILING

Ms. Carole J. Washburn Executive Secretary Washington Utilities and Transportation Commission 1300 S. Evergreen Park Drive SW Olympia, WA 98504-7250

Re:

(Advice No. 06-004) PacifiCorp Demand-Side Management filing

Dear Ms. Washburn:

Pursuant to Washington Law, including Sections 80.28.050 and 80.28.060 of the revised Code of Washington and the Commission's Rules and Regulations, PacifiCorp (d.b.a. Pacific Power & Light Company) submits for filing the following proposed tariff sheets. The Company respectfully requests an effective date of September 14, 2006.

Second Revision of Sheet No. 108.2	Schedule 108	Energy Star New Homes Incentive Program
Second Revision of Sheet No. 108.4	Schedule 108	Energy Star New Homes Incentive Program
First Revision of Sheet No. 108.6	Schedule 108	Energy Star New Homes
Original Sheet No. 118.1	Schedule 118	Incentive Program Home Energy Savings Incentive
Original Sheet No. 118.2	Schedule 118	Program Home Energy Savings Incentive Program

The Company is proposing the following:

- 1. a minor administrative change to the existing Energy Star New Homes program and
- 2. a new comprehensive residential incentive program.

Energy Star New Homes program (Schedule 108)

The Company is proposing to modify the heat pump specification from HSPF 9.0/SEER 14 to HSPF 8.5/SEER 13 to address equipment availability issues and to be consistent with the Northwest Energy Efficiency Alliance's (NEEA) most recent Energy Star Homes Northwest certification requirements.

Home Energy Savings Incentive Program

Evaluation Plan

This is a general evaluation plan for the Washington Home Energy Savings Incentive Program (Program) and describes general approaches. The program will initially be offered through 2009 and this evaluation plan describes both process and impact components. Timing and exact scope of one or both of these components will be determined based on measure mix and participation and will align evaluation investments with savings results and program expenditures.

Impact evaluations are a key component in determining cost-effectiveness and will be completed for periods in which the Program operates for a full year. For the period comprising the remainder of 2006, savings magnitude and measure mix for the balance of 2006 will be used to determine approach to the impact evaluation for this period. High percentage savings contributions from local delivery of the Alliance operated program, Savings With A Twist, may indicate the Company impact evaluation focuses more on local verification of their evaluation process instead of replicating their efforts.

Process evaluations will also be undertaken in order to quickly inform the Company of any program administration issues or opportunities. It is anticipated at least one process evaluation will be undertaken during the Program duration, but the need for a process evaluation will be determined by Program results and the Company Program manager. All Program evaluations will be performed by a third party evaluator selected and retained by the company for this specific task.

Overview

The goals of the evaluation are to:

- 1. Estimate actual energy (kWh) and demand (kW) savings
- 2. Analyze Program cost effectiveness
- 3. Assess Program delivery

Impact Evaluation

The impact evaluation will include collecting key data, selecting a statistically valid sample of participants and validating the reported net unit energy savings through appropriate engineering or statistical methods. In addition, activity that would have occurred absent the presence of the program will be estimated and the planning assumptions used for net energy savings will be evaluated. Net program energy savings will be employed to assess program cost-effectiveness. The impact evaluation approach

PacifiCorp's Ten-Year Conservation Potential and 2010-2011 Biennial Conservation Target Report Attachment B Page 4 of 20 may vary by type of measure installed and for each the separate components of the Home Energy Savings Incentive Program.

Measure Verification

PacifiCorp, through its Program Administrator, has a comprehensive quality assurance process in place for this Program consisting of:

Appliance (or any self-installed post purchase measure):

- Qualifying equipment specifications clearly available to customers and retailers throughout Program delivery.
- Incentive application requires address and account number. Program administrator confirms customer eligibility.
- Program administrator review of appliance participant tracking information.
- Program administrator quality control processes.

Post-purchase (equipment or services) with contractor requirement:

- Provide qualifying equipment specifications clearly available to customers and retailers throughout program delivery.
- Provide Program sponsored process for contractors to become program qualified.
- Make contractor installation requirements and list of program qualified contractors clearly available to customers throughout program delivery.
- Insure training, site visits and program requirement information available and used by program qualified contractors.
- Insure incentive applications from both customers and installing contractor require address and account number (customer) or customer name and address (contractor). Program Administrator confirms customer eligibility.
- Program administrator review of appliance participant tracking information.
- Program administrator quality assurance process including some or any of the following: sampling, phone verification and possible on –site inspection of appliance participant projects.

Manufacturer buy-down

- Manufacturer and retailer participation guidelines are available and consistently applied.
- Program administrator and manufacturer agreement on participation percentages by location depending on territory demographics are agreed to and documented.
- Invoice reconciliation is consistent and well documented.

Home Energy Savings Incentive Program Evaluation Plan

• Adequate data is collected at retailer level for Alliance evaluation efforts.

The evaluator will review the quality assurance process to assure that each of these steps has been fully implemented. In addition, the evaluator will independently review a sample of the quality assurance and inspection reports. Based on this review the evaluator will assess the level of additional verification (including on-site) required.

Establishment of Baseline Operating Practices and Efficiency Levels

Determination of what would have happened in the absence of the effort is key in assessing the effects of an efficiency program. Through review of application data, the evaluator will characterize the baseline efficiency levels and operation.

Specifically, the evaluator will characterize:

- Estimated existing and improved equipment efficiency levels.
- Estimated equipment efficiency levels in the absence of this program.

Additional data collection (including site visits) may be conducted to determine whether:

- Original assumptions used in the reported net deemed savings calculations were reasonable
- Measures were installed as planned
- Measures operated as planned
- Quality assurance was appropriate and conducted properly.

Any fundamental differences will be identified and revised savings estimates will be provided.

Savings estimates

Evaluated energy and demand savings will be estimated using one or more of the following methods:

- Unit Energy Consumption (UEC) data bases
- Simulation modeling
- Engineering calculations
- Billing analysis

Conduct Cost-Effectiveness Analysis

The evaluator will conduct a cost-effectiveness analysis incorporating established costeffectiveness tests and analysis methods employing the same methodology and

Home Energy Savings Incentive Program Evaluation Plan

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PacifiCorp's Ten-Year Conservation Potential and 2010-2011 Biennial Conservation Target Report Attachment B Page 6 of 20 analytical model employed in the planning assumptions. Results will be calculated using the values from the Company Integrated Resource Plan (IRP) and the Forward Price Curves used when the Program was initially filed as well as any updates to the values generated from these two sources.

Process Evaluation

In order to inform the Company about issues or opportunities regarding the delivery and administration of the Program, a process evaluation will be conducted on a regular basis. The process evaluation will include interviews with utility staff and participants.

Survey Program Administration and Utility Staff

The evaluator will interview program administration and utility staff regarding:

- Customer application process(es)
- Customer eligibility criteria and the verification process
- Marketing
- Vendor relations
- Program data collection
- Utility, implementer and other program coordination

Participant Survey Design and Implementation

After reviewing applications, the evaluator will complete telephone surveys with Program participants. The aim of the survey will be to determine:

- How each participant learned about the Program
- Their assessment of the value of the Home Energy Savings Incentive Program services
- Impact of the Home Energy Savings Incentive Program services on their energy consumption.
- Satisfaction with the program administrator and incentive application processing.
- Satisfaction with their participation in the Program
- Whether they implemented any additional energy efficiency measures and whether the Program influenced them to do so.

Develop Findings and Recommendations

The evaluator will analyze the collected data and opinions to assess Program strengths, weaknesses, bottlenecks, areas for improvement, and best practices.

Management & Reporting

The evaluator will deliver a draft and final report of findings. The final report will reflect all the comments made by stakeholders. It will provide a complete description of the relevant evaluation objectives and how they were achieved. The final report is to contain the following elements:

- Executive Summary
- Description of the Program, its goals, and objectives
- Statement of the evaluation goals and objectives
- Discussion of methodologies
- Implementation procedures and assumptions for each method
- Data-collection procedures and methods
- Sample design and sample attrition
- Results and their interpretation (demonstrated clearly with charts and tables)

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825 N.E. Multnomah Portland, Oregon 97232 (503) 813-5000



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March 1, 2005

Washington Utilities & Transportation Commission 1300 S. Evergreen Park Drive SW Olympia, Washington, 98504-7250

Attention: Carole Washburn Executive Secretary

RE:

Advice Filing 05-	004
Schedule 107 -	Residential Refrigerator Recycling Program
	Residential Service Optional for Qualifying Customers
Schedule 108 -	Energy Star New Homes Incentive Program
	Residential Service Optional for Qualifying Customers
Schedule 191	System Benefits Charge Adjustment
Schedule 111	Residential Energy Efficiency Program
	Energy Efficient Internet Audit Pilot Program

Pursuant to Washington Law, including Sections 80.82-050 and 80.28.060 of revised Code of Washington and the Commission's Rules and Regulations, PacifiCorp, (d.b.a. Pacific Power & Light Company) submits for electronic filing the following proposed tariff sheets. The Company respectfully requests that the proposed tariffs become effective on April 1, 2005.

Schedule 107, Residential Refrigerator Recycling Program Residential Service Optional for Qualifying Customers, Schedule 108, Energy Star New Homes Incentive Program Residential Service Optional for Qualifying Customers, Schedule 191, System Benefits Charge Adjustment. Also included is an Economic Analysis in Support of this tariff filing which includes program assumptions, cost effectiveness test results, and budget; plus an evaluation plan. This filing also proposes to cancel Schedule 111, Residential Energy Efficiency Program Internet Audit Pilot Program.

Eighteenth Revision of Sheet	No. B.	Tariff Index Sheet
Twenty-Fifth Revision of Sho	eet No. Ba	Tariff Index Sheet
Original Sheet No. 107.1	Schedule 107	Residential Refrigerator Recycling Program Residential Service Optional for Qualifying Customers
Original Sheet No. 108.1	Schedule 108	Energy Star New Homes Incentive Program Residential Service Optional for Qualifying Customers
Original Sheet No. 108.2	Schedule 108	Energy Star New Homes Incentive Program Residential Service Optional for Qualifying Customers



Date:	January 12, 2005
То:	Jim Gilroy
From:	Brian Hedman
Re:	Evaluation Plan for the Washington Appliance Recycling Program

Overview

The objective of this evaluation is to develop an estimate of the energy and demand savings due to the Washington Appliance Recycling Program and its cost effectiveness. A key component in this analysis is the energy consumption of the replaced refrigerators and freezers, or the full-year unit energy consumption (UEC). Secondary data sources are available for estimating the UEC of replaced units.

Because some refrigerator/freezer replacements may have occurred in the absence of this Program, we will include an assessment of the net-to-gross (NTG) ratio.

Task 1: Data Collection

Several refrigerator studies have been carried out in various parts of the country. These reports present a wide array of information. The first step in this task will be to identify relevant reports, review the data and analysis approaches, and document the findings.

Two primary data collection activities will be carried out including:

- 1. Unit energy consumption estimation
- 2. Customer surveys.

Energy Consumption Measurements

A study of energy use for replaced refrigerators and freezers was conducted in support of a similar program sponsored by Southern California Edison (*Refrigerator/Freezer UEC Estimation, 1996 ARCA/SCE Turn-In Program: In Support of XENERGY Inc.'s Evaluation of the*

PacifiCorp's Ten-Year Conservation Potential and 2010-2011 Biennial Conservation Target Report Attachment B Page 10 of 20 1996 Appliance Recycling Program, by John Peterson of Athens Research). This report and Quantec's August 3, 2004, report "Evaluation of the Utah Refrigerator and Freezer Recycling Program," will be used to corroborate the energy savings reported in this Program.

The Program implementer will provide the following information for each unit recycled:

- Customer name and address
- Appliance manufacturer, model number, year, serial number and size

For a minimum of 120 refrigerators and 120 freezers recycled through the Program, the implementer will also provide energy usage information as reported by the Association of Home Appliance Manufacturers (AHAM) for each unit. Degradation curves will be used to estimate the usage based on the age of the unit.

Participant Survey

A survey of participating customers will be undertaken to provide data needed to assess the NTG ratio for the Program and customer satisfaction levels. Table 1 shows the data categories and elements that need to be obtained through the survey. The following describe the data needs:

- 1. *Customer Information*. These data will be acquired to characterize the participants and allow for extrapolation of the results to the entire Program population.
- 2. *Participants' Perceptions and Satisfaction*. These questions will provide information about how the participant became aware of the Program, their satisfaction with its various components and the utility overall, and suggestions for improving Program delivery.
- 3. *Free Riders*. Participants will be asked questions about what they would have been most likely to do with their appliance(s) if they had not participated in the Program and when they would have taken action. The key data from this set of questions will be the proportion of customers who would have permanently removed their old appliance(s) from service, whether the customer has recently purchased a new refrigerator/freezer, how many refrigerators/freezers are in the home and the location of the removed refrigerator/freezer. A series of questions will be needed to clarify the specific actions that would have been taken and improve upon the validity of the responses.
- 4. Unit Replacement. Participants will be asked whether they have or plan to replace the recycled unit and, if so, the manufacturer and model number of the replacement unit.

PacifiCorp's Ten-Year Conservation Potential and 2010-2011 Biennial Conservation Target Report Attachment B Page 11 of 20 Participant Survey Data Collection

Data Category	Data Elemen	le pla		engleret sig Alfanoite sait
Customer Information	Name	 Addr 	ess	
	Household size	 Annu 	ial inco	me
	Head of household age	• Hom	e type	
Program Perceptions	 How did customer become aware 	How did customer become aware of Program?		
and Satisfaction	schedule, communications, imple incentive, overall? • What improvements would custor	What improvements would customer recommend?		
Free-Riders/ Unit Replacement	 How satisfied is customer with Pa What would customer have done refrigerator/freezer without the Pr When would customer have taken How often would refrigerator/free: it had been kept? Was the recycled unit replaced and and model of the replacement unit 	with exist ogram? n action? zer have l nd if so th	ing been oj	perated if

To ensure that results can be estimated to provide a 90% confidence and 10% precision level, two participant surveys (with sample sizes of 100 each) will be conducted – one each year of the Program.

Task 2: Estimate Energy Savings Due to Program

Program energy and demand impacts will be estimated using data collected in Task 1.

In cases where participants recycled an existing appliance but replaced it with a new unit, the savings will be calculated using an average energy consumption value for new units based on refrigerator and freezer energy guide label values. For the proportion of participants who recycled a unit through the Program and did not replace it, gross savings will be the consumption of the recycled unit.

Task 3: Assess Cost Effectiveness

The cost effectiveness of the Program will be calculated using the estimated savings from Task 2. Demand impacts will be calculated taking into account the average demand estimated for refrigerators and freezers from the energy savings of recycled units.

Because of the uncertainties associated with what participants would have done without the Program, it will be desirable to examine alternative assumptions that affect the NTG calculation and calculate a range of savings. Prior studies will be used to define reasonable assumptions that merit examination.

PacifiCorp's Ten-Year Conservation Potential and 2010-2011 Biennial Conservation Target Report Attachment B Page 12 of 20 The value of energy and demand savings will then be estimated by multiplying the savings by the hourly-avoided costs from PacifiCorp's market price forecasts. The product will then be discounted back to the present. From this and the Program cost data, Total Resource Cost test, Utility Cost test, Ratepayer Impact Measure test, and Participant Cost tests will be derived.

Task 4: Report Preparation and Presentation (Years 1, 2)

Quantec will prepare a draft and final report that will summarize the findings of this evaluation at the end of first Program year and at the end of Program. The reports will include the following sections:

• Executive Summary

Impact Evaluation

Background or Introduction

Process Information

Methodology

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Recommendations

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• Appendices (including a bibliography and reference list, clean copies of interview guides and survey instruments, and documentation of any electronic databases)

The evaluation team will provide a draft report to PacifiCorp and will incorporate all comments into the final report.

825 N.E. Multnomah Portland, Oregon 97232 (503) 813-5000



March 31, 2004

VIA FACSIMILE AND FEDERAL EXPRESS (360) 586-1150

Washington Utilities & Transportation Commission 1300 S. Evergreen Park Drive SW Olympia, Washington 98504-7250

Attention: Carole Washburn Executive Secretary

RE:

Advice No 04-03) Schedules 115, 116, 125 - Enhanced DSM Programs

Pursuant to Washington Law, including Sections 80.28.050 and 80.28.060 of the revised Code of Washington and the Commission's Rules and Regulations, PacifiCorp, (dba Pacific Power & Light Company) encloses for filing an original and two copies of proposed tariffs applicable to Pacific Power & Light Company's electric service in the state of Washington.

Twenty-Second Revision of Sheet N	o. Ba	Tariff Index
	Schedule 115	Commercial & Industrial Energy
	And a state of the	Efficiency Incentives
Second Revision of Sheet No. 115.2	Schedule 115	Commercial & Industrial Energy
		Efficiency Incentives
Second Revision of Sheet No. 115.3	Schedule 115	Commercial & Industrial Energy
		Efficiency Incentives
Third Revision of Sheet No. 115.4	Schedule 115	Commercial & Industrial Energy
		Efficiency Incentives
Third Revision of Sheet No. 115.5	Schedule 115	Commercial & Industrial Energy
		Efficiency Incentives
Second Revision of Sheet No. 115.6	Schedule 115	Commercial & Industrial Energy
		Efficiency Incentives
Second Revision of Sheet No. 115.7	Schedule 115	Commercial & Industrial Energy
		Efficiency Incentives
Second Revision of Sheet No. 115.8	Schedule 115	Commercial & Industrial Energy
		Efficiency Incentives
First Revision of Sheet No. 115.9	Schedule 115	
		Efficiency Incentives USA
Second Revision of Sheet No. 115.6 Second Revision of Sheet No. 115.7 Second Revision of Sheet No. 115.8	Schedule 115 Schedule 115 Schedule 115	Commercial & Industrial Energy Efficiency Incentives Commercial & Industrial Energy Efficiency Incentives Commercial & Industrial Energy Efficiency Incentives Commercial & Industrial Energy Efficiency Incentives Commercial & Industrial Energy

Proud Sponsor of the 2002/2004 U.S. Olympic Team The Company proposes using a process similar to the one used in evaluations of the predecessor program to provide estimates of energy and demand savings, and additional activities to assess the effects of the 2004 Program enhancements on customer responses.

The evaluation will be conducted in the following steps.

Step 1: Classify Participating Customer Projects

Customer projects will be placed into one of three categories as shown in Table VII.1. The categories depend on the complexity of the EEMs implemented and the estimated energy savings associated with the project. Category 1 includes the less complex projects (often lighting only) with small or medium energy savings, and medium complexity projects with small energy savings. Category 3 projects are complex with higher estimated energy savings. Category 2 projects are those that fall between the other two categories.

Energy Savings	Category 1: Least (Lighting Only)	Complexity Category 2: Medium	Category 3: Most
Small	· · · · 1	1	2
Medium	1	2	3
Large	2	3	3 .

Table VII.1. Project Categorization

As described below, the energy analysis approach will vary depending on which category each project falls into. The energy savings and complexity thresholds will be determined in a way to ensure that at least 50% of the total energy savings receives the most complete analysis and that Program savings can be estimated with a 90% confidence level and 10% precision.

Step 2: Select Project Data Collection Samples

Data collection for each project will consist of two generic tasks. First, a review of the Company's files and databases will be conducted for all projects. Second, the projects will be stratified into the following sample groups:

• Sample A will consist of all Category 3 (more complex and larger savings) projects and a representative sample of Category 2 projects.

- Sample B will consist of all remaining Category 2 projects and a representative sample of Category 1 (less complex and smaller savings) projects.
- Sample C will consist of all remaining Category 1 projects.

Step 3: Collect Data

Step 3A: Site visits will be conducted for all projects in Sample A. These visits will document and verify installed measures and operating conditions, and document any changes from the assumptions used in the Company's energy savings analysis.

Telephone interviews will be conducted with customer contacts for all sites in Sample B. These calls will document and verify measure installation and operating conditions, and document any changes from the assumptions used in the projected energy savings analysis.

The project data for the remaining projects, Sample C, will consist of data in the Company's files and databases.

Step 3B: Interviews will be conducted with a sample of motor dealers, HVAC trade allies, and lighting trade allies in the Pacific Power Energy Efficiency Alliance to document the effect of the program on their sales practices, changes in volume of high-efficiency product sales, influence of the incentive on pricing, and effectiveness of the incentives.

Step 4: Calculate Energy Savings

Evaluation energy savings will be calculated for all projects and measures for projects in Samples A and B, using a two-stage approach. First, the site visits or telephone calls will be used to verify project implementation and determine actual operating parameters, system installation, etc. Second, the original savings estimates will be assessed and modified, as needed, to reflect any observed differences. The assessment and analysis approach used will vary from conducting detailed engineering simulations to verifying the reasonableness of the original analysis, depending on the project and measure type and observed differences. Significant changes will be discussed with the original project engineer and the Company.

Evaluation energy savings for Sample C projects will be estimated using the extrapolation process described below.

Step 5: Compute EEM Realization Rates

Realization rates will be based on the comparison of the evaluation-estimated and original projected savings for all Sample A and B projects. They will be calculated as the ratio of the evaluated savings to projected savings. The realization rates from the directly analyzed projects will be averaged by building type for each EEM. Where possible, attempts will be made to combine results from similar facilities. For some facility types and EEMs, applicable examples may not be available in the same group; in these cases, those from a similar facility will be applied.

Depending on program performance; i.e. participation rates by technology and VMS, these realization rates may be added to a cumulative database of EEM realization rates constructed based on evaluations of the Company's 2002 and 2003 programs. The database can be used to extrapolate to those projects that were not analyzed directly by multiplying the projected savings times the realization rate for the relevant building type and EEM. The directly analyzed savings and the extrapolated savings will be summed to determine the program total evaluated savings and the program realization rate. Results will be summarized by building and measure type.

Step 6: Conduct Cost-Effectiveness Analysis

Cost-effectiveness analyses will then be conducted and the cost-effectiveness tests described in Section VI will be performed.

Step 7: Prepare Evaluation Report

An evaluation report on the Program will be prepared. It will document the energy savings, costs, cost-effectiveness, and findings about Program effects on key market actors and product sales. Individual case studies will be included for a selected number of large projects.

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825 N.E. Multnomah Portland, Oregon 97232 (503) 813-5000



June 5, 2001

Washington Utilities & Transportation Commission 1300 S. Evergreen Park Drive SW Mail Stop: FY-11/7250 Olympia, WA 98504-7250

Attention: Carole Washburn Executive Secretary

RE: Advice Filing 01-01 i Enhanced DSM

Pursuant to Washington Law, including Sections 80.28.050 and 80.28.060 of the revised Code of Washington and the Commission's Rules and Regulations, PacifiCorp (d.b.a., Pacific Power & Light Company) submits for filing an original and three (3) conformed copies of the following proposed tariff sheet. Pursuant to discussions with Staff, the Company respectfully requests that these tariffs become effective on June 28, 2001 with less than statutory notice.

Second Revision of Sheet	Schedule 115
First Revision of Sheet No	Schedule 115
First Revision of Sheet No.	Schedule 115
115.3 First Revision of Sheet No.	Schedule 115
115.4 First Revision of Sheet No.	Schedule 115
115.5 Original Sheet No. 115.6	Schedule 115
Original Sheet No. 115.7	Schedule 115

Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less

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The Company proposes using the six-step process outlined below.

Step 1: Select a Sample of Participants

A sample of participant sites with the largest savings estimates will be selected for analysis. Additional sites will be selected for the analysis based on a stratified random sampling technique. These two techniques must provide a sample of participants that represent *at least* 50% of the total estimated savings from the program and a representative number of Energy Efficiency Measures (EEMs) for the analysis. In addition, the sample should be adequate to provide an estimate of program savings with 90% confidence and 10% precision.

Step 2: Estimate Site Savings for Individual EEMs

Engineering simulation models will be constructed for each of the facilities in the sample. The models will be calibrated to the utility bills. Two models will be developed: the as-built as-operated model, which includes energy savings from EEMs, and the baseline model, which represents the same facility without the EEMs.

Savings will be computed as the difference in energy consumption between the two models when operated under typical weather conditions. In the case where an existing building is retrofitted, the model will be calibrated under both the before- and after-installation conditions. For new construction, the pre-installation conditions are simulated but not calibrated.

In addition, savings for individual measures will also be estimated through specific modeling runs in which one measure at a time will be added to the baseline model.

Step 3: Compute EEM Realization Rates

Realization rates will be based on the comparison of the estimated versus projected savings.

In addition, since 1995 a large cumulative database of EEM realization rates has been constructed. The database will be evaluated to determine which EEMs are relevant for the current evaluation. Relevant realization rates will be used, in conjunction, with the sample based realization rate estimate to assess the overall savings of the program.

Step 4: Average the EEM Realization Rates by Building Type

In this step, ratios will be averaged by building type for each EEM. Where possible, attempts should be made to combine results from similar facilities. For some facility types and EEMs, applicable examples may not be available in the same group, and those from a similar facility will be applied.

Step 5: Extrapolate to the Participant Population

The realization rates from the sample sites will then be used to compute savings for each participant in the population. To compute the adjusted energy savings, planning estimates will be multiplied by the realization rate. Thus, the initial savings estimates will be adjusted based on the average rate of realization (per EEM and building type) observed in the modeled sample.

Step 6: Sum Impact Results for All Participants

Final Program impact results is the sum of the modeled and the extrapolated results. Results will be summarized by state, building type, and measure type.

Cost-effectiveness tests will then be performed using the tests described in Section VI, above.