Calculating the Cost-Effectiveness of Puget Sound Energy's Energy Efficiency Programs

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Prepared By:
Bobette Wilhelm
Sr. Market Analyst

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1. Introduction

1.1. Background

Puget Sound Energy (PSE) has been providing energy efficiency services since the late 1970's and PSE will continue to deliver these services for the foreseeable future. With increasing customer demand for energy, PSE must acquire new resources to meet the needs of our customers over time. Every two years, PSE goes through a process of planning how it will meet expected customer demands over the next twenty years. Though this process, PSE compiles its Integrated Resource Plan (IRP). This plan provides guidance to assist PSE in selecting resources to meet expected energy demands.

Demand side resources (i.e. Energy Efficiency) are some of the cheapest ways for PSE to meet expected customer demand. When selecting which demand side resources to obtain, PSE conducts a series of tests which will assist PSE in determining which demand side resources to acquire compared to the alternative resources available.

Currently, PSE conducts four cost-effectiveness tests; two of the tests, the Utility Cost Test and the Total Resource Cost Test, are primarily of interest in the selection of demand side resources. Each of the four tests views cost-effectiveness from a slighting different perspective. The four tests PSE conducts are: Utility Cost Test (UC), Total Resource Cost Test (TRC), Ratepayer Impact Measurement Test (RIM), and the Participant Cost Test (PCT). These tests measure whether or not the benefits obtained by the demand side resource exceed the costs to obtain the resource.

How these tests are calculated can dramatically impact which demand side resources PSE obtains, whether or not the resources have a positive or negative impact on future customer rates, and if the resources save money for the customers who install items though our demand side resource programs.

1.2. Agreed Conditions

AGREED CONDITIONS FOR APPROVAL OF PUGET SOUND ENERGY, INC.'S 2010-2011 BIENNIAL ELECTRIC CONSERVATION TARGETS UNDER RCW 19.285. DOCKET NO. UE-100177

K. Conditions

(10) **Cost-Effectiveness Test is the Total Resource Cost (TRC) Test**

(a) The Commission uses the TRC, as modified by the Council, as its primary cost-effectiveness test. PSE's portfolio must pass the TRC test. In general, each program shall be designed to be cost-effective as measured by this test. PSE must demonstrate that the cost-effectiveness tests presented in support of its programs and portfolio are in compliance with the cost-effectiveness definition (RCW 80.52.030(7)) and system cost definition (RCW 80.52.030(8)) and incorporate, quantifiable non-energy benefits, the 10 percent conservation benefit and a risk adder consistent with the Council's approach. An outline of the major elements of the Council's methodology for determining achievable conservation potential, including the Total Resource Cost test, is available on the Council's website at http://www.nwcouncil.org/energy/powerplan/6/supplycurves/I937/CouncilMethodology_outline%20_2_.pdf.

(b) In addition to the Council-modified TRC, PSE must provide portfolio calculations of the Program Administrator Cost test (also called the Utility Cost test), Ratepayer Impact Measure test, and Participant Cost test described in the National Action Plan for Energy Efficiency's study "Understanding Cost-effectiveness of Energy Efficiency Programs." The study is available on the Web site of the United States Environmental Protection Agency at http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf.

(c) Overall conservation cost-effectiveness must be evaluated at the portfolio level. Costs included in the portfolio level analysis include conservation-related administrative costs. For the additional cost-effectiveness tests identified in 10b - PSE must consult with the CRAG to determine when it is appropriate to evaluate measure and program level cost-effectiveness. All cost-effectiveness calculations will assume a Net-to-Gross ratio of 1.0, consistent with the Council's methodology.

2. Overview of Cost-Effectiveness Tests

2.1. Introduction

The four cost-effectiveness tests discussed in this chapter each provide a unique set of information to assist different stakeholders in understanding if the investment in demand side resources is of an overall benefit to them.

At a very basic level, cost-effectiveness tests are performed by calculating the ratio of the net present value of benefits (in dollars) to the net present value of costs.

NPV $\sum$ benefits ÷ NPV $\sum$ costs

Holding all other factors constant, energy efficiency programs which have a benefit-cost ratio greater than one are in the best interest of the stakeholder for whom the ratio was calculated.

2.2. Utility Cost Test

The UC views demand side resource acquisition from the utility's perspective. This test is required for both gas and electric conservation programs. This test determines, from the utility's perspective, whether it is cheaper to purchase the demand side resource than it is to purchase an alternative supply side resource, like building a power plant or purchasing energy off of the open market.

Generally speaking, a benefit-cost ratio of one or greater in the UC is essential for a program to be considered in a demand side resource portfolio. However, there are some exceptions to this rule. State regulations currently allow PSE to run low-income weatherization programs that have a benefit-cost ratio as low as 0.6 when there are significant non-energy benefits which cannot be quantified.

As the name suggests, the UC only considers utility costs and utility benefits for the construction of the benefit-cost ratio. The basic costs and benefits included in the calculation of the test are listed below:

Costs:

1. Program Overhead Cost
    a. Marketing[1]
    b. Outside services[2]
    c. Internal labor & overhead[3]
    d. Miscellaneous expenses related to program activates[4]
2. Incentives provided to customers who purchase an energy efficient application
3. Other program specific costs[5]

Benefits:

1. Avoided cost of energy
    a. Market Cost of Energy
    b. Line losses
    c. Planning adjustments[6]
    d. Incremental cost avoidance of compliance with renewable portfolio standards
2. Avoided costs of capacity
    a. Deferred transmission and distribution (T&D) expense
    b. Total annual fixed cost of generating capacity

[1] Marketing costs include all costs of advertizing, bill inserts, campaigns, radio advertisements, etc.
[2] Many of PSE programs are ran, in part, by outside vendors. Outside services costs include all costs to contractors and vendors, who are not PSE employees, which are incurred by the energy efficiency program.

[3] Internal labor and overhead include all PSE employee expenses and PSE incurred overhead costs

[4] Miscellaneous expenses include any incurred costs for event prizes, car rentals, PSE employee hotel rooms, etc. which are incurred as a result of operating the program.
[5] The costs listed above are standard for all program UC calculations for the exception of cost element three, 'other program specific costs'. Some programs have additional costs associated with them, such as the additional cost of natural gas on an electric to natural gas fuel conversion program. These costs need to be included in the costs for the UC calculation.
[6] Planning adjustment is the value of energy efficiency, in the IRP, which is not accounted for by market prices of energy, capacity, or avoided incremental investments in the Renewable Portfolio Standards.

2.3. Total Resource Cost Test

The TRC views demand side resource acquisition from a total cost and benefit perspective. The test determines the benefit of the demand side resource given the total cost, not simply the acquisition cost to the utility. PSE is required to run the TRC for both gas and electric programs.

As with the UC, a TRC benefit-cost ratio of one or greater is essential for programs to be considered for inclusion in a demand side resource portfolio. However, like the UC, there are also exceptions to this rule. State regulations allow PSE to run low-income weatherization programs which have a benefit cost-ratio as low as 0.6 when there are significant non-energy benefits which cannot be quantified.

The TRC considers all costs, including those incurred by the utility and by the customer. The costs and benefits included in the calculation of the TRC Test are listed below:

Costs:

1. Program Overhead Cost
    a. Marketing
    b. Outside Services
    c. Internal Labor & overhead
    d. Miscellaneous expenses related to program activates
2. Incentives provided to customers to purchase an energy efficient application
3. Tax rebates and other contributions for third parties
4. Customer cost of acquiring the efficient equipment or item, net of any incentives provided by the utility, tax incentives, or other contributions
5. Other Program specific costs

Benefits:

1. Avoided cost of energy
    a. Market Cost of Energy
    b. Line losses
    c. Planning adjustments when applicable
    d. Avoided cost of compliance with renewable portfolio standards
    e. Conservation credit[7]

[7] The conservation credit is a 10% adder for the electric benefits only. It does not apply to gas conservation programs. For more information about the conservation credit, read appendix A.

2. Avoided costs of capacity
    a. Deferred T&D expense
    b. Total annual fixed cost of generating capacity
    c. Conservation credit
3. Non-energy related benefits[8]

For the majority of programs, the benefit-cost ratio calculated through the TRC will be smaller than the ratio developed through the UC. This has to do with adding the additional customer costs, which typically are far greater than, thus outweighing, the addition of the conservation credit to the benefits in the TRC.

The benefit-cost ratio in the TRC may be higher than the ratio developed in the UC for programs with little to no customer cost. In these cases, the conservation credit, which is added to the benefits in the TRC, outweighs the small contribution of customer costs.

In theory, programs where non-energy benefits are significant and quantifiable, the benefit-cost ratio of the TRC can be far greater than the ratio developed though the UC. However, most non-energy related benefits are difficult to quantify in the majority of programs, and often times the non-energy benefit is not included in the calculation of the TRC.

PSE recognizes that many of our programs also save water. However, PSE does not currently invest the effort into trying to quantify non-energy benefits for programs that pass the TRC using only energy benefits. For the Low Income Weatherization Program, the value of health and safety measures was included as a non-energy benefit for the 2012-2013 gas cost-effectiveness calculations.

2.4. Ratepayer Impact Measure Test

The use of the RIM is new to PSE in 2012-2013 program planning. Unlike the UC and the TRC, the RIM does not have hard and fast decision making criteria for program selection. Instead, it is an attempt to understand how the demand side resource program impacts ratepayers. The RIM is required for PSE's electric portfolio evaluation only. It is not required for the gas energy efficiency cost-effectiveness analyses.

The costs and benefits included in the calculation of the RIM Test are listed below:

[8] Non-Energy Benefits include savings on non-energy related items. These include items like costs savings on water for low-flow showerheads.

Costs:

1. Program Overhead Cost
    a. Marketing
    b. Outside services
    c. Internal labor & overhead
    d. Miscellaneous expenses related to program activates
2. Incentives provided to customers to purchase an energy efficient application
3. Lost utility revenues due to demand side resource
4. Other program specific costs

Benefits:

1. Avoided cost of energy
    a. Market cost of energy costs at market
    b. Line losses
    c. Planning adjustments when applicable
    d. Avoided cost of compliance with renewable portfolio standards
    e. Conservation credit
2. Avoided costs of capacity
    a. Deferred T&D expense
    b. Total annual fixed costs of generating capacity

2.5. Participant Cost Test

The final test, the PCT is also new to PSE beginning with the 2012-2013 program planning. This test compares the customer costs of purchasing the efficient equipment to the customers' associated utility bill savings. Essentially, this test allows the utility to understand if the investment in the efficient equipment pays off for the customer.

The PCT considers all customer costs and bill savings, ignoring all utility incurred costs and utility benefit. This test is required for the electric portfolio evaluation only; it is currently not required for gas energy efficiency program cost-effectiveness evaluations. The costs and benefits included in the calculation of the PCT are listed below:

Costs:

1. Equipment costs

Benefits:

1. Bill savings
2. Program incentives
3. Applicable tax credits or incentives
4. Non-energy benefits which are incurred by the customer[9]

3. Key Drivers of the Cost-Effectiveness Calculations

3.1. Framework for Cost-Effectiveness Calculations

Cost-effectiveness calculations have several key drivers, which include: the avoided cost of energy, the avoided costs of capacity, program overhead costs, customer costs, program incentives, non-energy benefits, measure life, the load shape used in the calculation of avoided costs, and the discount rate used for calculating the present value of benefits and costs.

Each of the major drivers to the outcome of the cost-effectiveness calculations are discussed below.

3.2. Avoided Cost of Energy & Capacity

Avoided costs of energy and capacity are the main driver of the benefits that are included in PSE's cost-effectiveness calculations for energy efficiency programs. Higher avoided costs of energy and capacity make energy efficiency programs more attractive to PSE and more cost-effective for the utility, all other things being equal.

Because avoided costs are developed for individual end-use types, each end-use will be impacted differently by changes in energy costs[10]. In addition, changes in the avoided cost of capacity will impact the cost-effectiveness of energy of programs differently. Programs which save energy from heating-related efficiency upgrades will be impacted significantly by changes in the avoided cost of capacity because they have a higher coincident savings (savings on peak) than programs that save

[9] The participant cost test only considers non-energy benefits which are incurred by the customer, such as water savings. Non-Energy benefits that are not directly incurred by the customer cannot be included in the participant cost test.

[10] If, for example, winter prices of energy increase but summer prices remain the same, the avoided costs of space heat measures will increase more dramatically than the avoided energy costs of water heating measures, with no impact on residential air conditioning avoided energy costs.

energy in the summer[11]. Changes in the avoided cost of capacity will have relatively little impact on energy efficiency programs which provide low savings in the peak hours.

Avoided costs of capacity are a function of the cost of building capacity resources for peak load and the load shape of the measure being assessed in the avoided cost calculation. PSE's peak load typically occurs during the weekday mornings or evenings during the month of December. For equipment where loads coincide with peak hours, capacity costs are included in the avoided costs.

Space heating measures have a higher coincidence with peak than non-heating related measures, such as lighting. Therefore, the avoided costs of capacity have a much greater impact on space heat measures than they do on measures which are used at a fairly constant rate throughout the year. This is because a larger portion of the total load for space heating measures coincides with times where PSE is paying for peak resources.

3.3. Program Overhead Costs

Program overhead costs consist of all costs incurred to run an efficiency program, except those that are incentive-related. Program overhead costs consist of marketing costs, expenses incurred for outside services, internal labor and labor overhead costs, and miscellaneous expenses[12] related to other costs of program activity.

Program overhead costs have a direct impact on the cost-effectiveness of the related energy efficiency programs. All else equal, an increase in program overhead costs will decrease the cost-effectiveness of efficiency programs. Controlling program over head costs is one of the few ways for program managers to influence the outcome of a cost-effectiveness calculation.

3.4. Measure Costs

Like program overhead costs, measure costs have a direct impact the outcome of the cost-effectiveness calculations. To the extent that total measure costs influence the incentive provided by the utility, thus impacting the customer cost, the measure cost impacts all of the tests discussed in this document. All other things equal, an increase in the cost of a measure will decrease the benefit-cost ratio in the cost-effectiveness tests.

3.4.1. Incremental Cost or Full Measure Cost

For the calculation of benefit-cost ratios, PSE considers either the full measure cost or the incremental measure cost, depending on the item being offered though the energy efficiency programs and the delivery mechanism where the rebate occurs.

[11] PSE plans for a winter peak, not for a summer peak.

[12] Miscellaneous expenses refer to non-typical program expenses such as travel, gift cards for program participants, ect.

The majority of participants in PSE efficiency programs receive rebates when they are replacing old, worn equipment such as a furnace, water heater, or light bulbs. For these programs, PSE uses the incremental measure cost when calculating the benefit-cost ratios. The incremental measure cost is defined as the cost difference between the piece of equipment installed though the PSE program and the item the customer would have installed without program intervention. The cost associated with the item which would have been installed without program intervention is assumed to have occurred without the program. Therefore, it's not prudent to include the entire cost of the efficient equipment in the cost-effectiveness test.

For programs where customers receive rebates to add a new item to their home or make large changes to existing items which are fully functioning, PSE utilizes the full measure cost when calculating the benefit-cost ratios. Examples of measures for where the full measure costs are used include insulation, windows, and some early replacement programs[13].

3.4.2. Incentive

The incentive amount provided by the utility has no impact on the TRC because this test uses the full or incremental cost, both of which include the incentive and customer cost when calculating the benefit-cost ratio. A change in the incentive will change the cost to the customer, but the total or incremental cost will remain the same.

However, the incentive provided by the utility has a direct impact on the outcome of the Utility Cost Test, RIM Test and Participant Cost Test. When incentives are increased, all else equal, the benefit-cost ratio of the UC and the RIM will decrease, since this will increase the cost to the utility and/or ratepayers with no change in the level of benefits. On the other hand, incentives are included in the numerator (benefits) of the PC. When the utility increases incentives, energy efficient equipment becomes more cost-effective for customers, all else equal.

[13] In 2011, PSE is launching an early refrigerator replacement program. This program removes older, working refrigerators from customer homes and replaces them with new, efficient refrigerators. Because the customer was not going to purchase a refrigerator without the help of this program, incremental measure costs is non-existent. Therefore, full measure cost is considered for cost-effectiveness analyses of this program.

3.4.3. Customer Cost

Customer costs are those costs that the customer pays for the item being installed. For programs that have cost-effectiveness tests which use a full measure cost, the customer cost is the full measure cost minus the incentive provided to the customer. For programs that have cost-effectiveness tests which use the incremental measure cost, the customer cost is the incremental cost minus the incentive provided to the customer. There are a small number of programs which offer incentives greater than the incremental measure cost, and where the incremental (not the full) measure cost is used on the cost-effectiveness analyses. For these programs, customer costs are set to zero.

The customer cost associated with a measure offered though PSE efficiency programs does not have an impact on the UC or RIM because customer costs are excluded from these tests. In addition, the customer cost doesn't directly impact the TRC or PC because those tests use either the full measure cost or the incremental cost, both of which include the customer cost, when calculating the benefit-cost ratio.

Customer cost indirectly impact the TRC and the PC in that they are a component of the total or incremental cost of the item being offered though the efficiency programs. For a given level of incentives, an increase in customer cost is a reflection of an increase in total or incremental measure cost. The increase in total or incremental measure cost will decrease the benefit-cost ratios of the TRC and the PC.

3.5. Additional Costs & Benefits (O&M)

To be consistent with the Northwest Power and Planning Council (The Council), additional costs (as well as any cost savings) for operation and maintenance faced by customers installing energy efficient equipment though a PSE program are counted as an additional customer cost for the TRC and PC.

The cost of natural gas in a fuel switching program is an example of additional cost associated with participating in an energy efficiency program. To be consistent with the methodology used by the Council, PSE adds the cost of gas to the total utility cost when calculating the cost-effectiveness of fuel switching programs, which convert PSE electric customer to PSE gas. The reason this cost is not included as an additional customer cost is because it would not be reflected in the UC if the cost of gas was only applied to the customer. In fuel switching programs, PSE is required to purchase more natural gas and that needs to be reflected in the UC as well as the TRC. All else equal, additional operation and maintenance costs faced by the customer will decrease the benefit-cost ratios of the TRC and PCT. Added customer costs will have no impact on the UC or RIM Tests.

3.6. Non-Energy Benefits

Non-energy benefits are defined as all benefits from energy efficiency program which are not energy-related. Examples of these benefits are: water and other resource savings, improved health and safety, fewer shutoff notices for the utility and improved quality of life or product quality. Non-energy benefits are only included in the TRC, but PSE typically only quantifies these for the Low Income Weatherization Program when we have solid documentation. PSE does not typically include non-energy benefits in the TRC for standard programs because they are difficult to quantify and most programs pass the TRC without including the non-energy benefits.

Non-energy benefits can be positive or negative and are always included in the numerator of the test, regardless of the sign. Changes in non-energy benefits are positively correlated with the benefit-cost ratio of the TRC Test increases, all else equal.

3.7. Measure Life

The measure life is the rated useful life of the item(s) being provided though the program. Measure life is typically assessed using Regional Technical Forum[14] guidance or from PSE engineers and program managers who have a significant level of knowledge regarding the item being assessed.

Measure life and the associated benefit-cost ratios are positively correlated for all four of the cost-effectiveness tests conducted by PSE, all else equal.

3.8. End-Use Load Shape

The shape of the load for each measure being assessed in the cost-effectiveness calculations impacts the TRC, RIM, and Utility Cost Tests. Because PSE generally does not offer time-of-use rates, the shape of the load for each measure being assessed does not impact the Participant Cost Test.

PSE calculates avoided costs using multiple inputs. The avoided costs are higher for those items which have a significant portion of their load occurring in the winter. Because winter saving typically coincide with the system peak, which increases the avoided capacity cost, items which save energy in the winter are assigned a higher value for avoided capacity costs.

[14] The Regional Technical Forum (RTF) is an advisory committee which was developed in 1999 to develop standards for the evaluation of conservation savings.

3.9. Discount rate

For the 2012-2013 program years, the discount rate for PSE efficiency program avoided costs is set at 8.10%. This discount rate is the most recently approved rate of return on rate base ("ROR") by PSE's state regulators (in the 2009 General Rate Case) and was used in the development of the 2011 Integrated Resource Plan. As utility discount rates increase, the present value of avoided costs decreases. All else equal, an increase in the discount rate decreases the benefit-cost ratios of PSE's cost effectiveness tests. This discount rate is used for the avoided costs of energy and capacity in the UC, the TRC, and the RIM. The PC does not consider utility avoided costs.

3.1. Summary of Key Drivers

Key Driver	Direction of Key Driver	Direction of Benefit-Cost Ratios			
		TRC	UC	RIM	PCT
Avoided Energy and Capacity Costs	↓	↓	↓	↓	↓
	↑	↑	↑	↑	↑
Program Overhead Costs for the utility	↓	↑	↑	↑	N/A[15]
	↑	↓	↓	↓	N/A
Measure Cost	↓	↑	N/A[16]	N/A	↑
	↑	↓	N/A	N/A	↓
Incentive	↓	N/A	↑	↑	↓
	↑	N/A	↓	↓	↑
Non Energy Benefits	↓	↓	N/A	N/A	↓
	↑	↑	N/A	N/A	↑
Measure Life	↓	↓	↓	Ambiguous	↓
	↑	↑	↑	Ambiguous	↑
Discount Rate	↓	↑	↑	↑	↑
	↑	↑	↑	↑	↓

[15] The Participant Cost Test is not impacted by utility overhead costs because it only considers participant costs and the rebate provided by the utility

[16] The Utility cost and Ratepayer Impact Measure tests are not impacted

4. Constructing Benefit Cost Ratios

4.1. Using Benefit-Cost Ratios for Program Planning

Benefit-cost ratios provide useful information to PSE implementation teams. Programs with high benefit-cost ratios, and low free-ridership rates, are of primary interest for expansion should PSE need to acquire more demand side resources.

Before benefit cost-ratios can be used for program planning, the inputs into the ratios need to be accounted for correctly. This section provides clarification on what to include as non-energy benefits, how to correctly account for additional O&M costs (or cost savings) incurred by the customer, and how to select discount rates for O&M costs (or cost savings) incurred by the customer.

4.2. Accounting for Non-Energy Benefits

When including non-energy benefits in the benefit-cost ratios, always include the benefit in the numerator of the benefit-cost ratio. These benefits should not be included in the UC or RIM. All non-energy benefits which are quantifiable can be included in the TRC. Customer facing non-energy benefits can be counted in the PCT.

Non-energy benefits which cannot be estimated with supporting documentation should not be included in the TRC or the PCT cost effectiveness test.

Moreover, non-energy benefits which are included in the TRC and/or the PCT should be accompanied with supporting documentations and calculations.

4.3. Incorporating Additional Customer Costs

Additional customer incurred costs, which are not included in the cost of the measure being purchased thought the efficiency program, can be negative (cost savings) or positive. If the cost is negative (cost savings), the absolute value of the cost savings should be included in the numerator (non-energy benefit) of the benefit-cost ratio. The cost should be included in the denominator of the benefit-cost ratio whenever the cost is positive (representing an additional cost).

Examples of additional customer costs include the cost of natural gas when participating in an electric to gas fuel conversion program. The added cost of natural gas, for an electric to gas fuel switching program, is difficult to assess. On one hand, the cost of gas can be counted as an additional cost to the customer. On the other hand, the cost of gas can be counted as a cost incurred by the utility.

The UC ignores customer costs, which would exclude the additional cost of gas if counted as a customer cost. Therefore, the additional cost of gas is counted as a utility cost in the UC and placed in the denominator of the benefit-cost ratio. Similarly, because the TRC is a function of the UC, with added customer costs and non-energy benefits, the additional cost of gas for fuel conversion programs is also included as a utility cost and placed in the denominator of the benefit-cost ratio.

For the PCT, the cost of gas from an electric to gas fuel switching program is counted as a customer cost. Therefore, the additional cost of gas is included in the denominator of the Participant Cost Test.

4.4. Applying the Correct Discount rate

The rate used to discount costs or benefits for energy efficiency programs can impact the outcome of the benefit-cost ratios of PSE's cost-effectiveness tests.

When discounting additional costs, nominal discount rates should be used. For additional costs (or savings) faced by the utility, program teams should use PSE's the ROR approved in its most recent General Rate Case as the nominal discount rate.

4.5. Summary of Benefits and Costs to Include in Each Test

TEST	Benefits (NUMERATOR)	Costs (Denominator)
Perspective of Puget Sound Energy		
Utility Cost Test	1. Avoided Energy 2. Avoided Capacity Costs	1. Program Overhead Costs 2. Incentives a
Perspective of All PSE Customers		
Total Resource Cost Test	1. Avoided Energy 2. Avoided Capacity Costs 3. Non-Energy Benefits 4. Additional cost savings from Non-program related Items	1. Program Overhead Costs 2. Incentives 3. Customer Costs (incremental or full measure cost-incentive)
Impact of Efficiency on Non-Participating Rate Payers		
Ratepayer Impact Measurement Test	1. Avoided Energy Costs 2. Avoided Capacity Costs	1. Program Overhead Costs 2. Incentives 3. Customer Costs (incremental or full measure cost-incentive) 4. Lost Revenues due to reduced bills
Perspective of the Customer Installing the Measure		
Participant Cost Test	1. Incentive Payments 2. Bill Savings 3. Applicable Tax Credits 4. Non-Energy Benefits 5. Cost Savings from Non-program related Items (section 5.3)	1. Incremental or full cost of equipment being installed 2. Additional costs from non-program related items (section 5.3)