PACIFIC POWER
A DIVISION OF PACIFICORP

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VIA ELECTRONIC FILING
AND OVERNIGHT DELIVERY

Washington Utilities and Transportation Commission
1300 S. Evergreen Park Drive SW
P.O. Box 47250
Olympia, WA 98504-7250

Attention: David W. Danner
Executive Director and Secretary

RE: **Docket UE-100170 PacifiCorp's Revised Report on its Ten-year Achievable Conservation Potential and its Biennial Conservation Target for 2010 and 2011**

Dear Mr. Danner:

PacifiCorp, d.b.a. Pacific Power ("PacifiCorp" or "Company"), submits this revised report on PacifiCorp's Ten-year Achievable Conservation Potential and 2010 – 2011 Biennial Conservation Target for its Washington Service Area. The Company originally filed its report on January 29, 2010, consistent with WAC 480-109-010(3). This report identifies the Company's revised ten-year achievable conservation potential and biennial conservation target for 2010 and 2011 and describes the process by which they were developed. PacifiCorp files the revised report to incorporate changes resulting from discussions with Washington Utilities and Transportation Commission staff, members of the Company's Demand-side Management Advisory Group, and other interested parties. Please note that Appendices 1 and 2 are voluminous and therefore provided on the enclosed CD.

If you have any questions regarding this report, please contact Cathie Allen, Regulatory Manager, at (503) 813-5934.

Sincerely,

Andrea L. Kelly /ca

Andrea L. Kelly
Vice President, Regulation

Enclosures

PacifiCorp's Ten-Year Conservation Potential and 2010 - 2011 Biennial Conservation Target for its Washington Service Area

PACIFIC POWER
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Introduction

Initiative Measure No. 937, which was passed by Washington voters in 2006 and is codified as RCW 19.285.040 and WAC 480-109, seeks to increase energy conservation in the state of Washington. WAC 480-109 requires each electric utility subject to the jurisdiction of the Washington Utilities and Transportation Commission ("Commission") to project its cumulative ten-year electric conservation potential and to establish biennial conservation targets.

As specified in WAC 480-109-010(1), electric utilities were required to establish their ten-year conservation potential by January 1, 2010. As a means of demonstrating PacifiCorp's ("Company") compliance with this requirement, the Company provided its ten-year conservation potential to the Commission on December 31, 2009[1], which was assigned to Docket No. UE-091982 by the Commission.[2] In determining its ten-year conservation potential, WAC 480-109-010(1) states that a utility need only consider conservation resources that are cost-effective, reliable and feasible. The sources from which a utility may derive its conservation potential are: a) the utility's most recent Integrated Resource Plan or b) the utility's proportionate share of the Northwest Power and Conservation Council's ("Council") current Northwest Power Plan[3] ("regional power plan") targets for the state of Washington.

In establishing its biennial conservation target, WAC 480-109-010(2) states that: a) the target must identify all achievable conservation opportunities, b) the target must be no lower than a pro rata share of the utility's cumulative achievable ten-year conservation potential and c) the target may be a range as opposed to an exact target. WAC 480-109-010(3) requires that on or before January 31, 2010 and every two years thereafter, each electric utility must file with the Commission a report identifying its ten-year achievable conservation potential and its biennial conservation target. In compliance with the requirement, PacifiCorp submits this report to the Commission which identifies its ten-year achievable conservation potential and its biennial conservation target for 2010 and 2011 and describes the process by which they were developed.

Executive Summary

As permitted by WAC 480-109-010(1)(b)(i), PacifiCorp has elected to utilize its 2008 Integrated Resource Plan[4] ("IRP"), a copy of which is provided as Appendix 1 to this report, as the source for establishing its projected ten-year conservation potential for its Washington service area[5]. PacifiCorp elected to utilize the 2008 IRP as the source for its conservation potential and biennial target as it more accurately represents the Company's resource position, resource options and resource costs than does the regional power plan. More importantly, the 2008 IRP had available more representative data on PacifiCorp's conservation potential in Washington

[1] PacifiCorp subsequently revised its ten-year conservation potential upward, as communicated by the Company in an email to the Commission staff, the Commission records center and other interested parties on January 28, 2010.
[2] This matter was subsequently assigned Docket No. 100170 by the Commission.
[3] As of the date of the initial filing of this report (January 29, 2010), the current power plan was the Council's 5th Northwest Power Plan dated May 2005, which is available at http://www.nwcouncil.org/energy/powerplan/5/. However, for the purposes of analysis and comparison, the Company references the 6th Northwest Power Plan dated February 11, 2010 as the "regional power plan".
[4] PacifiCorp's 2008 IRP was filed with the Commission in Docket No. UE-080826.
[5] A map of PacifiCorp's Washington service area is provided in this report in Appendix 5.

than that assumed in the regional power plan. The Company's 2008 IRP was informed by the conservation potential identified in PacifiCorp's Assessment of Long-Term System-Wide Potential for Demand-Side and Other Supplemental Resources ("conservation potential assessment")[6]. Completed in July 2007 by Quantec, LLC (now called the Cadmus Group, Inc.), the Company's conservation potential assessment represents an independent and reliable assessment of the magnitude, timing, and costs of conservation potential available specific to PacifiCorp, providing the Company a significant advantage in the development of its Washington conservation potential and biennial target. Unlike the regional avoided cost average data and sales allocation methodology used in the regional power plan to approximate economic potential available to each utility in the region, the use of PacifiCorp's 2008 IRP, informed by the service area specific conservation potential assessment, provides for the most reliable and accurate conservation forecast for both resource planning and the development of the Company's Washington conservation potential and biennial target. A copy of the conservation potential assessment is provided as Appendix 2 to this report.

The cumulative ten-year conservation potential determined by PacifiCorp and documented in this report is **49.2** average megawatts ("aMW"). Consistent with the rules under WAC-480-109, PacifiCorp's ten-year conservation potential represents the Company's 2008 IRP results adjusted to fully align for any differences between the process used by the Company in developing the 2008 IRP conservation results and that used by the Council in developing the regional power plan. Areas reviewed for process differences included planning methodologies, modeling methodologies and practices and measure sets. Table 1 shows PacifiCorp's cumulative ten-year conservation potential by year in aMW for the ten-year planning period from 2010 - 2019. As illustrated in Table 1, PacifiCorp added 14.5 aMW (an increase of 42 percent over the conservation resources identified in the 2008 IRP) to its 2008 IRP conservation targets in identifying its ten-year conservation potential documented in this report. These adjustments are described in further detail later in this document.

Table 1
2010 - 2019 Cumulative Ten-Year Conservation Potential (aMW)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
2008 IRP	3.6	6.9	10.2	13.4	16.7	20.2	23.7	27.3	31.0	34.7	6.9	34.7
Total of adjustments	0.8	1.5	2.6	4.2	6.0	7.5	9.1	10.8	12.6	14.5	1.5	14.5
2008 IRP with adjustments	4.3	8.5	12.8	17.6	22.6	27.7	32.8	38.1	43.6	49.2	8.5	49.2

PacifiCorp's biennial conservation target, also shown in Table 1, for 2010 and 2011 is **8.5** aMW[7], which represents the sum of the first two years in the ten-year conservation potential

[6] This report, prepared by The Cadmus Group (formerly Quantec) is included as Appendix 2 of this document and is also available at http://www.pacificorp.com/env/dsm.html. The report contains the most accurate assessment of conservation potential available in PacifiCorp's service territories to date. The Company plans to update the report as part of the 2010 integrated resource planning cycle. The update will incorporate several of the measure modifications noted in the adjustment section of this document that were made to the Company's 2008 IRP conservation targets in the preparation of this document. As such, it is anticipated this will reduce the need for similar adjustments in the preparation of the Company's next biennial (2012 - 2013) conservation target.

[7] To remain consistent with the Council's regional power plan, the ten-year potential and two-year target values in this report are shown prior to any net-to-gross adjustment and include line losses between the customer site and the

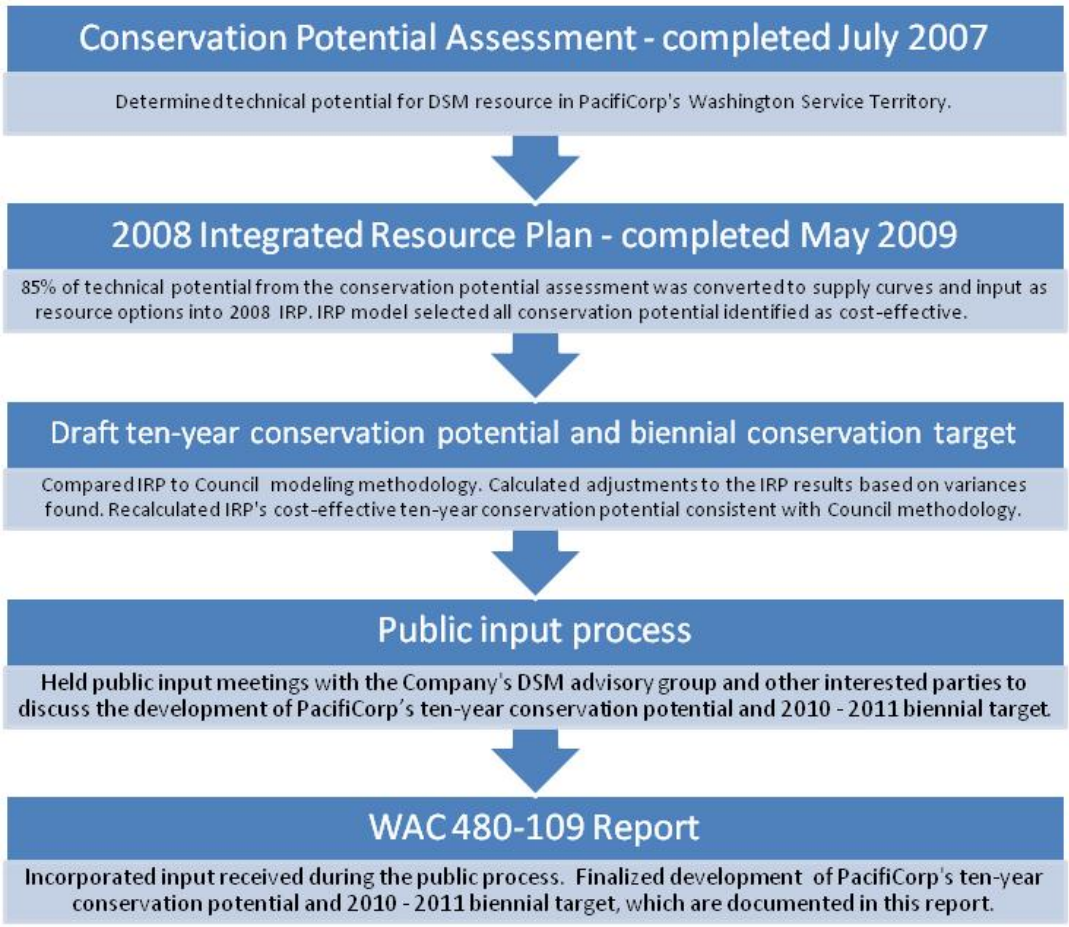
period. PacifiCorp's original report identifying its ten-year achievable conservation potential and 2010 – 2011 biennial conservation target, which was submitted to the Commission on January 29, 2010, identified a biennial target of 8.8 aMW. The variance between the previously identified 8.8 aMW target and the 8.5 aMW target identified herein is 0.3 aMW of potential associated with distribution efficiency initiatives ("DEI"). Upon further review of savings potential from DEI, the Company (with support from its DSM advisory group) shifted the 0.3 aMW of DEI savings potential from the 2010 – 2011 biennial period to the remaining years in the 2010 – 2019 ten-year period. Note the ten-year potential identified in this report (49.2 aMW) does not vary from the ten-year potential identified in the report filed on January 29, 2010. For additional information on DEI, refer to page 31 of this report.

The Company influences but does not control all aspects of achieving its conservation targets. It relies upon customer action, availability of equipment, and availability of qualified installation contractors, among other variables. For this reason, setting a hard target for conservation resource acquisition increases the Company's risk in achieving its biennial targets, allowing for little time to react to any market anomalies, such as downward economic trends, should they occur. Despite these risks, the Company intends to aggressively work to achieve the biennial target as documented herein and consistent with the spirit of Initiative No. 937, fully participate in acquiring all available cost-effective conservation potential available in PacifiCorp's Washington service area.

Figure 1 below presents an overview of the process that was followed in determining PacifiCorp's ten-year conservation potential and the 2010 and 2011 biennial conservation target. Each of the steps in this process will be discussed in greater detail subsequently in this report.

generation source. The Company's assumed line losses by sector are 11.031% for residential, 10.834% for commercial and 9.137% for industrial. These values are based on the Company's 2001 Transmission and Distribution Loss Study by Management Applications Consulting published in June 2004.

Figure 1
Overview of I-937 Process



As WAC 480-109-010 allows a utility to derive its ten-year conservation potential and biennial target from either its most recent IRP or the Council's regional power plan, the Company provides comparison information herein between the Council's assumed or proxy share of the regional potential available to PacifiCorp in its Washington service area and the ten-year potential and biennial target identified by PacifiCorp in this report. Table 2 below shows PacifiCorp's proxy share of the conservation potential identified in the draft 6th Power Plan using the Council's 6th Plan calculator[8] and compares this with the Company's ten-year conservation potential and biennial target documented in this report. The difference between the two for the 2010 - 2011 biennial target is 2.1 aMW. When comparing the conservation potential sources in Table 2, it is important to note that the Council's allocation of regional potential in the draft 6th Power Plan to individual utilities was based on a specific utility's percentage of the regional megawatt hour sales in 2007. This methodology is intended to be informative to utilities in identifying an "approximation" of the level of conservation they should target until such time as the utility is able to complete its own integrated resource plan or other similar process in which a utility specific conservation study is considered.

[8] Refer to Appendix 7 for PacifiCorp's Washington share of the draft 6th Power Plan regional target based on the 6th Plan calculator version 2.0 option 3.

Table 2
Comparison of Company Identified Conservation Potential and Draft 6th Power Plan

Conservation Metric	Share of Council's 6th Plan* (aMW)	I-937 Submittal (aMW)	Difference	Difference (aMW)
10-year Conservation Potential (aMW)	72.2	49.2	32%	23
2-year Acqusition Target (aMW)	10.6	8.5	20%	2.1

6th Plan Calculator Option 3 (allocated based on % of regional MWH sales)

As described in further detail subsequently in this report, a significant portion of the difference (23 aMW in ten-year potential and 2.1 aMW in biennial target) between the Council's approximation of PacifiCorp's conservation potential and that identified by the Company in this report resides in the residential sector, so the Company reviewed further the impact of the 6th Plan calculator savings allocation methodology relative to the residential sector. First, the Company reviewed the average annual energy use per home for the Washington service area compared to the state- and region-wide averages. Table 3 provides a comparison of annual average MWH/residential customer based on Energy Information Administration data for 2007, the same reference and year used by the Council in its draft 6th Power Plan and utility target calculator. Note the average annual electric consumption per housing unit in the Company's service area is 25% higher than the Washington state-wide average and 30% higher than the region represented by the Northwest Power and Conservation Council ("Northwest Region"), which is comprised of Idaho, Montana, Oregon and Washington.

Table 3

Form EIA-861 Final Data File for 2007			
	RESIDENTIAL_SALES (MWH/yr)	RESIDENTIAL_CONSUMERS	Annual MWh/ residential consumer
PacifiCorp - WA	1,626,726	101,245	16.1
WA State-wide	35,388,779	2,748,270	12.9
Northwest Region	67,644,242	5,452,210	12.4

Source: http://www.eia.doe.gov/cneaf/electricity/page/eia861.html

Next, the Company noted the 6th Plan calculator savings allocation methodology would imply there are more homes in the Company's Washington service area than there are. Given the Company's higher average annual use per residential customer in Washington, Table 4 shows the assumed number of residential customers given PacifiCorp's 2007 residential sales of 1,626,726 MWH/yr and the average annual MWH/consumer for PacifiCorp in Washington, Washington as

a whole, and the Northwest Region. An allocation based on MWH sales would imply PacifiCorp has approximately 30,000 more homes than actual (131,116 – 101,245 = 29,871).

Table 4[9]
Illustration of Number of Residential Consumers
Based on the Different Average Annual MWH/consumer in Table 3

	Residential Sales (MWH/yr) (a)	Annual MWH/ residential consumer (b)	Calculated # Residential Consumers (a/b)
PacifiCorp - WA	1,626,726	16.1	101,245
WA State-wide	1,626,726	12.9	126,331
Northwest Region	1,626,726	12.4	131,116

Next, PacifiCorp determined the impact of the Council's 6th Plan calculator allocation methodology applied to the residential sector. PacifiCorp's 2007 residential sales in its Washington service area represent 2.5 percent of the region's residential megawatt hour sales, while the Company has approximately 1.8 percent of the region's housing units. PacifiCorp compared its residential potential as calculated based on a percentage of regional sales and a percentage of regional housing units. The results of this analysis are provided in Table 5 below.

Table 5
Comparison of PacifiCorp's Share of Regional Residential Potential Using Percentage of Sales and Percentage of Housing Units Allocation Methodologies

6th Plan Residential Savings (aMW)	**2-year 2010 and 2011**	**10-year 2010-2019**
Region (from 6th Plan Calculator, Data Base and Calculations tab, row 224)	233	1,452
PacifiCorp WA share - allocated based on % MWH	5.8	36
PacifiCorp WA share - allocated based on % of homes	4.1	25
Difference	1.7	11

As is shown in Table 5, when using the percentage of housing unit methodology, PacifiCorp's residential biennial target is 1.7 aMW less than that suggested by the Council in the regional

[9] This document is available at http://www.nwcouncil.org/energy/powerplan/6/supplycurves/I937/default.htm

plan. As identified in Table 2 above, PacifiCorp's proposed biennial target for all sectors is 2.1 aMW less than that suggested in the Council's 6th Plan. The Company provides this analysis to illustrate the impact of the Council's simplifying potential allocation methodology on utility specific opportunities where such differences are found to exist. Although other factors certainly play a role between the Council's approximation of suggested utility by utility conservation opportunities, when the Council's conservation forecasting methodology is adjusted for the regional percentage of housing units the Council's suggested share of the region's biennial target for PacifiCorp is reduced to approximately 8.9 aMW, which is, in all material respects, in alignment with PacifiCorp's proposed biennial target of 8.5 aMW. Table 6 below compares the adjusted Council target to PacifiCorp's proposed biennial target.

Table 6
Comparison of 2-Year Target from Draft 6th Plan with PacifiCorp's Proposed 2-Year Target – Percentage of Sales and Percentage of Housing Units Methodology

Conservation Metric	6th Plan Savings Allocation	Share of Council's 6th Plan (aMW)	I-937 Submittmal (aMW)	Difference	Difference (aMW)
2-year Acquisition Target (aMW)	Based on % of MWH sales	10.6	8.5	-20%	2.1
2-year Acquisition Target (aMW)	Based on % of housing untis for residential	8.9	8.5	-4%	0.4

Source for Conservation Potential and Biennial Target

PacifiCorp's 2008 IRP, which was filed May 29, 2009 (Docket No. UE-080826) and acknowledged by the Commission on September 2, 2009, was selected as the source for establishing the Company's ten-year conservation potential and biennial acquisition target. The IRP provides for a forecast of cost-effective demand-side resource opportunity available to the Company over the 2010 - 2019 planning period. It reflects conservation potential identified in the Company's conservation potential assessment and the Company's specific resource requirements and avoided costs. The IRP was selected because it replaces the regional averages and general avoided cost assumptions used in the development of the regional power plan with Company specific planning assumptions, commercially available resource options, service area specific conservation assessment data and resource costs all tailored to PacifiCorp's resource position and customer energy requirements. Similar to the Council's regional power plan development process, PacifiCorp's IRP planning assumptions, considerations, methodology, and findings were developed and vetted through a well documented public process. The regional power plan is the logical choice and starting position for conservation forecast planning for utilities that don't have the need, resources or experience to warrant the development of a more specific and tailored plan. For utilities like PacifiCorp, who have invested heavily in conservation potential assessments specific to their service territories and do complete well documented and specific resource plans, IRPs become the logical choice and starting position for identifying and setting conservation forecasts.

As part of developing the ten-year conservation potential documented herein, the Company reviewed the Council's planning methodology, modeling methodology and practices, and

measure sets as used in the development of the regional power plan. Outcomes of this review included the following:

1. Appendix 3 contains an outline of the methodology used and provided by the Council in the development of the regional power plan[10] along with a description of the Company's aligning methodology. This analysis demonstrates the consistency of the methodologies used in the development of both plans as required by WAC 480-109-010(1)(b)(i).

2. The Company identified minor differences in modeling assumptions and measure sets between the regional power plan and the Company's IRP. These differences were analyzed and in most cases resulted in adjustments to PacifiCorp's ten-year conservation potential as documented in this filing.

To assist in the identification of measure set and conservation potential differences for the preparation of this filing, the Company enlisted the Cadmus Group, Inc. to compare and contrast the technical conservation potential identified in PacifiCorp's conservation potential assessment to the technical conservation potential identified for PacifiCorp (through the regional allocation process) from the regional power plan.

Starting at a comparison of technical potentials between the two plans provided for a more accurate way to compare and contrast differences in conservation opportunities assumed prior to any adjustments for service area refinements and avoided cost assumptions that would unnecessarily complicate the initial comparison work. The objective was to identify: (1) the degree to which the company's conservation potential assessment differed from the Council's regional power plan, (2) whether the difference was due to PacifiCorp's specific customer set, loads and service area, and (3) any adjustments to the IRP conservation forecast required in advance of filing PacifiCorp's conservation forecast and biennial target.

This work lead to several key observations:

1. There are significant differences between the Company's ten-year technical potential identified for PacifiCorp's Washington service area as identified in the Company's conservation potential assessment and that assumed, using regional averaging, available to PacifiCorp by the regional power plan.

2. The key differences, before further economic and achievable adjustments, are primarily found in the residential and industrial sector conservation potentials.

3. Assuming the Council's regional power plan is accurate in aggregate, Pacific Power's service area doesn't represent the regional average for conservation potential.

4. The most representative starting point in the development of the Company's ten-year conservation potential and biennial target, for the purposes of satisfying WAC 480-109, are the conservation targets identified in the Company's 2008 IRP.

[10] This document is available at http://www.nwcouncil.org/energy/powerplan/6/supplycurves/I937/default.htm

Table 7 below provides the relative differences in the underlying sector level technical conservation potentials used in the development of both plans. This table is provided to further illustrate the differences in the two-year and ten-year technical potentials by sector. Technical potential represents the potential prior to any adjustments made for economic or achievable potentials driven by differences in avoided costs, measure costs, and modeling methods. At the technical potential level, the only significant items to account for are whether both assessments include all the major measures available in the market and the methodology used to allocate savings to individual utilities, as discussed above. As noted in the observations above, the customer sectors identified as having the greatest variance in assumed conservation potential between the Council's assessment and that of PacifiCorp are found in the residential and industrial sectors. Distribution Efficiency contributes to the overall difference as well and is addressed further in the adjustment section of this report.

Table 7
PacifiCorp Washington Two-Year and Ten-Year Technical Potential (aMW)[11]

	2-year (aMW)			10-year (aMW)		
Sector	Draft 6th Power Plan	PacifiCorp Conservation Potential Assessment (CPA)	Difference	Draft 6th Power Plan	PacifiCorp Conservation Potential Assessment (CPA)	Difference
Residential	7.1	5.5	1.6	65	23	42
Commercial	3.2	3.8	-0.6	18	21	-3
Industrial	2.0	1.2	0.8	14	5	9
Agricultural	0.6	0.3	0.3	3	1	2
Distribution Efficiency	0.4		0.4	7		7
Total	13.4	10.8	2.6	106	51	55

Note: distribution efficiency initiatives were included in the regional power plan but are not included in the Company's conservation potential assessment.
Draft 6th Power Plan estimates of technical potential for PacifiCorp's Washington service area were determined based on PacifiCorp's share of 2007 regional MWH sales. Technical potential is not found in the 6th Power Plan calculator, but rather in the supply curves and other backup documentation on the Council's Web site.

In reviewing the differences in technical potential behind the regional power plan and the Company's IRP, the Company and the Cadmus Group focused its analysis efforts on areas with significant differences in the two-year technical potential. The difference in the technical potential in the out years appear to be due to several factors, not the least of which include regional verses PacifiCorp specific opportunities (especially noteworthy in the residential, industrial and distribution efficiency sectors and measures). The Company intends to refresh the conservation potential assessment in support of the 2010 IRP, the results of which will be used in

[11] Source – The Cadmus Group, July 17, 2009. Note the values shown in this table are at the customer site (not including estimated line losses between the customer site and generation source). They represent the technical potential and do not reflect any achievable or economic screens. The Agriculture sector in the regional power plan includes dairy production and irrigation efficiency. Two-Year numbers are for 2010 and 2011. Ten-Year numbers are for 2010-2019.

the development of the Company's 2012 - 2021 conservation potential and 2012 - 2013 biennial target.

Provided below are highlights from the analysis comparing the differences between the regional power plan and the IRP. Further detail on variances in the residential sector and modeling differences between the Company's IRP and the regional power plan are provided later in this section.

- Residential Sector - consumer electronics and water heating end uses account for 1.4 aMW of the 1.6 aMW difference in the two-year technical potential for the residential sector. These two end uses were reviewed at the measure level, and this analysis is described in further detail below. Based on the findings of the review, the Company determined adjustments to the 2008 IRP conservation potential were appropriate. These adjustments are detailed in the adjustments section of this report and in greater detail in Appendix 4.

- Commercial Sector - although the difference in technical potential for the commercial sector was not significant over the 10 year forecast, the Company noted one measure that was not considered during the development of the conservation potential assessment but was included by the Council in the regional power plan assessment. This measure, network personal computer power control, has been added to the 2008 IRP conservation potential. This adjustment is detailed in the adjustments section of this report and in greater detail in Appendix 4.

- Industrial Sector - Industrial energy management and operations and maintenance measures are a significant new addition to the regional power plan and were included, but to a lesser extent, in the Company's conservation potential assessment. It is the primary driver in the 0.8 aMW difference in two-year technical potential in the industrial sector. The key factors that influenced the Company's decision not to make an adjustment to account for industrial sector differences are as follows:

    - The measures and delivery practices are still emerging with significant development effort underway to define best practice program designs, appropriate measurement and verification strategies, and assumptions such as measure lives for these types of measures. The Northwest Energy Efficiency Alliance industrial sector work initially identified this opportunity. Utilities and other program delivery organizations are just starting to incorporate these types of resources in programs, and more work underway regionally must be completed to test designs and measurement and verification protocols sufficient to deem this resource cost-effective, reliable and feasible. While the regional power plan can be optimistic in the timing of the resources being available, provided they are available early enough in the regional power plan's ten-year planning period to be considered, utilities must take a more conservative approach, as they are required to guarantee the delivery of the resources when setting targets.

- As it relates to the 2010 - 2011 biennial target, the 0.8 aMW difference in technical potential, after further being adjusted for economic and achievable potentials, would have a relatively small impact.

- There is a greater difference in the assumed technical potential for these measures in the later years, years 2012 - 2019 which warrant further study. A factor that influences the technical potential is the demographics of PacifiCorp's industrial customer base. One large customer represents almost half of the industrial MWH sales. Additional detail on demographics is included in Appendix 5. Further analysis of the potential given customer demographics will be included in the Company's refresh of the conservation potential assessment and any relevant findings will be incorporated in the Company's subsequent conservation forecasts.

- In addition to industrial energy management and operations and maintenance measures, transformers are included in the regional power plan's potential assessment but were not considered in the Company's conservation potential assessment. The Council's potential for this measure was originally overstated in earlier versions of their draft assessment and has since been adjusted. The Company's assumed share of the region's average annual technical potential before the Council's adjustment was less than 0.1 aMW, leading the Company to conclude that the conservation potential for transformers is insufficient to warrant an adjustment in this report.

- Distribution Efficiency – Distribution efficiency measures are included in the regional power plan and are not considered in the Company's conservation potential assessment. The Company determined an adjustment is needed to include the additional savings from this category. This adjustment is described in the Ten-Year Conservation Potential section of this report.

Residential Sector Adjustment Detail

In reviewing the residential sector at the end use level, the Company determined the major differences in two-year technical potential are coming from the consumer electronics and water heating end uses. These two end uses account for 1.4 aMW of the 1.6 aMW difference in two-year technical potential for the residential sector (excluding solar PV[12]). Table 8 below provides a comparison between the technical potential identified in the Company's conservation potential assessment and the regional power plan for residential end uses.

[12] Solar PV was considered in both the regional power plan and the Company's conservation potential assessment; however, it does not pass economic screens so it does not impact the ten-year conservation potential projected in this report.

Table 8
Comparison - Residential Technical Potential - End Use Level[13]

	2-year (aMW)			10-year (aMW)		
Residential End Use	Draft 6th Power Plan	PacifiCorp Conservation Potential Assessment (CPA)	Difference	Draft 6th Power Plan	PacifiCorp Conservation Potential Assessment (CPA)	Difference
Appliances	0.3	0.7	-0.4	3.0	3.3	-0.3
Consumer Electronics	0.5	0.1	0.4	8.8	0.4	8.4
HVAC Equipment	1.1	0.9	0.2	8.7	4.1	4.7
Space Conditioning	2.1	1.9	0.3	11.7	9.3	2.4
Lighting	1.6	1.6	0.0	3.9	3.9	0.0
Solar PV	0.1		0.1	5.8		5.8
Water Heat	1.4	0.4	1.0	23.5	1.9	21.6
Residential Total	7.1	5.5	1.6	65.4	23.0	42.5
Residential Total w/o Solar PV	7.0	5.5	1.5	59.6	23.0	36.7

In reviewing the measures within consumer electronics and water heating, the major differences are coming from the television and monitor measures and showerhead replacement measures.[14] Table 9 below provides a comparison between the technical potential from the Company's conservation potential assessment and the regional power plan for residential consumer electronics and water heating end use measures.

[13] Note the values shown in this table are at the customer site (not including estimated line losses between the customer site and generation source).

[14] Note twister compact fluorescent lamps (CFLs) are included in the 2008 IRP and not in the regional power plan (except for low income). This measure will be added back into the regional power plan. No adjustment to the 2008 IRP is necessary for this measure.

Table 9
Comparison – Residential Technical Potential - Measure Level
for Consumer Electronics and Water Heating End Uses[15]

End Use	Measure		2 Year Difference (aMW)	10 Year Difference (aMW)
	6th Power Plan	**PacifiCorp CPA**		
Consumer Electronics	**Energy Star - Weighted Average TV**	Efficient high definition televisions	0.2	4.2
	Energy Star - Weighted Average Desktop	--	0.1	2.4
	Energy Star - Set Top Boxes	Digital set top Receivers	0.1	1.4
	Energy Star - Monitors	--	0.0	0.6
	--	Powerstrip, DVD players, 1-W Standby Power, HE PowerSupply	0.0	-0.3
	Consumer Electronics Total		*0.4*	*8.4*
Water Heat	**Heat Pump Water Heater**	Heat Pump Water Heater	0.1	6.7
	Solar Residential Water Heater - bundled	Solar Water Heater - report	0.3	11.3
	High Efficiency Water Heater	High Efficiency Water Heater	0.1	0.5
	Gravity Film Heat Exchanger (drain water heat recovery)	Gravity Film Heat Exchanger (drain water heat recovery)	0.0	2.3
	Showerhead Replacement	Low-Flow Showerheads	0.8	1.7
	--	Other (Heat Trap, Faucet Aerator)	-0.2	-1.0
	Water Heating Total		*1.0*	*21.6*

Consumer Electronics

As previously noted, the 2008 IRP is based on data from PacifiCorp's conservation potential assessment, which essentially relied on data from 2006 or earlier in its development. Consumer electronics, especially televisions, have evolved significantly over the last several years and as a result the data used in the development of the regional power plan was deemed more current for these measures. To reflect this finding, the Company has included an adjustment in this filing adding potential from the regional power plan (tailored to PacifiCorp's service area) for this category.

Water Heat

The primary measures driving the differences in the water heating end use are showerhead replacements and heat pump water heaters. Solar water heating is driving some of the differences in technical potential; however, this measure does not pass economic screens in either the

[15] Note the values shown in this table are at the customer site (not including estimated line losses between the customer site and generation source).

regional power plan or the 2008 IRP so it does not impact the ten-year conservation potential in this report.

In reviewing the showerhead replacement measure, the Company found the primary difference in technical potential was the result of one assumption: the Company was assuming a reduction in showerhead performance from 4.0 gallons per minute to 2.5 gallons per minute and the regional power plan was assuming 2.5 gallons per minute to 2.0 gallons per minute. The two measures are both possible, so the potential from the regional power plan for this measure is added to the potential identified in the 2008 IRP.[16] Table 10 below shows a comparison for this measure. This adjustment is detailed in the adjustments section and in greater detail in Appendix 4 of this report.

Table 10
Comparison - Residential Technical Potential - Showerhead Measure[17]

Low Flow Showerhead	Measure Description	Existing Saturation	Measure Cost	Levelized Cost ($/kWh)	Savings/ Measure (kWh/yr) *Generation	Two-year Technical Potential (aMW) *Generation
PacifiCorp	4.0 → 2.5 GPM	66%	$23	$0.01	395	0.083
6th Power Plan	2.5 → 2.0 GPM	5%	$24	<0	127	0.87

In reviewing the heat pump water heater measure, the Company determined the primary differences are driven by different assumptions, which stems from the timeliness of PacifiCorp's data for this measure compared to that used in the most recent regional power plan, in addition to the data sources used in support of those assumptions. The technical potential for this measure in the regional power plan is represented as available in the later years of the plan, years 2012-2019, reflecting the measure's level of commercialization and uncertainty as an emerging technology. For this reason no adjustment is planned at this time for this measure; however, the Company will consider revisions to this measure's assumptions as part of the Company's next conservation potential assessment refresh process. In addition, the Company will continue to follow the research and regional activity on this measure to help inform the refresh process. Table 11 below shows a comparison for this measure.

[16] The analysis is not intended to reflect how a program designed to achieve showerhead savings would be delivered.
[17] Technical potential in this table is at the generation source (includes estimated line losses between the customer site and the generation)

Table 11
Comparison - Residential Technical Potential – Heat Pump Water Heater Measure[18]

Heat Pump Water Heater	Measure Description	Existing Saturation	Measure Cost	Levelized Cost ($/kWh)	Savings/ Measure (kWh/yr) *Generation	Two-year Technical Potential (aMW) *Generation
PacifiCorp Does not pass economic screen	2.9 EF	2%	$1,220	$0.22	1,074	0.047
6th Power Plan	2.2 EF	0%	$701	$0.03	2,182	0.162

Differences in two-year technical potential from residential space conditioning and envelope measures were also reviewed as part of the analysis. The two-year difference in technical potential for residential space conditioning (envelope measures) is 0.25 aMW and the two-year difference for HVAC equipment measures is 0.20 aMW. The difference in technical potential for these measures is small prior to any adjustments for achievable and economic potential. As such, the Company determined these differences were not sufficient to warrant an adjustment to the 2008 IRP conservation potential and biennial target. Table 12 shows the comparison for space conditioning and HVAC equipment categories at the measure level.

Table 12
Comparison – Residential Technical Potential – Space Conditioning and HVAC Equipment

End Use	Measure		2 Year	10 Year
	6th Power Plan	PacifiCorp CPA	Difference (aMW)	Difference (aMW)
Space Conditioning	Attic Insulation	Attic Insulation	0.18	1.09
	Wall Insulation	Wall Insulation	0.13	0.85
	Floor Insulation	Floor Insulation	0.39	2.12
	Windows	Windows	0.62	3.34
	Infiltration	Infiltration	-0.50	-2.38
	Other (Door)	Other (Cool/Green Roof, New Construction Bundle, Heat Exchangers, etc)	-0.57	-2.67
	Space Conditioning Total		*0.25*	*2.37*
HVAC Equipment	Ductless Heat Pump	Ductless Heat Pump	0.59	2.92
	High Efficiency Heat Pump	High Efficiency Heat Pump	-0.18	0.15
	Electric Furnace to Heat Pump Conversion	Duct Sealing/Commissioning	0.00	2.47
	--	High Efficiency Central AC	-0.12	-0.48
	High Efficiency Room AC	High Efficiency Room AC	-0.02	-0.04
	--	Ceiling Fan, Evaporative Coolers	-0.08	-0.35
	HVAC Equipment Total		*0.20*	*4.66*

[18] Technical potential in this table is at the generation source (includes estimated line losses between the customer site and the generation)

Modeling and Other Differences Adjustment Detail

The Company also reviewed modeling and other differences between those used by the Council in the development of the regional power plan and by the Company in the development of the conservation forecast in the 2008 IRP. The modeling and other differences identified included the treatment of the Regional Act Credit (also referred to as the "10% Adder"), the Council's market price adder which captures conservation resource portfolio risk reduction benefits, and federal lighting legislation. WAC 480-109-010(1)(b)(i) states that utilities using their IRP for the purpose of filing their ten-year conservation forecast and biennial target must adopt methodologies that are consistent with those used by the Council in its most recent regional power plan. The following are the results of the comparison as well actions taken by PacifiCorp to remedy differences identified.

- 10% Adder - The 2008 IRP is a multi-state resource plan, and accordingly does not incorporate a 10% adder as it is not recognized by all of PacifiCorp's states. However, the 10% adder is included in the regional power plan[19] and in the Council's outline of major elements document (refer to Appendix 3). To adjust for this variance between modeling methodologies, the Company used a modeling approach to determine what effect the 10% adder would have on the Company's 2008 IRP ten-year potential and two-year conservation target for Washington. This adjustment is detailed in the adjustments section and in greater detail in Appendix 4 of this document.

- Market Price Adder - The market price adder is not specifically called out as a modeling methodology in the Council's outline of major elements document. As part of the public input process, the Company met with the Council, and the Council provided information on their market price adder. The DSM advisory group and other interested parties participating in the public process for WAC 480-109 encouraged the Company to be proactive on the market price adder adjustment. The role of the Council's market price adder[20] is to ensure that the full risk mitigation value of conservation is accounted for in determining the cost-effective amount of conservation to include in resource portfolios developed by the Council's Regional Portfolio Model. PacifiCorp's understanding is that the adder is the price needed to shift a portfolio to the "efficient frontier" for the population of portfolios.[21] After evaluating the applicability of estimating a risk mitigation cost credit to PacifiCorp's IRP models, the Company developed two separate cost credits representing different aspects of risk mitigation. These two cost credits were then applied to the Washington conservation cost curves, and the capacity expansion model used to derive a new set of conservation targets. This adjustment is detailed in the adjustments section and in greater detail in Appendix 4 of this document.

- Lighting Legislation - Recent lighting legislation (enacted by the Energy Independence and Security Act of 2007) which increases lighting efficiency standards is accounted for in the regional power plan and not in the Company's conservation potential assessment.

[19] Refer to the draft 6th Power Plan, page E-7
[20] Refer to the draft 6th Power Plan, page J-8
[21] As defined by the Council, the efficient frontier represents the set of portfolios with the least cost for a given risk level. Risk is defined as "TailVar90", which is the mean of the highest 10 percent of portfolio net present values.

The effect is an overstatement (in the later years) of lighting potential affected by the standards in the Company's conservation potential assessment and 2008 IRP conservation forecast. Given the new standards begin taking effect in 2012, which is outside of the first biennial target period, no adjustments were made for this conservation forecast filing resulting from the changing standards. However, the new lighting standards will be taken into consideration at the next refresh of the Company's conservation potential assessment.

Table 13 below shows a summary of the adjustments considered by the Company in adjusting the results of the 2008 IRP in the development of PacifiCorp's ten-year conservation potential forecast and biennial target. Additional detail on each adjustment as they relate to the conservation forecast and biennial target documented in this report is provided in the Ten-Year Conservation Potential section and Appendix 4 of this document.

Table 13
Items Reviewed for Potential Adjustment

Sector	Measure	Adjustment?
Residential	Consumer electronics	Yes
	Showerheads	Yes
	Heat pump water heaters	No
	Twister CFLs, envelope measures	No
Commercial	Network PC Power management	Yes
Industrial	Energy management, transformers	No
DEI	Distribution efficiency	Yes
Modeling and other differences	10% adder	Yes
	Council's "market price adder" (PacifiCorp's "risk reduction credit")	Yes
	Lighting legislation	No

Ten-Year Conservation Potential

PacifiCorp's ten-year conservation potential includes the following components:

1. Potential identified directly from the 2008 IRP.
2. Changes to the 2008 IRP conservation potential due to adjustments informed by the regional power plan and involvement from PacifiCorp's DSM Advisory Group and other interested parties as documented in this report.

Tables 14 and 15 below show the annual and cumulative ten-year conservation potential in aMW respectively, followed by detail on each of the two components referenced above that comprise the potential.

Table 14
2010 – 2019 Annual Conservation Potential (aMW)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
2008 IRP	3.6	3.3	3.3	3.1	3.3	3.5	3.5	3.6	3.7	3.7	6.9	34.7
Total of adjustments	0.8	0.8	1.0	1.6	1.7	1.5	1.7	1.6	1.8	2.0	1.5	14.5
2008 IRP with adjustments	4.3	4.1	4.4	4.7	5.1	5.0	5.2	5.3	5.5	5.6	8.5	49.2

Table 15
Cumulative 10-Year Conservation Potential (aMW)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
2008 IRP	3.6	6.9	10.2	13.4	16.7	20.2	23.7	27.3	31.0	34.7	6.9	34.7
Total of adjustments	0.8	1.5	2.6	4.2	6.0	7.5	9.1	10.8	12.6	14.5	1.5	14.5
2008 IRP with adjustments	4.3	8.5	12.8	17.6	22.6	27.7	32.8	38.1	43.6	49.2	8.5	49.2

Potential Identified in the 2008 Integrated Resource Plan

Table 16 provides the ten-year conservation potential identified in the 2008 IRP preferred portfolio in units of capacity (MW).

Table 16
2008 Integrated Resource Plan Table 8.44 – Preferred Portfolio, Detail Level, Washington[22]

	Capacity, MW									
Resource	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
DSM, Class 2 Walla Walla	3	3	3	3	3	3	3	3	3	3
DSM, Class 2, Yakima	6	5	5	5	5	6	5	5	6	6
DSM, Class 2, WA total	9	8	8	8	8	9	8	8	9	9

[22] Refer to the 2008 Integrated Resource Plan, Volume I, page 245, Table 8.44. Note the line item "DSM, Class 2, Washington" in the 2008 IRP Table 8.44 refers to Walla Walla, not Washington in total. This correction has been made in the table above in this report and on page 2 of the Errata, 2008 IRP.

Table 17 provides the ten-year annual conservation potential in the 2008 IRP in units of energy (MWH/yr and average MW[23]) while Table 18 provides cumulative energy values.

Table 17
2008 Integrated Resource Plan – Preferred Portfolio, Washington

	Annual Energy											
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2-year total**	**10-year total**
MWH/yr	31,427	29,237	29,103	27,212	29,159	30,914	30,602	31,708	32,293	32,142	60,664	303,796
aMW	3.6	3.3	3.3	3.1	3.3	3.5	3.5	3.6	3.7	3.7	6.9	34.7

Table 18
2008 Integrated Resource Plan – Preferred Portfolio, Washington

	2010 - 2019 Cumulative Energy									
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
MWH/yr	31,427	60,664	89,767	116,979	146,138	177,051	207,653	239,361	271,654	303,796
aMW	3.6	6.9	10.2	13.4	16.7	20.2	23.7	27.3	31.0	34.7

Pursuant to WAC 480-109-010(1)(a), the Company's projection of its cumulative ten-year conservation potential need only consider conservation resources that are cost-effective, reliable and feasible. The DSM resources identified in the preferred portfolio are the resources that are cost-effective, reliable and feasible. Provided below is further detail on the technologies, data collection, processes, procedures and assumptions used to develop these figures as required by WAC 480-109-010(3)(c).

Technologies

Integrated Resource Planning

PacifiCorp relies on two modeling systems to develop its preferred portfolio of resources, including energy conservation: a deterministic capacity expansion optimization tool called *System Optimizer*, and a stochastic chronological production cost system called *Planning and Risk*. The vendor for both models is Ventyx Energy, LLC. System Optimizer is a desktop application, while Planning and Risk is a client-server system that uses the Ventyx *ProSym* simulation engine and Microsoft SQL Server as the database server. Both models simulate all of the Company's generators, contracts, and DSM programs, as well as the transmission system and load areas, which are condensed into 29 zones or "bubbles". These models also simulate spot markets to optimize sales and purchases of energy for system balancing.

System Optimizer uses mathematical programming methods to produce a resource plan that minimizes the combined discounted system dispatch and resource investment costs subject to energy balance, capacity reserve margin, generation, transmission, reliability, and emissions constraints. The model tests combinations of resource options over a 20-year period to derive the

[23] 1 average MW (aMW) = 8,760 MWH/yr

optimal resource portfolio; both the size and timing of resources are factored in the optimization solution. For simulating unit dispatch, the model uses a time-of-day least-cost dispatch algorithm based on categorization of hours and days into representative time blocks (on-peak, super-peak, off-peak, peak-hour, week-day, week-end, etc.). The dispatch considers the characteristics of both existing and planned resources. These characteristics include heat rate, fuel prices, location, capacity, emission rates/prices, variable O&M cost, and energy pattern (in the case of DSM, hydro, and wind resources). The dispatch also includes optimal flows between regions, considering transmission capacity and line losses. The model calculates and applies capital recovery factors to address end effects associated with capital-intensive and long-service-life resources.

The Planning and Risk system, which simulates both unit dispatch and commitment on an hourly basis, uses a stochastic model[24] along with Monte Carlo sampling of variable values to capture volatility risk associated with prices, plant availability, and loads. The Planning and Risk system is configured to conduct 100 production cost simulations with the sampled variable values, providing a wide range of portfolio cost outcomes for risk analysis. (See pages 163-169 of the 2008 IRP for background on the Monte Carlo simulation process.)

Conservation

PacifiCorp models conservation on a comparable basis with supply-side resources in the IRP models, consistent with state IRP standards and guidelines. For resource portfolio development, conservation is structured as a five-step supply curve that provides capacity value and energy (based on predetermined hourly load shapes for each supply step) at a given marginal levelized cost. The supply curve is specified as 840 distinct resource options, reflecting quantities available by load area, year, and cost.

The conservation potential assessment analysis included a review of 156 unique measures across the residential, commercial industrial and irrigation sectors. Of those 156, there were 78 in the commercial sector, 62 in the residential sector, 13 in the industrial sector and 3 in the irrigation sector. Considering all permutations of these measures across all customer sectors, customer segments, and states, customized data was compiled and analyzed for nearly 12,500 measures. For a complete list of measures, see Assessment of Long-Term System-Wide Potential for Demand-Side and Other Supplemental Resources, Volume II, Appendix C.[25]

For conservation resource selection using System Optimizer, PacifiCorp used a load forecast that excluded reductions attributable to conservation (the "pre-DSM" load forecast). This is necessary because conservation is effectively treated as a supply resource in the model rather than a load reduction.

[24] A detailed description of the stochastic model is provided as Appendix G of the 2004 IRP. The 2004 IRP is available for download at PacifiCorp's IRP Web site: http://www.pacificorp.com/es/irp.html.
[25] The Company's conservation potential assessment is provided in Appendix 2.

Data Collection

Integrated Resource Planning

PacifiCorp uses a variety of data sources for development of its IRP, including (1) in-house studies, databases, and monitoring systems, (2) non-IRP model outputs, such as the MIDAS market fundamentals analysis system, (3) forecasting services, and (4) studies conducted by engineering and other consulting firms. Chapter 6 of the 2008 IRP (pages 97-133) summarizes the data resources used to develop the resource options entered into the IRP models. Chapter 7 of the 2008 IRP (specifically the "General Assumptions and Price Inputs" section, pages 97-133) cites applicable sources for key input assumptions used in the IRP modeling.

Conservation

For development of the conservation supply curve, a number of primary and secondary data collection approaches were used by the DSM potentials development project team (PacifiCorp and contractor staff).[26] PacifiCorp provided load forecasts, economic assumptions (discount rates and conservation credits), historical energy-efficiency activities, current customer counts and forecasts, and the 2004 Energy Decisions Surveys for the residential and commercial sectors. The contractor team—Quantec (now called the Cadmus Group, Inc.), Summit Blue Consulting, and Nexant, Inc.—conducted two surveys to obtain primary data. The first involved more than 200 PacifiCorp customers in the commercial and industrial sectors, and was used in the assessment of energy-efficiency potential, primarily to develop estimates of market acceptance. The second survey targeted 30 HVAC and lighting contractors, and was used to assess variations in costs for urban and rural populations and to validate measure characterization assumptions. The survey instruments can be found in Assessment of Long-Term System-Wide Potential for Demand-Side and Other Supplemental Resources, Volume II, Appendix A.[27]

The contractor team also relied on several entities for data, including the Council, the Regional Technical Forum (RTF), the Northwest Energy Efficiency Alliance (NEEA), the California Energy Commission (2005 Database of Energy Efficiency Resources, or DEER), and the Energy Information Administration. This information included technical information on measure savings, costs, and lives, hourly end-use load shapes, and commercial building and energy characteristics. The contractor team also relied on equipment vendors for cost and technical information, as well as past DSM potential assessments and publicly available survey data.

The DSM potential study is both included as Appendix 2 in this document and is available for download from PacifiCorp's DSM Web site: http://www.pacificorp.com/env/dsm.html.

[26] The DSM potential study covered the states of Washington, California, Utah, Idaho, and Wyoming. PacifiCorp relied on supply curve data from the Energy Trust of Oregon to create Oregon-specific conservation resource options.

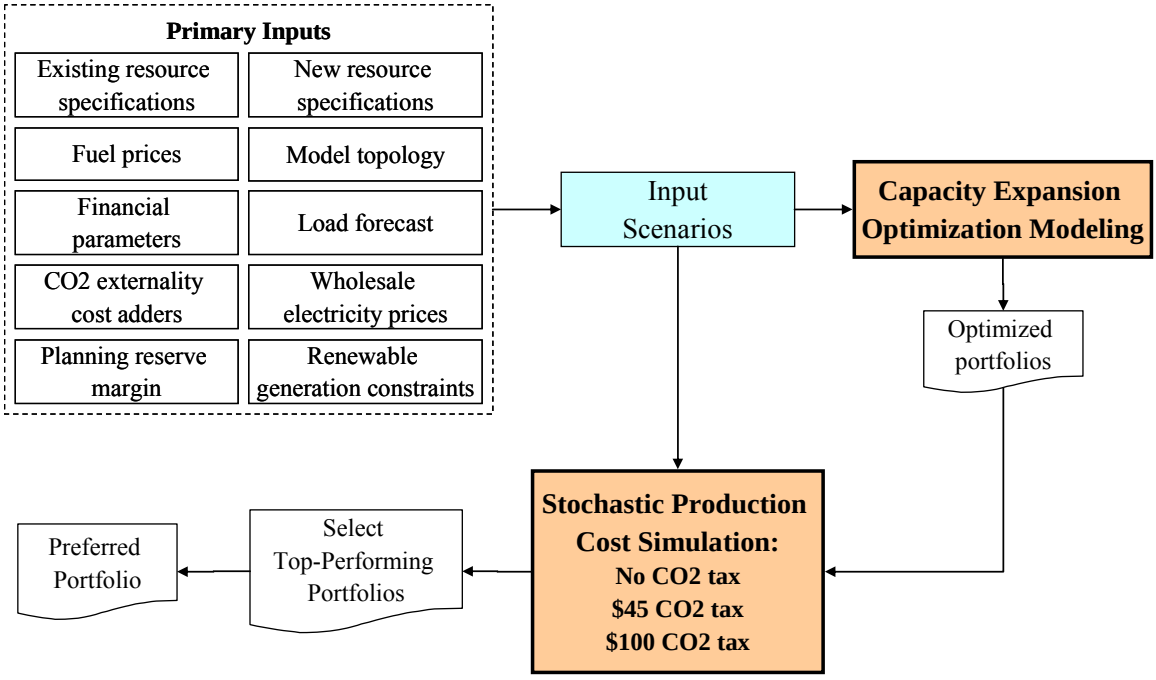
[27] The Company's conservation potential assessment is provided in Appendix 2.

Processes and Procedures

Integrated Resource Planning

The PacifiCorp IRP modeling process entails the development of many alternative resource portfolios based on different combinations of input forecasts, followed by stochastic production cost simulation of the portfolios to determine their risk-adjusted cost and reliability performance. As indicated above, the portfolios are developed using System Optimizer, and stochastic production cost simulation is conducted with the Planning and Risk system. The following diagram, labeled as Figure 2, summarizes at a high level the process flow associated with development of PacifiCorp's IRP preferred portfolio.

Figure 2
PacifiCorp IRP Development Process Flow



For the 2008 IRP, PacifiCorp developed 56 portfolios for analysis, based on a combination of commodity natural gas price forecasts, wholesale electricity price forecasts, load forecasts, carbon dioxide costs, and other input assumptions. Thirty-one of the 56 portfolios were subsequently simulated using the Planning and Risk system. For each of the 31 portfolios, PacifiCorp conducted three Monte Carlo simulations using different CO_2 cost assumptions to capture risk associated with an uncertain CO_2 regulatory cost liability.

To select its 2008 IRP preferred resource portfolio, PacifiCorp ranked the portfolios on the basis of a composite performance score developed from the output of the stochastic production cost

simulations as well as portfolio capital cost estimates produced by System Optimizer. The composite score consists of seven portfolio performance measures that are weighted based on their importance in meeting the Company's resource planning objectives. The performance measures cover (1) expected and "tail" costs (i.e., the extent of worst cost outcomes), (2) year-to-year total cost variability, (3) capital cost magnitude, (4) carbon dioxide cost risk, (5) production cost variability across the 100 simulation iterations, and (6) two measures that capture supply reliability risk.

In addition to performance scores, such considerations as procurement risks, rate impacts, resource diversity, and planning flexibility afforded by resource type, were also relied upon to select the IRP preferred portfolio. In keeping with various state IRP standards and guidelines, the 2008 IRP preferred portfolio was judged to be the least-cost set of resources after accounting for risk, uncertainty, and state energy regulations.

Conservation

This general methodology for the conservation potential assessment is best described as a combination "top-down/bottom-up" approach. The top-down methodology component begins with the most current load forecast, decomposes it into its constituent customer sector, customer segment, and end-use components. The bottom-up component considers the potential technical impacts of various demand-side and supplemental resource technologies, measures, and practices on each end use, which are then estimated based on engineering calculations, taking into account fuel shares, current market saturations, technical feasibility, and costs. These unique impacts are aggregated to produce estimates of resource potential at the end-use, customer sector, and service area levels. In many ways, the approach is analogous to generating two alternative load forecasts at the end-use level (one with and one without DSM), and calculating resource potential as the difference between the two forecasts. Further details are provided in Chapter 3 of Assessment of Long-Term System-Wide Potential for Demand-Side and Other Supplemental Resources, Volume I.[28]

Using the conservation potential assessment data as the starting point, conservation resources by load area, marginal levelized cost, and year conservation resource supply curves were developed for input into System Optimizer and the Planning and Risk system as discussed above. The prime contractor for the conservation potential assessment study, Quantec, LLC (now called the Cadmus Group, Inc.), helped convert the potential study conservation data into resource options suitable for entry into System Optimizer. A complete description of the derivation and modeling attributes of the conservation resource options are provided in Chapter 6 of the 2008 IRP (See pages 121 and 127-130) included as Appendix 1 of this document.

The conservation resources entered into System Optimizer reflect the technical potential adjusted for the impact of market barriers, or so-called achievable potential. PacifiCorp used an achievable potential adjustment of 85 percent in line with regional planning assumptions in the regional power plan[29]. The System Optimizer performs the role of the cost-effectiveness screen,

[28] The Company's conservation potential assessment is provided in Appendix 2.
[29] For information on the 85% assumption, refer to the 2008 IRP, Volume I, page 128, and the draft 6th Power Plan, page 4-15.

directly competing conservation against many other resource options including market purchases. The resulting optimized portfolio consists of conservation and other resources found to be cost-effective based on resource and system characteristics, load requirements, system constraints, and the set of scenario inputs used for the capacity expansion simulation.

Assumptions

Integrated Resource Planning

Assumptions used for the 2008 IRP are documented throughout the IRP report. Key assumption references are provided below:

- Load forecasts, existing/new resources, and forecasted capacity and energy deficits are provided in Chapter 5
- Resource option assumptions are provided in Chapter 6
- Financial and resource tax incentive assumptions are provided in Chapter 7 (pages 136-138)
- Scenario design assumptions are provided in Chapter 7 (pages 141-148)
- Carbon dioxide compliance modeling and cost assumptions are cited on pages 143-145
- Alternative load growth assumptions for scenario analysis are cited on pages 145-146
- Wholesale electricity and natural gas price forecast assumptions are provided in Chapter 7 (pages 148-160)

Conservation

The Company's conservation potential assessment, consisting of two volumes, documents the assumptions used to derive conservation potential estimates and associated costs. Appendices C-1 through C-4 in Volume II provides detailed supplementary information for conservation resources including assumed measure costs and savings, end-use saturations, electric fuel shares, current market shares, and calculated 2027 measure potential by state and urban or rural area. Appendix C also provides a short description of each unique measure analyzed in the study. In addition, building simulations were used to determine measure savings and end-use load shapes. The detailed assumptions behind the building simulation models are given in Appendix F of the DSM potential report.

The conservation potential assessment incorporated potential from "emerging technology" measures[30] that are not yet widely available, but are expected to become so over the planning horizon. This is consistent with the regional power plan.

Adjustments to the 2008 IRP Conservation Potentials and Target

In reviewing the regional power plan as part of the analysis identifying PacifiCorp's ten-year conservation potential and biennial target, key sector, measure and modeling differences were

[30] Emerging technology measures are described in the Assessment of Long-Term, System-Wide Potential for Demand-Side and Other Supplemental Resources: Appendices (volume II). Residential emerging technology measures are on pages C-10 to 13; commercial emerging technology measures are described on pages C-27 to 29.

identified and analyzed, resulting in adjustments to the Company's projected ten-year conservation potential. Table 19 below shows the measures and modeling differences identified which resulted in an adjustment to the 2008 IRP targets in this filing.

As described in the Source for Conservation Potential and Biennial Target section of this filing (see above), with the assistance of The Cadmus Group, the Company noted a difference between the customer technical potential identified by the regional power plan and the PacifiCorp conservation potential assessment. The differences were highest in the residential, industrial and distribution efficiency sectors and measures.

Based on the above noted comparison and analysis, the company focused on measures within the sectors with key differences in two-year technical potential as well as modeling and other differences to assist in determining whether adjustments were needed to the conservation potential identified in the 2008 IRP for the purposes of this filing. Table 19 below provides an overall summary of the areas where PacifiCorp determined adjustments were required to its 2008 IRP conservation potential prior to filing the Company's ten-year conservation forecast and biennial target provided in this report.

Table 19
Measures and Modeling Differences Identified for an Adjustment

Sector	Measure
Residential	Consumer electronics
	Showerheads
Commercial	Network PC Power management
DEI	Distribution efficiency
Modeling and Other Differences	
10% adder	
Council's "market price adder" (PacifiCorp's "risk reduction credit")	

Table 20 below provides the annual average MW (aMW) for each adjustment. More detail on each adjustment is included below with further detail in Appendix 4.

Table 20
2010 - 2019 Annual Conservation Potential - Summary of Adjustments (aMW)

		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
2008 IRP		3.6	3.3	3.3	3.1	3.3	3.5	3.5	3.6	3.7	3.7	6.9	34.7
Adjustments													
Residential	Consumer Electronics	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.2	4.1
Residential	Showerheads	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.7	1.7
Commercial	Network PC Power Control	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.1
Distribution efficiency	Distribution Efficiency	0.0	0.0	0.4	0.4	0.5	0.7	0.7	0.8	0.8	0.8	0.0	5.1
Modeling	10% Adder	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Other	Risk Reduction Credit	0.2	0.2	0.0	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.4	2.0
Total of adjustments		0.8	0.8	1.0	1.6	1.7	1.5	1.7	1.6	1.8	2.0	1.5	14.5
2008 IRP with adjustments		4.3	4.1	4.4	4.7	5.1	5.0	5.2	5.3	5.5	5.6	8.5	49.2

Consumer Electronics

As previously noted, the 2008 IRP is based on data from PacifiCorp's conservation potential assessment, which essentially relied on data from 2006 or earlier in its development. Consumer electronics, especially televisions, have evolved significantly over the last several years and as a result the data used in the development of the regional power plan was deemed more current for these measures. Savings from consumer electronics are calibrated on a "per home" basis rather than energy consumed or sales. On average, PacifiCorp's residential housing counts are below the regional average due to the rural nature of the company's Washington service area and availability of gas, both leading to higher average per customer use than the regional average assumes. For specifics on the housing data used and source, additional data is available in Appendix 5. This adjustment adds 0.2 aMW to PacifiCorp's 2010 – 2011 biennial conservation target and 4.1 aMW to its cumulative ten-year conservation potential.

Showerheads

The showerhead measure in the 2008 IRP was for a replacement of a 4.0 gallon per minute (GPM) showerhead with a 2.5 GPM showerhead. The measure in the regional power plan is the replacement of a 2.5 GPM showerhead with a 2.0 GPM showerhead. The two measures are both possible, so the potential from the regional power plan for this measure is added to the potential identified in the 2008 IRP. This measure is also one where the savings is calculated on a "per home" basis. On average, PacifiCorp's residential housing counts are below the regional average, this is due to the rural nature of the company's Washington service area and availability of gas, both leading to higher average per customer use than the regional average assumes. The adjustment is therefore based on the Company's share of regional housing units with electric water heat. This adjustment adds 0.7 aMW to PacifiCorp's 2010 – 2011 biennial conservation target and 1.7 aMW to its cumulative ten-year conservation potential.

Network PC Power Control

This measure is included in the regional power plan's conservation assessment however wasn't part of the Company's conservation potential assessment and 2008 IRP. Savings for this measure in the regional power plan were based on an estimated number of personal computers per employee within the business sector. PacifiCorp has no verifiable source for this type of information relevant to our service area at this time therefore has based our adjustment on the Company's share of data provided and savings identified by the Council using the regional averaging sales allocation methodology. This adjustment adds 0.2 aMW to PacifiCorp's 2010 – 2011 biennial conservation target and 1.1 aMW to its cumulative ten-year conservation potential.

Distribution Efficiency

Like Network PC Power Controls the conservation potential for Distribution Efficiency was included in the regional power plan's conservation assessment however wasn't part of the Company's conservation potential assessment and 2008 IRP. In the preparation for the development of the regional power plan, a regional study, conducted by RW Beck, was done to approximate the opportunity from improving the voltage regulation of utility distribution systems among other improvements. The RW Beck study dated December 2007 analyzed four cases that identified potential savings and investment:

1. Voltage regulation via line drop compensation (LDC) at an estimated cost of $15k-$25k per circuit;
2. Voltage regulation via LDC with minor system improvements at an estimated cost of $40k-$60k per circuit;
3. Voltage regulation via LDC with major system improvements at an estimated cost of $80k-$100k per circuit; and
4. Voltage regulation via end of line monitoring (EOL) with major system improvements at an estimated cost of $100k-$350k per circuit.

While PacifiCorp currently incorporates line drop compensation in the design and construction of all distribution circuits, it does not currently operate the system in conservation mode. Rather the system is operated to ensure the Company satisfies ANSI standards. Further, the rural nature of PacifiCorp's system in Washington results in typically long circuits with multiple sets of line regulators, capacitor banks and tapped distribution transformers. This limits the applicability of voltage regulation via end of line monitoring with major system improvements.

Consequently, prior to changing the operation of the Washington system to target a lower voltage level through established line drop compensation or investing in end of line monitoring with major system improvements, PacifiCorp will need to study the impact on its system, identify the capital required to effect a reduction in line losses and evaluate the cost effectiveness of the proposed changes. PacifiCorp's detailed study of its Washington network is expected to be complete by December 2011. To ensure sufficient data is available to support a decision to proceed with the proposed changes, PacifiCorp will prioritize circuit studies in a three tier approach starting with the most likely circuits to satisfy the cost effectiveness test, Tier 1, and working toward the least likely. To control excessive study costs, PacifiCorp will study an

adequate number of circuits that prove to be non cost-effective for voltage conservation reduction implementation. Whether this is reached in the first, second or third Tier will not be known until an adequate number of studies are completed that clearly show conservation measures to be non cost-effective. PacifiCorp will target 2012 as the first year for implementing any cost-effective efficiency savings programs identified by the study with benefits derived from the program realized in 2012. This adjustment adds 5.14 aMW to PacifiCorp's cumulative ten-year conservation potential based on the RW Beck study. Based on PacifiCorp's completed system study, the RW Beck targets for annual savings will either be confirmed or recommended for adjustments.

Modeling differences – Regional Act Credit (10% Adder)

The 2008 IRP is a multi-state resource plan and did not recognize the Regional Act Credit (10% adder) when selecting conservation resources in the 2008 IRP. As a result, it was necessary for PacifiCorp to account for this modeling difference for alignment with the regional power plan's modeling that incorporated the adder. Conservation resources available in Washington were re-modeled using the Company's IRP capacity expansion optimization model in order to account for the 10% adder. The methodology used was consistent with that used in the modeling for the regional power plan. The Company applied the input assumptions used to develop the 2008 IRP preferred portfolio, including a $45/ton (in 2008 dollars) carbon dioxide cost beginning in 2013. Major non-conservation resources were fixed in the portfolio, including the 200 MW of Washington wind in 2011 as well as natural gas resources added in Utah in 2014 and 2016. Resources allowed to be optimized included firm market purchases ("front office transactions"), distributed generation, and Class 1 (load control) DSM programs. The approach consisted of first running the System Optimizer capacity expansion model with the base input assumptions and fixed resources for 2009 through 2028, then running the model with Washington conservation resource costs reduced by the 10% value, and, finally, computing the differences in annual capacity and energy between the two model runs. The results were then added to the 2008 IRP conservation potential in this filing.

The Company calculates the 10 percent adder as a percentage of its 20-year levelized Mid-Columbia forward electricity market price curve and the transmission and distribution investment deferral credit. The levelized forward price curve serves as the proxy for DSM avoided costs in line with the Council's approach. The formula for the 10% adder adjustment is:

> ((first year MWH savings x levelized market value x 10%) + (first year MWH savings x T&D deferral credit x 10%))/first year MWh savings

The value of the 10 percent adder is applied as a deduction to the levelized cost of conservation for each of the six measure bundles included in the Company's integrated resource models. This approach is consistent with the Council's methodology and the Company's IRP modeling framework, and was adopted after discussions with Council staff in December 2009.

The 10% adder adjustment results in a slight increase in the targets for 2013 and 2014. This reflects PacifiCorp's capacity and energy requirements, additional Washington wind resources, and other alternative energy options in the near-term.

Table 20 above shows the adjustment to the 2008 Integrated Resource Plan targets to account for the 10% adder. This adjustment adds 0.0 aMW to PacifiCorp's 2010 – 2011 biennial conservation target and 0.6 aMW to its cumulative ten-year conservation potential. Please refer to Appendix 4 for further detail on the Company's efforts to quantify the impact of the 10% adder and explanation for the lack of near-term impact.

Other Differences – Council's "market price adder", PacifiCorp's "risk reduction credit"

PacifiCorp's demand side management and resource planning teams met with representatives from Council staff and participated in a conference call on December 21, 2009, to explain and discuss their respective conservation modeling methodologies. One of the topics for discussion was capturing and valuing the benefits of energy conservation in portfolio analysis, and how the Council accomplishes this, in part, through the use of a *market price adder.* PacifiCorp was asked by the Washington Demand-side Management Advisory Group to evaluate the applicability of the Council's market price adder to the Company's own conservation modeling methodology.

The role of the Council's market price adder is to ensure that the full risk mitigation value of conservation is accounted for in determining the cost-effective amount of conservation to include in resource portfolios developed by the Council's Regional Portfolio Model. PacifiCorp's understanding is that the adder is the price needed to shift a portfolio to the "efficient frontier" for the population of portfolios.[31]

After evaluating the applicability of estimating a risk mitigation cost credit to PacifiCorp's IRP models, the Company developed two separate cost credits representing different aspects of risk mitigation. These two cost credits were then applied to the Washington conservation cost curves, and the capacity expansion model used to derive a new set of conservation targets. This risk mitigation cost credit methodology reflects a broader effort by the Company to improve the characterization of resource risk across IRP models that will carry over into the next IRP.

This adjustment adds 0.4 aMW to PacifiCorp's 2010 – 2011 biennial conservation target and 2.0 aMW to its cumulative ten-year conservation potential. Please refer to Appendix 4 for further detail on the Company's efforts to quantify the impact of the risk reduction credit.

[31] As defined by the Council, the efficient frontier represents the set of portfolios with the least cost for a given risk level. Risk is defined as "TailVar90", which is the mean of the highest 10 percent of portfolio net present values.

Biennial (2010 - 2011) Conservation Target

Conservation Target

PacifiCorp's biennial conservation target for 2010 and 2011 is 8.5 aMW[32].

How the Target was developed from the Ten-Year Potential

The ten-year conservation potential includes an estimate of the potential for each year. These values were derived from annual numbers developed from the modeling of the two sources used to develop PacifiCorp's proposed target: 1) the integrated resource plan and 2) the Council's regional power plan where the power plan data was adopted and incorporated into PacifiCorp's proposed target. In the integrated resource plan, conservation potential is spread equally over the 20-year plan (1/20th each year). In the draft 6th Power Plan, ramp rates were similar, however varied depending on the specific measure (1/15th each year for retrofit measures and 1/20th each year for lost opportunity measures). The biennial target represents the achievable conservation potential for 2010 and 2011. The target represents 18% of PacifiCorp's ten-year conservation potential forecast for the planning years 2010 - 2019.

Range for the Target

The Company influences but does not control all aspects of achieving its conservation targets. It relies upon customer action, availability of equipment, availability of qualified installation contractors, among other variables. For this reason, setting a hard target increases the Company's risk of the achievement of the biennial target as stated. Despite this risk, the Company will aggressively pursue the biennial targets as stated in absolute terms.

Types of Resources

The ten-year potential identifies resources without identifying how the savings will be achieved. Savings may be achieved using a variety of methods which may include but are not limited to the following:

- Customer participation in Company programs approved by the Commission,
- Utility system initiatives such as distribution efficiency improvements,
- Savings acquisitions from regional efforts such as Northwest Energy Efficiency Alliance activities,
- Savings from energy code and standards changes not already accounted for in the ten-year potential, and
- Savings from naturally occurring conservation[33] not already captured in one of the above types of resources.

[32] To remain consistent with the Council's regional power plan, the ten-year potential and two-year target values in this report are shown prior to any net-to-gross adjustment and include line losses between the customer site and the generation source. The Company's assumed line losses by sector are 11.031% for residential, 10.834% for commercial and 9.137% for industrial. These values are based on the Company's 2001 Transmission and Distribution Loss Study by Management Applications Consulting published in June 2004.

Since the potential includes savings from these sources, subject to reasonability and acceptable methods for measurement and quantification, these savings may be reported toward achieving the biennial conservation target. However, PacifiCorp notes that it is not seeking pre-approval of specific programs, types of programs, or measures or any savings estimate associated with these as part of this report for purposes of compliance with RCW Ch. 19.285. Prudence, cost effectiveness and cost recovery of conservation programs will continue to be examined and reviewed by the Commission. Appendix 6 lists the conservation measures included in conservation supply curve bundle 1, which was selected by the Company's capacity expansion model based on the 2008 IRP portfolio modeling. These are the general measure categories; however, how savings from these measure categories will be achieved is not identified.

Naturally occurring conservation has been discussed further with the advisory group after receiving comments on the 4/26/2010 draft report. The company has included the language changes suggested by the advisory group in this revised report; however, opinions regarding inclusion of naturally occurring conservation as a resource for consideration continue to differ. The company indicated in the discussions that any consideration of savings from codes and standards would need to be measureable and quantifiable and would not represent savings claimed by or attributed to NEEA's efforts. The Company's conservation forecast and biennial target is a product of the 2007 resource potential work and subsequent IRP modeling. The potential includes all achievable cost-effective conservation, including that which may be achieved via code changes or is fulfilled by other means outside of utility programs (and not captured and counted towards the target via other means i.e. NEEA); therefore, eliminating the possibility of considering such occurrences within the biennial target period is not prudent.

Budget and Savings by Program

Provided as Attachment A to this report is the Company's Washington Demand-side Management Business Plan for the 2010 – 2011 biennial period. The business plan contains the savings and expenditures anticipated by program to achieve the 8.5 aMW biennial target for 2010 and 2011.

Reporting and Evaluation

Reporting

In the Accounting Order in Docket No. UE-001457, the Commission ordered the Company to report System Benefits Charge ("SBC") collections and demand-side management expenditures on a semi-annual basis with reports due within 45 days of the end of the second and fourth quarters. In compliance with this Order, the Company has provided SBC collections and demand-side management expenditures to the Commission on a semi-annual basis. The

[33] Naturally occurring conservation refers to reductions in energy use that occur due to normal market forces, such as technological change, energy prices, market transformation efforts, and improved energy codes and standards. (Assessment of Long-Term, System-wide Potential for Demand-Side and Other Supplemental Resources, Final Report, Volume I, July 11, 2007, page 6.) With I-937, the Company will begin reporting the savings achieved by the Northwest Energy Efficiency Alliance, which includes savings from market transformation and improved energy codes and standards. To the extent there is additional savings in these categories not already included in NEEA savings, the Company may propose a plan to report this savings and request advisory group input.

Company has also reported savings acquisitions by program on an annual basis for Company demand-side management programs approved by the Commission.

WAC 480-109-040 defines the annual requirements for reporting utility progress towards meeting conservation targets. As stated above in the Biennial (2010 - 2011) Conservation Target section of this report, PacifiCorp's proposed biennial target reflects more than the Company's currently approved demand-side management programs are designed to acquire. As such, the WAC 480-109-040 annual reporting may include savings reported for one or more of the resource types presented in Table 21 below, which contains detail on reporting for each of the types of resources listed above in the Biennial (2010 - 2011) Conservation Target section of this report.

Evaluation

For Refrigerator Recycling, Home Energy Savings, Energy FinAnswer, and FinAnswer Express programs approved by the Commission, the Company provided evaluation plans in its program filings in which the programs were initially proposed by the Company and approved by the Commission. For these programs in Washington, Table 22 below provides the docket number reference for each of the filings in which a program was initially proposed or a modification to an existing program was proposed. The evaluation plans from these filings are included in Appendix 8 of this report.

Evaluation plans were not included in the program filings for Low Income Weatherization or Energy Education in Schools programs approved by the Commission. Evaluation reports are included in Appendix 8 for these programs.

Evaluations are completed by a third party. The Company maintains a network of evaluation firms under contract, and in general, the Company selects a third party evaluation contractor from this network for specific evaluations through a competitive procurement process. The Company requests that respondents demonstrate an understanding of the California Evaluation Framework, which references the International Performance Measurement and Verification Protocols ("IPMVP"). The Company and the selected third party evaluation contractor(s) prepare a more detailed evaluation scope of work as part of the procurement process for specific program evaluations. Final evaluation approaches are guided by protocols, such as the IPMVP. The Company provides draft evaluation reports to its Washington DSM advisory group and requests comments, which are incorporated as appropriate into the final evaluation report. Included in Appendix 8 is the current status of evaluations for each of the Company's current approved Washington DSM programs. Table 21 provides more information about the evaluation for each type of resource listed above in the Biennial (2010 - 2011) Conservation Target section of this report.

Table 21
Reporting and Evaluation by Type of Resource

Type of resource	Reporting	Evaluation
Customer participation in Company programs approved by the Commission	Currently reported in the Company's DSM annual report filed in accordance with the Commission's Accounting Order in Docket No. UE-001457. Deemed savings are reported for most residential measures. For non-residential measures, Energy FinAnswer results are reported based on a post-installation inspection (includes commissioning for more complex measures). FinAnswer Express savings reporting varies based on the measure type and includes a combination of post-installation inspection, deemed savings, and simplified calculation based on installed equipment.	Programs evaluated based on the evaluation plan included with the program filing[34].
Savings acquisitions from Northwest Energy Efficiency Alliance activities	As reported by the Northwest Energy Efficiency Alliance[35]	The Northwest Energy Efficiency Alliance is responsible for evaluation.
Savings from other regional activities and initiatives	If savings from this type of resource are reported, it will be based either on a proportionate share of savings identified via a regional effort or based on an analysis specific to PacifiCorp's Washington service area, whichever case was used in the identification of the conservation forecast and target. Efforts will be made to avoid double-counting savings (e.g. with Northwest Energy Efficiency Alliance savings reporting).	Based either on a proportionate share of savings identified via a regional evaluation or based on an evaluation specific to PacifiCorp's Washington service area, whichever case was used in the identification of the conservation forecast and target.
Savings from energy code and standards changes not already accounted for in the ten-year potential	The ten-year conservation potential identified in this document incorporates energy code and standards changes that were known at the time of the Company's conservation potential assessment. Energy code and standards changes that have not been anticipated may become effective	Based either on a proportionate share of savings identified via a regional evaluation or based on an evaluation specific to PacifiCorp's Washington service area,

[34] Evaluation plans were included with the program filings identified in the Table 17. These evaluation plans are included in Appendix 8.
[35] The Company has a seat on the Northwest Energy Efficiency Alliance Board of Directors and participates in the Alliance expert committees.

Type of resource	Reporting	Evaluation
	during the ten year (and possibly the two year) planning periods covered in this report. If energy code or standards change and the Company intends to propose to report related savings toward its biennial conservation target, savings reporting will be based either on a proportionate share of savings identified via a regional effort or based on an analysis specific to PacifiCorp's Washington service area, whichever case was used in the identification of the conservation forecast and target. Efforts will be made to avoid double-counting savings (e.g. with Northwest Energy Efficiency Alliance savings reporting).	whichever case was used in the identification of the conservation forecast and target.
Naturally occurring conservation	The 10-year conservation potential identified in this document includes potential without regard to whether the savings is achieved via program participation or otherwise. If a significant reduction in potential occurs outside of Company programs (e.g. a community receives 100% funding from federal stimulus money for a significant weatherization effort outside Company programs), the Company may propose to report these savings. If this is the case and the Company intends to report savings toward its biennial conservation target, savings reported will be based either on a proportionate share of savings identified via a regional effort or based on an analysis specific to PacifiCorp's Washington service area, whichever case was used in the identification of the conservation forecast and target. Efforts will be made to avoid double-counting savings (e.g. with Northwest Energy Efficiency Alliance savings reporting).	Based either on a proportionate share of savings identified via a regional evaluation or based on an evaluation specific to PacifiCorp's Washington service area, whichever case was used in the identification of the conservation forecast and target.

Table 22
Reference to Program Details in Program Filings

Docket Number	Advice Number	Date on filing	Requested effective date	Schedule	Program	Filing overview
UE-091515	Advice No. 09-04	9/18/2009	10/30/2009	115	FinAnswer Express	Proposed increase in incentive levels. New measures and new measure categories.
UE-091515	Advice No. 09-04	9/18/2009	10/30/2009	125	Energy FinAnswer	Proposed increase in incentive levels. $0.12 to 0.15 and 50% to 60% for EF.
UE-090762	Advice No. 09-02	5/15/2009	6/17/2009	108	Energy Star New Homes	Request termination of program since new homes measures have been transitioned to Home Energy Savings
	Planned changes to Advisory group for input		*April 1, 2009 for measures where offer improving*	*118*	*Home Energy Savings*	*New measures (new homes, heat pumps), changes to some existing measures, year round CFLs + specialty bulbs, etc. No advisory comments on the proposed changes.*
UE-070723	Advice No. 07-02	4/13/2007	5/31/2007	107	Residential Refrigerator Recycling	Removed sunset date, reduced customer incentive from $40 to $30, other minor changes

Docket Number	Advice Number	Date on filing	Requested effective date	Schedule	Program	Filing overview
UE-061710	Advice No. 06-008	11/8/2006	1/1/2007	115	FinAnswer Express	New measures, changes to some existing measures, separate incentive tables for retrofits and new construction/major renovation, delivery mechanism change for motors and new construction lighting, incentive cap change, added design team honorarium, modified tariff format
UE-061710	Advice No. 06-008	11/8/2006	1/1/2007	125	Energy FinAnswer	Enhanced design assistance services and incentives for new construction/major renovation projects, incentive cap change (% of cost cap moved to project level)
UE-061297	Advice No. 06-004	8/11/2006	9/14/2006	118	Home Energy Savings	Original program filing
UE-051671	Advice No. 05-009	11/3/2005	1/1/2006	115	FinAnswer Express	Administration changes; Minor adjustments in equipment eligibility to align with federal minimum efficiency standards effective 1/23/2006

Docket Number	Advice Number	Date on filing	Requested effective date	Schedule	Program	Filing overview
UE-050319	Advice No. 05-004	3/1/2005	4/1/2005	107	Residential Refrigerator Recycling	Original program filing
UE-050319	Advice No. 05-004	3/1/2005	4/1/2005	108	Energy Star New Homes program	Original program filing
UE-041960	Advice 04-11	11/8/2004	12/11/2004	115	FinAnswer Express	Minor changes
UE-041960	Advice 04-11	11/8/2004	12/11/2004	125	Energy FinAnswer	Minor changes
UE-040608	Advice No. 04-03	3/31/2004	5/1/2004	115	Retrofit Incentive	Consolidated Schedules 115 and 116 into one, expanded to include new construction equipment upgrades, changed program delivery for motors to point of sale and for HVAC to post-purchase application, added premium T8 lighting, program name changed to FinAnswer Express, etc.
UE-040608	Advice No. 04-03	3/31/2004	5/1/2004	116	Retrofit Incentive	Cancelled Schedule 116 (115 and 116 were consolidated into 115)
UE-040608	Advice No. 04-03	3/31/2004	5/1/2004	125	Energy FinAnswer	Streamlined the baseline for new construction, added design professional honorarium, other administrative changes

Docket Number	Advice Number	Date on filing	Requested effective date	Schedule	Program	Filing overview
UE-011065	Advice No. 01-013	Jul-01	8/24/2001	115	Small Retrofit Incentive	Increase incentive for Vending Miser to align with regional initiatives
UE-010826	Advice No. 01-011	6/5/2001	6/28/2001	115	Small Retrofit Incentive	Added measures, added Short Term Incentive
UE-010826	Advice No. 01-011	6/5/2001	6/28/2001	116	Large Retrofit Incentive	Expanded to include mechanical measures, changed program name to Large Retrofit Incentive, added Short Term Incentive
UE-010826	Advice No. 01-011	6/5/2001	6/28/2001	125	Energy FinAnswer	Added $50/KW to incentive formula, added Short Term Incentive, removed the loan option
UE-001457	UE-001457	10/25/2000			Accounting Order	
UE-001457	Advice No. 00-009	9/25/2000	10/26/2000	115	Small Retrofit Incentive	Original program filing
UE-001457	Advice No. 00-009	9/25/2000	10/26/2000	116	Large Retrofit Incentive	Original program filing
UE-001457	Advice No. 00-009	9/25/2000	10/26/2000	125	Energy FinAnswer	Added incentive option
UE-001457	Advice No. 00-009	9/25/2000	1/1/2001	191	System Benefits Charge	SBC initially set at $2.8 million
UE-991832	UE-991832				Stipulation	Company agreed to file a system benefits charge

Commission Staff and Public Involvement in Developing Potential and Target

In accordance with WAC 480-109-010(3)(a), PacifiCorp involved the Commission staff and other interested parties from the public in the development of its ten-year conservation potential and biennial target proposed herein. In addition to Commission staff, representatives from the following organizations were invited to participate in the Company's conservation potential development process: Public Counsel, the NW Energy Coalition, the Washington Department of Commerce, the Energy Project, the Blue Mountain Action Council, the Northwest Community Action Center, the Northwest Energy Efficiency Council, the Opportunities Industrialization Center of Washington, and the Industrial Customers of Northwest Utilities.

PacifiCorp held several meetings to seek input regarding and to discuss the development of its conservation targets. PacifiCorp found these meetings, and the input received therein, to be highly beneficial in the development of its conservation potential and biennial target. In fact, as a direct result of input received during these meetings, the Company determined the risk reduction credit adjustment was appropriate to include in the development of its conservation potential and biennial target. This adjustment adds 2.0 aMW to PacifiCorp's ten-year potential and 0.4 aMW to its 2010 - 2011 biennial conservation target. A summary of the meetings held with the parties listed above and the topics discussed therein is provided in Table 23 below.

Table 23
Overview - Commission Staff and Public Involvement

Date	Summary
10/15/2009	Initial meeting with the DSM advisory group. Declaration and rational provided as to the use of the Company's conservation potential assessment and 2008 IRP as the source for filing the Company's ten-year conservation forecast and biennial target. Outlined the process and analysis planned for this filing, soliciting comments on the process and planned work
11/18/2009	Provided initial analysis results and reviewed the preliminary ten-year potential and biennial target figures with the DSM advisory group
12/8/2009	Commission staff met with the Company and Cadmus Group, Inc. to review and become better acquainted with the conservation potential assessment, the foundational document used in the development of the 2008 IRP
12/10/2009	Reviewed the preliminary draft report with the DSM advisory group and other interested parties, soliciting comments on areas missing and level of detail
12/21/2009	Company and Council met via teleconference to discuss the methodology for the 10% adder as well as the Council's market price adder.
12/22/2009	Following the incorporation of feedback received from the December 10 meeting, reviewed the second draft of the report with the DSM advisory group and other interested parties, again soliciting feedback on the current report
12/30/2009	Provided Company analysis via e-mail on the 10% adder (Regional Act Credit) to the DSM advisory group and other interested parties, requested feedback on the analysis and results
12/31/2009	As required under WAC 480-109-010(1) provided the Company's initial ten-year conservation potential via e-mail to the DSM advisory group and other

Date	Summary
	interested parties (Commission records center also received a copy)
1/15/2010	Company contacted the DSM advisory group and other interested parties to determine interest in another meeting to address any outstanding questions. Meeting was not convened as the majority declined to meet.
3/19/2010	PacifiCorp met with Commission Staff and Public Counsel to determine a schedule by which open issues regarding the Company's 10-year potential and biennial target would be addressed.
4/8/2010	The Company met with the DSM advisory group to discuss various issues and open items raised by parties.
4/26/2010	PacifiCorp provided the DSM advisory group a revised version of its 2010 – 2011 biennial conservation target report reflecting comments received from parties since it was originally filed with the Commission on January 29, 2010.
5/13/21010	PacifiCorp met with the DSM advisory group to discuss an adjustment to the distribution efficiency targets included in the Company's 2010 – 2011 biennial target.
5/18/2010	PacifiCorp met with the DSM advisory group and other interested parties to continue discussions on the Company's I-937 report and next steps.
5/19/2010 to 7/2/2010	PacifiCorp met with the DSM advisory group and other interested parties to continue discussions on the Company's I-937 report and a conditions list.

Conclusion

The cumulative ten-year conservation potential documented in this report is **49.2** aMW. The biennial conservation target for 2010 and 2011 is **8.5** aMW[36].

The Company began the process of identifying its ten-year potential and biennial target with the potential identified in the 2008 IRP, which was informed by the Company's conservation potential assessment specific to the Company's customers and loads. If the Company used its IRP without any adjustments, its ten-year conservation potential would be 34.7 aMW with a biennial target of 6.9 aMW for 2010 and 2011.

As demonstrated in this report, the Company reviewed the Northwest Power and Conservation Council's planning methodology, modeling methodology and practices, and measure sets used in the development of the most recent regional power plan. From this review, the Company identified the adjustments necessary to comply with the requirements of WAC 480-109-010 and account for all cost-effective conservation potential available in the Company's Washington service area. The adjustments were applied to the 2008 IRP conservation potential to arrive at the ten-year conservation potential and 2010 - 2011 biennial target proposed herein. These adjustments increased PacifiCorp's ten-year potential by 14.5 aMW while the biennial target increased by 1.9 aMW.

[36] To remain consistent with the Council's regional power plan, ten-year potential and two-year target values in this report are shown prior to any net-to-gross adjustment and include line losses between the customer site and the generation source. The Company's assumed line losses by sector are 11.031% for residential, 10.834% for commercial and 9.137% for industrial. These values are based on the Company's 2001 Transmission and Distribution Loss Study by Management Applications Consulting published in June 2004.

PacifiCorp's conservation potential assessment and its use within the 2008 IRP process, as described in this report, provides the most relevant and tailored forecast of cost-effective conservation resource opportunity available to the Company in its Washington service area over the 2010 - 2019 planning period. The adjustments noted in this report represent PacifiCorp's efforts to account for modeling and measure differences between the Northwest Power and Conservation Council's and PacifiCorp's resource planning processes. To facilitate the next conservation potential and biennial target (2012 - 2013) filing, PacifiCorp intends to follow the schedule as identified in Table 24 below.

Table 24
Proposed Schedule for Next Ten-Year Potential and Biennial Conservation Target Filing

Action Item	Scope	Estimated Schedule
Update the Conservation Potential Assessment	Incorporate measures as appropriate that were in the regional power plan and not in the 2007 conservation potential assessment which will limit the necessary adjustments needed for the Company's subsequent WAC 480-109-010 compliance filings. Update for changes in energy codes and standards, including the federal lighting legislation.	Completion in 2010
2010 Integrated Resource Plan	Incorporate data from updated conservation potential assessment. Continue to investigate and refine approaches to address modeling differences identified in this document.	Begin work in 2010. Filed 2011 IRP Work Plan on 3/31/2011 in UE-100514.
Advisory Group Meeting	Begin formal discussion on the next ten-year conservation potential and two-year target to be filed by January 31, 2012.	Proposed first meeting in July 2011

List of Appendices

1. 2008 Integrated Resource Plan - PacifiCorp's 2008 Integrated Resource Plan filed on May 29, 2009 (Docket No. UE-080826) and acknowledged by the Washington Utilities and Transportation Commission on September 2, 2009. The 2008 IRP is available at http://www.pacificorp.com/es/irp.html.

2. Assessment of Long-Term, System-Wide Potential for Demand-Side and Other Supplemental Resources - Prepared for PacifiCorp on July 11, 2009. This report is available at http://www.pacificorp.com/env/dsm.html.

3. Comparison of methodologies - Northwest Power and Conservation Council's Regional Power Plan and PacifiCorp's Integrated Resource Plan

4. Additional Detail on Adjustments made to PacifiCorp's 2008 IRP Conservation Targets

5. Demographic Information on PacifiCorp's Washington Service Area

6. List of Measures selected for 2010 and 2011 in the Preferred Portfolio during PacifiCorp's 2008 IRP Process

7. PacifiCorp's share of the Northwest Power and Conservation Council's Regional Conservation Target for Washington (based on the draft 6th Plan dated 09/03/09). The Council's Draft 6th Power Plan is available at: http://www.nwcouncil.org/energy/powerplan/6/default.htm

8. Program Evaluations

Appendix 1
PacifiCorp's 2008 Integrated Resource Plan

(Appendix 1 is voluminous and therefore provided on compact disc)

Appendix 2
Assessment of Long-Term, System-Wide Potential for Demand-Side and Other Supplemental Resources

(Appendix 2 is voluminous and therefore provided on compact disc)

Appendix 3
Comparison of Methodologies
Northwest Power Plan and PacifiCorp Integrated Resource Plan

Appendix 3 contains an outline of the methodology used and provided by the Northwest Power and Conservation Council in the development of the regional power plan along with a description of the Company's aligning methodology. This analysis demonstrates the consistency of the methodologies used in the development of both plans.

The information on the left side of the Table A3-1 below is Tom Eckman's outline of major elements for the Northwest Power and Conservation Council's Methodology for Determining Achievable Conservation Potential[37]. Tom Eckman stated the methodology outline below applies to both the 5th and the 6th regional power plans. The information on the right side is the comparable information related to PacifiCorp's 2008 Integrated Resource Plan methodology. Differences are highlighted in yellow.

Table A3-1
Methodology for Determining Achievable Conservation Potential – Outline of Major Elements

Northwest Power and Conservation Council		**PacifiCorp 2008 IRP**
1) Resource Definitions	i) Technical Potential	
	ii) Economic Potential	
	iii) Achievable Potential	PacifiCorp uses these same categories.
	(1) Non-lost opportunity resources ("schedulable")	In PacifiCorp's conservation potential assessment, these resources are referred to as "retrofit."
	(2) Lost opportunity resources	PacifiCorp uses same definitions, distinguishing between new construction and "normal replacement" as lost opportunity resources.
2) Technical Resource Potential Assessment	a) Review wide array of energy efficiency technologies and practices across all sectors and major end uses	PacifiCorp examined 156 "unique" measures in its conservation potential assessment, inclusive of all measures included in the Council's 5th Plan (the current plan at the time). Distribution efficiency improvement (DEI) and the PC network management measure are in the 6th Plan, but not in PacifiCorp's 2008 IRP and are accounted for in this filing.
	b) Methodology	
	i) Technically feasibility savings = Number of applicable units * incremental savings/applicable unit	PacifiCorp used same methodology.
	ii) "Applicable" Units accounts for	

[37] Provided by Tom Eckman to utilities in attendance at a kickoff meeting hosted by the Commission in Olympia on September 3, 2009. Refer to http://www.nwcouncil.org/energy/powerplan/6/supplycurves/I937/default.htm.

Northwest Power and Conservation Council		PacifiCorp 2008 IRP
	(a) Fuel saturations (e.g. electric vs. gas DHW)	PacifiCorp used the same variables based on the latest survey data available for residential sector. Data for the commercial sector were obtained through field surveys and from the Northwest Commercial Building Stock Assessment (CBSA), the same source used by the Council.
	(b) Building characteristics (single family vs. mobile homes, basement/non-basement, etc.)	
	(c) System saturations, (e.g., heat pump vs. zonal, central AC vs. window AC)	
	(d) Current measure saturations	
	(e) New and existing units	
	(f) Measure life (stock turnover cycle)	Technical specifications for measures were compiled from secondary sources. Measure life estimates are consistent with Council's assumptions.
	(g) Measure substitutions (e.g., duct sealing of homes with forced-air resistance furnaces vs. conversion of homes to heat pumps with sealed ducts)	PacifiCorp examined and accounted for all measure interactions and substitution effects.
	iii) "Incremental" Savings/applicable unit accounts for	
	(a) Expected kW and kWh savings shaped by time-of-day, day of week and month of year	PacifiCorp used hourly (8760) end use load shapes to determine hourly impacts for all measures.
	(b) Savings over baseline efficiency	
	(i) Baseline set by codes/standards or current practices	PacifiCorp set baselines according to codes & standards in effect at the time of the analysis.
	(ii) Not always equivalent to savings over "current use" (e.g., new refrigerator savings are measured as "increment above current federal standards, not the refrigerator being replaced)	All savings were calculated based on existing *codes and standards*, and not existing *stock* characteristics.
	(c) Climate - heating, cooling degree days and solar availability	All analyses were based on typical meteorological year (TMY) data embedded in the eQUEST energy simulation model.
	(d) Measure interactions (e.g. lighting and HVAC, duct sealing and heat pump performance, heat pump conversion and weatherization savings)	Technical measure interactions were taken into account.
3) Economic Potential - Ranking Based on Resource Valuation	a) Total Resource Cost (TRC) is the criterion for economic screening - TRC includes all cost and benefits of measure, regardless of who pays for or receives them.	Total Resource Cost is the criterion for economic screening in the 2008 IRP. The 2008 IRP did not include the regional act credit, and it is discussed in the adjustments section of this filing.
	i) TRC B/C Ratio $\geq$ = 1.0	

Northwest Power and Conservation Council		PacifiCorp 2008 IRP
	ii) Levelized cost of conserved energy (CCE) ≤ levelized avoided cost for the load shape of the savings may substitute for TRC if "CCE" is adjusted to account for "non-kWh" benefits, including deferred T&D, non-energy benefits, environmental benefits and Act's 10% conservation credit	
	b) Methodology	
	i) Energy and capacity value (i.e., benefit) of savings based on avoided cost of future wholesale market purchases (forward price curves)	PacifiCorp used full energy and capacity avoided costs in its calculation of measure benefits, based on PacifiCorp's system avoided cost decrements.
	ii) Energy and capacity value accounts for shape of savings (i.e., uses time and seasonally differentiated avoided costs and measure savings)	
	iii) Uncertainties in future market prices are accounted for by performing valuation under wide range of future market price scenario during Integrated Resource Planning process (See 4.1)	PacifiCorp analyzed potential under 3 (baseline, high, low) avoided cost decrements for 2007 and 2 (expected, high) market penetration assumptions.
	c) Costs Inputs (Resource Cost Elements)	
	i) Full incremental measure costs (material and labor)	PacifiCorp fully accounted for these costs, including 15% program administration expenses.
	ii) Applicable on-going O&M expenses (plus or minus)	
	iii) Applicable periodic O&M expenses (plus or minus)	
	iv) Utility administrative costs (program planning, marketing, delivery, on-going administration, evaluation)	
	d) Benefit Inputs (Resource Value Elements)	
	i) Direct energy savings	All included in the analysis.
	ii) Direct capacity savings	
	iii) Avoided T&D losses	
	iv) Deferral value of transmission and distribution system expansion (if applicable)	PacifiCorp applied a T&D investment deferral credit of $23/kW-yr. The 6th Plan uses a distribution-only credit of $25/kW-yr.
	v) Non-energy benefits (e.g. water savings)	These benefits were not included. PacifiCorp recognizes that generally we don't account for non-energy benefits in our assumptions in acquiring DSM resources. DSM acquisition at PacifiCorp is done for least cost acquisition of electric resource. The non energy benefits associated with customer projects are an ancillary benefit to customers, not necessarily PacifiCorp or non-participants. The additional non-electric benefits in most cases will not have a decisive effect on cost effectiveness of the measure.

Northwest Power and Conservation Council		PacifiCorp 2008 IRP
	vi) Environmental externalities	PacifiCorp and the Council use a carbon tax, and both include the tax for derivation of wholesale electricity prices. The Council treats the CO2 price as a stochastic variable for risk analysis (given a uniform distribution with values between $0 and $100), whereas PacifiCorp does not. The Council's forecast of expected CO2 allowance prices begins in 2012 at a price of $8/ton, increasing to $27/ton in 2020, and to $47 per ton in 2030. PacifiCorp does not assume an expected CO2 price stream, but evaluated portfolios with values of $0, $45, $70, $100, and $45 with real escalation.
	e) Discounted Presented Value Inputs	
	i) Rate = After-tax average cost of capital weighted for project participants (real or nominal)	PacifiCorp used the weighted cost of capital (WACC) for economic valuation of all measures.
	ii) Term = Project life, generally equivalent to life of resources added during planning period	PacifiCorp uses the same methodology.
	iii) Money is discounted, not energy savings	Only monetary values (avoided cost benefits) were discounted.
4) Achievable Potential	a) Annual acquisition targets established through Integrated Resource Acquisition Planning (IRP) process (i.e., portfolio modeling)	PacifiCorp uses the same methodology.
	b) Conservation competes against all other resource options in portfolio analysis	PacifiCorp's 2008 IRP model treats DSM and supply options equally. Refer also to discussion of the regional act credit.
	i) Conservation resource supply curves separated into	
	(1) Discretionary (non-lost opportunity)	PacifiCorp used identical definitions and reported the results in these formats in the conservation potential assessment.
	(2) Lost-opportunity	
	(3) Annual achievable potential constrained by historic "ramp rates" for discretionary and lost-opportunity resources	In its Conservation Potential Assessment, PacifiCorp used consumer surveys to determine achievable potentials based on market response. For the Integrated Resource Plan, the Company used the Council's assumption of maximum 85% achievable potential. For the 2008 Integrated Resource Plan the DSM supply curves were structured as 1/20th of the 20-year potential.
	(a) Maximum ramp up/ramp down rate for discretionary is 3x prior year for discretionary, with upper limit of 85% over 20 year planning period	
	(b) Ramp rate for lost-opportunity is 15% in first year, growing to 85% in twelfth year	

Northwest Power and Conservation Council		PacifiCorp 2008 IRP
	(c) Achievable potentials may vary by type of measure, customer sector, and program design (e.g., measures subject to federal standards can have 100% "achievable" potential)	
	c) Revise Technical, Economic and Achievable Potential based on changes in market conditions (e.g., revised codes or standards), program accomplishments, evaluations and experience	PacifiCorp will revise its estimates of achievable potential based on latest data and, particularly, the effects Federal codes and standards established in EISA in the next compliance filing.
	i) All programs should incorporate Measurement and Verification (M&V) plans that at a minimum track administrative and measure costs and savings.	PacifiCorp routinely evaluates its programs to measure actual savings based on industry best practices, including the IPMVP.
	ii) Use International Performance Measurement and Verification Protocols (IPMVP) as a guide	

Appendix 4
Additional Detail on Adjustments made to PacifiCorp's 2008 IRP Conservation Targets

Consumer Electronics

The 2008 IRP is based on data from the conservation potential assessment, which is essentially from 2006 and before for this category. Consumer electronics, especially televisions, have evolved significantly since then. The data in the regional power plan is more current, so the Company is adding potential from the regional power plan (tailored to the Company's Washington service area) for this category.

This category is one where the savings is essentially "per home". Rather than an allocation based on MWH sales, the adjustment for this category is based on the Company's Washington share of housing units in the region. This allocation change is necessary because the Company's average annual MWH/residential consumer is 30% higher than the average for the Northwest Region. Refer to Table A4-1 for detail.

Table A4-1 provides a comparison of annual average MWH/residential customer based on Energy Information Administration data for 2007, the same reference and year used by the Council in its draft 6th Power Plan and utility target calculator. Note the average annual electric consumption per housing unit in the Company's service area is 25% higher than the Washington state-wide average and 30% higher than the average for the Northwest Region.

Table A4-1

Form EIA-861 Final Data File for 2007			
	RESIDENTIAL_SALES (MWH/yr)	RESIDENTIAL_CONSUMERS	Annual MWh/ residential consumer
PacifiCorp - WA	1,626,726	101,245	16.1
WA State-wide	35,388,779	2,748,270	12.9
Northwest Region	67,644,242	5,452,210	12.4

Source: http://www.eia.doe.gov/cneaf/electricity/page/eia861.html

Given the Company's higher average annual use per residential customer in Washington, Table A4-2 shows the assumed number of residential customers given PacifiCorp's 2007 residential sales of 1,626,726 MWH/yr and the average annual MWH/consumer for PacifiCorp in Washington, Washington as a whole, and the Northwest Region. An allocation based on MWH sales would imply PacifiCorp has approximately 30,000 more homes than actual (131,116 – 101,245 = 29,871).

Table A4-2
Illustration of Number of Residential Consumers
Based on the Different Average Annual MWH/consumer in Table A4-1

	Residential Sales (MWH/yr) (a)	Annual MWH/ residential consumer (b)	Calculated # Residential Consumers (a/b)
PacifiCorp - WA	1,626,726	16.1	101,245
WA State-wide	1,626,726	12.9	126,331
Northwest Region	1,626,726	12.4	131,116

Table A4-3 shows the detail for the adjustment calculation for the consumer electronics measures. The adjustment totals by year in aMW are in the last line of the table.

Table A4-3
Determination of Adjustment to 2008 IRP – Consumer Electronics

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Comments
Council # housing units	5,890,223	5,982,378	6,072,702	6,162,137	6,251,531	6,341,723	6,432,447	6,523,234	6,614,064	6,704,928	PNWResSectorSupplyCurveUnits_6th Plan
PacifiCorp # housing units	104,495	105,384	106,282	107,275	108,337	109,598	110,883	112,132	113,351	114,547	customer forecast used in CPA
PacifiCorp % of region housing units	1.8%	1.8%	1.8%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	
Council # TV per household	2.85	2.87	2.88	2.90	2.91	2.93	2.95	2.97	2.98	2.99	PNWConsumerElectronicsSupplyCurve_6th, Appendix_ResEconDrivers
Council # PC per household	1.26	1.31	1.36	1.40	1.44	1.47	1.50	1.53	1.56	1.59	PNWConsumerElectronicsSupplyCurve_6th, Residential_Desktops

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
PacifiCorp share of regional savings based on % of region MWH sales (aMW)												
Energy Star - Weighted Average TV	0.07	0.12	0.18	0.24	0.30	0.36	0.42	0.47	0.53	0.59	0.19	3.28
Energy Star - Set top box	0.01	0.03	0.04	0.06	0.07	0.09	0.10	0.12	0.13	0.13	0.04	0.78
Energy Star - Weighted Average Residential Monitor	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.05	0.06	0.02	0.33
Energy Star - Weighted Average Residential Desktop	0.03	0.06	0.09	0.11	0.14	0.17	0.20	0.22	0.25	0.28	0.09	1.56
Total based on % of MWH sales	0.12	0.22	0.33	0.44	0.54	0.65	0.76	0.86	0.97	1.06	0.34	5.94

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
PacifiCorp share based on % of region housing units (aMW)												
Energy Star - Weighted Average TV	0.05	0.09	0.13	0.17	0.21	0.25	0.29	0.33	0.37	0.41	0.13	2.28
Energy Star - Set top box	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.09	0.03	0.54
Energy Star - Weighted Average Residential Monitor	0.00	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.01	0.23
Energy Star - Weighted Average Residential Desktop	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.17	0.19	0.06	1.08
Total based on PacifiCorp % of housing units	0.08	0.16	0.23	0.31	0.38	0.45	0.53	0.60	0.67	0.73	0.24	4.13

Showerheads

The showerhead measure in the 2008 IRP is for a replacement of a 4.0 gallon per minute (GPM) showerhead with a 2.5 GPM showerhead. The measure in the regional power plan is replacement of a 2.5 GPM showerhead with a 2.0 one. The two measures are both possible, so the potential from the regional power plan for this measure is added to the potential already identified in the 2008 IRP. The adjustment calculated below reflects the additional savings for decreasing the flow rate for showerheads down to 2.0 GPM. This measure is one where the savings is "per home with electric water heat". The adjustment is based on the Company's share of regional housing units with electric water heat.

Table A4-4
Comparison of % of Housing Units with Electric Water Heat

Residential Housing Units w/ Electric WH	WH fuel share	
Council # housing units with electric water heat	64%	DHW & Appliance Units sheet in PNWResSectorSupply CurveUnits_6thPlan
PacifiCorp # housing units with electric water heat	72%	Energy Decisions Survey, weighted avg across all res bldg types

Table A4-5
Determination of Adjustment to 2008 IRP – Showerhead

Residential Housing Units	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	Comments
Council # housing units	5,890,223	5,982,378	6,072,702	6,162,137	6,251,531	6,341,723	6,432,447	6,523,234	6,614,064	6,704,928	PNWResSectorSupplyCurve Units_6th Plan
PacifiCorp # housing units	104,495	105,384	106,282	107,275	108,337	109,598	110,883	112,132	113,351	114,547	customer forecast used in CPA
PacifiCorp % of region housing units	1.8%	1.8%	1.8%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	

Residential Housing Units w/ Electric WH	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	WH fuel share	
Council # housing units with electric water heat	3,769,743	3,828,722	3,886,529	3,943,767	4,000,980	4,058,702	4,116,766	4,174,869	4,233,001	4,291,154	64%	Appliance Units sheet in PNWResSectorSupplyCurveUnits_6thPlan
PacifiCorp # housing units with electric water heat	75,236	75,876	76,523	77,238	78,003	78,911	79,836	80,735	81,613	82,474	72%	Energy Decisions Survey, weighted avg across all res bldg types
PacifiCorp % of region housing units with electric water heat	2.0%	2.0%	2.0%	2.0%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%		

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2-year**	**10-year**
Council's Orig Potential (Econ) aMW allocated based on MWH sales	0.43	0.43	0.43	0.43	0.43	0.00	0.00	0.00	0.00	0.00	0.86	2.14
New Potential aMW (adjusted for % of housing units with electric water heat)	0.34	0.34	0.34	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.69	1.70

Network PC Power Control

This measure is included in the regional power plan and not in the 2008 IRP. The adjustment is to add this measure to the 2008 IRP targets. The savings is estimated per personal computer and is based on the estimated number of personal computers per employee. Absent better data on the number of employees working for businesses served by PacifiCorp in Washington, the Company is adding its share of the regional target for this measure based on MWH sales.

Table A4-6
Determination of Adjustment to 2008 IRP – Network PC Power Control (aMW)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.21	1.07

Modeling Differences - 10% Adder

The 2008 IRP is a multi-state resource plan, and it does not incorporate a 10% adder (Regional Act Credit) since this adder is not recognized by all of the states. However, the 10% adder is included in the regional power plan[38]. For this filing, the Company used a modeling approach to determine the effect the 10% adder would have on the DSM targets for Washington.

The adjustment to account for the 10% adder results in a slight increase in the targets for 2013 and 2014. Table A4-7 below shows the adjustment to the 2008 IRP targets to account for the 10% adder.

Table A4-7
Determination of Adjustment to 2008 IRP – 10% Adder

Annual Energy (aMW)												
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
Adjustments												
10% adder	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6

Below is further detail on the effort to quantify the impact of the 10% adder.

PacifiCorp conducted a capacity expansion optimization study to determine the resource selection impact of reducing Washington energy conservation costs by 10 percent of the Levelized Market Prices. For this study, the Company applied the input assumptions used to develop the 2008 IRP preferred portfolio, including a $45/ton (in 2008 dollars) carbon dioxide cost beginning in 2013. Note that major non-conservation resources were fixed in the portfolio, including the 200 MW of Washington wind in 2011 as well as natural gas resources added in Utah in 2014 and 2016. Resources allowed to be optimized included firm market purchases ("front office transactions"), distributed generation, and Class 1 (load control) DSM programs. The study approach consisted of first running the System Optimizer capacity expansion model with the base input assumptions and fixed resources for 2009 through 2028, then running the model with Washington conservation resource costs reduced by the 10% value, and, finally, computing the differences in annual capacity and energy between the two model runs.

Table A4-8 below shows the Class 2 (energy efficiency) DSM Cost Bundles and Bundle Prices with the transmission & distribution (T&D) credit and 10% Market Value credit.

[38] Refer to the draft 6th Power Plan, page E-7

Table A4-8 – Class 2 DSM Bundle Prices with the T&D Credit and 10% Market Value Credit

Class 2 DSM Cost Bundle	Resource Cost Range	Bundle Price ($/MWh)	Bundle Price with $23 kw-year T&D Credit ($/MWh)	Bundle Price with T&D Credit and 10% Market Value Credit ($/MWh)
Cost Bundle 1	$0.01/kWh to $0.07/Kwh	$70	$65	$56
Cost Bundle 2	$0.07/kWh to $0.09/Kwh	$90	$83	$74
Cost Bundle 3	$0.09/kWh to $0.11/Kwh	$110	$103	$94
Cost Bundle 4	$0.11/kWh to $0.13/Kwh	$130	$123	$114
Cost Bundle 5	$0.13/kWh to $0.15/Kwh	$150	$143	$134
Cost Bundle 6	$0.15/kWh to $0.18/Kwh	$180	$173	$164

Study Results

The tables below show the annual incremental and cumulative megawatt (capacity) differences in conservation between the base and cost-reduction model runs for 2010 – 2019.

Table A4-9 - Incremental (1st year) MW Capacity Differences Between Base and Cost Reduction Runs

Year	Incremental Megawatts		Percent Diff.
	WA Base DSM	DSM with 10% Mkt Value credit	
2010	7.36	7.36	0.0%
2011	6.86	6.86	0.0%
2012	6.83	6.83	0.0%
2013	6.26	7.21	15.2%
2014	6.84	7.35	7.5%
2015	7.35	7.35	0.0%
2016	7.27	7.27	0.0%
2017	7.33	7.33	0.0%
2018	7.67	7.67	0.0%
2019	7.43	7.43	0.0%
TOTAL	71.2	72.66	2.1%

The tables below show the annual incremental (first-year) energy differences in conservation between the base and cost-reduction model runs for 2010 – 2019.

Table A4-10 - Incremental (1st year) GWH and Average MW (aMW) Energy Differences Between Base and Cost Reduction Runs

	Incremental GWH				Incremental aMW		
Year	Base DSM	DSM with 10% Mkt Value credit	Percent Diff.	Year	Base DSM	DSM with 10% Mkt Value credit	Percent Diff.
2010	31.4	31.4	0.0%	2010	3.59	3.59	0.0%
2011	29.2	29.2	0.0%	2011	3.34	3.34	0.0%
2012	29.1	29.1	0.0%	2012	3.32	3.32	0.0%
2013	27.2	30.4	11.7%	2013	3.11	3.47	11.7%
2014	29.2	30.9	5.9%	2014	3.33	3.52	5.9%
2015	30.9	30.9	0.0%	2015	3.53	3.53	0.0%
2016	30.6	30.6	0.0%	2016	3.49	3.49	0.0%
2017	31.7	31.7	0.0%	2017	3.62	3.62	0.0%
2018	32.3	32.3	0.0%	2018	3.69	3.69	0.0%
2019	32.1	32.1	0.0%	2019	3.67	3.67	0.0%
TOTAL	303.8	308.7	1.6%	TOTAL	34.7	35.2	1.6%

The average increase for the period from 2010 through 2019 was 2.1 percent on a capacity basis (1.6 percent on a gigawatt-hour energy basis).

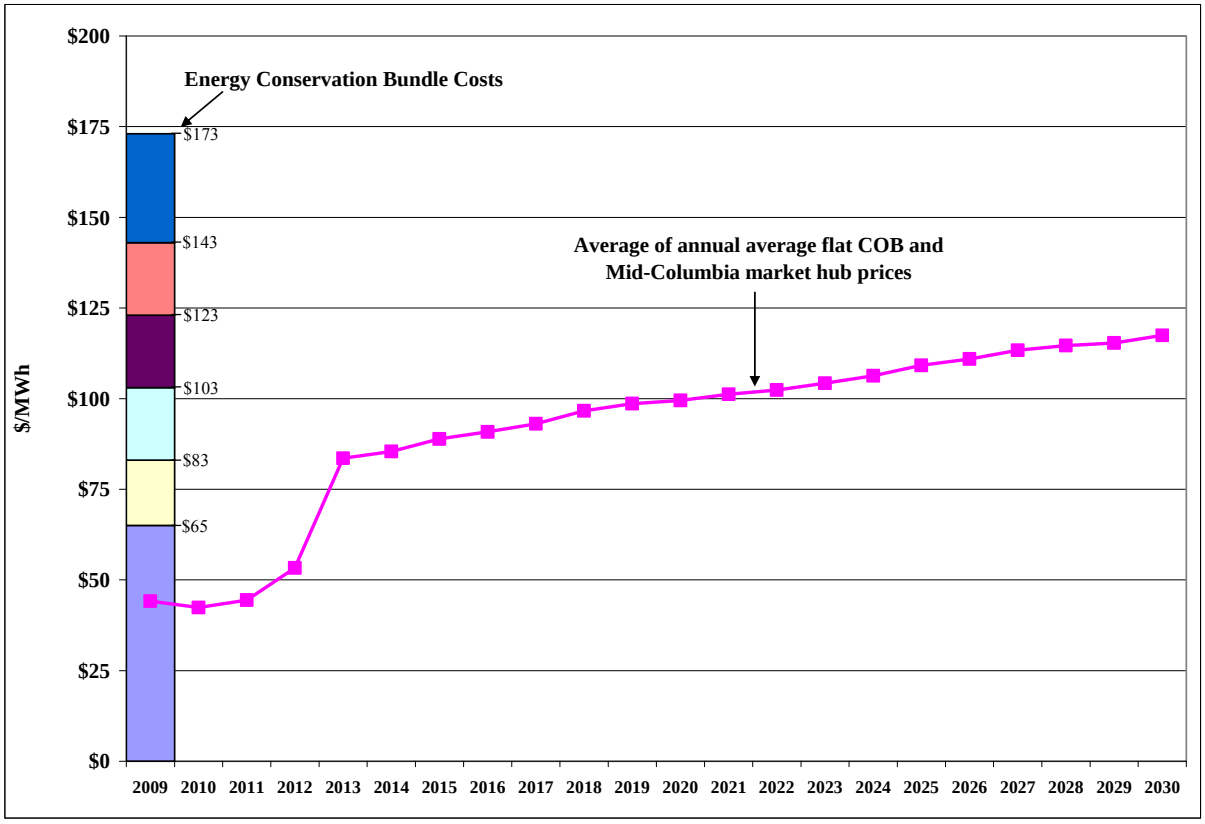
For the 2010-2011 biennial conservation target period, the 10-percent cost reduction was found to have no impact on conservation capacity selected by the System Optimizer model. The reasons for this outcome include the following:

- The west side of the system is long on capacity until 2012, and is long on energy on an average annual basis until 2012-2013.
- A significant amount of wind generation has been added in Washington and Oregon in the 2008 to 2011 period, which reduces the need for incremental resources.[39]
- Forward wholesale electricity prices are below (or at least competitive with) energy conservation costs until 2013. Low gas prices also tend to favor increased dispatch of existing gas plants over the cost of new conservation.

The following chart (Figure A4-1) shows average annual western electricity prices used for developing the 2008 IRP preferred portfolio (Table 7.15 pg 157) as compared with the per-MWh levelized conservation costs for each measure bundle. (Note that wheeling costs would need to be accounted for in making a direct comparison between conservation and market purchase costs.)

[39] Wind projects are treated as must-run generation in the model.

Figure A4-1



In addition to the role of market and gas prices, the increase in conservation capacity in 2013 and 2014 resulting from the 10-percent cost reduction—about 1.1 megawatts capacity—is attributable to an increased need for resources because of purchase contract expirations and load growth. The imposition of carbon dioxide costs in 2013 may also contribute to the increase.

A sensitivity analysis was conducted to determine the impact of the early wind resource additions on the quantity and timing of conservation and front office transactions selected. The base and cost-reduction simulations were configured to allow the model to choose the amount and timing of wind resources. (Previous portfolio modeling for the IRP indicated that the model prefers to defer the start of wind additions to 2015). The impact on wind resources was to defer them to 2015 and beyond as expected. The model selected front office transactions to make up for the deferred wind resources, as well as reduced Washington conservation capacity by 1.2 megawatts in 2009. This result supports the expectation that in the near term, conservation is not cost-effective *on the margin* relative to firm market purchases based on the forecasted prices and resource costs used in the model.

Study Considerations

A consideration for this sensitivity study is the capacity size of the conservation measure bundles and associated prices. A more granular representation of the conservation supply curve may change the marginal quantity of conservation selected by the model. However, the extent and

timing of such changes cannot be determined without reformulating the supply curve to test at what quantity-price thresholds cause resource selection changes. Nevertheless, it is reasonable to expect that a more granular supply curve would not result in materially higher conservation capacity in the near-term as a result of the 10-percent cost reduction, and using the 2008 IRP input assumptions.

Conclusion

The impact of the 10-percent cost reduction on capacity is to increase Washington conservation by about 1.5 megawatts by 2019, with the majority of the increase occurring in 2013 (about one megawatt capacity). The impact of the 10-percent cost reduction on energy is to increase Washington conservation by about 0.56 aMW over the 2010 – 2019 planning period.

Other Differences – Council's "market price adder", PacifiCorp's "risk reduction credit"

PacifiCorp and Northwest Power and Conservation Council ("Council") staff participated in a conference call on December 21, 2009, to explain and discuss their respective conservation modeling methodologies. One of the topics for discussion was capturing and valuing the benefits of energy conservation in portfolio analysis, and how the Council accomplishes this, in part, through the use of a *market price adder.* The market price adder is not specifically called out as a modeling methodology in the Council's outline of major elements document. The DSM advisory group and additional invitees participating in the public process for WAC 480-109 asked the Company to evaluate the applicability of the Council's market price adder to the Company's own conservation modeling methodology. The background and description of this effort is provided below. Table A4-11 shows the adjustment to the 2008 Integrated Resource Plan conservation potential for what PacifiCorp refers to as a risk reduction credit and the Council accomplishes via a market price adder.

Table A4-11
Determination of Adjustment to 2008 IRP – Risk Reduction Credit
(Council's Market Price Adder)

		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
Modeling	Risk Reduction Credit	0.2	0.2	0.0	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.4	2.0

Below is background and further detail on this adjustment. The information is broken into two parts. Part 1 covers the planning and pre-work before any modeling work. Part 2 describes PacifiCorp's modeling work and results.

Part 1 – Planning and Pre-work to Define the Approach

This section first describes the key differences in portfolio modeling strategy adopted by the Council and PacifiCorp to provide context for the rest of the section. It then summarizes PacifiCorp's understanding of the role of the Council's market price adder, and discusses the appropriateness of implementing the adder concept in PacifiCorp's resource portfolio modeling

framework. The conclusion section outlines a proposal for testing and implementing an interim capacity expansion modeling approach for Washington conservation selection that is more in line with the Council's risk mitigation valuation objectives.

Portfolio Modeling Strategy

The Council's Regional Portfolio Model, a sophisticated spreadsheet-based modeling system, was developed from the ground up with evaluation of regional conservation potential as a key policy objective. The model's logic and data processing routines are based on an integrated approach to modeling uncertainty, risk, and portfolio cost-effectiveness evaluation. To accomplish this with reasonable execution run-times, the model relies on certain simplifications such as aggregating regional resources into reference technologies and bypassing representation of intra-regional transmission.

In contrast, PacifiCorp and most other utilities rely on separate modeling systems—typically proprietary products from well-established software vendors—to perform these analytic functions for integrated resource planning. For example, PacifiCorp uses a capacity expansion optimization model to develop portfolios based on various futures. These portfolios are then analyzed with a detailed production cost model using stochastic Monte Carlo simulation methods. The Monte Carlo production cost model is also used to develop conservation avoided cost estimates for the Company's demand-side management department for program development and evaluation.

This multi-model strategy takes advantage of each individual model's strengths and capabilities to represent the utility system in detail. For example, the capacity expansion model can represent various market purchase product types consistent with those frequently transacted by the Company's front office as well as include transmission expansions as portfolio resource options. This detail is necessary to (1) comprehensively characterize system operations and transmission constraints on a wide geographic scale, (2) analyze individual resources[40], and (3) assist in validating other PacifiCorp models used for commercial and regulatory compliance purposes.

On the other hand, use of separate proprietary models in this fashion presents its own challenges. These challenges include addressing differences in representation of system characteristics and costs across the models, the need for additional data management activities, and model evolution that can lag regulatory, market, and energy technology developments.

The upshot is that while there are many parallels between the modeling strategies employed by PacifiCorp and the Council (for example, the use of conservation supply curves and the framework for estimating conservation potential) there are also fundamental differences reflecting dissimilar modeling tools, analytical objectives, and planning requirements. This means that functionality cannot be lifted from the Council's Portfolio Model without re-architecting PacifiCorp's capacity expansion model. Such re-architecting has to be performed by the model vendor, assuming that the model could accommodate the added solution complexity

[40] For example, PacifiCorp's IRP models are used to evaluate investment and contract opportunities, transmission system expansions, and multiple bid resources as part of competitive procurements.

without compromising other required functionality. Such a project would involve significant time and cost to complete.

Market Price Adder Overview

The Council's market price adder is a construct tailored to the Portfolio Model's logic and data processing routines. The role of the Council's market price adder is to ensure that the full risk mitigation value of conservation is accounted for in determining the cost-effective amount of conservation to include in resource portfolios developed by the Council's Regional Portfolio Model. PacifiCorp's understanding is that the adder is the price needed to shift a portfolio to the "efficient frontier" for the population of portfolios.[41] Since conservation is viewed as the least-risk resource among all alternatives by virtue of having minimal operating costs and other risk mitigation benefits such as electricity price volatility mitigation, this price is attributed to conservation as marginal benefit, and therefore increases conservation's cost-effectiveness threshold by this amount. The market price adder is determined dynamically inside the Regional Portfolio Model as portfolios are developed and portfolio cost/risk profiles based on the Council's 750 futures are determined. The Council stresses that the market price adder is positive (reflecting a net benefit) even in cases where a utility system has surplus resources and/or low electricity market prices—the rationale being that conservation's risk mitigation value helps make it the least expensive source of reserve capacity.

Applicability of the Market Price Adder Concept to PacifiCorp's Conservation Modeling

PacifiCorp's current IRP modeling framework assesses the relative cost-effectiveness of conservation in relation to many other resource types over a 20-year period, accounting for fixed and operating costs (including carbon dioxide emission costs), capacity value, T&D investment deferral benefits, and stochastic risk mitigation. In line with the Council, PacifiCorp also computes stochastic average cost and tail risk measures to enable inspection of an efficient frontier for assessing the trade-off between portfolio cost and risk. For the risk measure, PacifiCorp uses the mean of the five highest PVRRs stemming from a stochastic production cost simulation involving 100 simulation iterations. Real levelized fixed costs included in the PVRR are determined by the capacity expansion model.

Since the efficient frontier is determined after portfolios and associated conservation amounts are developed, the market price adder concept is not directly applicable to PacifiCorp's portfolio modeling. (Recall that the market price adder is dynamically estimated as portfolios are developed and assessed by the Council's Portfolio Model.) Nevertheless, the Company can derive an average dollars-per-megawatt price from the efficient frontier of portfolios evaluated for its 2008 Integrated Resource Plan. This price can be compared against the Council's market price adders ($10/MWh for discretionary conservation and $50/MWh for lost opportunity conservation), and if believed to be reasonable, can then be credited against PacifiCorp's conservation cost curve and tested for the impact on Washington conservation selection. This may be a practical way, on an interim basis, to more closely align with the Council's risk

[41] As defined by the Council, the efficient frontier represents the set of portfolios with the least cost for a given risk level. Risk is defined as "TailVar90", which is the mean of the highest 10 percent of portfolio net present values.

mitigation valuation approach until PacifiCorp revisits the conservation modeling methodology for its next IRP. Alternatively, PacifiCorp can model Washington conservation with a time-period average of forward market prices to remove the volatility predicted in the early years. This is consistent with the view that a utility's conservation planning must account for phasing in quantities over several years. Either or both approaches may be applied as stop-gap solutions.

Ultimately, the issue for PacifiCorp is not whether a market price adder can or should be adopted, but rather to what extent do the IRP models capture the risk mitigation value of conservation in a way that is consistent with the IRP regulatory mandate to treat all resource options on a consistent and comparable basis. Any improvements that the Company makes in modeling resource risk mitigation benefits will therefore need to apply to all technologies.

With this caveat in mind, PacifiCorp identified four options for more closely aligning with the Council's approach for valuing conservation in portfolio modeling.

- Option 1 – Apply an externally determined cost adjustment to the conservation supply curve used in System Optimizer that reflects risk mitigation value. This cost adjustment can be provided as an output of PacifiCorp's conservation avoided cost estimation process, which could include the market price averaging approach described above.

- Option 2 – Redesign PacifiCorp's capacity expansion model to incorporate a risk processor that determines a market adder in the same (or simplified) fashion as the Council's Portfolio Model.

- Option 3 – Adopt the Council's Portfolio Model for estimating conservation targets only, and feed these targets as fixed resource selections in System Optimizer.

- Option 4 – Replace System Optimizer with the Council's Portfolio Model.

Option 1 is attractive because it utilizes the current modeling tools and processes, and avoids having to make structural model changes. PacifiCorp is currently developing a revised resource avoided cost methodology using System Optimizer to estimate capacity value and the stochastic production cost model to estimate energy value. A more comprehensive treatment of risk mitigation value can be integrated into the avoided cost estimation methodology. However, the Company is not in a position to churn out a quick I-937 analysis with such an enhanced avoided cost methodology because it is still under development and has not been vetted within the Company.

PacifiCorp rules out Option 2. Such model changes are probably not technically feasible given the model's current complexity and the scope of the set-up reflecting the Company's transmission topology and resources. An alternative approach is to operate System Optimizer in a batch process with stochastically determined futures, effectively turning System Optimizer into a "pseudo" stochastic capacity expansion model. A separate automated post-processing routine could adjust conservation selection based on the efficient frontier concept. System Optimizer would then need to be re-run with the adjusted fixed conservation quantities. This approach,

while technically feasible, dramatically complicates the portfolio development process, and is not realistic given IRP and business planning development requirements and schedules.

Options 3 and 4 involve adoption of the Portfolio Model to different degrees to ensure that conservation target development is fully aligned with the Council's evaluation methodology. The Company has strong reservations regarding expanding its modeling tool set because of the additional work load and model management requirements, and therefore rules out Option 3. As the modeling strategy section above suggests, replacing System Optimizer with the Council's Portfolio Model is not a practical solution given the Company's analytical objectives and planning requirements.

Conclusion

PacifiCorp agrees to test an interim capacity expansion modeling approach for Washington conservation selection more in line with the Council's risk mitigation valuation objectives. The Company describes two approaches for this testing:

- Use stochastic cost and risk measures from its 2008 IRP to adjust conservation costs based on the efficient frontier concept.

- Conduct the capacity expansion modeling with average forward market prices over a designated period.

After evaluating the results of both tests individually and in combination, the Company will adjust the Washington conservation targets accordingly.

The Company is also developing an improved resource avoided cost estimation methodology, the results of which can be used to adjust conservation resource costs in the capacity expansion model (Option 1). Option 1 represents the Company's favored long-term solution for fully accounting for risk mitigation benefits in the IRP modeling framework.

Part 2 – Modeling and Results

Risk Mitigation Cost Credit Estimation

After further evaluating the applicability of estimating a risk mitigation cost credit to PacifiCorp's IRP models, the Company developed two separate cost credits representing different aspects of risk mitigation. These two cost credits were then applied to the Washington conservation cost curves, and the capacity expansion model used to derive a new set of conservation targets.

The first cost credit, a measure of average stochastic risk reduction benefit, was developed by comparing the value of a 100-megawatt increment of conservation derived from both deterministic and stochastic production cost simulations of the 2008 IRP preferred portfolio, assuming a \$45/ton CO_2 regulatory cost. The difference in value, expressed as a reduction in the portfolio's 20-year Present Value Revenue Requirements (PVRR), reflects the stochastic risk

reduction benefit.[42] This value is then converted to a dollars-per-megawatt-hour figure. Table A4-12 below shows the derivation of the stochastic average risk reduction benefit from the four simulations conducted (two deterministic and two stochastic) using PacifiCorp's Planning and Risk production cost model.

Table A4-12

	20-Year Present Value Revenue Requirement, $ Million		
Simulation Type	**2008 Preferred Portfolio**	**2008 Preferred Portfolio with 100 MW of Additional Conservation**	**Difference**
Deterministic	35,900	35,332	567
Stochastic	34,091	33,507	583
Risk Reduction Value	1,809	1,825	16
$/MWh Risk Reduction Value Calculation			
NPV of GWh Generation (Stochastic Simulation)			5,889
$/MWh Risk Reduction Value			**2.74**

As the table shows, the addition of 100 megawatts of conservation reduces portfolio deterministic PVRR by $567 million, while on a stochastic average basis, the PVRR is reduced by $583 million. The difference—$16 million, or $2.74/MWh—reflects the average stochastic risk reduction value of the additional conservation.

The second cost credit reflects the price premium one needs to pay to significantly reduce a portfolio's upper-tail risk by adjusting the resource mix towards clean, zero or low operating cost resources such as conservation and wind; in other words, to move the portfolio closer to the low-risk end of the efficient frontier of portfolios. PacifiCorp defines tail risk as the average of the five highest PVRR outcomes out of the 100 simulated futures determined through the stochastic Monte Carlo production cost modeling.

PacifiCorp selected two portfolios for comparison of upper-tail costs, chosen from the set of portfolios developed for the 2008 IRP. These two portfolios consist of the Company's preliminary preferred portfolio, referred to in the 2008 IRP document as "Case 5", and the lowest-risk portfolio that excludes coal resource additions, referred to as "Case 20". Case 20 was developed assuming a high carbon dioxide regulatory cost ($70/ton in 2008 dollars, beginning in 2013 and escalating at the rate of inflation) and a high electricity market and gas commodity cost scenario. Relative to Case 5, Case 20 includes 5,000 MW of additional wind and 200 MW of additional conservation on a system basis through 2028. Other resource differences are trivial.

[42] The stochastic simulation uses Monte Carlo sampling to generate 100 simulated futures, consistent with PacifiCorp's regular IRP practice. As the primary stochastic cost measure, the Company computes the average PVRR across the 100 simulated futures.

To derive the tail-risk mitigation premium, PacifiCorp took the difference in tail-risk PVRR between Case 5 and Case 20, and converted it to a dollars-per-megawatt-hour value. Table A4-13 below shows the derivation of the $12.24/MWh credit.

Table A4-13

Portfolio ID	Stochastic Upper-Tail Risk	
	PVRR, $ Million	Difference
Case 5	78,168	9,722
Case 20	68,446	--
NPV of Cumulative Generation 2009-2028, GWh		794,582
Upper-tail Risk Mitigation Premium		**$12.24**

There are a few caveats associated with the upper-tail risk mitigation premium:

- Wind plants and conservation are both modeled as fixed energy resources in the IRP models (each assigned an hourly energy pattern), so the assumption was made that a joint price premium was a reasonable proxy for a conservation value determined independently. Differences in the wind and conservation energy patterns would affect the premium value.

- As a premium determined as a joint contribution of both wind and conservation, this value would appropriately be applied to both wind and conservation resource option costs in the capacity expansion model. However, the credit was only applied to the conservation supply curve for this study. Applying the credit to wind would change the resource mix, and likely reduce the amount of conservation selected.

- As mentioned above, wind plant output is modeled in the IRP as a fixed hourly energy pattern as opposed to a stochastic variable. The tail-risk risk mitigation premium will thus be overstated because wind volatility, another source of risk, is not accounted for in the stochastic production simulations.

- The two cost credits are assumed to be additive. However, the stochastic average PVRR includes the five highest PVRR outcomes used for deriving the tail-risk PVRR, so these two risk metrics are not strictly independent.

The two cost credits, totaling $14.98/MWh, were then applied to the conservation supply curve costs. Tables A4-14, A4-15 and A4-16 below shows the annual conservation selection impacts of the 10 percent Northwest Power Act credit, the risk reduction credit, and the combined impact.

Table A4-14

Year	Incremental Megawatts				Percent Diff.
	WA Base DSM	Additional DSM from 10% credit	Additional DSM with Risk Reduct. Value	TTL DSM with 10% Credit + Risk Reduct. Value	
2009	6.77	0.00	0.42	7.19	6.2%
2010	7.36	0.00	0.57	7.93	7.7%
2011	6.86	0.00	0.48	7.34	7.0%
2012	6.83	0.00	0.00	6.83	0.0%
2013	6.26	0.95	0.24	7.45	19.0%
2014	6.84	0.51	0.59	7.94	16.1%
2015	7.35	0.00	0.63	7.98	8.6%
2016	7.27	0.00	0.79	8.06	10.9%
2017	7.33	0.00	0.47	7.80	6.4%
2018	7.67	0.00	0.65	8.32	8.5%
2019	7.43	0.00	0.80	8.23	10.8%
2020	7.79	0.00	0.67	8.46	8.6%
2021	8.52	0.00	0.03	8.55	0.4%
2022	8.06	0.07	0.02	8.15	1.1%
2023	8.18	0.59	0.00	8.77	7.2%
2024	8.61	0.88	0.00	9.49	10.2%
2025	8.07	0.74	0.00	8.81	9.2%
2026	8.35	0.62	0.00	8.97	7.4%
2027	8.24	0.47	0.41	9.12	10.7%
2028	8.33	0.56	0.44	9.33	12.0%
TOTAL	152.12	5.39	7.21	164.72	8.3%

Table A4-15

Year	Cumulative Megawatts				Percent Diff.
	WA Base DSM	Additional DSM from 10% credit	Additional DSM with Risk Reduct. Value	TTL DSM with 10% Credit + Risk Reduct. Value	
2009	6.77	0.00	0.42	7.19	6.2%
2010	14.13	0.00	0.99	15.12	7.0%
2011	20.99	0.00	1.47	22.46	7.0%
2012	27.82	0.00	1.47	29.29	5.3%
2013	34.08	0.95	1.71	36.74	7.8%
2014	40.92	1.46	2.30	44.68	9.2%
2015	48.27	1.46	2.93	52.66	9.1%
2016	55.54	1.46	3.72	60.72	9.3%
2017	62.87	1.46	4.19	68.52	9.0%
2018	70.54	1.46	4.84	76.84	8.9%
2019	77.97	1.46	5.64	85.07	9.1%
2020	85.76	1.46	6.31	93.53	9.1%
2021	94.28	1.46	6.34	102.08	8.3%
2022	102.34	1.53	6.36	110.23	7.7%
2023	110.52	2.12	6.36	119.00	7.7%
2024	119.13	3.00	6.36	128.49	7.9%
2025	127.20	3.74	6.36	137.30	7.9%
2026	135.55	4.36	6.36	146.27	7.9%
2027	143.79	4.83	6.77	155.39	8.1%
2028	152.12	5.39	7.21	164.72	8.3%
TOTAL	152.12	5.39	7.21	164.72	8.3%

Table A4-16

Year	Cumulative Gigawatt-hours				Percent Diff.
	WA Base DSM	Additional DSM from 10% credit	Additional DSM with Risk Reduct. Value	TTL DSM with 10% Credit + Risk Reduct. Value	
2009	28.8	0.0	1.4	30.3	4.9%
2010	60.3	0.0	3.3	63.6	5.5%
2011	89.5	0.0	4.9	94.4	5.5%
2012	118.6	0.0	4.9	123.5	4.2%
2013	145.8	3.2	5.7	154.8	6.1%
2014	175.0	4.9	7.7	187.6	7.2%
2015	205.9	4.9	9.8	220.6	7.2%
2016	236.5	4.9	12.5	253.9	7.4%
2017	268.2	4.9	14.1	287.2	7.1%
2018	300.5	4.9	16.2	321.6	7.0%
2019	332.6	4.9	18.9	356.5	7.2%
2020	365.4	4.9	21.2	391.5	7.1%
2021	400.7	4.9	21.3	426.9	6.5%
2022	434.6	4.9	21.6	461.1	6.1%
2023	469.0	6.9	21.6	497.5	6.1%
2024	503.8	9.8	21.6	535.2	6.2%
2025	537.9	12.3	21.6	571.8	6.3%
2026	572.8	14.4	21.6	608.7	6.3%
2027	607.3	16.0	23.0	646.2	6.4%
2028	642.0	17.9	24.4	684.3	6.6%
TOTAL	6,495.3	124.5	297.4	6,917.2	6.5%

Tables A4-17, A4-18 and A4-19 below are the same information specific to the 2010-2019 planning period and including a table with the data in energy units of aMW. The difference column in the third table shows the adjustment to the 2008 IRP conservation potential in aMW.

Table A4-17

Year	Incremental Megawatts		
	DSM with 10% Mkt Value credit	DSM with 10% Mkt Value + Risk/Opt credit	Differnce (MW)
2010	7.36	7.93	0.57
2011	6.86	7.34	0.48
2012	6.83	6.83	0
2013	7.21	7.45	0.24
2014	7.35	7.94	0.59
2015	7.35	7.98	0.63
2016	7.27	8.06	0.79
2017	7.33	7.8	0.47
2018	7.67	8.32	0.65
2019	7.43	8.23	0.8
Total	72.66	77.9	5.22

Table A4-18

Year	1st Year Gigawatt-hours		
	DSM with 10% Mkt Value credit	DSM with 10% Mkt Value + Risk/Opt credit	Difference (GWH)
2010	31.43	33.34	1.91
2011	29.24	30.85	1.61
2012	29.10	29.10	-
2013	30.40	31.21	0.81
2014	30.87	32.85	1.98
2015	30.91	33.03	2.11
2016	30.60	33.25	2.65
2017	31.71	33.29	1.58
2018	32.29	34.47	2.18
2019	32.14	34.83	2.68
Total	308.70	326.21	17.52

Table A4-19

Year	aMW		
	DSM with 10% Mkt Value credit	DSM with 10% Mkt Value + Risk/Opt credit	Difference (aMW)
2010	3.59	3.81	0.22
2011	3.34	3.52	0.18
2012	3.32	3.32	-
2013	3.47	3.56	0.09
2014	3.52	3.75	0.23
2015	3.53	3.77	0.24
2016	3.49	3.80	0.30
2017	3.62	3.80	0.18
2018	3.69	3.94	0.25
2019	3.67	3.98	0.31
Total	35.24	37.24	2.00

Appendix 5
Demographic Information on PacifiCorp's Washington Service Area

The Company determined early in the planning process the ten-year technical potential identified in its conservation potential assessment was 50% lower than the Company's Washington share of the technical potential identified in the regional power plan. This is a significant indication the Company's service area is not similar to the regional average for the four-state planning area of the regional power plan.

Below are a few demographic differences between the Company's Washington service area and the region as a whole.

- Communities the Company serves in Washington are smaller and more rural
  - The Company has customers in 36 communities in WA (refer to detailed list of communities (Table A5-2) and service area map (Figure A5-1) included below)
    - 10 communities have 87% of the Company's residential customers
    - 20 communities have fewer than 1,000 residential customers
  - Infrastructure characteristics in smaller markets (e.g. vendors and contractors)
    - More generalists, fewer specialists
    - Implication – longer ramps for new measures/technology
  - Percent of low income households - significantly higher percentage than the statewide average
  - As is typical for many rural areas, many (but not all) of the Company's customers have access to gas. Cascade Natural Gas just started ramping up DSM programs fairly recently, so there is not a significant benefit to Company program participation from gas company marketing efforts yet.
  - In the industrial sector,
    - One large customer represents almost half of the industrial MWH sales, and this customer has been active in Company energy efficiency programs for many years.
    - There are approximately 36 Schedule 48 industrial customers (> 1 MW each)

- The Company's average annual electric consumption per home is significantly higher than the regional average likely due to higher than average number of homes with electric space heating, water heating, and clothes dryers. See Table A5-1 below.
  - If a regional savings target is allocated based on MWH sales and the potential were determined per housing unit, the Company's share of the regional target would be out of proportion with the number of housing units.
  - This is a factor for measures where there is typically one per housing unit such as water heaters, clothes washers, and other appliances.

Table A5-1 provides a comparison of annual average MWH/residential customer based on Energy Information Administration data for 2007, the same reference and year used by the Council in its draft 6th Power Plan and utility target calculator. Note the average annual electric consumption per housing unit in the Company's service area is 25% higher than the Washington

state-wide average and 30% higher than the average for the 4-state total for the Northwest Region.

Table A5-1

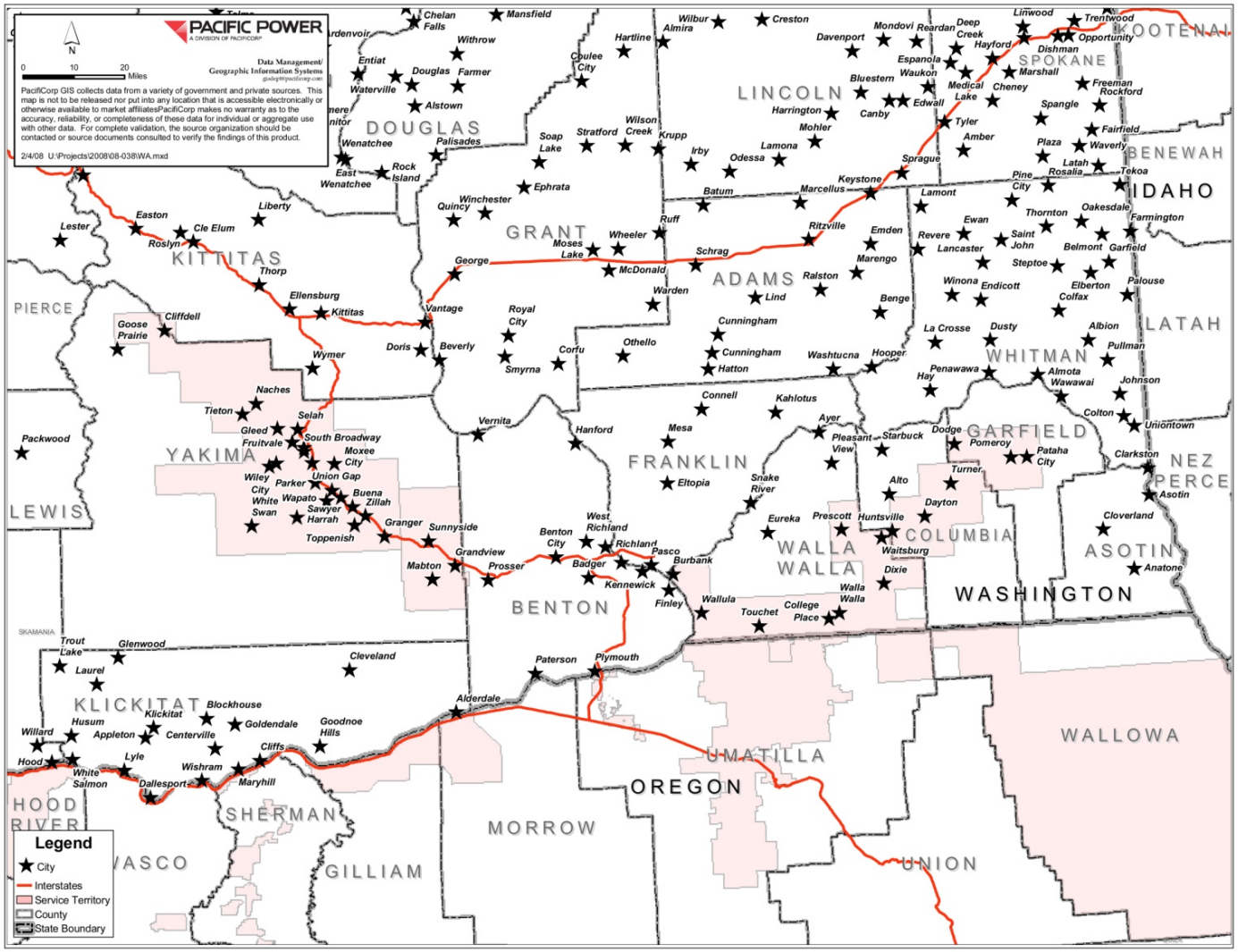
Form EIA-861 Final Data File for 2007			
	RESIDENTIAL_SALES (MWH/yr)	RESIDENTIAL_CONSUMERS	Annual MWh/ residential consumer
PacifiCorp - WA	1,626,726	101,245	16.1
WA State-wide	35,388,779	2,748,270	12.9
Northwest Region	67,644,242	5,452,210	12.4

Source: http://www.eia.doe.gov/cneaf/electricity/page/eia861.html

Table A5-2
Communities (including unincorporated areas)
Served by PacifiCorp in Washington

Community (including unincorporated areas)	County	# Residential customers
PROSSER Total	Yakima/Benton	35
YAKIMA	Yakima	44,307
SELAH	Yakima	6,307
SUNNYSIDE	Yakima	5,795
GRANDVIEW	Yakima	3,908
WAPATO	Yakima	3,484
TOPPENISH	Yakima	3,063
ZILLAH	Yakima	2,205
UNION GAP	Yakima	2,181
NACHES	Yakima	2,011
MOXEE CITY Total	Yakima	1,908
GRANGER Total	Yakima	1,221
TIETON Total	Yakima	1,015
MABTON Total	Yakima	823
OUTLOOK Total	Yakima	529
COWICHE Total	Yakima	458
WHITE SWAN Total	Yakima	340
HARRAH Total	Yakima	256
BUENA Total	Yakima	235
PARKER Total	Yakima	87
BROWNSTONE Total	Yakima	6
WALLA WALLA	Walla Walla	14,934
COLLEGE PLACE	Walla Walla	3,067
BURBANK Total	Walla Walla	810
WAITSBURG Total	Walla Walla	612
TOUCHET Total	Walla Walla	326
PRESCOTT Total	Walla Walla	174
DIXIE Total	Walla Walla	110
WALLULA Total	Walla Walla	74
LOWDEN Total	Walla Walla	17
PASCO Total	Walla Walla	6
WHITE SALMON Total	Klickitat	2
POMEROY Total	Garfield	858
DAYTON Total	Columbia	1,483
HUNTSVILLE Total	Columbia	14
		102,661

Figure A5-1
PacifiCorp Washington Service Area Map - Detail View



Appendix 6

The 2008 Integrated Resource Plan selected all of the measures in Bundle 1. Below is a list of measures in Bundle 1 for 2010 and 2011 sorted by year and sector. Table A6-1 provides the Bundle 1 measures included in 2010 and Table A6-2 provides the measures in Bundle 1 included in 2011.

Table A6-1
Bundle 1 2010 Measures

State	Year	Sector	Measure Name	Cost Bundle
WA	2010	Residential	1-Watt Standby Power	$0.00 to$0.07
WA	2010	Residential	CFL Fixtures	$0.00 to$0.07
WA	2010	Residential	CFL Lamps	$0.00 to$0.07
WA	2010	Residential	CFL Torchieries	$0.00 to$0.07
WA	2010	Residential	Check Me Tune-up/Maintenance	$0.00 to$0.07
WA	2010	Residential	Cool Roof	$0.00 to$0.07
WA	2010	Residential	Duct Insulation Upgrade	$0.00 to$0.07
WA	2010	Residential	Ductless Heat Pump	$0.00 to$0.07
WA	2010	Residential	ECPM Furnace Fan Motor	$0.00 to$0.07
WA	2010	Residential	Efficient DVD systems	$0.00 to$0.07
WA	2010	Residential	Energy Star Dishwasher	$0.00 to$0.07
WA	2010	Residential	Evaporative coolers	$0.00 to$0.07
WA	2010	Residential	Faucet Aerators	$0.00 to$0.07
WA	2010	Residential	Heat Pumps - Service Contracts	$0.00 to$0.07
WA	2010	Residential	Heat Trap	$0.00 to$0.07
WA	2010	Residential	Low-Flow Showerheads	$0.00 to$0.07
WA	2010	Residential	Power Supply Transformer/Converter	$0.00 to$0.07
WA	2010	Residential	Removal of Secondary Freezer	$0.00 to$0.07
WA	2010	Residential	Removal of Secondary Refrigerator	$0.00 to$0.07
WA	2010	Residential	VFD Furnace Fan Motor	$0.00 to$0.07
WA	2010	Residential	Whole house air sealing	$0.00 to$0.07
WA	2010	Residential	Windows, ENERGY STAR or better	$0.00 to$0.07
WA	2010	Commercial	Chemical Dishwashing System	$0.00 to$0.07
WA	2010	Commercial	Cold Cathode Lighting	$0.00 to$0.07
WA	2010	Commercial	Compressor VSD retrofit	$0.00 to$0.07
WA	2010	Commercial	Cool Roof	$0.00 to$0.07
WA	2010	Commercial	Cooling Tower-Decrease Approach Temperature	$0.00 to$0.07
WA	2010	Commercial	Cooling Tower-Two-Speed Fan Motor	$0.00 to$0.07
WA	2010	Commercial	Duct Insulation	$0.00 to$0.07
WA	2010	Commercial	Duct Repair and Sealing	$0.00 to$0.07
WA	2010	Commercial	DX Package-Air Side Economizer	$0.00 to$0.07
WA	2010	Commercial	Faucet Aerators	$0.00 to$0.07
WA	2010	Commercial	High Efficiency Case Fans	$0.00 to$0.07
WA	2010	Commercial	High Efficiency Compressors	$0.00 to$0.07
WA	2010	Commercial	High Efficiency Convection Oven	$0.00 to$0.07
WA	2010	Commercial	Hot Water (SHW) Pipe Insulation	$0.00 to$0.07
WA	2010	Commercial	Ice Maker	$0.00 to$0.07

State	Year	Sector	Measure Name	Cost Bundle
WA	2010	Commercial	Infiltration Reduction	$0.00 to$0.07
WA	2010	Commercial	Installation of Floating Condenser Head Pressure C	$0.00 to$0.07
WA	2010	Commercial	Insulation - 2*4 Walls 16" O.C.	$0.00 to$0.07
WA	2010	Commercial	Leak Proof Duct Fittings	$0.00 to$0.07
WA	2010	Commercial	LED Exit Signs	$0.00 to$0.07
WA	2010	Commercial	LED Refrigeration Case Lights	$0.00 to$0.07
WA	2010	Commercial	Lighting Package, High Efficiency	$0.00 to$0.07
WA	2010	Commercial	Lighting Package, Premium Efficiency	$0.00 to$0.07
WA	2010	Commercial	Lighting Package, Premium High Bay	$0.00 to$0.07
WA	2010	Commercial	Low Wattage Ceramic Metal Halide Lamps	$0.00 to$0.07
WA	2010	Commercial	Low-Flow Showerheads	$0.00 to$0.07
WA	2010	Commercial	Low-flow spray heads	$0.00 to$0.07
WA	2010	Commercial	Occupancy Sensor Control, Fluorescent	$0.00 to$0.07
WA	2010	Commercial	Power Supply Transformer/Converter	$0.00 to$0.07
WA	2010	Commercial	Programmable Thermostat	$0.00 to$0.07
WA	2010	Commercial	Refrigeration System Upgrade	$0.00 to$0.07
WA	2010	Commercial	Solid Door ES Refrigerators/Freezers	$0.00 to$0.07
WA	2010	Commercial	Special Glass Doors for Refrigerated Reach-in Cas	$0.00 to$0.07
WA	2010	Commercial	Strip Curtains for Walk-Ins	$0.00 to$0.07
WA	2010	Commercial	Terminal HVAC units-Occupancy Sensor Control	$0.00 to$0.07
WA	2010	Commercial	Vending Machines- High Efficiency	$0.00 to$0.07
WA	2010	Commercial	Water Heater Temperature Setback	$0.00 to$0.07
WA	2010	Industrial	Air Comp Improvements	$0.00 to$0.07
WA	2010	Industrial	Air Comp O&M	$0.00 to$0.07
WA	2010	Industrial	Bldg Improvements	$0.00 to$0.07
WA	2010	Industrial	Cool Improvements	$0.00 to$0.07
WA	2010	Industrial	Heat Improvements	$0.00 to$0.07
WA	2010	Industrial	HVAC Improvements	$0.00 to$0.07
WA	2010	Industrial	HVAC O&M	$0.00 to$0.07
WA	2010	Industrial	Lighting Improvements	$0.00 to$0.07
WA	2010	Industrial	Motor Improvements	$0.00 to$0.07
WA	2010	Industrial	Motor O&M	$0.00 to$0.07
WA	2010	Industrial	Other Improvements	$0.00 to$0.07
WA	2010	Irrigation	System Improvements	$0.00 to$0.07
WA	2010	Irrigation	Motor Improvements	$0.00 to$0.07

Table A6-2
Bundle 1 2011 Measures

State	Year	Sector	Measure Name	Cost Bundle
WA	2011	Residential	1-Watt Standby Power	$0.00 to$0.07
WA	2011	Residential	CFL Fixtures	$0.00 to$0.07
WA	2011	Residential	CFL Lamps	$0.00 to$0.07
WA	2011	Residential	CFL Torchieries	$0.00 to$0.07
WA	2011	Residential	Check Me Tune-up/Maintenance	$0.00 to$0.07
WA	2011	Residential	Cool Roof	$0.00 to$0.07
WA	2011	Residential	Duct Insulation Upgrade	$0.00 to$0.07
WA	2011	Residential	Ductless Heat Pump	$0.00 to$0.07
WA	2011	Residential	ECPM Furnace Fan Motor	$0.00 to$0.07
WA	2011	Residential	Efficient DVD systems	$0.00 to$0.07
WA	2011	Residential	Energy Star Dishwasher	$0.00 to$0.07
WA	2011	Residential	Evaporative coolers	$0.00 to$0.07
WA	2011	Residential	Faucet Aerators	$0.00 to$0.07
WA	2011	Residential	Heat Pumps - Service Contracts	$0.00 to$0.07
WA	2011	Residential	Heat Trap	$0.00 to$0.07
WA	2011	Residential	Low-Flow Showerheads	$0.00 to$0.07
WA	2011	Residential	Power Supply Transformer/Converter	$0.00 to$0.07
WA	2011	Residential	Removal of Secondary Freezer	$0.00 to$0.07
WA	2011	Residential	Removal of Secondary Refrigerator	$0.00 to$0.07
WA	2011	Residential	VFD Furnace Fan Motor	$0.00 to$0.07
WA	2011	Residential	Whole house air sealing	$0.00 to$0.07
WA	2011	Residential	Windows, ENERGY STAR or better	$0.00 to$0.07
WA	2011	Commercial	Chemical Dishwashing System	$0.00 to$0.07
WA	2011	Commercial	Cold Cathode Lighting	$0.00 to$0.07
WA	2011	Commercial	Compressor VSD retrofit	$0.00 to$0.07
WA	2011	Commercial	Cool Roof	$0.00 to$0.07
WA	2011	Commercial	Cooling Tower-Decrease Approach Temperature	$0.00 to$0.07
WA	2011	Commercial	Cooling Tower-Two-Speed Fan Motor	$0.00 to$0.07
WA	2011	Commercial	DX Package-Air Side Economizer	$0.00 to$0.07
WA	2011	Commercial	Duct Insulation	$0.00 to$0.07
WA	2011	Commercial	Duct Repair and Sealing	$0.00 to$0.07
WA	2011	Commercial	Faucet Aerators	$0.00 to$0.07
WA	2011	Commercial	High Efficiency Case Fans	$0.00 to$0.07
WA	2011	Commercial	High Efficiency Compressors	$0.00 to$0.07
WA	2011	Commercial	High Efficiency Convection Oven	$0.00 to$0.07
WA	2011	Commercial	Hot Water (SHW) Pipe Insulation	$0.00 to$0.07
WA	2011	Commercial	Ice Maker	$0.00 to$0.07
WA	2011	Commercial	Infiltration Reduction	$0.00 to$0.07
WA	2011	Commercial	Installation of Floating Condenser Head Pressure C	$0.00 to$0.07
WA	2011	Commercial	Insulation - 2*4 Walls 16" O.C.	$0.00 to$0.07
WA	2011	Commercial	LED Exit Signs	$0.00 to$0.07
WA	2011	Commercial	LED Refrigeration Case Lights	$0.00 to$0.07
WA	2011	Commercial	Leak Proof Duct Fittings	$0.00 to$0.07

State	Year	Sector	Measure Name	Cost Bundle
WA	2011	Commercial	Lighting Package, High Efficiency	$0.00 to$0.07
WA	2011	Commercial	Lighting Package, Premium Efficiency	$0.00 to$0.07
WA	2011	Commercial	Lighting Package, Premium High Bay	$0.00 to$0.07
WA	2011	Commercial	Low Wattage Ceramic Metal Halide Lamps	$0.00 to$0.07
WA	2011	Commercial	Low-Flow Showerheads	$0.00 to$0.07
WA	2011	Commercial	Low-flow spray heads	$0.00 to$0.07
WA	2011	Commercial	Occupancy Sensor Control, Fluorescent	$0.00 to$0.07
WA	2011	Commercial	Power Supply Transformer/Converter	$0.00 to$0.07
WA	2011	Commercial	Programmable Thermostat	$0.00 to$0.07
WA	2011	Commercial	Refrigeration System Upgrade	$0.00 to$0.07
WA	2011	Commercial	Solid Door ES Refrigerators/Freezers	$0.00 to$0.07
WA	2011	Commercial	Special Glass Doors for Refrigerated Reach-in Cas	$0.00 to$0.07
WA	2011	Commercial	Strip Curtains for Walk-Ins	$0.00 to$0.07
WA	2011	Commercial	Terminal HVAC units-Occupancy Sensor Control	$0.00 to$0.07
WA	2011	Commercial	Vending Machines- High Efficiency	$0.00 to$0.07
WA	2011	Commercial	Water Heater Temperature Setback	$0.00 to$0.07
WA	2011	Industrial	Air Comp Improvements	$0.00 to$0.07
WA	2011	Industrial	Air Comp O&M	$0.00 to$0.07
WA	2011	Industrial	Bldg Improvements	$0.00 to$0.07
WA	2011	Industrial	Cool Improvements	$0.00 to$0.07
WA	2011	Industrial	HVAC Improvements	$0.00 to$0.07
WA	2011	Industrial	HVAC O&M	$0.00 to$0.07
WA	2011	Industrial	Heat Improvements	$0.00 to$0.07
WA	2011	Industrial	Lighting Improvements	$0.00 to$0.07
WA	2011	Industrial	Motor Improvements	$0.00 to$0.07
WA	2011	Industrial	Motor O&M	$0.00 to$0.07
WA	2011	Industrial	Other Improvements	$0.00 to$0.07
WA	2011	Irrigation	Motor Improvements	$0.00 to$0.07
WA	2011	Irrigation	System Improvements	$0.00 to$0.07

Appendix 7

Table A7-1 shows a summary view of PacifiCorp's Washington share of the draft 6th Power Plan regional target based on the 6th Plan, calculator version 2.0, option 3. In this calculator, the Company's allocation of the regional target is based on MWH sales by sector. Table A7-2 provides a more detailed view.

Table A7-1
Summary - PacifiCorp Washington Share of Northwest Power Plan Regional Target Allocated Based on MWH Sales (aMW)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2-year	10-year
6th Plan	5.0	5.6	6.1	6.6	7.1	7.3	8.1	8.6	8.8	9.1	10.6	72.2

6th Plan, calculator version 2.0, option 3
http://www.nwcouncil.org/energy/powerplan/6/supplycurves/I937/default.htm

Table A7-2
Detail - PacifiCorp Washington Share of Northwest Power Plan Regional Target, Allocated Based on MWH Sales

Option 3 - Target Based on Utility Reported Share of Total Regional Retail Sales by Sector - Adjusted for Irrigation Sales

Sector	2007 Retail Sales (MWH)	Share of Regional Sales	sales in its industrial sector total. In order to adjust for this, please enter your utility's 2007 retail sales in MWH for irrigation below in cell I35. The industrial sector sales will update automatically so that the total still agrees with	Reported Industrial and Irrigated Agriculture
Residential	1,626,726	2.48%	Combined Ind & Irrig Sales (MWh)=>	997,157
Commercial	1,428,656	2.66%	Net Industrial Sales (MWh) =>	833,183
Industrial	833,183	2.37%	Enter 2007 Irrigation Sales (MWh) =>	163,974
Agriculture	163,974	2.88%		
Distribution System	3,219,356	2.70%		
Sectors	4,052,539	2.53%		

Annual Conservation Target (aMW)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total 2010 - 2023	Average Annual Target 2010 - 2023
Residential	2.811	2.968	3.158	3.376	3.649	3.105	3.660	4.051	4.521	4.726	5.077	5.164	5.516	5.519	57.30	4.1
Commercial	1.130	1.339	1.526	1.703	1.836	2.076	2.224	2.315	2.063	2.094	2.202	2.087	2.176	2.050	26.82	1.9
Industrial	0.742	0.797	0.847	0.890	0.928	1.253	1.262	1.255	1.243	1.234	0.959	0.968	0.902	0.894	14.17	1.0
Agriculture	0.244	0.230	0.219	0.207	0.196	0.256	0.259	0.256	0.253	0.251	-	-	-	-	2.37	0.2
Distribution System Efficiency	0.116	0.218	0.310	0.392	0.464	0.646	0.687	0.718	0.746	0.774	0.956	0.966	0.589	0.587	8.17	0.6
Total - All Sectors	5.043	5.552	6.061	6.568	7.072	7.336	8.092	8.595	8.827	9.078	9.193	9.186	9.183	9.050	108.84	7.8

Annual Conservation Target (MWH)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total 2010 - 2023	Average Annual Target 2010 - 2023
Residential	24,629	26,004	27,665	29,574	31,965	27,200	32,059	35,489	39,608	41,398	44,471	45,235	48,319	48,349	501,966	35,854.7
Commercial	9,897	11,726	13,372	14,915	16,081	18,185	19,478	20,277	18,073	18,345	19,292	18,286	19,059	17,954	234,939	16,781.4
Industrial	6,499	6,983	7,420	7,794	8,126	10,974	11,057	10,995	10,891	10,807	8,397	8,480	7,898	7,835	124,155	8,868.2
Agriculture	2,139	2,018	1,917	1,816	1,715	2,245	2,270	2,245	2,220	2,195	-	-	-	-	20,782	1,484.4
Distribution System Efficiency	1,015	1,908	2,717	3,435	4,064	5,658	6,017	6,286	6,533	6,780	8,374	8,464	5,164	5,141	71,555	5,111.1
Total - All Sectors	44,178	48,639	53,090	57,534	61,952	64,261	70,882	75,292	77,325	79,525	80,534	80,465	80,440	79,280	953,397	68,099.8

Appendix 8

Table A8-1 provides the current status of evaluations by program.

Table A8-1
Status of Evaluations by Program

Program	Status of Evaluation
Energy Education in Schools	Evaluated annually after the end of each school year. Next evaluation will be for the 2009-2010 school year. Estimated completion is November 2010.
Low Income Weatherization	The program changes proposed in Advice 08-07 were approved effective March 1, 2009. In Advice 08-07, the Company requested that the program changes be in place for at least three and one half years before any additional changes are considered. This will allow the program to be in effect for two years before collecting post-consumption data in the third year.
Refrigerator Recycling	In October, 2009, the Company initiated process and impact evaluations for program years 2005 – 2008. The draft results of these evaluations are expected to be available during the third quarter of 2010.
Home Energy Savings	In October, 2009, the Company initiated process and impact evaluations for program years 2006 – 2008. The draft results of these evaluations are expected to be available during the third quarter of 2010.
Energy FinAnswer and FinAnswer Express	In October, 2009, the Company initiated process and impact evaluations for program years 2005 – 2008. The draft results of these evaluations are expected to be available during the third quarter of 2010.

The evaluation plans contained in the program filings listed in Table 22 are provided in Attachment B. Evaluation plans were not included in the program filings for the Low Income Weatherization or Energy Education in Schools programs approved by the Commission. The most recent evaluation reports for these programs are provided in Attachment C.

Attachment A
Demand-Side Management Business Plan – Washington
2010–2011

PACIFIC POWER
A DIVISION OF PACIFICORP

Table of Contents

1. Budget and Savings by Program

Table 1 below provides the savings and expenditures anticipated by program to achieve the 8.5 aMW biennial target for 2010 and 2011.

Table 1
2010 – 2011 Biennial Target Savings and Budget by Program

Program	2010 PacifiCorp Washington DSM Estimates				2011 PacifiCorp Washington DSM Estimates				2010 + 2011
	Gross kWh/Yr Savings (at site)	Gross kWh/Yr Savings (at generator)	Gross aMW Savings (at gen)	Estimated Expenditures	Gross kWh/Yr Savings (at site)	Gross kWh/Yr Savings (at generator)	Gross aMW Savings (at gen)	Estimated Expenditures	Gross aMW Savings (at gen)
Low Income Weatherization (114) [1]	180,000	195,712	0.02	$ 400,000	180,000	195,712	0.02	$ 400,000	0.04
Energy Education in Schools (113)	1,725,000	1,875,575	0.21	$ 450,000	1,725,000	1,875,575	0.21	$ 450,000	0.43
Refrigerator Recycling (107)	2,325,000	2,527,949	0.29	$ 400,000	1,875,000	2,038,669	0.23	$ 300,000	0.52
Home Energy Savings (118)	5,850,000	6,360,647	0.73	$ 1,300,000	5,700,000	6,197,553	0.71	$ 1,300,000	1.43
CFL Adjustment	(750,000)	(815,468)	(0.09)	$ -	(750,000)	(815,468)	(0.09)	$ -	(0.19)
Total Residential	**9,330,000**	**10,144,416**	**1.16**	**$ 2,550,000**	**8,730,000**	**9,492,042**	**1.08**	**$ 2,450,000**	**2.24**
Energy FinAnswer (125)	900,000	967,887	0.11	$ 400,000	600,000	645,258	0.07	$ 300,000	0.18
FinAnswer Express (115)	2,400,000	2,581,032	0.29	$ 800,000	2,100,000	2,258,403	0.26	$ 800,000	0.55
Total Commercial	**3,300,000**	**3,548,919**	**0.41**	**$ 1,200,000**	**2,700,000**	**2,903,661**	**0.33**	**$ 1,100,000**	**0.74**
Energy FinAnswer (125)	11,250,000	12,247,538	1.40	$ 2,600,000	10,125,000	11,022,784	1.26	$ 2,700,000	2.66

Program	2010 PacifiCorp Washington DSM Estimates				2011 PacifiCorp Washington DSM Estimates				2010 + 2011
	Gross kWh/Yr Savings (at site)	Gross kWh/Yr Savings (at generator)	Gross aMW Savings (at gen)	Estimated Expenditures	Gross kWh/Yr Savings (at site)	Gross kWh/Yr Savings (at generator)	Gross aMW Savings (at gen)	Estimated Expenditures	Gross aMW Savings (at gen)
FinAnswer Express (115)	825,000	898,153	0.10	$ 300,000	600,000	653,202	0.07	$ 300,000	0.18
Total Industrial	**12,075,000**	**13,145,690**	**1.50**	**$ 2,900,000**	**10,725,000**	**11,675,986**	**1.33**	**$ 3,000,000**	**2.83**
Total - current Company programs	**24,705,000**	**26,839,025**	**3.06**	**$ 6,650,000**	**22,155,000**	**24,071,688**	**2.75**	**$ 6,550,000**	**5.81**
Northwest Energy Efficiency Alliance (NEEA)		11,200,831	1.28	$ 925,000		12,111,877	1.38	$ 1,100,000	2.66
Distribution efficiency									
Production efficiency									
Total including Company programs, NEEA and other company initiatives		**38,039,856**	**4.3**	**$ 7,575,000**		**36,183,566**	**4.1**	**$ 7,650,000**	**8.5**
Additional residential expenditures for administration related to prior programs				$ 1,000				$ 1,000	
Total System Benefits Charge Expenditures				**$ 7,576,000**				**$ 7,651,000**	

Table 1

[1] Low income forecasts for 2010 and 2011 are based on historic performance despite having $1M annually available for matching commitments.

Savings and expenditures for consumer electronics and showerheads are captured in the residential program forecasts however may be delivered through standalone programs if more appropriate.

Savings and expenditures for network PC power control are captured in the business program forecasts however may be delivered through standalone programs if more appropriate.

Business program projections are based on the current activity forecasts. There are many factors that influence the realization of these projections since the Company influences but does not control energy efficiency project implementation at customer facilities. Variability in forecasts are expected.

2010 expenditures include estimated costs for 2005-2008 program evaluations for several of the programs. This evaluation work is in progress with all costs expected in 2010.

Northwest Energy Efficiency Alliance projections are based on NEEA's current forecast.

Expenditure projections for production efficiency are not included because these costs are not anticipated to be recovered by the System Benefits Charge. Savings are not included at this time in the biennial target.

Additional new initiatives may be considered in 2010 and 2011.

2.0 Program Details by Program

In this section program details, including specific measures, incentives, and eligibility requirements are provided by program.

2.1 Refrigerator Recycling (Schedule 107)

Program details for this program are contained in the program tariff. Any changes to the details included in the program tariff must be filed and approved by the Commission prior to becoming effective.

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 107
RESIDENTIAL REFRIGERATOR RECYCLING PROGRAM
RESIDENTIAL SERVICE OPTIONAL FOR QUALIFYING CUSTOMERS

PURPOSE:
Service under this tariff is intended to decrease residential refrigeration loads through the removal and recycling of inefficient models.

AVAILABLE:
In all territory served by Pacific Power (The Company) in the State of Washington.

APPLICABLE:
To residential customers and landlords with residential units in all service territory served by The Company in Washington.

CUSTOMER PARTICIPATION:
Customer participation is voluntary and is initiated by contacting a specified toll-free number or website.

DESCRIPTION:
Customers receive a $30 incentive to discontinue use of their working second refrigerators and/or freezers or to replace their working primary refrigerators and freezers with new more efficient models. To qualify for the incentive, customers must give up their appliances for recycling. Appliances will be collected and recycled to ensure they are not resold on the secondary market. Company will offer a packet with written energy efficiency information, and instant savings measures.

QUALIFYING EQUIPMENT:
Working refrigerators and freezers that are a minimum of 10 cubic feet in size, utilizing inside measurements.

PROVISIONS OF SERVICE:
Incentives will be available on a maximum of two appliances per qualifying household. Incentive checks will be mailed within 30 days of the appliance collection date.

Incentives are also available to landlords who own the appliances used in rental properties in The Company's Washington service territory where their tenant is billed on a residential schedule. Landlords may receive incentives on a maximum of two appliances per unit.

Company and/or Program Administrator may employ a variety of quality assurance techniques during the delivery of the program. Verification or evaluation may include, but is not limited to, telephone survey, site visit, billing analysis, and pre- and post-installation of monitoring equipment as necessary to quantify actual energy savings.

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 107
RESIDENTIAL REFRIGERATOR RECYCLING PROGRAM
RESIDENTIAL SERVICE OPTIONAL FOR QUALIFYING CUSTOMERS

RULES AND REGULATIONS:

Service under this Schedule is subject to the General Rules and Regulations contained in the tariff of which this Schedule is a part, and to those prescribed by regulatory authorities.

Issued April 13,2007 Effective May 31, 2007

Issued by PACIFIC POWER & LIGHT COMPANY
By Andrea L. Kelly Title Vice President, Regulation

TF2 107.2.NEW Advice No. 07-02

Form F

2.2 Energy Education in Schools (Schedule 113)

Program details for this program are contained in the program tariff. Any changes to the details included in the program tariff must be filed and approved by the Commission prior to becoming effective.

PACIFIC POWER & LIGHT COMPANY

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SCHEDULE 113
RESIDENTIAL ENERGY EFFICIENCY PROGRAM
ENERGY EDUCATION IN SCHOOLS

PURPOSE:

Service under this tariff is intended to educate students on energy related topics so that they better understand how electricity is generated and the importance of using electricity efficiently.

APPLICABLE:

To sixth grade students in territory served by the Company in the state of Washington.

DESCRIPTION:

Energy education services and do-it-yourself measures will be provided to 6th grade classrooms through partnerships with local non-profit agencies. The services will be at no cost to students or schools.

VERIFICATION:

All measures provided are intended to be installed in the Company's service territory.

RULES AND REGULATIONS:

Service under this Schedule is subject to the General Rules and Regulations contained in the tariff of which this Schedule is a part, and to those prescribed by regulatory authorities.

2.3 Low Income Weatherization (Schedule 114)

Program details for this program are contained in the program tariff. Any changes to the details included in the program tariff must be filed and approved by the Commission prior to becoming effective.

PACIFIC POWER & LIGHT COMPANY

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SCHEDULE 114
RESIDENTIAL ENERGY EFFICIENCY RIDER
OPTIONAL FOR QUALIFYING LOW INCOME CUSTOMERS

PURPOSE:

Service under this schedule is intended to maximize the efficient utilization of the electricity requirement of existing residential dwellings inhabited by customers that meet income guidelines through the installation of permanent energy efficient materials.

APPLICABLE:

To residential Customers residing in single family, multi-family and manufactured home dwellings billed under Schedule 16 or Schedule 17 in all territory served by the Company in the State of Washington. This schedule is applicable to existing dwellings built before July 1, 1991 with permanently installed operable electric space heating designed to heat the living space of the dwelling, except as noted under the energy efficient measures section of this tariff.

DESCRIPTION:

Service under this program is available to improve the energy efficiency of applicable residential dwellings connected to Company's system. The decision to extend service under this schedule shall be based on eligibility requirements contained herein.

DEFINITIONS:

(1) "Dwelling" means real or personal property within the state inhabited as the principal residence of a dwelling owner or a tenant. "Dwelling" includes a manufactured home, a single-family home, duplex or multi-unit residential housing. "Dwelling" does not include a recreational vehicle.

(a) Duplexes and fourplexes are eligible if at least one half of the dwelling is occupied by low income tenants.

(b) Triplexes and multi-family dwellings are eligible if at least 66% of the units are occupied by low income tenants.

(2) "Agency" means a non-profit group, Municipality or County authorized to receive funds for installation of weatherization materials in low income properties.

(3) "Energy Audit" means a service provided by the Agency that includes the measurement and analysis of the energy efficiency of a dwelling including energy savings potential that would result from installing energy efficient measures that are determined to be cost effective.

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 114
RESIDENTIAL ENERGY EFFICIENCY RIDER
OPTIONAL FOR QUALIFYING LOW INCOME CUSTOMERS
(Continued)

DEFINITIONS: (Continued)

(4) "Low Income" means households qualifying under the federal low income guidelines and certified for eligibility according to agency procedure.

(5) "Major Measures" means ceiling insulation, wall insulation and floor insulation applicable in dwellings with permanently installed electric space heating systems. If physical barriers exist that prohibit the installation of a measure, then the measure is not required as a condition for financial assistance under this schedule.

(6) "Supplemental Measures" are not required measures under this schedule, but may qualify for a Company reimbursement based on audit results.

(7) The "Energy Matchmaker Program" in the State of Washington is designed to increase resources for low-income weatherization by leveraging local matching dollars. A community based agency can access the Energy Matchmaker funds by providing a dollar-for-dollar match. Anticipated match providers include utilities, local governments, service organizations and rental housing owners. All measures installed under the Pacific Power Program must also be eligible under the Energy Matchmaker Program.

FINANCIAL ASSISTANCE:

(1) The Company will reimburse the "Agency" 50% of the installed cost of all eligible Energy Efficient Measures listed in this tariff. If Matchmaker Program participating Agencies exhaust Matchmaker Funds, Company will fund "Agency" 100% of costs associated with the installation of eligible Energy Efficient Measures. Measures will be determined to be cost effective (Savings to Investment Ratio of 1.0 or greater) through the results of an U.S. Department of Energy (DOE) approved audit. Financial assistance will be provided one time only on any individual major or supplemental measure, and up to two times per dwelling.

(2) The Company will reimburse the "Agency" for administrative costs when all major measures determined to be cost effective have been installed. The administrative reimbursement will be calculated as: 15% of the Pacific Power rebate.

(Continued)

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By Andrea L. Kelly Title Vice President, Regulation

TF2 114.2E Advice No. 08-07

Form F

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 114
RESIDENTIAL ENERGY EFFICIENCY RIDER
OPTIONAL FOR QUALIFYING LOW INCOME CUSTOMERS
(Continued)

FINANCIAL ASSISTANCE: (Continued)

(3) The Company will reimburse the "Agency" 50% of the installed cost of repairs necessary to make the installation of the energy efficient measures included in this effective tariff. When matching funds are exhausted funding will be at 100%. The total reimbursement on repairs available to the "Agency" is limited to 15% of the annual reimbursement on energy efficient measures received.

(4) Agencies must notify Company when matching funds are depleted, no less than 30 days prior to billing at 100% funding levels.

(5) Total funding for all program components will not exceed $1,000,000 annually.

(6) Agencies must invoice the Company within forty-five days of job completion.

ENERGY EFFICIENT MEASURES:

Financial assistance will be provided based on the results of a cost-effective analysis (Savings to Investment Ratio of 1.0 or greater) through a DOE approved energy audit. The energy efficient measures eligible for funding must be installed in dwellings with permanently installed operable electric space heat except where noted. The installation of measures listed as "Always considered cost effective" under Major and Supplemental Measures are not dependent on audit results. The energy efficient measures that may be eligible for funding are listed as follows along with their estimated measure life where applicable:

Major Measures:

(1) Ceiling insulation up to R-49 for ceilings with less than R-30 in place. R-30 or better attics will not be further insulated: 30 years.

(2) Floor insulation over unheated spaces up to R-30: 30 years.

(3) Wall insulation or exterior insulation sheathing up to R-26 for walls with no insulation installed (financing will not be available for the installation of urea-formaldehyde wall insulation): 30 years.

Nothing shall preclude the Company from providing a reimbursement for the installation of a greater R value of insulation for the above items that are determined to be cost effective (Savings to Investment Ratio of 1.0 or greater) through the audit process.

(Continued)

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PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 114
RESIDENTIAL ENERGY EFFICIENCY RIDER
OPTIONAL FOR QUALIFYING LOW INCOME CUSTOMERS
(Continued)

ENERGY EFFICIENT MEASURES: (Continued)

Supplemental Measures:

(1) Attic ventilation, excluding power ventilators when installed with ceiling insulation (required if needed at the time ceiling insulation is installed). Whole house mechanical ventilation, and spot ventilation for kitchen and baths at time ceiling insulation is installed: Always considered cost effective.

(2) Ground cover and water pipe wrap when installed with floor insulation; other vapor barrier materials as required when installed with floor or ceiling insulation: Always considered cost effective.

(3) Forced air electric space heating duct insulation and sealing in unheated spaces: 30 years.

(4) Weatherstripping and/or caulking, including blower door assisted air sealing and duct sealing: Always considered cost effective.

(5) Thermal doors: 30 years.

(6) Dehumidifiers: Always considered cost effective.

(7) Timed thermostats on centrally controlled multi-room heating systems except when used with heat pumps. Heat anticipating type thermostats for zonal electric resistance heating systems. Zonal thermostats must be separate from the heating unit and must be calibrated at the site to within 2°F of actual room temperature in the range of 65°F-75°F: Always considered cost effective.

(8) Energy efficient showerheads and aerators where electric water heaters are present. Showerheads with a visible flow rating greater than 2.5 gallons per minute (gpm) will be replaced, and showerheads without a gpm marking may be replaced at the discretion of agency staff: Always considered cost effective.

(9) Water heaters: Tank replacement of existing electric water heaters when audit indicates a Savings to Investment Ratio of 1.0 or greater. Replacement will be an Energy Star certified model with an EF rating of at least 1.0: 13 years.

(10) Fluorescent light fixtures applicable in all homes: 15 years.

(11) Compact fluorescent light bulbs applicable in all homes - limit 10 Energy Star certified bulbs per home placed in fixtures that are on 2 or more hours per day: Always considered cost effective, 7 years.

(Continued)

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PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 114
RESIDENTIAL ENERGY EFFICIENCY RIDER
OPTIONAL FOR QUALIFYING LOW INCOME CUSTOMERS
(Continued)

ENERGY EFFICIENT MEASURES: (Continued)
Supplemental Measures: (Continued)

(12) Refrigerators applicable in all homes: Refrigerators with monitored results showing annual usage of 1,500 kWh or greater may be replaced with an Energy Star model with an estimated annual consumption of 600 kWh or less. Replaced refrigerators must be removed and recycled in accordance with EPA guidelines: Always considered cost effective, 15 years.

(13) Class 40 Replacement windows: 25 years.

PROVISIONS OF SERVICE:

(1) A Department of Energy approved Energy Audit must be completed by the Agency prior to installation of the measures by the Agency.

(2) Agency must qualify residential customers for assistance using the Federal Low Income Guidelines.

(3) Installation shall meet Federal, State and Local building codes.

(4) Measures installed under this schedule shall not receive financial incentives from other Company programs.

(5) Agency shall inspect the installation to insure that the weatherization meets or exceeds required specifications.

(6) Company may audit Agency weatherization and financial records and inspect the installations in dwellings of customers receiving weatherization under this program. Records will include audit results.

(7) Company shall pay the Agency the amount established under the terms of their contract when provisions of this schedule have been met.

RULES AND REGULATIONS:

Service under this schedule is subject to the General Rules and Regulations contained in the tariff of which this schedule is a part, and to those prescribed by regulatory authorities.

(Continued)

2.4 Home Energy Savings (Schedule 118)

Program details for this program are contained in the program tariff. Any changes to the details included in the program tariff must be filed and approved by the Commission prior to becoming effective. In addition, there are program details managed outside of the program tariff. The program tariff and the text below from the Advice Letter (Docket UE-061297) describe the information that is managed outside of the tariff and the process for changes.

> The comprehensive nature of the program and changing equipment standards indicate a flexible and market-driven program delivery is required. The Company is proposing that Schedule 118 outline the basic program elements including customer eligibility, use of a program administrator for delivery, the seasonal nature of selected incentive offers, and that current incentive levels may change. Specific details such as incentive levels, eligible equipment specifications and dates for incentive availability would be managed by the program administrator using a dedicated program Web site with easy links from the Company web site.
>
> Changes in equipment eligibility or minimum efficiency levels would be driven by program and market data. The Company and program administrator will be assessing program performance on an on-going basis and proposing changes at least once per year. Changes may be proposed more frequently if there is compelling market feedback that changes need to occur ahead of the annual changes. Similar to the filing process, the Company would present information on proposed changes to its Advisory Group and seek comments prior to making changes. Changes in equipment specifications or incentive levels would be clearly posted on the Web site and emailed to the appropriate Commission staff person with at least 45 days advance notice.

Program details, including specific measures, incentives, and eligibility requirements are posted on the Company's Web site at www.pacificpower.net/wattsmart. A summary table of incentives is available at www.homeenergysavings.net/Washington/forms.html.

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE NO 118
HOME ENERGY SAVINGS
INCENTIVE PROGRAM

PURPOSE:

Service under this tariff is intended to maximize the efficient utilization of the electricity requirements of new and existing loads in new and existing residences including manufactured housing and multi-family dwellings.

APPLICABLE:

To new and existing residential customers in all territory served by the Company in the state of Washington billed on Schedules 16, 17 and 18. Landlords who own rental properties served by the company in the state of Washington where the tenant is billed on Schedules 16, 17 and 18 also qualify for this program.

CUSTOMER PARTICIPATION:

Customer participation is voluntary and is initiated by following the participation procedures listed on the program web site.

DESCRIPTION:

On-going program to deliver incentives for a variety of equipment and services intended for and located in residential dwellings. Home Energy Savings Incentive Program will be delivered by the Program Administrator and periodic changes will be made to insure or enhance program cost effectiveness as defined by the Company.

QUALIFYING EQUIPMENT OR SERVICES:

Equipment or services for residential dwellings, which when correctly installed or performed, result in verifiable electric energy usage reductions where such usage is compared to the existing equipment or baseline equipment as determined by the Company.

PROGRAM ADMINISTRATOR:

Qualified person or entity hired by the Company to administer this program.

PROVISIONS OF SERVICE:

1. Qualifying Equipment or Services, incentive amounts, and participation procedures will be listed on the program Web site.
2. Incentive delivery may vary by technology and may include any or all of the following; post purchase mail-in, point-of-purchase buy-down, manufacturer buy-down or pre- purchase offer and approval.

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE NO 118
(Continued)
HOME ENERGY SAVINGS
INCENTIVE PROGRAM

PROVISIONS OF SERVICE: (continued)

3. Incentives may be offered for year-round or for selected time periods.
4. Incentive offer availability, incentive levels and Qualifying Equipment or Services may be changed by the Program Administrator after consultation with the Company to reflect changing codes and standards, sales volumes, quality assurance data or to enhance program cost effectiveness.
5. All changes will occur with a minimum of 45 days notice, be prominently displayed as a change, include a minimum 45 day grace period for processing prior offers (except for manufacturer buy-down incentive delivery) and be communicated at least once to retailers who have participated within the last year.
6. Except for manufacturer buy-downs, incentives paid directly to participants will be in the form of a check issued within 45 days of Program Administrator's receipt of a complete and approved incentive application.
7. Equipment and services receiving an incentive under this program are not eligible for incentives under other Company programs.
8. Company and/or Program Administrator will employ a variety of quality assurance techniques during the delivery of the program. They may differ by equipment or service type and may include, but are not limited to, pre and post installation inspections, phone surveys, retailer invoice reconciliations and confirmation of customer and equipment eligibility.
9. Company may verify or evaluate the energy savings of installed equipment or services. Verification or evaluation may include, but are not limited to, telephone survey, site visit, billing analysis, pre- and post-installation of monitoring equipment as necessary to quantify actual energy savings.

ELECTRIC SERVICE REGULATIONS:

Service under this schedule will be in accordance with the terms of the electric service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Washington Utilities and Transportation Commission, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

2.5 FinAnswer Express (Schedule 115)

Program details for this program are contained in the program tariff. Any changes to the details included in the program tariff must be filed and approved by the Commission prior to becoming effective. In addition, there are program details managed outside of the program tariff. The program tariff and the text below from the Advice Letter (Docket UE-061710) describe the information that is managed outside of the tariff and the process for changes.

> Future changes in the … incentive tables and definitions would be driven by program and market data. The Company assesses program performance on an ongoing basis and would propose changes at least annually. Changes may be proposed more frequently if there is compelling market data. Similar to the filing process, the Company would present information on proposed changes to its Advisory Group and seek comments prior to making changes. Changes would be clearly posted on the program web site and e-mailed to the appropriate Commission staff person with at least 45 days advance notice.

The following program details are managed outside of the program tariff on the Company Web site via the process described above:

- Incentive tables
- Program definitions
- Custom incentive offering

The incentive tables are included in the program brochures which can be found at the links below.

> For retrofits at existing facilities:
> http://www.pacificpower.net/content/dam/pacific_power/doc/Business/Save_Energy_Money/WA_FinAnswer_Express_Retrofits_Brochure_and_Incentive_Tables.pdf
>
> For new construction and major renovation projects:
> http://www.pacificpower.net/content/dam/pacific_power/doc/Business/Save_Energy_Money/WA_FinAnswer_Express_NCMR_Brochure_and_Incentive_Tables.pdf

Program definitions are available at this link:
http://www.pacificpower.net/content/dam/pacific_power/doc/Business/Save_Energy_Money/FinAnswer_Express_29.pdf

Information about custom incentives is available at this link:
http://www.pacificpower.net/content/dam/pacific_power/doc/Business/Save_Energy_Money/WA_FinExpress_Custom_Incentives_10302009.pdf

The current program definitions, custom incentive information and incentive tables are also included following the program tariff below.

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 115
COMMERCIAL & INDUSTRIAL ENERGY EFFICIENCY INCENTIVES—
OPTIONAL FOR QUALIFYING CUSTOMERS

PURPOSE:
Service under this Schedule is intended to maximize the efficient utilization of the electricity requirements of new and existing loads in Commercial Buildings and Industrial Facilities through the installation of Energy Efficiency Measures.

APPLICABLE:
To service under the Company's General Service Schedules 24, 33, 36, 40, 47T, 48T, 53 and 54 in all territory served by the Company in the State of Washington. This Schedule is applicable to new and existing Commercial Buildings and Industrial Facilities.

CUSTOMER PARTICIPATION:
Customer participation is voluntary and is initiated by following the participation procedures on the Washington energy efficiency program section of the Company Web site.

DESCRIPTION:
Ongoing program to provide incentives for a variety of equipment located in commercial buildings and industrial facilities. Periodic program changes will be made to insure or enhance program cost-effectiveness as defined by the Company.

QUALIFYING EQUIPMENT:
Equipment which when installed in an eligible facility results in verifiable electric energy efficiency improvement compared to existing equipment or baseline equipment as determined by the Company.

PROVISIONS OF SERVICE:
(1) Qualifying equipment of services, incentive amounts, and other terms and conditions will be listed on the Washington energy efficiency program section of the Company Web site and may be changed by the Company with at least 45 days notice. Such changes will be prominently displayed on the Washington energy efficiency program section of the Company Web site and include a minimum 45 day grace period for processing prior offers.

(2) Company may elect to offer EEM incentives through different channels and at different points in the sales process other than individual Energy Efficiency Incentive Agreement(s) prior to EEM purchase. The differences will depend on EEM and will be consistent for all EEMs of similar type.

(3) Incentives may be offered year-round or for selected time periods.

(4) Equipment or services receiving an incentive under this program are not eligible for incentives under other Company programs.

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 115
COMMERCIAL & INDUSTRIAL ENERGY EFFICIENCY INCENTIVES—
OPTIONAL FOR QUALIFYING CUSTOMER
(continued)

PROVISIONS OF SERVICE:(Continued)

(5) Company may offer payment as described on the Washington energy efficiency program section of the Company Web site to a design team member to encourage early initial Company consultation on Owner/Customer design and plans for New Construction/Major Renovation.

(6)Company will employ a variety of quality assurance techniques during the delivery of the program. They will differ by EEM and may include pre and post installation inspections, phone surveys, confirmation of Owner/Customer and equipment eligibility.

(7)Company may verify or evaluate the energy savings of installed EEMs. This verification may include a telephone survey, site visit, review of facility operation characteristics, and pre- and post-installation of monitoring equipment and as necessary to quantify actual energy savings.

ELECTRIC SERVICE REGULATIONS:
Service under this Schedule will be in accordance with the terms of the Electric Service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Utilities & Transportation Commission of the State of Washington, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

Washington FinAnswer Express

This document includes the following three sections:

- Definitions of terms used in Schedule 115 and other program documents
- Incentives – General Information
- Incentive tables

Definitions

Commercial Building: A structure that is served by Pacific Power and meets the applicability requirements of Washington Schedule 115, the program tariff, on file with the Washington Utilities & Transportation Commission at the time an Energy Efficiency Incentive Agreement is executed or an Energy Efficiency Incentive Application is submitted and which does not meet the definition of an Industrial Facility.

Customer: Any party who has applied for, been accepted and receives service at the real property, or is the electricity user at the real property.

Energy Efficiency Incentive: Payments of money made by Pacific Power to Owner or Customer for installation of an Energy Efficiency Measure pursuant to an executed Energy Efficiency Incentive Agreement or approved Energy Efficiency Incentive Application.

Energy Efficiency Incentive Agreement: An agreement between Owner or Customer and Pacific Power providing for Pacific Power to furnish Energy Efficiency Incentives for an Energy Efficiency Project.

Energy Efficiency Incentive Application: An application submitted by Owner or Customer to Pacific Power for Energy Efficiency Incentives.

Energy Efficiency Measure (EEM): A permanently installed measure which can improve the efficiency of the Customer's electric energy use.

Energy Efficiency Measure (EEM) Cost:
• New Construction/Major Renovation: EEM Cost is the total installed cost of energy efficiency equipment or system minus the cost of the code compliance/common practice equipment or system.
• Retrofit: EEM Cost is the total installed cost of the energy efficiency equipment or modification. In the case of New Construction, Major Renovations, and Retrofits, EEM Costs shall mean the Owner or Customer's reasonable costs incurred (net of any discounts, rebates or incentives other than Energy Efficiency Incentives from Pacific Power, or other consideration that reduces the final actual EEM Cost incurred by the Owner or Customer) to purchase and install EEMs at the Owner's or Customer's facility. If the Owner or Customer installs the EEM then the cost of installation shall be equal to the Owner's or Customer's actual labor costs for such installation.

Energy Efficiency Project: One or more EEM(s) with similar one year payback limitations (see below) covered by one Energy Efficiency Incentive Agreement.

Energy Efficiency Project Cost: The sum of EEM Costs for one or more EEM(s) with similar one year payback limitations (see below) covered by one Energy Efficiency Incentive Agreement.

Industrial Facility: Buildings and process equipment associated with manufacturing.

Major Renovation: A change in facility use type or where the existing system will not meet Owner/Customer projected requirements within existing facility square footage.

Mixed Use: Buildings served by a residential schedule and a rate schedule listed under **Applicable** in Washington Schedule 115 shall be eligible for services under this schedule provided the Energy Efficiency Project meets the definition of New Construction or Major Renovation.

New Construction: A newly constructed facility or newly constructed square footage added to an existing facility.

Owner: The person who has both legal and beneficial title to the real property, and is the mortgager under a duly recorded mortgage of real property, the trustor under a duly recorded deed of trust.

Retrofit: Changes, modifications or additions to systems or equipment in existing facility square footage.

Incentives – General Information

Prescriptive incentives
Per unit incentives are listed in the program incentive tables for specific Energy Efficiency Measures (EEMs) and are subject to the incentive caps below. Incentives are subject to change and current incentives can be found at www.pacificpower.net.

Custom incentives
Energy Efficiency Measures not listed in the incentive tables may be eligible for a Custom Energy Efficiency Incentive. Pacific Power will complete an analysis of the EEM Cost and electric energy savings and determine whether to offer a custom Energy Efficiency Incentive and the incentive amount. The custom Energy Efficiency Incentive is Pacific Power's estimate of annual electric savings multiplied by $0.10/kWh and subject to the incentive caps described below.

Electric savings resulting from lighting interaction with mechanical equipment is not eligible for a custom Energy Efficiency Incentive.

The baseline wattage for all retrofit fluorescent lighting EEMs not listed in the Retrofit Lighting Incentive Table is the lesser of

a) Existing equipment, or
b) Energy efficient magnetic ballast and energy saving lamp combination.

Pacific Power may adjust baseline electric energy consumption and costs to reflect any of the following: energy codes, standard practice, changes in capacity, changes in production or facility use and equipment at the end of its useful life. Such adjustments may be made for lighting energy efficiency measures installed in new construction projects where energy code does not apply.

Incentive caps

	Percent of Energy Efficiency Project Cost Cap	1 Year Simple Payback Cap for Energy Efficiency Projects
Measures Listed in Incentive Tables		
Lighting - Retrofit	60%	Yes
Lighting - New Construction/ Major Renovation	None	No
Motors	None	No
HVAC	None	No
Building Envelope	None	No
Food Service	None	No
Appliances	None	No
Irrigation (see note)	None	No
Dairy/Farm Equipment	None	No
Compressed Air	None	No
Other Energy Efficiency Measures (see note)	None	No
Measures Not Listed in Incentive Tables		
Lighting - New Construction/ Major Renovation Measures Receiving a Custom Incentive	None	No
Other Measures Receiving a Custom Incentive	60%	Yes

1. The 1 year simple payback cap means Energy Efficiency Incentives will not be available to reduce the simple payback of an Energy Efficiency Project below one year. If required, individual EEM Energy Efficiency Incentives will be adjusted downward pro-rata so the Energy Efficiency Project has a simple payback after incentives of one year or more.
2. EEM Costs are subject to Pacific Power review and approval and Pacific Power may require additional documentation from the Customer or Owner.
3. Two irrigation Energy Efficiency Measures have a measure cost cap. See the Irrigation Equipment incentive table for details.
4. The Network PC Power Management Software measure has a measure cost cap. See the Other Energy Efficiency Measures incentive table for details.

Retrofit Lighting Incentive Table

Category	Replace	With	Retrofit Incentive
Fluorescent Fixture Upgrade to Standard T8 Fixtures [Standard T8 lamps and electronic ballasts with ballast factor (BF) ≤0.88]	4' - 1 or 2 T12 lamp(s) + 1 magnetic ballast (MB)	4'- 1 or 2 T8 lamps + 1 electronic ballast (EB)	$6
	4' - 3 or 4 T12 lamp(s) + MB(s)	4' - 3 or 4 T8 lamps + EB	$12
	8' - 1 or 2 T12 lamp(s) + MB(s)	4'- 2, 3 or 4 T8 lamps + EB	$12
	8'- 1,2,3 or 4 T12 lamps + MB(s)	8' - 1,2,3 or 4 T8 lamps +EB	$12
	8'- 1,2,3 or 4 T12 HO/VHO lamps + MB(s)	8' - 1,2,3, or 4 T8 HO/VHO lamps + EB(s)	$18
Fluorescent Fixture Upgrade to 4' Premium T8 Fixtures [Lamps with initial lumens ≥3100 or wattage ≤30 W; electronic ballasts with BF ≤0.8]	4' - 1 or 2 T12 lamp(s) + MB or Standard T8 lamp(s) + EB	4' - 1 or 2 Premium T8 lamp(s) + EB	$12
	4' - 3 or 4 T12 lamps + MB(s) or Standard T8 lamps + EB	4' - 3 or 4 Premium T8 lamps + EB	$18
	8' - 1 or 2 T12 lamp(s) + MB(s)	4' - 2, 3 or 4 Premium T8 lamps + EB	$20
Fluorescent Delamping and Standard T8 Fixture Upgrade [Standard T8 lamps and electronic ballasts (EB) with BF ≤0.88 - Fixture removal is not eligible]	4' - 2 T12 lamps + MB	4' - 1 Standard T8 lamp + EB	$12
	4' - 3 T12 lamps + MB(s)	4' - 2 or 1 Standard T8 lamp + EB	$18
	4' - 4 T12 lamps + MB(s)	4' - 3 Standard T8 lamps + EB	$18
	4' - 4 T12 lamps + MB(s)	4' - 2 or 1 Standard T8 lamp + EB	$30
Fluorescent Delamping and Premium T8 Fixture Upgrade [Lamps with initial lumens ≥3100 or wattage ≤30 W; electronic ballasts with BF ≤0.8. Fixture removal is not eligible]	4' - 2 T12 lamps + MB	4' - 1 Premium T8 lamp + EB	$18
	4' - 3 T12 lamps + MB(s)	4' - 1 or 2 Premium T8 lamp + EB	$24
	4' - 4 T12 lamps + MB(s)	4' - 3 Premium T8 lamps + EB	$24
	4' - 4 T12 lamps + MB(s)	4' - 1 or 2 Premium T8 lamp + EB	$35
T8 Fluorescent Lamp Upgrade	≥ 32 W T8 lamp	≤ 30 W T8 lamp	$0.50
Compact Fluorescent Lighting (CFL)	Incandescent	<10W (nominal) CFL hardwire fixture	$10
	Incandescent	≥10W and < 20W (nominal) CFL hardwire fixture	$15
	Incandescent	≥20W (nominal) CFL hardwire fixture	$20
T5 Fluorescent Fixture Upgrade	≥250 W MH, MV or HPS	3 T5HO lamps (nominal 4') + EB (High Bay)	$70
	≥ 400 W MH, MV, or HPS	4,5, or 6 T5HO lamps (nominal 4') + EB (High Bay)	$75
	≥ 750 W MH, MV, or HPS	≥8 T5HO lamps (nominal 4') + EB(s)	$110
	4' - 4 T12 lamps + MB(s)	2 T5 lamps (nominal 4') + EB (interior fixtures)	$30
	4' - 4 T12 lamps + MB(s)	2 T5HO lamps (nominal 4') + EB (interior fixtures)	$25

Category	Replace	With	Retrofit Incentive
High Intensity Discharge (HID) Upgrades Based on lamp wattages	Incandescent or tungsten	≤100W Ceramic Metal Halide	$25
	≥400W MH, MV or HPS	≤320W Ceramic Metal Halide	$100
	≥750W MH, MV, or HPS	≤400 W Ceramic Metal Halide	$120
	≥150W and ≤ 250W MH, MV, or HPS, or ≥150W incandescent	≥125W and ≤175W Pulse Start MH	$50
	>250W and ≤ 400W MH, MV, or HPS	≥175W and ≤320W Pulse Start MH	$60
	> 400W MH, MV, or HPS	≤400W Pulse Start MH	$100
	≥1000W MH, MV or HPS	≤750W Pulse Start MH	$100
	≥ 250 W & < 750 W MH, MV, or HPS	4' - 4, 5, or 6 T8 lamps + EB(s) (High Bay)	$75
	≥750 W MH, MV or HPS	4' - ≥ 8 lamp T8 + EB(s) (High Bay)	$100
Exit Signs	Incandescent or fluorescent exit sign	Light Emitting Diode (LED) or Electro luminescent (EL) exit sign – 1 or 2 faced	$15
	Incandescent or fluorescent exit sign	Photoluminescent or Tritium	$20
Lighting Controls	Wall switch or no control	Wall or Ceiling Mounted Occupancy Sensor (per sensor)	$35
	No control	Integral occupancy sensor	$30
	No control	Photocell (per sensor) (exterior lights only)	$20
	No control	Time clock (per control)	$20
	No control	Daylighting control	$0.10/ connected Watt
	No control	Bi-level controlled fixtures with integral occupancy sensor (per fixture)	$35
LED Lighting	Indoor incandescent, neon, or fluorescent signage	LED channel letter signage ≤ 2' high	$4/linear foot
		LED channel letter signage > 2' high	$6/linear foot
	Outdoor incandescent, neon, or fluorescent signage	LED channel letter signage ≤ 2' high	$2/linear foot
		LED channel letter signage > 2' high	$3/linear foot
	Fluorescent refrigeration case lighting	LED case lighting	$10/linear foot
	Incandescent, neon or fluorescent signage	LED fixed or scrolling message center signage	See Note 7

Notes for Retrofit lighting incentives:

1. Incentives are capped at 60 percent of Energy Efficiency Project Costs and subject to the one-year payback cap.
2. 2' U-tube lamps may be substituted for 4' linear fluorescent lamps in the above table.
3. For retrofits of existing equipment, lighting incentives will be paid on a one-for-one equipment replacement basis. If fixture counts are changing, the project may be eligible for a custom Energy Efficiency Incentive.
4. Incentives for T8 Fluorescent Lamp Upgrades may not be combined with other fluorescent fixture incentives and will only be paid once per facility.

5. T8 HO/VHO and High Bay T-8 electronic ballasts are required to have a BF≤ 1.2 to be eligible for incentives.
6. To determine the length of LED channel letter signs, measure the length of individual letter at the centerline and add the individual values; do not measure the distance between letters.
7. LED fixed or scrolling message center signage incentives are $0.10 per kilowatt-hour of annual energy savings - see note 1. Savings is subject to Pacific Power approval.
8. Incentives are not available for LED traffic light upgrades.
9. Lighting equipment listed only in the “Replace” column is not eligible for incentives.
10. Incentives are available via an Energy Efficiency Incentive Agreement signed prior to ordering new equipment.

CFL = Compact Fluorescent Lamp

MH = Metal Halide

MV = Mercury Vapor

HPS = High Pressure Sodium

HO = High Output

VHO = Very High Output

LED = Light-emitting diode

New Construction/Major Renovation Lighting Incentive Table

Category	Install	Incentive
Premium T8 Fluorescent Fixture Upgrade [Lamps with initial lumens ≥3100 or wattage ≤30 W; electronic ballasts with BF ≤0.8]	4' - 1 or 2 Premium T8 lamp(s) + EB	$7
	4' - 3 or 4 Premium T8 lamps + EB	$10
T5 Fluorescent Fixture Upgrade	2 T5HO lamps (nominal 4') EB (interior fixtures)	$24
	3 T5HO lamps (nominal 4') + EB (High Bay)	$48
	4-7 T5HO lamps (nominal 4') + EB(s) (High Bay)	$60
	≥ 8 T5HO lamps (nominal 4') + EB(s) (High Bay)	$120
	1 T5 lamp (nominal 4') + EB (interior fixtures)	$12
	2 T5 lamps (nominal 4') + EB (interior fixtures)	$30
	3 T5 lamps (nominal 4') + EB (interior fixtures)	$36
T8 Fluorescent Fixture Upgrade (High Bay)	4' - ≥4 T8 lamps + EB(s) (High Bay)	$45
High Intensity Discharge (HID) Upgrades Based on lamp wattages	≤100W Ceramic Metal Halide	$20
	>100W Ceramic Metal Halide	$40
	>500W Pulse Start MH	$36
Lighting Controls	Integral occupancy sensor	$30
	Daylighting control	$0.10/ connected Watt
	Bi-level controlled fixtures with integral occupancy sensor (per fixture)	$35
LED Lighting	Indoor LED channel letter signage ≤ 2' high	$4/linear foot
	Indoor LED channel letter signage > 2' high	$6/linear foot
	Outdoor LED channel letter signage ≤ 2' high	$2/linear foot
	Outdoor LED channel letter signage > 2' high	$3/linear foot

Notes for new construction and major renovation lighting incentives:

1. The date of the building permit application shall establish the applicable version of the Washington energy code.
2. The total connected interior lighting power for New Construction/Major Renovation projects required to comply with the energy code must be 10 percent lower than the interior lighting power allowance calculated under the applicable version of the Washington energy code. For New Construction/Major Renovation projects not required to comply with the energy code, the total connected lighting power must be 10% lower than common practice as determined by Pacific Power.
3. Incentives are not available for lighting controls required under the applicable version of the Washington energy code. Incentives are not available for day- lighting controls and bi-level fixtures if utilized to comply with the applicable version of the Washington energy code.
4. 2' U-tube lamps may be substituted for 4' linear fluorescent lamps in the above table.
5. Electronic ballasts for High Bay T8 fixtures are required to have a ballast factor ≤ 1.2 to be eligible for incentives.
6. To determine the length of LED channel letter signs, measure the length of individual letter at the centerline and add the individual values; do not measure the distance between letters.
7. Incentives are not available for LED traffic light upgrades.
8. Incentives are available via a post-purchase incentive application process. Applying prior to placing equipment orders is recommended but not required.

HO = High Output, LED= Light-emitting diode, VHO= Very High Output

Premium Efficiency Motors Incentive Table

Horsepower	Customer Incentive ($/motor)	Nominal Full Load Efficiencies (%)					
		1200 RPMs		1800 RPMs		3600 RPMs	
		Open Drip-Proof (ODP)	Totally Enclosed Fan-Cooled (TEFC)	Open Drip-Proof (ODP)	Totally Enclosed Fan-Cooled (TEFC)	Open Drip-Proof (ODP)	Totally Enclosed Fan-Cooled (TEFC)
1	$45	82.5	82.5	85.5	85.5	77.0	77.0
1.5	$45	86.5	87.5	86.5	86.5	84.0	84.0
2	$54	87.5	88.5	86.5	86.5	85.5	85.5
3	$54	88.5	89.5	89.5	89.5	85.5	86.5
5	$54	89.5	89.5	89.5	89.5	86.5	88.5
7.5	$81	90.2	91.0	91.0	91.7	88.5	89.5
10	$90	91.7	91.0	91.7	91.7	89.5	90.2
15	$104	91.7	91.7	93.0	92.4	90.2	91.0
20	$113	92.4	91.7	93.0	93.0	91.0	91.0
25	$117	93.0	93.0	93.6	93.6	91.7	91.7
30	$135	93.6	93.0	94.1	93.6	91.7	91.7
40	$162	94.1	94.1	94.1	94.1	92.4	92.4
50	$198	94.1	94.1	94.5	94.5	93.0	93.0
60	$234	94.5	94.5	95.0	95.0	93.6	93.6
75	$270	94.5	94.5	95.0	95.4	93.6	93.6
100	$360	95.0	95.0	95.4	95.4	93.6	94.1
125	$540	95.0	95.0	95.4	95.4	94.1	95.0
150	$630	95.4	95.8	95.8	95.8	94.1	95.0
200	$630	95.4	95.8	95.8	96.2	95.0	95.4
250	$687	95.4	95.8	95.8	96.2	95.0	95.8
300	$770	95.4	95.8	95.8	96.2	95.4	95.8
350	$960	95.4	95.8	95.8	96.2	95.4	95.8
400	$1,049	95.8	95.8	95.8	96.2	95.8	95.8
450	$1,139	96.2	95.8	96.2	96.2	95.8	95.8
500	$1,229	96.2	95.8	96.2	96.2	95.8	95.8

Notes for Premium Efficiency Motor incentive table:

1. Motors larger than 500 horsepower may be eligible for a custom Energy Efficiency Incentive.
2. The NEMA Premium efficiency ratings listed are nominal full-load efficiency ratings. Motors that meet or exceed these efficiency requirements may qualify for an incentive.
3. Incentives are available via a post-purchase incentive application process.

Other Motor Incentives Table

Equipment Type	Size Category	Sub-Category	Minimum Efficiency Requirement	Customer Incentive
Electronically Commutated Motor	≤ 1 horsepower	Refrigeration application	--	$0.50/watt
		HVAC application	--	$50/horsepower
Variable-Frequency Drives (HVAC fans and pumps)	≤ 100 horsepower	HVAC fans and pumps	See Note 3	$65/horsepower
Green Motor Rewinds	≥ 15 and ≤ 500 hp	--	Must meet GMPG Standards	$1/horsepower

Notes for other motor incentives table:

1. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
2. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.
3. Throttling or bypass devices, such as inlet vanes, bypass dampers, three-way valves, or throttling valves must be removed or permanently disabled to qualify for HVAC fan or pump VFD incentives. VFDs required by energy code are not eligible for incentives. Washington energy code requires a VFD on HVAC fans greater than or equal to 10 horsepower. Savings will only be realized for installations where a variable load is present.
4. Except for Green Motor Rewinds, all equipment listed in the table will be eligible for incentives in new construction or retrofit projects.
5. For Green Motor Rewinds, the participating electric motor service center is paid $2/horsepower for eligible Green Motor Rewinds. A minimum of $1/horsepower is paid by the service center to the customer as a credit on the motor rewind invoice. The balance is retained by the service center.
6. For retrofits of existing equipment, incentives are for one-for-one same size equipment replacements.

ECM = Electronically Commutated Motor
VFD = Variable Frequency Drive
GMPG = Green Motors Practices Group

HVAC Equipment Incentive Table			Minimum Efficiency Requirement & Customer Incentive		
Equipment Type	**Size Category**	**Sub-Category**	**$50/ton**	**$75/ton**	**$100/ton**
Unitary Commercial Air Conditioners, Air-Cooled (Cooling Mode)	< 65, 000 Btu/hr	Split system and single package (single phase)	15.0 SEER and 12.5 EER	--	--
	< 65, 000 Btu/hr See Note 8	Split system and single package (three phase)	13.0 SEER and 11.6 EER	14.0 SEER and 11.6 EER	15.0 SEER and 12.0 EER
	≥ 65,000 Btu/hr and < 135,000 Btu/hr See Note 8	Split system and single package	11.0 EER and 11.4 IPLV	11.5 EER and 11.9 IPLV	12.0 EER and 12.4 IPLV
	≥ 135,000 Btu/hr and < 240,000 Btu/hr See Note 8	Split system and single package	10.8 EER and 11.2 IPLV	11.5 EER and 11.9 IPLV	12.0 EER and 12.4 IPLV
	≥ 240,000 Btu/hr and < 760,000 Btu/hr See Note 8	Split system and single package	10.0 EER and 10.4 IPLV	10.5 EER and 10.9 IPLV	10.8 EER and 12.0 IPLV
	≥ 760,000 Btu/hr See Note 8	Split system and single package	9.7 EER and 10.1 IPLV	9.7 EER and 11.0 IPLV	10.2 EER and 11.0 IPLV
Unitary Commercial Air Conditioners, Water and Evaporatively Cooled	< 135,000 Btu/hr	Split system and single package	14.0 EER	--	--
	≥ 135,000 Btu/hr	Split system and single package	14.0 EER	--	--
Package Terminal Air Conditioners and Heat Pumps (PTAC/PTHP) (Heating & Cooling Mode)	≤ 8,000 Btu/hr	Single package	11.8 EER and 3.3 COP Heating	--	--
	> 8,000 Btu/hr and < 10,500 Btu/hr	Single package	11.4 EER and 3.2 COP Heating	--	--
	≥ 10,500 Btu/hr and ≤ 13,500 Btu/hr	Single package	10.7 EER and 3.1 COP Heating	--	--
	> 13,500 Btu/hr	Single package	10.0 EER and 3.0 COP Heating	--	--
Heat Pumps, Air-Cooled (Cooling Mode)	< 65, 000 Btu/hr	Split system and single package (single phase)	15.0 SEER and 12.5 EER	--	--
	< 65, 000 Btu/hr See Note 8	Split system and single package (three phase)	13.0 SEER and 11.6 EER	14.0 SEER and 11.6 EER	15.0 SEER and 12.0 EER
	≥ 65,000 Btu/hr and < 135,000 Btu/hr See Note 8	Split system and single package	11.0 EER and 11.4 IPLV	11.5 EER and 11.9 IPLV	12.0 EER and 12.4 IPLV
	≥ 135,000 Btu/hr and < 240,000 Btu/hr See Note 8	Split system and single package	10.8 EER and 11.2 IPLV	11.5 EER and 11.9 IPLV	12.0 EER and 12.4 IPLV
	≥ 240,000 Btu/hr See Note 8	Split system and single package	10.0 EER and 10.4 IPLV	10.5 EER and 10.9 IPLV	10.8 EER and 12.0 IPLV
Heat Pumps, Air-Cooled (Heating Mode) - See Note 3	< 65, 000 Btu/hr	Split system (single phase)	8.5 HSPF	--	--
		Single package (single phase)	8.0 HSPF	--	--
	< 65, 000 Btu/hr See Note 8	Split system (three phase)	8.0 HSPF	8.5 HSPF	9.0 HSPF
		Single package (three phase)	7.5 HSPF	8.0 HSPF	8.5 HSPF
	≥ 65,000 Btu/hr and < 135,000 Btu/hr See Note 8	47°F db/43°F wb outdoor air	3.4 COP	3.4 COP	3.4 COP
		17°F db/15°F wb outdoor air	2.4 COP	2.4 COP	2.4 COP
	≥ 135,000 Btu/hr See Note 8	47°F db/43°F wb outdoor air	3.2 COP	3.2 COP	3.2 COP
		17°F db/15°F wb outdoor air	2.1 COP	2.1 COP	2.1 COP

HVAC Equipment Incentive Table (cont.)			Minimum Efficiency Requirement & Customer Incentive		
Equipment Type	**Size Category**	**Sub-Category**	**$50/ton**	**$75/ton**	**$100/ton**
Heat Pumps, Water-Source (Cooling Mode)	< 135,000 Btu/hr	86°F Entering Water	14.0 EER	--	--
Heat Pumps, Water-Source (Heating Mode) - See Note 3	< 135,000 Btu/hr	68°F Entering Water	4.6 COP	--	--
Heat Pumps, Ground-Source (Cooling Mode)	< 135,000 Btu/hr	77°F Entering Water	14.1 EER	--	--
Heat Pumps, Ground-Source (Heating Mode) - See Note 3	< 135,000 Btu/hr	32°F Entering Water	3.3 COP	--	--
Heat Pumps, Groundwater-Source (Cooling Mode)	< 135,000 Btu/hr	59°F Entering Water	16.2 EER	--	--
Heat Pumps, Groundwater-Source (Heating Mode) - See Note 3	< 135,000 Btu/hr	50°F Entering Water	3.6 COP	--	--
Equipment Type	**Size Category**	**Sub-Category**	**Incentive**		
Ground–Source or Groundwater-Source Heat Pump Loop	All sizes	Open Loop	$25/ton		
		Closed Loop			

Notes for HVAC equipment incentive table

1. For retrofits of existing equipment, incentives are for one-for-one same size equipment replacements. Exception: PTHPs can replace electric resistive heating, which must be removed.
2. Equipment that meets or exceeds the efficiency requirements listed for the size category in the above table may qualify for an incentive. Equipment must meet both listed efficiency requirements to qualify for incentives.
3. Incentives for heat pumps are $50-100 per ton of cooling capacity ONLY. No incentives are paid per ton of heating capacity. Heat Pumps must meet both the cooling mode and heating mode efficiency requirements to qualify for per ton cooling efficiency incentives.
4. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.
5. Except where noted, all equipment listed in the table will be eligible for incentives in both new construction and retrofit projects.
6. Equipment size categories are specified in terms of net cooling capacity at AHRI standard conditions as determined by AHRI Standard 210/240 for units <65,000 Btu/hr, AHRI Standard 340/360 for units ≥65,000 Btu/hr, and AHRI Standard 310/380 for PTAC and PTHP units.
7. Ground and Water Source Heat Pumps must meet or exceed listed efficiency requirements when rated in accordance with ISO-13256-1 to qualify for an incentive
8. **For HVAC equipment in size categories that indicate "See Note 8", $50/ton incentives will <u>not</u> be available for equipment purchased after December 31 2009.**

SEER = Seasonal Energy Efficiency Ratio
EER = Energy Efficiency Ratio
COP = Coefficient of Performance
HSPF = Heating Seasonal Performance Factor
IPLV = Integrated Part Load Value
PTHP = Package Terminal Heat Pump
PTAC = Package Terminal Air Conditioner
HVAC = Heating, Ventilation and Air Conditioning

Other HVAC Equipment and Controls Incentives

Equipment Type	Size Category	Sub-Category	Minimum Efficiency Requirement	Customer Incentive
Evaporative Cooling	All sizes	Direct or Indirect	Industry Standard Rating (ISR)	$0.02/ISR CFM
Indirect-Direct Evaporative Cooling (IDEC)	All sizes	--	Applicable system components must exceed minimum efficiencies required by energy code	(See Note 4)
Chillers	All except chillers intended for backup service only	Serving primarily occupant comfort cooling loads (no more than 20% of process cooling loads)	Must exceed minimum efficiencies required by energy code	(See Note 5)
365/366 day Programmable Thermostat	All sizes in portable classrooms with mechanical cooling	Must be installed in portable classroom unoccupied during summer months	365/366 day thermostatic setback capability	$150/thermostat
Occupancy Based PTHP/PTAC control	All sizes with no prior occupancy based control	--	See Note 6	$50/controller

Notes for other HVAC equipment and controls incentive table

1. For retrofits of existing equipment, incentives are for one-for-one same size equipment replacements.
2. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
3. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.
4. Incentives are paid at $0.12/kWh + $50/kW. IDEC energy and demand savings subject to approval by Pacific Power.
5. Incentives are paid at $0.12/kWh + $50/kW. Chiller energy and demand savings subject to approval by Pacific Power.
6. Controller units must include an occupancy sensor and include the capability to set back the zone temperature during extended unoccupied periods and set up the temperature once the zone is occupied.

CFM = Cubic Feet per Minute
ISR = Industry Standard Rating
IDEC = Indirect Direct Evaporative Cooling
PTHP = Package Terminal Heat Pump
PTAC = Package Terminal Air Conditioner

Building Envelope (Retrofit) Incentives

Equipment Type	Category	Minimum Efficiency Requirement	Customer Incentive
Cool Roof	--	ENERGY STAR Qualified	$0.10/square foot
Roof/Attic Insulation	--	Minimum increment of R-10 insulation	$0.08/square foot
Wall Insulation	--	Minimum increment of R-10 insulation	$0.10/square foot
Windows (See Note 4)	Site-Built	U-Factor ≤ 0.30 and SHGC ≤ 0.33 (Glazing Only Rating)	$0.34/square foot
	Assembly	U-Factor ≤ 0.35 and SHGC ≤ 0.33 (Entire Window Assembly Rating)	$0.34/square foot
Window Film	Existing Windows	See Note 6	See Note 6

Notes for retrofit building envelope incentive table

1. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
2. Incentives for all equipment listed in the incentive table are available via a post-purchase application process for retrofit projects only.
3. Building must be conditioned with mechanical cooling to be eligible for envelope incentives.
4. Energy performance of window assemblies and glazing products must be rated in accordance with NFRC. Site-Built metal window systems must include a thermal break within the frame or other appropriate NFRC certification to qualify for incentives. Skylights are not eligible to receive incentives.
5. Window square footage is determined by the dimensions of the entire window assembly, not just the window glass.
6. Incentives for window film are calculated based on film specifications and window orientation at $0.12/kWh annual energy savings. Energy savings subject to approval by Pacific Power.

NFRC = National Fenestration Rating Council

Building Envelope (New Construction/Major Renovation) Incentives

Equipment Type	Category	Minimum Efficiency Requirement	Customer Incentive
Cool Roof	--	ENERGY STAR Qualified	$0.10/square foot
Roof/Attic Insulation	--	Minimum increment of R-5 insulation above code (See Note 6)	$0.04/square foot
Wall Insulation	--	Minimum increment of R-3.7 continuous insulation above code (See Note 6)	$0.05/square foot
Windows (See Note 5)	Site-Built	U-Factor ≤ 0.30 and SHGC ≤ 0.33 (Glazing Only Rating)	$0.34/square foot
	Assembly	U-Factor ≤ 0.35 and SHGC ≤ 0.33 (Entire Window Assembly Rating)	$0.34/square foot

Notes for building envelope (new construction/major renovation) incentives table

1. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
2. Incentives for all equipment listed in the incentive table are available via a post-purchase application process for new construction projects only.
3. Building must be conditioned with mechanical cooling to be eligible for envelope incentives.
4. Window square footage is determined by the dimensions of the entire window assembly, not just the window glass.
5. Energy performance of window assemblies and glazing products must be rated in accordance with NFRC. Energy performance of window assemblies and glazing products must be rated in accordance with NFRC. Site-Built metal window systems must include a thermal break within the frame or other appropriate NFRC certification to qualify for incentives. Skylights are not eligible to receive incentives.
6. Compliance with the minimum efficiency requirements of Roof/Attic Insulation and Wall Insulation measures may be demonstrated with equivalent U-factors and is subject to Pacific Power approval.

NFRC = National Fenestration Rating Council

Food Service Equipment Incentives

Equipment Type	Equipment Category	Minimum Efficiency Requirement	Customer Incentive
Residential Dishwasher (Electric Water Heating Only) (See Note 3)	Used in a Commercial Facility	ENERGY STAR Qualified	$20
Commercial Dishwasher (Electric Water Heating Only) (See Note 3)	Undercounter	ENERGY STAR Qualified	$500
	Stationary Rack, Single Tank, Door Type	ENERGY STAR Qualified	$1,000
	Single Tank Conveyor	ENERGY STAR Qualified	$1,500
	Multiple Tank Conveyor	ENERGY STAR Qualified	$2,000
Electric Insulated Holding Cabinet	Full Size	ENERGY STAR Qualified	$300
	3/4 Size		$250
	1/2 Size		$200
Electric Steam Cooker	3-, 4-, 5- and 6-pan sizes	ENERGY STAR Qualified	$750
Electric Convection Oven	--	≥70% cooking efficiency (tested in accordance with ASTM F1496)	$350
Electric Griddle	--	≥70% cooking efficiency (tested in accordance with ASTM F1275)	$300
Electric Combination Oven	--	≥60% cooking efficiency (tested in accordance with ASTM F1639)	$1,000
Electric Commercial Fryer	--	ENERGY STAR Qualified	$200
Ice Machines (Air-Cooled Only)	All types, ≤500 lbs/day	ENERGY STAR Qualified	$125
		CEE Tier 3 Qualified	$150
	All types, >500 lbs/day	ENERGY STAR Qualified	$250
		CEE Tier 3 Qualified	$400
Residential Refrigerator	Used in a Commercial Facility	ENERGY STAR Qualified	$20
Commercial Glass Door Refrigerator	≤ 30 cubic feet volume (V)	CEE Tier 2 Qualified	$125
	31-60 cubic feet		$150
	≥ 61 cubic feet		$175
Solid Door Refrigerator	≤ 30 cubic feet volume (V)	CEE Tier 2 Qualified	$50
	31-60 cubic feet		$70
	≥ 61 cubic feet		$90
Solid Door Freezer	≤ 30 cubic feet volume (V)	CEE Tier 2 Qualified	$150
	31-60 cubic feet		$175
	≥ 61 cubic feet		$200

Notes for food service equipment incentives table

1. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
2. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.
3. Dishwashers must be supplied with electrically heated domestic hot water. Models with either electric or gas booster heaters are eligible for incentives.

ASTM = American Society for Testing and Materials, CEE = Consortium for Energy Efficiency

Appliances Incentive Table

Equipment Type	Equipment Category	Minimum Efficiency Requirement	Customer Incentive
Ceiling Fans	Residential (used in a business)	ENERGY STAR Qualified	$20
High-Efficiency Clothes Washer (must have electric water heating)	Residential (used in a business)	ENERGY STAR Qualified	$50
		CEE Tier 2	$100
	Commercial (Coin-operated/Laundromat)	ENERGY STAR Qualified	$150
		CEE Tier 2	$200
Room Air Conditioners	Residential (used in a business)	ENERGY STAR Qualified	$30
Electric Water Heater	Residential (40 gallon or larger)	EF $\geq$ 0.93	$50

Notes for appliances incentive table

1. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
2. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.

EF = Energy Factor
MEF = Modified Energy Factor
WF = Water Factor
CEE = Consortium for Energy Efficiency

Irrigation Incentive Table (Retrofit Only)

Irrigation Measure	Replace	With	Limitations	Customer Incentive
Repair Leaking Wheel Lines, Hand Lines and Portable Mainlines	Worn and leaking pipe connections	Cut and pipe press or weld repair of leaking pipe connections	1. Invoice must show number of joints repaired	$8.00/joint
Rotating type, Spray Heads or Low-Pressure Pivot Sprinkler Heads	Worn rotating, impact, or spray-type sprinklers	New rotating type, spray heads, or low-pressure pivot sprinkler heads	1. Must be same design flow or less 2. Limited to 2 replacements per irrigated acre	$3.00 each (up to 60% of measure costs)
Center Pivot Base Boot Gasket	Worn and leaking center pivot base boot gasket	New center pivot base boot gasket	--	$80 each
Drains and Gaskets for Wheel Lines, Hand Lines, Pivots or Portable Main Lines	Worn and leaking drains and gaskets	New drains and gaskets (See Note 4)	1. Limited to 2 replacements per irrigated acre	$1.00 each
Flow-Controlling Type Nozzles	Existing brass or worn flow-controlling type nozzles	New flow-controlling type nozzles	1. Must be same design flow or less 2. Limited to 2 replacements per irrigated acre	$1.50 each
Sprinkler Nozzles	Existing worn nozzle	New brass or plastic range nozzle	1. Must be same design flow or less 2. Limited to 2 replacements per irrigated acre	$0.25 each
Gooseneck Elbow with Drop Tube or Boomback	Worn or leaking gooseneck elbow with drop tube or boomback	New gooseneck elbow with drop tube or boomback	--	$1.00/outlet
Wheel-line Hubs (on Thunderbird Wheel Lines)	Worn or leaking hub	New wheel-line hub	--	$12.00 each
Sprinkler Pressure Regulators	Worn or faulty regulator	New Pressure regulator	1. Must be same design pressure or less 2. Limited to 2 replacements per irrigated acre	$2.75 each
Brass-Impact Sprinklers	Worn or leaking brass-impact sprinkler	New or rebuilt brass impact sprinkler	1. Limited to 2 replacements per irrigated acre	$3.00 each (up to 60% of measure costs)
Wheel-line Leveler	Worn or faulty wheel-line leveler	New or rebuilt wheel-line leveler	--	$0.75 each
Wheel-line Feed Hose	Worn or leaking wheel-line feed hose	New or rebuilt wheel-line feedhose	--	$15.00 each

Notes for irrigation incentive table

1. Irrigation measures that meet the replacement requirements listed in the above table may qualify for an incentive.
2. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.
3. All equipment listed in the table will be eligible for incentives only in replacement or retrofit projects.
4. Also includes seals and riser caps (dome discs) for valve openers.
5. For Energy Efficiency Measures where the incentive is limited to 60% of Energy Efficiency Measure costs, Energy Efficiency Measure costs are subject to Pacific Power approval.

Dairy/Farm Equipment Incentives Table

Equipment Type	Equipment Category	Minimum Efficiency Requirements	Customer Incentive
Automatic Milker Takeoffs (Retrofit Only)	--	Equipment must be able to sense milk flow and remove milker when flow reaches a pre-set level.	$235 each
Tractor Block Heater Timers	--	Timer must be a UL-listed device and rated for a minimum of 15 amps continuous duty.	$10 each
Circulating Fans (See Note 3)	12-23" Diameter	Fans must achieve an efficiency level of 11 cfm/W	$25/fan
	24-35" Diameter	Fans must achieve an efficiency level of 18 cfm/W	$35/fan
	36-47" Diameter	Fans must achieve an efficiency level of 18 cfm/W	$50/fan
	≥48" Diameter	Fans must achieve an efficiency level of 25 cfm/W	$75/fan
Heat Reclaimers	--	Heat reclaimer must use waste heat from compressor to heat water. Customer must use electricity to heat water.	$220/condenser kW
High-efficiency Ventilation Systems (See Note 3)	12-23" Diameter	Fans must achieve an efficiency level of 11 cfm/W	$45/fan
	24-35" Diameter	Fans must achieve an efficiency level of 13 cfm/W	$75/fan
	36-47" Diameter	Fans must achieve an efficiency level of 17 cfm/W	$125/fan
	≥48" Diameter	Fans must achieve an efficiency level of 19.5 cfm/W	$150/fan
Milk Pre-coolers	--	The equipment must cool milk with well-water before it reaches the bulk cooling tank.	See Note 4
Programmable Ventilation Controller	--	The equipment must control ventilation fans based on temperature or environmental settings.	$20/fan controlled
Variable Frequency Drives for Dairy Vacuum Pumps (Retrofit Only	--	The equipment must vary the motor speed in accordance with the air flow needs of the vacuum system. Incentive available for retrofit only.	$165/hp

Notes for dairy/farm equipment incentives table

1. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
2. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.
3. Fan performance must by rated by an independent testing body in accordance with the appropriate ANSI/AMCA standards.
4. Incentives are paid at $0.12/kWh + $50/kW. Milk Pre-Cooler energy and demand savings subject to approval by Pacific Power.
5. Except where noted, all equipment listed in the table will be eligible for incentives in both new construction and retrofit projects.

AMCA = Air Movement & Control Association International, Inc.
ANSI = American National Standards Institute

Compressed Air Incentive Table (Size ≤ 75 Horsepower)

Equipment Category	Replace	With	Limitations	Customer Incentive
Low-Pressure Drop Filters	Standard Coalescing Filter	Rated Low-Pressure Drop Filter where: 1. Pressure Loss at Rated Flow is ≤ 1psi, ≤ 3psi at element change 2. Particulate Filtration is 100% at ≥ 3.0 microns, 99.98% at 0.1 to 3.0 microns, ≤ 5 ppm liquid carryover 3. Filter is of deep-bed "mist eliminator"	1. Compressor must be ≥ 25 HP	$0.80/scfm
Receiver Capacity Addition	Limited or no Receiver Capacity (≤ 2 gallons per scfm of compressor capacity)	Receiver capacity > 2 gallons per scfm of compressor capacity	1. Compressor must use load/unload controls without inlet modulation or on/off control. 2. Systems with a VFD or using variable displacement control are not eligible.	$1.50/gallon above 2 gallons per scfm
Refrigerated Cycling Dryers	Non-Cycling Refrigerated Dryer	Cycling Refrigerated Dryer	1. Rated dryer capacity must be ≤ 500 scfm 2. Dryer must operate exclusively in cycling mode and cannot be equipped with the ability to select between cycling and non-cycling mode 3. Refrigeration compressor must cycle off during periods of reduced dem	$1.50/scfm
VFD Controlled Compressor	Compressor 75 hp or Smaller	VFD-Controlled Oil-Injected Screw Compressor	1. Compressor must adjust speed as primary means of capacity control 2. Compressor must not use inlet modulation when demand is below minimum speed air production	$0.15/kWh See Note 4
Zero Loss Condensate Drains	Fixed Timer Drain	Zero Loss Condensate Drain (See Note 5)	Drain is designed to function without release of compressed air into the atmosphere	$90 each
Outside Air Intake	Compressor intake drawing air from compressor room	Permanent ductwork between compressor air intake and outdoors	Ductwork must meet manufacturer's specifications, which may include: (a) ≤ 0.25" W.C. pressure loss at rated flow, and (b) allow use of compressor room air during extremely cold conditions	$6.00/hp

Notes for compressed air incentive table

1. Eligibility for incentives is limited to customers with compressed air system(s) containing a single operating compressor less than or equal to 75 hp in size. Multiple compressor systems and compressors larger than 75hp will not be eligible for incentives listed above.
2. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
3. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.
4. Incentives for VFD-controlled compressors are calculated based on compressor size and other system parameters at $0.15/kWh annual energy savings. Energy savings subject to approval by Pacific Power.
5. Zero Loss Condensate Drains purchased as requirements for other compressed air measures are eligible for incentive

SCFM = Cubic Feet of air per Minute at standard conditions (14.5 psia, 68°F, and 0% relative humidity)

Incentives for Other Energy Efficiency Measures

Equipment Type	Replace	Minimum Efficiency Requirements	Customer Incentive
Network PC Power Management Software	--	1. Installed software must automatically control the power settings of networked personal computers (PC) at the server level 2. The software must manage power consumption for each individual PC 3. The software must include the capability to report energy	$7 per controlled PC (up to 100% of measure costs)
Smart Plug Strip	--	Incentive applies to any plug strip that eliminates idle or stand-by power consumption of connected plug-load appliance through the use of an occupancy sensor, electric load sensor, or timer.	$15/qualifying unit
Beverage or refrigerated display machine occupancy sensor	No occupancy sensor control	See Note 4	$75/sensor

Notes for other energy efficiency measures incentives table

1. Equipment that meets or exceeds the efficiency requirements listed for the equipment category in the above table may qualify for an incentive.
2. Incentives for all equipment listed in the incentive table are available via a post-purchase application process.
3. All equipment listed in the table will be eligible for incentives in new construction or retrofit projects.
4. Intended for refrigerated vending machines and display cases containing only non-perishable bottled and canned beverages. Refurbished equipment that includes occupancy control is eligible.
5. Energy Efficiency Measure Costs for Network PC Power Management Software are subject to Pacific Power approval.

2.6 Energy FinAnswer (Schedule 125)

Program details for this program are contained in the program tariff. Any changes to the details included in the program tariff must be filed and approved by the Commission prior to becoming effective.

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 125
COMMERCIAL AND INDUSTRIAL ENERGY SERVICES
OPTIONAL FOR QUALIFYING CUSTOMERS

PURPOSE:
Service under this Schedule is intended to maximize the efficient utilization of the electricity requirements of new and existing loads in Commercial and Industrial Facilities by promoting the installation of Energy Efficiency Measures.

APPLICABLE:
To service under the Company's General Service Schedules 24, 33, 36, 40, 47T, 48T and 54 in all territory served by the Company in the State of Washington. This Schedule is not applicable to existing Commercial Buildings under 20,000 square feet. Square footage is the total Building or Facility area served by the Company's meter(s).

DEFINITIONS:

Annual kWh Savings: The annual kilowatt-hour (kWh) savings resulting from installation of the Energy Efficiency Measures, as estimated by Company using engineering analysis.

Average Monthly kW Savings: The Average Monthly kilowatt (KW) savings resulting from the installation of Energy Efficiency Measures as estimated by Company using engineering analysis as described below:

Average monthly KW Savings = (baseline average monthly kW - proposed average monthly kW), where:

⇒ Average monthly kW = sum of the 12 Monthly Maximum kW/12, where
⇒ Monthly Maximum kW = highest of all 15 minute average kW (as determined below)
⇒ 15 minute average kW = sum of kWh used over 0.25 hrs /0.25 hrs

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 125
COMMERCIAL AND INDUSTRIAL ENERGY SERVICES
OPTIONAL FOR QUALIFYING CUSTOMERS

DEFINITIONS: (continued)

Baseline Level:

Baseline Adjustments: Company may adjust baseline electric energy consumption and costs during engineering analysis to reflect any of the following: energy codes, standard practice, changes in capacity, changes in production or facility use and equipment at the end of its useful life. For existing fixtures, baseline wattages for all fluorescent lighting Energy Efficiency Measures in all facilities shall be the lesser of existing equipment or the energy efficient magnetic ballast and energy saving lamp combination listed in the lighting table available on the Washington energy efficiency program section of the Company web site.

Commercial Building: A structure that is served by Company and meets the applicability requirements of this tariff at the time an Energy Efficiency Incentive Agreement is executed which does not meet the definition of an Industrial Facility.

Commissioning: The process of verifying and documenting that the performance of electric energy using systems meets the design intent and owner's operational requirement.

Customer: Any party who has applied for, been accepted and receives service at the real property, or is the electricity user at the real property.

Energy Efficiency Incentive: Payment of money made by Company to Owner or Customer for installation of an Energy Efficiency Project pursuant to an executed Energy Efficiency Incentive Agreement.

(Continued)

Issued November 9, 2006 Effective January 1, 2007

Issued by PACIFIC POWER & LIGHT COMPANY
By Andrea L. Kelly Title Vice President, Regulation
TF2 125.2E Advice No. 06-008
Form F

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 125
COMMERCIAL AND INDUSTRIAL ENERGY SERVICES
OPTIONAL FOR QUALIFYING CUSTOMERS

DEFINITIONS: (continued)

Energy Efficiency Incentive Agreement: An agreement between Owner or Customer and Company providing for Company to furnish Energy Efficiency Incentive with respect to Energy Efficiency Project pursuant to this tariff schedule.

Energy Efficiency Measure (EEM): A permanently installed measure specified in an Energy Efficiency Incentive Agreement which can improve the efficiency of the Customer's electric energy use. EEMs designed to primarily reduce Average Monthly kW must also reduce electric energy use to be eligible for Energy Efficiency Incentives.

Energy Efficiency Measure (EEM) Cost:
New construction: EEM Cost is the total installed cost of the energy efficient equipment or system minus the cost of the code compliance/common practice equipment or system.
Major Renovation: EEM Cost is the total installed cost of the energy efficient equipment or system minus the cost of the code compliance/common practice equipment or system.
Retrofit: EEM Cost is the total installed cost of the energy efficiency equipment or modification.
In the case of new construction, major renovation and retrofits, EEM Costs shall mean the Owner or Customer's reasonable costs incurred (net of any discounts, rebates or incentives other than Energy Efficiency Incentives from the Company, or other consideration that reduces the final actual EEM Cost incurred by the Owner or Customer) to purchase and install EEMs at the Owner or Customer's facility. If the Owner or Customer installs the EEM then the cost of installation shall be equal to the Owner's or Customer's actual labor costs for such installation.

For Energy Efficiency Projects involving EEM(s) that save both natural gas and electricity where the Owner or Customer can reasonably expect to receive an incentive from their gas company, the EEM Cost will be pro-rated prior to calculating the Energy Efficiency Incentive. This does not apply to design assistance projects.

Energy Efficiency Project: One or more EEM(s) covered by one Energy Efficiency Incentive Agreement. Annual kWh and Average Monthly kW savings for an Energy Efficiency Project shall be the sum of the individual EEM values.

Energy Efficiency Project Cost: Energy Efficiency Project cost shall be the sum of the individual EEM costs.

Industrial Facility: Buildings and process equipment associated with manufacturing.

Mixed Use: Buildings served by a residential schedule and a rate schedule listed under **Applicable** shall be eligible for services under this schedule provided the Energy Efficiency Project meets the definition of New

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 125
COMMERCIAL AND INDUSTRIAL ENERGY SERVICES
OPTIONAL FOR QUALIFYING CUSTOMERS

DEFINITIONS: (continued)

New Construction: A newly constructed facility or newly constructed square footage added to an existing facility.

Major Renovation: A change in facility use type or where the existing system will not meet Owner/Customer projected requirements within existing square footage.

Owner: The person who has both legal and beneficial title to the real property specified in an Energy Efficiency Incentive Agreement or Energy Services Agreement or who is the mortgagor under a duly recorded mortgage or the grantor under a duly recorded deed of trust or a purchaser under a duly recorded agreement with respect to such real property.

Retrofit: Changes, modifications or additions to systems or equipment in existing facility square footage.

Supplemental Services Agreement: An agreement between Owner or Customer and Company providing for Company to furnish Supplemental Services with respect to Supplemental Services section of this Tariff Schedule.

INCENTIVES FOR ENERGY EFFICIENCY PROJECTS:

Energy Efficiency Incentives: The Energy Efficiency Incentive made by the Company for installation of EEMs pursuant to an Energy Efficiency Incentive Agreement shall be the **lesser** of the sum of (a) and (b) **OR** (c):

(a) $0.15/kWh for the Energy Efficiency Project Annual kWh savings as determined using Company provided or approved engineering analysis;
(b) $50/kW for the Energy Efficiency Project Average Monthly kW savings determined using Company provided or approved engineering analysis.
(c) 60 percent of the Energy Efficiency Project Cost as determined by the Company.

Energy Efficiency Projects are eligible for Energy Efficiency Incentives per Table 1.

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 125
COMMERCIAL AND INDUSTRIAL ENERGY SERVICES
OPTIONAL FOR QUALIFYING CUSTOMERS

Table 1

Program track	**Design Assistance**	**Standard**	**Standard**	**Standard**
Project Scope	Comprehensive	System	System	System
Type	New Construction/ Major renovation	New Construction/ Major renovation	New Construction/ Major renovation	Retrofit
Energy code applies	Yes	Yes	No	No
Owner/Customer Energy Efficiency Incentive caps applied to the Energy Efficiency Project				
60 % of project cost cap	No	Yes	Yes	Yes
1 yr simple payback cap	No	Yes	Yes	Yes
Lighting savings cap	No	50%	50%	50%
Energy savings threshold	Must exceed code by 10% - whole building electric basis	Qualifying equipment must exceed code	none	none
Design team incentives				
Honorarium	Yes	Yes	Not available	Not available
Design Incentive	Based on project size	Not available	Not available	Not available

(Continued)

Issued September 18, 2009 Effective October 30, 2009

Issued by PACIFIC POWER & LIGHT COMPANY
By Andrea Kelly Andrea L. Kelly Title Vice President, Regulation

TF2 125.5E Advice No. 09-04
Form F

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 125
COMMERCIAL AND INDUSTRIAL ENERGY SERVICES
OPTIONAL FOR QUALIFYING CUSTOMERS

INCENTIVES FOR ENERGY EFFICIENCY PROJECTS: (continued)

All proposed Energy Efficiency Measure costs are subject to Company review and approval prior to offering an Energy Efficiency Incentive Agreement. All final Energy Efficiency Measure costs are subject to Company review and approval prior to paying an Energy Efficiency Incentive per the terms of an Energy Efficiency Incentive Agreement. Company review and approval of Energy Efficiency Measure costs may require additional documentation from the Customer or Owner.

For the purposes of calculating maximum annual electric savings resulting from lighting, electric savings resulting from lighting interaction with mechanical equipment and from lighting controls will be considered to be lighting savings.

The ten percent whole building energy savings threshold shall be calculated as follows: The Energy Efficiency Project must reduce the proposed electric energy consumption by at least 10% when compared to the baseline level of whole building electric consumption that would have resulted under the current Washington energy code. The date of the building permit application shall establish the current version of the code.

The Customer or Owner may receive only one financial incentive from the Company per EEM. Design team incentives are available per Table 1 and the terms posted on the Washington energy efficiency program page of the Company web site.

PROVISIONS OF SERVICE:

(1) **Energy Analysis**

Company shall meet with Customer or Owner and any design team and may perform an initial site visit/plans review to determine what EEMs may be appropriate for an energy analysis.

(2) **Supplemental Services**

Company may offer Supplemental Services beyond those described elsewhere in this Tariff Schedule through a Supplemental Services Agreement. Supplemental services shall include, but are not limited to: detailed design, life cycle costs calculations or compliance documentation for green or high performance building standards. Company will negotiate the amount and terms of the supplemental services on a project specific basis and may require any or all of the following: installation of EEMs delivering a certain amount of annual kWh savings, offset of a portion of the available incentive or direct reimbursement of a portion (up to 100%) of the direct Company costs for the service provided.

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 125
COMMERCIAL AND INDUSTRIAL ENERGY SERVICES
OPTIONAL FOR QUALIFYING CUSTOMERS

PROVISIONS OF SERVICE: (continued)

(3) **EEM Inspection**
Company will inspect any EEMs which are funded by or installed under this program. Satisfactory inspection by Company will be required prior to receiving Energy Efficiency Incentives specified in the Energy Efficiency Incentive Agreement.

(4) **EEM Commissioning**
Company will require that EEMs as specified in the Energy Efficiency Incentive Agreement be commissioned prior to receiving Energy Efficiency Incentives specified in the Energy Efficiency Incentive Agreement.

(4a) **Commissioning Opt-Out:** Required EEM Commissioning may be omitted with the following adjustments. Annual kWh savings, Average Monthly kW savings and eligible EEM Costs will all be reduced by 20% prior to calculation of the eligible Energy Efficiency Project Incentive. EEMs where the Owner or Customer has "opted–out" of EEM Commissioning that are later commissioned are not eligible for an additional incentive after the Energy Efficiency Project Incentive is paid.

(5) **Measure Performance Verification/Evaluation**
Company may verify or evaluate the energy savings of installed Energy Efficiency Measures specified in the Energy Efficiency Incentive Agreement. This verification may include a telephone survey, site visit, review of plant operation characteristics, and pre- and post-installation of monitoring equipment as necessary to quantify actual energy savings.

(6) **Minimum Equipment Efficiency**
For Retrofit Energy Efficiency Projects, EEMs must meet minimum equipment efficiency levels and equipment eligibility requirements in Schedule 115 to be eligible for incentives available under this Schedule.

(7) **Prior Energy Service program participation requirements and definitions:**

- Energy Efficiency Payments are not available to Owners after July 16, 2001. The elimination of the Energy Service Charge portion associated with Schedule 125 does not affect Energy Service Charges' currently outstanding and obligations pursuant to an executed Energy Services Agreement remain in effect until the Energy Efficiency Payment with interest is re-paid in full.
- **Energy Efficiency Payments:** Any payments of money made by Company to Owner for installation of EEMs pursuant to an Energy Services Agreement.
- **Energy Services Agreement:** An agreement between the Owner and the Company providing for Company to furnish or provide Energy Efficiency Payments with respect to EEMs pursuant to this Tariff Schedule.

(Continued)

PACIFIC POWER & LIGHT COMPANY

FOR COMMISSION'S RECEIPT STAMP

SCHEDULE 125
COMMERCIAL AND INDUSTRIAL ENERGY SERVICES
OPTIONAL FOR QUALIFYING CUSTOMERS

PROVISIONS OF SERVICE: (continued)

- **Energy Services Charge:** As specified in the Energy Services Agreement, the monthly Energy Services Charge is that monthly payment required to repay the Energy Efficiency Payments, with interest at the Melded Interest Rate or the Performance Guarantee Interest Rate as applicable, in equal monthly payments over the term specified in the Energy Services Agreement.

(8) **Fuel Switching**
Energy Efficiency Incentives will not be made available to induce fuel switching by Owner.

(9) **Design team incentives**
Company may offer incentives to a design team member with current professional certification including architects and engineers. Incentives are available per Table 1 and include honorariums and design incentives.

Honorariums are designed to encourage early initial Company consultation on Owner/Customer's design and plans. Honorariums will be equally available to all professionally certified architects and engineers for Washington projects within Company's territory and will be limited to one honorarium per project.

Design incentives will be offered to all professional certified architects and engineers for Washington projects within Company's territory. Payment of incentives to the design team will require final construction documents include an efficient design meeting Company requirements. Incentives will be based on the square footage of the project and limited to one per project.

Additional conditions for design team incentives will be available on the Washington energy efficiency program section of the Company's web site and may be changed with 45 days notice posted on the web site.

RULES AND REGULATIONS:
Service under this Schedule is subject to the General Rules and Regulations contained in the tariff of which this Schedule is a part, and to those prescribed by regulatory authorities.

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

PACIFIC POWER
A DIVISION OF PACIFICORP

Table of Contents

PACIFIC POWER
A DIVISION OF PACIFICORP

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 Incentive Program
Original Sheet No. 118.1	Schedule 118	Home Energy Savings Incentive Program
Original Sheet No. 118.2	Schedule 118	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

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.

- 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 cost-effectiveness tests and analysis methods employing the same methodology and

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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PACIFICORP
PACIFIC POWER UTAH POWER

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 Sheet 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

quantec

Date: January 12, 2005

To: 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*

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.

Participant Survey Data Collection

Data Category	Data Element
Customer Information	• Name • Address • Household size • Annual income • Head of household age • Home type
Program Perceptions and Satisfaction	• How did customer become aware of Program? • How satisfied is customer with Program delivery – schedule, communications, implementer performance, incentive, overall? • What improvements would customer recommend? • How satisfied is customer with Pacific Power overall?
Free-Riders/ Unit Replacement	• What would customer have done with existing refrigerator/freezer without the Program? • When would customer have taken action? • How often would refrigerator/freezer have been operated if it had been kept? • Was the recycled unit replaced and if so the manufacturer and model of the replacement unit.

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.

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
- Methodology
- Impact Evaluation
- Background or Introduction
- Process Information
- Recommendations
- 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

PACIFICORP
PACIFIC POWER UTAH POWER

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 No. 8a		Tariff Index
Third Revision of Sheet No. 115.1	Schedule 115	Commercial & Industrial Energy 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	Commercial & Industrial Energy Efficiency Incentives

VII. Evaluation Plan

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.

Table VII.1. Project Categorization

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

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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PACIFICORP
PACIFIC POWER UTAH POWER

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 1
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 No. 115.1	Schedule 115	Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less
First Revision of Sheet No 115.2	Schedule 115	Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less
First Revision of Sheet No. 115.3	Schedule 115	Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less
First Revision of Sheet No. 115.4	Schedule 115	Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less
First Revision of Sheet No. 115.5	Schedule 115	Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less
Original Sheet No. 115.6	Schedule 115	Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less
Original Sheet No. 115.7	Schedule 115	Commercial and Industrial Energy Efficiency Retrofit Incentives – 20,000 square Feet or Less

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.

Attachment C
Program Evaluations for Low Income Weatherization and Energy Education in Schools

PACIFIC POWER
A DIVISION OF PACIFICORP

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Final Report

Washington Low-Income Weatherization Program

Prepared for:
Pacific Power

January 19, 2007

Prepared by:
M. Sami Khawaja
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Table of Contents

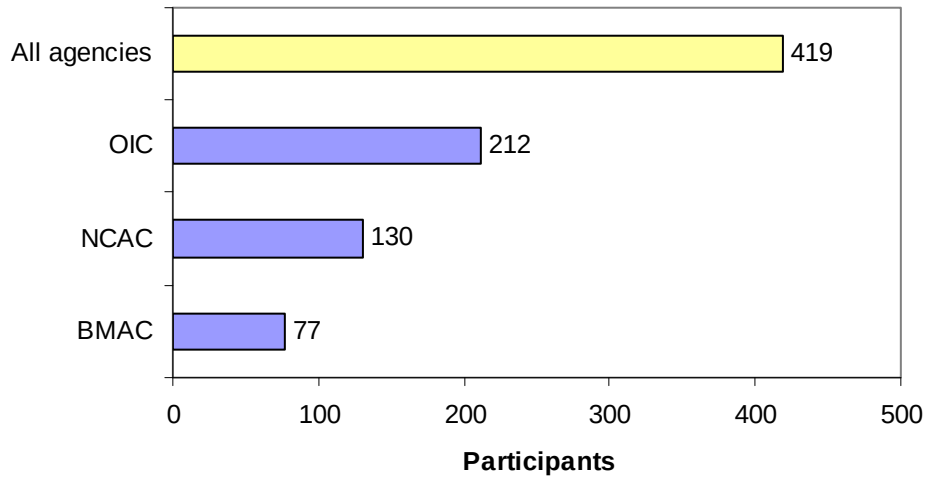
1. Executive Summary

Program Description

Pacific Power's Weatherization Program (the Program) in Washington assists low-income households in controlling energy consumption and heating costs through comprehensive home weatherization and energy education.

Between July 1, 2003, and June 30, 2005, the Program provided service to 419 Pacific Power customers. As shown in Figure 1, the majority of participants were served by the Opportunities Industrial Center (OIC) of Washington located in Yakima. The remaining participants were either served by the Blue Mountain Action Council (BMAC) in Walla Walla or the Yakima Valley Farm Worker's Northwest Community Action Center (NCAC).

Figure 1. Program Participation Among Agencies



Evaluation Approach

Pacific Power contracted with Quantec to conduct an impact and a process evaluation of the Program. The process evaluation was designed to assess Program delivery and efficacy, bottlenecks, barriers, and means of improvement. The impact evaluation assessed energy impacts, non-energy benefits, and Program cost effectiveness. The following were the major tasks associated with the evaluation:

Data Collection

Data that were provided by Pacific Power and the agencies included:

- Participant and non-participant billing histories
- Measure installations
- Program costs

Surveys were conducted with 65 Program participants to assess multiple aspects of the Program, including the value of the Program, Program delivery, client satisfaction levels, and customer recall of energy education recommendations.

In-depth discussions with key staff at each agency were conducted to ensure that all facets of Program delivery were assessed, including bottlenecks, client and agency satisfaction, methods of improving delivery, and agency assessment of non-energy benefits.

Finally, an interview was conducted with Pacific Power's inspector to provide insight into the issues identified through this evaluation and by the inspector, and to discuss improvements that have been made at the agency level.

Evaluation of Program Energy Savings

Estimated as well as actual Program energy savings were assessed in the following manners:

- Deemed Savings: A measure analysis to identify measure installation frequencies and estimated savings was conducted.
- Actual Savings: The Princeton Scorekeeping Method algorithm was run to estimate weather-normalized, Program-induced energy (kWh) savings based on participant and non-participant billing data.

Assessment of Non-Energy Benefits

In addition to those that were reported by the participants, numerous non-energy benefits in the areas of economic impact, environmental benefits, mobility, health and safety, and participant arrearages were analyzed.

Assessment of Cost-Effectiveness

An economic analysis of the Program, in accordance with the benefit-cost tests from the California Standard Practices Manual, was performed. Results are presented both with and without the inclusion of non-energy benefits.

Major Findings

Cost Effectiveness

The Program did not pass the traditional cost-effectiveness test. The Total Resource Cost (TRC) benefit cost ratios were between .60 and .65 depending on the stream of avoided costs used. However, when non-energy benefits are included, the Program passes the TRC with a benefit/cost ratio between 1.01 and 1.06.

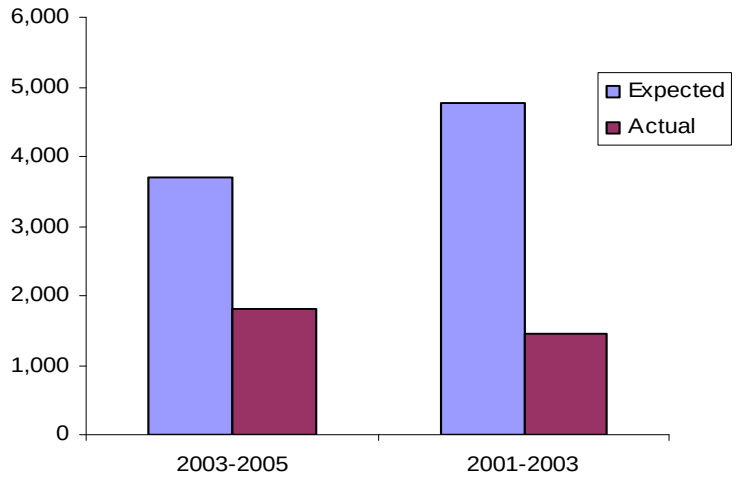
We did not find that cost-effectiveness is recognized by all parties as an explicit goal of this Program. Theoretically, only measures with a savings to investment ratio (SIR) of 1.0 or more should be installed. However, that is not the approach followed by the agencies. We discuss this issue further below in relation to the use of a Department of Energy (DOE) approved audit.

Electricity Savings

Overall, Program net annual energy savings are estimated at 1,840 kWh (12% of pre-Program energy consumption) per completed household. This is an improvement over the prior Program period, which had an evaluated net annual energy savings of 1,439 kWh (8% pre-Program energy consumption).

Estimated savings during the audit seem to greatly inflate the potential, as shown in Figure 2.

Figure 2. Actual and Expected Savings by Program Year



Non-Energy Benefits

The Program also provided non-energy benefits to participants, the environment, and the economy. At the participant level these included increased comfort (reported by 94% of survey respondents), improved health (66%), decreased work or school absences (43%), and more

money for non-energy necessities (83%). Additionally, while 68% of respondents reported that the Program had improved their ability to stay in their current homes, an analysis of participant billing data found that the Program may have helped to prevent approximately 68 participant moves (16%) . Other benefits included:

- An estimated 6 net job-years of employment
- Approximately $557,605 added to the Washington economy
- Approximately $22,809 worth of air emission reductions based on relevant market values as of August 2006
- A reduction in annual arrearages, totaling approximately $26,816

Energy Education

Great improvement was made in participant recollection of energy education materials in comparison to the previous Program period. In fact, 75% of the participants surveyed remembered receiving supplemental material compared to 35% in the previous Program evaluation. Additionally, most of the participants implemented at least one of the energy education tips. Participants reported that the agency and weatherization staff were courteous, and few problems or complaints were identified.

Although we requested from all agencies that we be allowed to participate in at least one energy education session, no such arrangements were made for us during our site visits. As such, we are unable to comment on the quality of the education. In general, we do not feel that energy education delivered through the auditor without a clear curriculum, materials, clear approach, training, etc. is considered good energy education. We feel that for the compensation received by the agencies, they need to develop a significantly more thorough energy education program.

Agency Program Assessment

During our interviews with the Agencies, we asked for an assessment of the Program and the relationship with Pacific Power. The answers were unanimous: all agency staff liked the Program and thought that Pacific Power was flexible and easy to work with.

Recommendations

While the Program did not pass our cost-effectiveness tests without the inclusion of non-energy benefits, we feel Program enhancements can greatly improve the results.

Specifications within the contract should be revisited, as it was simply extended without alteration, to July 31, 2007. The following are issues to consider for the next contract period:

1. The requirement to use the DOE approved audit on all homes needs to be fulfilled. The contract should state that every job must be analyzed using the DOE approved audit tool *in conjunction with the household's pre-weatherization consumption data*. Every invoice must

include the audit runs and clearly show that only measures with SIR of 1.0 or better are being installed. Failure to follow contract requirements should have a tangible consequence.

2. The "lookup tables" that have been used in previous programs should be destroyed to prevent continued use of this method of energy estimation.
3. Glass replacement should be moved from "Major Measures" to "Supplemental Measures," and should be allowed only if found to be cost-effective by a DOE approved audit, *with pre weatherization consumption incorporated*. The state is currently revising their specifications and as of Jan. 1, 2007 will just pay 25% of the cost of replacing windows. Since Pacific Power pays up to 50%, this will likely mean that windows will not be installed unless they are considered a repair.
4. Including rebates for dehumidifiers and air-to-air heat exchangers in the Program should be reconsidered. They are not currently being installed.
5. Stating that showerheads are always cost effective should be reconsidered. While this is nearly always the case, their cost effectiveness is a function of the frequency of use and water flow rates. In order to ensure that this measure is cost effective, these rates should be measured and replacement should be considered when frequently used showers have flows of greater than 2.5 gallons per minute.
6. With the decrease of the cost of compact fluorescent light bulbs, increasing the maximum number installed to 10 should be considered. Also, lowering the number of hours of use from three per day to as low as one per day should be considered; this would still be cost effective for the average home.
7. We do not believe that the energy education currently being provided by the agencies justifies the cost of $200 per home. With the auditor performing the service at the same time as the audit, $50 per home is more reasonable. To continue receiving $200 per home, it is suggested that agencies have a separate employee on staff to provide energy education, and that they should develop a model for providing energy education, attend training sessions, and have a checklist of items to be covered. There are proven energy education approaches that agencies need to follow.
8. Cost effectiveness acquisition of energy savings needs to be explicitly recognized by all parties as one of the Program goals.
9. All Program spending, including multiple funding sources, needs to be reported by the agencies. In order to improve the tracking of costs, Pacific Power should replace the "other funding" category and record each funding source in addition to the Program rebates. This is a common practice, and makes business sense.

2. Process Evaluation

Process evaluations tell the story of the program. They describe program delivery, bottlenecks, what worked and what did not, and provide overall assessment of program efficacy.

Program Services

Agencies employ energy professionals who are trained to evaluate and measure the performance of a home. They have the knowledge to identify the important energy-saving opportunities and measures that will result in the most savings. There is a high use of diagnostics in this Program with an emphasis on blower door testing. The energy professional also focuses on enhancing health and safety in the client's home. Other Program services include conservation and energy education. The goal of all Program services is to conserve energy, reduce clients' energy burden, and create a more comfortable living space for the client. All services are available in English and Spanish.

The Program installs a variety of measures to improve the efficiency of clients' homes, as listed in the impact evaluation. The same criteria are used for deciding which measures to install in all home types (site-built, manufactured home, etc.). Reasons for a "walk away" (deciding not to install any measures in a given structure) would include that a home was built after July 1, 1991, or that there existed physical barriers, structural damage, or unsafe/unsanitary conditions at the home.

Data Collection

Data collection for this portion of the evaluation consisted of:

- Agency visits
- Interview with a Pacific Power inspector
- Participant surveys
- Review of relevant program documents and filings

Agency Visits

Multiple interviews were conducted on-site with staff at each agency to ensure that all facets of Program delivery were assessed, including information regarding bottlenecks, client and agency satisfaction, methods of improving delivery, and agencies' assessment of non-energy benefits.

We attempted to schedule site visits to participating homes in order to observe components of Program services. Unfortunately, for various reasons, we were only able to visit one home in Toppenish.

Interview with Pacific Power Inspector

An interview was conducted with Pacific Power's inspector to provide insight into the issues identified through this evaluation and by the inspector, and to discuss improvements that have been made at the agency level. It was found that a number of issues identified in this evaluation had already been addressed with the agencies. However, many of the resulting improvements did not take place until after the close of the 2003-2005 Program period. For instance, the DOE approved audit TREAT, which is now in use by the agencies, was introduced in October, 2005 which was three months after the end of the contract period. Only that information which was found to be relevant for the evaluation period is included here, unless otherwise stated.

Participant Interviews

In addition to obtaining information on basic household characteristics, surveys were conducted with participants in an effort to assess the value of the Program, the Program's delivery, client satisfaction levels, and finally, to test participant recall of energy education recommendations. Surveys were also used to assess non-energy benefits, which are further discussed in Section 4.

Sample Selection Methodology

While the entire population of households that participated in the Program between July 2003 and June 2005 was eligible to interview as part of the evaluation, as a result of several filters, the final sample used to conduct the surveys consisted of 211 participants. Participants were removed from the sample of potential respondents based on the following criteria:

- Inability to match participant with Pacific Power customer information file (contains address, home number, etc.), possibly due to relocation
- Account inactive at time of survey effort
- Invalid or missing phone number
- Repeat participant at a different location

Table 1 details the attrition associated with each filter and provides the final sample size used for the participant survey.

Table 1. Sample Attrition Participant Survey

Metric	Number of Households	%	Number of Unique Participants Removed	Percentage of Total Unique Participants Removed
Total Program Participants	419	100%		
Matched to Customer Information File	340	81%	79	18%
Account "Active" At Time of Survey	225	60%	115	31%
Valid Phone Number	219	59%	6	2%
Duplicate Individuals*	211	57%	8	2%
Final Sampling Frame	211	57%		
*Different agreement number, but same person and phone number				

Sixty-five phone interviews were completed. Table 2 demonstrates the hard-to-reach nature of the Program participants.

Table 2. Sample Attrition

Metric	Number of Unique Participants Removed	Percentage of Total Unique Participants Removed	Number of Unique Participants	Percentage of Total Unique Participants
Total Program Participants			211	100%
Inactive Phone Numbers	84	23%	127	60%
Participant Refusal	11	5%	116	55%
Ineligible*	9	4%	107	51%
Unresolved**	42	20%	65	31%
Final Sample			*65*	*31%*

*Client moved into home after July 2003 or did not remember receiving weatherization services

**Defined by multiple calls resulting in the following: no answer, busy signal, answering machine, "not available," or request for call back

Review Program Documents

In order to get a better understanding of Program delivery intent, we reviewed the individual agency contracts with Pacific Power.

Process Findings

The following sections present our findings by major component of the Program services.

Client Eligibility

Customers are eligible to participate if they are Pacific Power customers who use electric heat and their household incomes do not exceed 125% of the Federal Poverty Guidelines (or do not exceed 60% of the state median income).[1] Households that do not heat with electricity are eligible to receive base load measures. Agencies identify qualified households primarily through their Energy Assistance programs. Other identifying sources are community centers, senior centers, schools, and government agencies. As discussed further in Section 3, it was thought that the screening process has resulted in making it more difficult for participants to qualify for the Program, and that this customer base is generally considered "hard to reach," making participation recruitment challenging.

[1] According to the agencies' contract with the Company, the Program applies to "residential customers residing in existing dwelling built before July 1, 1991, where electricity is their primary source of hearting energy. This is defined as an electric system that is operable and permanently installed with capacity to heat at least 51% of the dwelling."

Once an agency determines that a household is eligible, the following process is supposed to take place:

- Referral to weatherization staff
- Energy education (during intake process)
- Audit (which also includes in-home energy education)
- Agency crew scheduled
- Subcontractor scheduled (if necessary)
- Installation of measures
- Inspection of completed household

A number of these steps have been bypassed at the agency level due to lay-offs, lack of communication within each agency, and a lack of accountability. In particular, it was a finding of the Pacific Power inspector that in some cases weatherization projects had been left incomplete, as demonstrated when follow-up visits to the weatherized homes revealed as many as 80% of the homes in a specific region did not receive all of the services that were billed to Pacific Power. A new system of accountability, requiring agency staff to "sign-off" any work that is completed, was thought to be necessary to help guarantee that this issue be resolved. While this system was not formalized, discussions between the inspector and the agencies may have resulted in some improvements that could show up in future evaluations.

Energy Audit Specifications

This is the cornerstone of any energy saving program offering. The agency contract with the Company states:

> "To the extent that a Department of Energy approved audit determines that a major measure is cost-effective and such a major measure qualifies for installation, it must be installed if financial assistance will not be offered for any other measures."

It further states that "[m]easures must be determined through audit results to be fully cost-effective"

The intent of this language in the contract is clear:

1. A Department of Energy approved audit *must* be used
2. Cost-effectiveness is determined by the audit tool
3. Cost-effective measures must be installed

Energy Audit Realities

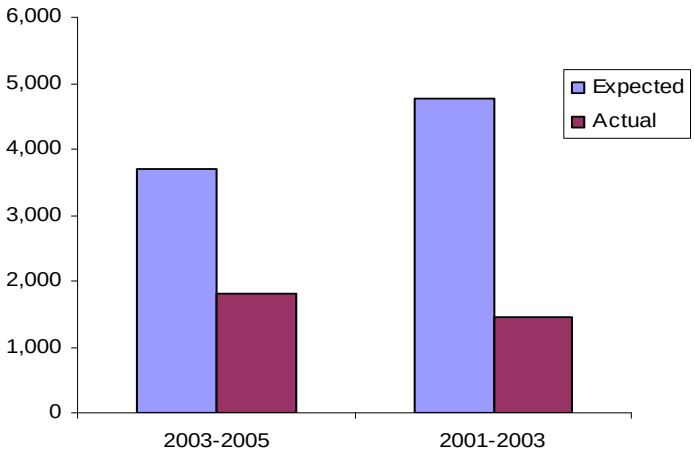
The agencies generally did not use any audit tools in estimating savings at individual sites. Instead, they used lookup tables that were provided by Pacific Power prior to the implementation

of the current tariff and contracts, and that have been outdated for many years. These tables drastically overstate the expected savings, which we noted in our 2001-2003 evaluation:

> *"We have found no reason for applying these (lookup table) numbers. The contract between Pacific Power and the agencies does not call for their use. They are highly inflated and should not be utilized. The agencies should estimate savings in accordance with the contract* (emphasis in original)*"*

In addition to the use of these "deemed values," the agencies do not make use of actual, pre-weatherization energy consumption data obtained from Pacific Power. This information, as valuable as it is, does not get used in estimating Program savings or in targeting Program services. For example, overall, the agencies expected to save 3,249 kWh/home, but actually saved about 1,840 kWh/home. In comparison, the average expected savings reported in the 2001-2003 evaluation was 4,775 kWh per home, while the actual was approximately 1,400 kWh/home. Figure 3 displays these numbers.

Figure 3. Actual and Expected Savings by Program Year



Case Studies

When examining data at the individual home levels, some rather extreme cases are observed, as displayed in Figure 4. These are not presented as being representative. Rather, they serve as examples of what can go wrong without the use of proper tools.

***Client A*:** This is a manufactured home with pre-consumption of 10,645 kWh annually. Based on installation of ceiling insulation (7,514 kWh estimated savings), floor insulation (2,184 kWh), window replacement (93 kWh), and insulated door (446 kWh), total savings were estimated at 11,170 kWh annually (105% of total pre-consumption). While this is obviously not possible, it was still recorded as such and the measures were installed. This is a result of the failure to use the DOE approved audit and not comparing savings estimates to pre-consumption. In this case, the total project cost was nearly $8,000, of which Pacific Power paid nearly $4,200. When actual energy savings are considered, estimated by Quantec to be 1,958 kWh, the dollar savings to the

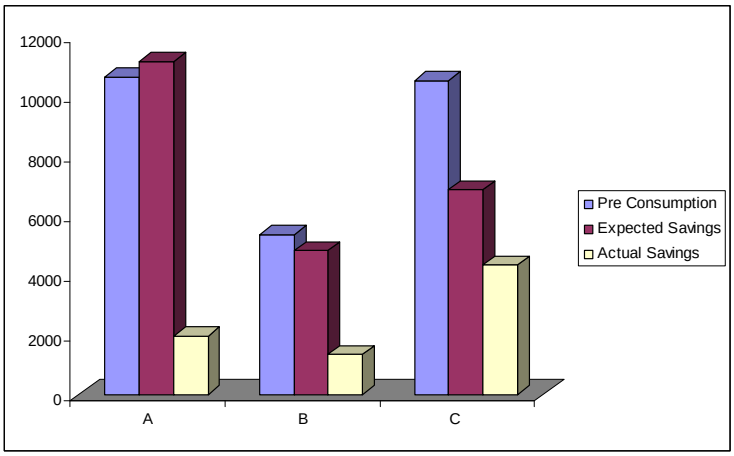
owner can be estimated at about $120 annually. Therefore, this project has a simple payback of nearly 68 years.

***Client B*:** This is a single-family dwelling with 5,358 kWh consumed during the 12 months preceding the weatherization. The audit produced an expected total of 4,821 kWh (90% reduction in consumption). Measures installed included ceiling insulation, wall insulation, window replacement, some infiltration measures, and insulated doors. Pacific Power's contribution was estimated at $2,217 plus a $332 administration fee. Total cost was over $4,750. Simple savings to investment ratio analysis would have shown doors and windows would not have been cost-effective.

***Client C*:** This is a single-family dwelling with 10,530 kWh consumed during the 12 months preceding the weatherization. The audit produced an expected total of 6,863 kWh (65% reduction in consumption). Measures installed included ceiling insulation, wall insulation, window replacement, some infiltration measures, and insulated doors. Pacific Power's contribution was estimated at $3,189 plus a $350 administration fee. Total cost was over $6,700. Simple savings to investment ratio analysis would have shown doors and windows would not have been cost-effective. Actual savings was estimated by Quantec at about 4,333 kWh. Given actual savings and the cost of installation, this project has a simple payback of over 25 years.

In all three cases, the DOE approved audit was not used. Cost effectiveness does not appear to be a consideration. The contract clearly states that this needs to be considered and provides measure lives to facilitate the calculation of cost effectiveness.

Figure 4. Examples of Extreme Cases



It was found by the Pacific Power inspector that even when an audit had been performed as required, the final stages of reporting would revert back to the use of the inaccurate lookup tables to input savings estimates, thereby corrupting any accurate data.

Introduction of TREAT

Starting in October 2005, after the close of this evaluation period, the State of Washington Community, Trade, and Economic Development began requiring the use of TREAT as an audit tool. The requirement is set at at least three homes per month. At this time it is believed that each of the agencies does apply TREAT to all homes, though this will need to be verified during the next evaluation. This is a positive step forward. *However, use of TREAT by itself does not solve the issue of inflated savings. TREAT, as well as all audit programs, will inflate savings if actual, pre-audit energy consumption is not used as an input.* Not using the actual consumption is a serious shortcoming.

Energy Education

Table 3 lists the contract requirements for energy education and compares these requirements with current agency activities. In most cases, energy education is provided by the auditor during the same visit and does not include a review of site-specific energy consumption. Table 3 displays, as best as we could determine, the contract requirements and services actually provided.

Table 3. Minimum Energy Education Required for Reimbursement

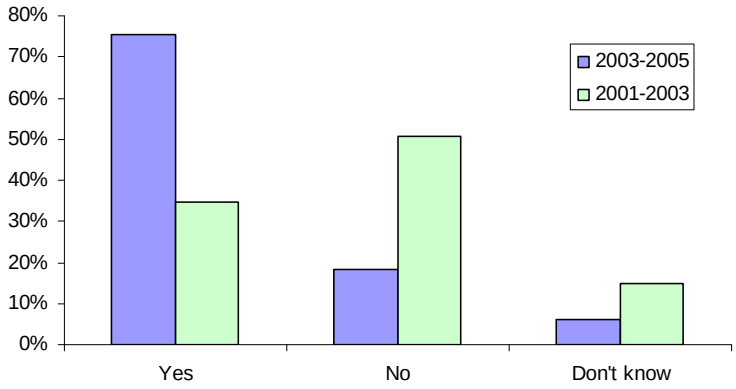
Energy Education Contract Requirements	Energy Education Activities Provided
1. Conservation tips and materials provided and site-specific energy consumption reviewed during intake session.	Each participant is provided with a Pacific Power "Bright Ideas" handbook.
2. Auditor or weatherization crew member describes measures to be installed and expected benefits to residents.	Participants are informed of measures installed and expected economic benefits.
3. An in-home education session is provided to household that includes conservation tips on a room by room basis, instruction on reading a meter, proper use of heating system, hot water usage and moisture control.	Client Assessment Survey and post-assessment. Hands-on participation. In-home education demonstration.
4. A post-weatherization session with household that addresses how to live in a weatherized home.	Follow –up home visit.
5. Follow-up contact with household is made with a discussion of the outcome of weatherization services, and energy conservation recommendations and actions.	Follow–up home visit.

We requested to attend energy education sessions at participating sites. However, these arrangements were not made for our staff during our agency visits. Therefore, our assessment of energy education is based on participant surveys and interviews with staff. From this review of the service, it was found that for the energy education currently being provided, the cost of $200 per home is not justified. With the auditor performing the service at the same time as the audit,

$50 per home is more reasonable. To continue receiving $200 per home, it is suggested that agencies should develop a model for providing energy education, attend training sessions, and have a checklist of items to be covered.

As part of the energy education materials, the agencies provide the Pacific Power "Bright Ideas" Handbook to serve as a reference for energy-saving tips. As shown in Figure 5, 75% of the participants surveyed remember receiving supplemental material, compared to 35% in the previous Program evaluation – a statistically significant difference.[2]

Figure 5. Participants Who Received Information Regarding Reducing Electricity Usage

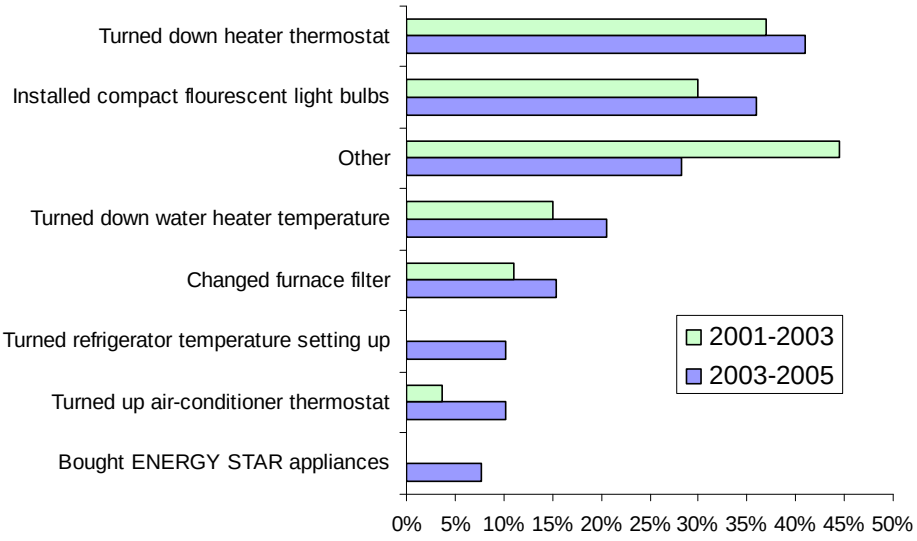


Across agencies, 85% of NCAC, 80% of BMAC, and 66% of OIC clients recalled receiving energy education.

Of the 49 participants that recalled receiving energy education materials, 94% thought it was easy to understand and 96% found it useful. Additionally, 80% had implemented at least one of the recommended actions, an increase from the previous evaluation. Actions ranged from adjusting thermostats to closing doors, and being more aware of leaving lights and appliances on when not needed. The most common action taken was changing the heating thermostat setting, as shown below in Figure 6. Of those who turned down their heater's thermostat, 18% provided before and after temperature information. The average original temperature setting of 73.2° was lowered to 64.1°, resulting in an average net change of 9.1°.

[2] z = -5.12 with a p-value of 0.001

Figure 6. Additional Actions Taken by Participants

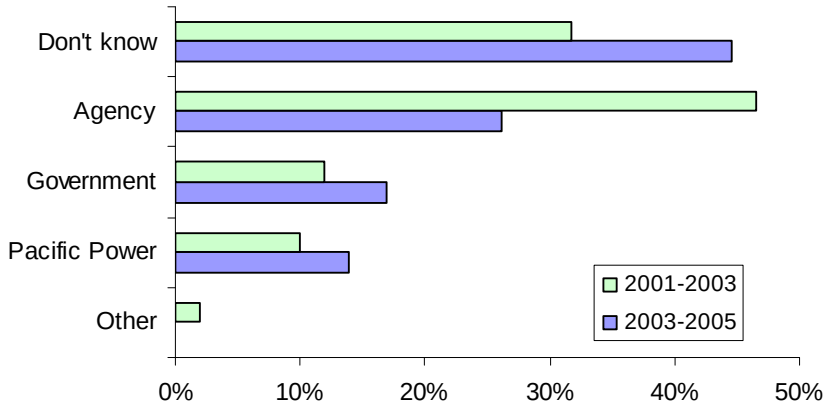


Pacific Power Involvement

This issue was examined from two perspectives. We asked the staff at the agency how they felt about their involvement with Pacific Power. The opinion was unanimous that Pacific Power was extremely easy to deal with.

We also examined it from the perspective of the client's awareness of the Company's contribution to the weatherization of their homes. This issue was a concern in the previous evaluation and continues to be so over the period of this study. As shown in Figure 7, only 14% of respondents correctly identified Pacific Power as a funding source. Though this is an improvement from the previous Program evaluation, the majority of respondents (60%) were unable to identify any funding source for the Program. It was suggested by one agency that having a flier or handout available to leave at the participating home would be helpful.

Figure 7. Sources of Weatherization Funding Identified by Participants



Perceptions of Agencies

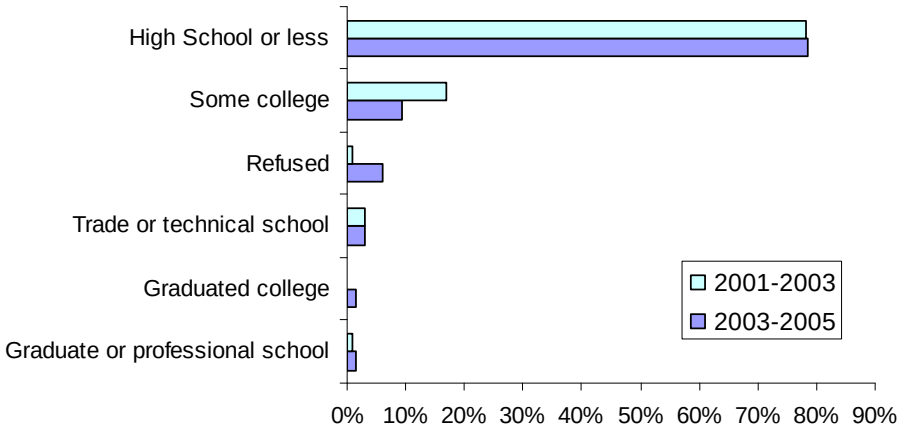
Participants gave high marks to the agencies that provided them with the weatherization service. With regard to courtesy, more than 95% of the respondents rated them positively.

Participant Demographics

Survey results indicate that the average number of people per household is between three and four (3.6) people. Only 8% of the participants said that this number had increased since receiving the service, which is unchanged from the previous evaluation. This percentage is possibly misleading, however, as discussions with agency staff have indicated that participants may be hesitant to reveal household size, especially when the household has increased.

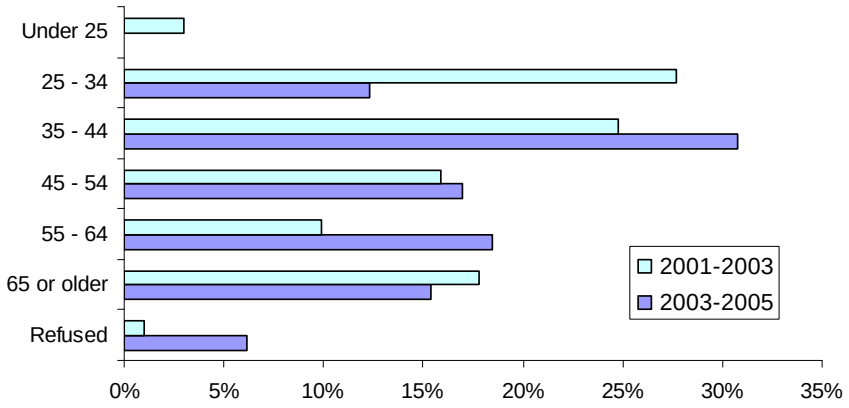
As shown in Figure 8, 78% of the participants had up to a high school education, 14% have completed some college or trade school, and one respondent had completed graduate or professional school.

Figure 8. Highest Education Level Attained by Participants



While the single greatest age category was 35-to 44-years-old, shown in Figure 9, most participants fell in the 45-and-over range. This represents a 10-year upward shift in the age demographic from the previous Program evaluation.

Figure 9. Age Distribution of Weatherization Program Participants



Overall Findings

Overall, we found the agencies were highly dedicated to providing the best services to the clients in the Program. We were alarmed, however, by the lack of understanding of the contract requirements. This is most troubling for the estimation of savings and for determining cost effectiveness. We feel that the agencies need to clearly understand the contract and follow it closely. There should be a clear consequence for failure to follow contract requirements.

Recommendations

Based on the review of the contract and discussions with the agency staff and the Pacific Power inspector, this section highlights some findings and recommendations.

The contract was simply extended to July 31, 2007. No language changes were made. The following are issues to consider for the next contract period:

1. The requirement to use the DOE approved audit on all homes needs to be fulfilled. The contract should state that every job must be analyzed using the DOE approved audit tool *in conjunction with the household's pre-weatherization consumption data*. Every invoice must include the audit runs and clearly show that only measures with SIR of 1.0 or better are being installed. Failure to follow contract requirements should have a tangible consequence.
2. The "lookup tables" that have been used in previous programs should be destroyed to prevent continued use of this method of energy estimation.

3. Glass replacement should be moved from “Major Measures” to “Supplemental Measures,” and should be allowed only if found to be cost-effective by a DOE approved audit, *with pre-weatherization consumption incorporated***.**
4. Including rebates for dehumidifiers and air-to-air heat exchangers in the Program should be reconsidered. They are not currently being installed.
5. Stating that showerheads are always cost effective should be reconsidered. While this is nearly always the case, their cost effectiveness is a function of the frequency of use and water flow rates. In order to ensure that this measure is cost effective, these rates should be measured and replacement should be considered when frequently used showers have flows of greater than 2.5 gpm.
6. With the decrease of the cost of compact fluorescent light bulbs, increasing the maximum number installed to 10 should be considered. Also, lowering the number of hours of use from three per day to as low as one half an hour per day should be considered; this would still be cost effective for the average home.
7. Cost effectiveness acquisition of energy savings needs to be explicitly recognized by all parties as one of the Program goals.
8. We do not believe that the energy education currently being provided by the agencies justifies the cost of $200 per home. With the auditor performing the service at the same time as the audit, $50 per home is more reasonable. To continue receiving $200 per home, it is suggested that agencies have a separate employee on staff to provide energy education, and that they should develop a model for providing energy education, attend training sessions, and have a checklist of items to be covered. There are proven energy education approaches that agencies need to follow.
9. All Program spending, including multiple funding sources, needs to be reported by the agencies. In order to improve the tracking of costs, Pacific Power should replace the “other funding” category and record each funding source in addition to the Program rebates. This is a common practice, and makes business sense.

3. Impact Evaluation

Impact evaluation data were obtained from a number of different sources, including:

- ***Program measures***: Pacific Power provided information regarding the Program's installed measures, including measure-specific saving estimates reported by the agencies and installation dates.
- ***Billing records***: Pacific Power provided participant and non-participant meter records from July 2002 through June 2006. Non-participants were defined as households that participated in the Low Income Home Energy Assistance Program (LIHEAP), but did not receive weatherization.
- ***Weather data***: Quantec collected weather data for the corresponding time period for both Walla Walla and Yakima counties from the National Weather Service (NOAA).
- ***Contact information***: For the purpose of conducting surveys, Pacific Power provided Quantec with all available contact information, including name, address, and phone number for participants.

Deemed Savings – Measure Analysis

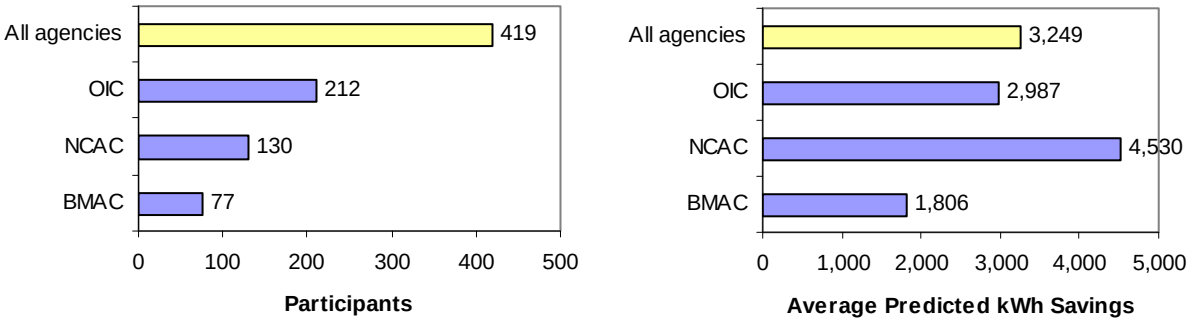
Between July 1, 2003, and June 30, 2005 (the two-year Matchmaker period), the Program provided service to 419 Pacific Power households. This represents a 35% reduction in participation in comparison to the previous Program period, which reported 635 participants. Interviews with the Pacific Power inspector and with the two agencies that exhibited a reduction in participation resulted in the following explanations:

- There was an increase in the cost per measure.
- The previous program (2001-2003) had full Matchmaker funding, while the 2003-2005 Program had half of that funding.
- There was a suspension of Program activity while waiting for funds to be redistributed.

Most of the homes were completed in 2004 (59%). Over half of weatherization participants were serviced by OIC. The average expected household savings was estimated at 3,249 kWh annually based on deemed savings values. This compares to an estimated average household savings of 4,775 kWh reported in the previous Program evaluation. The lower savings value may represent an improvement in the methods used for estimation, as the previous evaluation found that the savings estimates were inflated. However, as is discussed in this report, the expected savings continue to be overestimated.

Figure 10 shows the participation rate and energy savings across the three agencies.

Figure 10. Participant and Savings, by Agency



The most frequently installed weatherization measures were double-glass replacement and ceiling insulation, with 84% and 83% of all households receiving these services, respectively. The frequency of installation of window replacement and the increase of these installations from the last evaluation is unjustifiable, as they are rarely cost effective.

This is an issue that has been identified by the Pacific Power inspector and discussed with the agencies prior to this evaluation, with consideration given to removing window replacement as an option. The state is currently revising their specifications and as of Jan 1, 2007 will just pay 25% of the cost of replacing windows. Since Pacific Power pays up to 50%, this will likely mean that windows will not be installed unless they are considered a repair.

Table 4 shows the frequency of weatherization measures installed at the households in this Program period, as well as those reported in the last evaluation. Only 13 of the 23 measures listed had attributed kWh savings. Additionally, it was found that the agencies' reporting errors would occasionally result in measures that were generally associated with an estimate of 0 energy savings. For example, installation of ceiling insulation had an estimated savings value of 0 kWh in 18 households. Double glass replacement was estimated by the agencies as having 0 kWh savings in 16 households.

Table 4. Weatherization Measures and Frequencies

Measure	2003-2005	2001 - 2003 Evaluated Measures
Double Glass Replacement	84%	66%
Ceiling Insulation	83%	82%
Air Sealing/Infiltration	58%	21%
Thermal Doors[3]	45%	56%
Fluorescent Lights	40%	46%
Floor Insulation	36%	-
Faucet Aerators	36%	-
Low Flow Shower Head	32%	-
Wall Insulation	21%	25%
Refrigerator Replacement	20%	2%
Pipe Insulation	15%	4%
Water Heater < 50 Gallon	12%	-
Duct Sealing	9%	87%
Water Heater Blankets	8%	-
Weatherstrip Windows	5%	3%
Duct Insulation/Sealing	4%	6%
Ground Cover	3%	.2%
Attic Ventilation	3%	.3%
Dehumidifier	1%	-
Water Heater > 60 Gallon	1%	-
Weatherstrip Doors	1%	3%
Clock Thermostat	0.7%	-

Base-load Measures

The previous evaluation recommended that an increased emphasis should be placed upon base-load measures, which typically account for some 30% to 40% of total energy use. This evaluation found that an increased emphasis had been made, resulting in the installation of previously unevaluated measures such as energy efficient shower heads and faucet aerators, refrigerator replacements, and water-heater improvements. However, it was found that the number of fluorescent lights that were installed actually decreased. Continued emphasis should be placed upon these measures.

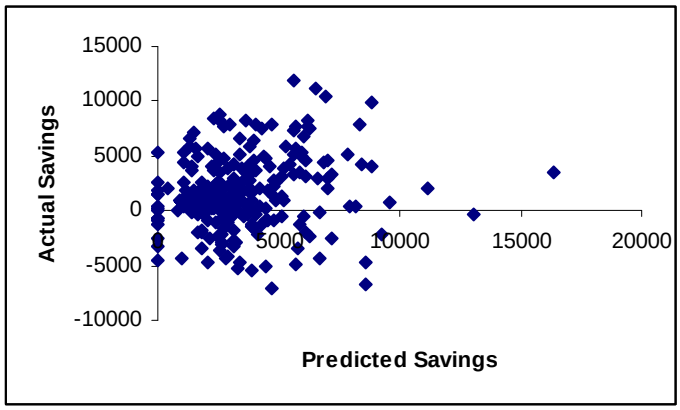
Audit-Based Savings Estimation

As discussed in the Process Evaluation, the lookup tables used during the audit process result in extremely overstated savings estimates.

[3] This was titled "Door Sealing" in the previous Program.

Figure 11 shows the lack of relationship between the audit-based estimates of savings and what actually occurred at the individual homes. One would expect some positive relationship between the expected and the actual savings; i.e., as predicted savings increase, actual savings would also increase. In a perfect world, this would be shown as a diagonal line between the x and y axis, but the relationship need not (nor will ever) be exact, due to behavioral factors that are beyond the capability of the auditor to predict. In this case, however, there is not even a positive relationship. This is a clear indication that these deemed numbers are invalid and should not be used. The agencies must, in compliance with the contract requirements, use audit generated savings. Furthermore, the actual consumption data provided by the Company needs to be used by the auditors in determining expected savings by measure.

Figure 11. Actual versus Predicted Savings (kWh) – All Agencies



Figures 11-13 illustrate the lack of correlation between deemed savings estimates and actual savings at the agency level.

Figure 12. Actual versus Predicted Savings (kWh) – NCAC

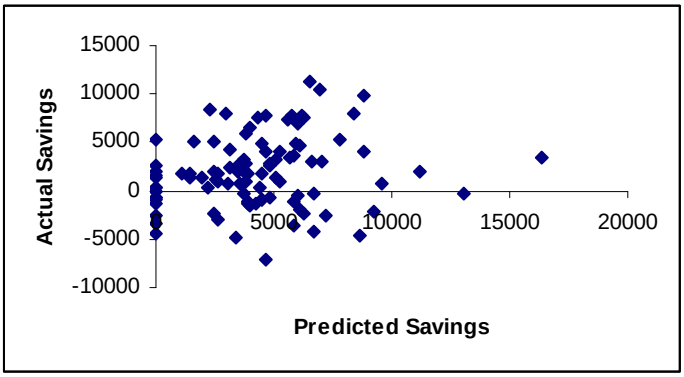


Figure 13. Actual versus Predicted Savings (kWh) – OIC

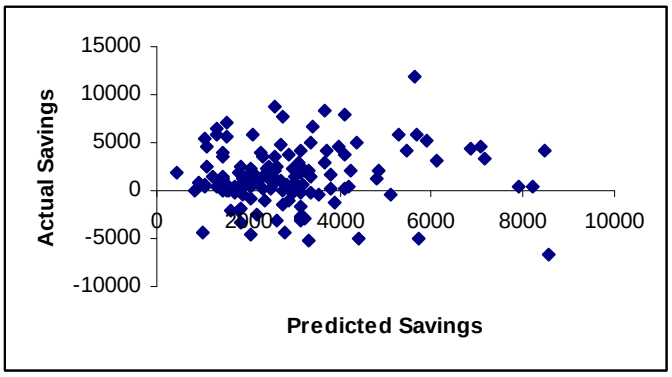


Figure 14. Actual versus Predicted Savings (kWh) – BMAC

Actual Savings – Billing Analysis

Methodology

Pacific Power provided data regarding the Program's 2003-2005 participants from 25 cities throughout Washington. Data were assessed, organized, and subsequently filtered to obtain complete customer profiles for evaluation using PRISM. (Princeton Scorekeeping Method). PRISM was used to estimate weather-adjusted annual energy consumption based on energy usage and outdoor temperature. In order to prepare the data for PRISM, several steps were taken.

Once the billing data contained only relevant meter readings, each participant's profile was split into pre and post periods based on the date his or her final weatherization measure was installed. To ensure that any consumption changes that may have occurred during the weatherization process itself were excluded from the analysis, any meter readings collected at the time of the installations were excluded. The participants' average completion date was then applied to all non-participants, creating artificial pre and post periods for them. Applying this break in periods allowed for the comparison of changes in post-weatherization energy consumption between the two groups over similar time periods.

In order to obtain accurate PRISM results, only participants and non-participants with a minimum of twelve eligible months of both pre- and post-consumption data were utilized for the analysis.

Lastly, the remaining participant and non-participant profiles were separated into Yakima and Walla Walla files in final preparation for PRISM.

Sample Data Attrition

We required the use of twelve months of pre- and post-participation data in order to achieve more reliable results. This eliminated 3 of the participants and 10 of the non-participants. In order to ensure that billing data for non-participants were distinct from participant data, all past participants of the Program were removed from the non-participant data set. Observations were eliminated from the analysis on the following grounds:

- **Outliers**: Unreasonable consumption levels were defined as those lying outside the 1st and 99th percentiles (less than 108 kWh or more than 4,433 kWh per month)
- **Insufficient Data Points**: Customers with less than twelve months pre-and post-Program data
- **Unable to Model**: PRISM is often unable to effectively model households exhibiting significant variance in consumption

Table 5 outlines data attrition. The final sample for the analysis contained 300 participants and 583 non-participants, 68% and 30% of the total sample, respectively.

Table 5. Sample Attrition

	Participants		Non-Participants	
	Removed	Remaining	Removed	Remaining
Original sample		371		1,927[4]
Unable to obtain billing data	42	330 (89%)		1,927 (100%)
Outliers	66	264 (71%)	156	1,771 (92%)
Insufficient data points	3	261 (70%)	10	1,761 (91%)
Geographic limitations	-	261 (70%)	1,161	600 (31%)
Unable to model with PRISM	8	253 (68%)	17	583 (30%)
Ineligible	1	252 (68%)	-	583 (30%)
Sample adjustment[5]	*48 (added)*	*300 (81%)*	-	*583 (30%)*
Final sample		300 (81%)		583 (30%)

[4] Non-participants who had received weatherization services in previous Program periods were removed from non-participant sample

[5] During the agency visits, it was discovered that predicted savings reported for one apartment were actually predicted savings for a forty-nine-unit apartment building. One unit's data was provided to Quantec and used in the PRISM analysis. The savings for that apartment was subsequently attributed to all units.

Overall Actual Savings

It was found that for the 300 clients with reliable consumption data, the gross savings were estimated at 1,452 kWh, as shown in Table 6. This gross estimate does not include any assessment of "what would have happened in the absence of the Program." We employed a comparison group of 583 clients who had received some form of energy assistance, but had not participated in the Program. During the same time span, these non-participants increased their consumption by 409 kWh, or 2.53% of their pre-Program consumption. We assume that, had our participants not been through the program, they also would have witnessed an increase in consumption of about 409 kWh. This process generates the *net* energy savings. **Overall net Program savings are estimated at 1,840 kWh per home.**

Table 6. Savings Summary

	Participants (n=300)	Comparison Group (n=587)
Pre NAC[6] (kWh)	15,343	16,161
Post NAC (kWh)	13,891	16,570
Gross Savings (kWh)	1,452	-409
Percent Change	9.46%	-2.53%
Net Impacts (kWh)	1,840	
Savings as % of pre	12%	

The analysis was also conducted by type of home, as shown in Table 7. The largest proportion of participating homes was single family.

Table 7. Savings Summary by Home Type

	Apartments (n=85)	Manufactured Home (n=86)	Single Family (n=129)	Overall (n=300)
Pre NAC	8,093	18,404	18,079	15,343
Post NAC	7,173	16,816	16,367	13,891
Savings	921	1,588	1,712	1,452
Net Savings	1,125	2,054	2,169	1,840
Net Savings as % of pre	14%	11 %	12%	12%

Overwhelmingly, apartments were the greatest energy savers for BMAC, as shown in Table 8, though it should be noted that 49 of the 50 apartment units that were serviced were located in a single apartment complex. Table 9 and Table 10 show the results for NCAC and OIC.

[6] Normalized annual consumption (NAC) reflects temperature adjusted consumption levels.

Table 8. BMAC Savings Summary by Home Type

	Apartments (n=50)	Manufactured Home (n=9)	Single Family (n=9)	Overall (n=68)
Pre NAC	5,221	17,927	16,807	8,436
Post NAC	4,395	16,349	16,029	7,517
Savings	825	1,579	778	919
Net Savings	958	2,032	1,203	1,132
Net Savings as % of pre	18%	11 %	7%	13 %

Table 9. NCAC Savings Summary by Home Type

	Apartments (n=1)	Manufactured Home (n=27)	Single Family (n=68)	Overall (n=96)
Pre NAC	15,053	18,666	19,418	19,161
Post NAC	13,157	16,571	17,613	17,274
Savings	1,897	2,095	1,804	1,887
Net Savings	2,278	2,568	2,296	2,372
Net Savings as % of pre	15%	14%	12%	12%

Table 10. OIC Savings Summary by Home Type (kWh)

	Apartments (n=34)	Manufactured Home (n=50)	Single Family (n=52)	Overall (n=136)
Pre NAC	12,113	18,348	16,549	16,101
Post NAC	11,081	17,032	14,796	14,689
Savings	1,032	1,316	1,752	1,412
Net Savings	1,338	1,781	2,171	1,819
Net Savings as % of pre	11 %	10%	13%	11%

When the results are broken down by home type, as shown in the following tables, the average savings between the agencies is noticeably variable. However, the sample size between the agencies makes direct comparisons unrealistic.

Table 11 shows the energy savings associated with apartment buildings treated under the Program. BMAC had a 49-unit apartment building weatherized, which dominates the calculated savings for those units. NCAC has the only apartment that was weatherized and experienced extreme savings. That apartment received the following measures: ceiling, floor, and pipe insulation; a low-flow showerhead; fluorescent lights; thermal doors; and double-glass window replacements.

Table 11. Apartment Energy Savings (kWh)

	Apartments				
	n	Maximum	Minimum	Mean	Median
BMAC	50	1,724	942	958	942
NCAC	1	2,278	2,278	2,278	2,278
OIC	34	5,438	-3,937	1,338	1,553

Sample size again plays a role in examining the savings of manufactured homes, shown in Table 12. The savings for BMAC are based on nine homes, one-third of those weatherized by NCAC and less than 20% of those weatherized by OIC. It is difficult to directly compare these saving when the sample sizes are so disparate.

Table 12. Manufactured Home Energy Savings (kWh)

	Manufactured Homes				
	n	Maximum	Minimum	Mean	Median
BMAC	9	8,888	-5,094	2,032	2,589
NCAC	27	11,210	-2,525	2,568	1,788
OIC	50	9,493	-4,938	1,781	1,651

The savings associated with single family households is more comparable between the agencies, as shown in Table 13.

Table 13. Single Family Home Energy Savings (kWh)

	Single Family Homes				
	n	Maximum	Minimum	Mean	Median
BMAC	9	4,855	-1,755	1,203	1,335
NCAC	68	12,151	-6,632	2,296	2,169
OIC	52	12,716	-6,082	2,171	1,335

4. Non-Energy Benefits

The non-energy benefits of low-income programs can be quite numerous and significant. As well as enabling positive change within the homes of participants, these benefits may have impacts on the environment, local economies, and society as a whole.

Participant interviews were used to assess non-energy benefits at the household level in the form of fewer work/school absences, the ability to remain in the home, fewer illnesses, more disposable income, and increased comfort. Additionally, billing data were used to estimate the Program's impact on arrearages and participant mobility. Environmental and economic impacts were estimated using appropriate software tools, as discussed further in this chapter.

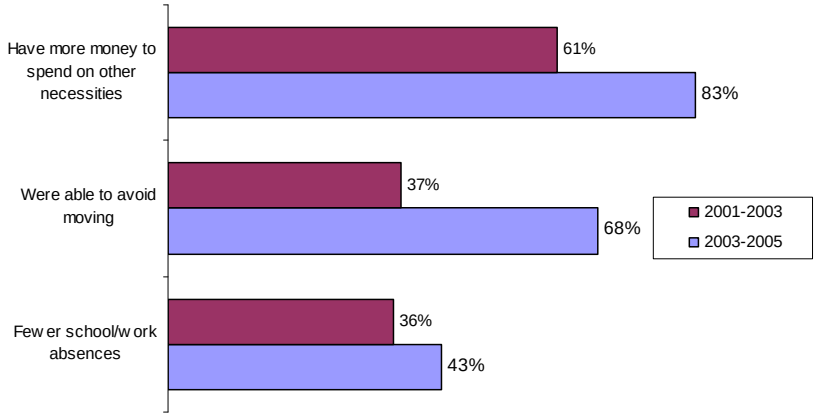
Participant Impacts

In addition to the information discussed in the process evaluation, surveys with participants were conducted to evaluate the non-energy benefits of the Program.

Energy Burden

Program participants reported having more money to spend on necessities and fewer absences from school or work, as shown in Figure 15. Additionally, participants reported that they were able to avoid moving as a result of the Program. Further analysis of mobility impacts was performed using billing data, and is discussed further in this evaluation. Each of these benefits exceeded those reported in the last Program period.

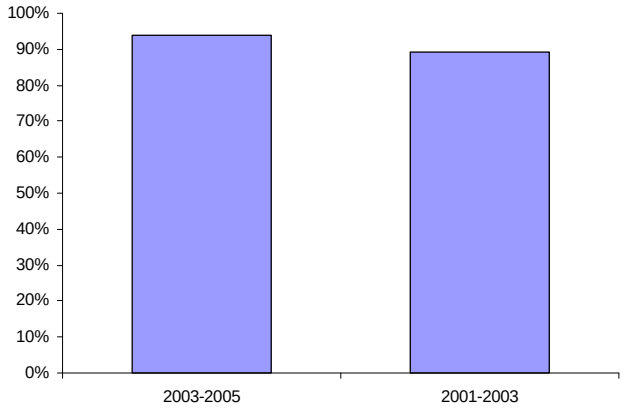
Figure 15. Program Impacts on Energy Burden, Mobility, and Absenteeism



Improved Comfort

When asked, nearly 94% of participants said they enjoyed increased comfort as a result of their participation in the Program, presumably because they were able to have the heating and cooling they desired. This is a slight improvement over the last Program period, as shown in Figure 16 below.

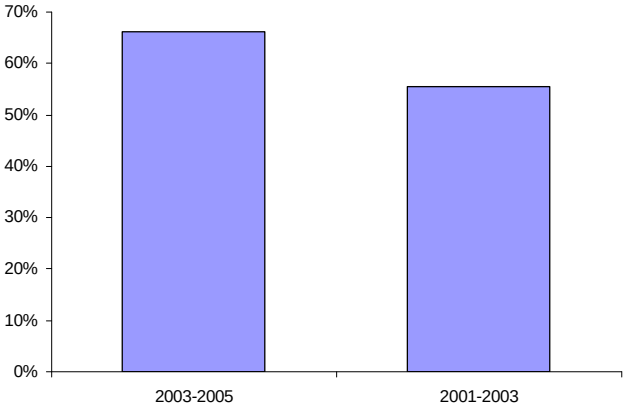
Figure 16. Program Impacts on Increased Comfort



Improved Health

For low-income families, critical needs may compete with very finite resources, resulting in trade-offs which may compromise the participant's health. As shown in Figure 17, 66% of respondents reported fewer illnesses as a direct result of receiving weatherization services, which was an improvement over the prior Program period. This may be due to the tangible benefits of home repairs and weatherization services, as well as the avoidance of arrearage related shut-offs. An analysis of the impacts on arrearages is presented further in this report.

Figure 17. Participants Reporting Fewer Illnesses



In addition, 12 (18%) respondents indicated that someone in their home suffers from asthma. Five of these respondents indicated that instances of asthma-related events had decreased since participation in the Program.

Mobility

When energy costs are high, household funds are diverted from other uses including food, medical care, and rent. Our research has shown that in some cases, high-energy bills may force occupants to move out of their current dwelling either to lower energy costs or to avoid paying an energy bill. In other cases, they may be evicted for inability to pay their rent or for having services disconnected. Not only are frequent moves expensive and inconvenient, they have other extremely serious effects. These may include increased school dropouts and inability to hold a job. Energy assistance and weatherization programs lower the energy burden of the participating low-income families and their forced mobility.[7] Mobility can be especially hard for the elderly and families with children. The value of reduced mobility can be as high as $1,460 per household.[8] In another national study, the cost of moving for low-income families was found to be between 10% and 20% of annual income.[9] These costs include moving expenses, rental deposits, bank fees, telephone connections, etc. We follow a conservative approach of assuming only $700 per move (less than mid-point of the Oak Ridge study and in line with Skumatz (1998)).

Methodology

Using the same sample of participants that were selected for the impact and arrearage analysis, mobility was assessed by using billing data to determine whether participants had moved into or out of their Program weatherized home within two years (both before and after) of participation.

Results

As apparent in Table 14, in the two years prior to participating in the Program 70% (n=238) of the participants matched to utility site level information (n=340) moved into the home that was weatherized. However, in the two years following the completion of weatherization work, only 50% (n=170) moved from the weatherized home. Therefore, the weatherization work conducted by the Program, and the lower energy bills that resulted, may have helped to prevent 68 participants from moving.

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7 Khawaja, M. (2001). Indiana REACH Evaluation. May. Portland, OR: Quantec, LLC.
In Indiana, as a result of participating in the Residential Energy Assistance Challenge Program, the participants received energy education that lowered their energy consumption by 12.5%, reduced their mobility by 52%, and reduced school absences by 18%.

8 Oak Ridge National Laboratory. (2002). Nonenergy Benefits from The Weatherization Assistance Program: A Summary of Findings from the Recent literature. April.

9 Howat, J. & Oppenheim, (1999). Analysis of Low-Income Benefits in Determining Cost-Effectiveness of Energy Efficiency Programs. http:www.consumerlaw.or/Energy/Energy&Utility/non_energy_benefits.htm

Table 14. Impact on Mobility

	Pre (2 Years Prior to Participation)		Post (2 Years Following Participation)	
Moved	N	%	n	%
Yes	238	70%	170	50%
No	102	30%	170	50%
Total	*340*	*100%*	*340*	*100%*

While other factors clearly contribute to the decision to move in either of the pre or post periods, there is a significant difference in the proportion of participants that moved prior to and after being weatherized. Using the conservative estimate of $700 per move noted above, and the estimated 68 prevented moves, the Program generated $ 47,600 for participants.

Arrearage Impact

In addition to having an immediate impact on participants' monthly energy bills, participation in the Program can also lead to an overall reduction in arrearages. Simply put, as a result of the reduction in monthly energy costs, participants are better able to put additional money towards their outstanding arrearage.

Methodology

In order to determine the net impact of the Program upon arrears, data regarding both customer bills and payments were collected for both participants and a select group of non-participants.

Table 15 details the sample attrition associated with the arrearage analysis.

Table 15. Sample Attrition: Arrearage Analysis

	Participants		Non-Participants	
	Removed	Remaining	Removed	Remaining
Original Sample		371 (100%)		1,927 (100%)
Unable to Match to Utility Records (Participants Only)	31	340 (92%)	---	---
Missing Installation Date (Participants Only)	33	307 (83%)	---	---
Not included in Billing Analysis Sample* (Non-Participants Only)	---	---	1,327	600 (31%)
Lacked Sufficient Billing or Payment Data**	129	178 (48%)	49	551 (12%)
Dissimilar Pre Period Arrearage*** (Non-Participants Only)	---	---	329	222 (12%)
Outliers****	24	154 (42%)	0	222 (12%)
Final Sample		154 (42%)		222 (12%)

* Prior to being analyzed in PRISM
** Minimum of 12 months meter and billing data in both pre and post period
*** Within ± 20% of the average pre participant arrearage level (defined as the percent of total bill paid by customer in pre period)
**** 1% and 99% tails of aggregated distribution

Results

Table 14 provides the results of the analysis. As evident in the table, participants arrears levels dropped by $35 (from $207 to $172). Conversely, once the non-participants pre-arrearage values were calibrated to the precise level of participants, it was determined the average non-participant arrearage amount actually increased by $29 (from $207 to $236). **As a result, the net impact of the Program is a decrease in arrears by an average of $64.**

Table 16. Program Impact: Arrearage Accumulation

	Average Arrearage Accumulated During Pre Period	Average Arrearage Accumulated During Post Period	Change
Participants (n=154)	$207	$172	$35
Non-Participants (n=222)	$207	$236	-$29
Net Impact			$64

Economic Impacts

This type of program has several economic impacts in addition to direct benefits such as decreasing the energy burden and increasing participants' disposable income. As incomes increase, so does spending on goods and services, leading to the creation of jobs. Weatherization work itself is also a source of job creation. Additionally, the Program affects the economy in several ways:

- It uses money from taxes and utility ratepayers to pay salaries and buy products used in the weatherization process
- Participants have lower energy bills and are able to use the extra money to purchase goods and services in other economic sectors
- Utilities receive less revenue due to lower energy bills for participants; this reduces the need for new electricity generation facilities

Input-output modeling was used to quantify the effect of each of these monetary shifts individually, as well as the impact on the Washington economy as a whole.[10] This method of modeling allows for an in-depth look at individual economic segments, as well as the effect that the entire economy sees. The economy is represented as a matrix that relates industries to each other so that effects of events can be tracked. In this case, these events are Program spending, changes in household spending, reduced utility revenue, etc. When an event is specified, the matrix tracks all direct, indirect, and induced effects on the economy. For example, the direct effect of participants having lower energy bills is effectively an increase in household income. The indirect effects are the redistribution of this income across the economy, thus creating more jobs in the industries where households are spending money. These new jobs create another

[10] IMPLAN Professional 2.0 was used for this analysis, utilizing state-level data for Washington from 2002.

increase in household income for the new employees and the induced effects are the redistribution of this new income across the economy. For the purpose of this evaluation, direct, indirect, and induced benefits have all been used to determine the benefits to the Washington economy.

Because the funding to pay for Program activities ultimately comes from tax dollars, this was modeled as a decrease to household income. This money is then distributed to certain industries that provide the materials and labor for weatherization. Modeling participant utility bill savings and utility lost revenue is somewhat more complex, because they do not completely offset one another. Although the participants' savings are equal to their full avoided utility payments, this amount is not all lost revenues to the utility because reduced sales to customers are offset by the amount that the utility reduces its purchases of required fuel or energy. Because the total energy savings are small in comparison to total energy sales in Washington, it is assumed that this will have no effect on ratepayers' payments towards the utilities' fixed costs, and that the portion of rates that are fixed is lost revenue to the utilities.

Results

In total, it was estimated that the Program created about 6 net job-years of employment and added $550,118 to the Washington economy. Though these numbers are small compared to Washington's economy and work force as a whole, this analysis shows that the Program has a positive effect on Washington's economy.

Environmental Benefits

Reducing participants' energy consumption also reduces the amount of pollution created by electricity generation and fuel use. In order to determine the total amount of avoided pollution and assign a dollar value to this environmental benefit, four steps were necessary:

1. Calculate the total Program kWh energy savings
2. Apply fuel mix specific to Pacific Power to determine the amount of fuel that was saved because of avoided electricity demand
3. Use Clean Air and Climate Protection Software[11] to calculate the avoided emissions attributable to the Program
4. Obtain dollar values by pollutant to determine societal benefit

[11] Developed and provided by the International Council for Local Environmental Initiatives (ICLEI), the State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO)

Results

Table 17 shows fuel saved through avoided electricity generation, based on the fuel mix specific to Pacific Power. These are fuels that would have been necessary for the purpose of electricity generation had the participant's homes not been weatherized. The first column specifies the type of fuel. The second column is the avoided annual electricity generated, while the third column quantifies the annual fuel savings in the units commonly used for the respective fuel types. The last column is the total fuel savings over the 30-year life of weatherization.

Table 17. Total Energy Savings by Fuel Type

Fuel Type[12]	Annual Avoided Electricity Generated (kWh)	Annual Fuel Savings	Lifetime Savings
Natural Gas	98,297	9,693 therms	193,852 therms
Fuel Oil	100	7 gal.	145 gal.
Coal	332,338	116 tons	2,327 tons

Dollar values were assigned to the three most substantial air emission reductions based on relevant market values as of August 2006, and are summarized in Table 18. In total, an Environmental Benefit of $125,529 was estimated.[13]

Table 18. Avoided Emissions and Societal Benefits

Pollutant	Lifetime Avoided Emission (tons)	Value Per Ton ($)	Societal Benefit (2003 $)
NOx	1,321	$1800	$35,936
SOx	7	$670	$70,880
Carbon Dioxide	302	$4.10	$18,713
Total			$125,529

a Value from Seattle NOx price curve: August 18, 2006
b Value from Seattle SOx price curve: August 18, 2006
c Value from the Chicago Climate Exchange: August 22, 2006

[12] Pacific Power's fuel mix also includes nuclear, biomass, hydro, and other fuel types; however they do not generate significant emissions.

[13] CO2: Chicago Climate Exchange. "CCX is the world's first, and North America's only, voluntary, legally binding rules-based greenhouse gas emission reduction and trading system." (www.chicagoclimatex.com)
SOx and NOx: Evolution Markets Weekly Market Update. "Evolution Markets publishes a weekly report covering U.S. SO2 and NOx emissions trading markets and global greenhouse gas emissions markets." (www.evomarkets.com)

5. Cost-Effectiveness Analysis

As part of this evaluation, we conducted an economic analysis of the Program in accordance with the benefit-cost tests from the California Standard Practices Manual. Program costs and benefits were analyzed from the following perspectives:

- Total Resource Cost Test (TRC) – This test examines Program benefits and costs from the perspectives of Pacific Power and Pacific Power's customers. Benefits include generation cost reduction, and costs include those incurred by Pacific Power as well as additional funding from Matchmaker. A 10% conservation adder is applied to generation cost savings in Washington.
- Utility Cost Test (UCT) – From Pacific Power's perspective, benefits are in the form of reduced generation and line loss costs. Costs include any incurred administrative or measure costs.
- Ratepayer Impact Test (RIM) – All ratepayers (participants and non-participants) may experience an increase in rates to recover lost revenue. This test includes all Pacific Power Program costs as well as lost revenues. On the benefits side, this test includes all avoided energy and capacity costs.
- Participant Cost Test (PCT) – This test examines benefits from a Program participant perspective, including participant utility bill reductions. Costs include any measure costs incurred by participants and the net of any utility-generated rebates. For this Program, participants did not incur measure-related costs and did not receive any direct rebates. They did, however, realize energy savings from the measures and their own energy-saving behaviors.

The analysis results are presented in multiple ways, including:

- Levelized Cost per kWh – Cost of achieving each kWh of savings levelized over time. The levelized cost per kWh can be compared to the cost of alternate resources to assess the cost effectiveness of an efficiency investment.
- Net Present Value (NPV) – The difference between the discounted Program benefits and costs. A net present value greater than zero would indicate that Program benefits exceed costs.
- Benefit to Cost (B/C) Ratio – The ratio of Program benefits to Program costs. The benefits and costs are determined over the life of the Program impact and discounted to reflect the time value of money. A B/C ratio greater than 1.0 indicates that Program benefits exceed costs.

With the exception of Matchmaker funding, which was incorporated into the TRC as described above, cost data used for this analysis were limited to those provided by Pacific Power. Although multiple attempts were made to secure total Program cost data from each of the agencies, it was discovered that this information was not readily available.

Finally, the value of savings is determined by using various avoided cost scenarios. We used the following Pacific Power forecasts of avoided costs in our analysis: Pacific Power's official market price forecast for Mid-Columbia, the base case of June 30, 2006, and Pacific Power's updated IRP 67% load factor decrement. The IRP decrement represents the avoided cost as determined by Pacific Power's long-term resource plan. Table 19 shows the discount rates, line loss, and residential rates used in our analysis.

Table 19. Pacific Power Discount Rates

Parameter	Value
Discount Rate for TRC test	5.15%
Discount Rate for UCT, RIM, PART tests	8.74%
Line Loss	11.03%
Net Residential Energy Rate ($ per kWh)	$0.0516

The cost-effectiveness analysis results are shown in Table 20 and Table 21. Under the Base Case and IRP Decrement scenarios, the Program is not cost effective from any of the perspectives.

Table 20. Cost-Effectiveness Results: Base Case Forward Curves (Excluding Non-Energy Benefits)

Perspective	Total Discounted Benefits	Total Costs	Net Present Value	Benefit to Cost Ratio	Levelized Cost ($ per kWh)
Utility (UCT)	$633,647	$1,526,475	-$892,828	0.42	$0.170
Participant (PCT)	$575,505	$0	$575,505		$0.000
Ratepayer Impact (RIM)	$633,647	$2,101,980	-$1,468,332	0.30	$0.234
Total Resource Cost (TRC)	$990,189	$1,526,475	-$536,286	0.65	$0.170

Table 21. Cost-Effectiveness Results: IRP Decrement-Load Factor = 67% (Excluding Non-Energy Benefits)

Perspective	Total Discounted Benefits	Total Costs	Net Present Value	Benefit to Cost Ratio	Levelized Cost ($ per kWh)
Utility (UCT)	$557,514	$1,526,475	-$968,961	0.37	$0.170
Participant (PCT)	$575,505	$0	$575,505		$0.000
Ratepayer Impact (RIM)	$557,514	$2,101,980	-$1,544,466	0.27	$0.234
Total Resource Cost (TRC)	$917,319	$1,526,475	-$609,156	0.60	$0.170

However, these results do not incorporate the non-energy benefits that were analyzed in this evaluation, including the Program's impact on forced mobility, arrearages, economic, and societal impacts. These benefits are presented in Table 22.

Table 22. Total Program Non-Energy Benefits

Non-Energy Benefit	Program Impact	Perspective Adjusted
Mobility	$47,600	TRC
Arrearage	$26,816	UCT, RIM, TRC
Economic	$550,118	TRC
Environmental	$125,529	TRC
Total	$750,063	

As with the previous evaluation, when these benefits are included in the analysis the Program becomes more cost effective. As presented in Table 23 and Table 24, the Program passes TRC with a benefit cost ratio of 1.06 and 1.01 respectively.

Table 23. Cost-Effectiveness Results: Base Case Forward Curves (Including Non-Energy Benefits)

Perspective	Total Discounted Benefits	Total Costs	Net Present Value	Benefit to Cost Ratio	Levelized Cost ($ per kWh)
Utility (UCT)	$660,463	$1,526,475	-$866,012	0.43	$0.170
Participant (PCT)	$575,505	$0	$575,505		$0.000
Ratepayer Impact (RIM)	$660,463	$2,101,980	-$1,441,517	0.31	$0.234
Total Resource Cost (TRC)	$1,716,674	$1,526,475	$88,271	1.12	$0.170

Table 24. Cost-Effectiveness Results: IRP Decrement-Load Factor = 67% (Including Non-Energy Benefits)

Perspective	Total Discounted Benefits	Total Costs	Net Present Value	Benefit to Cost Ratio	Levelized Cost ($ per kWh)
Utility (UCT)	$584,330	$1,526,475	-$942,145	0.38	$0.170
Participant (PCT)	$575,505	$0	$575,505		$0.000
Ratepayer Impact (RIM)	$584,330	$2,101,980	-$1,517,650	0.28	$0.234
Total Resource Cost (TRC)	$1,643,804	$1,526,475	$15,401	1.08	$0.170

When normalized to the household level, the benefit-cost ratio is higher before the addition of non-energy benefits when compared to the results of the previous Program evaluation, as shown in Table 25.

Table 25. Normalized Cost Effectiveness Between Program Periods

Perspective (Base Case)	Normalized - Without Non-Energy Benefits			Normalized - With Non-Energy Benefits		
	Benefits	Costs	Benefit to Cost Ratio	Benefits	Costs	Benefit to Cost Ratio
TRC 2003 Program	$2,502	$4,606	.54	$5,652	$4,606	1.23
TRC 2005 Program	$2,363	$3,643	.65	$3,854	$3,643	1.06

While the addition of non-energy benefits raises each benefit-cost ratio substantially, the 2005 Program has a slightly lower ratio than what was reported for the 2003 Program. This may be a result of the more detailed assignment of non-energy benefits in the current evaluation, which utilized billing data to analyze Program impacts. This was not within the scope of work for the previous evaluation.

THE CADMUS GROUP, INC.

quantec

Date: October 8, 2009

To: Becky Eberle

From: Jamie Drakos and Meghan Lee

Re: Assessment of Washington Energy Education in Schools – 2008-2009 Program Year

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This memo provides an assessment of the Washington Energy Education in Schools Program, and includes the following:

- Program Structure
- Participation
- Data Collection Procedures
- Participant Characteristics
- Measure Installation and Adoption of Energy Savings Actions
- Program Impacts
- Program Cost Effectiveness

Program Structure

A total of 4,158 sixth-grade students received education through the local Community Action Agencies (Agencies) delivering the program. The following three agencies were responsible for Program delivery:

- Blue Mountain Action Council (BMAC), Walla Walla
- Northwest Community Action Center (NCAC), Toppenish
- Opportunities Industrialization Center of Washington (OIC), Yakima

Each of the agencies employs a certified teacher (or teachers) to promote the Program to school administrators and teachers in local school districts. The certified teacher serves as an Energy Instructor, delivering energy education in three classroom sessions. The energy education curriculum covers the basics of energy production and consumption, creates awareness of resource use, and instructs students in ways that they and their families can reduce electricity use. Participating students receive a kit of low-cost efficiency measures to encourage them to put their new knowledge into practice. The kits contained the following efficiency measures:

- 14 watt compact fluorescent light bulb
- High efficiency kitchen faucet aerator
- Wall plate thermometer
- Electroluminescent (EL) nightlight
- Shower timer
- Various measurement devices to assess baseline energy consumption including refrigerator/freezer temperature card, water temperature card and water flow bag

Agencies also distribute a high-efficiency showerhead to students that have electric water heating and do not already have a high efficiency showerhead installed.[1]

Participation

Participation across the three agencies and overall is shown in Table 1.

Table 1. Participation by Agency

	Student Participants		Percent of
	Estimate	Actual	Estimate
BMAC[2]	700	436	62.3%
NCAC	1,600	1,758	110.0%
OIC	1,800	1,964	109.1%
Total	4,100	4,158	101.4%

Both OIC and NCAC exceeded their participation estimates, by about 9%. (OIC exceeded their target by 164 participants, or 9.1%, while NCAC exceeded their target by 158 participants, or 10%). The Program met 101.4% of its overall participation goal of 4,100 students, with 4,158 participants across the three Agencies.

Data Collection Procedures

The Program utilized three data collection tools this year: Home and Appliance Characteristics Survey, Installation Survey, and Follow-Up Survey. These data collection tools were designed to:

- Increase awareness of electricity usage in the home and capture key household characteristics that impact electricity consumption

[1] Determined by pre-installation flow rates of 2.5 gallons per minute or higher. Students test flow rate with water flow bag included in kit.

[2] The actual participation for BMAC does not meet the target this year because they serve one school only every other year as the classrooms have a mixed 5th and 6th grade.

- Encourage and track the installation of energy efficiency measures and adoption of savings behaviors
- Document student learning and their efforts to share their new knowledge with other members of their household

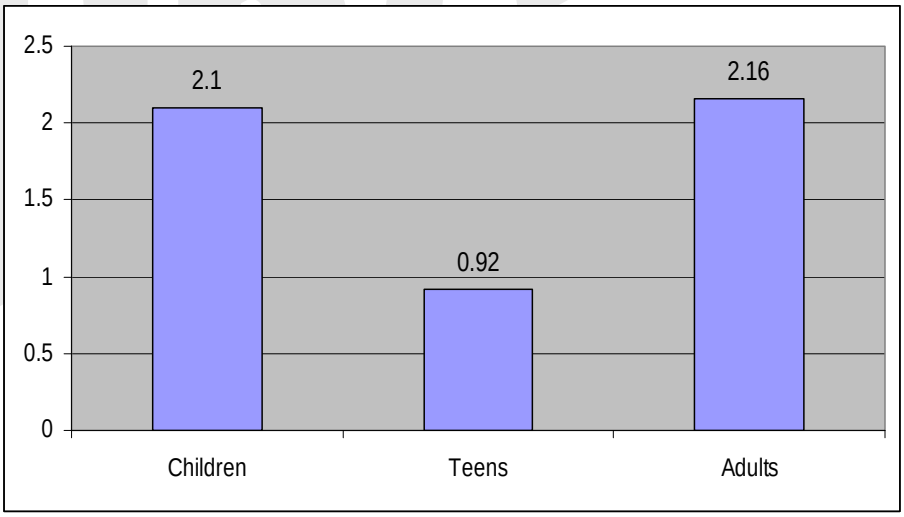
The data collected by students was entered into a database by Agency staff using a web-enabled interface. The data collection/survey instruments are refined on an annual basis to make them easier to use and more effective.

Key participant characteristics that define baseline consumption (type of appliances, occupancy, pre-installation usage factors), measure installation rates, and changes in electricity using behavior are analyzed in order to assess program impacts.

Participant Characteristics

The average participant's household had about 5 occupants as shown in Figure 1, below.

Figure 1. Average Household Occupancy by Age Group



Participants were asked to indicate the primary water heating, space heating and cooling sources in their home. Electricity is used by 80.4% of respondents for water heating, 18.0% use gas and 1.6% use other fuels. Table 2 indicates the percentage of households with each type of heating and cooling equipment.

Table 2. Types of Heating and Cooling Equipment[3]

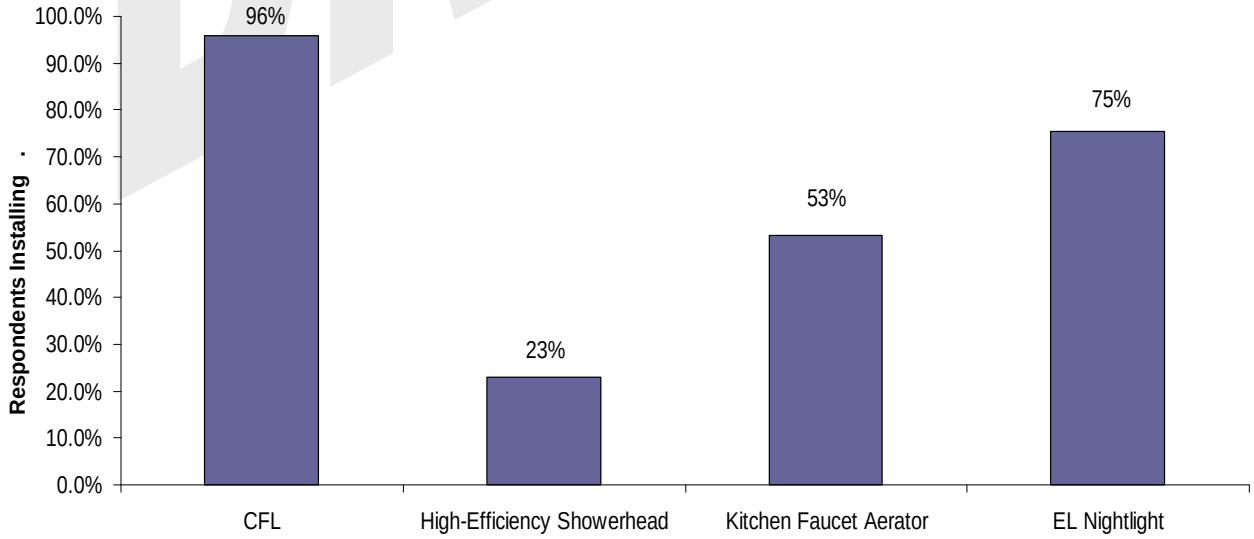
Electric Furnace	Gas Furnace	Other Electric	Oil Furnace	Heat Pump	Other
45.5%	22.7%	10.2%	2.0%	9.2%	10.4%
Central AC	**Room Fan**	**Heat Pump**	**Window AC**	**Attic Fan**	**No Cooling**
47.8%	20.0%	4.4 %	22.5%	1.4%	3.9%

The majority of the students (95.5%) indicated that Pacific Power provided electric service to their home. The second most common electric provider was Benton REA (3.8%). Nearly thirty-five percent (34.7%) of the participants reported having natural gas service, with Cascade Natural Gas as the most common provider.

Measure Installation and Adoption of Energy Savings Actions

Students reported back on their installation of measures from the energy kits. The education sessions are intended to encourage high installation rates of kit measures. Figure 2 shows the installation rates reported during the 2008-2009 school year.

Figure 2. Measure Installation Rates [4]



In addition, students also adopted several energy saving behaviors as encouraged by the energy education sessions. Key changes in energy using behaviors that were assessed included:

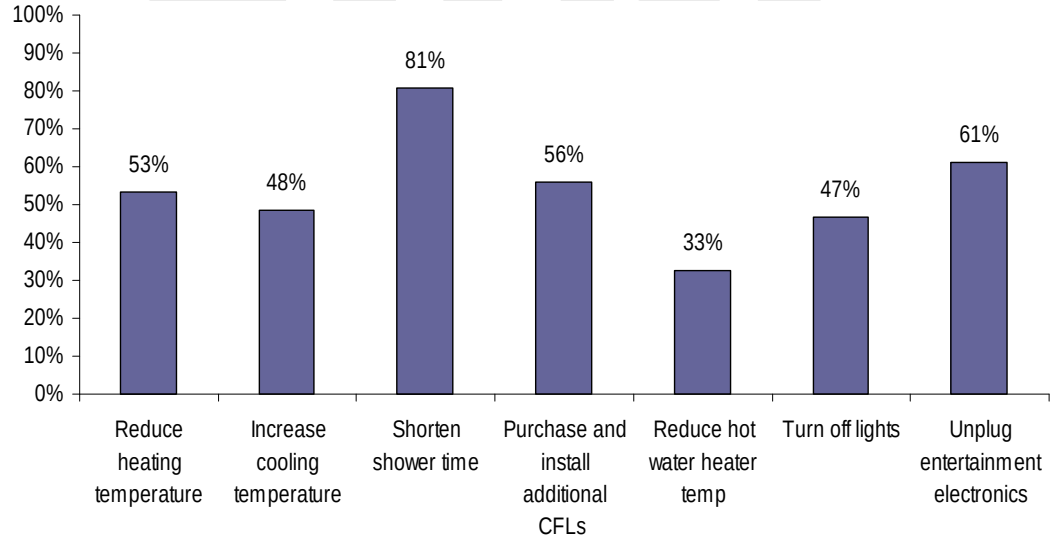
[3] Percentages may not add to 100% due to rounding.

[4] Showerheads are not distributed to all students. Based on results of flow testing, 28% of students received showerheads.

- Changing heating and cooling temperature settings (supported by the wall plate thermometer)
- Reducing shower length (using the shower timer)
- Purchasing and installing additional CFLs
- Reducing hot water temperature (based on temperature card)
- Turning off lights
- Unplugging entertainment electronics

The percentage of students adopting each of these energy savings behaviors is shown in Figure 3.

Figure 3. Adoption of Electricity Saving Behaviors



Program Impacts

We used the student completed surveys to determine baseline consumption characteristics, the installation of measures, and the adoption of energy saving behaviors. Based on their input, we then estimated the electric, natural gas and water savings of the program for the average participant and for the program overall. Table 3 shows the average annual savings per participant and Table 4 shows the total program savings.

Table 3. Average Participant Savings by Measure

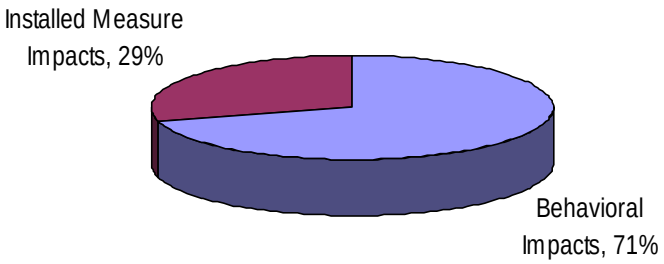
Measure	Average Annual Electric Savings (kWh)	Average Annual Gas Savings (Therms)	Average Annual Water Savings (Gallons)
Installation of Measures			
CFL	83		
Showerhead	284		2,532
EL Nightlight	16		
Kitchen Faucet Aerator	176	2.0	2,024
Install Additional CFLs	242		
Total Installation of Measures	801	2.0	4,556
Behavioral Impacts			
Shorten Shower Time	1,755	20.1	15,658
Adjust Heating Temp.	42	1.8	
Adjust Air Conditioning Temp.	26		
Reduce Hot Water Heater Temp.	21	0.4	
Turn off Lights	42		
Unplug Electronics	60		
Total Educational Impacts	1,946	22.3	15,658
Grand Total	2,747	24.3	20,214

Table 4. Total Program Savings by Measure

Measure	Annual Program Savings (kWh)	Annual Program Savings (Therms)	Annual Program Savings (Gallons)
Installation of Measures			
CFL	345,457		
Showerhead	1,179,581		10,525,034
EL Nightlight	68,335		
Kitchen Faucet Aerator	733,398	8,385	8,415,568
Install Additional CFLs	1,005,564		
Total Installation of Measures	3,332,335	8,385	18,940,602
Behavioral Impacts			
Shorten Shower Time	7,295,650	83,416	65,096,838
Adjust Heating Temp.	175,565	7,409	
Adjust Air Conditioning Temp.	108,683		
Reduce Hot Water Heater Temp.	85,749	1,503	
Turn off Lights	176,011		
Unplug electronics	250,998		
Total Educational Impacts	8,092,656	92,328	65,096,838
Grand Total	11,424,991	100,713	84,037,440

Of the per participant annual electricity savings, 801 kWh are attributed to the installation of measures, while 1,946 kWh are the result of behavioral changes. Figures 3 and 4 show the breakdown of savings between measures and behavioral changes.

Figure 4. Electric Savings Impacts



In addition to the electric savings, the Program also saves natural gas and water. Natural gas savings are attributed to adjustments in space heating thermostat settings, shower length and the installation of the faucet aerators. Water savings are attributed to shower length and the installation of faucet aerators and showerheads. The projected annual Program savings and dollar savings from installed measures and behavioral changes are shown below in Table 5.

Table 5. Annual Natural Gas and Water Savings

	Average Per Participant Savings	Total Program Savings	Total Dollar Savings
Electricity (kWh)	2,747	11,424,991	$771,187
Natural Gas (Therms)	24.3	100,713	$146,257
Water (Gallons)	20,214	84,037,440	$129,867
Total			$1,047,311

When the average participating household savings for electricity, natural gas and water are combined, the resulting first-year participant savings are $251.91, as shown below in Table 6.

Table 6. Average Participant Savings

	Annual Savings	Value of Savings ($)
Electricity (kWh)	2,747	$ 185.49
Natural Gas (Therms)	24.3	$ 35.18
Water (Gallons)	20,214	$ 31.24
Total		$251.91

Program Cost-Effectiveness

Using the calculated savings impacts and the program costs, we assessed the cost-effectiveness of the 2008-2009 Program. The costs to administer and deliver the Energy Education in Schools program during the 2008-2009 school year are shown below in Table 7.

Table 7. 2008-2009 Program Costs

Cost Category	Program Cost
PacifiCorp Administration	$ 5,460.72
Agency Costs	$ 309,045.92
Kits	$ 73,719.66
Data Tracking and Evaluation	$ 18,185.33
Total	$ 406,411.63

We calculate program cost-effectiveness for multiple scenarios and perspectives. For consistency and ease of comparison, we use the same scenarios employed in the analysis of the 2007-2008 school year. Specifically, we consider three scenarios related to program costs and savings:

- ***Scenario One*** – Savings from both installation of measures and behavioral changes are considered under this scenario. The cost of additional CFLs purchased by the customer was considered a positive participant cost. Kit costs, water, and gas savings are treated as a program benefit.
- ***Scenario Two*** – Savings from both installation of measures and behavioral changes are considered, but natural gas and water savings are not considered. Kit costs are treated as a Program benefit.
- ***Scenario Three –*** Only electric savings from measure installation are considered. Kit costs are treated a Program benefit.

A number of analyses were conducted to evaluate the costs and benefits associated with the Program, particularly:

1. ***Total Resource Cost Test (TRC)***: This test examines the Program benefits and costs from PacifiCorp's and PacifiCorp customers' perspectives. On the benefit

side, it includes reduction in generation costs. On the cost side, it includes costs incurred by both the utility and the participants. A 10% conservation adder is applied to generation cost savings in Washington.

2. ***Utility Cost Test (UCT)***: From the company's perspective, the benefits are in the form of reduced generation and line loss costs. The costs include any administrative or measure costs incurred by PacifiCorp.
3. ***Ratepayer Impact Test (RIM)***: All ratepayers (participants and non-participants) may experience an increase in rates to recover lost revenue. This test includes all PacifiCorp Program costs as well as lost revenues. On the benefits side, this test includes all avoided energy and capacity costs.
4. ***Participant Cost Test (PCT)***: This test examines the benefits from the Program participant perspective. Benefits include the participant utility bill reductions. Costs include any measure costs incurred by participants, net of any rebates received from the utility. For this Program, participants incurred no measure costs, and did not receive any direct rebates. They do realize energy savings from the various kit measures and the energy savings actions taken.

The results of this analysis are presented in multiple ways, including:

- ***Levelized Cost/kWh*** – Cost of achieving each kWh of savings levelized over time. The levelized cost/kWh can be compared to the cost of obtaining other resources to assess the cost-effectiveness of an efficiency investment. Energy efficiency resources that can be obtained for a levelized cost of $.04/kWh or less are generally cost-effective.
- ***Net Present Value (NPV)*** – The difference between the discounted program benefits and discounted program costs. A net present value greater than zero would indicate benefits of the program exceed costs.
- ***Benefit/Cost (B/C) Ratio*** – The ratio of program benefits to program costs. The benefits and costs are determined over the life of the program impact and discounted to reflect the time value of money. A B/C ratio greater than 1.0 indicates benefits of the program exceed costs.

Finally, the value of savings is determined using PacifiCorp's avoided cost scenario – that is, the cost to supply electricity that is avoided when it is saved through the Program. We use PacifiCorp's 2007 IRP decrement for the West with a 67% load factor in our analysis. The IRP decrement represents the marginal resource as considered in PacifiCorp's long-term resource plan.

Other key assumptions used in the cost-effectiveness analysis are shown in Table 8.

Table 8. Cost-Effectiveness Assumptions

Assumption	Value
Discount Rate	7.10%
Line Losses	9.94%
Retail Rate	$0.0675
Net Retail Rate	$0.0672

The results of the cost-effectiveness analysis for Scenario One are shown in Table 9.

Table 9. Scenario One: Cost-Effectiveness Results

	Levelized Cost $/kWh	Total Discounted Costs	Total Discounted Benefits	Difference	Total Benefit/Cost Ratio
Total Resource Cost Test	$0.0021	$78,837	$1,666,938	$1,588,102	21.144
Total Resource Cost Test (TRC) no Adder	$0.0021	$78,837	$1,515,399	$1,436,562	19.222
Utility Cost Test	$0.0107	$406,412	$1,515,399	$1,108,987	3.729
Rate Impact Measure (RIM)		$2,591,134	$1,515,399	$(1,075,735)	0.585
Participant (PCT)		$(327,575)	$2,201,835	$2,529,409	NA

Scenario One reflects savings from changes in household energy including behavioral changes. We also included the value of the kits as well as savings in natural gas and water costs as an additional benefit for the participants and the cost of additional CFLs purchased by the household is included as a participant cost. Non-electric and behavioral savings are not claimed by PacifiCorp.

The results of the cost-effectiveness analysis for Scenario Two are shown in Table 10.

Table 10. Scenario Two: Cost-Effectiveness Results

	Levelized Cost $/kWh	Total Discounted Costs	Total Discounted Benefits	Difference	Total Benefit/Cost Ratio
Total Resource Cost Test	$0.0095	$360,560	$1,666,938	$1,306,378	4.623
Total Resource Cost Test (TRC) no Adder	$0.0095	$360,560	$1,515,399	$1,154,839	4.203
Utility Cost Test	$0.0107	$406,412	$1,515,399	$1,108,987	3.729
Rate Impact Measure (RIM)		$2,591,134	$1,515,399	$(1,075,735)	0.585
Participant (PCT)		$(45,852)	$2,201,835	$2,247,686	NA

Scenario Two reflects savings from changes in household energy including behavioral changes but excluding natural gas and water savings. The value of the kit is included as a benefit to the participant and the cost of additional CFLs purchased by the household is included as a participant cost.

Finally, the results of the cost-effectiveness analysis for Scenario Three are shown in Table 11.

Table 11. Scenario Three: Cost-Effectiveness Results

	Levelized Cost $/kWh	Total Discounted Costs	Total Discounted Benefits	Difference	Total Benefit/Cost Ratio
Total Resource Cost Test	$0.0166	$360,560	$906,758	$546,198	2.515
Total Resource Cost Test (TRC) no Adder	$0.0166	$360,560	$824,326	$463,766	2.286
Utility Cost Test	$0.0187	$406,412	$824,326	$417,914	2.028
Rate Impact Measure (RIM)		$1,592,958	$824,326	$(768,632)	0.517
Participant (PCT)		$(45,852)	$1,208,095	$1,253,947	NA

Scenario Three does not reflect any savings from changes in household behaviors. Natural gas and water savings are also excluded from this scenario. The value of the kit is again included as a benefit to the participants and the cost of additional CFLs purchased by the household is included as a participant cost.

Conclusion

The attached presentation provides additional information on the performance of the program. In addition to providing cost-effective energy and cost savings, the Program also:

- Generated high levels of satisfaction amongst participating teachers
- Increased knowledge and awareness of the importance of energy efficiency among future energy consumers

The Washington Energy Education in Schools program continues to be a cost-effective initiative based on the standard cost-effectiveness analysis considered by the Washington Utilities and Transportation Commission and provides significant savings to participating families.