



# Washington Annual Report on Conservation Acquisition

January 1, 2016 – December 31, 2016

Filed July 19, 2017



 **PACIFIC POWER**  
A DIVISION OF PACIFICORP

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### List of Abbreviations and Acronyms

BPA	Bonneville Power Administration
CFL	Compact Fluorescent Lighting
DSM	Demand-side Management
Schedule 191	Schedule 191 System Benefits Charge Adjustment
EM&V	Evaluation, Measurement & Verification
GWh	Gigawatt-hour(s)
HVAC	Heating, Ventilation and Air Conditioning
IRP	Integrated Resource Plan
kWh	Kilowatt-hour
LED	Light-emitting Diode
MW	Megawatt
MWh	Megawatt-hour
NEEA	Northwest Energy Efficiency Alliance
NEEM	Northwest Energy Efficiency Manufactured Homes
NEF	National Energy Foundation
NTG	Net-to-Gross
PCT	Participant Cost Test
PTRC	PacifiCorp Total Resource Cost test
RIM	Ratepayer Impact Measure test
TRC	Total Resource Cost test
TRL	Technical Resource Library
UCT	Utility Cost Test
VFD	Variable-Frequency Drive

## Executive Summary

PacifiCorp is a multi-jurisdictional electric utility providing retail service to customers in Washington, California, Idaho, Oregon, Utah, and Wyoming. Pacific Power & Light Company (Pacific Power or Company), a division of PacifiCorp, serves approximately 130,000 customers in Washington. The Company works with its customers to reduce the need for investment in supply side resources and infrastructure by reducing energy and peak consumption through cost effective energy efficiency programs.

The Company is required to comply with the requirements of the Energy Independence Act (also known as I-937) codified in RCW19.285 and WAC 480-109. This report provides information on the Company's 2016 activities and expenditures related to pursuing all conservation in accordance with the I-937 framework, including Washington Utilities and Transportation Commission (Commission) orders and administrative rules.

In 2016, the Company offered four energy efficiency programs in Washington approved by the Commission, and received energy savings and market transformation benefits through its affiliation with the Northwest Energy Efficiency Alliance (NEEA). The Company recovers expenditures associated with these programs through the System Benefits Charge Adjustment, Schedule 191.

This report also provides details on Schedule 191 revenue for the performance period from January 1, 2016, through December 31, 2016. The Company, on behalf of its customers, invested \$12m in energy efficiency information, services, and incentives during the reporting period. The investment yielded approximately 55 gigawatt-hours (GWh) in first year savings<sup>1</sup> and approximately 7.2 megawatts (MW) of energy efficiency savings related capacity reductions.<sup>2</sup> Net benefits over the life of the individual measures are estimated at \$15.5m.<sup>3</sup>

The portfolio was cost effective based on four of the five standard cost effectiveness tests for the reporting period. The ratepayer impact measure test was less than 1.0, indicating near-term upward pressure was placed on the price per kilowatt-hour (kWh) given a reduction in sales. The cost effectiveness of the Company's Washington energy efficiency program portfolio from various perspectives is provided in Table 1 below.

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<sup>1</sup> Gross reported savings at the generation.

<sup>2</sup> See Planning section for explanation on how the capacity contribution savings values are calculated.

<sup>3</sup> See Appendix 1 – Total Resource Cost Test plus 10% Net Benefits including NEEA and Non-Energy Benefits.

Table 1  
Cost Effectiveness for the Portfolio<sup>4</sup>

Benefit/Cost Test	B/C Ratio with NEEA	B/C Ratio without NEEA
PacifiCorp Total Resource Cost Test ("PTRC") plus 10% <sup>5</sup>	1.86	1.89
Total Resource Cost ("TRC") Test <sup>6</sup>	1.70	1.73
Utility Cost Test ("UCT") <sup>7</sup>	2.50	2.61
Participant Cost Test ("PCT") <sup>8</sup>	3.18	3.05
Ratepayer Impact Cost Test ("RIM") <sup>9</sup>	0.63	0.65

All cost effectiveness calculations assume a net-to-gross (NTG) of 1.0, consistent with the Northwest Power and Conservation Council's methodology. Portfolio level cost effectiveness includes portfolio costs such as the Process and Impact Evaluations, Class 2 demand-side management (DSM) Potentials Assessment, and the DSM system database. Consistent with the Northwest Power and Conservation Council's methodology, the Company includes quantifiable non-energy benefits at the portfolio and residential level, as well as the *Home Energy Savings* and *Low Income Weatherization* program levels. *Low Income Weatherization* is not included in the portfolio or sector-level cost effectiveness analysis per WAC 480-109-100(10)(b). Appendix 1 provides 2016 cost effectiveness performance.

<sup>4</sup> Ratios include select quantifiable and directly attributable Non-Energy Benefits, but excludes costs as outlined in the Company's EM&V Framework (e.g. Class 1 & 3 of the potential study).

<sup>5</sup> The PTRC includes the 10 percent conservation benefit and risk adder in addition to quantifiable and directly attributable non-energy benefits. PTRC is consistent with the Northwest Power Council's cost effectiveness methodology and complies with the cost effectiveness definition (RCW 80.52.030(7)).

<sup>6</sup> The TRC compares the total cost of a supply side resource to the total cost of energy efficiency resources, including costs paid by the customer in excess of the program incentives. The test is used to determine if an energy efficiency program is cost effective from a total cost perspective.

<sup>7</sup> The UCT compares the total cost incurred by the utility to the benefits associated with displacing or deferring supply side resources.

<sup>8</sup> The PCT compares the portion of the resource paid directly by participants to the savings realized by the participants.

<sup>9</sup> The RIM examines the impact of energy efficiency expenditures on non-participating ratepayers overall. Unlike supply-side investments, energy efficiency programs reduce energy sales. Reduced energy sales can lower revenue requirements while putting upward pressure on rates as the remaining fixed costs are spread over fewer kilowatt-hours.

## Compliance

An external conservation advisory group of stakeholders is required to be maintained and used by the Company to advise them on conservation issues including program designs, incentive levels, third party evaluations, program marketing, and pilots. WAC 480-109-110 provides the scope of issues for the advisory group. The Company refers to their conservation advisory group as the Washington DSM Advisory Group. Meetings are typically held at the Commission offices in Olympia and include a call in number so stakeholders can participate remotely. This report provides information on the four meetings held in 2016 as well an outline of the primary agenda topics.

In compliance with I-937, the Company continuously reviews and updates, as appropriate, the conservation programs and portfolio to adapt to changing market conditions. Steps taken to adaptively manage the conservation programs during 2016 are included within program specific sections of this report. In the *Home Energy Savings* program, an outline home audit tool was deployed, additional online applications were released and compact fluorescent lighting (CFL) were removed from the energy savings kits. In the *wattsmart* Business program, changes were made to incorporate the impacts of the new Washington State Energy Code and to restructure light-emitting diode (LED) incentives to align with updated cost information.

Pilot projects are implemented when appropriate and are expected to be cost effective within the current or immediately subsequent biennium as long as the overall portfolio remains cost effective. The Company, after consultation with the DSM Advisory Group, offers initiatives or offers within two programs: *Home Energy Savings* and *wattsmart* Business. This focus is administratively efficient and uses existing program awareness—both important considerations in the Company’s rural territory. To further leverage other efforts, the Company has linked its pilot efforts with regional work supported by NEEA whenever possible.

In 2016, the Company, along with the other Washington utilities, received a request for information spanning multiple years about manufactured homes resident participation in the Company’s energy efficiency programs. After consulting its DSM Advisory Group, the Company agreed this information would provide additional insight into the manufactured homes market and support a broader regional effort. Specifically, the information could inform actions Bonneville Power Administration (BPA) and the region’s utilities could take with respect to underserved markets or hard-to-reach segments of markets, including manufactured homes outlined in Chapter Four (Action Plan item MCS-1) of the Seventh Northwest Conservation and Electric Power Plan. Manufactured home information is provided in a separate section in this report.

As an integral part of its efforts to pursue all conservation, the Company uses earned media, customer communications, paid media, and program specific media to communicate the value of conservation, and provide information regarding low-cost, no-cost energy efficiency measures. The Company endeavors to educate customers on the availability of technical assistance, services, and incentives with the overall goal to engage customers in reducing their energy usage. Annual communications plans for the upcoming year are reviewed with the DSM Advisory Group. The 2016 campaign delivered approximately 7.9 million total impression with online advertising

contributing almost half of the impressions. Additional information on communication channels and 2016 activity is contained in this report.

Detailed information on portfolio, program and measure group cost effectiveness, installation verifications, trade allies, and program evaluations can be found in the six appendices included with this report.



## Regulatory Activities

During the 2016 reporting period, the Company filed a number of compliance and/or informational reports, updates, and requests with the Commission in support of Company DSM programs. The following is a list of those filings:

- May 13, 2016 – Final revision of 2014-2015 DSM Business Plan submitted in compliance with Order 01 in Docket UE-132047 and to complete the Commission’s records for the 2014-2015 biennium.
- June 1, 2016 – 2014-2015 Biennial Conservation Report documenting the Company’s achievements of its 2014-2015 Biennial Conservation Target as set forth in Docket UE-132047, PacifiCorp’s Ten-Year Conservation Potential and 2014-2015 Biennial Conservation Target.
- June 1, 2016 – Washington Annual Report on Conservation Acquisition for 2015 as set forth in WAC 480-109-120(3). The report provided details on program results and activities, expenditures, and Schedule 191 revenue for the performance period 2015.
- June 1, 2016 – Schedule 191-System Benefits Charge adjustment, related to WAC 480-109-130(2), to increase Schedule 191 by approximately 0.6 percent. The request was approved August 4, 2016, per the no action agenda and effective August 5, 2016.
- June 1, 2016 – Pacific Power Conservation and Renewable Energy Target submitted to Washington Department of Commerce for 2014-2015 performance. The report detailed the Company’s progress in meeting the targets established in RCW 19.285.040 (EIA requirements).
- June 29, 2016 – Revised 2014-2015 Conservation Report and 2016 Renewable Energy Target Report. Reports to the Washington Department of Commerce and details the Company’s progress in meeting the targets established in RCW 19.285.040 and replaced the version filed on June 1, 2016, in its entirety.
- July 27, 2016 – Revised 2014-2015 Biennial Conservation Report.
- August 10, 2016 – Revised 2014-2015 Energy Independence Act (I-937) Conservation Report to Washington Department of Commerce.
- August 10, 2016 – Replacement pages for 2014-2015 Biennial Conservation Report. The revised report updated the Company’s portfolio target amount to 89,016 megawatt-hour (MWh) and includes 14,313 MWh from NEEA savings.
- November 15, 2016 – Pacific Power’s 2017 Annual Conservation Plan in Docket UE-152072.

### *Advisory Group Activities*

At least four times per year, the Company seeks input regarding its energy efficiency programs from its Washington DSM Advisory Group. This group includes representatives from a variety of constituent organizations. The Company collaborated with its DSM Advisory Group throughout 2016 on the following matters:

**March 22, 2016**

- 2014-2015 preliminary results
- Tariff rider information
- Appliance recycling wrap-up
- 2017 potential study highlights
- Evaluation results
- Georgetown University energy prize
- AirGenerate heat pump water heaters
- Preview of changes for business program

**June 27, 2016**

- 2014-2015 Biennial Report review, highlights and responses to comments
- Non-energy benefits for the next planning cycle
- Pilot measure update
- Air Generate – post NEEA remediation options
- Home Energy Savings – preview of changes
- Evaluation, Measurement & Verification (EM&V) framework updates
- Demand response relation to energy efficiency and cost recovery options
- Add Avista and PSE representation to the Company's advisory group

**September 30, 2016**

- Decoupling impact on biennial target
- 2016-2017 forecast and key changes
- Initial manufactured home data analysis
- Pilot updates
- *Retroefficiency* tool for targeted outreach
- November annual conservation plan

**December 21, 2016**

- Direct benefits to customer calculations for 2017 annual conservation plan
- 2017 Communications plan review
- Deep retrofit elements/ideas/next steps
- NEEA's end use load research project

## DSM Expenditures

### *System Benefits Charge Balancing Account Summary*

DSM activities are funded through Schedule 191, the System Benefits Charge Adjustment collections. Expenditures are charged as incurred and collected through Schedule 191. The balancing account is the mechanism used for managing the revenue collected and expenses incurred in the provision of DSM resources. The balancing account activity for 2016 is outlined in Table 3. The end of year balance in the balancing account, on an accrual basis, was an under-collection of expenses of \$2.5 million.

Table 3  
System Benefit Charge Balancing Account Summary

Month	Deferred Expenditures	Revenue Collected	Accumulative Balance	Monthly Net Accrued Costs	Accrual Basis Accumulative Balance
Dec-15			\$ 1,195,836	\$ 724,990	\$ 1,920,825
Jan-16	\$ 662,874	\$ (1,123,601)	\$ 735,108	\$ 282,257	\$ 1,742,354
Feb-16	\$ 792,700	\$ (925,215)	\$ 602,593	\$ (283,374)	\$ 1,326,465
Mar-16	\$ 677,188	\$ (810,191)	\$ 469,590	\$ 244,706	\$ 1,438,169
Apr-16	\$ 536,607	\$ (734,412)	\$ 271,786	\$ 46,409	\$ 1,286,773
May-16	\$ 1,171,437	\$ (753,253)	\$ 689,970	\$ 32,047	\$ 1,737,005
Jun-16	\$ 903,666	\$ (811,916)	\$ 781,720	\$ 234,052	\$ 2,062,807
Jul-16	\$ 987,845	\$ (837,367)	\$ 932,198	\$ (17,402)	\$ 2,195,883
Aug-16	\$ 1,043,229	\$ (1,019,474)	\$ 955,953	\$ (175,665)	\$ 2,043,973
Sep-16	\$ 1,094,241	\$ (1,057,355)	\$ 992,839	\$ (527,229)	\$ 1,553,630
Oct-16	\$ 687,103	\$ (971,426)	\$ 708,516	\$ 281,378	\$ 1,550,686
Nov-16	\$ 1,095,979	\$ (979,113)	\$ 825,382	\$ 6,409	\$ 1,673,961
Dec-16	\$ 1,726,782	\$ (1,229,349)	\$ 1,322,816	\$ 304,512	\$ 2,475,907
<b>TOTAL</b>	<b>\$ 11,379,653</b>	<b>\$ (11,252,672)</b>		<b>\$ 1,153,091</b>	

Note: December 2016 Accrual was \$1,153,091.

#### Column Explanations:

Deferred Expenditures: Monthly expenditures for all program activities posted in 2015, including funding for the Northwest Energy Efficiency Alliance.

Revenue Collected: Revenue collected through Schedule 191, System Benefits Charge Adjustment.

Accumulative Balance: A running total of account activities on a “cash” basis. A negative accumulative balance means cumulative revenue exceeds cumulative expenditures; positive accumulative balance means cumulative expenditures exceed cumulative revenue.

Monthly Net Accrued Costs: Two accrual entries are made each month for expenditures of energy efficiency programs. One estimates the incurred cost not yet processed, and the other reverses the estimate from the previous month. The amount shown here is the net of the two entries.

Accrual Basis Accumulative Balance: Current balance of account including accrued costs.

## Planning Process

### *Integrated Resource Plan*

The Company develops a biennial integrated resource plan (IRP) as a means of balancing cost, risk, uncertainty, supply reliability/deliverability and long-run public policy goals.<sup>10</sup> The IRP presents a framework of future actions to ensure the Company continues to provide its customers with reliable, reasonable-cost service, with manageable risks. Energy efficiency and peak management opportunities are incorporated into the IRP based on their availability, characteristics and costs.

Energy efficiency and peak management resources are divided into four general classes:

- Class 1 DSM (Resources from fully dispatchable or scheduled firm capacity product offerings/programs) – Capacity savings result from active Company control or advanced scheduling. After customers agree to participate, the timing and persistence of the load reduction is involuntary on their part within the agreed limits and parameters.
- Class 2 DSM (Resources from non-dispatchable, firm energy and capacity product offerings/programs) – Sustainable energy and related capacity savings are achieved through facilitating technological advancements in equipment, appliances, lighting and structures or repeatable and predictable voluntary actions by customers to manage the energy use at their facility or home, also commonly referred to as energy efficiency resources.
- Class 3 DSM (Resources from price responsive energy and capacity product offerings/programs) – Short-duration energy and capacity savings from actions taken by customers voluntarily based on pricing incentives or signals.
- Class 4 DSM (Resources from non-incented behavioral-based savings achieved through broad energy education and communication effort) – Energy and/or capacity reduction typically achieved from voluntary actions taken by customers to reduce costs or benefit the environment through education, communication, or public pleas.

Class, 1, 2, and 3 DSM resources are included as resource options in the resource planning process. Class 4 DSM actions are not considered explicitly in the resource planning process; however, the impacts are captured naturally in long-term load growth patterns and forecasts.

As technical support for the IRP, a third-party demand-side resource potential assessment (Potentials Assessment) is conducted to estimate the magnitude, timing, and cost of energy efficiency and peak management resources.<sup>11</sup> The main focus of the Potentials Assessment is on resources with sufficient reliability characteristics that are anticipated to be technically feasible

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<sup>10</sup> Information on the Company's integrated resource planning process can be found at the following address: <http://www.pacificorp.com/es/irp.html>

<sup>11</sup> PacifiCorp Demand-Side Resource Potential Assessment For 2015-2034, <http://www.pacificorp.com/es/dsm.html>.

and assumed achievable during the IRP's 20-year planning horizon. The estimated achievable energy efficiency potential identified in the 2015 Potentials Assessment for Washington is 948 GWh by 2034, or 21 percent of projected baseline loads.<sup>12</sup> By definition this is the energy efficiency potential that may be achievable to acquire during the 20-year planning horizon; prior to screening for cost effectiveness through the Company's integrated resource planning process.

The achievable technical potential of Class 2 (energy efficiency) resources for Washington by sector is shown in Table 4. The 2015 Potentials Assessment indicates that approximately nine percent of the achievable technical potential for the Company, excluding Oregon,<sup>13</sup> is available within its Washington service area.<sup>14</sup>

**Table 4**  
**Washington Energy Efficiency Achievable Technical Potential by Sector**

Sector	Cumulative GWh in 2034	Percent of Baseline Sales
Residential	392	21%
Commercial	395	26%
Industrial	145	13%
Irrigation	13	9%
Street Lighting	3	30%

Demand-side resources vary in their reliability, load reduction and persistence over time. Based on the significant number of measures and resource options reviewed and evaluated in the Potentials Assessment, it is impractical to incorporate each as a stand-alone resource in the IRP. To address this issue, Class 2 DSM measures and Class 1 DSM programs are bundled by cost for modeling against competing supply-side resource options reducing the number of discrete resource options the IRP must consider to a more manageable number.

The evaluation of Class 2 DSM (energy efficiency) resources within the IRP is also informed by state-specific evaluation criteria in the development of supply-curves. While all states generally use commonly accepted cost effectiveness tests to evaluate DSM resources, some states require variations in calculating or prioritizing the tests:

- Washington, Idaho, and Oregon use the TRC test and consider the inclusion of quantifiable non-energy benefits.
- Oregon and Washington, in addition to considering quantifiable non-energy benefits, apply an additional 10 percent benefit to account for non-quantifiable externalities, consistent with the Northwest Power Act.
- Wyoming and California use the standard TRC test excluding quantifiable non-energy benefits and the 10 percent benefit adder Oregon and Washington consider.
- Utah uses the UCT as the primary determination of cost effectiveness.

<sup>12</sup> Ibid, Volume 2, page 4-2.

<sup>13</sup> Oregon energy efficiency potentials assessments are performed by the Energy Trust of Oregon.

<sup>14</sup> Volume 1, Page 4-2, PacifiCorp Demand-Side Resource Potential Assessment for 2015-2034.

The Company evaluates program implementation cost effectiveness (both prospectively and retrospectively) under a variety of tests to identify the relative impact and/or value (e.g. near-term rate impact, program value to participants, etc.) to customers and the Company.

### *Estimated Peak Contributions*

The reported capacity reduction of 7.16 MW (at generation) for energy efficiency programs during 2016 represents the estimated MW impact of the energy efficiency portfolio during PacifiCorp's system peak period. An energy-to-capacity conversion factor developed from Class 2 DSM selections in the 2015 IRP is used to translate 2016 energy savings to estimated demand reduction during the system peak. The utilization of this factor in the MW calculation assumes that the energy efficiency resources acquired through energy efficiency programs have the same average load profile as those energy efficiency resources selected in the 2015 IRP. Utilization of this factor in determining the MW contribution of energy efficiency programs for 2016 is detailed in Table 5 below.

Table 5  
Estimated Peak Contribution

Description	Value
First year Energy Efficiency program MWh savings acquired during 2016 (@ Generation)	55,270
Conversion factor: Coincident MW/MWh	0.0001296
Estimated coincident peak MW contribution of 2016 Energy Efficiency acquisitions	7.16

## Energy Efficiency Programs

The Company offered energy efficiency programs to all major customer sectors: residential, commercial, industrial, and agricultural. The Company's energy efficiency portfolio included four programs: *Home Energy Savings*, Schedule 118; *Home Energy Reports*; *Low Income Weatherization*, Schedule 114; and *Non-Residential Energy Efficiency (wattsmart Business)*, Schedule 140. The Company also helps fund NEEA. In addition to the energy efficiency programs, the Company, on behalf of customers, invested in outreach and education for the purpose of promoting the efficient use of electricity and improving program performance. Results for 2016 are provided in Table 6.

Table 6  
Washington Results January 1, 2016 – December 31, 2016

Program	kWh/Yr Savings (at site)	kWh/Yr Savings (at generator)	Systems Benefits Charge Expenditures
Low Income Weatherization	294,462	322,936	\$ 778,519
Refrigerator Recycling	6,644	7,286	\$ (1,150)
Home Energy Savings	7,030,808	7,710,687	\$ 2,458,678
Home Energy Reports	9,164,167	10,050,342	\$ 338,703
<b>Total Residential Programs</b>	<b>16,496,082</b>	<b>18,091,253</b>	<b>\$ 3,574,750</b>
wattsmart Business Agricultural	690,513	757,286	\$ 164,246
wattsmart Business Commercial	16,642,824	18,229,052	\$ 4,046,759
wattsmart Business Industrial	13,210,222	14,288,308	\$ 2,563,171
<b>Total Business Programs</b>	<b>30,543,559</b>	<b>33,274,646</b>	<b>\$ 6,774,176</b>
Northwest Energy Efficiency Alliance	3,561,468	3,903,756	\$ 869,953
<b>Total</b>	<b>50,601,109</b>	<b>55,269,655</b>	<b>\$ 11,218,879</b>
		Portfolio DSM Central	\$ 28,189
		Portfolio Evaluation	\$ 421,389
		Portfolio Potential Study	\$ 77,368
		Portfolio Technical Reference Library	\$ 11,553
<b>Portfolio Level Expenditures (DSM Central, TRL, Evaluation and Potential Study)</b>			<b>\$ 538,498</b>
		School Energy Education	\$ 62,794
		Outreach and Communication	\$ 184,227
<b>Total System Benefits Charge expenditures</b>			<b>\$ 12,004,398</b>

In 2016, the Company delivered preliminary results of 55,270 MWh in first year energy savings at generation against the 2016 business plan forecast savings of 52,266 MWh, a positive variance of approximately six percent. The largest variances from the plan were due to the following:

- *Home Energy Savings*: Savings are lower than forecasted due to the market moving away from general CFLs faster than expected, and the effect was multiplied by a limited availability of LED products meeting the new Energy Star 2.0 specification than originally forecasted. These combined changes led to a decrease in lighting savings in 2016. In addition, the smart thermostat measure, new in 2016, experienced slower than forecasted participation.
- *wattsmart Business*: Savings are higher than originally forecasted driven primarily by increased lighting savings as business customers increasingly opt for LEDs as costs decline. The changes to lighting incentives effective July 11, 2016, motivated some customers to complete projects sooner than anticipated to use the higher incentives, thus increasing savings.
- *NEEA*: Savings reported by NEEA increased primarily due to additional savings from new programs such as Super-Efficient Dryers, Certified Refrigeration Energy Specialist, and Retail Products Portfolio. These programs were in early development when NEEA created the targets in August 2015. In addition, more mature programs such as Next Step Home, Heat Pump Water Heaters and Residential Lighting achieved savings above the initial forecast.

Consistent with requirements under WAC 480-109-120 (3)(b)(ii) and (iii), Table 7 provides a comparison of the Company's 2016 Business Plan filed on October 30, 2015, to actual 2016 program performance.



Table 7: Washington Business Plan Budget<sup>15</sup> compared to Actual<sup>16</sup>

Program	2016 PacifiCorp Washington Business Plan Budget			2016 PacifiCorp Washington DSM Actual		
	kWh/Yr Savings (at site)	kWh/Yr Savings (at generation)	Estimated Systems Benefit Expenditures	kWh/Yr Savings (at site)	kWh/Yr Savings (at generation)	Systems Benefits Charge Expenditures
Low Income Weatherization	243,540	267,090	\$ 780,000	294,462	322,936	\$ 778,519
Refrigerator Recycling				6,644	7,286	\$ (1,150)
Home Energy Savings	12,665,222	13,889,949	\$ 3,199,903	7,030,808	7,710,687	\$ 2,458,678
Home Energy Reports	8,911,279	9,773,000	\$ 364,526	9,164,167	10,050,342	\$ 338,703
<b>Total Residential Programs</b>	<b>21,820,041</b>	<b>23,930,039</b>	<b>4,344,429</b>	<b>16,496,082</b>	<b>18,091,253</b>	<b>\$ 3,574,750</b>
wattsmart Business Agricultural	1,409,700	1,546,018	\$ 384,539	690,513	757,286	\$ 164,246
wattsmart Business Commercial	10,852,890	11,887,278	\$ 3,081,525	16,642,824	18,229,052	\$ 4,046,759
wattsmart Business Industrial	11,765,975	12,726,196	\$ 2,254,460	13,210,222	14,288,308	\$ 2,563,171
<b>Total Business Programs</b>	<b>24,028,565</b>	<b>26,159,492</b>	<b>5,720,524</b>	<b>30,543,559</b>	<b>33,274,646</b>	<b>\$ 6,774,176</b>
<b>Northwest Energy Efficiency Alliance</b>	<b>1,984,871</b>	<b>2,176,130</b>	<b>\$ 909,968</b>	<b>3,561,468</b>	<b>3,903,756</b>	<b>\$ 869,953</b>
<b>TOTAL</b>	<b>47,833,477</b>	<b>52,265,661</b>	<b>\$ 10,974,921</b>	<b>50,601,109</b>	<b>55,269,655</b>	<b>\$ 11,218,879</b>
Portfolio DSM Central			\$ -			\$ 28,189
Portfolio Evaluation			\$ 634,629			\$ 421,389
Portfolio Potential Study			\$ 62,500			\$ 77,368
Portfolio Technical Reference Library			\$ 44,916			\$ 11,553
School Energy Education			\$ 60,947			\$ 62,794
Outreach and Communication			\$ 250,000			\$ 184,227
<b>Total System Benefits Charge Expenditures</b>			<b>\$ 12,027,913</b>			<b>\$ 12,004,398</b>

<sup>15</sup> Budget from 2016-2017 Business Plan filed October 30, 2015.

<sup>16</sup> System Benefit Charge expenditures represents total program costs for savings claimed 2016.

*Direct Benefits to Customers*

Estimates of direct benefits to customers delivered by the 2016 expenditures are provided in Table 8. This additional metric to assess program impacts is consistent with conversations between Commission Staff and the Company that occurred during the preparation of the 2017 annual conservation plan.

Table 8  
2016 Direct Benefits to Customers

Program or Initiative	Expenditures	Direct Benefit to Customers	Direct Benefit to Customers
Low Income Weatherization	\$ 778,519	\$ 654,175	84%
Refrigerator Recycling	\$ (1,150)		
Home Energy Savings	\$ 2,458,678	\$ 1,381,901	56%
Home Energy Reports	\$ 338,703		
<b>Total Residential Programs</b>	<b>\$ 3,574,750</b>		
	\$ -		
wattsmart Business Agricultural	\$ 164,246		
wattsmart Business Commercial	\$ 4,046,759		
wattsmart Business Industrial	\$ 2,563,171		
<b>Total Business Programs</b>	<b>\$ 6,774,176</b>	<b>\$ 4,452,397</b>	<b>66%</b>
	\$ -		
<b>Northwest Energy Efficiency Alliance</b>	<b>\$ 869,953</b>	<b>\$ 593,706</b>	<b>68%</b>
<b>TOTAL</b>	<b>\$ 11,218,879</b>		
	\$ -		
Portfolio DSM Central	\$ 28,189		
Portfolio Evaluation	\$ 421,389		
Portfolio Potential Study	\$ 77,368		
Portfolio Technical Reference Library	\$ 11,553		
School Energy Education	\$ 62,794		
Outreach and Communication	\$ 184,227		
<b>TOTAL</b>	<b>\$ 12,004,398</b>	<b>\$ 7,082,179</b>	<b>59%</b>

## Notes:

*Low Income Weatherization:* In 2016 payments to community action agencies for measure installation were classified as incentives. The value can be found in the cost effectiveness tables included in Appendix 1.

*Home Energy Savings:* Customer incentives, upstream, mid-stream and mail by request buy downs are included in the direct benefit to customer calculation. This information is provided in the Incentives column for the Home Energy Savings program in Appendix 1.

*wattsmart Business:* Customer incentives and expenditures for customer site specific energy engineering (~ \$510,000) is included in the direct benefit to customer calculation. Both amounts are provided in Appendix 1.

*NEEA:* Company subtracted \$21,802 in internal management costs and then applied the 70 percent estimate provided by staff to NEEA funding to calculate the direct benefit to customers.

### *Pilot Projects*

The Pilot Project section briefly describes the pilots underway in the biennial period and key activities in 2016 to support these pilots.

#### *Heat Pump Dryers*

In partnership with NEEA, the Company used outreach tactics combined with consumer incentives available for heat pump dryers through its Home Energy Savings program to increase the availability (and consumer purchase of) eligible machines on the showroom floor at smaller independent retailers.

During 2016, Home Energy Savings program field staff called on Bemis Home Appliance & TV Center, Sears Hometown #6914, and Best Buy #831 a total of sixteen times. Visits focused on creating awareness of the incentive, qualification requirements, placement of collateral, and identifying challenges to stocking the heat pump dryers. During this time, field staff learned consumer demand to date was not sufficient motivation for the retailers to invest showroom space and capital in floor models. Two units (one each in Yakima and Walla Walla) were sold and received incentives in 2016. Both units were special ordered by retailers for the customers. Results generated by 2016 tactics will help inform the tactics (manufacturer and additional retailer engagement) for the next year.

#### *New Manufactured Homes*

In partnership with NEEA, the Company focused on increasing the sale of efficient manufactured homes using incentives available through the Home Energy Savings program and targeted outreach tactics.

The manufactured homes offer was updated in early 2016 to expand the options for paying the incentives (downstream, upstream or midstream). Program field staff, as part of their normal sales calls, communicated incentive availability and payment options to the following local manufactured home dealers: Clayton Homes, Valley Quality Homes, Colombia Homes, Caris-Sell Homes, Palm Harbor Homes and Kit Home Builders West. The dealers sell one or more of the efficient versions of manufactured homes, including: High Performance Certification through Northwest Energy Efficient Manufactured Homes (NEEM), Eco-rated (also through NEEM), and Energy Star. During 2016, dealers reinforced the presence of barriers; i.e. the consumer incentive alone was not enough to overcome customer's perceptions of higher costs. As a result, program field staff engaged with NW Energy Works (a design consultant working with manufacturers), and identified some additional tactics such as adding to available consumer financing options that will be pursued for the next year.

#### *Waste Heat to Power*

The pilot program is designed to increase the technical talent pool to assess and conduct site analyses for business customer installations of waste heat to power technologies.

Incentives for waste heat to power and regenerative technologies were added to the *wattsmart* Business program in January 2016. Also in 2016, waste heat to power was a specific expertise request as part of the re-procurement of the energy engineering contracts. The Company contracted with 11 firms, including one new firm with demonstrated expertise in waste heat to power. During

2016, one customer with interest in waste heat to power and possible technical opportunity was identified. Site visit and technical assessment is scheduled for next year.

*Targeted Delivery*

Target businesses through customer outreach efforts to increase measure installation and program participation in a specific area where additional value, such as possible infrastructure investments, has been identified.

The targeted delivery pilot was brought before the DSM Advisory Group in September 2016 and focused on business customers. During the last part of 2016, analysis indicated some of the areas had residential loads that warranted the addition of residential efforts. In 2016, planning for the commercial and residential efforts started with efforts being deployed next year. The outreach efforts for business customers will use *Retroficiency* analytical services to analyze utility, customer, and third party data to help focus outreach activities. The effort is focused on the geographic area of Yakima. Installed projects will be tracked.

*Tier the wattsmart Business Trade Ally Network*

Develop a premium tier for the existing *wattsmart* Business trade ally network with the intent that it will increase trade allies' technical expertise and performance. Additionally, the premium tier is intended to encourage local trade allies to engage in NEEA's advanced lighting trade ally training (*NXT* Level).

During 2016, all the pre-deployment planning was completed and the premium tier will be rolled out in the next year.

### *Manufactured Homes*

In mid-2016, UCONs, a Washington contractor specializing in manufactured homes programs, provided written communication including some data analysis to Washington investor owned utilities and their stakeholders stating that the manufactured home market is being under-served by all investor owned utilities. The analysis drew upon regional and utility specific data (not Pacific Power data) to reach their conclusion. The communication also included a request for information about 2014 and 2015 participation by customers with manufactured homes. The Company does not agree with the analysis or that the conclusions are applicable to the Company's Washington territory. The Company does agree that additional insight into the manufactured homes market within their territory is useful to support a broader regional effort, specifically actions Bonneville Power Administration and the region's utilities should take with respect to underserved markets or hard-to-reach segments of markets, including manufactured homes outlined in Chapter Four (Action Plan item MCS-1) of the Seventh Northwest Conservation and Electric Power Plan.

At the September 30, 2016 DSM Advisory Group meeting, the Company and stakeholders discussed UCONs communications, its conclusion that the market is under-served, and its request for historical data. The group agreed that providing manufactured home participation data for two prior years (2014 and 2015) as well as the current year, 2016, would support utility activities in support of MCS-1.

Table 9 below provides information on historic (2014 and 2015) and current (2016) energy efficiency program participation by manufactured home residents.

**Table 9**  
**Participation by Manufactured Home Residents**

	<b>2014</b>	<b>2015</b>	<b>2016</b>
Low Income Weatherization homes	40	44	49
Home Energy Savings participants	256	1,028	403
Appliances	34	10	10
Duct Sealing	197	187	12
Heat Pump	24	26	18
Heat Pump Water Heater	4	-	1
Kits	-	817	362
Lighting	12	17	1
Lighting buy down	72,646	86,318	54,508
Weatherization	30	8	3

Information on all participants except the lighting buy down was compiled by matching customer identifiers (concatenated service location and agreement numbers) of participants with the same information in residential customer accounts bearing the manufactured home dwelling code flag. Lighting buy down information was compiled from survey information from the 2013-2014 Home Energy Savings evaluation. Customer awareness and prior year purchases for both CFLs and LEDs were added to arrive at a per-home purchase that was assumed to apply equally to all manufactured homes (approximately 15,300). The estimate of total purchases for manufactured homes was

compared to the two year total efficient lighting equipment receiving incentives through the buy down channel and twenty four percentage was calculated. This percentage was applied to the total lighting units in each year.

The Company also analyzed manufactured home customers who are also participants in the *Home Energy Reports* program. Table 10 below provides information on current 2016 behavioral program (Home Energy Reports) participation by manufactured home residents.

Table 10  
Home Energy Reports Participation by Manufactured Home Residents

	Recipient	Control	Total
Legacy	2,160	2,076	4,236
Expansion	4,177	1,312	5,489
Refill	420	448	868

Information on the behavioral program participation was compiled in the same manner (matching customer account number information) as described above for energy efficiency program participation.

In addition, the Advisory Group agreed that income data used to help categorize participants would also be useful for the regional efforts described above. Further, providing income information is not a program participation requirement and that available third party data would be used. Accordingly, this information is included in Table 11. The information in Table 11 uses zip code information for all *Home Energy Savings* program participants and those participants residing in manufactured homes as well as income information from the US Census Bureau. This comparison does not illustrate a strong correlation between lower income levels and manufactured home participation. Alternately stated, it appears program participation by manufactured home residents is similar to overall program participation by zip code/income level.

Table 11  
Manufactured Home Income Data

ZIP	Median Household Income- U.S. Census Bureau American Community Survey	Project Count - All DSM Projects 2014 - 2016	% Total DSM Projects	Project Count - MANUFACTURED Projects 2014 - 2016	% Total Manufactured Projects
98921	\$23,636	23	0%	9	1%
98948	\$36,604	205	2%	18	1%
98901	\$37,327	952	7%	152	9%
99328	\$37,338	288	2%	26	1%
99348	\$37,419	27	0%	12	1%
98951	\$38,698	287	2%	30	2%
98944	\$39,295	731	6%	97	5%
98902	\$39,485	1959	15%	78	4%
98932	\$42,270	191	1%	11	1%
98935	\$42,530	53	0%	10	1%
99324	\$43,525	532	4%	146	8%
98952	\$43,875	26	0%	7	0%
98947	\$44,619	132	1%	22	1%
99329	\$45,625	8	0%	6	0%
98923	\$45,980	50	0%	9	1%
98930	\$46,155	532	4%	85	5%
98903	\$46,207	826	6%	227	13%
99362	\$47,392	2248	17%	269	15%
99347	\$47,656	144	1%	25	1%
98933	\$47,917	29	0%	7	0%
98937	\$51,348	325	3%	46	3%
98603	\$52,188	2	0%	0	0%
99361	\$52,315	116	1%	23	1%
98942	\$54,551	840	6%	114	6%
99350	\$54,766	5	0%	1	0%
98953	\$56,047	248	2%	40	2%
98936	\$56,205	226	2%	49	3%
98908	\$56,357	1704	13%	167	9%
99343	\$56,512	0	0%	0	0%
99301	\$58,071	0	0%	0	0%
98938	\$62,171	53	0%	8	0%
99360	\$66,250	55	0%	8	0%
98950	\$68,625	0	0%	0	0%
99323	\$75,689	150	1%	68	4%
98939	data not available	9	0%	1	0%
99363	data not available	5	0%	3	0%

## Residential Programs

The residential energy efficiency portfolio is comprised of four programs: *Home Energy Savings*, *Home Energy Reports*, *Low Income Weatherization*, and *NEEA*. As shown in Table 12, the residential portfolio was cost effective based on four of the five standard cost effectiveness tests for the reporting period. The ratepayer impact test was less than 1.0 indicating that there is near term upward pressure placed on the price per kilowatt-hour given a reduction in sales.

Table 12  
Cost Effectiveness for Residential Portfolio<sup>17</sup>

Benefit/Cost Test	B/C Ratio with NEEA	B/C Ratio without NEEA
PTRC	1.96	2.06
TRC	1.83	1.94
UCT	1.77	1.91
PCT	3.42	3.00
RIM	0.55	0.58

Individual program performance, program management and program infrastructure is provided on the following pages.

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<sup>17</sup> Excludes *Low Income Weatherization* and includes select quantifiable and directly attributable non-energy benefits.



### *Home Energy Savings*

The *Home Energy Savings* program provides access to and incentives for more efficient products and services installed or received by customers residing in newly constructed homes, existing homes, multi-family housing units or manufactured homes. The program was cost effective as shown in Table 13.

Table 13  
Cost Effectiveness for Home Energy Savings<sup>18</sup>

Benefit/Cost Test	B/C Ratio
PTRC	2.12
TRC	1.99
UCT	1.99
PCT	2.71
RIM	0.60

Program participation by measure category is provided in Table 14.

Table 14  
Eligible Program Measures (Units)

Measure Category	Total kWh/Yr Savings (@ Site)	Total Incentive	Quantity
Appliances	21,776	\$ 8,630	171
Building Shell	116,503	\$ 59,109	181,952 (sq ft)
Electronics	25,800	\$ 5,160	86
Energy Kits	997,179	\$ 43,725	2,963
HVAC	1,892,584	\$ 658,216	672
Lighting	3,860,253	\$ 548,828	250,632
Water Heating	86,034	\$ 40,233	58
Whole Home	30,680	\$ 18,000	12
<b>Grand Total</b>	<b>7,030,808</b>	<b>\$ 1,381,901</b>	<b>436,546</b>

### Program Management

The program manager who is responsible for the program in Washington is also responsible for the *Home Energy Savings* program in California and *Home Energy Reports* program in Washington. For each program and in each state the program manager is responsible for the cost effectiveness of the program, contracting with the program administrator monitoring program

<sup>18</sup> Includes select quantifiable and directly attributable non-energy benefits.

performance and compliance, and recommending changes in measures, incentives, or delivery requirements as set out in the tariff and/or posted on the Company's website.

### Program Administration

The *Home Energy Savings* program is administered by CLEARResult. CLEARResult is responsible for the following:

- Retailer and trade ally engagement – CLEARResult identifies, recruits, supports, and assists retailers to increase the sale of energy efficient lighting, appliances and electronics. CLEARResult enters into promotion agreements with each lighting manufacturer and retailer for the promotion of discounted lighting equipment. The agreements include specific retail locations, lighting products receiving incentives and not-to-exceed annual budgets. Weatherization and HVAC trade allies engaged with the program are provided with program materials, training, and regular updates.
- Inspections – CLEARResult recruits and hires inspectors to verify on an on-going basis the installation of measures. A summary of the inspection process is in Appendix 2.
- Incentive processing and call-center operations – CLEARResult receives all requests for incentives, determines whether the applications are completed, works directly with customers when information is incorrect or missing from the application and processes the application for payment.
- Program specific customer communication and outreach – A summary of the communication and outreach is outlined in the Communication, Outreach and Education section.

The contract for Home Energy Savings program administration services for all states expired in early 2016. The Company initiated a request for proposal process in 2015 and, after extensive evaluation, awarded a new three year contract to CLEARResult in March 2016.

### Program Changes

As part of the 2016-2017 biennial process, the *Home Energy Savings* program was updated with changes effective January 1, 2016. New measures, including smart thermostats, heat pump dryers and heat pumps for manufactured homes were added. Measures where codes/current practice reduced available savings or in cases with low consumer interest were discontinued which include refrigerators, freezers, and central air conditioners. All measures, market conditions, measure costs, delivery channels and available savings were reviewed and necessary changes were made to qualifications and incentive levels.

On September 2, 2016, the Company updated its DSM Advisory Group about minor changes to the program. Changes included altering the requirements and incentives for floor insulation, incentives for new homes to meet the July 1, 2016 energy code, and advanced power strip incentive availability. In accordance with the program change process, notices were posted on the website on September 23, 2016, and became effective November 7, 2016.

### Infrastructure

The total number of participating retailers participating in the program is currently 117. The current count of participating retailers is provided in Appendix 3.

### Adaptive Management

The Company made substantial changes through an adaptive management approach. The following bullets summarize the changes.

- In October 2016, the online Home Energy Advisor tool was added to the program website. This five-minute survey asks customers about their home characteristics and generates a list of recommended actions to make their home more energy efficient. The online tool is a configured version of the platform provided by EnergySavvy, one of several established providers of online residential audits. Since the release of the survey, 96 customers have used the tool and received recommended actions such as purchasing an advanced power strip to air sealing their home.
- Online applications were developed and released for the following equipment: smart thermostats, evaporative coolers, heat pumps, ductless heat pumps, and heat pump water heater measures. Online applications streamline the application submittal process for customers and trade allies while reducing the instances of missing information. These applications complement the applications that were previously developed for online submittal that were released in the prior year and are part of an overall strategy to migrate the participation process while still maintaining mail/paper options for customers who prefer them.
- Retail Lighting Channel – Due to rapidly changing consumer lighting preferences shifting from CFL technology and toward LED technology, the program increased store visits and point of purchase material. The program partnered with manufacturers and corporate retailers to educate sales personnel to reinforce the quality and longevity attributes of LED equipment meeting the Energy Star (ES) 2.0 specifications and advocating for shelf space for ES 2.0 LEDs in place LEDs not meeting the ES 2.0 specifications. While this increased retailer support activity did not fully mitigate the limited availability of ES 2.0 LEDs during the beginning of the year, it was likely a contributing factor in ensuring a wider product selection and better availability during the last half of the year.
- Energy Savings Kits – The CFL lighting component included in energy kits was changed to LED only effective December 31, 2016.
- Smart Thermostats – Consumer interest in smart thermostat equipment has been driven by awareness and availability of the NEST product. NEST is using a direct to consumer delivery channel which is different from the established contractor delivery channel for many thermostat sales. In response, the program began training to educate retailer store associates on the benefits of the product, incentive availability and applications (both online and paper).

### Evaluation

A process and impact evaluation for program years 2013-2014 was published in 2016. Notable findings include:

- For non-lighting participants, retailers were the highest source of program awareness.
- Non-lighting participants expressed program satisfaction with the program overall, and reported high satisfaction with installed measures, their contractors and incentive amounts.
- General population survey respondents reported higher levels of satisfaction with LEDs over CFLs.
- High satisfaction with energy kits participants.

The results of the evaluation can be viewed at [www.pacificcorp.com/es/dsm/washington.html](http://www.pacificcorp.com/es/dsm/washington.html).

### *Home Energy Reports*

The *Home Energy Reports* program is a behavioral program designed to decrease participant energy usage by providing comparative energy usage data for similar homes located in the same geographical area. Additionally, the report provides the participant with information on how to decrease their energy usage. Equipped with this information, participants can modify behavior or make structural equipment, lighting, or appliance modifications to reduce their overall electric energy consumption.

Reports were initially provided to approximately 13,500 customers (referred to as “legacy” group). The number of participants decreased over time due to customer attrition from general customer churn (customer move-outs)<sup>19</sup> and customers requesting to be removed from the program. In 2014, the program was expanded to 38,500 additional customers (referred to as “expansion” group).<sup>20</sup> Another group of customers (referred to as “legacy refill” group) were added in January 2015 to offset attrition and lower energy savings than expected from the initial legacy group.<sup>21</sup>

Monthly reports are mailed to all new program participants for the initial three months to build program awareness. Following this initial three-month period, report frequency is moved to a bi-monthly schedule for the remainder of the program. All participants may request an electronic version delivered via email and have access to a web portal containing the same information about their usage and past usage provided in the report. The web portal also contains other functions such as a home energy audit tool, the ability for customers to update their home profile (for more accurate comparisons) and suggestions on more ways to save energy around their home.

Results are shown in Table 15.<sup>22</sup>

**Table 15**  
*Cost Effectiveness for Home Energy Reports*

<b>Benefit/Cost Test</b>	<b>B/C Ratio Combined</b>	<b>B/C Ratio Legacy + Refill Groups</b>	<b>B/C Ratio Expansion Group</b>
PTRC	1.42	1.81	1.16
TRC	1.29	1.64	1.05
UCT	1.29	1.64	1.05
PCT	N/A	N/A	N/A
RIM	0.39	0.42	0.37

Program savings by group for January 1, 2016 – December 31, 2016 is provided in Table 16.

<sup>19</sup> At the end of 2016 approximately 9,400 customers in the legacy group were still participating and receiving home energy reports.

<sup>20</sup> At the end of 2016, approximately 27,500 customers in the expansion group were still participating and receiving home energy reports.

<sup>21</sup> At the end of 2016, approximately 4,200 customers in the legacy refill group were still participating and receiving home energy reports.

<sup>22</sup> Due to the underachieved performance of the expansion group against the guaranteed savings, a \$100,000 credit was provided by the implementation contractor and applied against the costs to deliver the expansion group.

Table 16  
Program Savings

Home Energy Reports Group	Total kWh/Yr Savings (@ Site)
Expansion	4,466,390
Legacy + Refill	4,697,777
<b>Grand Total</b>	<b>9,164,167</b>

### Program Management

The program manager overseeing program activity in Washington is also responsible for *the Home Energy Savings* program in California and Washington. For each program in each state, the program manager is responsible for the cost effectiveness of the program, contracting with the program administrator, monitoring program performance and compliance, and recommending changes measures, incentives or delivery requirements as set in the tariff or posted on the Company's website.

### Program Administration

The *Home Energy Reports* program is administered by Opower. Opower's software creates individualized energy reports for utility customers that analyze their energy usage and offers recommendations on how to save energy and money by making small changes to their energy consumption. The Company contracts with Opower to provide energy savings, software services, and printing and delivery of energy reports to customers.

Opower is responsible for the following:

- Selecting Qualifying Customers – Opower conducts an analysis to identify qualifying customers. An independent, third party administrator then randomly assigns qualifying customers into the program's treatment (those who will receive reports) and control groups (for measurement and verification).
- Customer Comparison Analysis – Opower conducts statistical analysis to perform pattern recognition in order to derive actionable insights to selected customers.
- Energy Report Delivery – By mail and/or email.
- Web Portal Design and Support – Opower operates and maintains a customer Web portal that participants may visit for additional information about their energy usage and saving opportunities.

### Evaluation

In 2016, the Company published the results of a process and impact evaluation for program years 2014 - 2015. The legacy, refill, and expansion waves were evaluated. The primary objective of the evaluation report was to determine the extent to which participants in the *Home Energy Reports* program reduced their energy consumption due to the program. Secondary objectives are to report

on customer satisfaction with the program, and on behavioral and information effects of the program. Notable findings include:

- For the Legacy wave, savings remained relatively stable across the two years.
- Savings derived from the Legacy wave appear to have leveled off at about 2 percent savings, as is common for a mature program. The Expansion and Refill waves demonstrated increased savings, as is common for new waves.

The results of the evaluation can be viewed at [www.pacificorp.com/es/dsm/washington.html](http://www.pacificorp.com/es/dsm/washington.html).

### *Refrigerator Recycling*

The Refrigerator Recycling program (also known as “See ya later, refrigerator®”) was designed to decrease electricity use through voluntary removal and recycling of inefficient refrigerators and freezers. The program was available to residential, businesses and appliance retailers.

As part of the planning process for the 2016-2017 biennial period, the Company filed a tariff revision to cancel Schedule 107 effective January 1, 2016, based on forecasted sub-optimal cost effectiveness using new (and lower) unit energy savings from the Company’s program evaluation. The Commission approved this request at the December 30, 2015 open meeting.<sup>23</sup>

The cancellation of the program was compounded when the program administrator, JACO, entered into a voluntary receivership in November 2015. All pickups were cancelled and operations had ceased. The Company immediately posted this information on the program web site and used another vendor to contact the estimated 29 Washington customers affected by this development.

On November 30, 2015, the Company notified the DSM Advisory Group of the recent developments with JACO and the unavailability of the program offer ahead of the scheduled cancellation of the program.

In December 2015, the Company began an expedited sole source procurement process to contract for remedial or “clean-up” appliance recycling services including contacting customers who had pick-ups scheduled with JACO that were cancelled and offer the customer the same removal service and incentive. A contract with Appliance Recycling Centers of America was executed in late December 2015. In early 2016, all units were picked up from customers who were still interested. Table 17 below provides the savings, incentives and quantity of this clean-up effort.

Table 17  
Eligible Program Measures (Units)

Measure Category	Total kWh/Yr Savings (@ Site)	Total Incentive	Quantity
Freezers	1,980	\$ 120	4
Refrigerators	4,664	\$ 240	8
<b>Grand Total</b>	<b>6,644</b>	<b>\$ 360</b>	<b>12</b>

### Evaluation

A process and impact evaluation for program years 2013-2014 were published in 2016. This is the final evaluation for the program. Notable findings include:

- Overall NTG was 30 percent. The program had high freeridership levels due to three-quarters of respondents claiming they would have disposed of their unit without the program.

<sup>23</sup> Docket UE-152237.



- Participants expressed high satisfaction with the program.
- Participants most commonly learned about the program through bill inserts, word-of-mouth, print and television advertising.

The results of the evaluation can be viewed at [www.pacificorp.com/es/dsm/washington.html](http://www.pacificorp.com/es/dsm/washington.html).

### *Low Income Weatherization*

The *Low Income Weatherization* program provides energy efficiency services through a partnership between the Company and local non-profit agencies to residential customers who meet income-eligible guidelines. Services are at no cost to the program participants. Cost effectiveness for the *Low Income Weatherization* program was not included in the portfolio or sector-level analysis per WAC 480-109-100 (10)(b).

In 2016, 136 homes were treated, saving 294,462 kWh. Total homes treated, as well as the type and frequency of specific energy efficiency measures installed in each home, is provided in Table 18.

Table 18  
Eligible Program Measures (Units)

<b>Participation – Total # of Completed/Treated Homes</b>	<b>136</b>
<b>Number of Homes Receiving Specific Measures</b>	
Aerators	48
Attic Ventilation	126
Caulk/Weather-stripping	90
Ceiling Insulation	79
Compact Fluorescent Light bulbs	133
Duct Insulation	64
Floor Insulation	99
Fluorescent Light Fixture	2
LED Light Fixture	1
Ground Cover	83
Infiltration	136
Repairs	77
Replacement Refrigerators	14
Showerheads	32
Thermal Doors	2
Timed Thermostat	2
Wall Insulation	24
Water Heater Replacement	34
Water Pipe Insulation and Sealing	93

### Program Management

The program manager overseeing program activity in Washington is also responsible for the *Low Income Weatherization* programs in California, Idaho, Utah, and Wyoming; the bill discount programs in Washington, California, and Utah; and energy assistance programs in Washington, California, Idaho, Oregon, Utah, and Wyoming. For each program in each state, the program manager is responsible for the cost effectiveness of the energy efficiency programs, partnerships, and agreements in place with local agencies that serve income eligible households, establishing and monitoring program performance and compliance, and recommending changes in the terms and conditions set out in the tariff.

### Program Administration

The Company partners with three local non-profit agencies to provide weatherization services to income-qualifying households throughout its Washington service territory. These agencies include Blue Mountain Action Council located in Walla Walla, Northwest Community Action Center in Toppenish, and Opportunities Industrialization Center of Washington in Yakima. The leveraging of Company funding along with Washington Match Maker Program funds allows the agencies to provide these energy efficiency services to more households at no cost to participating customers. The Company provides rebates to partnering agencies for 50 percent of the cost of services while Match Maker funds are available, and will cover 100 percent of costs when these state funds are depleted. In 2016, all homes were funded at 50 percent. Participants qualify if they are homeowners or renters residing in single-family homes, manufactured homes, or apartments. Over 7,400 homes have been completed since the program's inception in the mid-1980s.

By contract with the Company, the agencies are responsible for the following:

- Income Verification – Agencies determine participant income eligibility based on Washington Department of Commerce guidelines. Households interested in obtaining weatherization services apply through the agencies. The 2016 income guidelines can be viewed on the Washington Department of Commerce website<sup>24</sup>.
- Energy Audit – Agencies use a U.S. Department of Energy approved audit tool or priority list to determine the cost effective measures to install in the participant's homes (audit results must indicate a savings to investment ratio of 1.0 or greater).
- Installation of Measures – Agencies install the energy efficiency measures.
- Post Inspections – Agencies inspect 100 percent of completed homes. A sample of 5 -10 percent are inspected by a Pacific Power inspector. See Appendix 2 for verification summary.
- Billing Notification – Agencies are required to submit a billing to Company within 90 days after job completion. A homeowner agreement and invoice form indicating the measures installed and associated cost is submitted on each completed home.

On September 1, 2016, the Commission issued Order 12 in Docket UE-152253, which included the following:

Pacific Power must also initiate a stakeholder collaborative to discuss changes to its low-income weatherization program. This collaborative may be conducted in concert with the LIBA collaborative; or separately, as resources permit. In addition to Staff and the Energy Project, the Company should invite Public Counsel, Boise, and NWECA to participate. Any mutually agreed-upon modifications or additions should be filed with the Commission by April 1, 2017.<sup>25</sup>

Representatives from the organizations mentioned in the order as well as from our partnering weatherization agencies have been invited to discuss program changes separately from the LIBA collaborative. A filing with proposed changes will be made in March 2017 based on mutually

<sup>24</sup><http://www.commerce.wa.gov/wp-content/uploads/2016/06/energy-weatherization-Eligibility-Guidelines-2016.pdf>

<sup>25</sup> *WUTC v. Pacific Power & Light Company*, Docket UE-152253, Order 12, ¶ 255 (Sept. 1, 2016).

agreed-upon revisions discussed in the collaborative meetings held on December 15, 2016, and February 2, 2017.

### Evaluation

No evaluation activities occurred in 2016.

### *Northwest Energy Efficiency Alliance*

The Northwest Energy Efficiency Alliance (NEEA) is a non-profit corporation that works collaboratively with its funders and other strategic market partners to accelerate the innovation and adoption of energy-efficient products, services, and practices. NEEA is supported by BPA, Energy Trust of Oregon, and more than 100 Northwest utilities, including Pacific Power

Program performance for 2016 is being reported based on NEEA's preliminary results for Pacific Power of 3,561 MWh (at site). Consistent with the reporting convention approved in Docket UE-132047 the savings represent Pacific Power's portion of Total Regional Savings less the Company's local program savings (adjustment to total movement in the market baseline for measures impacted by NEEA's efforts to account for savings already captured and reported through Pacific Power's Washington programs).

### Program Administration

The Company has a representative on the NEEA board of directors as well as representatives on each of the sector advisory committees, residential, commercial and industrial. The Company also has representation on NEEA's broader Regional Portfolio Advisory Committee and participants in the regional Northwest Research Group. Collectively the representatives work collaboratively with the other funders, advisory group members, and NEEA to direct the efforts of NEEA in the best interest of the region in the achievement of the region's market transformation objectives.

## Non-Residential Program

The Non-Residential Energy Efficiency program is promoted to the Company's commercial, industrial and agricultural customers as *wattsmart Business*.

The *wattsmart Business* program<sup>26</sup> is intended to maximize the efficient utilization of electricity for new and existing non-residential customers through the installation of energy efficiency measures and energy management protocols. Qualifying measures are any measures which, when implemented in an eligible facility, result in verifiable electric energy efficiency improvements.

The program was cost effective in 2016 as shown in Table 19 below.

Table 19  
Cost Effectiveness for *wattsmart Business*

Benefit/Cost Test	Benefit/Cost Ratio
PTRC	1.95
TRC	1.77
UCT	3.21
PCT	3.06
RIM	0.68

Sector level performance for 2016 is provided in Table 20.

Table 20  
Program Performance by Sector

Sector	Total kWh/Yr Savings @ Site	Total kW Savings @ Site	Total Incentive	Total Projects
Agricultural	690,513	159	\$81,169	28
Commercial	16,642,824	2,083	\$2,288,685	438
Industrial	13,210,222	1,040	\$1,572,782	58
<b>Total</b>	<b>30,543,559</b>	<b>3,282</b>	<b>\$3,942,636</b>	<b>524</b>

<sup>26</sup> The program brochure is available at [https://www.pacificpower.net/content/dam/pacific\\_power/doc/Business/Save\\_Energy\\_Money/WA\\_wattsmartBusiness\\_Brochure.pdf](https://www.pacificpower.net/content/dam/pacific_power/doc/Business/Save_Energy_Money/WA_wattsmartBusiness_Brochure.pdf). Program detail (in addition to the program tariff, Schedule 140) maintained on the Company website is available at [https://www.pacificpower.net/content/dam/pacific\\_power/doc/Business/Save\\_Energy\\_Money/WA\\_wattsmartBusiness\\_Incentive\\_tables\\_information.pdf](https://www.pacificpower.net/content/dam/pacific_power/doc/Business/Save_Energy_Money/WA_wattsmartBusiness_Incentive_tables_information.pdf).

Program performance by measure category is provided in Table 21.

Table 21  
Program Performance by Measure Category

Measure Category	Total kWh/Yr Savings (@ Site)	Total kW Savings	Total Incentive	Total # of Projects
Building Shell	58,143	9	\$ 35,776	9
Compressed Air	1,457,871	61	\$ 169,460	11
Energy Management	1,571,461	20	\$ 31,429	6
Farm & Dairy	103,251	11	\$ 9,165	2
Food Service Equipment	156,774	21	\$ 10,000	5
HVAC	962,554	420	\$ 125,527	21
Irrigation	779,279	227	\$ 90,240	29
Lighting	17,829,274	2,022	\$ 2,380,026	405
Motors	97,810	10	\$ 12,732	11
Refrigeration	5,603,090	312	\$ 798,659	21
Wastewater	1,924,052	169	\$ 279,621	4
<b>Grand Total</b>	<b>30,543,559</b>	<b>3,282</b>	<b>\$ 3,942,636</b>	<b>524</b>

Services and incentives offered through the *wattsmart* Business program include:

- Typical Upgrades: Incentives for lighting, HVAC, compressed air and other equipment upgrades that increase electrical energy efficiency and exceed energy code requirements.
- Custom analysis: Offers energy analysis studies, services and incentives for more complex projects.
- Energy Management: Provides expert facility and process analysis and incentives to help lower energy costs by optimizing customer's energy use.
- Energy Project Manager Co-funding: Available to customers who commit to an annual goal of completing energy projects resulting in at least 1,000,000 kWh/year in energy savings.
- Enhanced incentives for small businesses: Provides enhanced incentives for lighting upgrades installed by an approved *wattsmart* Small Business Contractor at an eligible existing small business customer facility.
- Midstream/LED Instant Incentive: Provides instant, point-of-purchase incentive for LED lamps and retrofit kits sold through qualifying participating distributors. Customers purchasing lamps from non-participating suppliers can apply for incentives after purchase.

### Program Management

The program manager overseeing program activity in Washington is also responsible for the business energy efficiency programs in California. For each state the program manager is

responsible for the cost effectiveness of the program, identifying, and contracting with the program administrators through a competitive bid process, program marketing, establishing and monitoring program performance and compliance, and recommending program changes.

### Program Administration

The program includes several delivery channels, including Trade Ally, Small Business Enhanced Incentive Offer, Midstream/LED Instant Incentive, and Project Manager delivery.

#### *Trade Ally*

In this channel, the program is primarily marketed through local trade allies who receive support from one of two program administrators. The Company contracts with Nexant, Inc. (Nexant) and Cascade Energy (Cascade) for trade ally coordination, training and application processing services for commercial measures and industrial/agricultural measures, respectively.

Nexant and Cascade are responsible for the following:

- Trade ally engagement – identify, recruit, train, support and assist trade allies to increase sales and installation of energy efficient equipment at qualifying business customer facilities.
- Incentive processing and administrative support – handle incoming inquiries as assigned, process incentive applications, develop and maintain simplified analysis tools and provide program design services, evaluation and regulatory support upon request.
- Direct customer outreach and project facilitation for smaller customer projects.
- Inspections – verify on an on-going basis the installation of measures.<sup>27</sup> A summary of the inspection process is in Appendix 2.

#### *Small Business Enhanced Incentive Offer*

In this channel, the program is primarily marketed through local contractors approved specifically for this offer who receive support from the program administrator, Nexant. Nexant is responsible for the following:

- Management of approved contractors – identify, recruit, contract with, train, support, and assist contractors to increase sales and installation of energy efficient lighting equipment at qualifying small business customer facilities.
- Incentive processing and administrative support – handle incoming inquiries as assigned, process incentive applications, develop and maintain simplified analysis tool and provide program design services, evaluation and regulatory support upon request.
- Inspections – verify on an on-going basis the installation of measures. A summary of the inspection process is in Appendix 2 to this report.

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<sup>27</sup> The Company contracts with firms from the energy engineering consultant list to perform required pre- and post-installation inspections for lighting projects.



### *Midstream/LED Instant Incentive Offer*

In this channel, the program is primarily marketed through distributors approved specifically for this offer who receive support from the program administrator, Nexant. Nexant is responsible for the following:

- Management of approved distributors – identify, recruit, contract with, train, support, and assist distributors to increase sales of energy efficient lighting equipment at qualifying business customer facilities.
- Incentive processing and administrative support – handle incoming inquiries as assigned, process incentive applications, and provide program design services, evaluation and regulatory support upon request.
- Inspections – verify on an on-going basis the installation of measures at eligible customer facilities. A summary of the inspection process is in Appendix 2 to this report.

### *Project Manager*

In this channel, the Company's project manager manages a subset of more complex projects. The project manager works directly with the customer or through the Company's regional business managers.<sup>28</sup> The project manager provides customers with program services and incentives using a pre-contracted group of energy engineering consultants. A current list of these consultants is included in the Infrastructure section below.

The *wattsmart* Business energy engineering consultant contracts expired in 2016 for all states. The Company initiated a request for proposal and new contracts were in place by November 1, 2016.

The *wattsmart* Business outsourced delivery program administration contracts expired in 2016 for all states. The Company initiated a request for proposal in 2015 and new contracts were in place as of July 1, 2016.

### Infrastructure

To help increase and improve the supplier and installation contractor infrastructure for typical energy efficient equipment and services, the Company established and continues to develop and support trade ally networks for lighting, HVAC, motors/VFDs, and irrigation. This work includes identifying and recruiting trade allies, providing program and technical training and providing sales support on an ongoing basis. The current searchable list of trade allies who have applied and been approved as participating *wattsmart* Business vendors are available on the Company website<sup>29</sup> and is included as Appendix 4 to this report. In most cases, customers are not required to select a vendor from these lists to receive an incentive.<sup>30</sup>

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<sup>28</sup> Regional business managers are responsible for directly working with Washington commercial and industrial/ag customers.

<sup>29</sup> Searchable participating vendor lists are available from the Company website. Direct link to the "Find a Vendor" search tool: [http://pacificpower-tradeally.energyefficiencyalliance.net/tradeally/jsp/Contractor\\_Search/ContractorSearch.jsp](http://pacificpower-tradeally.energyefficiencyalliance.net/tradeally/jsp/Contractor_Search/ContractorSearch.jsp)

<sup>30</sup> For the *wattsmart* Small Business enhanced incentives, customers are required to choose one of the approved contractors for this offer.

The total number of participating trade allies is currently 83. The current count of participating trade allies by technology are in Table 22.

Table 22  
Participating Trade Allies<sup>31</sup>

Lighting	HVAC	Motors and VFD	Irrigation	Small Business – approved contractors	LED Instant Incentive – approved distributors
68	22	44	5	7	7

For the project manager delivery channel supporting larger customers, a pre-approved, pre-contracted group of engineering firms can be used to perform facility specific energy efficiency analysis, quality assurance and verification. Table 23 lists the engineering firms currently under contract with the Company.

Table 23  
Energy Engineering Firms

Engineering Firm	Main Office Location
Cascade Energy	Portland, OR
Compression Engineering Corp	Beaverton, OR
EMP2, Inc	Richland, WA
Energy 350	Portland, OR
Energy Resource Integration, LLC	Sausalito, CA
EnSave, Inc.	Richmond, VT
Evergreen Consulting Group	Portland, OR
kW Engineering, Inc.	Oakland, CA
Lincus Inc.	Emeryville, CA
Nexant, Inc.	Portland, OR
Solarc Energy Group	Eugene, OR

### Program Changes

The Company made significant programmatic changes on two separate dates. Effective January 1, 2016, changes were made to:

- Update the program to align with changes in standards, third-party specifications (e.g. Consortium for Energy Efficiency, Regional Technical Forum unit energy savings values/protocols, and market data).
- Update measures for residential equipment used in a business to align with planned changes for the Home Energy Savings program.
- Incorporate waste heat to power and regenerative technologies into the program.

<sup>31</sup> Some trade allies may participate in more than one technology so the count of unique participating firms is less than the total count provided.

Effective July 11, 2016, changes were made to:

- Align the program with Washington State Energy Code 2015.
- Restructure and align lighting retrofit incentives with declining material costs for LED lighting technology.
- Add heat pump clothes dryer measures (residential equipment used in a business).
- Make minor adjustments to mid-market lamp categories and revise incentives for four categories of lamps in the Washington *wattsmart* Business LED Instant Incentive offer. This change aligns incentives with LED product costs which have declined since 2015 when the offer was introduced. It also aligns the offer with revised lighting retrofit incentives in the *wattsmart* Business program.

### Adaptive Management

The Company made substantial changes through an adaptive management approach. The following bullets summarize the changes.

#### *Mid-market lighting channel*

- During 2016, the Company's outsourced delivery contractor, Nexant, monitored LED lamp prices and participation and noted a decline in prices for some lamp categories. Nexant recommended reductions to incentives for four types of lamps in the midstream/mid-market offer.
- The Company and Nexant coordinated with NEEA on full category sales data. NEEA's data set for the Washington Pacific Power service area will be shared and analyzed in 2017.
- Given not all customers purchase lighting from a local distributor, Nexant explored options for online retailers to participate in the mid-market offer. Subsequently, a company called RebateBus is building the incentive applications at the point of sale for specific online retailers. Work will be finalized in 2017.

#### *Trade Ally Portal and Online Applications*

Nexant completed planning in 2016 for updates to the trade ally portal, a one-stop website resource for trade allies, as well as the online application to become a *wattsmart* Business vendor. There will be additional insurance requirements to align with best practices for trade ally management. The updates will launch in 2017.

#### *Financing*

A new contract signed in 2016 with Nexant includes provisions to add optional financing. Development work for this option was completed in 2016. The full launch will be in 2017.

#### *Lighting Tool*

A new contract signed in 2016 with Nexant includes provisions to move the current Excel based lighting tool to an iPad-based assessment platform (iEnergy Onsite), reducing version control challenges and increasing usability. Development work for this option was completed in 2016. The full launch will be in 2017.

Evaluation

A process and impact evaluation was in progress during 2016. The evaluation will be made publicly available once it has been published.

## Communications, Outreach and Education

The Company uses earned media, customer communications, paid media, and program specific media to communicate the value of energy efficiency, and provide information regarding low-cost and no-cost energy efficiency measures. The Company endeavors to educate customers on the availability of technical assistance, services, and incentives with the overall goal to engage customers in reducing their energy usage.

### *Earned Media*

Earned media is managed by the Company's external communications department in cooperation with the regional business managers located in Washington. "Earned media" generally refers to favorable television, radio, newspaper, or internet news coverage gained through press releases, media events, opinion pieces, story pitches, or other communication with news editors and reporters.

### *Customer Communications*

As part of the Company's regular communications to its customers, newsletters across all customer classes promote energy efficiency initiatives and case studies on a regular basis. Inserts and outer envelopes featuring energy efficiency messages have also been used on a consistent basis. In 2016, the Company issued two newsletters focused entirely on seasonal energy efficiency information (in the fall and spring).

The Company uses its website and social media, such as Twitter and Facebook, to communicate and engage customers on DSM offers and incentives.

### *Paid Media/wattsmart campaign*

In 2016 the Company continued with the multi-faceted campaign with programs aimed at specific customer groups, but all share the common theme: Pacific Power wants to help you save money and energy by being *wattsmart*. This communication campaign aims to create awareness of the importance of being energy efficient, and to help increase participation in the Company's DSM programs.

The Company's 2016 research showed that among Washington customers:

- Fifty-six percent of Washington respondents are familiar with energy efficiency programs from their utility.
- Nearly half of the respondents (49 percent) report taking action based on utility advertisements.

Of those persuaded to take action, the most common actions are switching to energy efficient appliances and lights, and shutting off lights and appliances when not in use.

Key strategies with this plan, keeping objectives and budgets in the forefront included:

- Implementing an advertising campaign featuring *wattsmart* energy efficiency messaging.
- Promoting customer conservation (behavioral changes) and increasing participation and savings through the Company's *wattsmart* DSM programs.
- Motivating customers to reduce consumption independently or to do so by participating in at least one of the Company's *wattsmart* DSM programs.
- Educating customers on how these programs can help them save money on their utility bills, reduce energy consumption, and keep costs down for all customers in Washington.

The *wattsmart* advertising campaign is comprised of a multi-media mix designed to reach as many customers as possible with the greatest frequency. New creative to specifically target small to mid-size business customers was added in 2016. Various communication channels were used to optimize effectiveness, frequency and coverage and to build on the messages. Table 24 outlines the Washington media channels used, the value of each channel, and the impressions achieved to date.

Table 24  
2016 Media Channels

Communication Channel	Value to Communication Portfolio	2016 Placements
Television	Television has the broadest reach and works as the most effective media channel	2,187,000 impressions
Radio	Given the cost relative to television, radio builds on communications delivered via television while providing for increased frequency of messages	902,000 impressions
Newspaper/Magazine	Supports broadcast messages and guarantees coverage in areas harder to reach with broadcast	898,787 impressions
Online advertising	Digital display and Google Search	3,270,792 impressions and 8,082 search impressions
Facebook Advertising	Advertising on Facebook	606,523 impressions
Twitter @PacificPower_WA	Awareness for early adopters regarding energy efficiency tips Tweets posted on a weekly basis	722 followers through December 2016
Facebook <a href="http://www.facebook.com/pacificpower">www.facebook.com/pacificpower</a>	Awareness for early adopters regarding energy efficiency tips and a location to share information	17,407 fans through December 2016 (for all Pacific Power states)

The total number impressions for the campaign in 2016 were 7,873,184.

Links to the Company's current portfolio of advertisements is included in Appendix 5. The audiences for these messages were prioritized as follows:

- Primary: Households in Pacific Power's service area.
- Secondary: Small and large business in Pacific Power's service area.

### *Program Specific*

All energy efficiency program communications are branded under the *wattsmart* umbrella to reinforce the campaign and to link changes in behavior to actions customers can take by participating in specific programs. Separate marketing activities administered by and specific to the programs ran in conjunction with the *wattsmart* campaign in 2016.

#### *Home Energy Savings*

Information on the *Home Energy Savings* program is communicated to customers, retailers and trade allies through a variety of channels including bill inserts, newsletters, website and social media.

Using a strategic approach, the Company communicates select program measures during key selling seasons and promotes *wattsmart* Starter Kits to targeted customers throughout the year to achieve savings goals.

In February, the Company included a bill insert to Washington residential customers with information on smart thermostats and the \$50 cash incentive.

Messaging shifted to cooling as summer approached. The Company emphasized the cooling benefits of ductless heat pumps and the \$1,000 incentive in a June bill insert, as well as on the website and on social media.

Targeted customer communications were also distributed to promote *wattsmart* Starter kits through direct mail and Facebook ads. The Facebook ads generated 808 customer clicks.

In 2016, Pacific Power launched the Home Energy Advisor online tool to provide another resource to engage customers and drive *wattsmart* program participation. Information about the new audit tool was included in company newsletters and on the website.

Program communications delivered approximately 310,849 impressions. Breakdown of estimated impressions by channel are shown in Table 25 below. These estimates do not reflect all of the customer, retailer and trade ally touch points.

Table 25  
Impressions by Channel

Communications Channel	2016 Estimated Impressions
Facebook ads	93,849
Bill inserts	212,000
Direct mail	5,000

#### *Home Energy Reports*

*Home Energy Reports* were mailed to about 41,000 customers several times throughout 2016. Many of these customers also received email reports with customized energy-saving tips. In

addition, customers could access the program web portal with additional tools, insights and ways to save energy.

### wattsmart Business

In 2016, customer communications and outreach supported *wattsmart Business* using radio, print, paid digital display and search advertising, direct mail, email and social media. This was in addition to customer direct contact by Company project managers and regional community managers, as well as trade ally partners; articles in the Company newsletters and content on the Company's website.

During 2016, radio communications encouraged business customers to make energy efficiency upgrades and print ads featured case study examples from program participants which were repurposed in social media. Eblasts and digital search ads directed viewers to the Company's website<sup>32</sup>. Targeted direct mail was also sent to irrigation customers in the fall to encourage energy-saving retrofits. Emails focused on vertical markets were sent to office/retail, grocery/convenience stores and restaurant/lodging businesses. A separate webinar was held for restaurants and food service customers to educate and inform them about incentives and savings available to their industry.

Two customers were recognized as *wattsmart Business Partners* of the year, presented with a trophy and announced in a press release. In 2016, the program garnered 2,599,279 impressions. A breakdown of impressions by media type is shown in Table 26.

Table 26  
*wattsmart Business*

Communications Channel	2016 Impressions
Radio	1,547,900
Newspaper	516,925
Magazine	268,800
Digital Display	246,693
Google Search	494
Eblasts	15,527
Direct Mail	2,940

### *Energy Education in Schools*

The Company offers a *wattsmart Schools* education program through the National Energy Foundation (NEF). The program is designed to develop a culture of energy efficiency among teachers, students, and families. The centerpiece is a series of one hour presentations with hands-on, large group activities for 4<sup>th</sup> and 5<sup>th</sup> grade students. Teachers are provided instructional materials for use in their classrooms, and students are sent home with a Household Report Card to explore energy use in their homes and to encourage efficient behaviors.

<sup>32</sup> [www.pacificpower.net/wasave](http://www.pacificpower.net/wasave)



In 2016, NEF conducted presentations in Washington schools in the fall. Between October 11 and November 12, 2016, the program met its outreach goals of reaching 3,964 students and 146 teachers in 48 schools with 64 percent of “Household Report Cards”, which are used as part of a home energy audit activity, completed, and returned.

## Evaluations

Evaluations are performed by independent external evaluators to validate energy and demand savings derived from the Company's energy efficiency programs. Industry best practices are adopted by the Company with regards to principles of operation, methodologies, evaluation methods, definitions of terms, and protocols including those outlined in the National Action Plan for Energy Efficiency Program Impact Evaluation and the California Evaluation Framework guides.

A component of the overall evaluation effort is aimed at the reasonable verification of installations of energy efficient measures and associated documentation through review of documentation, surveys and/or ongoing onsite inspections.

Verification of the potential to achieve savings involves regular inspection and commissioning of equipment. The Company engages in programmatic verification activities, including inspections, quality assurance reviews, and tracking checks and balances as part of routine program implementation and may rely upon these practices in the verification of installation information for the purposes of savings verifications in advance of more formal impact evaluation results. A summary of the inspection process is included in Appendix 2.

Evaluation, measurement and verification tasks are segregated within the Company to ensure they are performed and managed by personnel who are not directly responsible for program management.

Information on evaluation activities completed or in progress during 2016 is summarized in the chart below. Summary of the recommendations are provided in Appendix 6. The evaluation reports are available at [www.pacificorp.com/es/dsm/washington.html](http://www.pacificorp.com/es/dsm/washington.html).

<b>Program / Activities</b>	<b>Years Evaluated</b>	<b>Evaluator</b>	<b>Progress Status</b>
Home Energy Reports	2014-2015	Navigant Consulting	Completed
Refrigerator Recycling	2013 - 2014	Cadmus	Completed
Home Energy Savings	2013 - 2014	Cadmus	Completed
Home Energy Savings	2015-2016	Cadmus	In Progress
Low Income Weatherization	2013-2015	Opinion Dynamics	In Progress



## Appendix 1

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# Energy Efficiency Cost Effectiveness

Pacific Power



Navigant estimated the cost-effectiveness for the overall energy efficiency portfolio and component sectors, based on 2016 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall energy efficiency portfolio and the two sector components.

The program passes the cost-effectiveness for all the tests except the RIM test. The memo consists of the following tables.

Table 1 - Utility Inputs

Table 2 – Portfolio Level Costs 201

Table 3 – NEEA Inputs 201

Table 4 - Benefit/Cost Ratios by Portfolio Type

Table 5 – 2016 Total Portfolio Cost-Effectiveness Results

Table 6 – 2016 Total Portfolio Cost-Effectiveness Results (Including NEEA)

Table 7 – 2016 Total Portfolio Cost-Effectiveness Results (Including NEBs)

Table 8 – 2016 Total Portfolio Cost-Effectiveness Results (Including NEEA and NEBs)

Table 9 – 2016 C&I Energy Efficiency Portfolio Cost-Effectiveness Results

Table 10 – 2016 C&I Energy Efficiency Portfolio Cost-Effectiveness Results (Including NEEA)

Table 11 – 2016 Residential Energy Efficiency Portfolio Cost-Effectiveness Results

Table 12 – 2016 Residential Energy Efficiency Portfolio Cost-Effectiveness (Including NEEA)

Table 13 – 2016 Residential Energy Efficiency Portfolio Cost-Effectiveness (Including NEBs)

Table 14 – 2016 Residential Energy Efficiency Portfolio Cost-Effectiveness (Including NEEA and NEBs)

Table 15 – Home Energy Savings Non-Energy Benefits (2016)

**Table 1 - Utility Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Commercial Line Loss	9.53%
Industrial Line Loss	8.16%
Irrigation Line Loss	9.67%
Residential Energy Rate (\$/kWh)	\$0.0836
Commercial Energy Rate (\$/kWh)	\$0.0717
Industrial Energy Rate (\$/kWh)	\$0.0887
Irrigation Energy Rate (\$/kWh)	\$0.1327
Inflation Rate <sup>1</sup>	1.9%

<sup>1</sup> Future rates determined using a 1.9% annual escalator.

**Table 2 – Portfolio Level Costs 2016**

Expense	Cost
School Energy Education	\$62,794
Outreach and Communication	\$184,227
Portfolio Level Expenditures	\$538,498
<b>Total Costs</b>	<b>\$785,519</b>

**Table 3 – NEEA Inputs 2016**

Sector	Savings at Meter (kWh)	NEEA Expenses (\$)
Residential	2,483,827	\$607,047
Industrial	1,033,292	\$252,216
Commercial	44,349	\$10,690
<b>Total</b>	<b>3,561,468</b>	<b>\$869,953</b>

**Table 4 - Benefit/Cost Ratios by Portfolio Type**

Measure Group	PTRC	TRC	UCT	RIM	PCT
Total Portfolio	1.73	1.57	2.61	0.65	3.02
Total Portfolio (Including NEEA)	1.71	1.56	2.50	0.63	3.16
Total Portfolio (Including NEBs)	1.89	1.73	2.61	0.65	3.05
Total Portfolio (Including NEEA & NEBs)	1.86	1.70	2.50	0.63	3.18
C&I Programs	1.95	1.77	3.21	0.68	3.06
C&I Programs (Including NEEA)	1.94	1.76	3.14	0.68	3.12
Residential Programs	1.42	1.29	1.91	0.58	2.88
Residential Programs (Including NEEA)	1.40	1.27	1.77	0.55	3.29
Residential Programs (Including NEBs)	2.06	1.94	1.91	0.58	3.00
Residential Programs (Including NEEA & NEBs)	1.96	1.83	1.77	0.55	3.42

\*Portfolio and Residential results exclude the Low Income Program from the analysis.

**Table 5 – 2016 Total Portfolio Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0475	\$17,199,783	\$29,773,599	\$12,573,816	1.73
Total Resource Cost Test (TRC) No Adder	\$0.0475	\$17,199,783	\$27,066,909	\$9,867,125	1.57
Utility Cost Test (UCT)	\$0.0286	\$10,355,926	\$27,066,909	\$16,710,983	2.61
Rate Impact Test (RIM)		\$41,774,897	\$27,066,909	-\$14,707,989	0.65
Participant Cost Test (PCT)		\$12,168,394	\$36,743,530	\$24,575,135	3.02
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003049141

**Table 6 – 2016 Total Portfolio Cost-Effectiveness Results (Including NEEA)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0475	\$18,069,736	\$30,932,651	\$12,862,914	1.71
Total Resource Cost Test (TRC) No Adder	\$0.0475	\$18,069,736	\$28,120,592	\$10,050,855	1.56
Utility Cost Test (UCT)	\$0.0295	\$11,225,879	\$28,120,592	\$16,894,713	2.50
Rate Impact Test (RIM)		\$44,299,759	\$28,120,592	-\$16,179,167	0.63
Participant Cost Test (PCT)		\$12,168,394	\$38,398,438	\$26,230,044	3.16
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003659049

**Table 7 – 2016 Total Portfolio Cost-Effectiveness Results (Including NEBs)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0475	\$17,199,783	\$32,428,186	\$15,228,403	1.89
Total Resource Cost Test (TRC) No Adder	\$0.0475	\$17,199,783	\$29,721,495	\$12,521,712	1.73
Utility Cost Test (UCT)	\$0.0286	\$10,355,926	\$27,066,909	\$16,710,983	2.61
Rate Impact Test (RIM)		\$41,774,897	\$27,066,909	-\$14,707,989	0.65
Participant Cost Test (PCT)		\$12,168,394	\$37,089,055	\$24,920,660	3.05
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003049141

**Table 8 – 2016 Total Portfolio Cost-Effectiveness Results (Including NEEA and NEBs)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0475	\$18,069,736	\$33,587,237	\$15,517,501	1.86
Total Resource Cost Test (TRC) No Adder	\$0.0475	\$18,069,736	\$30,775,178	\$12,705,442	1.70
Utility Cost Test (UCT)	\$0.0295	\$11,225,879	\$28,120,592	\$16,894,713	2.50
Rate Impact Test (RIM)		\$44,299,759	\$28,120,592	-\$16,179,167	0.63
Participant Cost Test (PCT)		\$12,168,394	\$38,743,963	\$26,575,568	3.18
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003659049

**Table 9 – 2016 C&I Energy Efficiency Portfolio Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0423	\$12,288,719	\$23,910,899	\$11,622,179	1.95
Total Resource Cost Test (TRC) No Adder	\$0.0423	\$12,288,719	\$21,737,181	\$9,448,461	1.77
Utility Cost Test (UCT)	\$0.0233	\$6,774,176	\$21,737,181	\$14,963,005	3.21
Rate Impact Test (RIM)		\$31,779,478	\$21,737,181	-\$10,042,297	0.68
Participant Cost Test (PCT)		\$9,457,179	\$28,947,938	\$19,490,759	3.06
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001783812

**Table 10 – 2016 C&I Energy Efficiency Portfolio Cost-Effectiveness Results (Including NEEA)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0424	\$12,551,625	\$24,314,058	\$11,762,432	1.94
Total Resource Cost Test (TRC) No Adder	\$0.0424	\$12,551,625	\$22,103,689	\$9,552,063	1.76
Utility Cost Test (UCT)	\$0.0238	\$7,037,082	\$22,103,689	\$15,066,607	3.14
Rate Impact Test (RIM)		\$32,561,226	\$22,103,689	-\$10,457,537	0.68
Participant Cost Test (PCT)		\$9,457,179	\$29,466,779	\$20,009,600	3.12
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001857571

**Table 11 – 2016 Residential Energy Efficiency Portfolio Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0576	\$4,125,545	\$5,862,701	\$1,737,155	1.42
Total Resource Cost Test (TRC) No Adder	\$0.0576	\$4,125,545	\$5,329,728	\$1,204,182	1.29
Utility Cost Test (UCT)	\$0.0391	\$2,796,231	\$5,329,728	\$2,533,497	1.91
Rate Impact Test (RIM)		\$9,209,901	\$5,329,728	-\$3,880,173	0.58
Participant Cost Test (PCT)		\$2,711,215	\$7,795,592	\$5,084,377	2.88
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001378696

**Table 12 – 2016 Residential Energy Efficiency Portfolio Cost-Effectiveness (Including NEEA)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0562	\$4,732,592	\$6,618,593	\$1,886,001	1.40
Total Resource Cost Test (TRC) No Adder	\$0.0562	\$4,732,592	\$6,016,903	\$1,284,311	1.27
Utility Cost Test (UCT)	\$0.0404	\$3,403,278	\$6,016,903	\$2,613,625	1.77
Rate Impact Test (RIM)		\$10,953,014	\$6,016,903	-\$4,936,111	0.55
Participant Cost Test (PCT)		\$2,711,215	\$8,931,659	\$6,220,443	3.29
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001753890



**Table 13 – 2016 Residential Energy Efficiency Portfolio Cost-Effectiveness (Including NEBs)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0576	\$4,125,545	\$8,517,287	\$4,391,742	2.06
Total Resource Cost Test (TRC) No Adder	\$0.0576	\$4,125,545	\$7,984,314	\$3,858,769	1.94
Utility Cost Test (UCT)	\$0.0391	\$2,796,231	\$5,329,728	\$2,533,497	1.91
Rate Impact Test (RIM)		\$9,209,901	\$5,329,728	-\$3,880,173	0.58
Participant Cost Test (PCT)		\$2,711,215	\$8,141,117	\$5,429,901	3.00
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001378696

**Table 14 – 2016 Residential Energy Efficiency Portfolio Cost-Effectiveness (Including NEEA and NEBs)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0562	\$4,732,592	\$9,273,180	\$4,540,587	1.96
Total Resource Cost Test (TRC) No Adder	\$0.0562	\$4,732,592	\$8,671,489	\$3,938,897	1.83
Utility Cost Test (UCT)	\$0.0404	\$3,403,278	\$6,016,903	\$2,613,625	1.77
Rate Impact Test (RIM)		\$10,953,014	\$6,016,903	-\$4,936,111	0.55
Participant Cost Test (PCT)		\$2,711,215	\$9,277,183	\$6,565,968	3.42
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001753890

The table below summarizes the non-energy benefits for the Home Energy Savings program.

**Table 15 – Home Energy Savings Non-Energy Benefits (2016)**

Non-Energy Benefits	Non-Energy Benefits Water (\$/yr)	Non-Energy Benefits Other (\$/yr)	Measure Life	Quantity	Total Present Value Benefits
Appliances with NEBs	\$3,823.70	\$482.20	14	171	\$41,013
Energy Kits - DHW with NEBs	\$80,166.42	\$8,738.88	9	2,963	\$641,176
Energy Kits - Lighting with NEBs	\$2,323.12	\$253.24	9	2,963	\$18,580
HVAC with NEBs	\$0.00	\$12,501.27	17	672	\$132,131
Lighting with NEBs	\$0.00	\$237,235.90	10	250,632	\$1,821,686
<b>Total HES NEBs</b>	<b>\$86,313.24</b>	<b>\$259,211.49</b>	<b>12</b>	<b>257,401</b>	<b>\$2,654,587</b>



Navigant estimated the cost-effectiveness results for the Washington Home Energy Savings Program, based on 2016 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program and for the 9 measure categories.

Cost-effectiveness was tested using the 2015 IRP west residential heating 17%, west residential lighting 48%, west residential water heating 53%, west plug loads 61%, and west residential whole house load factor decrements. The program passes the cost-effectiveness for all the tests except the RIM test. The memo consists of the following tables.

- Table 1 - Home Energy Savings Inputs
- Table 2 – Home Energy Savings Annual Program Costs
- Table 3 – Home Energy Savings – Savings by Measure Category
- Table 4 - Benefit/Cost Ratios by Measure Category
- Table 5 – Home Energy Savings Program Level Cost-Effectiveness Results
- Table 6 - Home Energy Savings Appliance Cost-Effectiveness Results
- Table 7 - Home Energy Savings Building Shell Cost-Effectiveness Results
- Table 8 - Home Energy Savings Electronics Cost-Effectiveness Results
- Table 9 - Home Energy Savings Energy Kits - DHW Cost-Effectiveness Results
- Table 10 - Home Energy Savings Energy Kits - Lighting Cost-Effectiveness Results
- Table 11 - Home Energy Savings HVAC Cost-Effectiveness Results
- Table 12 - Home Energy Savings Lighting Cost-Effectiveness Results
- Table 13 - Home Energy Savings Water Heating Cost-Effectiveness Results
- Table 14 - Home Energy Savings Whole Home Cost-Effectiveness Results
- Table 15 - Home Energy Savings Non-Energy Benefits by Measure
- Table 16 - Home Energy Savings Program (with NEBs) Cost-Effectiveness Results
- Table 17 - Home Energy Savings Appliance (with NEBs) Cost-Effectiveness Results
- Table 18 - Home Energy Savings Energy Kits - DHW (with NEBs) Cost-Effectiveness Results
- Table 19 - Home Energy Savings Energy Kits – Lighting (with NEBs) Cost-Effectiveness Results
- Table 20 - Home Energy Savings HVAC (with NEBs) Cost-Effectiveness Results
- Table 21 - Home Energy Savings Lighting (with NEBs) Cost-Effectiveness Results

**Table 1 - Home Energy Savings Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Residential Energy Rate (\$/kWh)	\$0.0836
Inflation Rate <sup>1</sup>	1.9%

<sup>1</sup> Future rates determined using a 1.9% annual escalator.

**Table 2 – Home Energy Savings Annual Program Costs**

Measure Group	Engineering Costs	Utility Admin	Program Dev.	Program Delivery	Incentives	Total Utility Costs	Gross Customer Costs
Appliances	\$0	\$174	\$121	\$7,742	\$8,630	\$16,667	\$24,369
Building Shell	\$0	\$929	\$645	\$41,423	\$59,109	\$102,106	\$185,004
Electronics	\$0	\$206	\$143	\$9,173	\$5,160	\$14,682	\$3,775
Energy Kits - DHW	\$0	\$7,725	\$5,369	\$64,114	\$40,619	\$117,827	\$41,862
Energy Kits - Lighting	\$0	\$224	\$156	\$1,858	\$3,106	\$5,343	\$3,295
HVAC	\$0	\$15,087	\$10,484	\$672,911	\$658,216	\$1,356,698	\$1,534,060
Lighting	\$0	\$30,773	\$21,385	\$143,061	\$548,828	\$744,047	\$825,692
Water Heating	\$0	\$686	\$477	\$30,590	\$40,233	\$71,985	\$58,537
Whole Home	\$0	\$245	\$170	\$10,908	\$18,000	\$29,323	\$34,620
<b>Total</b>	<b>\$0</b>	<b>\$56,048</b>	<b>\$38,949</b>	<b>\$981,781</b>	<b>\$1,381,901</b>	<b>\$2,458,678</b>	<b>\$2,711,215</b>

**Table 3 – Home Energy Savings – Savings by Measure Category**

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Appliances	21,776	100%	21,776	100%	21,776	14
Building Shell	116,503	100%	116,503	100%	116,503	45
Electronics	25,800	100%	25,800	100%	25,800	5
Energy Kits - DHW	969,096	100%	969,096	100%	969,096	9
Energy Kits - Lighting	28,083	100%	28,083	100%	28,083	6
HVAC	1,892,584	100%	1,892,584	100%	1,892,584	17
Lighting	3,860,253	100%	3,860,253	100%	3,860,253	10
Water Heating	86,034	100%	86,034	100%	86,034	14
Whole Home	30,680	100%	30,680	100%	30,680	27
<b>Total</b>	<b>7,030,808</b>	<b>100%</b>	<b>7,030,808</b>	<b>100%</b>	<b>7,030,808</b>	<b>12</b>

**Table 4 - Benefit/Cost Ratios by Measure Category**

Measure Group	PTRC	TRC	UCT	RIM	PCT
Appliances	0.54	0.49	0.96	0.44	1.16
Appliances with NEBs	1.81	1.76	0.96	0.44	1.34
Building Shell	0.97	0.88	1.96	0.68	1.37
Electronics	0.56	0.51	0.46	0.27	4.03
Energy Kits - DHW	4.47	4.06	4.11	0.65	15.86
Energy Kits - DHW with NEBs	9.85	9.45	4.11	0.65	17.83
Energy Kits - Lighting	1.95	1.77	1.83	0.54	4.84
Energy Kits - Lighting with NEBs	5.30	5.13	1.83	0.54	7.57
HVAC	0.96	0.87	1.44	0.59	1.70
HVAC with NEBs	1.02	0.93	1.44	0.59	1.71
Lighting	2.29	2.09	2.86	0.62	3.94
Lighting with NEBs	4.08	3.87	2.86	0.62	4.22
Water Heating	0.77	0.70	0.88	0.42	2.01
Whole Home	0.74	0.67	1.05	0.44	1.72
<b>Total</b>	<b>1.42</b>	<b>1.29</b>	<b>1.99</b>	<b>0.60</b>	<b>2.59</b>
<b>Total (with NEBs)</b>	<b>2.12</b>	<b>1.99</b>	<b>1.99</b>	<b>0.60</b>	<b>2.71</b>

**Table 5 – Home Energy Savings Program Level Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0603	\$3,787,992	\$5,380,244	\$1,592,252	1.42
Total Resource Cost Test (TRC) No Adder	\$0.0603	\$3,787,992	\$4,891,131	\$1,103,139	1.29
Utility Cost Test (UCT)	\$0.0392	\$2,458,678	\$4,891,131	\$2,432,453	1.99
Rate Impact Test (RIM)		\$8,088,460	\$4,891,131	-\$3,197,329	0.60
Participant Cost Test (PCT)		\$2,711,215	\$7,011,683	\$4,300,468	2.59
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000611823
Discounted Participant Payback (years)					2.29

Table 6 through Table 21 provides cost-effectiveness results for all 9 measures.

**Table 6 - Home Energy Savings Appliance Cost-Effectiveness Results  
 (Decrement - West Residential Water Heating - 53%, Load Shape – Residential Water Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1480	\$32,406	\$17,640	-\$14,766	0.54
Total Resource Cost Test (TRC) No Adder	\$0.1480	\$32,406	\$16,036	-\$16,370	0.49
Utility Cost Test (UCT)	\$0.0761	\$16,667	\$16,036	-\$631	0.96
Rate Impact Test (RIM)		\$36,297	\$16,036	-\$20,261	0.44
Participant Cost Test (PCT)		\$24,369	\$28,260	\$3,891	1.16
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003358
Discounted Participant Payback (years)					10.44

**Table 7 - Home Energy Savings Building Shell Cost-Effectiveness Results  
 (Decrement - West Residential Heating - 17%, Load Shape – Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1063	\$228,001	\$220,159	-\$7,842	0.97
Total Resource Cost Test (TRC) No Adder	\$0.1063	\$228,001	\$200,145	-\$27,856	0.88
Utility Cost Test (UCT)	\$0.0476	\$102,106	\$200,145	\$98,039	1.96
Rate Impact Test (RIM)		\$295,993	\$200,145	-\$95,848	0.68
Participant Cost Test (PCT)		\$185,004	\$252,996	\$67,992	1.37
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000005157
Discounted Participant Payback (years)					18.30

**Table 8 - Home Energy Savings Electronics Cost-Effectiveness Results  
 (Decrement - West Plug Loads - 61%, Load Shape – Plug Loads)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1183	\$13,297	\$7,456	-\$5,841	0.56
Total Resource Cost Test (TRC) No Adder	\$0.1183	\$13,297	\$6,778	-\$6,519	0.51
Utility Cost Test (UCT)	\$0.1306	\$14,682	\$6,778	-\$7,904	0.46
Rate Impact Test (RIM)		\$24,733	\$6,778	-\$17,955	0.27
Participant Cost Test (PCT)		\$3,775	\$15,211	\$11,436	4.03
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000007441
Discounted Participant Payback (years)					n/a

**Table 9 - Home Energy Savings Energy Kits - DHW Cost-Effectiveness Results  
 (Decrement - West Residential Water Heating - 53%, Load Shape – Residential Water Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0171	\$119,069	\$532,188	\$413,118	4.47
Total Resource Cost Test (TRC) No Adder	\$0.0171	\$119,069	\$483,807	\$364,737	4.06
Utility Cost Test (UCT)	\$0.0169	\$117,827	\$483,807	\$365,980	4.11
Rate Impact Test (RIM)		\$741,121	\$483,807	-\$257,314	0.65
Participant Cost Test (PCT)		\$41,862	\$663,914	\$622,052	15.86
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000064010
Discounted Participant Payback (years)					0.02

**Table 10 - Home Energy Savings Energy Kits - Lighting Cost-Effectiveness Results  
 (Decrement - West Residential Lighting - 48%, Load Shape – Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0385	\$5,533	\$10,763	\$5,230	1.95
Total Resource Cost Test (TRC) No Adder	\$0.0385	\$5,533	\$9,785	\$4,252	1.77
Utility Cost Test (UCT)	\$0.0372	\$5,343	\$9,785	\$4,441	1.83
Rate Impact Test (RIM)		\$18,188	\$9,785	-\$8,403	0.54
Participant Cost Test (PCT)		\$3,295	\$15,951	\$12,655	4.84
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002986
Discounted Participant Payback (years)					0.08

**Table 11 - Home Energy Savings HVAC Cost-Effectiveness Results  
 (Decrement - West Residential Heating - 17%, Load Shape – Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1028	\$2,232,543	\$2,146,619	-\$85,924	0.96
Total Resource Cost Test (TRC) No Adder	\$0.1028	\$2,232,543	\$1,951,472	-\$281,071	0.87
Utility Cost Test (UCT)	\$0.0624	\$1,356,698	\$1,951,472	\$594,774	1.44
Rate Impact Test (RIM)		\$3,306,873	\$1,951,472	-\$1,355,401	0.59
Participant Cost Test (PCT)		\$1,534,060	\$2,608,391	\$1,074,330	1.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000187082
Discounted Participant Payback (years)					6.10

**Table 12 - Home Energy Savings Lighting Cost-Effectiveness Results  
(Decrement - West Residential Lighting - 48%, Load Shape – Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0339	\$1,020,911	\$2,341,706	\$1,320,795	2.29
Total Resource Cost Test (TRC) No Adder	\$0.0339	\$1,020,911	\$2,128,824	\$1,107,913	2.09
Utility Cost Test (UCT)	\$0.0247	\$744,047	\$2,128,824	\$1,384,777	2.86
Rate Impact Test (RIM)		\$3,444,896	\$2,128,824	-\$1,316,073	0.62
Participant Cost Test (PCT)		\$825,692	\$3,249,677	\$2,423,986	3.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000297640
Discounted Participant Payback (years)					0.84

**Table 13 - Home Energy Savings Water Heating Cost-Effectiveness Results  
(Decrement - West Water Heating - 53%, Load Shape – Residential Water Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1044	\$90,289	\$69,693	-\$20,596	0.77
Total Resource Cost Test (TRC) No Adder	\$0.1044	\$90,289	\$63,357	-\$26,932	0.70
Utility Cost Test (UCT)	\$0.0832	\$71,985	\$63,357	-\$8,628	0.88
Rate Impact Test (RIM)		\$149,544	\$63,357	-\$86,187	0.42
Participant Cost Test (PCT)		\$58,537	\$117,792	\$59,255	2.01
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000014286
Discounted Participant Payback (years)					2.60

**Table 14 - Home Energy Savings Whole Home Cost-Effectiveness Results  
(Decrement - West Residential Whole House - 49%, Load Shape – Residential Whole House)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0997	\$45,943	\$34,021	-\$11,922	0.74
Total Resource Cost Test (TRC) No Adder	\$0.0997	\$45,943	\$30,928	-\$15,015	0.67
Utility Cost Test (UCT)	\$0.0636	\$29,323	\$30,928	\$1,605	1.05
Rate Impact Test (RIM)		\$70,815	\$30,928	-\$39,887	0.44
Participant Cost Test (PCT)		\$34,620	\$59,492	\$24,872	1.72
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003531
Discounted Participant Payback (years)					7.32

In addition to the energy benefits reported above, appliances, energy savings kits, HVAC and lighting in the Home Energy Savings program offer significant non-energy benefits (NEBs). Table 15 through Table 21 detail the non-energy benefits and the cost-effectiveness results.

**Table 15 - Home Energy Savings Non-Energy Benefits by Measure**

Measure Name	Non-Energy Benefits Water (\$/yr)	Non-Energy Benefits Other (\$/yr)	Quantity	Measure Life	Total NEBs (\$/yr)	Discount Rate	Total Net Present Value Benefits
Appliances	\$3,824	\$482	171	14.0	\$4,306	6.66%	\$41,013.22
Energy Kits - DHW	\$80,166	\$8,739	2,963	9.3	\$88,905	6.66%	\$641,176.04
Energy Kits - Lighting	\$2,323	\$253	2,963	9.3	\$2,576	6.66%	\$18,580.44
HVAC	\$0	\$12,501	672	16.7	\$12,501	6.66%	\$132,131.13
Lighting	\$0	\$237,236	250,632	10.1	\$237,236	6.66%	\$1,821,685.70

The following tables provide the cost-effectiveness results after adding in the non-energy benefits detailed above beginning with the overall program results.

**Table 16 - Home Energy Savings Program (with NEBs) Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0603	\$3,787,992	\$8,034,831	\$4,246,838	2.12
Total Resource Cost Test (TRC) No Adder	\$0.0603	\$3,787,992	\$7,545,718	\$3,757,725	1.99
Utility Cost Test (UCT)	\$0.0392	\$2,458,678	\$4,891,131	\$2,432,453	1.99
Rate Impact Test (RIM)		\$8,088,460	\$4,891,131	-\$3,197,329	0.60
Participant Cost Test (PCT)		\$2,711,215	\$7,357,208	\$4,645,993	2.71
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000611823
Discounted Participant Payback (years)					2.38



**Table 17 - Home Energy Savings Appliance (with NEBs) Cost-Effectiveness Results  
 (Decrement - West Residential Water Heating - 53%, Load Shape – Residential Water Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1480	\$32,406	\$58,653	\$26,247	1.81
Total Resource Cost Test (TRC) No Adder	\$0.1480	\$32,406	\$57,049	\$24,643	1.76
Utility Cost Test (UCT)	\$0.0761	\$16,667	\$16,036	-\$631	0.96
Rate Impact Test (RIM)		\$36,297	\$16,036	-\$20,261	0.44
Participant Cost Test (PCT)		\$24,369	\$32,566	\$8,197	1.34
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003358
Discounted Participant Payback (years)					10.44

**Table 18 - Home Energy Savings Energy Kits - DHW (with NEBs) Cost-Effectiveness Results  
 (Decrement - West Residential Water Heating -53%, Load Shape – Residential Water Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0171	\$119,069	\$1,173,364	\$1,054,294	9.85
Total Resource Cost Test (TRC) No Adder	\$0.0171	\$119,069	\$1,124,983	\$1,005,914	9.45
Utility Cost Test (UCT)	\$0.0169	\$117,827	\$483,807	\$365,980	4.11
Rate Impact Test (RIM)		\$741,121	\$483,807	-\$257,314	0.65
Participant Cost Test (PCT)		\$41,862	\$746,403	\$704,541	17.83
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000064010
Discounted Participant Payback (years)					0.02

**Table 19 - Home Energy Savings Energy Kits – Lighting (with NEBs) Cost-Effectiveness Results**

**(Decrement - West Residential Lighting - 48%, Load Shape – Lighting)**

<b>Cost-Effectiveness Test</b>	<b>Levelized \$/kWh</b>	<b>Costs</b>	<b>Benefits</b>	<b>Net Benefits</b>	<b>Benefit/Cost Ratio</b>
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0385	\$5,533	\$29,344	\$23,811	5.30
Total Resource Cost Test (TRC) No Adder	\$0.0385	\$5,533	\$28,365	\$22,832	5.13
Utility Cost Test (UCT)	\$0.0372	\$5,343	\$9,785	\$4,441	1.83
Rate Impact Test (RIM)		\$18,188	\$9,785	-\$8,403	0.54
Participant Cost Test (PCT)		\$3,295	\$24,943	\$21,647	7.57
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002986
Discounted Participant Payback (years)					0.08

**Table 20 - Home Energy Savings HVAC (with NEBs) Cost-Effectiveness Results**  
**(Decrement - West Residential Heating - 17%, Load Shape – Heating))**

<b>Cost-Effectiveness Test</b>	<b>Levelized \$/kWh</b>	<b>Costs</b>	<b>Benefits</b>	<b>Net Benefits</b>	<b>Benefit/Cost Ratio</b>
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1028	\$2,232,543	\$2,278,750	\$46,207	1.02
Total Resource Cost Test (TRC) No Adder	\$0.1028	\$2,232,543	\$2,083,603	-\$148,940	0.93
Utility Cost Test (UCT)	\$0.0624	\$1,356,698	\$1,951,472	\$594,774	1.44
Rate Impact Test (RIM)		\$3,306,873	\$1,951,472	-\$1,355,401	0.59
Participant Cost Test (PCT)		\$1,534,060	\$2,620,892	\$1,086,832	1.71
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000187082
Discounted Participant Payback (years)					6.10

**Table 21 - Home Energy Savings Lighting (with NEBs) Cost-Effectiveness Results  
(Decrement - West Residential Lighting - 48%, Load Shape – Lighting)**

<b>Cost-Effectiveness Test</b>	<b>Levelized \$/kWh</b>	<b>Costs</b>	<b>Benefits</b>	<b>Net Benefits</b>	<b>Benefit/Cost Ratio</b>
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0339	\$1,020,911	\$4,163,392	\$3,142,481	4.08
Total Resource Cost Test (TRC) No Adder	\$0.0339	\$1,020,911	\$3,950,509	\$2,929,599	3.87
Utility Cost Test (UCT)	\$0.0247	\$744,047	\$2,128,824	\$1,384,777	2.86
Rate Impact Test (RIM)		\$3,444,896	\$2,128,824	-\$1,316,073	0.62
Participant Cost Test (PCT)		\$825,692	\$3,486,913	\$2,661,221	4.22
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000297640
Discounted Participant Payback (years)					0.84



Navigant estimated the cost-effectiveness results for the Washington Home Energy Reporting Program, based on 2016 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program and for Legacy/Refill and Expansion options.

Cost-effectiveness was tested using the 2015 IRP west residential whole house 49% load factor decrement. The program passes the PTRC, TRC and UCT cost-effectiveness tests.

Table 1 - Home Energy Reporting Inputs

Table 2 – Home Energy Reporting Annual Program Costs

Table 3 – Home Energy Reporting Savings by Measure Category

Table 4 - Benefit/Cost Ratios by Measure Category

Table 5 – Home Energy Reporting Program Level Cost-Effectiveness Results

Table 6 - Home Energy Reporting Legacy and Refill Cost-Effectiveness Results

Table 7 - Home Energy Reporting Expansion Cost-Effectiveness Results

**Table 1 - Home Energy Reporting Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Residential Energy Rate (\$/kWh)	\$0.0836
Inflation Rate <sup>1</sup>	1.9%

<sup>1</sup> Future rates determined using a 1.9% annual escalator.

**Table 2 – Home Energy Reporting Annual Program Costs**

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
HER Legacy	\$0	\$1,237	\$130,776	\$4,171	\$0	\$136,183	\$0
HER Expansion	\$0	\$3,519	\$187,131	\$11,870	\$0	\$202,520	\$0
<b>Total</b>	<b>\$0</b>	<b>\$4,756</b>	<b>\$317,907</b>	<b>\$16,041</b>	<b>\$0</b>	<b>\$338,703</b>	<b>\$0</b>

**Table 3 – Home Energy Reporting Savings by Measure Category**

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
HER Legacy	4,697,777	100%	4,697,777	100%	4,697,777	1
HER Expansion	4,466,390	100%	4,466,390	100%	4,466,390	1
<b>Total</b>	<b>9,164,167</b>	<b>100%</b>	<b>9,164,167</b>	<b>100%</b>	<b>9,164,167</b>	<b>1</b>

**Table 4 - Benefit/Cost Ratios by Measure Category**

Measure Group	PTRC	TRC	UCT	RIM	PCT
HER Legacy	1.81	1.64	1.64	0.42	0.00
HER Expansion	1.16	1.05	1.05	0.37	0.00
<b>Total</b>	<b>1.42</b>	<b>1.29</b>	<b>1.29</b>	<b>0.39</b>	<b>0.00</b>

**Table 5 – Home Energy Reporting Program Level Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0387	\$338,703	\$480,302	\$141,599	1.42
Total Resource Cost Test (TRC) No Adder	\$0.0387	\$338,703	\$436,638	\$97,935	1.29
Utility Cost Test (UCT)	\$0.0387	\$338,703	\$436,638	\$97,935	1.29
Rate Impact Test (RIM)		\$1,119,384	\$436,638	-\$682,746	0.39
Participant Cost Test (PCT)		\$0	\$780,681	\$780,681	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000848807
Discounted Participant Payback (years)					n/a

**Table 6 - Home Energy Reporting Legacy and Refill Cost-Effectiveness Results (Decrement - West Residential Whole House - 49%, Load Shape – Whole House)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0304	\$136,183	\$246,215	\$110,032	1.81
Total Resource Cost Test (TRC) No Adder	\$0.0304	\$136,183	\$223,831	\$87,648	1.64
Utility Cost Test (UCT)	\$0.0304	\$136,183	\$223,831	\$87,648	1.64
Rate Impact Test (RIM)		\$536,379	\$223,831	-\$312,548	0.42
Participant Cost Test (PCT)		\$0	\$400,196	\$400,196	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000388567
Discounted Participant Payback (years)					0.00

**Table 7 - Home Energy Reporting Expansion Cost-Effectiveness Results (Decrement - West Residential Whole House - 49%, Load Shape – Whole House)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0475	\$202,520	\$234,087	\$31,567	1.16
Total Resource Cost Test (TRC) No Adder	\$0.0475	\$202,520	\$212,807	\$10,286	1.05
Utility Cost Test (UCT)	\$0.0475	\$202,520	\$212,807	\$10,286	1.05
Rate Impact Test (RIM)		\$583,005	\$212,807	-\$370,198	0.37
Participant Cost Test (PCT)		\$0	\$380,485	\$380,485	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000460240
Discounted Participant Payback (years)					0.00



Navigant estimated the cost-effectiveness results for the Washington Low Income Weatherization Program, based on 2016 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program.

Cost-effectiveness was tested using the 2015 IRP west residential whole house 49% load factor decrement. The program does not pass any of the cost-effectiveness tests.

Table 1 - Home Energy Savings Inputs

Table 2 - Low Income Weatherization Annual Program Costs

Table 3 - Low Income Weatherization Savings by Measure Category

Table 4 - Low Income Weatherization Program Level Cost-Effectiveness Results

Table 5 - Low Income Weatherization Non-Energy Benefits

Table 6 - Low Income Weatherization Program (with NEBs) Level Cost-Effectiveness Results

**Table 1 - Home Energy Savings Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Residential Energy Rate (\$/kWh)	\$0.0836
Inflation Rate <sup>1</sup>	1.9%

<sup>1</sup> Future rates determined using a 1.9% annual escalator.

**Table 2 - Low Income Weatherization Annual Program Costs**

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
Low Income	\$0	\$32,243	\$91,495	\$607	\$654,175	\$778,519	\$0
<b>Total</b>	<b>\$0</b>	<b>\$32,243</b>	<b>\$91,495</b>	<b>\$607</b>	<b>\$654,175</b>	<b>\$778,519</b>	<b>\$0</b>

**Table 3 - Low Income Weatherization Savings by Measure Category**

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Low Income	294,462	100%	294,462	100%	294,462	30
<b>Total</b>	<b>294,462</b>	<b>100%</b>	<b>294,462</b>	<b>100%</b>	<b>294,462</b>	<b>30</b>

**Table 4 - Low Income Weatherization Program Level Cost-Effectiveness Results  
 (Decrement - West Residential Whole House - 49%, Load Shape – Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1673	\$778,519	\$463,755	-\$314,764	0.60
Total Resource Cost Test (TRC) No Adder	\$0.1673	\$778,519	\$421,595	-\$356,924	0.54
Utility Cost Test (UCT)	\$0.1673	\$778,519	\$421,595	-\$356,924	0.54
Rate Impact Test (RIM)		\$1,197,724	\$421,595	-\$776,128	0.35
Participant Cost Test (PCT)		\$0	\$1,073,380	\$1,073,380	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000062041
Discounted Participant Payback (years)					n/a



In addition to the energy benefits reported above, the Low Income program offers significant non-energy benefits (NEBs). Table 5 details the non-energy benefits and Table 6 provides the cost-effectiveness results.

**Table 5 - Low Income Weatherization Non-Energy Benefits**

Non-Energy Benefit	Program Impact	Perspective Adjusted
External Payment Reduction	\$25,725	PTRC, TRC, UCT, RIM
Home Repair Costs	\$30,817	PTRC, TRC, PCT
Economic Impact	\$303,506	PTRC, TRC
<b>Total</b>	<b>\$360,048</b>	-

**Table 6 - Low Income Weatherization Program (with NEBs) Level Cost-Effectiveness Results  
 (Decrement - West Residential Whole House - 49%, Load Shape – Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1673	\$778,519	\$823,803	\$45,284	1.06
Total Resource Cost Test (TRC) No Adder	\$0.1673	\$778,519	\$781,643	\$3,124	1.00
Utility Cost Test (UCT)	\$0.1673	\$778,519	\$447,320	-\$331,199	0.57
Rate Impact Test (RIM)		\$1,197,724	\$447,320	-\$750,403	0.37
Participant Cost Test (PCT)		\$0	\$1,104,197	\$1,104,197	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000059985
Discounted Participant Payback (years)					n/a



Navigant estimated the cost-effectiveness results for the Washington Wattsmart Business Program, based on 2016 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program and for the 11 measure categories.

Cost-effectiveness was tested using the 2015 IRP west industrial 44%, west plug loads 61%, west commercial lighting 46% and west commercial cooling 13% load factor decrements. The program passes the cost-effectiveness for all the tests except the RIM test. The memo consists of the following tables.

- Table 1 - Utility Inputs
- Table 2 – Annual Wattsmart Business Program Costs by Measure Category
- Table 3 – Annual Wattsmart Business Program Savings by Measure Category
- Table 4 - Benefit/Cost Ratios by Measure Category
- Table 5 – Wattsmart Business Program Level Cost-Effectiveness Results
- Table 6 - Wattsmart Business Building Shell Cost-Effectiveness Results
- Table 7 - Wattsmart Business Compressed Air Cost-Effectiveness Results
- Table 8 - Wattsmart Business Energy Management Cost-Effectiveness Results
- Table 9 - Wattsmart Business Farm & Dairy Cost-Effectiveness Results
- Table 10 - Wattsmart Business Food Service Equipment Cost-Effectiveness Results
- Table 11 - Wattsmart Business HVAC Cost-Effectiveness Results
- Table 12 - Wattsmart Business Irrigation Cost-Effectiveness Results
- Table 13 - Wattsmart Business Lighting Cost-Effectiveness Results
- Table 14 - Wattsmart Business Motors Cost-Effectiveness Results
- Table 15 - Wattsmart Business Refrigeration Cost-Effectiveness Results
- Table 16 - Wattsmart Business Wastewater Cost-Effectiveness Results

**Table 1 - Utility Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Commercial Line Loss	9.53%
Industrial Line Loss	8.16%
Irrigation Line Loss	9.67%
Residential Energy Rate (\$/kWh)	\$0.0836
Commercial Energy Rate (\$/kWh)	\$0.0717
Industrial Energy Rate (\$/kWh)	\$0.0887
Irrigation Energy Rate (\$/kWh)	\$0.1327
Inflation Rate <sup>1</sup>	1.9%

<sup>1</sup> Future rates determined using a 1.9% annual escalator.

**Table 2 – Annual Wattsmart Business Program Costs by Measure Category**

Measure Group	Engineering Costs	Utility Admin	Program Admin	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
Building Shell	\$996	\$751	\$65,771	\$271	\$35,776	\$103,565	\$166,363
Compressed Air	\$24,968	\$18,827	\$53,681	\$6,799	\$169,460	\$273,735	\$354,368
Energy Management	\$26,914	\$20,294	\$94,207	\$7,329	\$31,429	\$180,173	\$44,925
Farm & Dairy	\$1,768	\$1,333	\$11,500	\$482	\$9,165	\$24,248	\$32,531
Food Service Equipment	\$2,685	\$2,025	\$207,110	\$731	\$10,000	\$222,551	\$16,850
HVAC	\$16,485	\$12,430	\$791,965	\$4,489	\$125,527	\$950,897	\$578,488
Irrigation	\$0	\$10,064	\$74,517	\$3,210	\$90,240	\$178,031	\$290,507
Lighting	\$305,355	\$230,249	\$101,959	\$267,436	\$2,380,026	\$3,285,025	\$5,578,641
Motors	\$1,675	\$1,263	\$54,073	\$456	\$12,732	\$70,199	\$25,317
Refrigeration	\$95,962	\$72,359	\$146,248	\$26,131	\$798,659	\$1,139,359	\$1,695,890
Wastewater	\$32,952	\$24,847	\$0	\$8,973	\$279,621	\$346,394	\$673,298
<b>Total</b>	<b>\$509,761</b>	<b>\$394,442</b>	<b>\$1,601,031</b>	<b>\$326,307</b>	<b>\$3,942,636</b>	<b>\$6,774,176</b>	<b>\$9,457,179</b>

**Table 3 – Annual Wattsmart Business Program Savings by Measure Category**

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Building Shell	58,143	100%	58,143	100%	58,143	16
Compressed Air	1,457,871	100%	1,457,871	100%	1,457,871	14
Energy Management	1,571,461	100%	1,571,461	100%	1,571,461	3
Farm & Dairy	103,251	100%	103,251	100%	103,251	14
Food Service Equipment	156,774	100%	156,774	100%	156,774	9
HVAC	962,554	100%	962,554	100%	962,554	16
Irrigation	779,279	100%	779,279	100%	779,279	12
Lighting	17,829,274	100%	17,829,274	100%	17,829,274	13
Motors	97,810	100%	97,810	100%	97,810	13
Refrigeration	5,603,090	100%	5,603,090	100%	5,603,090	15
Wastewater	1,924,052	100%	1,924,052	100%	1,924,052	16
<b>Total</b>	<b>30,543,559</b>	<b>100%</b>	<b>30,543,559</b>	<b>100%</b>	<b>30,543,559</b>	<b>13</b>

**Table 4 - Benefit/Cost Ratios by Measure Category**

Measure Group	PTRC	TRC	UCT	RIM	PCT
Building Shell	0.41	0.37	0.83	0.56	0.51
Compressed Air	2.53	2.30	3.85	0.65	4.30
Energy Management	1.56	1.42	1.52	0.47	9.69
Farm & Dairy	1.63	1.48	2.91	0.68	2.74
Food Service Equipment	0.40	0.36	0.37	0.27	5.73
HVAC	0.65	0.59	0.87	0.47	1.63
Irrigation	2.78	2.53	5.38	0.87	3.49
Lighting	2.10	1.91	3.77	0.72	2.90
Motors	0.89	0.81	0.95	0.44	3.75
Refrigeration	2.37	2.16	3.86	0.68	3.64
Wastewater	2.29	2.08	4.45	0.65	3.42
<b>Total</b>	<b>1.95</b>	<b>1.77</b>	<b>3.21</b>	<b>0.68</b>	<b>3.06</b>

**Table 5 – Wattsmart Business Program Level Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0423	\$12,288,719	\$23,910,899	\$11,622,179	1.95
Total Resource Cost Test (TRC) No Adder	\$0.0423	\$12,288,719	\$21,737,181	\$9,448,461	1.77
Utility Cost Test (UCT)	\$0.0233	\$6,774,176	\$21,737,181	\$14,963,005	3.21
Rate Impact Test (RIM)		\$31,779,478	\$21,737,181	-\$10,042,297	0.68
Participant Cost Test (PCT)		\$9,457,179	\$28,947,938	\$19,490,759	3.06
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001783812

Table 6 through Table 16 provide cost-effectiveness results for all 11 measures.

**Table 6 - Wattsmart Business Building Shell Cost-Effectiveness Results (Decrement - West Commercial Cooling - 13%, Load Shape – HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.3653	\$234,152	\$94,971	-\$139,181	0.41
Total Resource Cost Test (TRC) No Adder	\$0.3653	\$234,152	\$86,338	-\$147,814	0.37
Utility Cost Test (UCT)	\$0.1616	\$103,565	\$86,338	-\$17,228	0.83
Rate Impact Test (RIM)		\$152,903	\$86,338	-\$66,565	0.56
Participant Cost Test (PCT)		\$166,363	\$85,114	-\$81,249	0.51
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000009732
Discounted Participant Payback (years)					n/a

**Table 7 - Wattsmart Business Compressed Air Cost-Effectiveness Results (Decrement - West Industrial - 44%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0313	\$458,643	\$1,160,149	\$701,505	2.53
Total Resource Cost Test (TRC) No Adder	\$0.0313	\$458,643	\$1,054,681	\$596,037	2.30
Utility Cost Test (UCT)	\$0.0187	\$273,735	\$1,054,681	\$780,946	3.85
Rate Impact Test (RIM)		\$1,628,464	\$1,054,681	-\$573,784	0.65
Participant Cost Test (PCT)		\$354,368	\$1,524,189	\$1,169,821	4.30
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000095111
Discounted Participant Payback (years)					1.47

**Table 8 - Wattsmart Business Energy Management Cost-Effectiveness Results  
 (Decrement - West Plug Loads - 61%, Load Shape - Plug Loads)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0451	\$193,668	\$301,703	\$108,035	1.56
Total Resource Cost Test (TRC) No Adder	\$0.0451	\$193,668	\$274,276	\$80,607	1.42
Utility Cost Test (UCT)	\$0.0419	\$180,173	\$274,276	\$94,103	1.52
Rate Impact Test (RIM)		\$584,007	\$274,276	-\$309,732	0.47
Participant Cost Test (PCT)		\$44,925	\$435,264	\$390,339	9.69
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000192621
Discounted Participant Payback (years)					0.10

**Table 9 - Wattsmart Business Farm & Dairy Cost-Effectiveness Results  
 (Decrement - West Plug Loads - 61%, Load Shape - Plug Loads)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0459	\$47,614	\$77,532	\$29,918	1.63
Total Resource Cost Test (TRC) No Adder	\$0.0459	\$47,614	\$70,483	\$22,870	1.48
Utility Cost Test (UCT)	\$0.0234	\$24,248	\$70,483	\$46,235	2.91
Rate Impact Test (RIM)		\$104,078	\$70,483	-\$33,595	0.68
Participant Cost Test (PCT)		\$32,531	\$88,995	\$56,464	2.74
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000005569
Discounted Participant Payback (years)					3.26

**Table 10 - Wattsmart Business Food Service Equipment Cost-Effectiveness Results  
 (Decrement - West Industrial - 44%, Load Shape – HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2037	\$229,401	\$91,747	-\$137,654	0.40
Total Resource Cost Test (TRC) No Adder	\$0.2037	\$229,401	\$83,406	-\$145,995	0.36
Utility Cost Test (UCT)	\$0.1976	\$222,551	\$83,406	-\$139,145	0.37
Rate Impact Test (RIM)		\$309,030	\$83,406	-\$225,624	0.27
Participant Cost Test (PCT)		\$16,850	\$96,480	\$79,629	5.73
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000056126
Discounted Participant Payback (years)					0.60

**Table 11 - Wattsmart Business HVAC Cost-Effectiveness Results  
 (Decrement - West Industrial - 44%, Load Shape - HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1323	\$1,403,858	\$911,645	-\$492,213	0.65
Total Resource Cost Test (TRC) No Adder	\$0.1323	\$1,403,858	\$828,768	-\$575,090	0.59
Utility Cost Test (UCT)	\$0.0896	\$950,897	\$828,768	-\$122,129	0.87
Rate Impact Test (RIM)		\$1,767,683	\$828,768	-\$938,915	0.47
Participant Cost Test (PCT)		\$578,488	\$942,313	\$363,825	1.63
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000137269
Discounted Participant Payback (years)					7.44

**Table 12 - Wattsmart Business Irrigation Cost-Effectiveness Results  
 (Decrement - West Commercial Cooling - 13%, Load Shape – Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0540	\$378,298	\$1,052,658	\$674,360	2.78
Total Resource Cost Test (TRC) No Adder	\$0.0540	\$378,298	\$956,962	\$578,663	2.53
Utility Cost Test (UCT)	\$0.0254	\$178,031	\$956,962	\$778,931	5.38
Rate Impact Test (RIM)		\$1,101,316	\$956,962	-\$144,355	0.87
Participant Cost Test (PCT)		\$290,507	\$1,013,525	\$723,018	3.49
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000027623
Discounted Participant Payback (years)					2.10

**Table 13 - Wattsmart Business Lighting Cost-Effectiveness Results  
 (Decrement - West Commercial Lighting - 46%, Load Shape - Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0382	\$6,483,639	\$13,617,079	\$7,133,440	2.10
Total Resource Cost Test (TRC) No Adder	\$0.0382	\$6,483,639	\$12,379,163	\$5,895,524	1.91
Utility Cost Test (UCT)	\$0.0193	\$3,285,025	\$12,379,163	\$9,094,138	3.77
Rate Impact Test (RIM)		\$17,107,735	\$12,379,163	-\$4,728,572	0.72
Participant Cost Test (PCT)		\$5,578,641	\$16,202,736	\$10,624,096	2.90
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000839935
Discounted Participant Payback (years)					2.40

**Table 14 - Wattsmart Business Motors Cost-Effectiveness Results  
 (Decrement - West Industrial - 44%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0888	\$82,784	\$73,462	-\$9,323	0.89
Total Resource Cost Test (TRC) No Adder	\$0.0888	\$82,784	\$66,783	-\$16,001	0.81
Utility Cost Test (UCT)	\$0.0753	\$70,199	\$66,783	-\$3,416	0.95
Rate Impact Test (RIM)		\$152,406	\$66,783	-\$85,623	0.44
Participant Cost Test (PCT)		\$25,317	\$94,939	\$69,622	3.75
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000015209
Discounted Participant Payback (years)					1.56

**Table 15 - Wattsmart Business Refrigeration Cost-Effectiveness Results  
 (Decrement – West Industrial - 44%, Load Shape - Refrigeration)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0345	\$2,036,590	\$4,835,086	\$2,798,497	2.37
Total Resource Cost Test (TRC) No Adder	\$0.0345	\$2,036,590	\$4,395,533	\$2,358,943	2.16
Utility Cost Test (UCT)	\$0.0193	\$1,139,359	\$4,395,533	\$3,256,174	3.86
Rate Impact Test (RIM)		\$6,505,680	\$4,395,533	-\$2,110,147	0.68
Participant Cost Test (PCT)		\$1,695,890	\$6,164,980	\$4,469,090	3.64
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000327852
Discounted Participant Payback (years)					0.68

**Table 16 - Wattsmart Business Wastewater Cost-Effectiveness Results  
 (Decrement - West Industrial - 44%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0349	\$740,071	\$1,694,866	\$954,795	2.29
Total Resource Cost Test (TRC) No Adder	\$0.0349	\$740,071	\$1,540,788	\$800,717	2.08
Utility Cost Test (UCT)	\$0.0163	\$346,394	\$1,540,788	\$1,194,394	4.45
Rate Impact Test (RIM)		\$2,366,175	\$1,540,788	-\$825,387	0.65
Participant Cost Test (PCT)		\$673,298	\$2,299,402	\$1,626,104	3.42
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000120671
Discounted Participant Payback (years)					2.34





## Appendix 2

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# Washington Measure Installation Verifications

Pacific Power

# Washington Measure Installation Verifications

## Home Energy Savings

Site inspections by Program Administrator staff for the following retrofit and/or new homes measures. Inspections are performed on  $\geq 5$  percent of single family homes,  $\geq 5$  percent of manufactured homes, 100 percent of multifamily projects, and 100 percent of new homes projects.

- Air sealing
- Central air conditioning best practices installation and sizing
- Duct sealing
- Duct sealing and insulation
- Heat pump performance tested comfort systems, commissioning, controls, and sizing
- Heat pump water heaters
- Insulation
- Windows

No site inspections are conducted for the following measures. However, all post-purchase incented measures undergo a quality assurance review prior to the issuance of the customer/dealer incentive and recording of savings (e.g. proof of purchase receipt review) and eligible equipment review. Additionally, customer account and customer address are checked to ensure the Company does not double pay for the same measure or double count measure savings.

- Central air conditioners
- Clothes washers
- Electric water heaters
- Evaporative coolers
- Freezers
- Light fixtures (post-purchase)
- Heat pumps
- Refrigerators

No site inspections are conducted for the following measures, which are delivered via an upstream, manufacturer buy-down model. Promotion agreement contracts are signed with manufacturers and retailers to set incentive levels, final product prices, and limits to the total number of units that can be purchased per customer. Program Administrator verifies measures for product eligibility and correct pricing. Pricing is also verified by Program Administrator field visits to retail locations.

- CFL bulbs
- LED bulbs
- Light fixtures (upstream)
- Room air conditioners

Customer eligibility for wattsmart Starter Kits is verified using the customer's account number and last name and cross-verifying with the current PacifiCorp customer database.

## **Low Income Weatherization**

### All projects

- All measures are qualified through US Department of Energy approved audit tool or priority list.
- 100 percent inspection by agency inspector of all homes treated, reconciling work completed and quality (corrective action includes measure verification) prior to invoicing Company.
- State inspector follows with random inspections.

The Company hires independent inspector to inspect between 5-10 percent of homes treated (post treatment and payment).

## **wattsmart Business**

### Lighting projects (typical upgrades, small business and midmarket/instant incentive offer)

- Retrofits - 100 percent pre- and post-installation site inspections of all projects with incentives over a specified dollar amount. Project cost documentation reviewed for all projects.
- New construction - 100 percent post-installation site inspections of all projects with incentives over a specified dollar amount.
- A percent of post-installation site inspections by program administrator of projects with incentives under a specified dollar amount. For the midmarket/instant incentive offer, these inspections are done by phone.

For typical upgrades, required inspections are performed by a third party consultant. For the small business and instant incentive offers, required inspections are performed by the program administrator.

### Non-lighting projects (typical upgrades/listed measures where savings is deemed)

- 100 percent of applications with an incentive that exceeds a specified dollar amount will be inspected (via site inspection) (typically by program administrator).
- A minimum of a specified percent of remaining non-lighting applications will be inspected, either in person or via telephone interview, (typically by program administrator).

### Non-lighting projects (typical upgrades/listed measures where savings is determined using a simplified analysis tool)

- 100 percent of applications with project savings that exceeds a specified threshold will be inspected (via site inspection) (typically by program administrator).
- A minimum of a specified percent of remaining non-lighting applications will be inspected, either in person or via telephone interview, (typically by program administrator).

### Custom projects

- 100 percent pre/post-installation inspections, invoice reconciled to inspection results. On-site pre/post inspections are required for projects with savings over a specified threshold. For projects with savings below the threshold, inspection information may be collected by phone or email.
- No pre-inspection for new construction.
- Inspections are conducted by third party energy engineering firms for the in-house project manager/consultant delivery channel.
- Inspections are conducted by outsourced delivery team for projects delivered by third party outsourced program delivery teams.

## **All Programs**

As part of the third-party program evaluations (two-year cycle) process, the Company has implemented semi-annual customer surveys to collect evaluation-relevant data more frequently to cure for memory loss and other detractors such as customers moving and data not be readily available at evaluation time). This will serve as a further check verifying customer participation and measures installed.

Additional record reviews and site inspections (including metering/data logging) is conducted as part of the process and impact evaluations, a final verification of measure installations.



## Appendix 3

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# Home Energy Savings Retailers

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**Table 1**  
**2016 Participating Upstream/Midstream Retailers and Redemptions**

<b>Retailer</b>	<b>City</b>	<b>State</b>	<b>CFLs</b>	<b>LEDs</b>	<b>Fixtures</b>
Ace Hardware - Stein's #7047	Yakima	WA		x	x
Ace Hardware #14965	Walla Walla	WA		x	
Ace Hardware #15365	Kennewick	WA	x	x	
Bi-Mart #619	Walla Walla	WA	x		
Costco #1013	Union Gap	WA	x	x	x
Costco 486	Kennewick	WA	x	x	x
Fred Meyer #163	Kennewick	WA		x	
Grigg's Department Store	Pasco	WA	x	x	
Habitat for Humanity ReStore #2	Yakima	WA	x		
Home Depot #4727	Yakima	WA	x	x	x
Home Depot #4735	College Place	WA	x	x	x
Home Depot #4739	Kennewick	WA	x	x	x
Hometown Ace Hardware #11909	Yakima	WA		x	x
Kmart #7034	Walla Walla	WA	x		
Kroger - Fred Meyer #70100486	Yakima	WA		x	
Lowe's #249	Kennewick	WA	x	x	
Lowe's #3240	Yakima	WA	x	x	
Lowes 2344	Pasco	WA		x	x
Roy's Ace Hardware #10640	Yakima	WA		x	x
Safeway #0563	Sunnyside	WA	x		
Safeway #1123	Hood River	WA	x		
Safeway #1160	Walla Walla	WA	x		
True Value Hardware - L&G Ranch Supply	Walla Walla	WA		x	
True Value Hardware #5353	Selah	WA		x	x
Wal-Mart - Supercenter #2101	Kennewick	WA	x	x	
Wal-Mart - Supercenter #2476	College Place	WA	x	x	
Wal-Mart - Supercenter #3380	Pasco	WA		x	
Wal-Mart - Supercenter #5078	Yakima	WA	x	x	x
Wal-Mart #1876	Hood River	WA	x		
Wal-Mart #2269	Yakima	WA	x	x	x

**Table 2**

**2016 Participating Upstream/Midstream Appliance Retailers**

<b>Retailer</b>	<b>City</b>	<b>Room Air Conditioners</b>	<b>Advanced Power Strips</b>
Plug Load Savers, <a href="http://www.plugloadsavers.com">www.plugloadsavers.com</a>	N/A		x
*There were no participating retailer for room air conditioners in Washington for 2016.			



**Table 3**  
**2016 Downstream Retailers and Redemptions**

<b>Participating Retailer (Retailers who are actively enrolled in the program)</b>	<b>City</b>	<b>State</b>	<b>Clothes Washer</b>	<b>Clothes Dryer</b>	<b>Smart Thermostat</b>	<b>Freezer</b>	<b>Heat Pump Water Heater</b>	<b>Insulation-Attic</b>	<b>Insulation-Floor</b>	<b>Windows</b>
Bemis Home Appliance & Tv Ctr	Yakima	WA	x			x				
Best Buy #831	Yakima	WA	x		x					
Ferguson Enterprises, Inc #3139	Walla Walla	WA					x			
Home Depot #4727	Yakima	WA	x		x	x		x	x	x
Home Depot #4735	College Place	WA	x		x	x				
Lowe's #3240	Yakima	WA	x		x		x	x		x
Sears #2029	Union Gap	WA	x	x		x	x			
Sears #3088	Sunnyside	WA	x							
Sears #5332	Toppenish	WA	x				x			
Sears #6914	Walla Walla	WA	x							

<b>Redemptions from Non- Participating Retailer's (Retailer may not be located in the service territory)</b>										
AJ MADISON INC	Brooklyn	NY	x							
Amazon.com	Online	N/A			x					
Appliancesconnection.com	Online	N/A					x			
Best Buy #590	Kennewick	WA	x							
Costco.com	Online	N/A	x							
E-Bay	Online	N/A			x					
Elgin Appliance Center	Milton Freewater	OR	x							
Elgin Electric	Elgin	OR	x							
Fred's Appliance - Parts and Service	Spokane	WA	x							
gpconservation.com	Online	N/A					x			
Helliesen Lumber & Supply Company	Yakima	WA							x	
HomeDepot.com	Online	N/A	x	x	x				x	
Lowe's #1114	Wood Village	OR					x			
Lowe's of Pasco	Pasco	WA					x			
Lowes.com	Online	N/A	x				x			
Sears	Ann Arbor	MI	x							
Sears #3439	Hermiston	OR	x							
Sears.com	Online	N/A	x							
Whirlpool Corporation	Centerville	WA	x							

**Table 4  
2016 HVAC Trade Allies**

<b>Trade Ally Name (Trade ally may be located outside of the territory)</b>	<b>City</b>	<b>State</b>	<b>Central Air Conditioner Equipment</b>	<b>Electric System to Heat Pump Conversion</b>	<b>Electric System to Heat Pumo Conversion - Tier 1</b>	<b>Electric System to Heat Pump Conversion - Tier 2</b>	<b>Evaporative Cooler - Tier 2</b>	<b>Heat Pump - PTCS Commissioning, Controls,</b>	<b>Heat Pump to Heat Pump Upgrade</b>	<b>Heat Pump to Heat Pump Upgrade - Tier 1</b>	<b>Heat Pump, Ductless</b>	<b>Heat Pump, Multi-Head, Ductless</b>	<b>Heat Pump, Single-Head, Ductless</b>
Absolute Comfort Technology, LLC	Selah	WA		x							x		
AccuTemp Heating and Air Conditioning	Yakima	WA		x							x		
Ackerman Heating & Air	Colfax	WA		x									
AEH Inc.	Kennewick	WA									x		
All Seasons Heating & Air Conditioning	Yakima	WA		x					x		x		
American Air Heating and Conditioning, LLC	Walla Walla	WA		x							x		
Apollo Sheet Metal Inc.	Kennewick	WA		x				x			x		
Aztec Heating & AC, Inc.	Grandview	WA		x							x		
Bid Mechanical	Kittitas	WA									x		
Blaze to Blizzard Heating & Cooling	Walla Walla	WA									x		
Campbell & Company	Pasco	WA	x	x				x	x		x		
Chapman Heating & Air Conditioning Inc	Dayton	WA									x		
CK Home Comfort Systems	Grandview	WA		x							x		
College Place Heating & Air Conditioning	College Place	WA		x				x			x		
Dayco Inc	Kennewick	WA		x									
Delta Heating and Cooling, Inc.	Richland	WA		x				x					
Farwest Climate Control	Yakima	WA		x					x		x		
Four Seasons HVAC	Yakima	WA		x					x		x		
Grassi Refrigeration	Walla Walla	WA		x							x		
Jacobs & Rhodes	Kennewick	WA						x					
Miller & Trujillo Heating and AC, LLC.	Zillah	WA		x									
Nico Enterprises, LLC	Walla Walla	WA									x		
One Hour Heating and A/C	Yakima	WA									x		
Panchos Heating & Cooling LLC	Kennewick	WA		x				x			x		
Paul's Air F/X	Yakima	WA									x		
Platte Heating & AC	Yakima	WA		x									
Quality Comfort	Yakima	WA		x									
Thermex Valley Heating and AC	Yakima	WA									x		
TJ's Refrigeration, Heating & Air	Sunnyside	WA									x		
TNG Heating & Refrigeration	Toppenish	WA		x							x		
Total Comfort Solutions, LLC	Walla Walla	WA	x	x					x		x		
Vance Heating and AC	Yakima	WA	x	x					x		x		
Young's Heating & Cooling, LLC	Walla Walla	WA		x							x		

**Table 5**  
**2016 Plumbing Trade Allies**

<b>Trade Ally Name (Trade ally may be located outside of the territory)</b>	<b>City</b>	<b>State</b>	<b>Heat Pump Water Heaters</b>
Burke's Plumbing	Selah	WA	x
Central Mechanical Services	Yakima	WA	x
Chris Johnson Plumbing	Walla Walla	WA	x
Miller & Trujillo Heating and AC, LLC.	Zillah	WA	x
Ray's Plumbing, Inc.	Yakima	WA	x
Vance Heating and AC	Yakima	WA	x
KIE Supply	Walla Walla	WA	x

**Table 6  
2016 Weatherization Trade Allies**

<b>Trade Ally Name (Trade ally may be located outside of the territory)</b>	<b>City</b>	<b>State</b>	<b>Air Sealing</b>	<b>Duct Sealing</b>	<b>Duct Sealing &amp; Insulation</b>	<b>Insulation-Attic</b>	<b>Insulation-Floor</b>	<b>Insulation-Wall</b>	<b>Windows</b>
Campbell & Company	Pasco	WA			x				
Central Valley Glass	Yakima	WA							x
Chon Insulation and Drywall	Walla Walla	WA				x			
Don Jordan Energy Systems	Yakima	WA				x	x		
Farwest Climate Control	Yakima	WA			x				
Intermountain West Insulation	Kennewick	WA				x	x	x	
K-5 Contracting, Inc.	Yakima	WA				x			
McKinney Glass Inc.	Yakima	WA							x
One Hour Heating and A/C	Yakima	WA			x				
Pro Build	Yakima	WA					x		
Probuild Northwest	Yakima	WA				x	x	x	
Smith Insulation	Walla Walla	WA	x	x	x	x	x	x	x
Specialty Weatherization & Technologies	Naches	WA	x						x
Vance Heating and AC	Yakima	WA		x					
Vinyl Products Inc	Spokane	WA							x
Windows Walla Walla	Walla Walla	WA							x

**Table 7**  
**2016 Manufactured Homes Trade Allies**

Trade Ally Name (Trade ally may be located outside of the territory)	City	State	Manufactured Homes Duct Sealing
Elite Energy Solutions	Lindon	UT	x



## Appendix 4

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### *wattsmart* Business Trade Allies

The following is a list of contractors, distributors and other businesses participating in Pacific Power's Energy Efficiency Alliance displayed in random order (unless sorted by the user) based on the search criteria selected. This listing is provided solely as a convenience to our customers. Pacific Power does not warrant or guarantee the work performed by these participating vendors. You are solely responsible for any contract with a participating vendor and the performance of any vendor you have chosen.

An asterisk (\*) indicates Pacific Power Outstanding Contribution Award winning trade allies in 2013, 2014 and/or 2015.

## Search Criteria:

**Selected State(s):** Washington  
**Specialties:** Lighting  
 HVAC - unitary  
 HVAC - evaporative  
 Motors and VFDs  
 Controls  
 Building envelope  
 Appliances  
 Office equipment  
 Food Service  
 Compressed Air  
 Farm and Dairy  
 Irrigation  
 Other  
**Business Type:** --ANY--

## Search Results: 83 - Date and Time: 01/31/2017 03:55:11 PM

Company Name	Specialties	Business Type	Join Date	Projects Completed
<b>AirCon Electric</b> 9904 NE 359th St. La Center, WA - 98629 Phone: 360-909-5095	Lighting Other: Other Specialty	Contractor	04/23/2015	Projects Completed
<b>All Seasons Heating &amp; Air Conditioning</b> 302 S. 3rd Ave. Yakima, WA - 98902 Phone: 509-248-6380 Website: www.allseasonsheating.com	HVAC - unitary	Contractor	06/01/2004	4
<b>All-Phase Electric, Inc. - Union Gap</b> 2500 S 12th Ave Union Gap, WA - 98903 Phone: 509-454-5093 Website: allphaseelectric.org	Lighting	Contractor	06/08/2006	41
<b>All-State Electric Co.</b> 310 S. 1st Street Selah, WA - 98942 Phone: 509-941-8739 Website: telkonet.com	Lighting Motors and VFDs Other: Other Specialty	Contractor	01/20/2009	37
<b>Allard Enterprises</b> 4506 Maple Ave. Yakima, WA - 98901 Phone: 509-575-0955	HVAC - unitary Motors and VFDs	Contractor	04/01/2006	Projects Completed
<b>Alternative LED LLC</b> 1200 Westlake Ave N Suite 1006 Seattle, WA - 98109 Phone: 800-330-0828 Website: www.alternativeled.com	Controls Lighting	Distributor Manufacturer - Rep	09/29/2015	Projects Completed
<b>Ambro, Inc*</b> 321 N Columbia Center Blvd Kennewick, WA - 99336 Phone: 509-783-3400 Website: www.batteriesplus.com	Lighting	Distributor	09/09/2015	Projects Completed

<b>Apollo Sheet Metal</b> 1207 W. Columbia Dr. Kennewick, WA - 99336 Phone: 509-586-1104 Website: apolloism.com	<b>Specialties</b> HVAC - unitary Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 04/01/2006	<b>Projects Completed</b> 17
<b>Batteries Plus Bulbs - Walla Walla</b> 632 S 9TH AVE Walla Walla, WA - 99362 Phone: 509-529-7001	<b>Specialties</b> Lighting Other: Other Specialty	<b>Business Type</b> Distributor	<b>Join Date</b> 07/23/2014	<b>Projects Completed</b> 3
<b>Champion Lighting, Inc.</b> 4523 S. Saint Andrews Ln Spokane, WA - 99223 Phone: 509-448-4477	<b>Specialties</b> Lighting	<b>Business Type</b> Other: Other	<b>Join Date</b> 01/20/2007	<b>Projects Completed</b> 10
<b>Columbia Electric Supply - Pasco</b> 1913 Washington Street Pasco, WA - 99301 Phone: 509-547-9733 Website: www.columbiaelectricssupplypasco.com	<b>Specialties</b> Controls Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 09/09/2014	<b>Projects Completed</b> 1
<b>Columbia Electric Supply - Sunnyside</b> 3211 Allen Rd Sunnyside, WA - 98944 Phone: 509-837-6033	<b>Specialties</b> Controls Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 10/23/2014	<b>Projects Completed</b> 3
<b>Columbia Electric Supply - Walla Walla</b> 932 N 13TH AVE Walla Walla, WA - 99362 Phone: 509-522-1419	<b>Specialties</b> HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 01/01/2008	<b>Projects Completed</b> 3
<b>Consolidated Electrical Distributors</b> 1920 Fowler St Richland, WA - 99352 Phone: 509-737-8282	<b>Specialties</b> Controls Irrigation Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 09/18/2015	<b>Projects Completed</b> 7
<b>Consolidated Electrical Distributors - Yakima</b> 131 S. 1st Ave. Yakima, WA - 98902 Phone: 509-248-0872	<b>Specialties</b> Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 01/01/2008	<b>Projects Completed</b> 20
<b>Core Northwest LLC</b> 5836 Scenic Ridge Loop Yakima, WA - 98908 Phone: 509-248-2673 Website: www.corenorthwest.com	<b>Specialties</b> Controls Irrigation Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 02/02/2016	<b>Projects Completed</b> 10
<b>CP Mechanical LLC</b> 1505 S 70th Ave Yakima, WA - 98908 Phone: 509-910-5027	<b>Specialties</b> Controls HVAC - unitary	<b>Business Type</b> Contractor	<b>Join Date</b> 01/10/2016	<b>Projects Completed</b> 1
<b>Current Electric Solution</b> 11979 W. Hwy 12 Lowden, WA - 99360 Phone: 509-526-0161 Website: www.currentelectricsolutions.com	<b>Specialties</b> Controls Irrigation Lighting Motors and VFDs Other: Other Specialty	<b>Business Type</b> Contractor	<b>Join Date</b> 12/14/2012	<b>Projects Completed</b> 2
<b>Dayco Heating &amp; Air</b> 11 N. Auburn Kennewick, WA - 99337 Phone: 509-586-9464	<b>Specialties</b> HVAC - unitary	<b>Business Type</b> Contractor	<b>Join Date</b> 04/01/2006	<b>Projects Completed</b> 1



<b>Dilbeck Electric, Inc.</b> 517 S. 2nd Avenue Yakima, WA - 98902 Phone: 509-575-4666	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 06/01/2005	<b>Projects Completed</b> 10
<b>Doyle Electric Inc.</b> 1421 Dell Avenue Walla Walla, WA - 99362 Phone: 509-529-2500 Website: doyleelectric.com	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 10/15/2006	<b>Projects Completed</b> 8
<b>ecomodus*</b> 5110 Tieton Drive Yakima, WA - 98908 Phone: 509-307-4363	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 02/01/2012	<b>Projects Completed</b> 92
<b>Ecosafe Technologies LLC DBA EcoSafe Lighting</b> 4600 NW Camas Meadows Drive #210 Camas, WA - 98607 Phone: 360-567-1923 Website: www.ecosafelighting.com	<b>Specialties</b> Lighting	<b>Business Type</b> Distributor Manufacturer - Rep	<b>Join Date</b> 07/06/2015	<b>Projects Completed</b>
<b>Electrical Frontier Inc.</b> 4240 Thorp Road Moxee, WA - 98936 Phone: 509-945-5703	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 07/01/2012	<b>Projects Completed</b> 1
<b>Evolve Guest Controls</b> 85 Denton Avenue New Hyde Park, NY - 11040 Phone: 516-448-1862 Website: eguestcontrols.com	<b>Specialties</b> Other: Other Specialty	<b>Business Type</b> Manufacturer - Rep Other: Other	<b>Join Date</b> 06/01/2012	<b>Projects Completed</b>
<b>Extra Effort Consulting &amp; Supply</b> 14530 SW 144th Ave. Tigard, OR - 97224 Phone: 503-780-2359 Website: www.ExtraEffortLLC.com	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 04/01/2012	<b>Projects Completed</b> 4
<b>Great Western Coatings</b> PO Box 12793 Everett, WA - 98206 Phone: 425-750-4250 Website: www.greatwesterncoatings.com	<b>Specialties</b> Building envelope	<b>Business Type</b> Contractor	<b>Join Date</b> 03/02/2015	<b>Projects Completed</b> 1
<b>Greenwalt Electric LLC</b> PO Box 850 Naches, WA - 98937 Phone: 509-949-8223	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 10/28/2008	<b>Projects Completed</b> 12
<b>Hultz BHU Engineers Inc.</b> 1111 Fawcett Avenue Suite 100, Tacoma, WA - 98402 Phone: 253-383-3257 Website: hultzbhu.com	<b>Specialties</b> Compressed Air Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Engineering Firm	<b>Join Date</b> 04/23/2016	<b>Projects Completed</b>
<b>Hutchinson Electric Inc.</b> 113 Sky Vista Place Yakima, WA - 98901 Phone: 509-391-0770	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 02/26/2007	<b>Projects Completed</b> 13
<b>Jaime Campos DBA JC Electrico</b> 604 S. 6TH ST YAKIMA, WA - 98901 Phone: 509-480-2097 x 0000	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 04/08/2015	<b>Projects Completed</b>

<b>KAPCO LLC*</b> 4207 Ahtanum Rd. Yakima, WA - 98903 Phone: 509-966-4540	<b>Specialties</b> Controls Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 03/04/2014	<b>Projects Completed</b> 49
<b>Kennewick Industrial &amp; Electrical Supply, Inc - Walla Walla</b> 1219 W POPLAR WALLA WALLA, WA - 99362 Phone: 509-529-5590 Website: www.kiesupply.com	<b>Specialties</b> Appliances Controls Irrigation Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 12/08/2015	<b>Projects Completed</b> 7
<b>Kinter Electric</b> 2761 E. Edison Rd. PO Box 1058, Sunnyside, WA - 98944 Phone: 509-839-3900 Website: www.kinterelectric.com	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 10/31/2009	<b>Projects Completed</b> 63
<b>Knobel's Electric Inc.</b> 801 Tenant Lane yakima, WA - 98901 Phone: 509-452-9157 Website: knobelselectric.com	<b>Specialties</b> Controls Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 12/30/2014	<b>Projects Completed</b> 2
<b>Lake Shore Electric, Inc.*</b> 9702 Tieton Dr. Yakima, WA - 98908 Phone: 509-965-4281	<b>Specialties</b> Lighting Motors and VFDs Other: Other Specialty	<b>Business Type</b> Contractor	<b>Join Date</b> 05/12/2009	<b>Projects Completed</b> 17
<b>Leading Force Energy &amp; Design Center</b> 17 N 3rd Street Suite 101, Yakima, WA - 98901 Phone: 509-571-1351 Website: www.leading forceedc.com	<b>Specialties</b> Building envelope HVAC - evaporative HVAC - unitary Lighting	<b>Business Type</b> Other: Green Building Product Consultant	<b>Join Date</b> 08/10/2015	<b>Projects Completed</b> 1
<b>Linden Electric, Inc.</b> 9401 Mieras Rd Yakima, WA - 98901 Phone: 509-575-1191	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 07/06/2006	<b>Projects Completed</b> 17
<b>M &amp; R Electric Inc.</b> 3806 OAK AVE. YAKIMA, WA - 98903 Phone: 509-965-1706	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 09/08/2014	<b>Projects Completed</b> 2
<b>M. Campbell &amp; Company, Inc.</b> 2828 W Irving St Pasco, WA - 99301 Phone: 509-545-9848 Website: www.callcampbell.com	<b>Specialties</b> HVAC - unitary	<b>Business Type</b> Contractor	<b>Join Date</b> 06/01/2004	<b>Projects Completed</b> 1
<b>Mantey Heating &amp; Air</b> 3703 W. Nobhill Blvd. Yakima, WA - 98902 Phone: 509-966-5520	<b>Specialties</b> HVAC - unitary Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 10/01/2005	<b>Projects Completed</b> 1
<b>Meier Architecture &amp; Engineering</b> 8697 W. Gage Blvd. Kennewick, WA - 99336 Phone: 509-735-1589 Website: meierinc.com	<b>Specialties</b> HVAC - unitary Lighting Motors and VFDs Other: Other Specialty	<b>Business Type</b> Architect	<b>Join Date</b> 02/01/2012	<b>Projects Completed</b> 1
<b>MH Electric Inc.*</b> Po Box 11224 Yakima, WA - 98909 Phone: 509-452-6039	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 01/06/2010	<b>Projects Completed</b> 165

<b>Nico Electrical Contracting</b> P.O. Box 476 Walla Walla, WA - 99362 Phone: 509-526-9658	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 09/21/2012	<b>Projects Completed</b> 3
<b>Norstar Electric</b> 11780 Mieras Rd. Yakima, WA - 98901 Phone: 509-961-8161	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 01/01/2006	<b>Projects Completed</b> 5
<b>North Coast Electric - Ellensburg</b> 2060 Vantage Highway, Suite 15 Ellensburg, WA - 98926 Phone: 509-962-3001	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 03/23/2016	<b>Projects Completed</b> Completed
<b>North Coast Electric - Hermiston</b> 30597 Lauback Street Hermiston, OR - 97838 Phone: 541-564-9009	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 03/23/2016	<b>Projects Completed</b> Completed
<b>North Coast Electric - Moses Lake</b> 1329 East Wheeler Road, suite 202 Moses Lake, WA - 98837 Phone: 509-764-0734	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 03/23/2016	<b>Projects Completed</b> Completed
<b>North Coast Electric - Pasco</b> 1928 West A Street Pasco, WA - 99301 Phone: 509-547-9514 Website: www.northcoastelectric.com	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 09/21/2012	<b>Projects Completed</b> 4
<b>North Coast Electric - Seattle</b> 2424 8th Ave. So. Seattle, WA - 98134 Phone: 503-310-7710 Website: www.ncelec.com	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 06/27/2014	<b>Projects Completed</b> Completed
<b>North Coast Electric - Spokane</b> 4216 E. Main Avenue Spokane, WA - 99202 Phone: 503-310-7710	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 03/28/2013	<b>Projects Completed</b> Completed
<b>North Coast Electric - Spokane Service Center</b> 4216 East Main Ave Spokane, WA - 99202 Phone: 509-328-1020	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 03/23/2016	<b>Projects Completed</b> Completed
<b>North Coast Electric - Wenatchee</b> 1415 N Miller Wenatchee, WA - 98801 Phone: 509-663-8603 Website: www.northcoastelectric.com	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 09/21/2012	<b>Projects Completed</b> Completed
<b>Northwest Electrical Supply Company (NESCO)</b> 111 S. 3rd Ave. Yakima, WA - 98902 Phone: 509-575-0354	<b>Specialties</b> HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 09/21/2012	<b>Projects Completed</b> 19
<b>Orange Dairy Service, Inc.</b> PO Box 522 2225 E Edison, Sunnyside, WA - 98944 Phone: 509-837-5078	<b>Specialties</b> Farm and Dairy Other: Other Specialty	<b>Business Type</b> Contractor	<b>Join Date</b> 12/01/2005	<b>Projects Completed</b> Completed
<b>Picatti Brothers Inc.</b> 105 S. 3rd St. Yakima, WA - 98902 Phone: 509-248-2540	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 06/18/2009	<b>Projects Completed</b> 5

<b>PLANLED INC</b> 1800 S 341st PL Federal Way, WA - 98003 Phone: 866-552-5529 Website: www.planled.com	<b>Specialties</b> Controls Lighting	<b>Business Type</b> Distributor Manufacturer - Rep	<b>Join Date</b> 09/15/2015	<b>Projects Completed</b> 1
<b>Platt Electric Supply - Grandview*</b> 100 Stover Loop Rd Grandview, WA - 98930 Phone: 509-882-1616 Website: www.platt.com	<b>Specialties</b> Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 07/13/2015	<b>Projects Completed</b> 1
<b>Platt Electric Supply - Walla Walla*</b> 415 West Main Walla Walla, WA - 99362 Phone: 509-522-0611 Website: platt.com	<b>Specialties</b> Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 04/07/2007	<b>Projects Completed</b> 28
<b>Platt Electric Supply - Yakima*</b> 16 S. 1st Avenue Yakima, WA - 98902 Phone: 509-452-6444 Website: platt.com	<b>Specialties</b> Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 08/16/2006	<b>Projects Completed</b> 174
<b>Pro Controls Inc.</b> 1312 Gordon Rd Yakima, WA - 98901 Phone: 509-388-4186 Website: procontrolsyakima.com	<b>Specialties</b> Controls HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 07/01/2012	<b>Projects Completed</b> 1
<b>Rainbow Electric, Inc.</b> 1312 Dazet Rd Yakima, WA - 98908 Phone: 509-972-2558 x 105	<b>Specialties</b> Building envelope Food Service Lighting Other: Other Specialty	<b>Business Type</b> Contractor	<b>Join Date</b> 06/11/2014	<b>Projects Completed</b> 5
<b>Rexel - Capitol Light - Hartford, CT</b> 270 Locust Street Hartford, CT - 06141 Phone: 866-520-2388 Website: www.capitollight.com	<b>Specialties</b> Controls Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 06/13/2014	<b>Projects Completed</b>
<b>Roberts Electrical Inc.</b> 13761 US Highway 12 PO Box 757, Naches, WA - 98937 Phone: 509-930-3803	<b>Specialties</b> HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 05/01/2012	<b>Projects Completed</b>
<b>Sage Electric of Selah LLC</b> 675 Gore Rd Selah, WA - 98942 Phone: 509-697-9334	<b>Specialties</b> Controls Irrigation Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 03/15/2016	<b>Projects Completed</b>
<b>Schaefer Refrigeration, Inc.</b> 2929 E. Isaacs Walla Walla, WA - 99362 Phone: 509-525-2076	<b>Specialties</b> HVAC - unitary Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 06/01/2004	<b>Projects Completed</b> 2
<b>Schneider Electric Buildings Americas, Inc.</b> 7525 SE 24th Street, Ste 470 Mercer Island, WA - 98040 Phone: 360-823-3040 Website: www.se-enable.com	<b>Specialties</b> HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Engineering Firm	<b>Join Date</b> 10/10/2010	<b>Projects Completed</b> 6
<b>Stanley inc DBA Ahtanum Electric</b> PO Box 8186 yakima, WA - 98908 Phone: 509-945-7414	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 11/12/2015	<b>Projects Completed</b> 1

<b>Stoneway Electric Supply - Walla Walla*</b> 44 S Palouse Street Walla Walla, WA - 99362 Phone: 509-522-1550 Website: stoneway.com	<b>Specialties</b> Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 06/08/2006	<b>Projects Completed</b> 7
<b>Stoneway Electric Supply - Yakima*</b> 23 N. 3rd Ave Yakima, WA - 98902 Phone: 509-469-6154	<b>Specialties</b> Controls HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 02/26/2008	<b>Projects Completed</b> 5
<b>Stoneway Electric Supply Co. - Richland*</b> 630 Railroad Street Richland, WA - 99352 Phone: 509-943-4664	<b>Specialties</b> Controls Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 08/26/2015	<b>Projects Completed</b> Completed
<b>Stusser Electric Company*</b> 116 N. 2nd Ave. Yakima, WA - 98902 Phone: 509-453-0378	<b>Specialties</b> HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 04/28/2007	<b>Projects Completed</b> 28
<b>T&amp;M Heating</b> PO Box 3120 2711 S. 5th Ave, Union Gap, WA - 98903 Phone: 509-575-1088	<b>Specialties</b> HVAC - unitary	<b>Business Type</b> Contractor	<b>Join Date</b> 07/01/2004	<b>Projects Completed</b> 1
<b>Thermex Valley Heating &amp; AC</b> 1916 Fruitvale Blvd. Yakima, WA - 98902 Phone: 509-965-0630 Website: thermexvalley.com	<b>Specialties</b> HVAC - unitary Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 07/01/2004	<b>Projects Completed</b> Completed
<b>Thunder Electric Inc.</b> 704 River Road Yakima, WA - 98902 Phone: 509-575-8362	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 09/11/2014	<b>Projects Completed</b> Completed
<b>Titan Electrical LLC</b> 651 North Keys Road Yakima, WA - 98901 Phone: 509-941-8306	<b>Specialties</b> Lighting Other: Other Specialty	<b>Business Type</b> Contractor	<b>Join Date</b> 09/15/2015	<b>Projects Completed</b> 1
<b>TJ's Refrigeration Heating and Air Conditioning LLC</b> 329 S 6th Street Sunnyside, WA - 98944 Phone: 509-839-8840	<b>Specialties</b> Appliances Building envelope Controls Food Service HVAC - evaporative HVAC - unitary Motors and VFDs	<b>Business Type</b> Other: General Contractor	<b>Join Date</b> 10/07/2015	<b>Projects Completed</b> Completed
<b>Tolman Electric</b> 380 Canyon Road Grandview, WA - 98930 Phone: 509-830-1164	<b>Specialties</b> HVAC - unitary Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 04/10/2010	<b>Projects Completed</b> 3
<b>Total Control Electric Inc.</b> 5 East F Street Yakima, WA - 98902 Phone: 509-453-1021	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 06/08/2006	<b>Projects Completed</b> 11
<b>Total Digital Systems</b> 13433 NE 20th St STE O, Bellevue, WA - 98005 Phone: 425-643-2728 Website: www.totaldigitalsystems.com	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 06/24/2016	<b>Projects Completed</b> Completed

**Transformative Wave Technologies**

1012 central ave s  
kent, WA - 98032  
Phone: 253-867-2333 x 794  
Website:  
<http://transformativewave.com/>

**Specialties**

Motors and VFDs  
Other: Other Specialty

**Business Type**

Manufacturer - Rep

**Join Date**

08/09/2016

**Projects****Completed****Twice the Light, Inc.**

6137 NE 63rd Street  
Vancouver, WA - 98661  
Phone: 360-573-6101  
Website: [www.twicethelight.com](http://www.twicethelight.com)

**Specialties**

Lighting

**Business Type**

Contractor  
Distributor  
Manufacturer - Rep

**Join Date**

06/28/2016

**Projects****Completed**  
1**Walla Walla Electric\***

1225 W. Poplar  
Walla Walla, WA - 99362  
Phone: 509-525-8672  
Website: [wwelectric.com](http://wwelectric.com)

**Specialties**

Lighting

**Business Type**

Contractor

**Join Date**

04/09/2001

**Projects****Completed**  
100



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## Appendix 5

### Communications

## Energy Efficiency Communications 2016 (only showing new creative)

Creative (click on the hyperlinks below to see the creative)

### TV

- [Washington efficiency for business customers” Baker”](#)
- [Washington hidden savings for business customers “Vet”](#)

### Radio

- [Hidden Savings for business customers](#)
- [Well-oiled machine for business customers](#)

### Print

- [Farm Bureau ad](#) *Neighbor's Magazine, Farm Bureau Newspaper, and Yakima Valley Business Times – special ag and dairy sections*
- [Ad to thank business customers and vendors](#) for being wattsmart in 2016
- [Newspaper ad \(b/w\)featuring business customer Walla Walla Public Schools](#)
- [Color ad featuring business customer Walla Walla Public Schools](#)
- [Newspaper ad \(b/w\) featuring business customer CPC International](#)
- [Color ad featuring business customer CPC International](#)
- [Newspaper ad featuring several business customers – Spring 2016](#)
- [Newspaper ad featuring several business customers – Fall 2016](#)

### Digital Ads:

- [Facebook ad – wattsmart Starter Kit](#)
- [“Hidden Savings for business" \(Static\)](#)
- ["Hidden Savings for business" \(Animated\)](#)

### Inserts:

- [February Smart Thermostat Insert](#)
- [June Cooling Ductless Heat Pump Insert](#)

### Press releases:



- [CPC International Apple Co. and Wray's Marketfresh IGA Recognized as Leaders in Energy Savings – September 7, 2016](#)
- [Five Ways to Beat the Heat – August 12, 2016](#)
- [Five Ways to Beat the Heat – June 3, 2016](#)

Newsletters:

- [January Voices](#)
- [January energy connections](#)
- [Winter Energy Insights](#)
  - Tech school masters efficiency
  - System upgrades improve reliability
  - Blue Sky boosts solar projects
  - Services help businesses thrive
- [February energy connections](#)
- [March Voices](#)
- [March energy connections](#)
- [April Voices](#)
- [April energy connections](#)
- [May wattsup insert](#)
- [May energy connections](#)
- [Spring Energy Insights](#)
  - Wray's Marketfresh IGA efficiency efforts honored
  - For the environment, with respect
  - Walla Walla moves up in contest
  - Grants lift local communities
- [June energy connections](#)
- [July Voices](#)
- [July energy connections](#)
- [Summer Energy Insights](#)
  - CPC wins wattsmart Business award
  - Birds get home away from wires
  - More features added to mobile app
  - Wildlife habitat work earns honor
- [August energy connections](#)
- [September Voices](#)
- [September energy connections](#)
- [October wattsup insert](#)
- [October energy connections](#)
- [November Voices](#)
- [November Energy Insights](#)
  - LED upgrade keeps car wash in gear
  - Choices meet energy needs
  - A river runs through it
  - Involved for stronger communities
- [November energy connections](#)

Direct mail:

- [wattsmart Starter Kit](#)
- [Monthly low-income weatherization mailing](#)
- Mailing to irrigation customers encouraging application for incentives:
  - [Letter](#)
  - [Application](#)

Emails:

- [Energy Connections for midsize business customers 1/16](#)
- [wattsmart Business lighting 2/17/16](#)
- [eVite CRES training 2/22/16](#)
- [Energy Connections for midsize business customers \(3/16/16\)](#)
- [wattsmart Business small office/retail 3/29/16](#)
- [Energy efficiency and the environment 4/16](#)
- [Seasonal change 5/26/16](#)
- [wattsmart Business food/lodging email 6/7/16](#)
- [wattsmart Business food service webinar evite 8/30/16](#)
- [Energy Connections for midsize business customers \(6/16\)](#)
- [Energy Connections for midsize business customers \(7/16\)](#)
- [wattsmart Business convenience/grocery email \(9/15/16\)](#)
- [Energy Connections for midsize business customers \(9/16\)](#)
- [eVite Compressed Air CAC1 9/16](#)
- [wattsmart Business lighting incentives email \(10/11/16\)](#)
- [wattsmart Business lighting controls email \(11/15/16\)](#)

Collateral:

- [Winter wattsmart handout](#)
- [Summer wattsmart handout](#)
- [wattsmart Business - overview](#)
- [wattsmart Business – overview Spanish](#)
- [wattsmart Business - brochure](#)

- wattsmart Business (office/small retail businesses):
  - [Printed](#)
  - [Co-branded version](#)
- wattsmart Business (grocery and convenience stores):
  - [Printed](#)
  - [Co-branded version](#)
- wattsmart Business (restaurant and lodging businesses):
  - [Printed](#)
  - [Co-branded version](#)
- [wattsmart Business LED instant incentives](#)
- [wattsmart Small Business lighting incentives](#)
- [wattsmart Business wastewater incentives](#)



Appendix 6

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Washington Program Evaluations

Pacific Power

## Washington 2016 Evaluations

### Program Evaluation Recommendations and Company Responses

Evaluation reports provide detailed information on the process and impact evaluations performed on each program, summarizing the methodology used to calculate the evaluated savings as well as providing recommendations for the Company to consider for improving the process or impact of the program, as well as customer satisfaction.

Outlined below is a list of the programs, the years that were evaluated during 2016 and the third party evaluator who completed the evaluation. Program evaluations are available for review at [www.pacificorp.com/es/dsm/washington.html](http://www.pacificorp.com/es/dsm/washington.html)

Program	Years Evaluated	Evaluator
Home Energy Savings	2013 - 2014	Cadmus
Home Energy Reports	2014 – 2015	Navigant

Company responses to the program recommendations contained in the evaluations are provided below.

**Table 1**  
**Home Energy Savings Evaluation Recommendations**

<b>Evaluation Recommendations</b>	<b>Pacific Power Action Plan</b>
<p>Assign measure categories by end use in the program administrator's tracking database (instead of delivery channel) to ensure the most appropriate cost-effectiveness results instead of delivery channel.</p>	<p>The program administrator worked with Pacific Power to update the measure categories so they align with end uses instead of delivery channels. These updates were completed coincident with the January 1, 2016 program changes and are reflected in the Pacific Power's Technical Reference Library (TRL).</p>
<p>For the upstream lighting database, track all data in a consistent manner across each program evaluation period. Cadmus had difficulty mapping the program administrator's lighting database to the price-scheduling database.</p>	<p>The program administrator worked with Cadmus in 2016 to develop a standardized lighting template. Also, the process was updated to ensure alignment between Cadmus and the program administrator regarding both the template and field definitions. The new process and templates were used for the most current (2015-2016) evaluation.</p>
<p>Consider accounting for commercial installation of upstream bulbs in the reported savings. Currently, Pacific Power does not account for cross-sector sales from the upstream lighting incentives.</p>	<p>The most recent RTF workbook (January 2017, V5) for residential lighting includes information about commercial installations resulting from retail incentives. This information will be evaluated during 2017 as part of 2018-2019 biennium planning. Any changes in savings reporting would begin in 2018.</p>
<p>Continue to pursue a multi-touch marketing strategy, using a mix of bill inserts and retailer/contractor training. Given the large percentage of customers who learned of wattsmart offerings through bill inserts, examine the proportion of customers selecting to receive online bills and ensure these online channels proportionately advertise the programs with the messages that motivated customers to participate: long-lasting products, saving energy, replacing equipment and reducing costs.</p>	<p>About a third of Pacific Power customers receive online bills. Customers who receive online bills are provided with online access to the bill messages provided in printed bills. Key messages are consistent across both paper and online bill inserts. The multi-touch marketing strategy is ongoing and a customer propensity model to improve targeting has recently been added by the program administrator.</p>
<p>Continue regular trainings with trade allies (e.g., distributors, retailers, sales associates, contractors), updating them on tariff changes and, where appropriate, supporting them with sales and marketing training.</p>	<p>Program administrator will continue retailer and trade ally trainings. Focus will be placed on when program offerings are updated, implementation is changed, and marketing changes. The program administrator will provide regular trainings to both retail and trade ally groups concentrating on priority measures, product/service quality, and program qualifications.</p>

<b>Evaluation Recommendations</b>	<b>Pacific Power Action Plan</b>
For energy savings kits, consider allowing customer to opt out of either the showerhead or faucet aerator offering. Lighting only kits are already available.	Potential changes to energy kit configurations will be evaluated during 2017 as part of planning for the 2018-2019 biennium. Any changes in configuration will be included in the 2018-2019 conservation plan.

**Table 2**  
**Home Energy Reports Evaluation Recommendations**

<b>Evaluation Recommendations</b>	<b>Pacific Power Action Plan</b>
Future refill waves should target the highest usage customers not already in the program. Prior to adding future refill waves, the program should verify that the allocation of households across the treatment and control groups is consistent with a RCT (randomized control trial).	OPower delivers the program for Pacific Power in Washington. Highest usage customers are targeted by OPower when customers are added to the refill wave to maximize savings opportunity. Households (for treatment and control groups) continue to be added in a manner consistent with established RCT protocols. In addition, to increase savings for program participants, digital engagements are layered on top of paper home energy reports.