



## Appendix 1

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# Energy Efficiency Cost Effectiveness

Pacific Power

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## **Portfolio and Sector Level Cost Effectiveness**

Navigant estimated the cost-effectiveness for the overall energy efficiency portfolio and component sectors, based on 2015 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.

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Table 15 – Home Energy Savings Non-Energy Benefits

**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)(base year 2015)	\$0.0885
Commercial Energy Rate (\$/kWh)(base year 2015)	\$0.0820
Industrial Energy Rate (\$/kWh)(base year 2015)	\$0.0666
Irrigation Energy Rate (\$/kWh)(base year 2015)	\$0.0836
Inflation Rate <sup>1</sup>	1.9%

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

**Table 2 – Portfolio Level Costs 2015**

Expense	Cost
School Energy Education	\$61,431
Outreach and Communication	\$208,268
Portfolio Level Expenditures	\$406,057
<b>Total Costs</b>	<b>\$675,756</b>

**Table 3 – NEEA Inputs 2015**

Sector	Savings at Meter (kWh)	NEEA Expenses (\$)
Commercial	1,430,886	\$413,005
Industrial	75,080	\$21,671
Residential	1,557,439	\$449,533
<b>Total</b>	<b>3,063,405</b>	<b>884,208</b>

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

Measure Group	PTRC	TRC	UCT	RIM	PCT
Total Portfolio	1.48	1.34	2.28	0.58	2.82
Total Portfolio (Including NEEA)	1.46	1.32	2.17	0.57	2.95
Total Portfolio (Including NEBs)	1.74	1.60	2.28	0.58	3.19
Total Portfolio (Including NEEA & NEBs)	1.70	1.57	2.17	0.57	3.31
C&I Programs	1.61	1.47	2.42	0.61	2.93
C&I Programs (Including NEEA)	1.59	1.45	2.32	0.60	3.04
Residential Programs	1.43	1.30	2.52	0.57	2.66
Residential Programs (Including NEEA)	1.39	1.27	2.32	0.55	2.81
Residential Programs (Including NEBs)	2.13	2.00	2.52	0.57	3.56
Residential Programs (Including NEEA & NEBs)	2.05	1.93	2.32	0.55	3.71

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

**Table 5 – 2015 Total Portfolio Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0503	\$16,271,951	\$24,033,123	\$7,761,172	1.48
Total Resource Cost Test (TRC) No Adder	\$0.0503	\$16,271,951	\$21,848,294	\$5,576,342	1.34
Utility Cost Test (UCT)	\$0.0296	\$9,577,193	\$21,848,294	\$12,271,101	2.28
Rate Impact Test (RIM)		\$37,418,690	\$21,848,294	-\$15,570,397	0.58
Participant Cost Test (PCT)		\$11,624,414	\$32,818,140	\$21,193,727	2.82
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003521371

**Table 6 – 2015 Total Portfolio Cost-Effectiveness Results (Including NEEA)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0506	\$17,156,159	\$24,970,140	\$7,813,981	1.46
Total Resource Cost Test (TRC) No Adder	\$0.0506	\$17,156,159	\$22,700,128	\$5,543,968	1.32
Utility Cost Test (UCT)	\$0.0309	\$10,461,401	\$22,700,128	\$12,238,726	2.17
Rate Impact Test (RIM)		\$39,721,799	\$22,700,128	-\$17,021,671	0.57
Participant Cost Test (PCT)		\$11,624,414	\$34,237,041	\$22,612,627	2.95
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003849588

**Table 7 – 2015 Total Portfolio Cost-Effectiveness Results (Including NEBs)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0503	\$16,271,951	\$28,251,822	\$11,979,871	1.74
Total Resource Cost Test (TRC) No Adder	\$0.0503	\$16,271,951	\$26,066,993	\$9,795,042	1.60
Utility Cost Test (UCT)	\$0.0296	\$9,577,193	\$21,848,294	\$12,271,101	2.28
Rate Impact Test (RIM)		\$37,418,690	\$21,848,294	-\$15,570,397	0.58
Participant Cost Test (PCT)		\$11,624,414	\$37,036,840	\$25,412,426	3.19
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003521371

**Table 8 – 2015 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) + Conversation Adder	\$0.0506	\$17,156,159	\$29,188,840	\$12,032,680	1.70
Total Resource Cost Test (TRC) No Adder	\$0.0506	\$17,156,159	\$26,918,827	\$9,762,668	1.57
Utility Cost Test (UCT)	\$0.0309	\$10,461,401	\$22,700,128	\$12,238,726	2.17
Rate Impact Test (RIM)		\$39,721,799	\$22,700,128	-\$17,021,671	0.57
Participant Cost Test (PCT)		\$11,624,414	\$38,455,740	\$26,831,327	3.31
Lifecycle Revenue Impacts (\$/kWh)					\$0.0003849588

**Table 9 – 2015 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) + Conversation Adder	\$0.0454	\$9,591,614	\$15,468,326	\$5,876,712	1.61
Total Resource Cost Test (TRC) No Adder	\$0.0454	\$9,591,614	\$14,062,115	\$4,470,501	1.47
Utility Cost Test (UCT)	\$0.0275	\$5,813,131	\$14,062,115	\$8,248,984	2.42
Rate Impact Test (RIM)		\$23,022,204	\$14,062,115	-\$8,960,089	0.61
Participant Cost Test (PCT)		\$6,945,700	\$20,376,290	\$13,430,590	2.93
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001714551

**Table 10 – 2015 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) + Conversation Adder	\$0.0459	\$10,062,817	\$16,021,460	\$5,958,643	1.59
Total Resource Cost Test (TRC) No Adder	\$0.0459	\$10,062,817	\$14,564,964	\$4,502,146	1.45
Utility Cost Test (UCT)	\$0.0286	\$6,284,335	\$14,564,964	\$8,280,629	2.32
Rate Impact Test (RIM)		\$24,219,481	\$14,564,964	-\$9,654,517	0.60
Participant Cost Test (PCT)		\$6,945,700	\$21,102,364	\$14,156,664	3.04
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001847433

**Table 11 – 2015 Residential Energy Efficiency Portfolio Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0536	\$6,004,582	\$8,564,796	\$2,560,215	1.43
Total Resource Cost Test (TRC) No Adder	\$0.0536	\$6,004,582	\$7,786,179	\$1,781,597	1.30
Utility Cost Test (UCT)	\$0.0276	\$3,088,306	\$7,786,179	\$4,697,872	2.52
Rate Impact Test (RIM)		\$13,720,731	\$7,786,179	-\$5,934,553	0.57
Participant Cost Test (PCT)		\$4,678,713	\$12,441,850	\$7,763,137	2.66
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001845432

**Table 12 – 2015 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) + Conversation Adder	\$0.0537	\$6,417,587	\$8,948,680	\$2,531,094	1.39
Total Resource Cost Test (TRC) No Adder	\$0.0537	\$6,417,587	\$8,135,164	\$1,717,577	1.27
Utility Cost Test (UCT)	\$0.0293	\$3,501,311	\$8,135,164	\$4,633,853	2.32
Rate Impact Test (RIM)		\$14,826,563	\$8,135,164	-\$6,691,399	0.55
Participant Cost Test (PCT)		\$4,678,713	\$13,134,677	\$8,455,964	2.81
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002080784

**Table 13 – 2015 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) + Conversation Adder	\$0.0536	\$6,004,582	\$12,783,496	\$6,778,914	2.13
Total Resource Cost Test (TRC) No Adder	\$0.0536	\$6,004,582	\$12,004,878	\$6,000,296	2.00
Utility Cost Test (UCT)	\$0.0276	\$3,088,306	\$7,786,179	\$4,697,872	2.52
Rate Impact Test (RIM)		\$13,720,731	\$7,786,179	-\$5,934,553	0.57
Participant Cost Test (PCT)		\$4,678,713	\$16,660,550	\$11,981,837	3.56
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001845432

**Table 14 – 2015 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) + Conversation Adder	\$0.0537	\$6,417,587	\$13,167,380	\$6,749,793	2.05
Total Resource Cost Test (TRC) No Adder	\$0.0537	\$6,417,587	\$12,353,863	\$5,936,277	1.93
Utility Cost Test (UCT)	\$0.0293	\$3,501,311	\$8,135,164	\$4,633,853	2.32
Rate Impact Test (RIM)		\$14,826,563	\$8,135,164	-\$6,691,399	0.55
Participant Cost Test (PCT)		\$4,678,713	\$17,353,377	\$12,674,663	3.71
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002080784

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

**Table 15 – Home Energy Savings Non-Energy Benefits (2015)**

Non-Energy Benefits	Non-Energy Benefits Water (\$/yr)	Non-Energy Benefits Other (\$/yr)	Measure Life	Quantity	Total Present Value Benefits
HES - Appliances	\$67.74	\$57.18	14	163	\$64,623
HES - Energy Kits	\$184.77	\$23.20	9	6,783	\$1,528,398
HES - Lighting	\$0.00	\$5.36	9	359,660	\$2,625,679
<b>Total HES NEBs</b>	<b>\$252.51</b>	<b>\$85.74</b>	<b>9</b>	<b>366,606</b>	<b>\$4,218,699</b>



## **Program Level Cost Effectiveness**

### **Home Energy Savings Program**

Navigant estimated the cost-effectiveness results for the Washington Home Energy Savings Program, based on 2015 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program and for the 6 measure categories.

Cost-effectiveness was tested using the 2015 IRP west residential heating 17%, west residential lighting 45%, west water heating 53% and west plug loads 61% 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 Energy Kits Cost-Effectiveness Results

Table 9 - Home Energy Savings HVAC Cost-Effectiveness Results

Table 10 - Home Energy Savings Lighting Cost-Effectiveness Results

Table 11 - Home Energy Savings Water Heating Cost-Effectiveness Results

Table 12 - Home Energy Savings Appliance Non-Energy Benefits

Table 13 - Home Energy Savings Energy Kits Non-Energy Benefits

Table 14 - Home Energy Savings Lighting Non-Energy Benefits

Table 15 - Home Energy Savings Program (with NEBs) Cost-Effectiveness Results

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

Table 17 - Home Energy Savings Energy Kits (with NEBs) Cost-Effectiveness Results

Table 18 - Home Energy Savings Lighting (with NEBs) Cost-Effectiveness Results

**Table 16 - Home Energy Savings Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.0885
Inflation Rate <sup>1</sup>	1.9%

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

**Table 17 – Home Energy Savings Annual Program Costs**

Measure Group	Engineering Costs	Utility Admin	Program Dev.	Program Delivery	Incentives	Total Utility Costs	Gross Customer Costs
Appliance	\$0	\$89	\$46	\$4,437	\$8,940	\$13,512	\$37,694
Building Shell	\$0	\$1,093	\$565	\$54,742	\$83,046	\$139,446	\$235,402
Energy Kits	\$0	\$9,181	\$4,750	\$160,512	\$100,128	\$274,571	\$110,718
HVAC	\$0	\$8,412	\$4,352	\$421,326	\$670,739	\$1,104,829	\$1,202,813
Lighting	\$0	\$28,893	\$14,949	\$108,924	\$864,830	\$1,017,596	\$3,039,747
Water Heating	\$0	\$241	\$125	\$12,068	\$34,756	\$47,190	\$52,339
<b>Total</b>	<b>\$0</b>	<b>\$47,909</b>	<b>\$24,788</b>	<b>\$762,009</b>	<b>\$1,762,438</b>	<b>\$2,597,143</b>	<b>\$4,678,713</b>

**Table 18 – 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
Appliance	22,203	100%	22,203	100%	22,203	15
Building Shell	273,910	100%	273,910	100%	273,910	45
Energy Kits	2,300,906	100%	2,300,906	100%	2,300,906	9
HVAC	2,108,185	100%	2,108,185	100%	2,108,185	19
Lighting	7,241,052	100%	7,241,052	100%	7,241,052	9
Water Heating	60,384	100%	60,384	100%	60,384	15
<b>Total</b>	<b>12,006,640</b>	<b>100%</b>	<b>12,006,640</b>	<b>100%</b>	<b>12,006,640</b>	<b>12</b>

**Table 19 - Benefit/Cost Ratios by Measure Category**

Measure Group	PTRC	TRC	UCT	RIM	PCT
Appliance	0.37	0.34	1.06	0.40	0.83
Appliance (with NEBs)	1.90	1.87	1.06	0.40	2.54
Building Shell	1.72	1.56	3.27	0.73	2.40
Energy Kits	4.05	3.68	3.83	0.57	14.94
Energy Kits (with NEBs)	9.41	9.04	3.83	0.57	28.75
HVAC	1.52	1.39	2.05	0.63	2.61
Lighting	1.18	1.07	3.36	0.57	1.91
Lighting (with NEBs)	2.00	1.89	3.36	0.57	2.77
Water Heating	0.75	0.68	0.93	0.41	1.82
<b>Total</b>	<b>1.45</b>	<b>1.31</b>	<b>2.79</b>	<b>0.60</b>	<b>2.41</b>
<b>Total (with NEBs)</b>	<b>2.21</b>	<b>2.08</b>	<b>2.79</b>	<b>0.60</b>	<b>3.31</b>

**Table 20 – 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) + Conversation Adder	\$0.0550	\$5,513,419	\$7,970,991	\$2,457,572	1.45
Total Resource Cost Test (TRC) No Adder	\$0.0550	\$5,513,419	\$7,246,356	\$1,732,937	1.31
Utility Cost Test (UCT)	\$0.0259	\$2,597,143	\$7,246,356	\$4,649,212	2.79
Rate Impact Test (RIM)		\$12,117,491	\$7,246,356	-\$4,871,136	0.60
Participant Cost Test (PCT)		\$4,678,713	\$11,282,786	\$6,604,073	2.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001009844
Discounted Participant Payback (years)					1.53

Table 6 through Table 18 provides cost-effectiveness results for all 6 measures.

**Table 21 - Home Energy Savings Appliance 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) + Conversation Adder	\$0.1804	\$42,266	\$15,764	-\$26,502	0.37
Total Resource Cost Test (TRC) No Adder	\$0.1804	\$42,266	\$14,330	-\$27,935	0.34
Utility Cost Test (UCT)	\$0.0577	\$13,512	\$14,330	\$819	1.06
Rate Impact Test (RIM)		\$35,757	\$14,330	-\$21,427	0.40
Participant Cost Test (PCT)		\$37,694	\$31,186	-\$6,508	0.83
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003552
Discounted Participant Payback (years)					n/a

**Table 22 - 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) + Conversation Adder	\$0.0578	\$291,802	\$501,065	\$209,263	1.72
Total Resource Cost Test (TRC) No Adder	\$0.0578	\$291,802	\$455,513	\$163,712	1.56
Utility Cost Test (UCT)	\$0.0276	\$139,446	\$455,513	\$316,068	3.27
Rate Impact Test (RIM)		\$622,009	\$455,513	-\$166,496	0.73
Participant Cost Test (PCT)		\$235,402	\$565,609	\$330,208	2.40
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000009158
Discounted Participant Payback (years)					n/a

**Table 23 - Home Energy Savings Energy Kits 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) + Conversation Adder	\$0.0174	\$285,161	\$1,155,414	\$870,253	4.05
Total Resource Cost Test (TRC) No Adder	\$0.0174	\$285,161	\$1,050,377	\$765,216	3.68
Utility Cost Test (UCT)	\$0.0167	\$274,571	\$1,050,377	\$775,806	3.83
Rate Impact Test (RIM)		\$1,828,664	\$1,050,377	-\$778,287	0.57
Participant Cost Test (PCT)		\$110,718	\$1,654,221	\$1,543,503	14.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000215161
Discounted Participant Payback (years)					0.05

\*Energy kits with lighting measures utilize the lighting decrement and load shape.

**Table 24 - 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) + Conversation Adder	\$0.0630	\$1,636,904	\$2,494,841	\$857,937	1.52
Total Resource Cost Test (TRC) No Adder	\$0.0630	\$1,636,904	\$2,268,037	\$631,133	1.39
Utility Cost Test (UCT)	\$0.0425	\$1,104,829	\$2,268,037	\$1,163,208	2.05
Rate Impact Test (RIM)		\$3,575,568	\$2,268,037	-\$1,307,532	0.63
Participant Cost Test (PCT)		\$1,202,813	\$3,141,478	\$1,938,664	2.61
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000170920
Discounted Participant Payback (years)					2.93

**Table 25 - 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) + Conversation Adder	\$0.0614	\$3,192,514	\$3,755,645	\$563,132	1.18
Total Resource Cost Test (TRC) No Adder	\$0.0614	\$3,192,514	\$3,414,223	\$221,709	1.07
Utility Cost Test (UCT)	\$0.0196	\$1,017,596	\$3,414,223	\$2,396,626	3.36
Rate Impact Test (RIM)		\$5,947,803	\$3,414,223	-\$2,533,580	0.57
Participant Cost Test (PCT)		\$3,039,747	\$5,795,036	\$2,755,289	1.91
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000700418
Discounted Participant Payback (years)					3.53

**Table 26 - 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) + Conversation Adder	\$0.1017	\$64,773	\$48,263	-\$16,510	0.75
Total Resource Cost Test (TRC) No Adder	\$0.1017	\$64,773	\$43,875	-\$20,897	0.68
Utility Cost Test (UCT)	\$0.0741	\$47,190	\$43,875	-\$3,314	0.93
Rate Impact Test (RIM)		\$107,690	\$43,875	-\$63,814	0.41
Participant Cost Test (PCT)		\$52,339	\$95,256	\$42,917	1.82
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000010578
Discounted Participant Payback (years)					3.42

In addition to the energy benefits reported above, appliances, energy savings kits and lighting in the Home Energy Savings program offer significant non-energy benefits (NEBs). Table 12 through

Table 30 detail the non-energy benefits and the cost-effectiveness results.

**Table 27 - Home Energy Savings Appliance Non-Energy Benefits**

Measure Name	Quantity	Non-Energy Benefits Water (\$/yr)	Non-Energy Benefits Other (\$/yr)	Measure Life	Total NEB (\$/yr)	Total Present Value Benefits
Clothes Washers 3.2 MEF - Electric DHW & Electric Dryer	117	\$22.58	\$19.06	14	\$41.64	\$46,385.76
Clothes Washers 3.2 MEF - Gas DHW & Electric Dryer	39	\$22.58	\$19.06	14	\$41.64	\$15,461.92
Clothes Washers 3.2 MEF - Gas DHW & Gas Dryer	7	\$22.58	\$19.06	14	\$41.64	\$2,775.22

**Table 28 - Home Energy Savings Energy Kits Non-Energy Benefits**

Measure Name	Quantity	Non-Energy Benefits Water (\$/yr)	Non-Energy Benefits Other (\$/yr)	Measure Life	Total NEB (\$/yr)	Total Present Value Benefits
Energy Savings Kit - Basic - 1 Bathroom	2,024	\$20.53	\$3.08	9	\$23.61	\$334,162.30
Energy Savings Kit - Basic - 2 Bathrooms	3,083	\$41.06	\$3.08	9	\$44.14	\$990,555.04
Energy Savings Kit - Best - 1 Bathroom	119	\$20.53	\$2.60	11	\$23.13	\$21,681.60
Energy Savings Kit - Best - 2 Bathrooms	403	\$41.06	\$2.60	11	\$43.66	\$138,598.20
Energy Savings Kit - Better - 1 Bathroom	21	\$20.53	\$3.08	9	\$23.61	\$3,467.10
Energy Savings Kit - Better - 2 Bathrooms	77	\$41.06	\$3.08	9	\$44.14	\$24,739.78
Energy Savings Kit - CFL	961	\$0.00	\$3.08	5	\$3.08	\$13,063.06
Energy Savings Kit - LED - WA	95	\$0.00	\$2.60	12	\$2.60	\$2,130.95

**Table 29 - Home Energy Savings Lighting Non-Energy Benefits**

Measure Name	Quantity	Non-Energy Benefits Water (\$/yr)	Non-Energy Benefits Other (\$/yr)	Measure Life	Total NEB (\$/yr)	Total Present Value Benefits
CFLs - General Purpose - Retail	187,393	\$0.00	\$0.77	6	\$0.77	\$741,345.99
CFLs - Specialty - Retail	37,093	\$0.00	\$1.18	7	\$1.18	\$254,607.91
LEDs - General Purpose (Omnidirectional) - Retail	87,288	\$0.00	\$0.65	12	\$0.65	\$489,490.52
LEDs - Specialty (Decorative and Directional) - Retail	47,886	\$0.00	\$2.76	12	\$2.76	\$1,140,234.11

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

**Table 30 - 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) + Conversation Adder	\$0.0550	\$5,513,419	\$12,189,691	\$6,676,272	2.21
Total Resource Cost Test (TRC) No Adder	\$0.0550	\$5,513,419	\$11,465,055	\$5,951,636	2.08
Utility Cost Test (UCT)	\$0.0259	\$2,597,143	\$7,246,356	\$4,649,212	2.79
Rate Impact Test (RIM)		\$12,117,491	\$7,246,356	-\$4,871,136	0.60
Participant Cost Test (PCT)		\$4,678,713	\$15,501,485	\$10,822,772	3.31
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001009844
Discounted Participant Payback (years)					3.62

**Table 31 - Home Energy Savings Appliance (with NEBs) 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) + Conversation Adder	\$0.1804	\$42,266	\$80,386	\$38,121	1.90
Total Resource Cost Test (TRC) No Adder	\$0.1804	\$42,266	\$78,953	\$36,688	1.87
Utility Cost Test (UCT)	\$0.0577	\$13,512	\$14,330	\$819	1.06
Rate Impact Test (RIM)		\$35,757	\$14,330	-\$21,427	0.40
Participant Cost Test (PCT)		\$37,694	\$95,808	\$58,114	2.54
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003552
Discounted Participant Payback (years)					n/a

**Table 32 - Home Energy Savings Energy Kits (with NEBs) Cost-Effectiveness Results  
(Decrement - West Water Heating -53%, Load Shape – Residential Water 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) + Conversation Adder	\$0.0174	\$285,161	\$2,683,812	\$2,398,651	9.41
Total Resource Cost Test (TRC) No Adder	\$0.0174	\$285,161	\$2,578,775	\$2,293,614	9.04
Utility Cost Test (UCT)	\$0.0167	\$274,571	\$1,050,377	\$775,806	3.83
Rate Impact Test (RIM)		\$1,828,664	\$1,050,377	-\$778,287	0.57
Participant Cost Test (PCT)		\$110,718	\$3,182,619	\$3,071,901	28.75
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000215161
Discounted Participant Payback (years)					0.05

\*Energy kits with lighting measures utilize the lighting decrement and load shape.

**Table 33 - 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) + Conversation Adder	\$0.0614	\$3,192,514	\$6,381,324	\$3,188,810	2.00
Total Resource Cost Test (TRC) No Adder	\$0.0614	\$3,192,514	\$6,039,901	\$2,847,388	1.89
Utility Cost Test (UCT)	\$0.0196	\$1,017,596	\$3,414,223	\$2,396,626	3.36
Rate Impact Test (RIM)		\$5,947,803	\$3,414,223	-\$2,533,580	0.57
Participant Cost Test (PCT)		\$3,039,747	\$8,420,715	\$5,380,968	2.77
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000700418
Discounted Participant Payback (years)					3.53



## **Home Energy Reporting**

Navigant estimated the cost-effectiveness results for the Washington Home Energy Reporting Program, based on 2015 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 64% load factor decrement. The program does not pass any of the 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 34 - Home Energy Reporting Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.0885
Inflation Rate <sup>1</sup>	1.9%

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

**Table 35 – 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 & Refill	\$0	\$6,806	\$132,000	\$3,608	\$0	\$142,414	\$0
HER Expansion	\$0	\$20,419	\$164,931	\$12,802	\$0	\$298,152	\$0
<b>Total</b>	<b>\$0</b>	<b>\$27,226</b>	<b>\$296,931</b>	<b>\$16,410</b>	<b>\$0</b>	<b>\$340,566</b>	<b>\$0</b>

**Table 36 – 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 & Refill	4,456,333	100%	4,456,333	100%	4,456,333	1
HER Expansion	3,263,809	100%	3,263,809	100%	3,263,809	1
<b>Total</b>	<b>7,720,142</b>	<b>100%</b>	<b>7,720,142</b>	<b>100%</b>	<b>7,720,142</b>	<b>1</b>

**Table 37 - Benefit/Cost Ratios by Measure Category**

Measure Group	PTRC	TRC	UCT	RIM	PCT
HER Legacy & Refill	1.30	1.18	1.18	0.31	n/a
HER Expansion	0.69	0.62	0.62	0.25	n/a
<b>Total</b>	<b>0.94</b>	<b>0.86</b>	<b>0.86</b>	<b>0.28</b>	n/a

**Table 38 – 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) + Conversation Adder	\$0.0462	\$340,566	\$321,187	-\$19,379	0.94
Total Resource Cost Test (TRC) No Adder	\$0.0462	\$340,566	\$291,989	-\$48,578	0.86
Utility Cost Test (UCT)	\$0.0462	\$340,566	\$291,989	-\$48,578	0.86
Rate Impact Test (RIM)		\$1,036,780	\$291,989	-\$744,792	0.28
Participant Cost Test (PCT)		\$0	\$696,214	\$696,214	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001854547
Discounted Participant Payback (years)					n/a

**Table 39 - 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) + Conversation Adder	\$0.0335	\$142,414	\$185,401	\$42,987	1.30
Total Resource Cost Test (TRC) No Adder	\$0.0335	\$142,414	\$168,546	\$26,132	1.18
Utility Cost Test (UCT)	\$0.0335	\$142,414	\$168,546	\$26,132	1.18
Rate Impact Test (RIM)		\$544,293	\$168,546	-\$375,747	0.31
Participant Cost Test (PCT)		\$0	\$401,879	\$401,879	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000935618
Discounted Participant Payback (years)					n/a

**Table 40 - 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) + Conversation Adder	\$0.0636	\$198,152	\$135,787	-\$62,365	0.69
Total Resource Cost Test (TRC) No Adder	\$0.0636	\$198,152	\$123,443	-\$74,710	0.62
Utility Cost Test (UCT)	\$0.0636	\$198,152	\$123,443	-\$74,710	0.62
Rate Impact Test (RIM)		\$492,487	\$123,443	-\$369,045	0.25
Participant Cost Test (PCT)		\$0	\$294,335	\$294,335	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000918929
Discounted Participant Payback (years)					n/a

## **See ya later, refrigerator®**

Navigant estimated the cost-effectiveness results for the Washington See Ya Later Refrigerator (SYLR) Program, based on 2015 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program and for the 3 measure categories.

Cost-effectiveness was tested using the 2015 IRP west plug loads 61% and west residential lighting 45% load factor decrements. The program passes the cost-effectiveness for all the tests except the RIM and PCT tests. The memo consists of the following tables.

Table 1 - SYLR Inputs

Table 2 – SYLR Annual Program Costs

Table 3 – SYLR Savings by Measure Category

Table 4 - Benefit/Cost Ratios by Measure Category

Table 5 – SYLR Program Level Cost-Effectiveness Results

Table 6 - SYLR Refrigerators Cost-Effectiveness Results

Table 7 - SYLR Freezers Cost-Effectiveness Results

Table 8 - SYLR Kits Cost-Effectiveness Results

**Table 41 - SYLR Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.0885
Inflation Rate <sup>1</sup>	1.9%

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

**Table 42 – SYLR Annual Program Costs**

Measure Group	Engineering Costs	Utility Admin	Program Admin	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
Refrigerators	\$0	\$9,472	\$70,064	\$3,215	\$32,400	\$115,151	\$0
Freezers	\$0	\$1,891	\$13,991	\$642	\$7,620	\$24,144	\$0
Kits	\$0	\$496	\$3,669	\$168	\$6,968	\$11,301	\$0
<b>Total</b>	<b>\$0</b>	<b>\$11,859</b>	<b>\$87,724</b>	<b>\$4,026</b>	<b>\$46,988</b>	<b>\$150,597</b>	<b>\$0</b>

**Table 43 – SYLR Savings by Measure Category**

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Refrigerators	629,640	100%	629,640	100%	629,640	7
Freezers	125,730	100%	125,730	100%	125,730	5
Kits	32,973	100%	32,973	100%	32,973	6
<b>Total</b>	<b>788,343</b>	<b>100%</b>	<b>788,343</b>	<b>100%</b>	<b>788,343</b>	<b>7</b>

**Table 44 - Benefit/Cost Ratios by Measure Category**

Measure Group	PTRC	TRC	UCT	RIM	PCT
Refrigerators	1.98	1.80	1.80	0.45	n/a
Freezers	1.37	1.24	1.24	0.39	n/a
Kits	1.04	0.94	0.94	0.39	n/a
<b>Total</b>	<b>1.81</b>	<b>1.65</b>	<b>1.65</b>	<b>0.44</b>	<b>n/a</b>

**Table 45 – SYLR Program Level Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0343	\$150,597	\$272,618	\$122,021	1.81
Total Resource Cost Test (TRC) No Adder	\$0.0343	\$150,597	\$247,834	\$97,238	1.65
Utility Cost Test (UCT)	\$0.0343	\$150,597	\$247,834	\$97,238	1.65
Rate Impact Test (RIM)		\$566,460	\$247,834	-\$318,625	0.44
Participant Cost Test (PCT)		\$0	\$462,851	\$462,851	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000113213
Discounted Participant Payback (years)					n/a

Table 6 through Table 8 provides cost-effectiveness results for all 6 measures.

**Table 46 - SYLR Refrigerators 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) + Conversation Adder	\$0.0313	\$115,151	\$227,937	\$112,786	1.98
Total Resource Cost Test (TRC) No Adder	\$0.0313	\$115,151	\$207,216	\$92,064	1.80
Utility Cost Test (UCT)	\$0.0313	\$115,151	\$207,216	\$92,064	1.80
Rate Impact Test (RIM)		\$463,196	\$207,216	-\$255,980	0.45
Participant Cost Test (PCT)		\$0	\$380,444	\$380,444	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000090954
Discounted Participant Payback (years)					n/a

**Table 47 - SYLR Freezers 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) + Conversation Adder	\$0.0441	\$24,144	\$32,963	\$8,818	1.37
Total Resource Cost Test (TRC) No Adder	\$0.0441	\$24,144	\$29,966	\$5,822	1.24
Utility Cost Test (UCT)	\$0.0441	\$24,144	\$29,966	\$5,822	1.24
Rate Impact Test (RIM)		\$75,998	\$29,966	-\$46,032	0.39
Participant Cost Test (PCT)		\$0	\$59,473	\$59,473	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000022902
Discounted Participant Payback (years)					n/a

**Table 48 - SYLR Kits Cost-Effectiveness Results  
(Decrement - West Residential Lighting - 45%, 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) + Conversation Adder	\$0.0670	\$11,301	\$11,718	\$417	1.04
Total Resource Cost Test (TRC) No Adder	\$0.0670	\$11,301	\$10,653	-\$648	0.94
Utility Cost Test (UCT)	\$0.0670	\$11,301	\$10,653	-\$648	0.94
Rate Impact Test (RIM)		\$27,266	\$10,653	-\$16,614	0.39
Participant Cost Test (PCT)		\$0	\$22,933	\$22,933	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000006886
Discounted Participant Payback (years)					n/a

## **Low-Income Weatherization**

Navigant estimated the cost-effectiveness results for the Washington Low Income Weatherization Program, based on 2015 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 64% 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 49 - Home Energy Savings Inputs**

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.67%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.0885
Inflation Rate <sup>1</sup>	1.9%

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

**Table 50 - 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	\$31,002	\$103,543	\$3,483	\$720,043	\$858,071	\$0
<b>Total</b>	<b>\$0</b>	<b>\$31,002</b>	<b>\$103,543</b>	<b>\$3,483</b>	<b>\$720,043</b>	<b>\$858,071</b>	<b>\$0</b>

**Table 51 - 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	144,648	100%	144,648	100%	144,648	37
<b>Total</b>	<b>144,648</b>	<b>100%</b>	<b>144,648</b>	<b>100%</b>	<b>144,648</b>	<b>37</b>

**Table 52 - 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) + Conversation Adder	\$0.3439	\$858,071	\$231,291	-\$626,780	0.27
Total Resource Cost Test (TRC) No Adder	\$0.3439	\$858,071	\$210,264	-\$647,807	0.25
Utility Cost Test (UCT)	\$0.3439	\$858,071	\$210,264	-\$647,807	0.25
Rate Impact Test (RIM)		\$1,096,391	\$210,264	-\$886,127	0.19
Participant Cost Test (PCT)		\$0	\$958,363	\$958,363	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000059313
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 53 details the non-energy benefits and Table 54 provides the cost-effectiveness results.

**Table 53 - 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	\$29,753	PTRC, TRC, PCT
Economic Impact	\$303,506	PTRC, TRC
<b>Total</b>	<b>\$358,984</b>	-

**Table 54 - 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) + Conversation Adder	\$0.3439	\$858,071	\$590,274	-\$267,797	0.69
Total Resource Cost Test (TRC) No Adder	\$0.3439	\$858,071	\$569,248	-\$288,823	0.66
Utility Cost Test (UCT)	\$0.3439	\$858,071	\$235,989	-\$622,082	0.28
Rate Impact Test (RIM)		\$1,096,391	\$235,989	-\$860,402	0.22
Participant Cost Test (PCT)		\$0	\$988,115	\$988,115	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000057591
Discounted Participant Payback (years)					n/a

## **wattsmart Business**

Navigant estimated the cost-effectiveness results for the Washington Wattsmart Business Program, based on 2015 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program and for the 10 measure categories.

Cost-effectiveness was tested using the 2015 IRP west industrial 44%, west plug loads 61%, and west commercial cooling 13% load factor decrement. 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 Commercial and Industrial Program Costs by Measure Category

Table 3 – Annual Commercial and Industrial 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 Electronics Cost-Effectiveness Results

Table 9 - Wattsmart Business Energy Management 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 55 - Utility Inputs**

Parameter	Value
Discount Rate	6.66%
Commercial Line Loss	9.53%
Industrial Line Loss	8.16%
Irrigation Line Loss	9.67%
Commercial Energy Rate (\$/kWh)(base year 2015)	\$0.0820
Industrial Energy Rate (\$/kWh)(base year 2015)	\$0.0666
Irrigation Energy Rate (\$/kWh)(base year 2015)	\$0.0836
Inflation Rate <sup>1</sup>	1.9%

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

**Table 56 – 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	\$528	\$321	\$1,073	\$125	\$12,530	\$14,578	\$40,167
Compressed Air	\$44,760	\$27,238	\$90,953	\$10,634	\$185,919	\$359,503	\$331,000
Electronics	\$6,739	\$4,101	\$13,694	\$1,601	\$15,176	\$41,311	\$26,016
Energy Management	\$34,424	\$20,948	\$69,951	\$8,178	\$24,014	\$157,515	\$9,556
Food Service Equip.	\$7,452	\$4,535	\$15,142	\$1,770	\$16,562	\$45,461	\$38,613
HVAC	\$10,934	\$6,654	\$22,218	\$2,598	\$43,530	\$85,933	\$139,481
Irrigation	\$33,402	\$20,326	\$67,874	\$7,935	\$91,416	\$220,954	\$275,981
Lighting	\$343,898	\$209,276	\$698,815	\$81,700	\$1,971,335	\$3,305,023	\$4,426,318
Motors	\$12,217	\$7,435	\$24,826	\$2,902	\$56,956	\$104,337	\$70,011
Refrigeration	\$187,908	\$114,350	\$381,837	\$44,641	\$749,780	\$1,478,516	\$1,588,558
<b>Total</b>	<b>\$682,261</b>	<b>\$415,185</b>	<b>\$1,386,383</b>	<b>\$162,085</b>	<b>\$3,167,218</b>	<b>\$5,813,131</b>	<b>\$6,945,700</b>

**Table 57 – 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	18,041	97%	17,500	100%	17,500	16
Compressed Air	1,529,031	97%	1,483,160	100%	1,483,160	15
Electronics	223,304	100%	223,304	100%	223,304	5
Energy Management	1,200,710	95%	1,140,675	100%	1,140,675	3
Food Service Equipment	254,555	97%	246,918	100%	246,918	9
HVAC	503,203	72%	362,306	100%	362,306	15
Irrigation	1,141,041	97%	1,106,810	100%	1,106,810	8
Lighting	11,747,894	97%	11,395,457	100%	11,395,457	14
Motors	417,360	97%	404,839	100%	404,839	15
Refrigeration	6,623,987	94%	6,226,548	100%	6,226,548	14
<b>Total</b>	<b>23,659,126</b>	<b>96%</b>	<b>22,607,517</b>	<b>100%</b>	<b>22,607,517</b>	<b>13</b>

**Table 58 - Benefit/Cost Ratios by Measure Category**

Measure Group	PTRC	TRC	UCT	RIM	PCT
Building Shell	0.35	0.32	0.92	0.43	0.72
Compressed Air	2.23	2.03	2.85	0.68	4.04
Electronics	1.13	1.03	1.30	0.42	3.86
Energy Management	1.38	1.25	1.14	0.47	25.75
Food Service Equipment	1.68	1.53	2.27	0.51	4.46
HVAC	1.60	1.46	3.09	0.63	2.72
Irrigation	2.66	2.42	4.45	1.04	2.94
Lighting	1.31	1.19	2.07	0.54	2.57
Motors	1.90	1.73	1.95	0.59	4.27
Refrigeration	2.09	1.90	2.98	0.69	3.55
<b>Total</b>	<b>1.61</b>	<b>1.47</b>	<b>2.42</b>	<b>0.61</b>	<b>2.93</b>

**Table 59 – Wattsmart Business Program Level Cost-Effectiveness Results**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0454	\$9,591,614	\$15,468,326	\$5,876,712	1.61
Total Resource Cost Test (TRC) No Adder	\$0.0454	\$9,591,614	\$14,062,115	\$4,470,501	1.47
Utility Cost Test (UCT)	\$0.0275	\$5,813,131	\$14,062,115	\$8,248,984	2.42
Rate Impact Test (RIM)		\$23,022,204	\$14,062,115	-\$8,960,089	0.61
Participant Cost Test (PCT)		\$6,945,700	\$20,376,290	\$13,430,590	2.93
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001714551

Table 6 through Table 15 provide cost-effectiveness results for all 10 measures.

**Table 60 - Wattsmart Business Building Shell 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) + Conversation Adder	\$0.2198	\$42,215	\$14,728	-\$27,487	0.35
Total Resource Cost Test (TRC) No Adder	\$0.2198	\$42,215	\$13,389	-\$28,826	0.32
Utility Cost Test (UCT)	\$0.0759	\$14,578	\$13,389	-\$1,189	0.92
Rate Impact Test (RIM)		\$31,163	\$13,389	-\$17,773	0.43
Participant Cost Test (PCT)		\$40,167	\$29,115	-\$11,052	0.72
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002761
Discounted Participant Payback (years)					n/a

**Table 61 - 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) + Conversation Adder	\$0.0322	\$504,585	\$1,127,531	\$622,946	2.23
Total Resource Cost Test (TRC) No Adder	\$0.0322	\$504,585	\$1,025,028	\$520,443	2.03
Utility Cost Test (UCT)	\$0.0230	\$359,503	\$1,025,028	\$665,525	2.85
Rate Impact Test (RIM)		\$1,509,699	\$1,025,028	-\$484,671	0.68
Participant Cost Test (PCT)		\$331,000	\$1,336,115	\$1,005,114	4.04
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000080340
Discounted Participant Payback (years)					1.42

**Table 62 - Wattsmart Business 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) + Conversation Adder	\$0.0536	\$52,151	\$58,991	\$6,840	1.13
Total Resource Cost Test (TRC) No Adder	\$0.0536	\$52,151	\$53,628	\$1,477	1.03
Utility Cost Test (UCT)	\$0.0424	\$41,311	\$53,628	\$12,317	1.30
Rate Impact Test (RIM)		\$126,641	\$53,628	-\$73,014	0.42
Participant Cost Test (PCT)		\$26,016	\$100,507	\$74,491	3.86
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000036325
Discounted Participant Payback (years)					0.58

**Table 63 - Wattsmart Business Energy Management 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) + Conversation Adder	\$0.0458	\$143,057	\$197,040	\$53,983	1.38
Total Resource Cost Test (TRC) No Adder	\$0.0458	\$143,057	\$179,127	\$36,070	1.25
Utility Cost Test (UCT)	\$0.0505	\$157,515	\$179,127	\$21,612	1.14
Rate Impact Test (RIM)		\$379,542	\$179,127	-\$200,415	0.47
Participant Cost Test (PCT)		\$9,556	\$246,041	\$236,485	25.75
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000166166
Discounted Participant Payback (years)					n/a

**Table 64 - Wattsmart Business Food Service Equipment 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) + Conversation Adder	\$0.0381	\$67,511	\$113,733	\$46,222	1.68
Total Resource Cost Test (TRC) No Adder	\$0.0381	\$67,511	\$103,394	\$35,883	1.53
Utility Cost Test (UCT)	\$0.0256	\$45,461	\$103,394	\$57,933	2.27
Rate Impact Test (RIM)		\$201,232	\$103,394	-\$97,838	0.51
Participant Cost Test (PCT)		\$38,613	\$172,333	\$133,721	4.46
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000027048
Discounted Participant Payback (years)					1.07

**Table 65 - 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) + Conversation Adder	\$0.0476	\$181,884	\$291,820	\$109,936	1.60
Total Resource Cost Test (TRC) No Adder	\$0.0476	\$181,884	\$265,291	\$83,407	1.46
Utility Cost Test (UCT)	\$0.0225	\$85,933	\$265,291	\$179,358	3.09
Rate Impact Test (RIM)		\$422,273	\$265,291	-\$156,982	0.63
Participant Cost Test (PCT)		\$139,481	\$379,870	\$240,390	2.72
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000026022
Discounted Participant Payback (years)					3.35

**Table 66 - 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) + Conversation Adder	\$0.0503	\$405,519	\$1,080,679	\$675,160	2.66
Total Resource Cost Test (TRC) No Adder	\$0.0503	\$405,519	\$982,435	\$576,916	2.42
Utility Cost Test (UCT)	\$0.0274	\$220,954	\$982,435	\$761,481	4.45
Rate Impact Test (RIM)		\$941,885	\$982,435	\$40,550	1.04
Participant Cost Test (PCT)		\$275,981	\$812,348	\$536,367	2.94
Lifecycle Revenue Impacts (\$/kWh)					-\$0.0000012609
Discounted Participant Payback (years)					2.00

**Table 67 - 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) + Conversation Adder	\$0.0530	\$5,760,007	\$7,521,850	\$1,761,843	1.31
Total Resource Cost Test (TRC) No Adder	\$0.0530	\$5,760,007	\$6,838,045	\$1,078,039	1.19
Utility Cost Test (UCT)	\$0.0304	\$3,305,023	\$6,838,045	\$3,533,022	2.07
Rate Impact Test (RIM)		\$12,695,829	\$6,838,045	-\$5,857,784	0.54
Participant Cost Test (PCT)		\$4,426,318	\$11,362,140	\$6,935,823	2.57
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001040517
Discounted Participant Payback (years)					2.73



**Table 68 - Wattsmart Business Motors Cost-Effectiveness Results  
(Decrement - West Industrial - 44%, Load Shape – Machinery General)**

<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) + Conversation Adder	\$0.0366	\$117,392	\$223,402	\$106,010	1.90
Total Resource Cost Test (TRC) No Adder	\$0.0366	\$117,392	\$203,093	\$85,700	1.73
Utility Cost Test (UCT)	\$0.0325	\$104,337	\$203,093	\$98,756	1.95
Rate Impact Test (RIM)		\$346,411	\$203,093	-\$143,319	0.59
Participant Cost Test (PCT)		\$70,011	\$299,030	\$229,019	4.27
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000023757
Discounted Participant Payback (years)					0.46

**Table 69 - Wattsmart Business Refrigeration Cost-Effectiveness Results  
(Decrement – West Industrial - 44%, Load Shape - Refrigeration)**

<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) + Conversation Adder	\$0.0353	\$2,317,294	\$4,838,553	\$2,521,259	2.09
Total Resource Cost Test (TRC) No Adder	\$0.0353	\$2,317,294	\$4,398,685	\$2,081,391	1.90
Utility Cost Test (UCT)	\$0.0225	\$1,478,516	\$4,398,685	\$2,920,169	2.98
Rate Impact Test (RIM)		\$6,367,527	\$4,398,685	-\$1,968,842	0.69
Participant Cost Test (PCT)		\$1,588,558	\$5,638,791	\$4,050,233	3.55
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000349725
Discounted Participant Payback (years)					1.95



## 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.

## **Refrigerator Recycling**

The Company hires an independent inspector to phone survey  $\geq 5$  percent program participants and to site inspect  $\geq 5$  percent of program participants in order to verifying program participation, eligibility of equipment, that vendor pick-up procedures are followed (equipment is disabled at site, kits distributed, etc.) and to survey customer experience.

## **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**

For projects delivered by third part program administrator

Lighting projects

- Retrofits - 100 percent pre- and post-installation site inspections by third party consultant 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 by third party consultant 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.

Non-lighting projects (typical upgrades/listed measures, custom measures)

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

For Company in-house project manager delivered projects

Lighting and non-lighting

- 100 percent pre/post-installation site inspections by third party consulting engineering firms, invoice reconciled to inspection results.
- No pre-inspection for new construction

## **All Programs**

As part of the third-party program evaluations (two-year cycle) process, the Company is implementing 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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The Company worked with 17 retailers in 2015 to promote efficient upstream technologies such as CFLs, LEDs, efficient lighting fixtures, and RACs (room air conditioner). Table 1 lists the upstream retailers and redemptions.

**Table 1<sup>1</sup>**  
**Participating Upstream Retailers and Redemptions**

<b>Retailer</b>	<b>City</b>	<b>CFLs</b>	<b>LEDs</b>	<b>Fixtures</b>	<b>RACs</b>
Ace Hardware - Stein's #7047	Yakima		√	√	
Ace Hardware #14426	Naches		√		
Ace Hardware #14965	Walla Walla		√	√	
Big Lots #4558	Yakima	√	√		
Corner Grocery & Hardware	Yakima		√	√	
Costco #1013	Union Gap	√	√	√	√
Habitat for Humanity ReStore #2	Yakima	√			
Home Depot #4727	Yakima	√	√	√	
Hometown Ace Hardware #11909	Yakima		√	√	
Lowe's #3240	Yakima	√	√		
Roy's Ace Hardware #10640	Yakima		√	√	
True Value Hardware - C&H	Yakima		√		
True Value Hardware - Country Farm and Garden	Yakima		√		
True Value Hardware - L&G Ranch Supply	Walla Walla		√	√	
True Value Hardware #5353	Selah	√	√	√	
Wal-Mart - Supercenter #5078	Yakima	√	√	√	
Wal-Mart #2269	Yakima	√	√	√	

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<sup>1</sup> To be considered as a participating retailer for discounted lighting products, the retailer's sales coming from Pacific Power customers must be a significant majority of their total sales.



Twenty-one local and national retailers promoted efficient appliances on behalf of the program. Table 2 provides the list of 2015 participating downstream retailers and the product types that were redeemed at each location.

**Table 2**  
**Participating Downstream Retailers and Redemptions**

<b>Retailer</b>	<b>City</b>	<b>Electric Water Heater</b>	<b>Clothes Washer</b>	<b>Freezer</b>	<b>Refrigerator</b>	<b>Evaporative Cooler - Tier 2</b>	<b>Insulation-Attic</b>	<b>Insulation-Floor</b>	<b>Insulation-Wall</b>	<b>Windows</b>	<b>No Redemptions in 2015</b>
All Your Building Needs	Pomeroy										√
Bemis Home Appliance & TV Ctr	Yakima		√	√							
Best Buy #831	Yakima		√	√							
Dependable Appliance	Pasco										√
Ferguson Enterprises	Yakima										√
Ferguson Enterprises, Inc	Walla Walla										√
Fred's Appliance	Kennewick		√								
Home Depot #4727	Yakima	√	√	√		√	√			√	
Home Depot #4735	College Place	√	√	√	√		√				
Inland Lighting Centre	Yakima										√
Inland Pipe & Supply	Yakima										√
Lowe's #3240	Yakima	√	√	√	√		√			√	
Probuild Northwest	Yakima						√	√	√		
Sears #2029	Union Gap	√	√	√							
Sears #3088	Sunnyside		√								
Sears #5332	Toppenish										√
Sears #6914	Walla Walla	√	√	√							
Suffield Furniture Company	Dayton										√
True Value Hardware #5353	Selah										√
TV Towne	Walla Walla										√
TV Towne	Yakima										√

The Company worked with 60 HVAC trade allies as shown in Table 3 to promote efficient central air conditioners (CAC) and heat pumps, duct sealing and insulation.

**Table 3  
HVAC Contractors**

Trade Ally	City	CAC Best Practice Installation & Sizing	CAC Equipment	Duct Sealing	Duct Sealing & Insulation	Electric System to Heat Pump Conversion	Heat Pump, Ductless	Heat Pump, Single-Head, Ductless	Heat Pump - PTCS Commissioning, Controls, and Sizing	Heat Pump to Heat Pump Upgrade	No Redemptions in 2015
A & N Heating and Cooling, LLC.	Walla Walla										√
Absolute Comfort Technology, LLC	Selah					√	√	√			
Absolute Comfort, LLC.	Yakima										√
AccuTemp Heating and Air Conditioning	Yakima					√					
Ackerman Heating & Air	Colfax					√					
AEH Inc.	Kennewick										√
Air F/X LLC	Yakima										√
All Assured Electric, Inc.	Kennewick										√
All Phase Refrigeration & Heating Inc.	Kennewick										√
All Seasons Heating & Air Conditioning	Yakima					√	√			√	
Allard Enterprises	Yakima										√
A-One Refrigeration & Heating	Kennewick										√
Apollo Sheet Metal Inc.	Kennewick					√					
Aztec Heating & AC, Inc.	Grandview					√					
Bid Mechanical	Kittitas										√
Blaze to Blizzard Heating & Cooling	Walla Walla						√				
Bob Rhodes Heating & Air Conditioning Inc	Kennewick										√
Bruce Mechanical Inc	Kennewick		√	√		√					
Campbell & Company	Pasco		√	√	√	√	√		√	√	
Central Mechanical Services	Yakima					√					
Chapman Heating & Air Conditioning Inc	Dayton					√	√				
CK Home Comfort Systems	Grandview					√	√		√		

Trade Ally	City	CAC Best Practice Installation & Sizing	CAC Equipment	Duct Sealing	Duct Sealing & Insulation	Electric System to Heat Pump Conversion	Heat Pump, Ductless	Heat Pump, Single-Head, Ductless	Heat Pump - PTCS Commissioning, Controls, and Sizing	Heat Pump to Heat Pump Upgrade	No Redemptions in 2015
College Place Heating & Air Conditioning	College Place	√	√	√	√	√	√		√	√	
CP Mechanical, LLC.	Yakima										√
Darby Heating & Air	Richland										√
Dave's Heating & AC	Yakima										√
Dayco Inc	Kennewick										√
Delta Heating and Cooling, Inc.	Richland										√
Elite Energy Solutions	Lindon, UT										√
E-Star Northwest LLC	Sequim										√
Farwest Climate Control	Yakima					√	√			√	
Four Seasons HVAC	Yakima						√				
Grassi Refrigeration	Walla Walla						√				
Intermountain West Insulation	Kennewick										√
Jacobs & Rhodes	Kennewick										√
Johnny's Heating and Cooling	Walla Walla										√
Miller & Trujillo Heating and AC, LLC.	Zillah					√					
Mountain Air Heating & Cooling Inc.	Yreka, CA										√
Nico Enterprises, LLC	Walla Walla						√				
Olmstead Electric/ CGO Inc	Walla Walla										√
One Hour Heating and A/C	Yakima			√			√				
Panchos Heating & Cooling LLC	Kennewick										√
Platte Heating & AC	Yakima					√	√				
Plumbing Excellence, Inc.	West Valley City, UT										√
Polar Heating & Air Conditioning	Selah										√
Quality Comfort	Yakima					√	√				
Rainwater Inc.	Grandview										√
Richart Family, Inc	Vancouver										√
Roger L Gibson	Richland										√
Schaefer Refrigeration	Walla Walla										√
Smith Insulation	Walla Walla			√	√						

Trade Ally	City	CAC Best Practice Installation & Sizing	CAC Equipment	Duct Sealing	Duct Sealing & Insulation	Electric System to Heat Pump Conversion	Heat Pump, Ductless	Heat Pump, Single-Head, Ductless	Heat Pump - PTCS Commissioning, Controls, and Sizing	Heat Pump to Heat Pump Upgrade	No Redemptions in 2015
ThermalWise Heating and Refrigeration	Walla Walla										√
Thermex Valley Heating and AC	Yakima										√
TJ's Refrigeration, Heating & Air	Sunnyside					√	√				
TNG Heating & Refrigeration	Toppenish										√
Total Comfort Solutions, LLC	Walla Walla		√			√	√		√	√	
Total Energy Management	Richland								√		
Total Quality Air	Pasco										√
Vance Heating and AC	Yakima		√	√		√	√			√	
Young's Heating & Cooling, LLC	Walla Walla						√			√	

Table 4 lists 47 plumbing trade allies the Company worked with to promote efficient plumbing technologies.

**Table 4**  
**Plumbing Contractors**

Trade Ally	City	Heat Pump Water Heater	No Redemptions in 2015
A & N Heating and Cooling, LLC.	Walla Walla		√
AccuTemp Heating and Air Conditioning	Yakima		√
AEH Inc.	Kennewick		√
Air F/X LLC	Yakima		√
All Assured Electric, Inc.	Kennewick		√
All Seasons Heating & Air Conditioning	Yakima		√
A-One Refrigeration & Heating	Kennewick		√
Apollo Sheet Metal Inc.	Kennewick		√
Aztec Heating & AC, Inc.	Grandview		√
Bid Mechanical	Kittitas		√
Bob Rhodes Heating & Air Conditiong Inc	Kennewick		√
Bruce Mechanical Inc	Kennewick		√
Burke's Plumbing	Selah		√
Campbell & Company	Pasco		√
Central Mechanical Services	Yakima	√	
Chris Johnson Plumbing	Walla Walla		√
CK Home Comfort Systems	Grandview		√
College Place Heating & Air Conditioning	College Place		√
Darby Heating & Air	Richland		√
Dave's Heating & AC	Yakima		√
Dayco Inc	Kennewick		√
Delta Heating and Cooling, Inc.	Richland		√
E-Star Northwest LLC	Sequim		√
Four Seasons HVAC	Yakima		√
Grassi Refrigeration	Walla Walla		√
Jacobs & Rhodes	Kennewick		√
Johnny's Heating and Cooling	Walla Walla		√
Ken Adams Plumbing, Inc.	Walla Walla	√	
Miller & Trujillo Heating and AC, LLC.	Zillah	√	

Trade Ally	City	Heat Pump Water Heater	No Redemptions in 2015
Mountain Air Heating & Cooling Inc.	Yreka, CA		√
Olmstead Electric/ CGO Inc	Walla Walla		√
One Hour Heating and A/C	Yakima		√
Platte Heating & AC	Yakima		√
Quality Comfort	Yakima		√
Rainwater Inc.	Grandview	√	
Ray's Plumbing, Inc.	YAKIMA	√	
Richart Family, Inc	Vancouver		√
Roto-Rooter Plumbing	Yakima	√	
ThermalWise Heating and Refrigeration	Walla Walla	√	
Thermex Valley Heating and AC	Yakima		√
TJ's Refrigeration, Heating & Air	Sunnyside		√
TNG Heating & Refrigeration	Toppenish		√
Total Comfort Solutions, LLC	Walla Walla		√
Total Energy Management	Richland		√
Total Quality Air	Pasco		√
Vance Heating and AC	Yakima	√	
Young's Heating & Cooling, LLC	Walla Walla		√

Table 5 lists 29 weatherization trade allies the Company worked with.

**Table 5**  
**Weatherization Contractors**

Trade Ally	City	Air Sealing	Insulation-Attic	Insulation-Floor	Insulation-Wall	Windows	No Redemptions in 2015
Allard Enterprises	Yakima						√
Benko Enterprises	Walla Walla						√
Central Valley Glass	Yakima					√	
Chon Insulation and Drywall	Walla Walla						√
Clarkston Glass	Clarkston					√	
Dave's Heating & AC	Yakima						√
Don Jordan Energy Systems	Yakima		√	√	√		
Elite Energy Solutions	Lindon, UT		√				
E-Star Northwest LLC	Sequim						√
Farwest Climate Control	Yakima						√
High Desert Glass	Prosser						√
Home Improvement Products	Moxee					√	
Intermountain West Insulation	Kennewick		√	√	√		
Jackson Siding and Windows	Walla Walla					√	
K-5 Contracting, Inc.	Yakima		√				
McKinney Glass Inc.	Yakima					√	
Merck General Construction LLC	Grandview		√				
Miller Glass Co.	Yakima						√
Perfection Glass, Inc.	Kennewick					√	
Pro Build	Yakima						√
Richart Family, Inc	Vancouver						√
Sierra West & Associates, LLC.	Midvale, UT						√
Smart Energy Today	Olympia						√
Smith Insulation	Walla Walla	√	√	√	√	√	
Specialty Weatherization & Technologies	Naches			√			
Vineyard Creek Construction	Walla Walla						√
Vinyl Products Inc	Spokane					√	
West Valley Glass & Window	Yakima					√	
Windows Walla Walla	Walla Walla					√	



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## Appendix 4

### Communications



## Energy Efficiency Communications 2015 (only showing new creative)

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

*Print*

- [Farm Bureau ad](#) *Neighbor's Magazine*
- [Farm Bureau Newspaper \(black & white\)](#)
- [Ad to thank business customers and vendors](#) for being wattsmart in 2015
- [Newspaper ad featuring Kenyon Zero Storage Inc.](#)
- [Newspaper ad featuring business customer Shields Bag and Printing](#)
- [\(Spanish\) wattsmart family](#)

Digital Ads:

- ["Being a wattsmart Business does wonders for your bottom line" \(Static\)](#)
- ["Being a wattsmart Business does wonders for your bottom line" \(Animated\)](#)
- wattsmart Starter Kits - [300x250](#), [728x90](#)
- **Pandora**  
See ya later, refrigerator: [audio](#) and [image](#)

Inserts:

- [March SYLR Insert](#)
- [April LED Insert](#)
- [June SYLR Insert](#)
- [June HVAC Insert](#)
- [June HES Cooling Insert](#)
- [September wattsmart starter kit insert](#)
- [August SYLR Insert](#)

Newsletters:

- [January Voices](#)
- [February Energy Insights](#)
- [March Voices](#)
- [April Voices](#)
- [May wattsup insert](#)
- [June Energy Insights](#)

- [July Voices](#)
- [August Energy Insights](#)
- [September Voices](#)
- [October watsup insert](#)
- [November Voices](#)
- [November Energy Insights](#)

Outer Envelope:

- [January](#)
- [February](#)
- [March](#)
- [July](#)
- [October](#)

Direct mail:

- [wattsmart Starter Kit \(3/16\)](#)
- [Monthly low-income weatherization mailing](#)
- [Monthly low-income weatherization mailing](#)
- [Home Energy Reports with refrigerator recycling message panel](#)
- Mailing to irrigation customers encouraging application for incentives:
  - [Letter](#)
  - [Application](#)
- [wattsmart Starter Kit \(6/15\)](#)
- Wattsmart Business incentive and rebate offer mailing, to 150 Washington compressed-air system customers (week of June 22)
  - [Letter](#)
  - [Brochure](#)
- [wattsmart Starter Kits - English/Spanish \(7/17\)](#)

Emails:

- [wattsmart Business retail/office email 2/27](#)
- [Energy Connections for midsize business customers \(3/17\)](#)
- [Voices \(3/20\)](#)
- [eVoices \(5/4\)](#)
- [wattsmart Business restaurant/lodging email 5/5](#)

- [Energy Connections for midsize business customers \(5/19\)](#)
- [Energy Insights](#)
- [wattsmart Business eBlast: HVAC upgrades \(6/23\)](#)
- [wattsmart Business convenience/grocery email \(8/3\)](#)
- [wattsmart Business lighting lunch and learn email invite \(8/27\)](#)
- [Energy Connections for midsize business customers \(9/15\)](#)
- [wattsmart Business LED instant incentives email \(9/24\)](#)
- [wattsmart Business lighting controls email \(11/19\)](#)

Collateral:

**wattsmart**

- [Winter wattsmart handout](#)
- [wattsmart Business - overview](#)
- [wattsmart Business – overview Spanish](#)
- [wattsmart Business - brochure](#)
- [Business Solutions Toolkit handout](#)
- [Business Solutions Toolkit tip sheet](#)
- [Home Energy Report handout](#)
- [Home Energy Savings brochure](#)
- [Home Energy Savings incentive list](#)
- wattsmart Business (grocery and convenience stores):
  - [Printed](#)
  - [Web version](#)
  - [Co-branded version](#)
- wattsmart Business (restaurant and lodging businesses):
  - [Printed](#)
  - [Web version](#)
  - [Co-branded version](#)
- [Home Energy Savings LED point of purchase](#)
- [wattsmart Business LED instant incentives](#)

- [Case study: Kenyon Zero Storage energy management project](#)
- [wattsmart Business Sunnyside Chamber lighting event flyer](#)
- [wattsmart Business Central Washington Hispanic Chamber event flyer](#)



## Appendix 5

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# Washington Energy Efficiency Alliance

Pacific Power

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 2009, 2010, 2011, 2012 and/or 2013.

## 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: 76 - Date and Time: 03/03/2015 06:08:28 PM

Company Name	Specialties	Business Type	Join Date	Projects Completed
<b>A &amp; T Quality Electric LLC</b> 4271 N Wenas Rd Selah, WA - 98942 Phone: 509-985-9890	HVAC - unitary Lighting Motors and VFDs	Contractor	07/15/2009	5
<b>Absolute Software, Inc.</b> 430-11401 Century Oaks Terrace Austin, TX - 78758 Phone: 512-600-7455 Website: www.absolute.com	Other: Other Specialty	Manufacturer - Rep Other: Software Company	02/11/2014	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	3
<b>All-Phase Electric, Inc.*</b> 2500 S 12th Ave Union Gap, WA - 98903 Phone: 509-454-5093 Website: allphaseelectric.org	Lighting	Contractor	06/08/2006	34
<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	35
<b>Allard Enterprises</b> 4506 Maple Ave. Yakima, WA - 98901 Phone: 509-575-0955	HVAC - unitary Motors and VFDs	Contractor	04/01/2006	Completed
<b>Apollo Sheet Metal</b> 1207 W. Columbia Dr. Kennewick, WA - 99336 Phone: 509-586-1104 Website: apollosm.com	HVAC - unitary Motors and VFDs	Distributor	04/01/2006	14

<b>Applied Industrial Technologies - Yakima</b> 909 N. Front St. Yakima, WA - 98901 Phone: 509-457-1600 Website: www.applied.com	<b>Specialties</b> Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 10/01/2004	<b>Projects Completed</b> 7
<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> 2
<b>C-Mation LLC</b> 3565 S West Temple Salt Lake City, UT - 84115 Phone: 801-268-1425 Website: cmation.com	<b>Specialties</b> HVAC - unitary Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 04/01/2009	<b>Projects Completed</b> 1
<b>Central Mechanical Services</b> 2601 Business Lane Yakima, WA - 98901 Phone: 509-248-5944	<b>Specialties</b> HVAC - unitary	<b>Business Type</b> Contractor	<b>Join Date</b> 08/01/2004	<b>Projects Completed</b> 1
<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>College Place Heating and Air Conditioning</b> 970 NE Rose College Place, WA - 99324 Phone: 509-525-8073 Website: www.cpheat.com	<b>Specialties</b> HVAC - unitary	<b>Business Type</b> Contractor	<b>Join Date</b> 03/01/2010	<b>Projects Completed</b> 1
<b>Columbia Electric Supply - Pasco</b> 1913 Washington Street Pasco, WA - 99301 Phone: 509-547-9733 Website: www.columbiaelectricsupplypasco.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> 2580 Yakima Valley Hwy 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> 1
<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> 2
<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> 10
<b>Cooper Lighting</b> 1121 Highway 74 South Peachtree City, GA - 30269 Phone: 770-486-3092 x 3092 Website: www.cooperlighting.com	<b>Specialties</b> Controls Lighting	<b>Business Type</b> Manufacturer - Rep	<b>Join Date</b> 11/20/2012	<b>Projects Completed</b> null
<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> 7
<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> 7
<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> 66
<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> 7
<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> 1
<b>FGI, llc</b> 932 W. 32nd Avenue Spokane, WA - 99203 Phone: 800-630-7345 Website: www.fgillumination.com	<b>Specialties</b> Lighting	<b>Business Type</b> Other: Consultant	<b>Join Date</b> 03/12/2013	<b>Projects Completed</b> 1
<b>Grassi Refrigeration</b> 1445 W. Rose Walla Walla, WA - 99362 Phone: 509-529-9700	<b>Specialties</b> HVAC - unitary Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 06/01/2006	<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>HanitaTek Window Film</b> 4010 La Reunion Pkwy, #100 Dallas, TX - 75212 Phone: 800-660-5559 Website: www.HanitaTek.com	<b>Specialties</b> Building envelope	<b>Business Type</b> Engineering Firm	<b>Join Date</b> 08/06/2013	<b>Projects Completed</b> 1
<b>Hendon Electric</b> 82075 Hwy 395 N Umatilla, OR - 97882 Phone: 541-922-3844	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 03/01/2005	<b>Projects Completed</b> 5
<b>Hoydar-Buck Inc.</b> 210 West Orchard Ave Selah, WA - 98942 Phone: 509-697-8800	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 09/28/2009	<b>Projects Completed</b> 2



<b>Hutchinson Electric Inc.</b> 3660 Washout Rd. Sunnyside, WA - 98944 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>K&amp;N Electric Motors, Inc.</b> 9933 N.E. Kinder Rd. Moses Lake, WA - 98837 Phone: 509-765-3399 Website: knelectric.com	<b>Specialties</b> Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 05/01/2004	<b>Projects Completed</b> 3
<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> 28
<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> 59
<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> 7
<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> 12
<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> 9
<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> 1
<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> 132
<b>Micro Computer Systems</b> 12631 Beverly Park Road Lynnwood, WA - 98087 Phone: 800-658-1000 x 9889 Website: www.microk12.com	<b>Specialties</b> Office equipment Other: Other Specialty	<b>Business Type</b> Other: Other	<b>Join Date</b> 04/01/2012	<b>Projects Completed</b> 1

<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> 2
<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 - Pasco</b> 1928 West A Street Pasco, WA - 99301 Phone: 509-547-9514 Website: www.northcoastelectric.com	<b>Specialties</b> Lighting	<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: 206-436-4444 x 4444 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> null
<b>North Coast Electric - Spokane</b> 4216 E. Main Avenue Spokane, WA - 99202 Phone: 509-951-3726	<b>Specialties</b> Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 03/28/2013	<b>Projects Completed</b> null
<b>North Coast Electric - Wenatchee</b> 1415 N Miller Wenatchee, WA - 98801 Phone: 509-663-8603 Website: www.northcoastelectric.com	<b>Specialties</b> Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 09/21/2012	<b>Projects Completed</b> null
<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> 10
<b>Parsons Electric</b> 415 Viewmont Pl. Yakima, WA - 98908 Phone: 509-930-1292	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 08/03/2007	<b>Projects Completed</b> 23
<b>Performance Lighting Solutions</b> PO Box 1626 Kalama, WA - 98625 Phone: 360-431-5112	<b>Specialties</b> Lighting	<b>Business Type</b> Other: General Contractor	<b>Join Date</b> 10/11/2013	<b>Projects Completed</b> 1
<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> 2
<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> 24
<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> 96
<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> 1
<b>Rexel - Capitol Light - Hartford, CT</b> 270 Locust Street Hartford, CT - 06141 Phone: 866-520-2388 Website: www.capitolight.com	<b>Specialties</b> Controls Lighting	<b>Business Type</b> Distributor	<b>Join Date</b> 06/13/2014	<b>Projects Completed</b> 1
<b>Roberts Electrical Inc.</b> 13761 US Highway 12 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> 2
<b>Rucker Electric, LLC</b> 9001 Roza Hill Drive Yakima, WA - 98901 Phone: 509-949-5156	<b>Specialties</b> Lighting Motors and VFDs	<b>Business Type</b> Contractor	<b>Join Date</b> 01/25/2015	<b>Projects Completed</b> 8
<b>S &amp; S Electric</b> 315 White Walla Walla, WA - 99362 Phone: 509-525-7720	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 05/31/2005	<b>Projects Completed</b> 3
<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> 95 S. Jackson Street, Suite 300 Seattle, WA - 98104 Phone: 360-823-3040 Website: www.schneider-electric.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> 4
<b>Stoneway Electric - 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> 4
<b>Stoneway Electric - Yakima</b> 23 N. 3rd Ave Yakima, WA - 98902 Phone: 509-469-6154	<b>Specialties</b> Controls HVAC - unitary Motors and VFDs	<b>Business Type</b> Distributor	<b>Join Date</b> 02/26/2008	<b>Projects Completed</b> 1
<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> 22
<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> 1
<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> 1

<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 Energy Management</b> 1975 Butler Loop Richland, WA - 99352 Phone: 509-946-4500	<b>Specialties</b> HVAC - unitary	<b>Business Type</b> Contractor	<b>Join Date</b> 08/01/2004	<b>Projects Completed</b> 2
<b>Walla Walla Electric*</b> 1225 W. Poplar Walla Walla, WA - 99362 Phone: 509-525-8672 Website: wwelectric.com	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 04/09/2001	<b>Projects Completed</b> 97
<b>Ziegler Electric*</b> 202 Country Crest Rd Yakima, WA - 98901 Phone: 509-930-3300	<b>Specialties</b> Lighting	<b>Business Type</b> Contractor	<b>Join Date</b> 04/01/2001	<b>Projects Completed</b> 82



## Appendix 6

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# Washington Program Evaluations

Pacific Power

## Washington 2015 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 2015 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)

<b>Program</b>	<b>Years Evaluated</b>	<b>Evaluator</b>
Low Income Weatherization	2011-2012	Smith & Lehmann Consulting
Energy FinAnswer	2012 – 2013	Navigant
FinAnswer Express	2012 – 2013	Navigant

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

**Table 1**  
**Low Income Weatherization Evaluation Recommendations**

<b>Evaluation Recommendations</b>	<b>Pacific Power Action Plan</b>
<p>If agencies continue to serve apartments and/or condominiums in multifamily buildings, Pacific Power should separately analyze energy savings to determine deemed savings specifically attributed to the weatherization of apartment units through an engineering analysis of savings on an individual measure or per-unit basis. Additionally, the specific quantities of installed measures (i.e., sq. feet of insulation) should be tracked.</p>	<p>The program's kWh savings was evaluated based upon a billing analysis. To alter this method would require agencies to submit additional documentation on multi-family dwellings. The recommendation conflicts with the desire for agencies to streamline the reporting requirements and the Company's goal to keep the low income weatherization agency billing/reporting requirements as simple as possible. The Program Manager will discuss this recommendation with internal planning staff and agencies to determine if the additional work required to fulfill this recommendation is warranted.</p>
<p>If agencies continue to serve apartments and/or condominiums, Pacific Power should discuss existing commercial DSM programs with agencies, and also consider developing an option for full building upgrades.</p>	<p>Commercial incentives are available for efficiency upgrades related to common areas in apartment building. Pacific Power will communicate appropriate incentives and information the agencies.</p>
<p>Continue to collaborate with agencies to find solutions to service more homes and develop deeper levels of energy savings.</p>	<p>The Program Manager will communicate this recommendation to the agencies.</p>
<p>Brand Pacific Power's weatherization program.</p>	<p>Pacific Power has implemented this recommendation.</p>
<p>Initiate discussions with WA WAP agencies in order to increase the percentage of total rebates claimed for repairs to allow agencies to service more of the homes they interact with.</p>	<p>The Program Manager will communicate this recommendation to the agencies. Agencies have not billed for the total amount allowed in the past, so increasing the funding percentage available may not be the solution.</p>

**Table 2**  
**Energy FinAnswer Evaluation Recommendations**

<b>Evaluation Recommendations</b>	<b>Pacific Power Action Plan</b>
Reduce load factor for motor baselines in ex-ante calculations.	Pacific Power is determining if it will proceed with the recommended proxy energy use as a standard in motor analysis.
Ensure measure classifications in database are correct.	Pacific Power has implemented its Technical Resource Library (TRL) and DSM Central software. These two applications assist in providing the administrative checks and balances to manage measure classification.
Increase awareness of program project opportunities to spur energy savings growth.	The approval of <i>wattsmart</i> Business has streamlined and enhanced program marketing, and includes new case studies for Energy Management. New program offerings, such as the enhanced small business lighting, help drive energy efficiency awareness.
Consider alternate funding or incentive options to overcome capital barriers for program participants.	Pacific Power is evaluating the viability proceeding with additional funding or incentive options.
Review “delayed,” “canceled,” or “on hold” projects in order to identify future project leads.	Pacific Power reviews “on hold” projects monthly and “cancelled” projects annually.

**Table 2**  
**FinAnswer Express Evaluation Recommendations**

<b>Evaluation Recommendations</b>	<b>Pacific Power Action Plan</b>
Review procedure for determining claimed hours of use for lighting projects with savings above 200,000 kWh.	Pacific Power is considering the recommendation and is in the process of determining if it will proceed with the recommended analysis.
When entering lighting project details into the program tracking database, use measure sub-types that allow for greater resolution in the application of effective useful life (EUL) values.	Pacific Power has implemented its Technical Resource Library (TRL) and DSM Central software following Navigant’s evaluation. The TRL breaks out lighting measures into subtypes within the database and provides the ability to assign them an individual EUL.
Use greater resolution in the application of effective useful life (EUL) values in the program tracking database.	Pacific Power has implemented recommended changes due to the TRL and DSM Central.