



Appendix 1

Wyoming Cost Effectiveness

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

Table 1 - Utility Inputs

Table 2 – Portfolio Level Costs 2015

Table 3 – Benefit/Cost Ratios by Portfolio Type

Table 4 – 2015 Total Energy Efficiency Portfolio Cost-Effectiveness Results

Table 5 - 2015 C&I Energy Efficiency Portfolio Cost-Effectiveness Results

Table 6 – 2015 Residential Energy Efficiency Portfolio Cost-Effectiveness Results

Table 1 - Utility Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.51%
Commercial Line Loss	8.90%
Industrial Line Loss	5.61%
Irrigation Line Loss	9.28%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1107
Commercial Energy Rate (\$/kWh)(base year 2015)	\$0.0888
Industrial Energy Rate (\$/kWh)(base year 2015)	\$0.0653
Irrigation Energy Rate (\$/kWh)(base year 2015)	\$0.0931
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – Portfolio Level Costs 2015

Cost	Value
Portfolio EM&V, DSM Central and Technical Reference Library - Cat 1	\$113,986
Portfolio EM&V, DSM Central and Technical Reference Library - Cat 2	\$29,704
Portfolio EM&V, DSM Central and Technical Reference Library - Cat 3	\$48,187
Outreach & Communication	\$120,626
Total Costs	\$312,504

Table 3 – Benefit/Cost Ratios by Portfolio Type

Measure Group	PTRC	TRC	UCT	RIM	PCT
Total Portfolio	1.47	1.34	1.74	0.51	3.46
C&I Programs	1.62	1.47	2.01	0.56	3.19
Residential Programs	1.12	1.01	1.13	0.34	5.04

Table 4 – 2015 Total 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	\$0.0464	\$8,874,900	\$13,085,906	\$4,211,006	1.47
Total Resource Cost Test (TRC) No Adder	\$0.0464	\$8,874,900	\$11,896,278	\$3,021,379	1.34
Utility Cost Test (UCT)	\$0.0356	\$6,820,461	\$11,896,278	\$5,075,817	1.74
Rate Impact Test (RIM)		\$23,163,280	\$11,896,278	-\$11,267,001	0.51
Participant Cost Test (PCT)		\$7,421,778	\$25,664,855	\$18,243,077	3.46
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000949952

Table 5 - 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	\$0.0426	\$7,026,785	\$11,372,133	\$4,345,349	1.62
Total Resource Cost Test (TRC) No Adder	\$0.0426	\$7,026,785	\$10,338,303	\$3,311,518	1.47
Utility Cost Test (UCT)	\$0.0311	\$5,132,838	\$10,338,303	\$5,205,465	2.01
Rate Impact Test (RIM)		\$18,331,892	\$10,338,303	-\$7,993,589	0.56
Participant Cost Test (PCT)		\$6,357,305	\$20,304,782	\$13,947,477	3.19
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000541584

Table 6 – 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	\$0.0579	\$1,535,611	\$1,713,773	\$178,161	1.12
Total Resource Cost Test (TRC) No Adder	\$0.0579	\$1,535,611	\$1,557,975	\$22,364	1.01
Utility Cost Test (UCT)	\$0.0518	\$1,375,119	\$1,557,975	\$182,856	1.13
Rate Impact Test (RIM)		\$4,518,884	\$1,557,975	-\$2,960,908	0.34
Participant Cost Test (PCT)		\$1,064,473	\$5,360,073	\$4,295,600	5.04
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000594526

Residential Program Level Cost Effectiveness

Home Energy Savings Program

Navigant estimated the cost-effectiveness results for the Wyoming 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 7 measure categories.

Cost-effectiveness was tested using the 2015 IRP east residential whole house 31% and east residential lighting 47% load factor decrements. The program passes the cost-effectiveness for the PCT, UCT and PCT tests. The memo consists of the following tables.

- Table 1 - Home Energy Savings Inputs
- Table 2 – Home Energy Savings Annual Program Costs
- Table 3 – Home Energy Savings – Savings by Measure Category
- Table 4 - Benefit/Cost Ratios by Measure Category
- Table 5 – Home Energy Savings Program Level Cost-Effectiveness Results
- Table 6 - Home Energy Savings Appliance Cost-Effectiveness Results
- Table 7 - Home Energy Savings Building Shell Cost-Effectiveness Results
- Table 8 - Home Energy Savings Electronics Cost-Effectiveness Results
- Table 9 - Home Energy Savings Energy Kits Cost-Effectiveness Results
- Table 10 - Home Energy Savings HVAC Cost-Effectiveness Results
- Table 11 - Home Energy Savings Lighting Cost-Effectiveness Results
- Table 12 - Home Energy Savings Water Heating Cost-Effectiveness Results

Table 1 - Home Energy Savings Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.51%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1107
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – Home Energy Savings Annual Program Costs

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
Appliances	\$0	\$281	\$83,942	\$100	\$15,860	\$100,184	\$59,673
Building Shell	\$0	\$126	\$37,674	\$45	\$5,528	\$43,373	\$12,867
Electronics	\$0	\$533	\$158,980	\$190	\$20,605	\$180,308	\$82,430
Energy Kits	\$0	\$4,982	\$39,915	\$1,777	\$24,982	\$71,655	\$26,524
HVAC	\$0	\$468	\$139,757	\$167	\$22,115	\$162,507	-\$59,256
Lighting	\$0	\$31,039	\$75,274	\$11,068	\$442,665	\$560,046	\$940,615
Water Heating	\$0	\$15	\$4,513	\$5	\$975	\$5,509	\$1,620
Total	\$0	\$37,445	\$540,055	\$13,352	\$532,730	\$1,123,582	\$1,064,473

Table 3 – Home Energy Savings – Savings by Measure Category

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Appliances	38,947	100%	38,947	60%	23,368	15
Building Shell	17,480	100%	17,480	100%	17,480	30
Electronics	73,762	100%	73,762	57%	42,044	6
Energy Kits	689,636	100%	689,636	77%	531,020	9
HVAC	64,843	100%	64,843	60%	38,906	17
Lighting	4,296,482	100%	4,296,482	65%	2,792,714	7
Water Heating	2,094	100%	2,094	80%	1,675	14
Total	5,183,244	100%	5,183,244	67%	3,447,206	8

Table 4 - Benefit/Cost Ratios by Measure Category

Measure Group	PTRC	TRC	UCT	RIM	PCT
Appliances	0.14	0.13	0.16	0.12	1.08
Building Shell	0.36	0.33	0.39	0.22	2.99
Electronics	0.07	0.06	0.07	0.06	0.79
Energy Kits	2.76	2.51	2.35	0.41	17.42
HVAC	0.27	0.25	0.16	0.12	0.00
Lighting	1.51	1.37	1.78	0.40	3.63
Water Heating	0.21	0.19	0.20	0.14	2.15
Total	1.06	0.97	1.10	0.35	3.91

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

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0631	\$1,284,074	\$1,363,414	\$79,340	1.06
Total Resource Cost Test (TRC) No Adder	\$0.0631	\$1,284,074	\$1,239,467	-\$44,607	0.97
Utility Cost Test (UCT)	\$0.0552	\$1,123,582	\$1,239,467	\$115,885	1.10
Rate Impact Test (RIM)		\$3,533,856	\$1,239,467	-\$2,294,389	0.35
Participant Cost Test (PCT)		\$1,064,473	\$4,157,896	\$3,093,423	3.91
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000288634
Discounted Participant Payback (years)					1.39

Table 6 through Table 12 provides cost-effectiveness results for all 7 measures.

**Table 6 - Home Energy Savings Appliance Cost-Effectiveness Results
(Decrement – East Residential Whole House - 31%, Load Shape – Plug Load)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.4873	\$120,128	\$17,107	-\$103,021	0.14
Total Resource Cost Test (TRC) No Adder	\$0.4873	\$120,128	\$15,552	-\$104,576	0.13
Utility Cost Test (UCT)	\$0.4064	\$100,184	\$15,552	-\$84,632	0.16
Rate Impact Test (RIM)		\$129,470	\$15,552	-\$113,918	0.12
Participant Cost Test (PCT)		\$59,673	\$64,670	\$4,997	1.08
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000007718
Discounted Participant Payback (years)					28.68

**Table 7 - Home Energy Savings Building Shell Cost-Effectiveness Results
(Decrement – East Residential Whole House - 31%, Load Shape – Heat Pump)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.1836	\$50,713	\$18,460	-\$32,252	0.36
Total Resource Cost Test (TRC) No Adder	\$0.1836	\$50,713	\$16,782	-\$33,931	0.33
Utility Cost Test (UCT)	\$0.1570	\$43,373	\$16,782	-\$26,591	0.39
Rate Impact Test (RIM)		\$76,325	\$16,782	-\$59,543	0.22
Participant Cost Test (PCT)		\$12,867	\$38,479	\$25,612	2.99
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002045
Discounted Participant Payback (years)					3.99

**Table 8 - Home Energy Savings Electronics Cost-Effectiveness Results
(Decrement – East Residential Whole House - 31%, Load Shape – Plug Load)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.9611	\$206,688	\$13,654	-\$193,034	0.07
Total Resource Cost Test (TRC) No Adder	\$0.9611	\$206,688	\$12,412	-\$194,275	0.06
Utility Cost Test (UCT)	\$0.8384	\$180,308	\$12,412	-\$167,895	0.07
Rate Impact Test (RIM)		\$205,772	\$12,412	-\$193,360	0.06
Participant Cost Test (PCT)		\$82,430	\$65,279	-\$17,151	0.79
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000032362
Discounted Participant Payback (years)					19.12

**Table 9 - Home Energy Savings Energy Kits Cost-Effectiveness Results
(Decrement – East Residential Lighting - 47%, Load Shape – Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0236	\$67,097	\$185,258	\$118,161	2.76
Total Resource Cost Test (TRC) No Adder	\$0.0236	\$67,097	\$168,416	\$101,319	2.51
Utility Cost Test (UCT)	\$0.0252	\$71,655	\$168,416	\$96,761	2.35
Rate Impact Test (RIM)		\$408,184	\$168,416	-\$239,768	0.41
Participant Cost Test (PCT)		\$26,524	\$462,032	\$435,508	17.42
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000024186
Discounted Participant Payback (years)					0.29

*Water heating measures utilized the water heating decrement with the water heating load shape.

**Table 10 - Home Energy Savings HVAC Cost-Effectiveness Results
(Decrement – East Residential Whole House - 31%, Load Shape – Heat Pump)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.2348	\$104,838	\$28,359	-\$76,480	0.27
Total Resource Cost Test (TRC) No Adder	\$0.2348	\$104,838	\$25,781	-\$79,058	0.25
Utility Cost Test (UCT)	\$0.3639	\$162,507	\$25,781	-\$136,726	0.16
Rate Impact Test (RIM)		\$215,592	\$25,781	-\$189,812	0.12
Participant Cost Test (PCT)		-\$59,256	\$110,590	\$169,846	-1.87
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000011382
Discounted Participant Payback (years)					n/a

**Table 11 - Home Energy Savings Lighting Cost-Effectiveness Results
(Decrement – East Residential Lighting - 47%, Load Shape – Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0447	\$728,781	\$1,099,380	\$370,599	1.51
Total Resource Cost Test (TRC) No Adder	\$0.0447	\$728,781	\$999,437	\$270,656	1.37
Utility Cost Test (UCT)	\$0.0344	\$560,046	\$999,437	\$439,391	1.78
Rate Impact Test (RIM)		\$2,491,004	\$999,437	-\$1,491,567	0.40
Participant Cost Test (PCT)		\$940,615	\$3,413,370	\$2,472,755	3.63
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000214194
Discounted Participant Payback (years)					1.61

**Table 12 - Home Energy Savings Water Heating Cost-Effectiveness Results
(Decrement – East Residential Whole House - 31%, Load Shape – Water Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.3462	\$5,830	\$1,196	-\$4,633	0.21
Total Resource Cost Test (TRC) No Adder	\$0.3462	\$5,830	\$1,088	-\$4,742	0.19
Utility Cost Test (UCT)	\$0.3271	\$5,509	\$1,088	-\$4,421	0.20
Rate Impact Test (RIM)		\$7,508	\$1,088	-\$6,421	0.14
Participant Cost Test (PCT)		\$1,620	\$3,475	\$1,855	2.15
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000465
Discounted Participant Payback (years)					3.63

Refrigerator Recycling (See ya later, refrigerator)

Navigant estimated the cost-effectiveness results for the Wyoming 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 east plug loads 71% and east residential lighting 47% load factor decrements. The program does not pass any of the cost-effectiveness 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 1 - SYLR Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.51%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1107
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – SYLR Annual Program Costs

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
Refrigerators	\$0	\$9,085	\$52,051	\$609	\$32,105	\$93,850	\$0
Freezers	\$0	\$2,161	\$12,379	\$145	\$7,957	\$22,642	\$0
Kits	\$0	\$335	\$1,917	\$22	\$0	\$2,274	\$0
Total	\$0	\$11,580	\$66,347	\$777	\$40,062	\$118,766	\$0

Table 3 – 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	789,870	94%	745,685	33%	246,076	7
Freezers	187,856	92%	172,732	25%	43,183	5
Kits	29,084	97%	28,066	100%	28,066	6
Total	1,006,810	94%	946,483	34%	317,325	7

Table 4 - Benefit/Cost Ratios by Measure Category

Measure Group	PTRC	TRC	UCT	RIM	PCT
Refrigerators	0.72	0.65	0.65	0.23	n/a
Freezers	0.38	0.34	0.34	0.17	n/a
Kits	4.23	3.84	3.84	0.45	n/a
Total	0.72	0.66	0.66	0.24	n/a

Table 5 – 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	\$0.0672	\$118,766	\$85,720	-\$33,046	0.72
Total Resource Cost Test (TRC) No Adder	\$0.0672	\$118,766	\$77,927	-\$40,838	0.66
Utility Cost Test (UCT)	\$0.0672	\$118,766	\$77,927	-\$40,838	0.66
Rate Impact Test (RIM)		\$328,185	\$77,927	-\$250,257	0.24
Participant Cost Test (PCT)		\$0	\$661,755	\$661,755	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000035938
Discounted Participant Payback (years)					n/a

Table 6 through Table 8 provides cost-effectiveness results for all 3 measures.

**Table 6 - SYLR Refrigerators Cost-Effectiveness Results
(Decrement – East Plug Load - 71%, Load Shape – Plug Load)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0653	\$93,850	\$67,612	-\$26,238	0.72
Total Resource Cost Test (TRC) No Adder	\$0.0653	\$93,850	\$61,466	-\$32,384	0.65
Utility Cost Test (UCT)	\$0.0653	\$93,850	\$61,466	-\$32,384	0.65
Rate Impact Test (RIM)		\$263,994	\$61,466	-\$202,528	0.23
Participant Cost Test (PCT)		\$0	\$547,692	\$547,692	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000029084
Discounted Participant Payback (years)					n/a

**Table 7 - SYLR Freezers Cost-Effectiveness Results
(Decrement – East Plug Load - 71%, Load Shape – Plug Load)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.1203	\$22,642	\$8,499	-\$14,143	0.38
Total Resource Cost Test (TRC) No Adder	\$0.1203	\$22,642	\$7,726	-\$14,916	0.34
Utility Cost Test (UCT)	\$0.1203	\$22,642	\$7,726	-\$14,916	0.34
Rate Impact Test (RIM)		\$44,919	\$7,726	-\$37,193	0.17
Participant Cost Test (PCT)		\$0	\$97,065	\$97,065	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000007468
Discounted Participant Payback (years)					n/a

**Table 8 - SYLR Kits Cost-Effectiveness Results
(Decrement – East Residential Lighting - 47%, Load Shape – Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0158	\$2,274	\$9,609	\$7,335	4.23
Total Resource Cost Test (TRC) No Adder	\$0.0158	\$2,274	\$8,735	\$6,462	3.84
Utility Cost Test (UCT)	\$0.0158	\$2,274	\$8,735	\$6,462	3.84
Rate Impact Test (RIM)		\$19,272	\$8,735	-\$10,537	0.45
Participant Cost Test (PCT)		\$0	\$16,998	\$16,998	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001763
Discounted Participant Payback (years)					n/a

Low Income Weatherization

Navigant estimated the cost-effectiveness results for the Wyoming 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 east residential whole house 31% load factor decrement. The program passes cost-effectiveness for all the tests except RIM and PCT tests.

Table 1 – Low Income Weatherization 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 1 - Low Income Weatherization Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.51%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1107
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 - Low Income Weatherization Annual Program Costs

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
Low Income Weatherization	\$0	\$6,357	\$1,635	\$702	\$16,351	\$25,045	\$0
Total	\$0	\$6,357	\$1,635	\$702	\$16,351	\$25,045	\$0

Table 3 - Low Income Weatherization Savings by Measure Category

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Low Income Weatherization	48,111	90%	43,300	100%	43,300	26
Total	48,111	90%	43,300	100%	43,300	26

**Table 4 - Low Income Weatherization Program Level Cost-Effectiveness Results
(Decrement – East Residential Whole House - 31%, Load Shape – Whole House)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0392	\$25,045	\$42,229	\$17,184	1.69
Total Resource Cost Test (TRC) No Adder	\$0.0392	\$25,045	\$38,390	\$13,345	1.53
Utility Cost Test (UCT)	\$0.0392	\$25,045	\$38,390	\$13,345	1.53
Rate Impact Test (RIM)		\$101,096	\$38,390	-\$62,706	0.38
Participant Cost Test (PCT)		\$0	\$92,402	\$92,402	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002480
Discounted Participant Payback (years)					n/a

Home Energy Reporting

Navigant estimated the cost-effectiveness results for the Wyoming 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.

Cost-effectiveness was tested using the 2015 IRP east residential whole house 31% load factor decrement. The program passes the cost-effectiveness for all the tests except the RIM and PCT 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 – Home Energy Reporting Program Level Cost-Effectiveness Results

Table 1 - Home Energy Reporting Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.51%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1107
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – Home Energy Reporting Annual Program Costs

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
Home Energy Reports	\$0	\$10,894	\$93,752	\$3,081	\$0	\$107,726	\$0
Total	\$0	\$10,894	\$93,752	\$3,081	\$0	\$107,726	\$0

Table 3 – Home Energy Reporting Savings by Measure Category

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Home Energy Reports	3,971,695	100%	3,971,695	100%	3,971,695	1
Total	3,971,695	100%	3,971,695	100%	3,971,695	1

**Table 4 - Home Energy Reporting Program Level Cost-Effectiveness Results
 ((Decrement – East Residential Whole House - 31%, Load Shape – Whole House)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0284	\$107,726	\$222,410	\$114,683	2.06
Total Resource Cost Test (TRC) No Adder	\$0.0284	\$107,726	\$202,191	\$94,464	1.88
Utility Cost Test (UCT)	\$0.0284	\$107,726	\$202,191	\$94,464	1.88
Rate Impact Test (RIM)		\$555,747	\$202,191	-\$353,556	0.36
Participant Cost Test (PCT)		\$0	\$448,020	\$448,020	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000355341
Discounted Participant Payback (years)					n/a

Non-Residential Energy Efficiency

Non-Residential Category 2 & 3

Navigant estimated the cost-effectiveness results for the Wyoming Wattsmart Business Program Category 2 and 3, based on 2015 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program and for the individual categories.

Cost-effectiveness was tested using the 2015 IRP east industrial 40%, east commercial lighting 53% and east commercial cooling 14% load factor decrements. The program passes cost-effectiveness for all tests except the RIM test. The memo consists of the following tables.

Table 1 – Utility Inputs

Table 2 – Annual wattsmart Business Program Costs by Category

Table 3 – Annual wattsmart Business Program Savings by Category

Table 4 – Benefit/Cost Ratios by Category

Table 5 – wattsmart Business Program Level Cost-Effectiveness Results – Category 2 & 3

Table 6 – wattsmart Business Program Level Cost-Effectiveness Results – Category 2

Table 7 – wattsmart Business Program Level Cost-Effectiveness Results – Category 3

Table 1 - Utility Inputs

Parameter	Value
Discount Rate	6.66%
Commercial Line Loss	8.90%
Industrial Line Loss	5.61%
Irrigation Line Loss	9.28%
Commercial Energy Rate (\$/kWh)(base year 2015)	8.88%
Industrial Energy Rate (\$/kWh)(base year 2015)	\$0.0653
Irrigation Energy Rate (\$/kWh)(base year 2015)	\$0.0931
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – Annual Wattsmart Business Program Costs by Category

Category	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Bill Credits	Total Utility Costs	Gross Customer Costs
Category 2	\$210,957	\$53,809	\$840,363	\$68,478	\$969,036	\$0	\$2,142,644	\$3,151,820
Category 3	\$577,812	\$226,540	\$161,988	\$55,285	\$960,275	\$1,008,294	\$2,990,194	\$3,205,485
Total	\$788,770	\$280,349	\$1,002,351	\$123,763	\$1,929,310	\$1,008,294	\$5,132,838	\$6,357,305

Table 3 – Annual Wattsmart Business Program Savings by Category

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Category 2	6,462,509	100%	6,462,509	76%	4,911,507	14
Category 3	14,678,932	100%	14,678,932	76%	11,155,988	15
Total	21,141,441	100%	21,141,441	76%	16,067,495	14

Table 4 - Benefit/Cost Ratios by Category

Measure Group	PTRC	TRC	UCT	RIM	PCT
Category 2	0.95	0.87	1.45	0.47	2.16
Category 3	2.30	2.09	2.42	0.62	4.21
Total	1.62	1.47	2.01	0.56	3.19

Table 5 through Table 7 provide cost-effectiveness results for each Wattsmart Business Program Category beginning with the combination of Category 2 and 3.

Table 5 - Wattsmart Business Program Level Cost-Effectiveness Results – Category 2 & 3

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0426	\$7,026,785	\$11,372,133	\$4,345,349	1.62
Total Resource Cost Test (TRC) No Adder	\$0.0426	\$7,026,785	\$10,338,303	\$3,311,518	1.47
Utility Cost Test (UCT)	\$0.0311	\$5,132,838	\$10,338,303	\$5,205,465	2.01
Rate Impact Test (RIM)		\$18,331,892	\$10,338,303	-\$7,993,589	0.56
Participant Cost Test (PCT)		\$6,357,305	\$20,304,782	\$13,947,477	3.19
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000623090

Table 6 - Wattsmart Business Program Level Cost-Effectiveness Results – Category 2

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0736	\$3,568,991	\$3,408,031	-\$160,960	0.95
Total Resource Cost Test (TRC) No Adder	\$0.0736	\$3,568,991	\$3,098,210	-\$470,781	0.87
Utility Cost Test (UCT)	\$0.0442	\$2,142,644	\$3,098,210	\$955,566	1.45
Rate Impact Test (RIM)		\$6,574,174	\$3,098,210	-\$3,475,964	0.47
Participant Cost Test (PCT)		\$3,151,820	\$6,799,997	\$3,648,178	2.16
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000270947

Table 7 - Wattsmart Business Program Level Cost-Effectiveness Results – Category 3

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0297	\$3,457,794	\$7,964,102	\$4,506,308	2.30
Total Resource Cost Test (TRC) No Adder	\$0.0297	\$3,457,794	\$7,240,093	\$3,782,299	2.09
Utility Cost Test (UCT)	\$0.0257	\$2,990,194	\$7,240,093	\$4,249,899	2.42
Rate Impact Test (RIM)		\$11,757,718	\$7,240,093	-\$4,517,625	0.62
Participant Cost Test (PCT)		\$3,205,485	\$13,504,785	\$10,299,299	4.21
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000327437

Non-Residential Category 2

Navigant estimated the cost-effectiveness results for the Wyoming Wattsmart Business Program Category 2, based on 2015 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall Category 2 program and for the 9 measure categories.

Cost-effectiveness was tested using the 2015 IRP east industrial 40%, east commercial lighting 53% and east commercial cooling 14% load factor decrements. The program passes UCT and PCT cost-effectiveness tests. The memo consists of the following tables.

Table 1 – Utility Inputs

Table 2 – Annual wattsmart Business Program Costs by Measure Category – Category 2

Table 3 – Annual wattsmart Business Program Savings by Measure Category – Category 2

Table 4 – Benefit/Cost Ratios by Measure Category

Table 5 – wattsmart Business Program Level Cost-Effectiveness Results – Category 2

Table 6 – wattsmart Business Building Shell Cost-Effectiveness Results

Table 7 – wattsmart Business Controls Cost-Effectiveness Results

Table 8 – wattsmart Business Food Service Equipment Cost-Effectiveness Results

Table 9 – wattsmart Business HVAC Cost-Effectiveness Results

Table 10 – wattsmart Business Irrigation Cost-Effectiveness Results

Table 11 – wattsmart Business Lighting Cost-Effectiveness Results

Table 12 – wattsmart Business Motors Cost-Effectiveness Results

Table 13 – wattsmart Business Oil and Gas Cost-Effectiveness Results

Table 14 – wattsmart Business Refrigeration Cost-Effectiveness Results

Table 1 - Utility Inputs

Parameter	Value
Discount Rate	6.66%
Commercial Line Loss	8.90%
Industrial Line Loss	5.61%
Irrigation Line Loss	9.28%
Commercial Energy Rate (\$/kWh)(base year 2015)	8.88%
Industrial Energy Rate (\$/kWh)(base year 2015)	\$0.0653
Irrigation Energy Rate (\$/kWh)(base year 2015)	\$0.0931
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

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

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Bill Credits	Total Utility Costs	Gross Customer Costs
Building Shell	\$390	\$202	\$3,344	\$258	\$15,524	\$0	\$19,717	\$33,116
Controls	\$1,474	\$762	\$6,594	\$975	\$5,067	\$0	\$14,872	\$12,210
Food Service Equipment	\$1,112	\$575	\$9,539	\$736	\$6,770	\$0	\$18,732	\$26,104
HVAC	\$5,470	\$2,828	\$46,909	\$3,621	\$31,615	\$0	\$90,442	\$99,737
Irrigation	\$0	\$1,492	\$10,111	\$1,495	\$17,180	\$0	\$30,279	\$104,394
Lighting	\$182,478	\$37,594	\$651,233	\$48,133	\$723,782	\$0	\$1,643,220	\$2,566,778
Motors	\$13,139	\$6,793	\$77,689	\$8,697	\$106,568	\$0	\$212,884	\$181,161
Oil & Gas	\$3,803	\$1,966	\$17,020	\$2,517	\$35,634	\$0	\$60,940	\$57,851
Refrigeration	\$3,091	\$1,598	\$17,925	\$2,046	\$26,897	\$0	\$51,557	\$70,468
Total	\$210,957	\$53,809	\$840,363	\$68,478	\$969,036	\$0	\$2,142,644	\$3,151,820

Table 3 – Annual Wattsmart Business Program Savings by Measure Category – Category 2

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Building Shell	24,355	100%	24,355	76%	18,510	19
Controls	92,042	100%	92,042	76%	69,952	15
Food Service Equipment	69,480	100%	69,480	76%	52,805	6
HVAC	341,686	100%	341,686	76%	259,681	15
Irrigation	141,127	100%	141,127	76%	107,257	7
Lighting	4,542,458	100%	4,542,458	76%	3,452,268	14
Motors	820,726	100%	820,726	76%	623,752	15
Oil & Gas	237,557	100%	237,557	76%	180,543	7
Refrigeration	193,078	100%	193,078	76%	146,739	15
Total	6,462,509	100%	6,462,509	76%	4,911,507	14

Table 4 - Benefit/Cost Ratios by Measure Category

Measure Group	PTRC	TRC	UCT	RIM	PCT
Building Shell	0.59	0.54	0.80	0.38	1.33
Controls	2.60	2.36	3.03	0.68	5.99
Food Service Equipment	0.53	0.48	0.81	0.34	1.55
HVAC	1.51	1.37	2.05	0.53	3.74
Irrigation	1.60	1.45	4.44	1.45	0.95
Lighting	0.82	0.74	1.30	0.43	1.97
Motors	1.83	1.66	1.90	0.57	4.24
Oil & Gas	0.96	0.87	0.99	0.45	2.29
Refrigeration	1.40	1.27	1.93	0.50	3.14
Total	0.95	0.87	1.45	0.47	2.16

Table 5 – Wattsmart Business Program Level Cost-Effectiveness Results – Category 2

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0736	\$3,568,991	\$3,408,031	-\$160,960	0.95
Total Resource Cost Test (TRC) No Adder	\$0.0736	\$3,568,991	\$3,098,210	-\$470,781	0.87
Utility Cost Test (UCT)	\$0.0442	\$2,142,644	\$3,098,210	\$955,566	1.45
Rate Impact Test (RIM)		\$6,574,174	\$3,098,210	-\$3,475,964	0.47
Participant Cost Test (PCT)		\$3,151,820	\$6,799,997	\$3,648,178	2.16
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000270947

Table 6 through Table 14 provide cost-effectiveness results for all 9 measure categories in Category 2.

Table 6 - Wattsmart Business Building Shell Cost-Effectiveness Results (Decrement – East Industrial - 40%, Load Shape – HVAC)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.1287	\$29,361	\$17,300	-\$12,061	0.59
Total Resource Cost Test (TRC) No Adder	\$0.1287	\$29,361	\$15,728	-\$13,634	0.54
Utility Cost Test (UCT)	\$0.0864	\$19,717	\$15,728	-\$3,989	0.80
Rate Impact Test (RIM)		\$41,483	\$15,728	-\$25,756	0.38
Participant Cost Test (PCT)		\$33,116	\$44,164	\$11,048	1.33
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001385
Discounted Participant Payback (years)					13.88

**Table 7 - Wattsmart Business Controls Cost-Effectiveness Results
(Decrement - East Industrial - 40%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0259	\$19,085	\$49,630	\$30,545	2.60
Total Resource Cost Test (TRC) No Adder	\$0.0259	\$19,085	\$45,118	\$26,033	2.36
Utility Cost Test (UCT)	\$0.0202	\$14,872	\$45,118	\$30,246	3.03
Rate Impact Test (RIM)		\$66,585	\$45,118	-\$21,467	0.68
Participant Cost Test (PCT)		\$12,210	\$73,111	\$60,901	5.99
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001454
Discounted Participant Payback (years)					n/a

**Table 8 - Wattsmart Business Food Service Equipment Cost-Effectiveness Results
(Decrement - East Comm. Lighting - 53%, Load Shape – Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.1177	\$31,801	\$16,788	-\$15,013	0.53
Total Resource Cost Test (TRC) No Adder	\$0.1177	\$31,801	\$15,262	-\$16,539	0.48
Utility Cost Test (UCT)	\$0.0694	\$18,732	\$15,262	-\$3,470	0.81
Rate Impact Test (RIM)		\$44,387	\$15,262	-\$29,125	0.34
Participant Cost Test (PCT)		\$26,104	\$40,526	\$14,422	1.55
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000004875
Discounted Participant Payback (years)					4.37

**Table 9 - Wattsmart Business HVAC Cost-Effectiveness Results
(Decrement – East Industrial - 40%, Load Shape – HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0491	\$134,627	\$203,494	\$68,867	1.51
Total Resource Cost Test (TRC) No Adder	\$0.0491	\$134,627	\$184,995	\$50,367	1.37
Utility Cost Test (UCT)	\$0.0330	\$90,442	\$184,995	\$94,553	2.05
Rate Impact Test (RIM)		\$349,933	\$184,995	-\$164,938	0.53
Participant Cost Test (PCT)		\$99,737	\$373,050	\$273,313	3.74
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000011175
Discounted Participant Payback (years)					3.11

**Table 10 - Wattsmart Business Irrigation Cost-Effectiveness Results
(Decrement - East Comm. Cooling - 14%, Load Shape – Irrigation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.1476	\$92,438	\$147,780	\$55,342	1.60
Total Resource Cost Test (TRC) No Adder	\$0.1476	\$92,438	\$134,345	\$41,908	1.45
Utility Cost Test (UCT)	\$0.0484	\$30,279	\$134,345	\$104,067	4.44
Rate Impact Test (RIM)		\$92,648	\$134,345	\$41,697	1.45
Participant Cost Test (PCT)		\$104,394	\$99,245	-\$5,149	0.95
Lifecycle Revenue Impacts (\$/kWh)					-\$0.0000005988
Discounted Participant Payback (years)					n/a

**Table 11 - Wattsmart Business Lighting Cost-Effectiveness Results
(Decrement - East Comm. Lighting - 53%, Load Shape – Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0827	\$2,870,190	\$2,351,160	-\$519,030	0.82
Total Resource Cost Test (TRC) No Adder	\$0.0827	\$2,870,190	\$2,137,418	-\$732,772	0.74
Utility Cost Test (UCT)	\$0.0474	\$1,643,220	\$2,137,418	\$494,198	1.30
Rate Impact Test (RIM)		\$4,929,944	\$2,137,418	-\$2,792,526	0.43
Participant Cost Test (PCT)		\$2,566,778	\$5,048,419	\$2,481,641	1.97
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000202402
Discounted Participant Payback (years)					6.90

**Table 12 - Wattsmart Business Motors Cost-Effectiveness Results
(Decrement - East Industrial - 40%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0371	\$243,999	\$445,991	\$201,992	1.83
Total Resource Cost Test (TRC) No Adder	\$0.0371	\$243,999	\$405,447	\$161,447	1.66
Utility Cost Test (UCT)	\$0.0324	\$212,884	\$405,447	\$192,562	1.90
Rate Impact Test (RIM)		\$715,540	\$405,447	-\$310,094	0.57
Participant Cost Test (PCT)		\$181,161	\$767,957	\$586,796	4.24
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000021010
Discounted Participant Payback (years)					5.90

**Table 13 - Wattsmart Business Oil and Gas Cost-Effectiveness Results
(Decrement - East Industrial - 40%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0657	\$69,273	\$66,232	-\$3,041	0.96
Total Resource Cost Test (TRC) No Adder	\$0.0657	\$69,273	\$60,211	-\$9,063	0.87
Utility Cost Test (UCT)	\$0.0578	\$60,940	\$60,211	-\$729	0.99
Rate Impact Test (RIM)		\$134,576	\$60,211	-\$74,366	0.45
Participant Cost Test (PCT)		\$57,851	\$132,524	\$74,673	2.29
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000010679
Discounted Participant Payback (years)					n/a

**Table 14 - Wattsmart Business Refrigeration Cost-Effectiveness Results
(Decrement - East Industrial - 40%, Load Shape – Refrigeration)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0505	\$78,216	\$109,656	\$31,440	1.40
Total Resource Cost Test (TRC) No Adder	\$0.0505	\$78,216	\$99,688	\$21,471	1.27
Utility Cost Test (UCT)	\$0.0333	\$51,557	\$99,688	\$48,130	1.93
Rate Impact Test (RIM)		\$199,077	\$99,688	-\$99,389	0.50
Participant Cost Test (PCT)		\$70,468	\$221,001	\$150,533	3.14
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000006734
Discounted Participant Payback (years)					n/a

Non-Residential Category 3

Navigant estimated the cost-effectiveness results for the Wyoming Wattsmart Business Program Category 3, based on 2015 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall Category 3 program and for the 7 measure categories.

Cost-effectiveness was tested using the 2015 IRP east industrial 40%, east commercial lighting 53% and east commercial cooling 14% load factor decrements. The program passes cost-effectiveness for all tests except the RIM test. The memo consists of the following tables.

Table 1 – Utility Inputs

Table 2 – Annual wattsmart Business Program Costs by Measure Category – Category 3

Table 3 – Annual wattsmart Business Program Savings by Measure Category – Category 3

Table 4 – Benefit/Cost Ratios by Measure Category

Table 5 – wattsmart Business Program Level Cost-Effectiveness Results – Category 3

Table 6 – wattsmart Business Building Shell Cost-Effectiveness Results

Table 7 – wattsmart Business Compressed Air Cost-Effectiveness Results

Table 8 – wattsmart Business Controls Cost-Effectiveness Results

Table 9 – wattsmart Business HVAC Cost-Effectiveness Results

Table 10 – wattsmart Business Lighting Cost-Effectiveness Results

Table 11 – wattsmart Business Motors Cost-Effectiveness Results

Table 12 – wattsmart Business Oil and Gas Cost-Effectiveness Results

Table 1 - Utility Inputs

Parameter	Value
Discount Rate	6.66%
Commercial Line Loss	8.90%
Industrial Line Loss	5.61%
Irrigation Line Loss	9.28%
Commercial Energy Rate (\$/kWh)(base year 2015)	8.88%
Industrial Energy Rate (\$/kWh)(base year 2015)	\$0.0653
Irrigation Energy Rate (\$/kWh)(base year 2015)	\$0.0931
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – Annual Wattsmart Business Program Costs by Measure Category – Category 3

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Bill Credits	Total Utility Costs	Gross Customer Costs
Building Shell	\$2,393	\$938	\$671	\$229	\$28,605	\$0	\$32,837	\$58,551
Compressed Air	\$12,223	\$4,792	\$3,426	\$1,169	\$47,926	\$0	\$69,536	\$83,854
Controls	\$6,523	\$2,558	\$1,828	\$624	\$19,306	\$0	\$30,840	\$27,580
HVAC	\$92,131	\$36,121	\$25,821	\$8,815	\$196,526	\$0	\$359,414	\$446,276
Lighting	\$37,208	\$14,588	\$10,473	\$3,560	\$76,987	\$80,162	\$222,977	\$326,800
Motors	\$414,938	\$162,683	\$116,295	\$39,701	\$568,274	\$928,133	\$2,230,023	\$2,217,398
Oil & Gas	\$12,396	\$4,860	\$3,474	\$1,186	\$22,651	\$0	\$44,567	\$45,027
Total	\$577,812	\$226,540	\$161,988	\$55,285	\$960,275	\$1,008,294	\$2,990,194	\$3,205,485

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

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Building Shell	60,800	100%	60,800	76%	46,208	19
Compressed Air	310,509	100%	310,509	76%	235,987	15
Controls	165,724	100%	165,724	76%	125,950	15
HVAC	2,340,517	100%	2,340,517	76%	1,778,793	15
Lighting	945,237	100%	945,237	76%	718,380	14
Motors	10,541,226	100%	10,541,226	76%	8,011,332	15
Oil & Gas	314,919	100%	314,919	76%	239,338	7
Total	14,678,932	100%	14,678,932	76%	11,155,988	15

Table 4 - Benefit/Cost Ratios by Measure Category

Measure Group	PTRC	TRC	UCT	RIM	PCT
Building Shell	0.89	0.81	1.20	0.45	1.71
Compressed Air	2.10	1.91	2.35	0.67	3.31
Controls	2.84	2.58	2.72	0.53	6.74
HVAC	2.78	2.53	3.53	0.59	5.71
Lighting	1.54	1.40	1.97	0.53	2.91
Motors	2.35	2.14	2.32	0.63	4.19
Oil & Gas	1.56	1.42	1.79	0.56	3.36
Total	2.30	2.09	2.42	0.62	4.21

Table 5 – Wattsmart Business Program Level Cost-Effectiveness Results – Category 3

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0297	\$3,457,794	\$7,964,102	\$4,506,308	2.30
Total Resource Cost Test (TRC) No Adder	\$0.0297	\$3,457,794	\$7,240,093	\$3,782,299	2.09
Utility Cost Test (UCT)	\$0.0257	\$2,990,194	\$7,240,093	\$4,249,899	2.42
Rate Impact Test (RIM)		\$11,757,718	\$7,240,093	-\$4,517,625	0.62
Participant Cost Test (PCT)		\$3,205,485	\$13,504,785	\$10,299,299	4.21
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000327437

Table 6 through Table 12 provide cost-effectiveness results for all 7 measure categories in Category 3.

Table 6 - Wattsmart Business Building Shell Cost-Effectiveness Results (Decrement – East Industrial - 40%, Load Shape – HVAC)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0856	\$48,730	\$43,189	-\$5,541	0.89
Total Resource Cost Test (TRC) No Adder	\$0.0856	\$48,730	\$39,263	-\$9,467	0.81
Utility Cost Test (UCT)	\$0.0577	\$32,837	\$39,263	\$6,426	1.20
Rate Impact Test (RIM)		\$87,175	\$39,263	-\$47,912	0.45
Participant Cost Test (PCT)		\$58,551	\$100,103	\$41,552	1.71
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002577
Discounted Participant Payback (years)					31.29

Table 7 - Wattsmart Business Compressed Air Cost-Effectiveness Results (Decrement – East Industrial - 40%, Load Shape – HVAC)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0343	\$85,339	\$179,463	\$94,124	2.10
Total Resource Cost Test (TRC) No Adder	\$0.0343	\$85,339	\$163,148	\$77,809	1.91
Utility Cost Test (UCT)	\$0.0279	\$69,536	\$163,148	\$93,612	2.35
Rate Impact Test (RIM)		\$243,994	\$163,148	-\$80,846	0.67
Participant Cost Test (PCT)		\$83,854	\$277,476	\$193,622	3.31
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000005477
Discounted Participant Payback (years)					n/a

**Table 8 - Wattsmart Business Controls Cost-Effectiveness Results
(Decrement - East Industrial - 40%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0245	\$32,494	\$92,143	\$59,649	2.84
Total Resource Cost Test (TRC) No Adder	\$0.0245	\$32,494	\$83,767	\$51,272	2.58
Utility Cost Test (UCT)	\$0.0232	\$30,840	\$83,767	\$52,927	2.72
Rate Impact Test (RIM)		\$157,459	\$83,767	-\$73,693	0.53
Participant Cost Test (PCT)		\$27,580	\$185,911	\$158,331	6.74
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000004993
Discounted Participant Payback (years)					n/a

**Table 9 - Wattsmart Business HVAC Cost-Effectiveness Results
(Decrement – East Industrial - 40%, Load Shape – HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0268	\$502,058	\$1,394,874	\$892,816	2.78
Total Resource Cost Test (TRC) No Adder	\$0.0268	\$502,058	\$1,268,067	\$766,009	2.53
Utility Cost Test (UCT)	\$0.0192	\$359,414	\$1,268,067	\$908,653	3.53
Rate Impact Test (RIM)		\$2,147,662	\$1,268,067	-\$879,595	0.59
Participant Cost Test (PCT)		\$446,276	\$2,549,484	\$2,103,207	5.71
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000059595
Discounted Participant Payback (years)					14.56

**Table 10 - Wattsmart Business Lighting Cost-Effectiveness Results
(Decrement - East Comm. Lighting - 53%, Load Shape – Lighting)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0435	\$314,197	\$482,736	\$168,539	1.54
Total Resource Cost Test (TRC) No Adder	\$0.0435	\$314,197	\$438,851	\$124,654	1.40
Utility Cost Test (UCT)	\$0.0309	\$222,977	\$438,851	\$215,874	1.97
Rate Impact Test (RIM)		\$826,691	\$438,851	-\$387,840	0.53
Participant Cost Test (PCT)		\$326,800	\$951,509	\$624,709	2.91
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000028111
Discounted Participant Payback (years)					0.56

**Table 11 - Wattsmart Business Motors Cost-Effectiveness Results
(Decrement - East Industrial - 40%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0286	\$2,418,839	\$5,683,897	\$3,265,058	2.35
Total Resource Cost Test (TRC) No Adder	\$0.0286	\$2,418,839	\$5,167,179	\$2,748,340	2.14
Utility Cost Test (UCT)	\$0.0264	\$2,230,023	\$5,167,179	\$2,937,155	2.32
Rate Impact Test (RIM)		\$8,152,553	\$5,167,179	-\$2,985,374	0.63
Participant Cost Test (PCT)		\$2,217,398	\$9,289,209	\$7,071,811	4.19
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000202266
Discounted Participant Payback (years)					n/a

**Table 12 - Wattsmart Business Oil and Gas Cost-Effectiveness Results
(Decrement – East Industrial - 40%, Load Shape – HVAC)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conversation Adder	\$0.0402	\$56,137	\$87,800	\$31,663	1.56
Total Resource Cost Test (TRC) No Adder	\$0.0402	\$56,137	\$79,819	\$23,682	1.42
Utility Cost Test (UCT)	\$0.0319	\$44,567	\$79,819	\$35,251	1.79
Rate Impact Test (RIM)		\$142,184	\$79,819	-\$62,366	0.56
Participant Cost Test (PCT)		\$45,027	\$151,094	\$106,067	3.36
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000008956
Discounted Participant Payback (years)					n/a



Appendix 2

Home Energy Savings Retailers
2015

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2015 Participating Wyoming Upstream Retailers

Retailer	City	CFLs	LEDs	RAC
Ace Hardware - Baileys	Casper	√	√	
Ace Hardware - Cazin's	Evanston	√	√	
Ace Hardware #10776	Kemmerer	√	√	
Ace Hardware #11263	Green River	√	√	
Ace Hardware #8349	Rock Springs	√	√	
Big Lots #4444	Casper	√		
Do It Best - Build Right	Rawlins	√	√	
Dollar Tree #2891	Rock Springs	√	√	
Dollar Tree #3288	Casper	√	√	
Dollar Tree #3851	Casper	√	√	
Dollar Tree #4544	Evanston	√	√	
Dollar Tree #5266	Rawlins	√	√	
Family Dollar #5599	Rawlins	√	√	
Family Dollar #5767	Mills	√	√	
Family Dollar #6014	Green River	√	√	
Family Dollar #6081	Casper	√	√	
Family Dollar #8278	Rock Springs	√	√	
Family Dollar #9163	Kemmerer	√	√	
Family Dollar #9399	Pinedale	√	√	
Habitat for Humanity ReStore #3	Mills	√		
Home Depot #6001	Casper	√	√	
Home Depot #6003	Rock Springs	√	√	√
Menards #3243	Casper	√	√	
Ridley's #1132	Casper	√	√	
Ridley's #1133	Casper	√	√	
Ridley's #1163	Kemmerer	√	√	
Ridley's #14758	Pinedale	√	√	
Safeway #0433	Casper	√	√	
Safeway #2468	Casper	√	√	
Sam's Club #6425	Casper	√	√	
Smith's #182	Rock Springs	√	√	
Smith's #185	Casper	√	√	
Smith's #187	Green River	√	√	
Smith's #86	Evanston	√	√	
Sutherlands #2219	Casper	√	√	
Target #T0164	Casper	√	√	
True Value Hardware - Coupens CY	Casper		√	
True Value Hardware #7425	Rawlins	√	√	
Walgreens #09092	Rock Springs	√		
Walgreens #7462	Casper	√		
Walgreens #7601	Casper	√		
Walmart #1456	Evanston	√	√	
Walmart #1461	Rock Springs	√	√	
Walmart #1617	Casper	√	√	
Walmart #3778	Casper	√	√	

2015 Participating Wyoming Downstream Retailers

Retailer	City	Electric Water Heater	Ceiling Fan	Clothes Washer	Dishwasher	Freezer	Refrigerator	Evaporative Cooler - Tier 1	Evaporative Cooler - Tier 2, Self-Installed	Heat Pump Water Heater, Self-installed	Insulation-Attic	Insulation-Wall	No Redemptions in 2015
Ace Hardware - Cazin's	Evanston	√											
Ace Hardware #11263	Green River							√					
Ace Hardware #8349	Rock Springs								√				
Ace Hardware - Kennedy Hardware	Worland								√				
Ace Hardware & Paint #11299	Laramie	√											
Alco Discount Store 415	Pinedale												√
Best Buy #1527	Casper			√	√	√							
Brown's Western Appliance	Worland			√	√		√						
Cost Plus	Casper			√		√							
Gizmo's/Cost Plus Appliance	Cody			√									
Hammer Electronics	Riverton												√
Home Depot #6001	Casper	√		√	√	√	√	√	√		√		
Home Depot #6002	Cheyenne				√								
Home Depot #6003	Rock Springs	√	√	√	√	√	√	√	√		√	√	
Home Depot #6004	Sheridan			√	√		√		√				
John Paras Furniture & Appliance	Rock Springs			√		√							
Kmart #4736	Casper												√
Kmart #4837	Riverton												√
Kmart #7107	Rock Springs												√
Kmart #9792	Laramie												√
Kusel's Home Furnishings	Riverton			√									
Letz's TV and Appliance	Casper			√			√						
Lowe's of Cheyenne	Cheyenne			√									
Menards #3243	Casper	√		√	√	√		√			√	√	
Meyer's Gambles	Lander			√	√		√						
Neilson's Furniture and Appliance	Kemmerer			√									
Radio Shack	Riverton												√
Ralston Plumbing & Heating	Cody	√											
Rasmusson Furniture	Rawlins			√	√		√						

Retailer	City	Electric Water Heater	Ceiling Fan	Clothes Washer	Dishwasher	Freezer	Refrigerator	Evaporative Cooler - Tier 1	Evaporative Cooler - Tier 2, Self-Installed	Heat Pump Water Heater, Self-installed	Insulation-Attic	Insulation-Wall	No Redemptions in 2015
Rushmore Furniture Company	Rock Springs												√
Sam's Club #6425	Casper												√
Schofield's Appliance	Evanston			√									
Sears #1867	Laramie			√		√				√			
Sears #2341	Casper			√	√	√	√						
Sears #2371	Cheyenne						√						
Sears #3018	Riverton			√	√	√	√						
Sears #3359	Cody			√			√						
Sears #3410	Sheridan						√						
Sears #3578	Rock Springs			√									
Sears #3911	Jackson			√									
Southeastern Wyoming Insulation	Laramie										√		
Sutherlands #2219	Casper							√	√				
Target #T0164	Casper												√
The Electronic Super Store	Laramie												√
True Value of Laramie	Laramie												√
Valley Hardware	Basin								√				
Wal-Mart - Supercenter #1412	Laramie												√
Wal-Mart - Supercenter #1457	Riverton												√
Wal-Mart - Supercenter #1778	Cody												√
Walmart #1456	Evanston												√
Walmart #1461	Rock Springs												√
Walmart #1617	Casper												√
Walmart #3778	Casper												√
Walmart of Cheyenne	Cheyenne												√
Walmart Supercenter #1508	Sheridan												√

2015 Participating Wyoming Home Electronics Retailers

Retailer	City	Computer Monitor	Flat Panel Television	No Redemptions in 2015
Ace Hardware - Cazin's	Evanston		√	
Ace Hardware - Kennedy Hardware	Worland			√
Ace Hardware #11263	Green River			√
Ace Hardware #8349	Rock Springs			√
Ace Hardware & Paint #11299	Laramie			√
Alco Discount Store 415	Pinedale			√
Best Buy #1527	Casper		√	
Brown's Western Appliance	Worland			√
Cost Plus	Casper			√
Gizmo's/Cost Plus Appliance	Cody			√
Hammer Electronics	Riverton		√	
Home Depot #6001	Casper			√
Home Depot #6002	Cheyenne			√
Home Depot #6003	Rock Springs			√
Home Depot #6004	Sheridan			√
John Paras Furniture & Appliance	Rock Springs			√
Kmart #4736	Casper		√	
Kmart #4837	Riverton		√	
Kmart #7107	Rock Springs		√	
Kmart #9792	Laramie		√	
Kusel's Home Furnishings	Riverton			√
Letz's TV and Appliance	Casper		√	
Lowe's of Cheyenne	Cheyenne			√
Menards #3243	Casper			√
Meyer's Gambles	Lander			√
Neilson's Furniture and Appliance	Kemmerer			√
Radio Shack	Riverton			√
Ralston Plumbing & Heating	Cody			√
Rasmusson Furniture	Rawlins		√	
Rushmore Furniture Company	Rock Springs			√
Sam's Club #6425	Casper		√	
Schofield's Appliance	Evanston			√
Sears #1867	Laramie			√
Sears #2341	Casper		√	
Sears #2371	Cheyenne			√
Sears #3018	Riverton			√

Retailer	City	Computer Monitor	Flat Panel Television	No Redemptions in 2015
Sears #3359	Cody			√
Sears #3410	Sheridan			√
Sears #3578	Rock Springs		√	
Sears #3911	Jackson			√
Southeastern Wyoming Insulation	Laramie			√
Sutherlands #2219	Casper			√
Target #T0164	Casper		√	
The Electronic Super Store	Laramie			√
True Value of Laramie	Laramie			√
Wal-Mart - Supercenter #1412	Laramie		√	
Wal-Mart - Supercenter #1457	Riverton		√	
Wal-Mart - Supercenter #1778	Cody		√	
Walmart #1456	Evanston		√	
Walmart #1461	Rock Springs		√	
Walmart #1617	Casper	√	√	
Walmart #3778	Casper		√	
Walmart of Cheyenne	Cheyenne			√
Walmart Supercenter #1508	Sheridan			√
Walmart #3778	Casper			√
Valley Hardware	Basin			√

List of 2015 Participating Wyoming HVAC Trade Allies

Trade Ally	City	CAC Best Practice Installation & Sizing	CAC Equipment	CAC Proper Sizing	Efficient Gas Furnace with ECM	Electric System to Heat Pump Conversion	Evaporative Cooler - Tier 2	Heat Pump to Heat Pump Upgrade	Heat Pump, Ductless	No Redemptions in 2015
Arrowhead Inc.	Casper							√	√	
Baker Heating & Air Conditioning	Lander									√
CK Mechanical	Mills	√	√	√	√	√	√		√	
CK Mechanical Plumbing & Heating Inc.	Casper									√
Elite Energy Solutions	Lindon, UT									√
Gary's Plumbing & Heating Inc	Laramie									√
Home Energy Solutions	Centerville, UT									√
Palmer Heating & Cooling	Idaho Falls, ID									√
Tim Force Tin Shop Inc.	Casper								√	

List of 2015 Participating Wyoming Weatherization Trade Allies

Trade Ally	City	Insulation-Attic	Insulation-Wall	Windows	No Redemptions in 2015
Advanced Insulation	Morgan	√			
Campbell's Quality Exteriors	Idaho Falls, ID				√
Casper Window and Door	Casper				√
Elite Energy Solutions	Lindon, UT				√
F&R Insulation, Inc.	Cody				√
Home Energy Solutions	Centerville, UT				√
Insulation Inc.	Rock Springs	√			
Ram Insulation	Casper				√
Rocky Mountain Insulation Systems	Riverton	√			
United Subcontractors, Inc.	Salt Lake City	√	√		
USI Cardalls LLC	Logan		√		

List of 2015 Participating Wyoming Plumbing Trade Allies

Trade Ally	City	Insulation-Attic	Insulation-Wall	Windows	No Redemptions in 2015
Advanced Insulation	Morgan	√			
Campbell's Quality Exteriors	Idaho Falls, ID				√
Casper Window and Door	Casper				√
Elite Energy Solutions	Lindon, UT				√
F&R Insulation, Inc.	Cody				√
Home Energy Solutions	Centerville, UT				√
Insulation Inc.	Rock Springs	√			
Ram Insulation	Casper				√
Rocky Mountain Insulation Systems	Riverton	√			
United Subcontractors, Inc.	Salt Lake City	√	√		
USI Cardalls LLC	Logan		√		

Percentage of 2015 Wyoming Applications by Category

Customer City	% of All Applications	% of Appliance & Fixture Applications	% of HVAC Applications	% of Home Electronics Applications	% of Weatherization Applications
ALBIN	0.03%	0.00%	0.00%	0.00%	0.00%
ATLANTIC CITY	0.03%	0.00%	0.00%	0.00%	0.00%
BAIROIL	0.19%	0.03%	0.00%	0.00%	0.00%
BAR NUNN	0.69%	0.22%	0.03%	0.09%	0.00%
BASIN	0.12%	0.03%	0.03%	0.00%	0.00%
BEAR RIVER	0.16%	0.12%	0.00%	0.00%	0.00%
BIG PINEY	0.66%	0.00%	0.00%	0.00%	0.00%
BOULDER	1.44%	0.28%	0.00%	0.06%	0.00%
BUFFALO	1.12%	0.44%	0.00%	0.00%	0.00%
BYRON	0.19%	0.00%	0.00%	0.03%	0.00%
CASPER	27.30%	8.25%	0.87%	4.69%	0.09%
CODY	1.62%	0.25%	0.00%	0.25%	0.00%
COKEVILLE	0.19%	0.12%	0.00%	0.03%	0.00%
CORA	0.09%	0.06%	0.00%	0.00%	0.00%
COWLEY	0.34%	0.12%	0.00%	0.03%	0.00%
DANIEL	1.25%	0.03%	0.00%	0.03%	0.00%
DIAMONDVILLE	0.16%	0.03%	0.03%	0.03%	0.00%
DOUGLAS	2.00%	0.47%	0.00%	0.41%	0.00%
EDGERTON	0.06%	0.00%	0.00%	0.03%	0.00%
EVANSTON	5.06%	1.87%	0.09%	0.91%	0.06%
EVANSVILLE	0.78%	0.19%	0.00%	0.19%	0.00%
GLENDO	0.25%	0.00%	0.03%	0.03%	0.00%
GLENROCK	4.00%	0.25%	0.09%	0.16%	0.03%
GREEN RIVER	5.47%	2.28%	0.19%	0.72%	0.09%
GREYBULL	0.47%	0.06%	0.03%	0.00%	0.00%
HANNA	1.53%	0.00%	0.00%	0.03%	0.03%
HUDSON	0.19%	0.03%	0.00%	0.03%	0.00%
KEMMERER	1.56%	0.25%	0.00%	0.12%	0.03%
LABARGE	0.75%	0.16%	0.00%	0.00%	0.00%
LANDER	2.87%	0.97%	0.00%	0.31%	0.00%
LARAMIE	9.50%	0.62%	0.03%	1.72%	0.03%
LINCH	0.03%	0.00%	0.00%	0.00%	0.00%
LOVELL	0.78%	0.00%	0.00%	0.06%	0.00%
MANDERSON	0.16%	0.00%	0.00%	0.00%	0.00%
MARBLETON	0.75%	0.00%	0.00%	0.00%	0.00%
MEETEETSE	0.03%	0.00%	0.00%	0.00%	0.00%
MIDWEST	0.47%	0.03%	0.00%	0.00%	0.00%
MILLS	1.81%	0.19%	0.00%	0.25%	0.00%
OPAL	0.03%	0.00%	0.00%	0.00%	0.00%
PINEDALE	4.06%	0.47%	0.00%	0.03%	0.00%
POWELL	0.25%	0.00%	0.00%	0.03%	0.00%

Customer City	% of All Applications	% of Appliance & Fixture Applications	% of HVAC Applications	% of Home Electronics Applications	% of Weatherization Applications
RAWLINS	2.37%	0.84%	0.06%	0.22%	0.00%
RIVERTON	2.87%	0.47%	0.03%	0.53%	0.03%
ROCK SPRINGS	11.53%	6.34%	0.28%	1.69%	0.22%
ROLLING HILLS	0.19%	0.03%	0.03%	0.00%	0.00%
SHOSHONI	0.81%	0.00%	0.00%	0.06%	0.00%
SINCLAIR	0.72%	0.03%	0.00%	0.03%	0.00%
SUPERIOR	0.16%	0.16%	0.00%	0.00%	0.00%
THERMOPOLIS	1.09%	0.06%	0.03%	0.09%	0.00%
WAMSUTTER	0.19%	0.03%	0.00%	0.00%	0.00%
WORLAND	1.62%	0.66%	0.03%	0.00%	0.00%



Appendix 3

Energy Efficiency Alliance 2015

The following is a list of contractors, distributors and other businesses participating in Rocky Mountain 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. Rocky Mountain 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.

Search Criteria:

Selected State(s): Wyoming
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: 157 - Date and Time: 03/10/2016 02:52:12 PM

Company Name	Specialties	Business Type	Join Date	Projects Completed
Mark Clary 2302 West 8540 South West Jordan, UT - 84088 Phone: 801-233-0882	Lighting	Architect	08/08/2013	Completed
Smart Building Solutions 2876 South 460 West Salt Lake City, UT - 84115 Phone: 801-733-6000 Website: www.intellivex.com	Building envelope Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs Office Equipment Other: Other Specialty	Distributor Manufacturer - Rep	03/04/2015	Completed
Boyle Electric Inc 707 Garfield ST Lander, WY - 82520 Phone: 307-332-8139 Website: boyleelectric.com	Motors and VFDs	Contractor	02/01/2009	Completed 1
Bastion Technologies, LLC 175 W 7065 S Midvale, UT - 84047 Phone: 800-328-6024 Website: www.bastiontech.com	Lighting	Distributor Manufacturer - Rep Other: consultant	07/30/2014	Completed 16
Electrical Marketing Solutions (DBA) EMS 2139 S West Temple Salt Lake City, UT - 84115 Phone: 801-869-1445 Website: http://emsreps.com/	Controls Lighting	Manufacturer - Rep	12/31/2014	Completed 1
Jadeco Inc. P.O. Box 788 Thermopolis, WY - 82443 Phone: 307-864-2505 Website: jadecoelectric.com	Lighting	Contractor	08/27/2009	Completed 2
GE 664 East 1300 North Pleasant Grove, UT - 84062 Phone: 801-785-8838 Website: www.gelighting.com	Controls Lighting	Manufacturer - Rep	09/04/2014	Completed

Felt Lighting Inc. 1220 East 3300 South Salt Lake City, UT - 84106 Phone: 801-484-8571 Website: www.feltlighting.com	Specialties Controls Lighting	Business Type Distributor	Join Date 11/27/2013	Projects Completed 1
ESL Vision LLC 391 Lawndale Dr Salt Lake City, UT - 84115 Phone: 801-415-5177 Website: www.eslvision.com	Specialties Controls Lighting	Business Type Distributor Manufacturer - Rep	Join Date 01/13/2013	Projects Completed 1
MARS Electric p.o. box 732 1664 Wyoming ave, laramie, WY - 82073 Phone: 307-760-6943	Specialties Appliances Lighting	Business Type Contractor	Join Date 07/16/2013	Projects Completed 1
Network Consulting Services, inc. 563 West 500 South Suite 245, Bountiful, UT - 84010 Phone: 801-295-7555 Website: http://www.ncsi.us	Specialties Office Equipment	Business Type Architect Contractor Engineering Firm Manufacturer - Rep	Join Date 04/29/2013	Projects Completed 1
Virile Electric Inc. 410 Lawson Ave. Worland, WY - 82401 Phone: 307-347-4787	Specialties Controls Lighting Motors and VFDs	Business Type Contractor	Join Date 01/12/2016	Projects Completed 1
LMS - Lighting Maintenance Service - Wyoming 663 West 4330 South Salt Lake City, UT - 84123 Phone: 801-281-0400	Specialties Lighting	Business Type Other: Lighting Maintenance	Join Date 09/17/2014	Projects Completed 13
American Mechanical Systems Service, LLC 7530 South State Street Midvale, UT - 84047 Phone: 801-428-0400 Website: www.ams-ut.com	Specialties Controls HVAC - unitary Motors and VFDs	Business Type Contractor	Join Date 11/30/2012	Projects Completed 1
WESCO Distribution - Wyoming HC 70 500 Mainline Green River, WY - 82935 Phone: 307-875-4910 Website: wesco.com	Specialties HVAC - unitary Lighting Motors and VFDs	Business Type Distributor	Join Date 02/01/2009	Projects Completed 14
Architectural Nexus, Inc. 2505 East Parleys Way Salt Lake City, UT - 84109 Phone: 801-924-5000 Website: www.archnexus.com	Specialties Appliances Building envelope Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs Office Equipment	Business Type Architect	Join Date 08/18/2014	Projects Completed 1
Castle Rock Electric P.O. Box 339 Green River, WY - 82935 Phone: 307-875-3012	Specialties Lighting	Business Type Contractor	Join Date 04/10/2010	Projects Completed 30
Case, Lowe & Hart, Inc. 2484 Washington Blvd. Suite 510, Ogden, UT - 84401 Phone: 801-399-5821 Website: www.clhae.com	Specialties Building envelope Compressed Air Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Architect Engineering Firm	Join Date 05/17/2013	Projects Completed 1

Green Light National, LLC 1001 South 400 East Orem, UT - 84077 Phone: 801-722-8677 Website: www.greenlightnational.com	Specialties Lighting	Business Type Contractor Distributor	Join Date 02/18/2015	Projects Completed 34
Consolidated Electrical Distributors - Vernal 397 South 1000 East Vernal, UT - 84078 Phone: 435-789-9070	Specialties Building envelope Controls Irrigation Lighting Motors and VFDs	Business Type Distributor	Join Date 09/16/2015	Projects Completed 2
Crum Electric Supply - Casper 1165 English Avenue Casper, WY - 82601 Phone: 307-266-6278 Website: crum.com	Specialties Lighting	Business Type Distributor	Join Date 05/01/2009	Projects Completed 2
Homespun Electrical, LLC PO Box 1042 Lander, WY - 82520 Phone: 307-851-2079	Specialties Appliances Building envelope Compressed Air Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs Office Equipment	Business Type Contractor	Join Date 02/27/2015	Projects Completed 2
Compressor - Pump & Service, Inc. 3333 W. 2400 S. Salt Lake City, UT - 84119 Phone: 801-973-0154 Website: www.compressor-pump.com	Specialties Compressed Air	Business Type Distributor	Join Date 10/21/2013	Projects Completed 2
MKK Consulting Engineers Inc. 4760 S. Highland Drive Suite 106 Salt Lake City, UT - 84115 Phone: 303-796-6000	Specialties Compressed Air Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Engineering Firm	Join Date 01/18/2016	Projects Completed 2
PVE, Inc 1040 North 2200 West, Suite 100 Salt Lake City, UT - 84107 Phone: 801-359-3158	Specialties Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Engineering Firm	Join Date 07/29/2013	Projects Completed 2
Electric Service Company 615 SW Wyoming Blvd Mills, WY - 82644 Phone: 307-266-1000	Specialties Controls Lighting Motors and VFDs	Business Type Contractor	Join Date 03/17/2014	Projects Completed 2
Harris Mechanical Intermountain 1925 South Milestone Drive Suite E, Salt Lake City, UT - 84104 Phone: 801-433-2640 Website: www.hmcc.com	Specialties HVAC - evaporative HVAC - unitary	Business Type Contractor	Join Date 01/27/2014	Projects Completed 2
Casper Electric Inc 3150 E Yellowstone Hwy Casper, WY - 82609 Phone: 307-237-3003	Specialties Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Contractor Engineering Firm	Join Date 01/01/2009	Projects Completed 35
Musgrove Engineering, PA 234 Whisperwood Way Boise, ID - 83709 Phone: 208-384-0585 Website: musgrovepa.com	Specialties Compressed Air Controls Food Service HVAC - evaporative HVAC - unitary Motors and VFDs Office Equipment	Business Type Engineering Firm	Join Date 07/28/2015	Projects Completed 2

The Lighting Agency 2661 17th Street Denver, CO - 80211 Phone: 303-455-1012 Website: www.thelightingagency.com	Specialties Controls Lighting	Business Type Manufacturer - Rep	Join Date 12/10/2014	Projects Completed
Hussmann Corporation 1385 W 2200 St Salt Lake City, UT - 84119 Phone: 805-458-7615 Website: hussmann.com	Specialties Controls Food Service HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Manufacturer - Rep	Join Date 01/14/2015	Projects Completed
Crum Electric Supply - Gillette 901 Edwards St Gillette, WY - 82718 Phone: 307-682-7203 Website: crum.com	Specialties Lighting	Business Type Distributor	Join Date 05/01/2009	Projects Completed
Electrical Connections, Inc. 2214 Upland Suite A Rock Springs, WY - 82901 Phone: 307-382-0647	Specialties Controls Lighting Motors and VFDs	Business Type Contractor	Join Date 02/03/2016	Projects Completed
Consolidated Electrical Distributors Inc. - Casper 3330 E Yellowstone Hwy Casper, WY - 82609 Phone: 307-232-8300 Website: www.cedcasper.shopced.com	Specialties Controls Irrigation Lighting Motors and VFDs	Business Type Distributor	Join Date 11/12/2015	Projects Completed
Eagle Electric LLC 6713 W. Yellowstone Hwy Casper, WY - 82604 Phone: 307-266-4404	Specialties Lighting	Business Type Contractor	Join Date 09/27/2012	Projects Completed 2
Ovation Engineering & Consulting 1113 N Victoria Way Salt Lake City, UT - 84116 Phone: 801-871-0900	Specialties Controls Lighting	Business Type Engineering Firm	Join Date 12/08/2014	Projects Completed
Graybar Electric - Billings MT 1465 Monad Road Billings, MT - 59102 Phone: 406-237-2569 Website: www.graybar.com	Specialties Lighting	Business Type Distributor	Join Date 01/17/2014	Projects Completed
D&S Electrical 363 West Chubbuck Road Pocatello, ID - 83202 Phone: 208-731-3701	Specialties Lighting Motors and VFDs	Business Type Distributor	Join Date 12/01/2008	Projects Completed 45
HD Supply Facilities Maintenance, Ltd. 10641 Scripps Summit Court San Diego, CA - 92131 Phone: 858-831-2231 Website: www.hdsupplysolutions.com	Specialties Appliances HVAC - evaporative HVAC - unitary	Business Type Distributor	Join Date 01/22/2014	Projects Completed
H-C Design & Consulting P.O. Box 10545 Bozeman, MT - 59719 Phone: 406-522-7700	Specialties Food Service	Business Type Manufacturer - Rep	Join Date 07/01/2013	Projects Completed
City Service Electric Co. Inc. 1919 E Yellowstone Hwy Casper, WY - 82602 Phone: 307-265-0659	Specialties Lighting	Business Type Contractor	Join Date 01/20/2009	Projects Completed 30

Envision Electric, Inc. P.O. Box 2022 Casper, WY - 82602 Phone: 307-262-9990	Specialties Lighting	Business Type Contractor	Join Date 04/07/2009	Projects Completed 1
Childress Electric 1219 Dalsy St. Rawlins, WY - 82301 Phone: 307-328-3831	Specialties Lighting	Business Type Contractor	Join Date 09/25/2012	Projects Completed 7
Heil Electric LLC 440 Buena Vista PO Box 952 Lander, WY - 82520 Phone: 307-332-5197	Specialties Lighting	Business Type Contractor	Join Date 03/11/2009	Projects Completed 3
Trident Electric LLC. P.O. Box 1609 Laramie, WY - 82073 Phone: 307-399-6315	Specialties Controls Lighting Motors and VFDs	Business Type Contractor	Join Date 05/10/2010	Projects Completed 1
Energy Planning Associates, Inc (DBA) Envirobrite 148 Maritime Dr Sanford, FL - 32771 Phone: 407-302-0001 Website: www.envirobrite.net	Specialties Lighting	Business Type Manufacturer - Rep	Join Date 07/24/2015	Projects Completed 1
Fremont Electric Inc. 910 S Adams Laramie, WY - 82070 Phone: 307-721-4176	Specialties Lighting	Business Type Contractor	Join Date 01/26/2009	Projects Completed 25
4 Dimensional Lighting, LLC 940 Foster Rd. Casper, WY - 82601 Phone: 307-472-1965	Specialties Controls Food Service Lighting Motors and VFDs	Business Type Distributor Manufacturer - Rep	Join Date 01/26/2009	Projects Completed 221
Summit Electric, LLC 490 Foster Road Casper, WY - 82601 Phone: 307-577-1131	Specialties Lighting	Business Type Contractor Distributor	Join Date 02/01/2009	Projects Completed 14
Riverton Sheet Metal Works Inc 217 N 3rd E Riverton, WY - 82501 Phone: 307-856-3431	Specialties HVAC - unitary Motors and VFDs	Business Type Contractor	Join Date 01/01/2009	Projects Completed 1
Crescent Electric Supply - Casper 535 N. Beverly Casper, WY - 82609 Phone: 307-235-5060	Specialties Lighting	Business Type Distributor	Join Date 09/12/2014	Projects Completed 1
LONG Buildings Technologies, Inc. - Wyoming 3534 Salt Creek Highway Casper, WY - 82601 Phone: 307-265-5997 Website: www.long.com	Specialties Lighting	Business Type Contractor	Join Date 01/19/2009	Projects Completed 1
Arrow Electric Inc 1300 E Richards Douglas, WY - 82633 Phone: 307-358-2334 Website: arrowelectricinc.com	Specialties Lighting	Business Type Contractor	Join Date 08/01/2009	Projects Completed 1
DiVi Energy, LLC 191 North 290 West London, UT - 84042 Phone: 801-243-1811	Specialties Lighting	Business Type Manufacturer - Rep Other	Join Date 01/23/2013	Projects Completed 76

Utah Yamas Controls Inc. 13526 S. 110 W. Draper, UT - 84020 Phone: 801-990-1950 Website: www.utahyamas.com	Specialties Building envelope Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs Other: Other Specialty	Business Type Contractor Distributor Engineering Firm Manufacturer - Rep	Join Date 01/21/2013	Projects Completed 7
Electrical Solutions, LLC. 1502 Mill St. Laramie, WY - 82072 Phone: 307-742-7483	Specialties Lighting	Business Type Contractor	Join Date 04/11/2011	Projects Completed 7
Catalyst LED Lighting Solutions 5936 N 16th St Dalton Gardens, ID - 83815 Phone: 480-789-3773 Website: http://www.catalystleds.com	Specialties Lighting	Business Type Distributor Manufacturer - Rep	Join Date 05/01/2014	Projects Completed 7
Aspen Engineering and Environmental LLC 140 Aspen Circle Park City, UT - 84098 Phone: 435-565-1535 Website: www.a2e-llc.com	Specialties Building envelope Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Engineering Firm	Join Date 03/18/2013	Projects Completed 7
Honeywell International 2371 S. Presidents Way Suite A Salt Lake City, UT - 84120 Phone: 801-978-7136 Website: honeywell.com	Specialties Controls HVAC - evaporative HVAC - unitary Motors and VFDs	Business Type Contractor Distributor Manufacturer - Rep	Join Date 05/01/2006	Projects Completed 7
ProTech Electric Inc 6651 White Rock Dr Casper, WY - 82604 Phone: 307-265-8045 Website: protechelectric.net	Specialties Lighting	Business Type Contractor	Join Date 01/01/2009	Projects Completed 19
Optica Energy Management, LLC 1772 Ross Dr Ogden, UT - 84403 Phone: 888-442-4866 Website: www.opticaenergy.com	Specialties HVAC - unitary Lighting Motors and VFDs	Business Type Distributor Other: Energy Management Company	Join Date 04/11/2013	Projects Completed 17
Trane 2817 S. 1030 W. Salt Lake City, UT - 84119 Phone: 801-486-0500 Website: www.trane.com	Specialties Controls HVAC - unitary Motors and VFDs	Business Type Distributor Manufacturer - Rep	Join Date 03/01/2005	Projects Completed 7
Engineered Systems Assoc., Inc. 1355 E. Center Street Pocatello, ID - 83201 Phone: 208-233-0501	Specialties Controls HVAC - evaporative HVAC - unitary Motors and VFDs	Business Type Engineering Firm	Join Date 01/10/2014	Projects Completed 7
JRW & Associates, PLLC 1152 Bond Ave Rexburg, ID - 83440 Phone: 208-359-2309	Specialties Building envelope	Business Type Architect	Join Date 10/21/2013	Projects Completed 7
Codale Electric Supply, Inc - Rock Springs 1718 Desora Dr Rock Springs, WY - 82901 Phone: 307-922-5000 Website: codale.com	Specialties Lighting	Business Type Distributor	Join Date 02/01/2009	Projects Completed 25
E2 Electrical Contractor, Inc. 1317 Edgar Street Rock Springs, WY - 82901 Phone: 307-705-7682	Specialties Motors and VFDs	Business Type Contractor	Join Date 01/30/2013	Projects Completed 7

Electrical Support Services LLC 1037 E 1400 N. Shelly, ID - 83274 Phone: 208-251-6022	Specialties Farm and Dairy Irrigation Lighting Motors and VFDs	Business Type Contractor	Join Date 03/12/2015	Projects Completed 1
Anchor Electric, Inc. PO Box 40046 Casper, WY - 82604 Phone: 307-234-8799	Specialties Lighting	Business Type Contractor	Join Date 02/13/2009	Projects Completed 24
Johnson Controls, Inc. 2255 Technology Parkway West Valley City, UT - 84119 Phone: 801-946-4059	Specialties Controls HVAC - evaporative HVAC - unitary Motors and VFDs	Business Type Contractor Manufacturer - Rep	Join Date 06/01/2007	Projects Completed 7
Brosius Electric, LLC 912 Jersey Ave Lovel, WY - 82431 Phone: 307-250-1076	Specialties Lighting	Business Type Contractor	Join Date 01/31/2014	Projects Completed 1
Colvin Engineering Associates, Inc. 244 W 300 N Suite 200, Salt Lake City, UT - 84103 Phone: 801-322-2400	Specialties Controls HVAC - evaporative HVAC - unitary Other: Other Specialty	Business Type Architect Engineering Firm	Join Date 04/29/2013	Projects Completed 1
Consolidated Electrical Distributors - Logan, UT 636 N. 600 W. Logan, UT - 84321 Phone: 435-752-8905	Specialties Farm and Dairy Irrigation Lighting	Business Type Distributor	Join Date 03/26/2005	Projects Completed 64
Crum Electric Supply - Evanston 231 Allegiance Cir Evanston, WY - 82930 Phone: 307-789-6120 Website: crum.com	Specialties HVAC - unitary Lighting Motors and VFDs	Business Type Distributor	Join Date 05/01/2009	Projects Completed 1
CAO Group, Inc. 4628 W. Skyhawk Drive West Jordan, UT - 84084 Phone: 801-256-9282 Website: www.caolighting.com	Specialties Lighting	Business Type Engineering Firm Other: Manufacturer	Join Date 11/16/2015	Projects Completed 1
McKinstry Essention, LLC 112 N. Rubey Dr. Suite 200, Golden, CO - 80403 Phone: 435-632-8433 Website: www.mckinstry.com	Specialties Building envelope Compressed Air Controls HVAC - evaporative HVAC - unitary Irrigation Lighting Motors and VFDs Other: Other Specialty	Business Type Engineering Firm	Join Date 02/12/2014	Projects Completed 1
Engineering Design Associates 1607 CY Avenue Suite 303, Casper, WY - 82604 Phone: 307-766-5033 Website: EDAengineering.com	Specialties Lighting	Business Type Engineering Firm	Join Date 03/10/2010	Projects Completed 1
Dealers Electrical Supply 928 N. Federal Riverton, WY - 82501 Phone: 307-856-1741 Website: dealerselectrical.com	Specialties Lighting	Business Type Distributor	Join Date 06/19/2012	Projects Completed 1

American Electric Company, Inc. 78 West 13775 South, Suite 9 Draper, UT - 84020 Phone: 801-254-0782 Website: www.americanelectric.cc	Specialties Appliances Building envelope Controls Lighting Motors and VFDs Other: Other Specialty	Business Type Contractor	Join Date 04/06/2015	Projects Completed 7
LONG Building Technologies, Inc. P.O. Box 51089 3534 Salt Creek Highway, Casper, WY - 82601 Phone: 307-265-5997 Website: www.long.com	Specialties Lighting	Business Type Distributor Manufacturer - Rep	Join Date 09/27/2012	Projects Completed 1
Mountain West Electrical Services, LLC P.O. Box 2102 208 Fayette Pole Creek Road, Pinedale, WY - 82941 Phone: 307-367-8400 Website: www.mwesllc.com	Specialties Compressed Air Controls Farm and Dairy Food Service HVAC - evaporative HVAC - unitary Irrigation Lighting Motors and VFDs Office Equipment Other: Other Specialty	Business Type Contractor	Join Date 03/26/2013	Projects Completed 1
Hatch Lighting 4133 N 45 E Idaho Falls, ID - 83401 Phone: 208-200-3000	Specialties Lighting	Business Type Distributor	Join Date 05/06/2014	Projects Completed 7
JRC Inc. 3041 West 2100 South Salt Lake City, UT - 84119 Phone: 801-972-3970 Website: jrclight.com	Specialties Controls Lighting	Business Type Manufacturer - Rep Other	Join Date 06/18/2007	Projects Completed 12
C.D.'s Electric Inc 242 Aspen Hills Court Evanston, WY - 82930 Phone: 307-679-1734	Specialties Lighting	Business Type Contractor	Join Date 06/01/2009	Projects Completed 4
Eco Safe Lighting 4600 NW Camas Meadows Drive, Suite 210 Camas, WA - 98607 Phone: 360-567-1923 Website: http://www.est-lights.com/about-us/	Specialties Lighting	Business Type Distributor	Join Date 02/11/2013	Projects Completed 1
Candle3 LLC 6385 Corporate Dr. Colorado Springs, CO - 80919 Phone: 719-930-9099 Website: www.candle3.com	Specialties Controls Lighting	Business Type Distributor Manufacturer - Rep	Join Date 11/21/2014	Projects Completed 1
Wyoming Lighting Associates 130 S. Lincoln Casper, WY - 82601 Phone: 307-237-0693 Website: www.wyominglighting.com	Specialties Lighting	Business Type Manufacturer - Rep	Join Date 10/16/2012	Projects Completed 1
West Plains Engineering, Inc. 145 S Durbin Suite 205, Casper, WY - 82601 Phone: 307-234-9484 Website: www.westplainsengineering.com	Specialties Building envelope HVAC - evaporative HVAC - unitary Lighting Motors and VFDs Other: Other Specialty	Business Type Engineering Firm	Join Date 04/08/2013	Projects Completed 11

Mountain West Mechanical 2336 W. 5200 S. Rexburg, ID - 83440 Phone: 208-356-0370 Website: www.mountainwestmechanical.com	Specialties HVAC - evaporative HVAC - unitary	Business Type Contractor	Join Date 03/17/2014	Projects Completed Completed
Valley Implement 213 West 8th North Preston, ID - 83263 Phone: 208-852-0430 Website: valley-implement.com	Specialties Controls Irrigation Motors and VFDs	Business Type Contractor	Join Date 12/05/2012	Projects Completed null
Crum Electric Supply - Cheyenne 1010 Dunn Avenue South Cheyenne, WY - 82001 Phone: 307-778-8442 Website: www.crum.com	Specialties HVAC - unitary Lighting Motors and VFDs	Business Type Distributor	Join Date 05/01/2009	Projects Completed Completed
Perfect Power Electric Inc. P.O. Box 201 Lander, WY - 82520 Phone: 307-332-7184	Specialties Lighting	Business Type Contractor	Join Date 07/09/2009	Projects Completed 3
Energy Efficient Lighting 2228 Bryan Circle Salt Lake City, UT - 84108 Phone: 801-913-1965	Specialties Lighting	Business Type Distributor	Join Date 09/16/2013	Projects Completed 1
Valley Implement 2570 N Main Logan, UT - 84341 Phone: 435-787-1586 Website: valley-implement.com	Specialties Controls Farm and Dairy Irrigation Motors and VFDs	Business Type Contractor	Join Date 12/05/2012	Projects Completed null
Primary Electric Inc. 2332 Cottonwood Laramie, WY - 82070 Phone: 307-742-7447	Specialties Lighting	Business Type Contractor	Join Date 01/26/2009	Projects Completed 5
Sprecher Electric 128 N Center Casper, WY - 82601 Phone: 307-265-8135	Specialties Lighting	Business Type Contractor Distributor	Join Date 02/26/2009	Projects Completed 26
Wheeler Electric 469 West 16th St. Idaho Falls, ID - 83402 Phone: 208-522-1906 Website: wheelerelectric.com	Specialties Building envelope Compressed Air Controls Farm and Dairy Food Service Lighting Motors and VFDs	Business Type Contractor	Join Date 01/01/2007	Projects Completed 5
Elysium Energy LLC 14466 South Long Ridge Drive Herriman , UT - 84096 Phone: 801-440-6821	Specialties Lighting Other: Other Specialty	Business Type Other	Join Date 04/30/2015	Projects Completed 9
Instrument Electric Service Inc 918 Pendell Blvd Mills, WY - 82644 Phone: 307-235-2009 Website: www.instrumentelectric.com	Specialties Controls Lighting Motors and VFDs Other: Other Specialty	Business Type Contractor Distributor Engineering Firm Other: UL panel Shop	Join Date 04/25/2013	Projects Completed Completed
BKJ Holdings, LLC 3458 E Fairway Lane Spanish Fork, UT - 84660 Phone: 801-636-5969	Specialties Lighting	Business Type Distributor Manufacturer - Rep	Join Date 01/06/2015	Projects Completed 2

Company Name	Specialties	Business Type	Join Date	Projects Completed
Loeb Lighting Services 1800 E 5th Ave Columbia, OH - 43219 Phone: 800-866-5616	Controls Lighting	Distributor	03/16/2015	Projects Completed
Custom Lighting Services, LLC 9901 South Prosperity Road West Jordan, UT - 84081 Phone: 801-569-9219 Website: www.blackandmcdonald.com	Controls Lighting	Contractor Engineering Firm	11/01/2013	Projects Completed
Wyatt Electric 490 Foster Cir Casper, WY - 82601 Phone: 307-262-1251	Lighting	Contractor	05/01/2010	Projects Completed 58
AC Electric, LLC Box 991, 492 E South St. Powell, WY - 82435 Phone: 307-754-5872	Lighting	Contractor	03/07/2014	Projects Completed
Lux Energy Group 1111 South 120 East Farmington, UT - 84025 Phone: 801-989-8375	Building envelope Compressed Air Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Engineering Firm Other: Energy Resource Managers	10/13/2015	Projects Completed
Cobb Electric LLC 903 Leah Douglas, WY - 82633 Phone: 307-351-0440	Lighting	Contractor	01/01/2009	Projects Completed 5
Intermountain Electric Service, Inc. - Evanston 110 Commerce Dr Evanston, WY - 82930 Phone: 307-789-6500 Website: intermountainelectric.com	HVAC - unitary Lighting Motors and VFDs	Contractor	02/01/2009	Projects Completed
Wired Electric 3741 Aspen Pl Casper, WY - 82604 Phone: 307-262-9523	Lighting	Contractor	01/01/2012	Projects Completed 16
Fireside Plumbing, Heating & Electric P.O. Box 230 Evanston, WY - 82931 Phone: 307-789-6716 Website: www.firesidewyo.com	HVAC - evaporative HVAC - unitary Motors and VFDs	Contractor	03/22/2013	Projects Completed
Intermountain Electric Service, Inc. - Big Piney P.O. Box 40 Big Piney, WY - 83113 Phone: 307-276-3049 Website: intermountainelectric.com	HVAC - unitary Lighting Motors and VFDs	Contractor	03/03/2009	Projects Completed
Fanlight Corp 2000 S Grove Ave Bldg B Ontario, CA - 91761 Phone: 909-930-6868 Website: plusriteusa.com / mynaturazled.com	Lighting	Manufacturer - Rep	02/22/2016	Projects Completed
Verismic Software Inc. 65 Enterprise Aliso Viejo, CA - 92656 Phone: 949-270-1903 x 4736 Website: www.verismic.com	Office Equipment Other: Other Specialty	Contractor Distributor Manufacturer - Rep Other	01/16/2013	Projects Completed

Encentiv Energy, LLC 1501 Ardmore Blvd. Suite 102, Pittsburgh, PA - 15221 Phone: 412-723-1516 Website: www.encentivenergy.com	Specialties Building envelope Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Other: Energy Efficiency Analytics Other: Energy Efficiency Rebate Processing	Join Date 11/11/2015	Projects Completed 7
Process Systems International P.O. Box 6187 103N. 5th East, Riverton, WY - 82501 Phone: 307-856-4600 Website: www.prosystemsintl.com	Specialties Controls Lighting Motors and VFDs Office Equipment	Business Type Contractor	Join Date 11/12/2014	Projects Completed 7
Restaurant and Store Equipment Company 230 West 700 South Salt Lake City, UT - 84101 Phone: 801-364-1981 Website: rescosl.com	Specialties Appliances Food Service	Business Type Distributor	Join Date 10/15/2013	Projects Completed 7
Crum Electric Supply - Cody 3307 Bighorn Avenue Cody, WY - 82414 Phone: 307-527-5252 Website: www.crum.com	Specialties Lighting	Business Type Distributor	Join Date 05/01/2009	Projects Completed 7
Casper Winlectric 1743 East Yellowstone Hwy Casper, WY - 82601 Phone: 307-235-5222	Specialties Lighting	Business Type Distributor	Join Date 01/24/2013	Projects Completed 7
H & H Electric 125 Highway 93 Douglas, WY - 82633 Phone: 307-358-1826	Specialties Lighting	Business Type Contractor	Join Date 08/24/2009	Projects Completed 4
Codale Electric Supply, Inc - Casper 3131 Wood Court Casper, WY - 82601 Phone: 702-261-8900 Website: www.codale.com	Specialties Lighting	Business Type Distributor	Join Date 06/27/2013	Projects Completed 1
Express Lighting LLC 7050 South State Street Midvale, UT - 84047 Phone: 801-617-1133 Website: www.express.lighting	Specialties Lighting	Business Type Distributor Manufacturer - Rep	Join Date 12/01/2015	Projects Completed 7
Intermountain Electric Service, Inc. - Rock Springs 507 Mitchelson Rock Springs, WY - 82901 Phone: 307-362-1417 Website: intermountainelectric.com	Specialties HVAC - unitary Lighting Motors and VFDs	Business Type Contractor	Join Date 02/01/2009	Projects Completed 2
American Electric 4145 Almy Rd 105 Evanston, WY - 82930 Phone: 307-789-3130	Specialties Lighting	Business Type Contractor	Join Date 01/01/2009	Projects Completed 5
A.C.R. Electric LLC 2671 Sand Draw Thermopolis, WY - 82443 Phone: 307-921-1343	Specialties Controls Farm and Dairy Irrigation Lighting	Business Type Contractor	Join Date 04/20/2015	Projects Completed 7
Grainger, Inc. 1110 Wilkins Cir Casper, WY - 82601 Phone: 307-577-5797 Website: www.grainger.com	Specialties Lighting	Business Type Distributor	Join Date 02/24/2014	Projects Completed 3

Allred's Incorporated - Logan 642 North 1000 West Unit # 104 Logan, UT - 84321 Phone: 435-774-1200 Website: www.allreds.net	Specialties HVAC - unitary	Business Type Distributor	Join Date 05/11/2011	Projects Completed 0
HD Supply Utilities 836 N Glenn Rd Casper, WY - 82604 Phone: 307-237-4719 Website: HDSupply.com	Specialties Lighting	Business Type Distributor	Join Date 12/01/2008	Projects Completed 0
Clark's Quality Roofing, Inc. 334 W. Anderson Avenue Salt Lake City, UT - 84107 Phone: 801-266-3575 Website: clarkroof.com	Specialties Building envelope	Business Type Contractor	Join Date 09/19/2012	Projects Completed 0
Engineering System Solutions DBA ES2 4943 N 29 E Suite A Idaho Falls, ID - 83401 Phone: 208-552-9874 Website: www.es2eng.com	Specialties Appliances Building envelope Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Engineering Firm	Join Date 05/08/2014	Projects Completed 0
Royal Engineering, Inc. 2335 S. State Street Suite 100, Provo, UT - 84606 Phone: 801-375-2228 Website: www.royaleng.com	Specialties Building envelope Controls HVAC - evaporative HVAC - unitary Lighting Motors and VFDs	Business Type Engineering Firm	Join Date 12/31/2014	Projects Completed 0
Chesbro Electric Inc 2651 4th Ave W Buffalo, WY - 82834 Phone: 307-684-8613 Website: http://www.chesbroelectricwindsolar.com/	Specialties Lighting	Business Type Contractor	Join Date 09/01/2009	Projects Completed 25
Crum Electric Supply - Rock Springs 800 Elk St Rock Springs, WY - 82901 Phone: 307-362-4415 Website: crum.com	Specialties Lighting	Business Type Distributor	Join Date 05/01/2009	Projects Completed 0
Engineering Economics, Inc. 780 Simms Street Suite 210 Golden, CO - 80401 Phone: 800-869-6902	Specialties Building envelope Controls HVAC - evaporative HVAC - unitary	Business Type Engineering Firm	Join Date 01/20/2014	Projects Completed 0
Wind River Blasting LLC 3905 Spy Glass Circle Riverton, WY - 82501 Phone: 307-851-7440	Specialties Lighting	Business Type Other: consultant	Join Date 06/03/2014	Projects Completed 4
Western Land Management LLC 2815 East Linwood Lane Manila, UT - 84046 Phone: 949-285-9454	Specialties Food Service Lighting	Business Type Distributor	Join Date 01/29/2016	Projects Completed 0
RealWinWin, Inc. 1926 Arch Street, 4F Philadelphia, PA - 19103 Phone: 215-732-4480 x 349 Website: www.realwinwin.com	Specialties Appliances Building envelope Controls Food Service HVAC - evaporative HVAC - unitary Lighting Motors and VFDs Office Equipment	Business Type Other: Energy Efficiency Incentive Administration and Consultation	Join Date 10/14/2013	Projects Completed 36

CCMS Lighting, Inc. 88 A Elm Street Hopkinton, MA - 01748 Phone: 508-435-5837 Website: ccmslighting.com	Specialties Lighting	Business Type Other	Join Date 05/01/2011	Projects Completed 1
Green Creative LLC 533 Airport Blvd., Suite 212 Burlingame, CA - 94010 Phone: 866-774-5433 Website: www.gc-lighting.com	Specialties Lighting	Business Type Manufacturer - Rep	Join Date 06/25/2013	Projects Completed 1
Hedlund Electric, LLC 7929 W. Sims Creek Rd. Casper, WY - 82604 Phone: 307-333-4720	Specialties Lighting	Business Type Contractor	Join Date 09/16/2014	Projects Completed 3
Van Boerum & Frank Associates 330 South 300 East Salt Lake City, UT - 84111 Phone: 801-530-3148 Website: www.vbfa.com	Specialties Building envelope Controls HVAC - evaporative HVAC - unitary Motors and VFDs	Business Type Architect Engineering Firm Other	Join Date 01/01/2012	Projects Completed 1
Cooper Lighting 1121 Highway 74 South Peachtree, GA - 30269 Phone: 770-486-3092 Website: www.cooperlighting.com	Specialties Controls Lighting	Business Type Manufacturer - Rep	Join Date 12/13/2012	Projects Completed 1
Frontier Electric P.O. Box 937 Pinedale, WY - 82941 Phone: 307-367-6434	Specialties Lighting	Business Type Contractor	Join Date 03/01/2012	Projects Completed 1
Paradise Valley Electric Inc. 120 Paradise Valley Rd Riverton, WY - 82501 Phone: 307-856-9296	Specialties Lighting	Business Type Contractor	Join Date 03/03/2009	Projects Completed 5
WHW Engineering Inc. 8619 Sandy Parkway #101 Sandy, UT - 84070 Phone: 801-466-4021	Specialties HVAC - evaporative HVAC - unitary Motors and VFDs	Business Type Engineering Firm	Join Date 02/23/2015	Projects Completed 1
Titan LED - North Logan 641 E 2200 N North Logan, UT - 84341 Phone: 801-784-8260 Website: www.titanled.net	Specialties Lighting	Business Type Manufacturer - Rep	Join Date 07/08/2014	Projects Completed 5
Pacheco Company LLC 3646 E. Summer Hill Salt Lake City, UT - 84121 Phone: 801-541-3375 Website: www.pachecoco.com	Specialties Lighting Other: Other Specialty	Business Type Contractor Distributor Manufacturer - Rep	Join Date 02/12/2015	Projects Completed 1
Electrical Dynamics, Inc 118 S 5th West Riverton, WY - 82501 Phone: 307-856-4677 Website: www.ediwyo.com	Specialties Lighting	Business Type Contractor	Join Date 06/04/2014	Projects Completed 23
Denver Electrical Contractors 1855 W. Union Ave. Unit V Sheridan, CO - 80110 Phone: 303-432-8879 Website: www.denverelectrical.com	Specialties Lighting Motors and VFDs	Business Type Other: Electrical Design Build Engineering and Construction	Join Date 12/02/2013	Projects Completed 5

Modern Electric Co. 246 W. 1st Street Casper, WY - 82601 Phone: 307-266-1711 Website: modern-electric.com	Specialties Lighting	Business Type Contractor	Join Date 01/19/2009	Projects Completed 179
Intermountain Electric Service, Inc. - Riverton 701 S Federal Blvd Riverton, WY - 82501 Phone: 307-856-7321 Website: intermountainelectric.com	Specialties HVAC - unitary Lighting Motors and VFDs	Business Type Contractor	Join Date 02/01/2009	Projects Completed 179
Atlantic Electric, Inc. P.O. Box 51163 Casper, WY - 82605 Phone: 307-265-8658	Specialties Lighting	Business Type Contractor	Join Date 11/23/2009	Projects Completed 11
Sika Sarnafil Incorporated 2881 South 900 West Salt Lake City, UT - 84119 Phone: 801-575-8648 Website: usa.sarnafil.sika.com	Specialties Building envelope	Business Type Contractor	Join Date 11/01/2011	Projects Completed 179
Bright Star Energy Management, LLC 214 S. Cole Rd. Boise, ID - 83709 Phone: 208-922-6460 Website: brightstarenergy.net	Specialties Lighting	Business Type Other	Join Date 07/01/2012	Projects Completed 17
Amp Electric PO Box 1389 Riverton, WY - 82501 Phone: 307-463-7345	Specialties Lighting	Business Type Contractor	Join Date 11/01/2011	Projects Completed 9
Rexel Holdings USA 2004 East Allison Rd. Cheyenne, WY - 82007 Phone: 307-638-8470 Website: www.rexelholdingsusa.com	Specialties Controls Lighting Motors and VFDs	Business Type Distributor	Join Date 02/16/2016	Projects Completed 179
TreeFrog LED, Inc. 7594 North Swansea Court Eagle Mountain, UT - 84005 Phone: 801-372-8720 Website: www.treefrogled.com	Specialties Lighting	Business Type Distributor	Join Date 07/29/2013	Projects Completed 179
Precision-Paragon [P2] 23281 La Palma Ave Yorba Linda, CA - 92887 Phone: 714-386-5550 Website: www.p-2.com	Specialties Lighting	Business Type Manufacturer - Rep Other: Manufacturer	Join Date 03/13/2013	Projects Completed 179
Northwestern Electric PO Box 2781 Casper, WY - 82602 Phone: 307-266-4206	Specialties Lighting	Business Type Contractor	Join Date 02/13/2009	Projects Completed 5
Prairie Dog Electric 106 State St Saratoga, WY - 82331 Phone: 307-326-8534	Specialties Building envelope Farm and Dairy Irrigation Lighting Motors and VFDs	Business Type Contractor	Join Date 12/04/2015	Projects Completed 179



Appendix 4

Wyoming Measure Installation Verifications

Wyoming Measure Installation Verifications

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 prior to invoicing Company.
- State inspectors randomly inspect 5-10 percent of completed homes.

Home Energy Savings

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

- Central air conditioner / heat pump tune-ups
- Central air conditioner best practice installation
- Central air conditioner proper sizing
- Ductless heat pumps
- Duct sealing and insulation
- Heat pumps
- Heat pump best practice installation and sizing
- Heat pump water heaters
- Insulation
- Windows

Site inspections are not 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.

- Air conditioners
- Ceiling fans
- Clothes washers
- Dishwasher
- Electric water heaters
- Evaporative coolers
- Freezers
- Home electronics (flat panel televisions / monitors / desktops)
- Light fixtures
- Refrigerators

Other measures

- CFL bulbs 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.

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

Company hired independent inspectors to phone survey ≥ 5 percent of program participants and to site inspect ≥ 5 percent of program participants in order to verify 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.

***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 5

Wyoming Program Evaluations

Wyoming 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/wyoming.html

PROGRAM	YEARS EVALUATED	EVALUATOR
Low-Income Weatherization	2011-2013	Smith & Lehmann Consulting
Energy FinAnswer	2011-2013	Navigant
FinAnswer Express	2011-2013	Navigant
Self-Direction	2011-2013	Navigant

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

Table 1
Low Income Weatherization Program Evaluation Recommendations

Evaluation Recommendations	Rocky Mountain Power Action Plan
Conduct client surveys within six to eight months of receiving weatherization services to more confidently determine whether services and products meet the utility's standards and to proactively respond to any client concerns that may be identified.	Rocky Mountain Power ("RMP") is investigating the financial prudence in surveying participants once a year.
Consider providing a branded item concurrently with weatherization services to increase customer recognition.	Currently in practice as of February 2015.
Allow for a percentage of available funding to be used for health and safety repairs, which are deemed necessary to installing weatherization measures. This will allow agencies to target homes with marginal repair costs, but that are good candidates for energy efficiency upgrades. The percentage should be left to the discretion of RMP to maintain a cost-effective program.	The program manager will discuss this recommendation with our partnering agencies to determine if this is beneficial.

Table 2
Energy FinAnswer Program Evaluation Recommendations

Evaluation Recommendations	Rocky Mountain Power Action Plan
Increase project scrutiny on Wastewater Treatment Plants (“WWTP”). Generally, WWTP have frequent shutdowns and poor realization rates. WWTP must prioritize continuous, reliable operations over energy savings.	RMP has recently revised and increased the monitoring and verification for all projects dependent upon potential kWh savings. RMP will evaluate the appropriate level of rigor applied to WWTP when projects present themselves. WWTP do not traditionally provide high numbers of energy efficiency projects.
Consider incentives for leak detection training of facility staff for large compressed air users.	Incentives are currently provided through the Energy Management Program at \$0.02 per kWh saved, including RMP Engineers who provide guidance and limited training. RMP also supports training through partnerships and seminars with the University of Wyoming.
Ensure measure classifications in database are correct.	RMP 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.

Table 3
FinAnswer Express Program Evaluation Recommendations

Evaluation Recommendations	Rocky Mountain Power Action Plan
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.	RMP has implemented its TRL and DSM Central software. These two applications assist in providing the administrative checks and balances to manage measure classification.
Use greater resolution in the application of EUL values in the program tracking database.	The TRL breaks out lighting measures into subtypes and can assign them an individual EUL.
Leverage existing relationships with program participants for repeat participation.	RMP has increased the number of WY-based program staff members, revamped its marketing efforts and added new offerings such as the enhanced small business lighting. Project volume has increased well over 100% and repeat participation is expected.
Provide trade allies with fresh and up to date marketing material.	The approval of <i>wattsmart</i> Business has streamlined and enhanced program marketing. Regular newsletters, including case studies and other program information, are provided via email to trade allies.

Table 4
Self-Direction Program Evaluation Recommendations

Evaluation Recommendations	Rocky Mountain Power Action Plan
Ensure measure classifications in database are correct.	RMP has implemented its TRL and DSM Central software. These two applications assist in providing the administrative checks and balances to manage measure classification.