



Appendix 2

Utah 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 DSM Portfolio with Load Control Programs Cost-Effectiveness Results

Table 5 - 2015 Total Energy Efficiency Portfolio Cost-Effectiveness Results

Table 6 – 2015 C&I Energy Efficiency Portfolio Cost-Effectiveness Results

Table 7 – 2015 Residential Energy Efficiency Portfolio Cost-Effectiveness Results

Table 1 - Utility Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.32%
Commercial Line Loss	8.71%
Industrial Line Loss	5.85%
Irrigation Line Loss	9.24%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1105
Commercial Energy Rate (\$/kWh)(base year 2015)	\$0.0840
Industrial Energy Rate (\$/kWh)(base year 2015)	\$0.0591
Irrigation Energy Rate (\$/kWh)(base year 2015)	\$0.0767
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – Portfolio Level Costs 2015

Expense	Cost
U of U Ambassador Sponsorship	\$90
Outreach & Communications Wattsmart	\$1,611,024
Technical Reference Library	\$39,668
DSM Central	\$207,870
Total Costs	\$1,858,651

Table 3 – Benefit/Cost Ratios by Portfolio Type

Measure Group	PTRC	TRC	UCT	RIM	PCT
DSM Portfolio with Load Control Programs	1.49	1.36	1.53	0.68	2.80
Total Energy Efficiency Portfolio	1.32	1.20	1.95	0.53	2.57
C&I Programs	1.24	1.13	1.80	0.55	2.24
Residential Programs	1.48	1.34	2.29	0.52	2.94
Load Control Programs	1.82	1.66	1.17	1.17	n/a

Table 4 – 2015 DSM Portfolio with Load Control Programs Cost-Effectiveness Results

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	n/a	\$133,216,850	\$198,815,183	\$65,598,333	1.49
Total Resource Cost Test (TRC) No Adder	n/a	\$133,216,850	\$180,741,076	\$47,524,226	1.36
Utility Cost Test (UCT)	n/a	\$118,371,345	\$180,741,076	\$62,369,730	1.53
Rate Impact Test (RIM)		\$264,857,278	\$180,741,076	-\$84,116,202	0.68
Participant Cost Test (PCT)		\$84,471,078	\$236,386,579	\$151,915,500	2.80
Lifecycle Revenue Impacts (\$/kWh)					n/a

Table 5 - 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) + Conservation Adder	\$0.0600	\$87,864,167	\$116,195,106	\$28,330,939	1.32
Total Resource Cost Test (TRC) No Adder	\$0.0600	\$87,864,167	\$105,631,915	\$17,767,747	1.20
Utility Cost Test (UCT)	\$0.0369	\$54,094,728	\$105,631,915	\$51,537,187	1.95
Rate Impact Test (RIM)		\$200,580,660	\$105,631,915	-\$94,948,745	0.53
Participant Cost Test (PCT)		\$84,471,078	\$217,462,644	\$132,991,565	2.57
Lifecycle Revenue Impacts (\$/kWh)					\$0.0004290742

Table 6 – 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) + Conservation Adder	\$0.0584	\$45,635,201	\$56,565,393	\$10,930,191	1.24
Total Resource Cost Test (TRC) No Adder	\$0.0584	\$45,635,201	\$51,423,084	\$5,787,883	1.13
Utility Cost Test (UCT)	\$0.0366	\$28,584,012	\$51,423,084	\$22,839,072	1.80
Rate Impact Test (RIM)		\$94,067,012	\$51,423,084	-\$42,643,927	0.55
Participant Cost Test (PCT)		\$44,411,615	\$99,545,906	\$55,134,292	2.24
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001578822

Table 7 – 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) + Conservation Adder	\$0.0590	\$40,370,315	\$59,629,714	\$19,259,399	1.48
Total Resource Cost Test (TRC) No Adder	\$0.0590	\$40,370,315	\$54,208,831	\$13,838,516	1.34
Utility Cost Test (UCT)	\$0.0346	\$23,652,064	\$54,208,831	\$30,556,766	2.29
Rate Impact Test (RIM)		\$104,654,997	\$54,208,831	-\$50,446,167	0.52
Participant Cost Test (PCT)		\$40,059,464	\$117,916,737	\$77,857,274	2.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002928841

Program Level Cost Effectiveness

Home Energy Savings

Navigant estimated the cost-effectiveness results for the Utah 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%, east residential lighting 47%, east plug loads 71%, east residential cooling 9% and east residential water heating 53% load factor decrements. The program passes the cost-effectiveness for all the tests except the RIM test. The memo consists of the following tables.

- Table 1 – Home Energy Savings Inputs
- Table 2 – Home Energy Savings Annual Program Costs
- Table 3 – Home Energy Savings – Savings by Measure Category
- Table 4 – Benefits/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	9.32%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1105
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	\$1,907	\$194,197	\$3,084	\$342,201	\$541,388	\$1,017,143
Building Shell	\$0	\$4,001	\$407,474	\$6,471	\$1,033,853	\$1,451,798	\$5,648,088
Electronics	\$0	\$1,019	\$103,778	\$1,648	\$206,940	\$313,385	\$441,472
Energy Kits	\$0	\$6,837	\$164,003	\$11,057	\$153,291	\$335,187	\$169,118
HVAC	\$0	\$21,750	\$2,215,281	\$35,178	\$3,545,817	\$5,818,027	\$1,807,695
Lighting	\$0	\$188,140	\$513,132	\$304,290	\$8,367,537	\$9,373,098	\$23,986,057
Water Heating	\$0	\$16	\$1,670	\$27	\$3,350	\$5,063	\$6,206
Total	\$0	\$223,669	\$3,599,534	\$361,754	\$13,652,989	\$17,837,946	\$33,075,779

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	774,480	100%	774,480	81%	627,328	15
Building Shell	1,625,054	95%	1,543,801	95%	1,466,611	30
Electronics	413,880	100%	413,880	66%	273,161	5
Energy Kits	2,777,043	100%	2,777,043	78%	2,166,094	9
HVAC	8,834,808	100%	8,834,808	83%	7,332,890	16
Lighting	76,421,125	100%	76,421,125	73%	55,787,421	9
Water Heating	6,660	100%	6,660	100%	6,660	15
Total	90,853,049	100%	90,771,797	75%	67,660,166	10

Table 4 - Benefit/Cost Ratios by Measure Category

Measure Group	PTRC	TRC	UCT	RIM	PCT
Appliances	0.35	0.32	0.60	0.25	1.29
Building Shell	0.39	0.36	1.43	0.49	0.70
Electronics	0.13	0.12	0.16	0.11	0.95
Energy Kits	3.09	2.81	2.63	0.41	14.87
HVAC	5.26	4.78	3.10	1.17	8.35
Lighting	1.48	1.35	2.66	0.44	3.06
Water Heating	0.56	0.51	0.80	0.30	1.88
Total	1.71	1.55	2.59	0.58	2.92

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

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0564	\$29,814,224	\$50,901,453	\$21,087,229	1.71
Total Resource Cost Test (TRC) No Adder	\$0.0564	\$29,814,224	\$46,274,048	\$16,459,824	1.55
Utility Cost Test (UCT)	\$0.0338	\$17,837,946	\$46,274,048	\$28,436,102	2.59
Rate Impact Test (RIM)		\$80,388,767	\$46,274,048	\$34,114,719	0.58
Participant Cost Test (PCT)		\$33,075,779	\$96,630,341	\$63,554,562	2.92
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001398118
Discounted Participant Payback (years)					2.65

Tables 6 through 12 provide cost-effectiveness results for all 7 measures.

Table 6 - Home Energy Savings Appliance Cost-Effectiveness Results (Decrement - East Plug Load- 71%, Load Shape – Plug Loads)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1546	\$1,023,073	\$358,345	-\$664,728	0.35
Total Resource Cost Test (TRC) No Adder	\$0.1546	\$1,023,073	\$325,768	-\$697,305	0.32
Utility Cost Test (UCT)	\$0.0818	\$541,388	\$325,768	-\$215,620	0.60
Rate Impact Test (RIM)		\$1,326,165	\$325,768	-\$1,000,398	0.25
Participant Cost Test (PCT)		\$1,017,143	\$1,311,062	\$293,919	1.29
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000027305
Discounted Participant Payback (years)					12.19

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

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2496	\$5,783,628	\$2,280,034	-\$3,503,595	0.39
Total Resource Cost Test (TRC) No Adder	\$0.2496	\$5,783,628	\$2,072,758	-\$3,710,870	0.36
Utility Cost Test (UCT)	\$0.0626	\$1,451,798	\$2,072,758	\$620,960	1.43
Rate Impact Test (RIM)		\$4,211,534	\$2,072,758	-\$2,138,776	0.49
Participant Cost Test (PCT)		\$5,648,088	\$3,938,839	-\$1,709,249	0.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000029681
Discounted Participant Payback (years)					n/a

**Table 8 - Home Energy Savings Electronics Cost-Effectiveness Results
(Decrement - East Plug Load - 71%, Load Shape – Plug Loads)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.3342	\$397,817	\$53,655	-\$344,162	0.13
Total Resource Cost Test (TRC) No Adder	\$0.3342	\$397,817	\$48,777	-\$349,040	0.12
Utility Cost Test (UCT)	\$0.2632	\$313,385	\$48,777	-\$264,608	0.16
Rate Impact Test (RIM)		\$454,046	\$48,777	-\$405,269	0.11
Participant Cost Test (PCT)		\$441,472	\$420,063	-\$21,409	0.95
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000033002
Discounted Participant Payback (years)					9.12

**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) + Conservation Adder	\$0.0202	\$313,809	\$970,440	\$656,631	3.09
Total Resource Cost Test (TRC) No Adder	\$0.0202	\$313,809	\$882,218	\$568,409	2.81
Utility Cost Test (UCT)	\$0.0215	\$335,187	\$882,218	\$547,030	2.63
Rate Impact Test (RIM)		\$2,176,636	\$882,218	-\$1,294,419	0.41
Participant Cost Test (PCT)		\$169,118	\$2,514,123	\$2,345,005	14.87
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000058495
Discounted Participant Payback (years)					0.06

*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 Cooling - 9%, Load Shape – Cooling)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0467	\$3,772,597	\$19,830,300	\$16,057,704	5.26
Total Resource Cost Test (TRC) No Adder	\$0.0467	\$3,772,597	\$18,027,546	\$14,254,949	4.78
Utility Cost Test (UCT)	\$0.0720	\$5,818,027	\$18,027,546	\$12,209,519	3.10
Rate Impact Test (RIM)		\$15,407,647	\$18,027,546	\$2,619,899	1.17
Participant Cost Test (PCT)		\$1,807,695	\$15,099,577	\$13,291,881	8.35
Lifecycle Revenue Impacts (\$/kWh)					-\$0.0000067152
Discounted Participant Payback (years)					0.02

**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) + Conservation Adder	\$0.0462	\$18,515,383	\$27,404,223	\$8,888,841	1.48
Total Resource Cost Test (TRC) No Adder	\$0.0462	\$18,515,383	\$24,912,930	\$6,397,547	1.35
Utility Cost Test (UCT)	\$0.0234	\$9,373,098	\$24,912,930	\$15,539,832	2.66
Rate Impact Test (RIM)		\$56,799,343	\$24,912,930	-\$31,886,413	0.44
Participant Cost Test (PCT)		\$23,986,057	\$73,334,996	\$49,348,938	3.06
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001440950
Discounted Participant Payback (years)					n/a

**Table 12 - Home Energy Savings Water Heating Cost-Effectiveness Results
(Decrement - East Water Heating - 53%, Load Shape – Water Heating)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1127	\$7,919	\$4,457	-\$3,462	0.56
Total Resource Cost Test (TRC) No Adder	\$0.1127	\$7,919	\$4,052	-\$3,867	0.51
Utility Cost Test (UCT)	\$0.0721	\$5,063	\$4,052	-\$1,011	0.80
Rate Impact Test (RIM)		\$13,394	\$4,052	-\$9,343	0.30
Participant Cost Test (PCT)		\$6,206	\$11,682	\$5,476	1.88
Lifecycle Revenue Impacts (\$/kWh)					\$0.000000255
Discounted Participant Payback (years)					n/a

Refrigerator Recycling

Navigant estimated the cost-effectiveness results for the Utah Refrigerator Recycling Program (See Ya Later Refrigerator®), 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 passes the cost-effectiveness for all the tests except the RIM and PCT tests. The memo consists of the following tables.

Table 1 – SYLR Inputs

Table 2 – SYLR Annual Program Costs

Table 3 – SYLR Savings by Measure Category

Table 4 – Benefit/Cost Ratios by Measure Category

Table 5 – SYLR Program Level Cost-Effectiveness Results

Table 6 – SYLR Energy Savings Kits Cost-Effectiveness Results

Table 7 – SYLR Freezer Recycling Cost-Effectiveness Results

Table 8 – SYLR Refrigerator Recycling Cost-Effectiveness Results

Table 1 - SYLR Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.32%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1105
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	Admin	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
Energy Savings Kit	\$0	\$2,978	\$24,308	\$857	\$61,660	\$89,802	\$0
Freezer Recycling	\$0	\$14,471	\$118,143	\$4,167	\$67,600	\$204,381	\$0
Refrigerator Recycling	\$0	\$79,477	\$648,837	\$22,883	\$286,010	\$1,037,206	\$0
Total	\$0	\$96,925	\$791,287	\$27,906	\$415,270	\$1,331,389	\$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
Energy Savings Kit	461,452	100%	461,452	42%	193,810	6
Freezer Recycling	2,242,765	100%	2,242,765	40%	897,106	5
Refrigerator Recycling	12,317,220	100%	12,317,220	100%	12,317,220	7
Total	15,021,437	100%	15,021,437	89%	13,408,136	7

Table 4 - Benefit/Cost Ratios by Measure Category

Measure Group	PTRC	TRC	UCT	RIM	PCT
Energy Savings Kit	0.74	0.67	0.67	0.29	n/a
Freezer Recycling	0.86	0.78	0.78	0.24	n/a
Refrigerator Recycling	3.26	2.96	2.96	0.32	n/a
Total	2.72	2.47	2.47	0.32	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) + Conservation Adder	\$0.0173	\$1,331,389	\$3,620,004	\$2,288,616	2.72
Total Resource Cost Test (TRC) No Adder	\$0.0173	\$1,331,389	\$3,290,913	\$1,959,524	2.47
Utility Cost Test (UCT)	\$0.0173	\$1,331,389	\$3,290,913	\$1,959,524	2.47
Rate Impact Test (RIM)		\$10,411,589	\$3,290,913	-\$7,120,676	0.32
Participant Cost Test (PCT)		\$0	\$10,350,208	\$10,350,208	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000413418

Tables 6 through 8 provide cost-effectiveness results for all 3 measures.

**Table 6 - SYLR Energy Savings 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) + Conservation Adder	\$0.0906	\$89,802	\$66,236	-\$23,566	0.74
Total Resource Cost Test (TRC) No Adder	\$0.0906	\$89,802	\$60,215	-\$29,587	0.67
Utility Cost Test (UCT)	\$0.0906	\$89,802	\$60,215	-\$29,587	0.67
Rate Impact Test (RIM)		\$206,972	\$60,215	-\$146,757	0.29
Participant Cost Test (PCT)		\$0	\$340,634	\$340,634	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000009943
Discounted Participant Payback (years)					0.13

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

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0523	\$204,381	\$176,211	-\$28,169	0.86
Total Resource Cost Test (TRC) No Adder	\$0.0523	\$204,381	\$160,192	-\$44,188	0.78
Utility Cost Test (UCT)	\$0.0523	\$204,381	\$160,192	-\$44,188	0.78
Rate Impact Test (RIM)		\$666,336	\$160,192	-\$506,144	0.24
Participant Cost Test (PCT)		\$0	\$1,222,489	\$1,222,489	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000041216
Discounted Participant Payback (years)					n/a

**Table 8 - SYLR Refrigerator Recycling Cost-Effectiveness Results
(Decrement - East Plug Loads - 71%, Load Shape – Plug Loads)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0144	\$1,037,206	\$3,377,557	\$2,340,351	3.26
Total Resource Cost Test (TRC) No Adder	\$0.0144	\$1,037,206	\$3,070,506	\$2,033,300	2.96
Utility Cost Test (UCT)	\$0.0144	\$1,037,206	\$3,070,506	\$2,033,300	2.96
Rate Impact Test (RIM)		\$9,538,281	\$3,070,506	-\$6,467,775	0.32
Participant Cost Test (PCT)		\$0	\$8,787,085	\$8,787,085	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000375511
Discounted Participant Payback (years)					n/a

New Homes

Navigant estimated the cost-effectiveness results for the Utah New Homes 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 does not pass any of the cost-effectiveness tests.

Table 1 – New Homes Program Inputs

Table 2 – New Homes Annual Program Costs

Table 3 – New Homes Savings by Measure Category

Table 4 – New Homes Program Level Cost-Effectiveness Results

Table 1 – New Homes Program Inputs

Parameter	Value
Discount Rate	6.66%
Residential Line Loss	9.32%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1105
Inflation Rate ¹	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 – New Homes Annual Program Costs

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Total Utility Costs	Gross Customer Costs
New Homes	\$0	\$48,689	\$757,590	\$179,874	\$844,976	\$1,831,129	\$6,983,685
Total	\$0	\$48,689	\$757,590	\$179,874	\$844,976	\$1,831,129	\$6,983,685

Table 3 – New Homes Savings by Measure Category

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
New Homes	2,908,612	100%	2,908,612	80%	2,326,890	14
Total	2,908,612	100%	2,908,612	80%	2,326,890	14

**Table 4 - New Homes 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) + Conservation Adder	\$0.2810	\$6,573,101	\$1,636,851	-\$4,936,250	0.25
Total Resource Cost Test (TRC) No Adder	\$0.2810	\$6,573,101	\$1,488,046	-\$5,085,055	0.23
Utility Cost Test (UCT)	\$0.0783	\$1,831,129	\$1,488,046	-\$343,083	0.81
Rate Impact Test (RIM)		\$4,603,760	\$1,488,046	-\$3,115,713	0.32
Participant Cost Test (PCT)		\$6,983,685	\$4,310,764	-\$2,672,921	0.62
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000090972
Discounted Participant Payback (years)					n/a

Home Energy Reports

Navigant estimated the cost-effectiveness results for the Utah 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	9.32%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1105
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	\$57,584	\$2,507,560	\$26,400	\$0	\$2,591,545	\$0
Total	\$0	\$57,584	\$2,507,560	\$26,400	\$0	\$2,591,545	\$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	56,615,083	100%	56,615,083	100%	56,615,083	1
Total	56,615,083	100%	56,615,083	100%	56,615,083	1

**Table 4 - Home Energy Reporting Program Level Cost-Effectiveness Results
(Decrement – 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) + Conservation Adder	\$0.0480	\$2,591,545	\$3,339,876	\$748,332	1.29
Total Resource Cost Test (TRC) No Adder	\$0.0480	\$2,591,545	\$3,036,251	\$444,707	1.17
Utility Cost Test (UCT)	\$0.0480	\$2,591,545	\$3,036,251	\$444,707	1.17
Rate Impact Test (RIM)		\$8,966,375	\$3,036,251	-\$5,930,123	0.34
Participant Cost Test (PCT)		\$0	\$6,374,830	\$6,374,830	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002432126
Discounted Participant Payback (years)					n/a

Low Income

Navigant estimated the cost-effectiveness results for the Utah 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 lighting 47% 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	9.32%
Residential Energy Rate (\$/kWh)(base year 2015)	\$0.1105
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	\$15,713	\$2,382	\$15,818	\$26,143	\$60,056	\$0
Total	\$0	\$15,713	\$2,382	\$15,818	\$26,143	\$60,056	\$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	225,327	100%	225,327	100%	225,327	11
Total	225,327	100%	225,327	100%	225,327	11

**Table 4 - Low Income Weatherization Program Level 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) + Conservation Adder	\$0.0317	\$60,056	\$131,528	\$71,472	2.19
Total Resource Cost Test (TRC) No Adder	\$0.0317	\$60,056	\$119,571	\$59,515	1.99
Utility Cost Test (UCT)	\$0.0317	\$60,056	\$119,571	\$59,515	1.99
Rate Impact Test (RIM)		\$284,507	\$119,571	-\$164,936	0.42
Participant Cost Test (PCT)		\$0	\$250,594	\$250,594	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000006106
Discounted Participant Payback (years)					n/a

Non-Residential Energy Efficiency

Navigant estimated the cost-effectiveness results for the Utah Wattsmart Business Program, based on 2015 costs and savings estimates provided by PacifiCorp. This memo provides the cost-effectiveness results for the overall program and for the 13 measure categories.

Cost-effectiveness was tested using the 2015 IRP east industrial 40%, east commercial lighting 53%, east commercial cooling 14% and east plug loads 71% load factor decrements. The program passes PTRC, TRC and UCT cost-effectiveness tests. The memo consists of the following tables.

- Table 1 - Utility Inputs
- Table 2 – Annual Wattsmart Business Program Costs by Measure Category
- Table 3 – Annual Wattsmart Business Program Savings by Measure Category
- Table 4 - Benefit/Cost Ratios by Measure Category
- Table 5 – Wattsmart Business Program Level Cost-Effectiveness Results
- Table 6 - Wattsmart Business Additional Measures Cost-Effectiveness Results
- Table 7 - Wattsmart Business Building Shell Cost-Effectiveness Results
- Table 8 - Wattsmart Business Compressed Air Cost-Effectiveness Results
- Table 9 - Wattsmart Business Energy Management Cost-Effectiveness Results
- Table 10 - Wattsmart Business Electronics Cost-Effectiveness Results
- Table 11 - Wattsmart Business Energy Project Manager Co-Funding Cost-Effectiveness Results
- Table 12 - Wattsmart Business Farm and Dairy Cost-Effectiveness Results
- Table 13 - Wattsmart Business Food Service Equipment Cost-Effectiveness Results
- Table 14 - Wattsmart Business HVAC Cost-Effectiveness Results
- Table 15 - Wattsmart Business Irrigation Cost-Effectiveness Results
- Table 16 - Wattsmart Business Lighting Cost-Effectiveness Results
- Table 17 - Wattsmart Business Motors Cost-Effectiveness Results
- Table 18 - Wattsmart Business Refrigeration Cost-Effectiveness Results

Table 1 - Utility Inputs

Parameter	Value
Discount Rate	6.66%
Commercial Line Loss	8.71%
Industrial Line Loss	5.85%
Irrigation Line Loss	9.24%
Commercial Energy Rate (\$/kWh)(base year 2015)	8.40%
Industrial Energy Rate (\$/kWh)(base year 2015)	\$0.0591
Irrigation Energy Rate (\$/kWh)(base year 2015)	\$0.0767
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

Measure Group	Engineering Costs	Utility Admin	Program Delivery	Program Dev.	Incentives	Bill Credits	Total Utility Costs	Gross Customer Costs
Additional Measures	\$57,080	\$14,001	\$67,133	\$14,220	\$274,407	\$0	\$426,841	\$823,449
Building Shell	\$44,318	\$10,870	\$52,124	\$11,041	\$539,982	\$0	\$658,336	\$1,276,034
Compressed Air	\$181,103	\$44,421	\$213,000	\$45,116	\$555,839	\$333,810	\$1,373,289	\$1,735,081
Energy Management	\$414,573	\$101,686	\$487,589	\$103,278	\$287,296	\$0	\$1,394,422	\$242,431
Electronics	\$7,689	\$1,886	\$9,044	\$1,916	\$21,040	\$0	\$41,575	\$39,332
Energy Project Manager Co-funding	\$0	\$0	\$0	\$0	\$411,587	\$0	\$411,587	\$0
Farm & Dairy	\$10,204	\$2,503	\$12,001	\$2,542	\$22,506	\$0	\$49,756	\$38,478
Food Service Equipment	\$154,743	\$37,955	\$181,997	\$38,549	\$480,763	\$0	\$894,007	\$1,355,783
HVAC	\$332,888	\$81,651	\$391,518	\$82,929	\$1,455,778	\$301,434	\$2,646,198	\$5,808,832
Irrigation	\$0	\$17,881	\$85,738	\$18,160	\$297,356	\$0	\$419,135	\$792,073
Lighting	\$1,929,466	\$473,259	\$2,269,292	\$480,668	\$12,103,592	\$1,137,452	\$18,393,728	\$29,445,681
Motors	\$105,044	\$25,765	\$123,544	\$26,168	\$328,892	\$129,112	\$738,525	\$954,946
Refrigeration	\$163,860	\$40,192	\$192,720	\$40,821	\$699,021	\$0	\$1,136,614	\$1,899,495
Total	\$3,400,968	\$852,069	\$4,085,699	\$865,409	\$17,478,059	\$1,901,809	\$28,584,012	\$44,411,615

Table 3 – Annual Wattsmart Business Program Savings by Measure Category

Measure Group	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Additional Measures	1,977,803	92%	1,819,579	81%	1,473,859	14
Building Shell	1,535,617	92%	1,412,768	81%	1,144,342	14
Compressed Air	6,275,158	92%	5,773,145	81%	4,676,248	14
Energy Management	14,364,804	100%	14,364,804	100%	14,364,804	3
Electronics	266,433	92%	245,118	81%	198,546	8
Energy Project Manager Co-funding	0	0%	0	0%	0	0
Farm & Dairy	353,567	92%	325,282	81%	263,478	14
Food Service Equipment	5,361,788	92%	4,932,845	81%	3,995,604	6
HVAC	11,534,467	92%	10,611,710	81%	8,595,485	14
Irrigation	2,525,907	92%	2,323,834	81%	1,882,306	9
Lighting	66,855,345	92%	61,506,918	81%	49,820,603	13
Motors	3,639,724	92%	3,348,546	81%	2,712,322	13
Refrigeration	5,677,699	92%	5,223,483	81%	4,231,021	15
Total	120,368,312	93%	111,888,032	83%	93,358,618	12

Table 4 - Benefit/Cost Ratios by Measure Category

Measure Group	PTRC	TRC	UCT	RIM	PCT
Additional Measures	1.23	1.11	2.14	0.59	2.01
Building Shell	0.71	0.65	1.13	0.44	1.41
Compressed Air	1.67	1.52	2.09	0.65	2.70
Energy Management	1.77	1.61	1.56	0.51	13.09
Electronics	1.20	1.09	1.37	0.36	4.18
Energy Project Manager Co-funding	0.00	0.00	0.00	0.00	0.00
Farm & Dairy	3.11	2.83	3.32	0.60	7.79
Food Service Equipment	0.84	0.76	1.29	0.42	2.03
HVAC	1.69	1.54	3.25	0.85	1.90
Irrigation	2.20	2.00	3.65	0.99	2.13
Lighting	1.09	0.99	1.57	0.48	2.18
Motors	1.64	1.49	2.13	0.61	2.84
Refrigeration	1.58	1.44	2.50	0.61	2.68
Total	1.24	1.13	1.80	0.55	2.24

Table 5 – Wattsmart Business Program Level Cost-Effectiveness Results

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0584	\$45,635,201	\$56,565,393	\$10,930,191	1.24
Total Resource Cost Test (TRC) No Adder	\$0.0584	\$45,635,201	\$51,423,084	\$5,787,883	1.13
Utility Cost Test (UCT)	\$0.0366	\$28,584,012	\$51,423,084	\$22,839,072	1.80
Rate Impact Test (RIM)		\$94,067,012	\$51,423,084	-\$42,643,927	0.55
Participant Cost Test (PCT)		\$44,411,615	\$99,545,906	\$55,134,292	2.24
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001578822

Tables 6 through 18 provide cost-effectiveness results for all 13 measures.

**Table 6 - Wattsmart Business Additional Measures Cost-Effectiveness Results
(Decrement - West Industrial - 40%, Load Shape – Machinery General)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0553	\$819,427	\$1,004,822	\$185,394	1.23
Total Resource Cost Test (TRC) No Adder	\$0.0553	\$819,427	\$913,474	\$94,047	1.11
Utility Cost Test (UCT)	\$0.0288	\$426,841	\$913,474	\$486,634	2.14
Rate Impact Test (RIM)		\$1,547,641	\$913,474	-\$634,166	0.59
Participant Cost Test (PCT)		\$823,449	\$1,658,111	\$834,662	2.01
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000018516
Discounted Participant Payback (years)					5.78

**Table 7 - 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) + Conservation Adder	\$0.1001	\$1,151,941	\$818,054	-\$333,887	0.71
Total Resource Cost Test (TRC) No Adder	\$0.1001	\$1,151,941	\$743,685	-\$408,256	0.65
Utility Cost Test (UCT)	\$0.0572	\$658,336	\$743,685	\$85,350	1.13
Rate Impact Test (RIM)		\$1,678,687	\$743,685	-\$935,002	0.44
Participant Cost Test (PCT)		\$1,276,034	\$1,799,676	\$523,642	1.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000027300
Discounted Participant Payback (years)					9.14

**Table 8 - Wattsmart Business Compressed Air 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) + Conservation Adder	\$0.0402	\$1,889,056	\$3,155,275	\$1,266,219	1.67
Total Resource Cost Test (TRC) No Adder	\$0.0402	\$1,889,056	\$2,868,432	\$979,376	1.52
Utility Cost Test (UCT)	\$0.0292	\$1,373,289	\$2,868,432	\$1,495,142	2.09
Rate Impact Test (RIM)		\$4,446,284	\$2,868,432	-\$1,577,853	0.65
Participant Cost Test (PCT)		\$1,735,081	\$4,683,470	\$2,948,389	2.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000046070
Discounted Participant Payback (years)					3.05

**Table 9 - Wattsmart Business Energy Management 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) + Conservation Adder	\$0.0343	\$1,349,557	\$2,392,241	\$1,042,684	1.77
Total Resource Cost Test (TRC) No Adder	\$0.0343	\$1,349,557	\$2,174,764	\$825,207	1.61
Utility Cost Test (UCT)	\$0.0355	\$1,394,422	\$2,174,764	\$780,342	1.56
Rate Impact Test (RIM)		\$4,281,306	\$2,174,764	-\$2,106,542	0.51
Participant Cost Test (PCT)		\$242,431	\$3,174,180	\$2,931,749	13.09
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000285111
Discounted Participant Payback (years)					n/a

**Table 10 - Wattsmart Business Electronics Cost-Effectiveness Results
(Decrement - West Plug Loads - 71%, Load Shape – Plug Loads)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0404	\$52,393	\$62,823	\$10,429	1.20
Total Resource Cost Test (TRC) No Adder	\$0.0404	\$52,393	\$57,112	\$4,718	1.09
Utility Cost Test (UCT)	\$0.0321	\$41,575	\$57,112	\$15,537	1.37
Rate Impact Test (RIM)		\$157,766	\$57,112	-\$100,654	0.36
Participant Cost Test (PCT)		\$39,332	\$164,486	\$125,154	4.18
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000005115
Discounted Participant Payback (years)					1.08

Table 11 - Wattsmart Business Energy Project Manager Cost-Effectiveness Results

(Decrement - None, Load Shape – None)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	n/a	\$411,587	\$0	-\$411,587	0.00
Total Resource Cost Test (TRC) No Adder	n/a	\$411,587	\$0	-\$411,587	0.00
Utility Cost Test (UCT)	n/a	\$411,587	\$0	-\$411,587	0.00
Rate Impact Test (RIM)		\$411,587	\$0	-\$411,587	0.00
Participant Cost Test (PCT)		\$0	\$411,587	\$411,587	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000168804
Discounted Participant Payback (years)					n/a

**Table 12 - Wattsmart Business Farm and Dairy 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) + Conservation Adder	\$0.0221	\$58,417	\$181,771	\$123,353	3.11
Total Resource Cost Test (TRC) No Adder	\$0.0221	\$58,417	\$165,246	\$106,829	2.83
Utility Cost Test (UCT)	\$0.0188	\$49,756	\$165,246	\$115,490	3.32
Rate Impact Test (RIM)		\$274,279	\$165,246	-\$109,033	0.60
Participant Cost Test (PCT)		\$38,478	\$299,695	\$261,217	7.79
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003184
Discounted Participant Payback (years)					0.75

**Table 13 - 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) + Conservation Adder	\$0.0740	\$1,511,429	\$1,268,097	-\$243,332	0.84
Total Resource Cost Test (TRC) No Adder	\$0.0740	\$1,511,429	\$1,152,815	-\$358,614	0.76
Utility Cost Test (UCT)	\$0.0437	\$894,007	\$1,152,815	\$258,808	1.29
Rate Impact Test (RIM)		\$2,730,283	\$1,152,815	-\$1,577,468	0.42
Participant Cost Test (PCT)		\$1,355,783	\$2,747,770	\$1,391,987	2.03
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000106871
Discounted Participant Payback (years)					2.66

Table 14 - Wattsmart Business HVAC Cost-Effectiveness Results

(Decrement - East Comm. Cooling - 14%, Load Shape – HVAC)

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0656	\$5,594,140	\$9,455,812	\$3,861,672	1.69
Total Resource Cost Test (TRC) No Adder	\$0.0656	\$5,594,140	\$8,596,193	\$3,002,053	1.54
Utility Cost Test (UCT)	\$0.0310	\$2,646,198	\$8,596,193	\$5,949,995	3.25
Rate Impact Test (RIM)		\$10,141,430	\$8,596,193	-\$1,545,237	0.85
Participant Cost Test (PCT)		\$5,808,832	\$11,010,585	\$5,201,753	1.90
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000045118
Discounted Participant Payback (years)					6.37

*HVAC motor measures utilized the Industrial decrement and HVAC load shape.

**Table 15 - 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) + Conservation Adder	\$0.0564	\$763,357	\$1,682,231	\$918,873	2.20
Total Resource Cost Test (TRC) No Adder	\$0.0564	\$763,357	\$1,529,301	\$765,943	2.00
Utility Cost Test (UCT)	\$0.0310	\$419,135	\$1,529,301	\$1,110,166	3.65
Rate Impact Test (RIM)		\$1,546,424	\$1,529,301	-\$17,124	0.99
Participant Cost Test (PCT)		\$792,073	\$1,689,072	\$896,999	2.13
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000774
Discounted Participant Payback (years)					3.51

**Table 16 - 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) + Conservation Adder	\$0.0611	\$29,003,686	\$31,687,784	\$2,684,099	1.09
Total Resource Cost Test (TRC) No Adder	\$0.0611	\$29,003,686	\$28,807,077	-\$196,609	0.99
Utility Cost Test (UCT)	\$0.0387	\$18,393,728	\$28,807,077	\$10,413,349	1.57
Rate Impact Test (RIM)		\$59,593,179	\$28,807,077	-\$30,786,102	0.48
Participant Cost Test (PCT)		\$29,445,681	\$64,104,563	\$34,658,882	2.18
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000966801
Discounted Participant Payback (years)					4.25

**Table 17 - 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) + Conservation Adder	\$0.0408	\$1,054,027	\$1,732,781	\$678,754	1.64
Total Resource Cost Test (TRC) No Adder	\$0.0408	\$1,054,027	\$1,575,256	\$521,228	1.49
Utility Cost Test (UCT)	\$0.0286	\$738,525	\$1,575,256	\$836,730	2.13
Rate Impact Test (RIM)		\$2,564,992	\$1,575,256	-\$989,736	0.61
Participant Cost Test (PCT)		\$954,946	\$2,712,901	\$1,757,955	2.84
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000031081
Discounted Participant Payback (years)					2.85

**Table 18 - 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) + Conservation Adder	\$0.0443	\$1,976,183	\$3,123,702	\$1,147,519	1.58
Total Resource Cost Test (TRC) No Adder	\$0.0443	\$1,976,183	\$2,839,729	\$863,546	1.44
Utility Cost Test (UCT)	\$0.0255	\$1,136,614	\$2,839,729	\$1,703,116	2.50
Rate Impact Test (RIM)		\$4,693,153	\$2,839,729	-\$1,853,424	0.61
Participant Cost Test (PCT)		\$1,899,495	\$5,089,811	\$3,190,316	2.68
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000050588
Discounted Participant Payback (years)					4.02