



Memorandum

To: Angela Long, PacifiCorp/Rocky Mountain Power

From: David Basak, Navigant

Date: February 10, 2017

Re: Cost Effectiveness for the Utah Wattsmart Business Program – High (+10%) Participation

Navigant has developed this memo in response to PacifiCorp's proposed Wattsmart Business Program cost-effectiveness modeling needs in the state of Utah. This memo presents the cost-effectiveness results of individual analysis runs for the state of Utah with and without program changes. Each scenario is analyzed using modeled assumptions provided by PacifiCorp. These scenarios utilize the following assumptions:

- **Scenarios:** Ran cost-effectiveness for the "Business as Usual" and "Proposed with Changes" scenarios for program years 2017 and 2018.
- **Avoided Costs:** Utilized the "East" 40% Industrial, 53% Commercial Lighting, 14% Commercial Cooling, and 71% Plug Loads decrements provided in the 2015 PacifiCorp Integrated Resource Plan along with the Utah Commercial and Industrial load shapes to calculate avoided costs.
- **Modeling Inputs:** Measure category savings provided by PacifiCorp in the file *UT CE 2017-2018_011917.xlsx*.
- **Energy Rates:** Utilized the rates provided by PacifiCorp and applied an escalation of 1.9% to arrive at estimated energy rates PY2017 and PY2018.
- **Line Loss Factors:** Commercial and industrial line loss factor utilized throughout the analysis.
- **Realization Rate:** Navigant utilized a realization rate of 92% which is consistent with the 2015 Annual Reports.

This memo will begin by addressing the inputs used in the analysis of the Utah Wattsmart Business Program. The program passes cost effectiveness for all the tests except the RIM test. The cost-effectiveness inputs are as follows:

Table 1 - Utility Inputs

Parameter	PY2017	PY2018
Discount Rate	6.66%	6.66%
Commercial Line Loss	8.71%	8.71%
Industrial Line Loss	5.85%	5.85%
Commercial Energy Rate (\$/kWh) ¹	\$0.0872	\$0.0889
Industrial Energy Rate (\$/kWh) ¹	\$0.0614	\$0.0625
Inflation Rate	1.9%	1.9%

¹ Future rates determined using a 1.9% annual escalator.

Table 2 –Program Costs by Scenario and Program Year (High (+10%) Participation)

Scenario	Program Year	Admin Costs	Incentives	Total Utility Costs	Gross Customer Costs
Business as Usual	2017	\$5,084,000	\$8,526,271	\$13,610,271	\$25,590,223
Proposed with Changes	2017	\$5,084,000	\$9,351,441	\$14,435,441	\$28,201,588
Business as Usual	2018	\$5,450,050	\$7,985,010	\$13,435,060	\$22,568,853
Proposed with Changes	2018	\$5,450,050	\$9,739,110	\$15,189,160	\$27,935,271
Business as Usual	2017-2018	\$10,534,050	\$16,511,281	\$27,045,331	\$48,159,076
Proposed with Changes	2017-2018	\$10,534,050	\$19,090,551	\$29,624,601	\$56,136,859

Table 3 – Program Savings by Scenario and Program Year (High (+10%) Participation)

Scenario	Program Year	Gross kWh Savings	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Business as Usual	2017	83,666,472	76,973,155	81%	62,348,255	13
Proposed with Changes	2017	89,108,154	81,979,501	81%	66,403,396	13
Business as Usual	2018	80,507,130	74,066,560	81%	59,993,913	13
Proposed with Changes	2018	95,123,268	87,513,407	81%	70,885,860	13
Business as Usual	2017-2018	164,173,602	151,039,714	81%	122,342,169	13
Proposed with Changes	2017-2018	184,231,422	169,492,908	81%	137,289,256	13

Table 4 - Benefit/Cost Ratios by Measure Category (High (+10%) Participation)

Scenario	Program Year	PTRC	TRC	UCT	RIM	PCT
Business as Usual	2017	1.66	1.51	2.86	0.56	3.02
Proposed with Changes	2017	1.70	1.55	3.00	0.58	2.94
Business as Usual	2018	1.67	1.52	2.69	0.53	3.33
Proposed with Changes	2018	1.86	1.69	3.12	0.59	3.22
Business as Usual	2017-2018	1.67	1.51	2.77	0.55	3.16
Proposed with Changes	2017-2018	1.78	1.62	3.06	0.59	3.08

Table 5 and 6 provide cost-effectiveness results for each scenario in both program year 2017 and 2018.

**Table 5 – Wattsmart Business Program Level Cost-Effectiveness Results - PY2017 and PY2018
 Business as Usual (High (+10%) Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0424	\$49,542,902	\$82,524,261	\$32,981,359	1.67
Total Resource Cost Test (TRC) No Adder	\$0.0424	\$49,542,902	\$75,022,055	\$25,479,154	1.51
Utility Cost Test (UCT)	\$0.0231	\$27,045,331	\$75,022,055	\$47,976,725	2.77
Rate Impact Test (RIM)		\$137,017,918	\$75,022,055	-\$61,995,862	0.55
Participant Cost Test (PCT)		\$48,159,076	\$152,279,907	\$104,120,830	3.16
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001873232

**Table 6 – Wattsmart Business Program Level Cost-Effectiveness Results - PY2017 and PY2018
 Proposed with Changes (High (+10%) Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0423	\$56,004,906	\$99,769,683	\$43,764,777	1.78
Total Resource Cost Test (TRC) No Adder	\$0.0423	\$56,004,906	\$90,699,712	\$34,694,806	1.62
Utility Cost Test (UCT)	\$0.0224	\$29,624,601	\$90,699,712	\$61,075,111	3.06
Rate Impact Test (RIM)		\$154,225,551	\$90,699,712	-\$63,525,839	0.59
Participant Cost Test (PCT)		\$56,136,859	\$172,918,885	\$116,782,026	3.08
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001919461

Table 7 and 8 provide cost-effectiveness results for each scenario in program year 2017.

**Table 6 – Wattsmart Business Program Level Cost-Effectiveness Results - PY2017
 Business as Usual (High (+10%) Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0432	\$25,812,081	\$42,841,283	\$17,029,203	1.66
Total Resource Cost Test (TRC) No Adder	\$0.0432	\$25,812,081	\$38,946,621	\$13,134,540	1.51
Utility Cost Test (UCT)	\$0.0228	\$13,610,271	\$38,946,621	\$25,336,351	2.86
Rate Impact Test (RIM)		\$69,246,618	\$38,946,621	-\$30,299,996	0.56
Participant Cost Test (PCT)		\$25,590,223	\$77,213,119	\$51,622,896	3.02
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000915527

**Table 7 – Wattsmart Business Program Level Cost-Effectiveness Results - PY2017
 Proposed with Changes (High (+10%) Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0437	\$27,927,286	\$47,560,789	\$19,633,503	1.70
Total Resource Cost Test (TRC) No Adder	\$0.0437	\$27,927,286	\$43,237,081	\$15,309,795	1.55
Utility Cost Test (UCT)	\$0.0226	\$14,435,441	\$43,237,081	\$28,801,640	3.00
Rate Impact Test (RIM)		\$73,992,140	\$43,237,081	-\$30,755,059	0.58
Participant Cost Test (PCT)		\$28,201,588	\$82,878,230	\$54,676,642	2.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000929277

Table 9 and 10 provide cost-effectiveness results for each scenario in program year 2018.

**Table 8 – Wattsmart Business Program Level Cost-Effectiveness Results - PY2018
 Business as Usual (High (+10%) Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0415	\$23,730,821	\$39,682,978	\$15,952,157	1.67
Total Resource Cost Test (TRC) No Adder	\$0.0415	\$23,730,821	\$36,075,434	\$12,344,613	1.52
Utility Cost Test (UCT)	\$0.0235	\$13,435,060	\$36,075,434	\$22,640,374	2.69
Rate Impact Test (RIM)		\$67,771,300	\$36,075,434	-\$31,695,866	0.53
Participant Cost Test (PCT)		\$22,568,853	\$75,066,788	\$52,497,935	3.33
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000957704

**Table 9 – Wattsmart Business Program Level Cost-Effectiveness Results - PY2018
 Proposed with Changes (High (+10%) Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0410	\$28,077,619	\$52,208,894	\$24,131,274	1.86
Total Resource Cost Test (TRC) No Adder	\$0.0410	\$28,077,619	\$47,462,631	\$19,385,011	1.69
Utility Cost Test (UCT)	\$0.0222	\$15,189,160	\$47,462,631	\$32,273,471	3.12
Rate Impact Test (RIM)		\$80,233,411	\$47,462,631	-\$32,770,780	0.59
Participant Cost Test (PCT)		\$27,935,271	\$90,040,654	\$62,105,384	3.22
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000990183