



## 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 – Expected 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) <sup>1</sup>	\$0.0872	\$0.0889
Industrial Energy Rate (\$/kWh) <sup>1</sup>	\$0.0614	\$0.0625
Inflation Rate	1.9%	1.9%

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

**Table 2 –Program Costs by Scenario and Program Year (Expected Participation)**

Scenario	Program Year	Admin Costs	Incentives	Total Utility Costs	Gross Customer Costs
Business as Usual	2017	\$5,084,000	\$7,751,155	\$12,835,155	\$23,263,839
Proposed with Changes	2017	\$5,084,000	\$8,501,310	\$13,585,310	\$25,637,807
Business as Usual	2018	\$5,450,050	\$7,259,100	\$12,709,150	\$20,517,139
Proposed with Changes	2018	\$5,450,050	\$8,853,736	\$14,303,786	\$25,395,701
<b>Business as Usual</b>	<b>2017-2018</b>	<b>\$10,534,050</b>	<b>\$15,010,255</b>	<b>\$25,544,305</b>	<b>\$43,780,979</b>
<b>Proposed with Changes</b>	<b>2017-2018</b>	<b>\$10,534,050</b>	<b>\$17,355,046</b>	<b>\$27,889,096</b>	<b>\$51,033,508</b>

**Table 3 – Program Savings by Scenario and Program Year (Expected Participation)**

Scenario	Program Year	Gross kWh Savings	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Business as Usual	2017	76,060,430	69,975,595	81%	56,680,232	13
Proposed with Changes	2017	81,007,412	74,526,819	81%	60,366,724	13
Business as Usual	2018	73,188,300	67,333,236	81%	54,539,921	13
Proposed with Changes	2018	86,475,698	79,557,643	81%	64,441,690	13
<b>Business as Usual</b>	<b>2017-2018</b>	<b>149,248,730</b>	<b>137,308,831</b>	<b>81%</b>	<b>111,220,153</b>	<b>13</b>
<b>Proposed with Changes</b>	<b>2017-2018</b>	<b>167,483,111</b>	<b>154,084,462</b>	<b>81%</b>	<b>124,808,414</b>	<b>13</b>

**Table 4 - Benefit/Cost Ratios by Measure Category (Expected Participation)**

Scenario	Program Year	PTRC	TRC	UCT	RIM	PCT
Business as Usual	2017	1.63	1.48	2.76	0.56	3.02
Proposed with Changes	2017	1.67	1.52	2.89	0.58	2.94
Business as Usual	2018	1.63	1.49	2.58	0.53	3.33
Proposed with Changes	2018	1.82	1.66	3.02	0.59	3.22
<b>Business as Usual</b>	<b>2017-2018</b>	<b>1.63</b>	<b>1.48</b>	<b>2.67</b>	<b>0.54</b>	<b>3.16</b>
<b>Proposed with Changes</b>	<b>2017-2018</b>	<b>1.75</b>	<b>1.59</b>	<b>2.96</b>	<b>0.58</b>	<b>3.08</b>

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 (Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0433	\$45,996,643	\$75,022,055	\$29,025,413	1.63
Total Resource Cost Test (TRC) No Adder	\$0.0433	\$45,996,643	\$68,201,869	\$22,205,226	1.48
Utility Cost Test (UCT)	\$0.0240	\$25,544,305	\$68,201,869	\$42,657,564	2.67
Rate Impact Test (RIM)		\$125,519,384	\$68,201,869	-\$57,317,516	0.54
Participant Cost Test (PCT)		\$43,780,979	\$138,436,279	\$94,655,300	3.16
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001731873

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

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0431	\$51,871,192	\$90,699,712	\$38,828,520	1.75
Total Resource Cost Test (TRC) No Adder	\$0.0431	\$51,871,192	\$82,454,284	\$30,583,092	1.59
Utility Cost Test (UCT)	\$0.0232	\$27,889,096	\$82,454,284	\$54,565,187	2.96
Rate Impact Test (RIM)		\$141,162,687	\$82,454,284	-\$58,708,404	0.58
Participant Cost Test (PCT)		\$51,033,508	\$157,198,986	\$106,165,478	3.08
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001773900

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 (Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0441	\$23,927,710	\$38,946,621	\$15,018,911	1.63
Total Resource Cost Test (TRC) No Adder	\$0.0441	\$23,927,710	\$35,406,019	\$11,478,309	1.48
Utility Cost Test (UCT)	\$0.0236	\$12,835,155	\$35,406,019	\$22,570,864	2.76
Rate Impact Test (RIM)		\$63,413,652	\$35,406,019	-\$28,007,633	0.56
Participant Cost Test (PCT)		\$23,263,839	\$70,193,744	\$46,929,905	3.02
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000846263

**Table 7 – Wattsmart Business Program Level Cost-Effectiveness Results - PY2017  
 Proposed with Changes (Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0445	\$25,850,624	\$43,237,081	\$17,386,457	1.67
Total Resource Cost Test (TRC) No Adder	\$0.0445	\$25,850,624	\$39,306,438	\$13,455,814	1.52
Utility Cost Test (UCT)	\$0.0234	\$13,585,310	\$39,306,438	\$25,721,127	2.89
Rate Impact Test (RIM)		\$67,727,764	\$39,306,438	-\$28,421,326	0.58
Participant Cost Test (PCT)		\$25,637,807	\$75,343,846	\$49,706,038	2.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000858763

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 (Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0424	\$22,068,933	\$36,075,434	\$14,006,501	1.63
Total Resource Cost Test (TRC) No Adder	\$0.0424	\$22,068,933	\$32,795,849	\$10,726,916	1.49
Utility Cost Test (UCT)	\$0.0244	\$12,709,150	\$32,795,849	\$20,086,699	2.58
Rate Impact Test (RIM)		\$62,105,732	\$32,795,849	-\$29,309,883	0.53
Participant Cost Test (PCT)		\$20,517,139	\$68,242,535	\$47,725,395	3.33
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000885611

**Table 9 – Wattsmart Business Program Level Cost-Effectiveness Results - PY2018  
 Proposed with Changes (Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0418	\$26,020,568	\$47,462,631	\$21,442,063	1.82
Total Resource Cost Test (TRC) No Adder	\$0.0418	\$26,020,568	\$43,147,846	\$17,127,278	1.66
Utility Cost Test (UCT)	\$0.0230	\$14,303,786	\$43,147,846	\$28,844,060	3.02
Rate Impact Test (RIM)		\$73,434,924	\$43,147,846	-\$30,287,077	0.59
Participant Cost Test (PCT)		\$25,395,701	\$81,855,140	\$56,459,440	3.22
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000915137