



1407 W. North Temple, Suite 330
Salt Lake City, Utah 84116

March 19, 2019

VIA ELECTRONIC FILING

Public Service Commission of Utah
Heber M. Wells Building, 4th Floor
160 East 300 South
Salt Lake City, UT 84114

Attn: Gary Widerburg
Commission Secretary

RE: Advice No. 19-05
Proposed Changes to Schedule 118, Low Income Weatherization Program
Docket No. 19-035-T04

Enclosed for electronic filing are the proposed tariff sheets associated with Tariff P.S.C.U. No. 50 of PacifiCorp, d.b.a. Rocky Mountain Power (the “Company”), applicable to electric service in the State of Utah. Pursuant to the requirement of Rule R746-405-2(D), the Company states that the proposed tariff sheets do not constitute a violation of state law or Commission rule. The Company respectfully requests an effective date of April 19, 2019 for these changes.

First Revision of Sheet No. 118.2	Schedule 118	Low Income Weatherization
Second Revision of Sheet No. 118.3	Schedule 118	Low Income Weatherization
Second Revision of Sheet No. 118.5	Schedule 118	Low Income Weatherization
First Revision of Sheet No. 118.6	Schedule 118	Low Income Weatherization

The purpose of this filing is to propose changes to the Low Income Weatherization Program (“Program”) administered through Electric Service Schedule No. 118, specifically to add eligibility criteria to insulation measures, add crisis measure funding, add efficient evaporative cooler replacement offering, and extend energy education funding to all participating customers. These tariff changes were researched at the request DSM Steering Committee members and align with targets illustrated in Figure 1 below, filed in the Demand Side Management November 1st Deferred Account and Forecast Report on November 1, 2018, in Docket No. 18-035-27. Proposed changes to the Schedule 118 tariff sheets are included as Exhibit A.

Figure 1 – 2019 Budget and Savings Forecast from November 1st Report

***	2019 MWH Savings Forecast	2019 Budget Forecast
Low Income Weatherization	180	\$75,000

DESCRIPTION OF CHANGES

Proposed adjustments are listed below, with further explanation provided in subsequent sections.

1. Add eligibility for insulation to homes with cooling systems;
2. Allow replacement of inefficient evaporative coolers and window air conditioning units;
3. Add crisis measure funding; and
4. Extend energy education funding to all Program participants.

COOLING SYSTEM ELIGIBILITY

Currently, eligibility for ceiling and wall insulation measures is only afforded to homes with permanently installed operable electric space heating systems. It is proposed to extend eligibility to allow homes with central air conditioning systems or evaporative coolers to be eligible. Adding insulation to these homes will help keep them cool more efficiently and use less energy during warm months.

EVAPORATIVE COOLER REPLACEMENT

Currently, only inefficient central air conditioning units may be replaced with evaporative coolers. It is proposed to also allow the replacement of inefficient evaporative coolers and window air conditioning units with more efficient evaporative coolers when found to be cost-effective.

CRISIS MEASURE FUNDING

If there is an emergency, the Housing and Community Development Division of the Utah Department of Work Force Services (“HCD”) will repair and/or replace heating and cooling systems for customers. It is proposed to add a Crisis Measure Funding section to Schedule 118 to allow the Company to reimburse the HCD for 50 percent of associated costs during emergency situations. Crisis eligibility will be determined by HCD policies and will be in effect when an agency responds to an emergency situation for a customer.

ENERGY EDUCATION

Currently, the Company reimburses \$50 for electrically heated households served through Schedule 118 that are provided energy education from curriculum developed by the HCD. It is proposed to extend energy education and reimbursement to all participating households, regardless of heat type, so more customers can be educated on energy use.

STAKEHOLDER FEEDBACK

On December 12, 2018, at the request of DSM Steering Committee members, the Company met with the Steering Committee to review the Low Income Weatherization program and discuss possible changes for improvement. The proposed changes in this filing align with the discussion during the December 12th meeting. The Company also circulated a draft advice letter for these changes to the Steering Committee on March 4, 2019. Some clarifying questions were asked and answered with Steering Committee members, but no pending or anticipated disputes in need of resolution were raised with the Company prior to this filing.

COST-EFFECTIVENESS

The cost-effectiveness analysis for the Program is attached hereto as Exhibit B. Table 5 below, pulled from Exhibit B, presents the expected cost-effectiveness of the Program for 2019 assuming the proposed changes in this filing. Additional details and inputs are included in Exhibit B. Sensitivity analyses for the Program are also included as Exhibits C and D. The Program is expected to remain cost-effective from the Utility Cost Test perspective under all scenarios.

**Table 5 – Low Income Program Level Cost-Effectiveness Results – PY2019
(Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0182	\$42,275	\$125,990	\$83,715	2.98
Total Resource Cost Test (TRC) No Adder	\$0.0182	\$42,275	\$114,536	\$72,261	2.71
Utility Cost Test (UCT)	\$0.0223	\$51,920	\$114,536	\$62,616	2.21
Rate Impact Test (RIM)		\$343,273	\$114,536	-\$228,737	0.33
Participant Cost Test (PCT)		\$24,012	\$325,009	\$300,998	13.54
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000005439
Discounted Participant Payback (years)					n/a

It is respectfully requested that all formal correspondence and staff requests regarding this matter be addressed to:

By E-mail (preferred): datarequest@pacificorp.com
michael.snow@pacificorp.com

By regular mail: Data Request Response Center
PacifiCorp
825 NE Multnomah Blvd., Suite 2000
Portland, OR 97232

Informal inquiries regarding this matter may be directed to me at (801) 220-4214.

Sincerely,



Michael S. Snow
Manager, DSM Regulatory Affairs

Enclosures

cc: Division of Public Utilities
Office of Consumer Services

Exhibit A

Proposed Tariff Sheets

ELECTRIC SERVICE SCHEDULE NO. 118 - Continued

DEFINITIONS: (continued)

Agency: A non-profit group, State, Municipality or County authorized by HCD to receive funds for installation of weatherization materials in low income properties.

Energy Audit: A service provided by the Agency that includes the measurement and analysis of the energy efficiency of a dwelling including energy savings potential that would result from installing energy efficient measures that are determined to be cost effective.

Low Income: Households qualifying under the federal low income guidelines and certified for eligibility according to agency procedure. Income eligibility is based on current requirements set by HCD.

Major Measures: Ceiling insulation, wall insulation, floor insulation, and window replacement, applicable in dwellings with permanently installed operable electric space heating systems and/or cooling systems when indicated in the Energy Efficient Measure section of this tariff.

Supplemental Measures: Measures that are not required under this schedule, but may qualify for a Company reimbursement.

Additional Measures: Measures where reimbursement is specified instead of calculated as 50% of the installed cost.

FINANCIAL ASSISTANCE:

- (1) The Company will reimburse the Agency 50% of the installed cost of all major measures and supplemental measures installed, and 50% of the cost related to refrigerator testing, as required in this tariff. These reimbursements will be calculated after property owner contributions are deducted. Financial assistance on additional measures that are not calculated as 50% of the installed cost are detailed under the Additional Measures section in page 5 of this tariff. Financial assistance will be provided one time only on any individual measure, and up to two times per dwelling.
- (2) The Company will reimburse the Agency for administrative costs based on 10% of Rocky Mountain Power's rebate on installed measures, not to exceed the following

(continued)

Issued by authority of Report and Order of the Public Service Commission of Utah in ~~Docket No. 13-035-~~
~~184~~Advice No. 19-05

FILED: March 19, 2019~~September 5, 2014~~

EFFECTIVE: April 19, 2019~~September 1, 2014~~

ELECTRIC SERVICE SCHEDULE NO. 118 - Continued

FINANCIAL ASSISTANCE: (continued)

Total administrative payment per building:

Dwelling Units in Building	Maximum RMP Administrative Payment
1 to 4	\$350
5 to 10	\$800
11 to 15	\$1200
16 to 20	\$1400
21 to 25	\$1600
26 to 30	\$1800
31+	\$2100

- (3) HCD must invoice the Company within sixty days after they receive billing data from their subcontracting weatherization agencies.

ENERGY EFFICIENT MEASURES:

Financial assistance will be provided based on the results of a cost effective analysis through a Department of Energy approved energy audit. The energy efficient measures eligible for funding must be installed in dwellings with permanently installed operable electric space heat except where noted. The electric space heating system must be designed to heat at least 51% of the home. The energy efficient measures that may be eligible for funding are listed as follows along with their estimated measure life where applicable:

Major Measures:

- (1) Ceiling insulation up to R-48 for ceilings with less than R-30 in place. R-30 or better attics will not be further insulated. Also available in homes with central air conditioning systems or evaporative coolers: 30 years.
- (2) Floor insulation over unheated spaces up to R-30: 30 years.
- (3) Wall insulation up to R-26 for walls with no insulation installed (financing will not be available for the installation of urea-formaldehyde wall insulation). Also available in homes with central air conditioning systems or evaporative coolers: 30 years.
- (4) Low E double pane replacement windows with U-value of 0.30 or lower: 20 years.

Nothing shall preclude the Company from providing a reimbursement for the installation of a greater R value of insulation for the above items that are determined to be cost effective through the audit process.

(continued)

Issued by authority of Report and Order of the Public Service Commission of Utah in Advice No. ~~16-01-19-05~~

FILED: ~~March 19, 2019~~ January 19, 2016

EFFECTIVE: ~~April 19, 2019~~ March 1, 2016

ELECTRIC SERVICE SCHEDULE NO. 118 - Continued

ENERGY EFFICIENT MEASURES: (continued)

Supplemental Measures – No Electric Heating System Requirement (continued)

- (3) Replacement of inefficient window air conditioning units when audit results determine this to be cost effective. Existing units must have been operated during the past 12 months. Replacements must be Energy Star rated.
- (4) Replacement of inefficient evaporative coolers, window air conditioning units and central air conditioning units with evaporative coolers when audit results determine this to be cost effective. Existing units must have been operated during past 12 months.
- (5) Forced air electric cooling duct insulation and sealing in unheated spaces.
- (6) Light emitting diode (LED) light fixtures: 15 years.

Additional Measures – The funding mechanism for these measures is specified below:

- (1) Compact fluorescent light (CFL) bulbs, the Company will reimburse HCD for 100% of costs associated with the purchase of Energy Star certified CFL installed through this program tariff. CFLs may be installed in all fixtures in use for two or more hours a day: 5 years.
- (2) LED light bulbs, a reimbursement of 100% of costs associated with the purchase and installation of Energy Star certified LEDs. LEDs may be installed in all fixtures in use for two or more hours a day: 12 years.
- (3) Furnace fans, a reimbursement of up to \$100/home is available to cover costs associated with an efficient furnace fan that is included in the installation of an efficient gas furnace.
- (4) Energy education, ~~an up to a reimbursement of \$50 reimbursement~~ will be provided ~~on electrically heated for~~ households ~~served through this tariff~~ that ~~receive one or more major measures and~~ are provided energy education ~~through from~~ a curriculum developed by HCD.

CRISIS MEASURE FUNDING:

Heating and cooling system repair and/or replacement, the Company will reimburse HCD for 50% of associated costs. Crisis eligibility will be determined by HCD policies and is in effect when an agency responds to an emergency situation. This can be a stand-alone measure.

PROVISIONS OF SERVICE:

(continued)

Issued by authority of Report and Order of the Public Service Commission of Utah in Advice No. ~~16-0119-05~~

FILED: ~~March 19, 2019~~ ~~January 19, 2016~~
~~2019~~ ~~March 1, 2016~~

EFFECTIVE: April 19,

ELECTRIC SERVICE SCHEDULE NO. 118 - Continued

- ~~(1) — A Department of Energy approved Energy Audit must be completed by the Agency prior to installation of major measures by the Agency.~~
- ~~(2) — Agency must qualify residential customers for assistance using the federal low income guidelines. Income eligibility is based on current requirements set by HCD.~~
- ~~(3) — HCD will ensure installation meets Federal, State and Local building codes.~~

(continued)

Issued by authority of Report and Order of the Public Service Commission of Utah in Advice No. ~~16-0119-05~~

FILED: ~~March 19, 2019~~ ~~January 19, 2016~~
~~2019~~ ~~March 1, 2016~~

EFFECTIVE: ~~April 19,~~

ELECTRIC SERVICE SCHEDULE NO. 118 - Continued

PROVISIONS OF SERVICE: ~~(continued)~~

- (1) A Department of Energy approved Energy Audit must be completed by the Agency prior to installation of major measures by the Agency.
- (2) Agency must qualify residential customers for assistance using the federal low income guidelines. Income eligibility is based on current requirements set by HCD.
- (3) HCD will ensure installation meets Federal, State and Local building codes.
- (4) Measures installed under this schedule shall not receive financial incentives from other Company programs.
- (5) Agency shall inspect measure installation to insure that the weatherization measures and installation practices meet or exceed required specifications.
- (6) Company may audit Agency weatherization and financial records and inspect the installations in dwellings of customers receiving services under this program.
- (7) Company shall pay the Agency the amount established under the terms of their contract when provisions of the schedule have been met.

ELECTRIC SERVICE REGULATIONS: Service under this Schedule will be in accordance with the terms of the Electric Service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Public Service Commission of the State of Utah, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

ELECTRIC SERVICE SCHEDULE NO. 118 - Continued

DEFINITIONS: (continued)

Agency: A non-profit group, State, Municipality or County authorized by HCD to receive funds for installation of weatherization materials in low income properties.

Energy Audit: A service provided by the Agency that includes the measurement and analysis of the energy efficiency of a dwelling including energy savings potential that would result from installing energy efficient measures that are determined to be cost effective.

Low Income: Households qualifying under the federal low income guidelines and certified for eligibility according to agency procedure. Income eligibility is based on current requirements set by HCD.

Major Measures: Ceiling insulation, wall insulation, floor insulation, and window replacement, applicable in dwellings with permanently installed operable electric space heating systems and/or cooling systems when indicated in the Energy Efficient Measure section of this tariff.

Supplemental Measures: Measures that are not required under this schedule, but may qualify for a Company reimbursement.

Additional Measures: Measures where reimbursement is specified instead of calculated as 50% of the installed cost.

FINANCIAL ASSISTANCE:

- (1) The Company will reimburse the Agency 50% of the installed cost of all major measures and supplemental measures installed, and 50% of the cost related to refrigerator testing, as required in this tariff. These reimbursements will be calculated after property owner contributions are deducted. Financial assistance on additional measures that are not calculated as 50% of the installed cost are detailed under the Additional Measures section in page 5 of this tariff. Financial assistance will be provided one time only on any individual measure, and up to two times per dwelling.
- (2) The Company will reimburse the Agency for administrative costs based on 10% of Rocky Mountain Power's rebate on installed measures, not to exceed the following

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FILED: March 19, 2019

EFFECTIVE: April 19, 2019

ELECTRIC SERVICE SCHEDULE NO. 118 - Continued
FINANCIAL ASSISTANCE: (continued)

Total administrative payment per building:

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5 to 10	\$800
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16 to 20	\$1400
21 to 25	\$1600
26 to 30	\$1800
31+	\$2100

- (3) HCD must invoice the Company within sixty days after they receive billing data from their subcontracting weatherization agencies.

ENERGY EFFICIENT MEASURES:

Financial assistance will be provided based on the results of a cost effective analysis through a Department of Energy approved energy audit. The energy efficient measures eligible for funding must be installed in dwellings with permanently installed operable electric space heat except where noted. The electric space heating system must be designed to heat at least 51% of the home. The energy efficient measures that may be eligible for funding are listed as follows along with their estimated measure life where applicable:

Major Measures:

- (1) Ceiling insulation up to R-48 for ceilings with less than R-30 in place. R-30 or better attics will not be further insulated. Also available in homes with central air conditioning systems or evaporative coolers: 30 years.
- (2) Floor insulation over unheated spaces up to R-30: 30 years.
- (3) Wall insulation up to R-26 for walls with no insulation installed (financing will not be available for the installation of urea-formaldehyde wall insulation) . Also available in homes with central air conditioning systems or evaporative coolers: 30 years.
- (4) Low E double pane replacement windows with U-value of 0.30 or lower: 20 years.

Nothing shall preclude the Company from providing a reimbursement for the installation of a greater R value of insulation for the above items that are determined to be cost effective through the audit process.

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ELECTRIC SERVICE SCHEDULE NO. 118 - Continued

ENERGY EFFICIENT MEASURES: (continued)

Supplemental Measures – No Electric Heating System Requirement (continued)

- (3) Replacement of inefficient window air conditioning units when audit results determine this to be cost effective. Existing units must have been operated during the past 12 months. Replacements must be Energy Star rated.
- (4) Replacement of inefficient evaporative coolers, window air conditioning units and central air conditioning units with evaporative coolers when audit results determine this to be cost effective. Existing units must have been operated during past 12 months.
- (5) Forced air electric cooling duct insulation and sealing in unheated spaces.
- (6) Light emitting diode (LED) light fixtures: 15 years.

Additional Measures – The funding mechanism for these measures is specified below:

- (1) Compact fluorescent light (CFL) bulbs, the Company will reimburse HCD for 100% of costs associated with the purchase of Energy Star certified CFL installed through this program tariff. CFLs may be installed in all fixtures in use for two or more hours a day: 5 years.
- (2) LED light bulbs, a reimbursement of 100% of costs associated with the purchase and installation of Energy Star certified LEDs. LEDs may be installed in all fixtures in use for two or more hours a day: 12 years.
- (3) Furnace fans, a reimbursement of up to \$100/home is available to cover costs associated with an efficient furnace fan that is included in the installation of an efficient gas furnace.
- (4) Energy education, a reimbursement of \$50 will be provided for households served through this tariff that are provided energy education from a curriculum developed by HCD.

CRISIS MEASURE FUNDING:

Heating and cooling system repair and/or replacement, the Company will reimburse HCD for 50% of associated costs. Crisis eligibility will be determined by HCD policies and is in effect when an agency responds to an emergency situation. This can be a stand-alone measure.

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Issued by authority of Report and Order of the Public Service Commission of Utah in Advice No. 19-05

FILED: March 19, 2019

EFFECTIVE: April 19, 2019

ELECTRIC SERVICE SCHEDULE NO. 118 - Continued

PROVISIONS OF SERVICE:

- (1) A Department of Energy approved Energy Audit must be completed by the Agency prior to installation of major measures by the Agency.
- (2) Agency must qualify residential customers for assistance using the federal low income guidelines. Income eligibility is based on current requirements set by HCD.
- (3) HCD will ensure installation meets Federal, State and Local building codes.
- (4) Measures installed under this schedule shall not receive financial incentives from other Company programs.
- (5) Agency shall inspect measure installation to insure that the weatherization measures and installation practices meet or exceed required specifications.
- (6) Company may audit Agency weatherization and financial records and inspect the installations in dwellings of customers receiving services under this program.
- (7) Company shall pay the Agency the amount established under the terms of their contract when provisions of the schedule have been met.

ELECTRIC SERVICE REGULATIONS: Service under this Schedule will be in accordance with the terms of the Electric Service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Public Service Commission of the State of Utah, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

Exhibit B

Low Income Weatherization Program Cost-Effectiveness (Expected Participation)



Memorandum

To: Nicole Karpavich, PacifiCorp

From: David Basak, Navigant

Date: January 22, 2019

Re: Cost Effectiveness for the Utah Low Income Weatherization Program
(Expected Participation)

Navigant has developed this memo in response to PacifiCorp's proposed Low Income Weatherization Program cost-effectiveness modeling needs in the state of Utah. Each scenario is analyzed using modeled assumptions provided by PacifiCorp. These scenarios utilize the following assumptions:

- **Scenarios:** Ran cost-effectiveness for program year 2019.
- **Avoided Costs:** Navigant performed a custom analysis of calculating avoided costs by using the *2017 Decrement* and applied against Utah specific residential end-use specific load shapes.
- **Modeling Inputs:** Measure category savings provided by PacifiCorp in the file *UT LIWX Forecast for CE.xlsx*.
- **Energy Rates:** Utilized the rates provided by PacifiCorp for PY2017 and applied an escalation of 2.22% to arrive at estimated energy rates PY2019.
- **Line Loss Factors:** Residential line loss factor utilized throughout the analysis.

This memo will begin by addressing the inputs used in the analysis of the Utah Low Income Weatherization Program. The cost-effectiveness inputs are as follows:

Table 1 - Utility Inputs

Parameter	PY2019
Discount Rate	6.57%
Residential Line Loss	9.32%
Residential Energy Rate (\$/kWh) ¹	\$0.1167
Inflation Rate	2.22%

¹ Future rates determined using a 2.22% annual escalator.

Table 2 – Program Costs by Measure Category (Expected Participation)

Measure Category	Agency Admin. Costs	Internal Utility Costs	Incentives	Total Utility Costs	Gross Customer Costs
Appliance	\$887	\$4,079	\$15,306	\$20,273	\$15,306
Building Shell	\$2	\$7	\$6	\$14	\$6
HVAC	\$919	\$4,226	\$8,700	\$13,846	\$8,700
Lighting	\$1,455	\$6,688	\$9,645	\$17,788	\$0
All Measures	\$3,263	\$15,000	\$33,657	\$51,920	\$24,012

Table 3 – Program Savings by Measure Category (Expected Participation)

Measure Category	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Appliance	56,682	100%	56,682	100%	56,682	20
Building Shell	98	100%	98	100%	98	30
HVAC	58,725	100%	58,725	100%	58,725	18
Lighting	92,928	100%	92,928	100%	92,928	12
All Measures	208,433	100%	208,433	100%	208,433	16

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

Measure Category	PTRC	TRC	UCT	RIM	PCT
Appliance	2.16	1.97	1.97	0.35	7.12
Building Shell	6.99	6.35	6.35	0.42	35.94
HVAC	2.91	2.65	2.65	0.35	11.41
Lighting	5.12	4.66	2.13	0.30	n/a
All Measures	2.98	2.71	2.21	0.33	13.54

The following tables provide cost-effectiveness results for PY2019 starting with the overall program followed by the individual measure category results.

**Table 5 – Low Income Program Level Cost-Effectiveness Results - PY2019
(Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0182	\$42,275	\$125,990	\$83,715	2.98
Total Resource Cost Test (TRC) No Adder	\$0.0182	\$42,275	\$114,536	\$72,261	2.71
Utility Cost Test (UCT)	\$0.0223	\$51,920	\$114,536	\$62,616	2.21
Rate Impact Test (RIM)		\$343,273	\$114,536	-\$228,737	0.33
Participant Cost Test (PCT)		\$24,012	\$325,009	\$300,998	13.54
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000005439
Discounted Participant Payback (years)					n/a

**Table 6 – Low Income Measure Category Level Cost-Effectiveness Results – Appliance
(Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0271	\$20,273	\$43,875	\$23,603	2.16
Total Resource Cost Test (TRC) No Adder	\$0.0271	\$20,273	\$39,887	\$19,614	1.97
Utility Cost Test (UCT)	\$0.0271	\$20,273	\$39,887	\$19,614	1.97
Rate Impact Test (RIM)		\$113,956	\$39,887	-\$74,069	0.35
Participant Cost Test (PCT)		\$15,306	\$108,989	\$93,683	7.12
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001415
Discounted Participant Payback (years)					n/a

**Table 7 – Low Income Measure Category Level Cost-Effectiveness Results – Building Shell
(Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0089	\$14	\$101	\$86	6.99
Total Resource Cost Test (TRC) No Adder	\$0.0089	\$14	\$92	\$77	6.35
Utility Cost Test (UCT)	\$0.0089	\$14	\$92	\$77	6.35
Rate Impact Test (RIM)		\$219	\$92	-\$127	0.42
Participant Cost Test (PCT)		\$6	\$210	\$204	35.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000002
Discounted Participant Payback (years)					n/a

**Table 8 – Low Income Measure Category Level Cost-Effectiveness Results – HVAC
(Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0192	\$13,846	\$40,313	\$26,468	2.91
Total Resource Cost Test (TRC) No Adder	\$0.0192	\$13,846	\$36,649	\$22,803	2.65
Utility Cost Test (UCT)	\$0.0192	\$13,846	\$36,649	\$22,803	2.65
Rate Impact Test (RIM)		\$104,423	\$36,649	-\$67,774	0.35
Participant Cost Test (PCT)		\$8,700	\$99,277	\$90,577	11.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001436
Discounted Participant Payback (years)					n/a

**Table 9 – Low Income Measure Category Level Cost-Effectiveness Results – Lighting
(Expected Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0095	\$8,142	\$41,700	\$33,558	5.12
Total Resource Cost Test (TRC) No Adder	\$0.0095	\$8,142	\$37,909	\$29,767	4.66
Utility Cost Test (UCT)	\$0.0208	\$17,788	\$37,909	\$20,122	2.13
Rate Impact Test (RIM)		\$124,675	\$37,909	-\$86,766	0.30
Participant Cost Test (PCT)		\$0	\$116,533	\$116,533	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002731
Discounted Participant Payback (years)					n/a

Exhibit C

Low Income Weatherization Program Sensitivity Analysis (High Participation)



Memorandum

To: Nicole Karpavich, PacifiCorp

From: David Basak, Navigant

Date: January 22, 2019

Re: Cost Effectiveness for the Utah Low Income Weatherization Program
High (+10%) Participation

Navigant has developed this memo in response to PacifiCorp's proposed Low Income Weatherization Program cost-effectiveness modeling needs in the state of Utah. Each scenario is analyzed using modeled assumptions provided by PacifiCorp. These scenarios utilize the following assumptions:

- **Scenarios:** Ran cost-effectiveness for program year 2019.
- **Avoided Costs:** Navigant performed a custom analysis of calculating avoided costs by using the *2017 Decrement* and applied against Utah specific residential end-use specific load shapes.
- **Modeling Inputs:** Measure category savings provided by PacifiCorp in the file *UT LIWX Forecast for CE.xlsx*.
- **Energy Rates:** Utilized the rates provided by PacifiCorp for PY2017 and applied an escalation of 2.22% to arrive at estimated energy rates PY2019.
- **Line Loss Factors:** Residential line loss factor utilized throughout the analysis.

This memo will begin by addressing the inputs used in the analysis of the Utah Low Income Weatherization Program. The cost-effectiveness inputs are as follows:

Table 1 - Utility Inputs

Parameter	PY2019
Discount Rate	6.57%
Residential Line Loss	9.32%
Residential Energy Rate (\$/kWh) ¹	\$0.1167
Inflation Rate	2.22%

¹ Future rates determined using a 2.22% annual escalator.

Table 2 –Program Costs by Measure Category (High Participation)

Measure Category	Agency Admin. Costs	Internal Utility Costs	Incentives	Total Utility Costs	Gross Customer Costs
Appliance	\$887	\$4,079	\$16,837	\$21,803	\$16,837
Building Shell	\$2	\$7	\$6	\$15	\$6
HVAC	\$919	\$4,226	\$9,570	\$14,716	\$9,570
Lighting	\$1,455	\$6,688	\$10,610	\$18,752	\$0
All Measures	\$3,263	\$15,000	\$37,023	\$55,286	\$26,413

Table 3 – Program Savings by Measure Category (High Participation)

Measure Category	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Appliance	62,350	100%	62,350	100%	62,350	20
Building Shell	108	100%	108	100%	108	30
HVAC	64,598	100%	64,598	100%	64,598	18
Lighting	102,221	100%	102,221	100%	102,221	12
All Measures	229,276	100%	229,276	100%	229,276	16

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

Measure Category	PTRC	TRC	UCT	RIM	PCT
Appliance	2.21	2.01	2.01	0.35	7.12
Building Shell	7.39	6.72	6.72	0.42	35.94
HVAC	3.01	2.74	2.74	0.35	11.41
Lighting	5.63	5.12	2.22	0.31	n/a
All Measures	3.10	2.82	2.28	0.34	13.54

The following tables provide cost-effectiveness results for PY2019 starting with the overall program followed by the individual measure category results.

**Table 5 – Low Income Program Level Cost-Effectiveness Results - PY2019
(High Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0175	\$44,676	\$138,589	\$93,912	3.10
Total Resource Cost Test (TRC) No Adder	\$0.0175	\$44,676	\$125,990	\$81,313	2.82
Utility Cost Test (UCT)	\$0.0216	\$55,286	\$125,990	\$70,704	2.28
Rate Impact Test (RIM)		\$375,774	\$125,990	-\$249,784	0.34
Participant Cost Test (PCT)		\$26,413	\$357,510	\$331,097	13.54
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000005940
Discounted Participant Payback (years)					n/a

**Table 6 – Low Income Measure Category Level Cost-Effectiveness Results – Appliance
(High Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0265	\$21,803	\$48,263	\$26,460	2.21
Total Resource Cost Test (TRC) No Adder	\$0.0265	\$21,803	\$43,875	\$22,072	2.01
Utility Cost Test (UCT)	\$0.0265	\$21,803	\$43,875	\$22,072	2.01
Rate Impact Test (RIM)		\$124,855	\$43,875	-\$80,980	0.35
Participant Cost Test (PCT)		\$16,837	\$119,888	\$103,052	7.12
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001547
Discounted Participant Payback (years)					n/a

**Table 7 – Low Income Measure Category Level Cost-Effectiveness Results – Building Shell
(High Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0084	\$15	\$111	\$96	7.39
Total Resource Cost Test (TRC) No Adder	\$0.0084	\$15	\$101	\$86	6.72
Utility Cost Test (UCT)	\$0.0084	\$15	\$101	\$86	6.72
Rate Impact Test (RIM)		\$240	\$101	-\$139	0.42
Participant Cost Test (PCT)		\$6	\$231	\$225	35.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000002
Discounted Participant Payback (years)					n/a

**Table 8 – Low Income Measure Category Level Cost-Effectiveness Results – HVAC
(High Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0185	\$14,716	\$44,345	\$29,629	3.01
Total Resource Cost Test (TRC) No Adder	\$0.0185	\$14,716	\$40,313	\$25,598	2.74
Utility Cost Test (UCT)	\$0.0185	\$14,716	\$40,313	\$25,598	2.74
Rate Impact Test (RIM)		\$114,350	\$40,313	-\$74,037	0.35
Participant Cost Test (PCT)		\$9,570	\$109,205	\$99,635	11.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001569
Discounted Participant Payback (years)					n/a

**Table 9 – Low Income Measure Category Level Cost-Effectiveness Results – Lighting
(High Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0087	\$8,142	\$45,870	\$37,728	5.63
Total Resource Cost Test (TRC) No Adder	\$0.0087	\$8,142	\$41,700	\$33,558	5.12
Utility Cost Test (UCT)	\$0.0199	\$18,752	\$41,700	\$22,948	2.22
Rate Impact Test (RIM)		\$136,329	\$41,700	-\$94,628	0.31
Participant Cost Test (PCT)		\$0	\$128,186	\$128,186	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002979
Discounted Participant Payback (years)					n/a

Exhibit D

Low Income Weatherization Program Sensitivity Analysis (Low Participation)



Memorandum

To: Nicole Karpavich, PacifiCorp

From: David Basak, Navigant

Date: January 22, 2019

Re: Cost Effectiveness for the Utah Low Income Weatherization Program
Low (-10%) Participation

Navigant has developed this memo in response to PacifiCorp's proposed Low Income Weatherization Program cost-effectiveness modeling needs in the state of Utah. Each scenario is analyzed using modeled assumptions provided by PacifiCorp. These scenarios utilize the following assumptions:

- **Scenarios:** Ran cost-effectiveness for program year 2019.
- **Avoided Costs:** Navigant performed a custom analysis of calculating avoided costs by using the *2017 Decrement* and applied against Utah specific residential end-use specific load shapes.
- **Modeling Inputs:** Measure category savings provided by PacifiCorp in the file *UT LIWX Forecast for CE.xlsx*.
- **Energy Rates:** Utilized the rates provided by PacifiCorp for PY2017 and applied an escalation of 2.22% to arrive at estimated energy rates PY2019.
- **Line Loss Factors:** Residential line loss factor utilized throughout the analysis.

This memo will begin by addressing the inputs used in the analysis of the Utah Low Income Weatherization Program. The cost-effectiveness inputs are as follows:

Table 1 - Utility Inputs

Parameter	PY2019
Discount Rate	6.57%
Residential Line Loss	9.32%
Residential Energy Rate (\$/kWh) ¹	\$0.1167
Inflation Rate	2.22%

¹ Future rates determined using a 2.22% annual escalator.

Table 2 –Program Costs by Measure Category (Low Participation)

Measure Category	Agency Admin. Costs	Internal Utility Costs	Incentives	Total Utility Costs	Gross Customer Costs
Appliance	\$887	\$4,079	\$13,775	\$18,742	\$13,775
Building Shell	\$2	\$7	\$5	\$14	\$5
HVAC	\$919	\$4,226	\$7,830	\$12,976	\$7,830
Lighting	\$1,455	\$6,688	\$8,681	\$16,823	\$0
All Measures	\$3,263	\$15,000	\$30,291	\$48,554	\$21,611

Table 3 – Program Savings by Measure Category (Low Participation)

Measure Category	Gross kWh Savings	Realization Rate	Adjusted Gross kWh Savings	Net to Gross Ratio	Net kWh Savings	Measure Life
Appliance	51,014	100%	51,014	100%	51,014	20
Building Shell	88	100%	88	100%	88	30
HVAC	52,853	100%	52,853	100%	52,853	18
Lighting	83,635	100%	83,635	100%	83,635	12
All Measures	187,590	100%	187,590	100%	187,590	16

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

Measure Category	PTRC	TRC	UCT	RIM	PCT
Appliance	2.11	1.92	1.92	0.35	7.12
Building Shell	6.56	5.96	5.96	0.42	35.94
HVAC	2.80	2.54	2.54	0.35	11.41
Lighting	4.61	4.19	2.03	0.30	0.00
All Measures	2.84	2.59	2.12	0.33	13.54

The following tables provide cost-effectiveness results for PY2019 starting with the overall program followed by the individual measure category results.

**Table 5 – Low Income Program Level Cost-Effectiveness Results - PY2019
(Low Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0190	\$39,874	\$113,391	\$73,517	2.84
Total Resource Cost Test (TRC) No Adder	\$0.0190	\$39,874	\$103,082	\$63,209	2.59
Utility Cost Test (UCT)	\$0.0232	\$48,554	\$103,082	\$54,528	2.12
Rate Impact Test (RIM)		\$310,772	\$103,082	-\$207,689	0.33
Participant Cost Test (PCT)		\$21,611	\$292,508	\$270,898	13.54
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000004939
Discounted Participant Payback (years)					n/a

**Table 6 – Low Income Measure Category Level Cost-Effectiveness Results – Appliance
(Low Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0279	\$18,742	\$39,488	\$20,746	2.11
Total Resource Cost Test (TRC) No Adder	\$0.0279	\$18,742	\$35,898	\$17,156	1.92
Utility Cost Test (UCT)	\$0.0279	\$18,742	\$35,898	\$17,156	1.92
Rate Impact Test (RIM)		\$103,057	\$35,898	-\$67,159	0.35
Participant Cost Test (PCT)		\$13,775	\$98,090	\$84,315	7.12
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001283
Discounted Participant Payback (years)					n/a

**Table 7 – Low Income Measure Category Level Cost-Effectiveness Results – Building Shell
(Low Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0095	\$14	\$91	\$77	6.56
Total Resource Cost Test (TRC) No Adder	\$0.0095	\$14	\$83	\$69	5.96
Utility Cost Test (UCT)	\$0.0095	\$14	\$83	\$69	5.96
Rate Impact Test (RIM)		\$198	\$83	-\$115	0.42
Participant Cost Test (PCT)		\$5	\$189	\$184	35.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000001
Discounted Participant Payback (years)					n/a

**Table 8 – Low Income Measure Category Level Cost-Effectiveness Results – HVAC
(Low Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0199	\$12,976	\$36,282	\$23,307	2.80
Total Resource Cost Test (TRC) No Adder	\$0.0199	\$12,976	\$32,984	\$20,008	2.54
Utility Cost Test (UCT)	\$0.0199	\$12,976	\$32,984	\$20,008	2.54
Rate Impact Test (RIM)		\$94,495	\$32,984	-\$61,511	0.35
Participant Cost Test (PCT)		\$7,830	\$89,349	\$81,519	11.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001303
Discounted Participant Payback (years)					n/a

**Table 9 – Low Income Measure Category Level Cost-Effectiveness Results – Lighting
(Low Participation)**

Cost-Effectiveness Test	Levelized \$/kWh	Costs	Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0106	\$8,142	\$37,530	\$29,388	4.61
Total Resource Cost Test (TRC) No Adder	\$0.0106	\$8,142	\$34,118	\$25,976	4.19
Utility Cost Test (UCT)	\$0.0219	\$16,823	\$34,118	\$17,295	2.03
Rate Impact Test (RIM)		\$113,022	\$34,118	-\$78,904	0.30
Participant Cost Test (PCT)		\$0	\$104,880	\$104,880	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000002484
Discounted Participant Payback (years)					n/a

CERTIFICATE OF SERVICE

Advice No. 19-05
Docket No. 19-035-T04

I hereby certify that on March 19, 2019, a true and correct copy of the foregoing was served by electronic mail to the following:

Utah Office of Consumer Services

Michele Beck mbeck@utah.gov

Division of Public Utilities

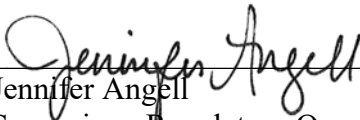
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