

APPENDIX 1

PROGRAM AND PORTFOLIO LEVEL COST-EFFECTIVENESS



MEMORANDUM

To: Nancy Goddard and Peter Schaffer, Pacific Power
From: Eli Morris, Andy Hudson, and Dylan Royalty, AEG
Date: November 9, 2022
Re: Washington Portfolio Level Cost-Effectiveness Analysis – 2022-2023 Biennium

AEG estimated the cost-effectiveness of Pacific Power's overall energy efficiency portfolio and individual programs in the state of Washington based on Program Year (PY) 2022 and PY2023 costs and savings estimates provided by Pacific Power.¹ The memo provides analysis inputs and results in the following tables:

Table 1: Utility Inputs

Table 2: Portfolio-Level Costs - PY2022 and PY2023

Table 3: Program Costs, Nominal - PY2022 and PY2023

Table 4: Savings by Program - PY2022 and PY2023

Table 5: Portfolio-Level Benefit/Cost Ratios - PY2022 and PY2023

Table 6: Total Portfolio Cost-Effectiveness Results - PY2022 and PY2023

Table 7: Total Portfolio Including NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 8: Total Portfolio Including NEEA Cost-Effectiveness Results - PY2022 and PY2023

Table 9: Total Portfolio Including NEIs and NEEA Cost-Effectiveness Results - PY2022 and PY2023

Table 10: Benefit/Cost Ratios by Program - PY2022 and PY2023

Table 11: Home Energy Savings Cost-Effectiveness Results - PY2022 and PY2023

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Table 13: Home Energy Reports Cost-Effectiveness Results - PY2022 and PY2023

Table 14: Wattsmart Business Cost-Effectiveness Results - PY2022 and PY2023

Table 15: Wattsmart Business Including NEIs Cost-Effectiveness Results - PY2022 and PY2023

¹ Consistent with Section 480-109-100 (10) (b) of the Washington Administrative Code, the Low-Income Weatherization program is excluded from this analysis.



Table 16: NEEA Cost-Effectiveness Results - PY2022 and PY2023

Table 17: Home Energy Savings Non-Energy Impacts - PY2022 and PY2023

Table 18: Wattsmart Business Non-Energy Impacts - PY2022 and PY2023

The following assumptions were utilized in the analysis:

- **Avoided Costs:** derived from PacifiCorp's 2021 Integrated Resource Plan (IRP) Preferred Portfolio "P02-MM-CETA", converted into annual values using load shapes from the same IRP.
- **Modeling Inputs:** measure savings, costs, non-energy impacts (NEIs), measure lives, incentive levels, program delivery, and portfolio costs were based on estimates provided by PacifiCorp.
- **Net-to-Gross (NTG):** All cost effectiveness calculations utilize a Net-to-gross ratio of 1.0 consistent with the Council's methodology and 8(a) of Order 01 in Docket UE-210830.
- **Retail Rates:** 2021 rates provided by PacifiCorp and escalated by inflation for future years.

The following tables summarize cost-effectiveness assumptions and results for the Washington portfolio and associated programs.

Table 1: Utility Inputs

Parameter	Value
Discount Rate	6.880%
Residential Line Loss	7.676%
Commercial Line Loss	7.602%
Industrial Line Loss	6.815%
Irrigation Line Loss	7.676%
Residential Energy Rate (\$/kWh)	\$0.0881
Commercial Energy Rate (\$/kWh)	\$0.0836
Industrial Energy Rate (\$/kWh)	\$0.0665
Irrigation Energy Rate (\$/kWh)	\$0.0713
Inflation Rate ²	2.16%

² Future rates determined using a 2.16% annual escalator.



Table 2: Portfolio-Level Costs, Nominal - PY2022 and PY2023

Category	PY2022	PY2023
Be Wattsmart, Begin at Home	\$64,523	\$70,008
Customer Outreach/Communication	\$250,000	\$250,000
Program Evaluations (& Savings Verification)	\$192,837	\$254,497
Potential Study Update/Analysis	\$0	\$0
System Support	\$0	\$0
End Use Load Research & RTF Funding	\$109,500	\$65,500
Total	\$616,860	\$640,005

Table 3: Program Costs, Nominal - PY2022 and PY2023

Program	Program Delivery	Utility Admin	Incentives	Total Utility Budget	Gross Customer Costs
Home Energy Savings	\$5,406,180	\$113,287	\$3,932,102	\$9,451,569	\$8,926,325
Home Energy Reports	\$802,896	\$41,408	\$0	\$844,304	\$0
Wattsmart Business	\$7,788,327	\$1,059,261	\$13,956,487	\$22,804,074	\$16,539,228
NEEA	\$1,684,538	\$55,000	\$0	\$1,739,538	\$0
Total (excluding Portfolio-Level)	\$15,681,941	\$1,268,956	\$17,888,588	\$34,839,485	\$25,465,553

Table 4: Annual Savings and NEIs by Program - PY2022 and PY2023

Program	Gross kWh Savings at Site	Realization Rate	Adjusted Gross kWh Savings at Site	Net to Gross Ratio	Net kWh Savings at Site	NEIs	Measure Life
Home Energy Savings	5,825,574	93%	5,411,301	100%	5,411,301	\$146,444	18
Home Energy Reports	6,684,581	100%	6,684,581	100%	6,684,581	\$0	1
Wattsmart Business	70,086,793	99%	69,243,015	100%	69,043,015	\$1,096,411	10
NEEA*	6,776,658	100%	6,776,658	100%	6,776,658	\$0	15
Total Program	89,373,605	99%	88,115,554	100%	88,115,554	\$1,242,855	10



Table 5: Portfolio-Level Benefit/Cost Ratios - PY2022 and PY2023

Program	PTRC	TRC	UCT	PCT	RIM
Total Portfolio	1.56	1.42	1.73	2.67	0.70
Total Portfolio with NEIs	1.73	1.59	1.73	2.95	0.70
Total Portfolio with NEEA	1.66	1.51	1.83	2.92	0.71
Total Portfolio with NEEA and NEIs	1.56	1.42	1.73	2.67	0.70

Table 6: Total Portfolio Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0743	\$40,309,796	\$62,837,053	\$22,527,257	1.56
Total Resource Cost Test (TRC) No Adder	\$0.0743	\$40,309,796	\$57,124,594	\$16,814,798	1.42
Utility Cost Test (UCT)	\$0.0609	\$33,039,556	\$57,124,594	\$24,085,038	1.73
Participant Cost Test (PCT)		\$24,429,823	\$65,189,214	\$40,759,391	2.67
Rate Impact Test (RIM)		\$81,069,187	\$57,124,594	(\$23,944,593)	0.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0014570
Discounted Participant Payback (years)					3.43

Table 7: Total Portfolio Including NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0743	\$40,309,796	\$69,740,826	\$29,431,030	1.73
Total Resource Cost Test (TRC) No Adder	\$0.0743	\$40,309,796	\$64,028,367	\$23,718,571	1.59
Utility Cost Test (UCT)	\$0.0609	\$33,039,556	\$57,124,594	\$24,085,038	1.73
Participant Cost Test (PCT)		\$24,429,823	\$72,092,987	\$47,663,164	2.95
Rate Impact Test (RIM)		\$81,069,187	\$57,124,594	(\$23,944,593)	0.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0014570
Discounted Participant Payback (years)					3.00



Table 8: Total Portfolio Including NEEA Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0695	\$41,992,852	\$69,829,580	\$27,836,728	1.66
Total Resource Cost Test (TRC) No Adder	\$0.0695	\$41,992,852	\$63,481,437	\$21,488,584	1.51
Utility Cost Test (UCT)	\$0.0575	\$34,722,612	\$63,481,437	\$28,758,825	1.83
Participant Cost Test (PCT)		\$24,429,823	\$71,390,732	\$46,960,909	2.92
Rate Impact Test (RIM)		\$88,953,762	\$63,481,437	(\$25,472,325)	0.71
Lifecycle Revenue Impacts (\$/kWh)					\$0.0015987
Discounted Participant Payback (years)					3.23

Table 9: Total Portfolio Including NEIs and NEEA Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0695	\$41,992,852	\$76,733,354	\$34,740,501	1.83
Total Resource Cost Test (TRC) No Adder	\$0.0695	\$41,992,852	\$70,385,210	\$28,392,358	1.68
Utility Cost Test (UCT)	\$0.0575	\$34,722,612	\$63,481,437	\$28,758,825	1.83
Participant Cost Test (PCT)		\$24,429,823	\$78,294,505	\$53,864,682	3.20
Rate Impact Test (RIM)		\$88,953,762	\$63,481,437	(\$25,472,325)	0.71
Lifecycle Revenue Impacts (\$/kWh)					\$0.0015987
Discounted Participant Payback (years)					2.85

Table 10: Benefit/Cost Ratios by Program - PY2022 and PY2023

Program	PTRC	TRC	UCT	PCT	RIM
Home Energy Savings	0.48	0.43	0.66	1.09	0.41
Home Energy Savings with NEIs	0.58	0.53	0.66	1.25	0.41
Home Energy Reports	1.07	0.97	0.97	0.00	0.57
Wattsmart Business	2.27	2.07	2.30	3.49	0.79
Wattsmart Business with NEIs	2.50	2.29	2.30	3.84	0.79
NEEA	4.15	3.78	3.78	0.00	0.81



Table 11: Home Energy Savings Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2586	\$13,911,784	\$6,612,089	(\$7,299,696)	0.48
Total Resource Cost Test (TRC) No Adder	\$0.2586	\$13,911,784	\$6,010,990	(\$7,900,794)	0.43
Utility Cost Test (UCT)	\$0.1689	\$9,086,855	\$6,010,990	(\$3,075,866)	0.66
Participant Cost Test (PCT)		\$8,593,531	\$9,368,497	\$774,966	1.09
Rate Impact Test (RIM)		\$14,686,751	\$6,010,990	(\$8,675,761)	0.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002640
Discounted Participant Payback (years)					15.31

Table 12: Home Energy Savings Including NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2586	\$13,911,784	\$8,025,486	(\$5,886,298)	0.58
Total Resource Cost Test (TRC) No Adder	\$0.2586	\$13,911,784	\$7,424,387	(\$6,487,397)	0.53
Utility Cost Test (UCT)	\$0.1689	\$9,086,855	\$6,010,990	(\$3,075,866)	0.66
Participant Cost Test (PCT)		\$8,593,531	\$10,781,895	\$2,188,364	1.25
Rate Impact Test (RIM)		\$14,686,751	\$6,010,990	(\$8,675,761)	0.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002640
Discounted Participant Payback (years)					13.16

Table 13: Home Energy Reports Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1262	\$814,500	\$870,523	\$56,023	1.07
Total Resource Cost Test (TRC) No Adder	\$0.1262	\$814,500	\$791,385	(\$23,115)	0.97
Utility Cost Test (UCT)	\$0.1262	\$814,500	\$791,385	(\$23,115)	0.97
Participant Cost Test (PCT)		\$0	\$575,052	\$575,052	n/a
Rate Impact Test (RIM)		\$1,389,552	\$791,385	(\$598,167)	0.57
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001829
Discounted Participant Payback (years)					0.00



Table 14: Wattsmart Business Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0505	\$24,367,846	\$55,354,441	\$30,986,595	2.27
Total Resource Cost Test (TRC) No Adder	\$0.0505	\$24,367,846	\$50,322,219	\$25,954,374	2.07
Utility Cost Test (UCT)	\$0.0455	\$21,922,534	\$50,322,219	\$28,399,685	2.30
Participant Cost Test (PCT)		\$15,836,292	\$55,245,665	\$39,409,373	3.49
Rate Impact Test (RIM)		\$63,777,218	\$50,322,219	(\$13,454,999)	0.79
Lifecycle Revenue Impacts (\$/kWh)					\$0.0014564
Discounted Participant Payback (years)					2.65

Table 15: Wattsmart Business Including NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0505	\$24,367,846	\$60,844,817	\$36,476,971	2.50
Total Resource Cost Test (TRC) No Adder	\$0.0505	\$24,367,846	\$55,812,595	\$31,444,749	2.29
Utility Cost Test (UCT)	\$0.0455	\$21,922,534	\$50,322,219	\$28,399,685	2.30
Participant Cost Test (PCT)		\$15,836,292	\$60,736,040	\$44,899,748	3.84
Rate Impact Test (RIM)		\$63,777,218	\$50,322,219	(\$13,454,999)	0.79
Lifecycle Revenue Impacts (\$/kWh)					\$0.0014564
Discounted Participant Payback (years)					2.29

Table 16: NEEA Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0272	\$1,683,056	\$6,992,527	\$5,309,471	4.15
Total Resource Cost Test (TRC) No Adder	\$0.0272	\$1,683,056	\$6,356,843	\$4,673,787	3.78
Utility Cost Test (UCT)	\$0.0272	\$1,683,056	\$6,356,843	\$4,673,787	3.78
Participant Cost Test (PCT)		\$0	\$6,201,518	\$6,201,518	n/a
Rate Impact Test (RIM)		\$7,884,574	\$6,356,843	(\$1,527,731)	0.81
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001716
Discounted Participant Payback (years)					0.00



Table 17: Home Energy Savings Non-Energy Impacts - PY2022 and PY2023

Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Single Family - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert FAF w/CAC - WA	\$7,201.73	2	15	\$67,376
Single Family - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert FAF w/out CAC - WA	\$7,380.80	2	17	\$75,389.26
Single Family - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert FAF w/CAC - WA	\$7,737.21	2	15	\$71,542
Single Family - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert FAF w/out CAC - WA	\$6,978.02	2	17	\$70,313.12
Manufactured Home - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert FAF w/CAC - WA	\$2,386.14	2	15	\$24,547
Insulation - Floor - Heat Pump - R0 to R19 - WA	\$7.64	2	45	\$108.86
Manufactured Home - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert FAF w/out CAC - WA	\$2,272.30	2	17	\$24,055
Single Family Ductless Heat Pump - eFAF to DHP 9.0 HSPF and above - WA	\$25,739.91	2	15	\$248,761.90
Manufactured Home - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert FAF w/CAC - WA	\$1,193.42	2	15	\$11,320
Manufactured Home - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert FAF w/out CAC - WA	\$1,728.93	2	17	\$18,034.24
Single Family Ductless Heat Pump - Zonal to DHP - WA	\$9,671.65	2	15	\$91,924
Manufactured Home - Duct Sealing - Direct Install - Heat Pump - Test and Seal - WA	\$2,271.76	1	18	\$24,636.96
Single Family - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert FAF w/CAC - WA	\$6,057.34	2	15	\$57,866
Smart Thermostat - Heat Pump - WA	\$922.54	1	5	\$4,055.86
Single Family - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert FAF w/out CAC - WA	\$5,842.03	2	17	\$59,940
Smart Thermostat - eFAF - WA	\$648.00	1	5	\$2,848.89
Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Zonal or DHP - WA	\$0.17	2	45	\$2
LEDs - General Purpose & Three-Way - 250 to 1049 Lumens - WA	\$947.00	2	9	\$12,940.03
Manufactured Home - Duct Sealing - Not Direct Install - eFAF - WA	\$161.28	1	18	\$1,749
Manufactured Home - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert FAF w/CAC - WA	\$1,819.26	2	15	\$18,616.03
Manufactured Home - Duct Sealing - Direct Install - eFAF - Test, Seal, & Crossover - WA	\$3,594.18	1	18	\$38,978
Manufactured Home - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert FAF w/out CAC - WA	\$1,741.51	2	17	\$18,391.99
HPWH Tier 3 Ducted Heat Pump 0-55 Gallons - WA	\$3.39	2	13	\$61
HPWH Tier 3 Indoor Heat Pump 0-55 Gallons - WA	\$3.37	2	13	\$60.59



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
HPWH Tier 3 Ducted Heat Pump 0-55 Gallons - Self Install - WA	\$6.77	2	13	\$122
HPWH Tier 3 Indoor Heat Pump 0-55 Gallons - Self Install - WA	\$6.74	2	13	\$121.17
Insulation - Attic - eFAF - R11 to R49 - WA	\$73.59	2	45	\$1,046
Manufactured Home - Duct Sealing - Not Direct Install - Heat Pump - WA	\$116.50	1	18	\$1,263.43
Manufactured Home - Smart Thermostat - eFAF - WA	\$648.00	1	5	\$2,849
Single Family - Heat Pump Upgrade to 12.0 HSPF/18.0 SEER - WA	\$919.38	2	18	\$9,970.61
New Manufactured Home - Air Source Heat Pump - WA	\$271.41	2	15	\$2,662
LED - Direct install - Exterior - General Purpose and Three-Way - 250 to 1049 lumens - WA	\$379.51	2	2	\$1,277.14
Manufactured Home Ductless Heat Pump - eFAF to DHP 9.0 HSPF and above - WA	\$721.07	2	15	\$6,823
HPWH Tier 3 Basement 0-55 Gallons - WA	\$7.16	2	13	\$128.74
HPWH Tier 3 Garage 0-55 Gallons - WA	\$7.14	2	13	\$128
Manufactured Home - Smart Thermostat - Heat Pump - WA	\$937.66	1	5	\$4,122.35
Multifamily Ductless Heat Pump - Electric Resistance Heating to DHP 9.0 HSPF and above - WA	\$3,549.18	2	15	\$33,563
LEDs - Reflectors & Outdoor - 250 to 1049 Lumens - WA	\$1,251.09	2	8	\$15,580.21
HPWH Tier 3 Ducted Electric Resistance Heat 0-55 Gallons - WA	\$5.82	2	13	\$105
HPWH Tier 4 Garage 0-55 Gallons - WA	\$8.39	1	13	\$75.47
HPWH Tier 4 Basement 0-55 Gallons - WA	\$4.20	1	13	\$38
LED - Direct install - High Use - General Purpose and Three-Way - 250 to 1049 lumens - WA	\$251.27	2	2	\$1,360.24
Single Family - Heat Pump Upgrade to 9.0 HSPF/14.0 SEER - WA	\$394.45	2	18	\$4,073
Clothes Washers - Front Load - Electric DHW & Electric Dryer - WA	\$419.71	2	13	\$3,585.92
HPWH Tier 4 Indoor Heat Pump 0-55 Gallons - WA	\$3.79	1	13	\$34
HPWH Tier 4 Indoor Heat Pump 0-55 Gallons - Self Install - WA	\$3.79	1	13	\$34.06
HPWH Tier 3 Indoor Electric Resistance Heat 0-55 Gallons - WA	\$2.47	2	13	\$0
HPWH Tier 4 Ducted Heat Pump 0-55 Gallons - WA	\$3.70	1	13	\$33.31
HPWH Tier 4 Ducted Heat Pump 0-55 Gallons - Self Install - WA	\$3.70	1	13	\$33
HPWH Tier 3 Basement 0-55 Gallons - Self Install - WA	\$3.58	2	13	\$0.00
Clothes Dryer - Vented_UCEF 3.80 to 4.19 - WA	-\$1.06	2	12	\$0
HPWH Tier 3 Garage 0-55 Gallons - Self Install - WA	\$3.57	2	13	\$0.00



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Clothes Dryer - Vented_UCEF 4.70 to 5.29 - WA	-\$1.41	2	12	\$0
Insulation - Attic - Heat Pump - R11 to R49 - WA	\$87.25	2	45	\$1,227.85
Manufactured Home Ductless Heat Pump - Zonal to DHP - WA	\$351.21	2	15	\$3,306
Insulation - Attic - Zonal or DHP - R19 to R49 - WA	\$47.59	2	45	\$669.74
HPWH Tier 4 Ducted Electric Resistance Heat 0-55 Gallons - WA	\$3.06	1	13	\$27
LED - Direct install - Exterior - Decorative and Mini-Base - 250 to 1049 lumens - WA	\$218.52	2	2	\$604.86
HPWH Tier 3 Ducted Electric Resistance Heat 0-55 Gallons - Self Install - WA	\$2.91	2	13	\$0
LED - Direct install - Exterior - Reflectors and Outdoor - 250 to 1049 lumens - WA	\$231.09	2	1	\$121.94
HPWH Tier 3 Indoor Electric Resistance Heat 0-55 Gallons - Self Install - WA	\$2.47	2	13	\$0
LED - Direct install - TLED - 4ft - WA	\$43.45	2	12	\$357.42
Insulation - Attic - Zonal or DHP - R11 to R49 - WA	\$113.69	2	45	\$1,600
LED - Direct install - High Use - Decorative and Mini-Base - 250 to 1049 lumens - WA	\$161.98	2	2	\$451.80
LED - Direct install - High Use - Reflectors and Outdoor - 250 to 1049 lumens - WA	\$164.02	2	2	\$24
LED - Direct install - Moderate Use - General Purpose and Three-Way - 250 to 1049 lumens - WA	\$143.53	2	4	\$519.12
LED - Direct install - MR - 46 to 59W equivalent - WA	\$142.64	2	3	\$27
Manufactured Home - Heat Pump Upgrade to 12.0 HSPF/18.0 SEER - WA	\$215.86	2	18	\$2,341.01
Manufactured Home - Heat Pump Upgrade to 9.0 HSPF/14.0 SEER - WA	\$110.83	2	18	\$1,153
HPWH Tier 4 Indoor Electric Resistance Heat 0-55 Gallons - WA	\$2.81	1	13	\$25.28
Insulation - Attic - eFAF - R19 to R49 - WA	\$66.10	2	45	\$930
LED - Direct install - Moderate Use - Decorative and Mini-Base - 250 to 1049 lumens - WA	\$99.91	2	3	\$279.95
Duct Sealing - Electric Forced Air Furnace - WA	\$178.16	1	20	\$2,036
LED - Direct install - Moderate Use - Reflectors and Outdoor - 250 to 1049 lumens - WA	\$106.84	2	4	\$386.82
Duct Sealing - Heat Pump - WA	\$140.56	1	20	\$1,606
HPWH Tier 4 Garage 0-55 Gallons - Self Install - WA	\$4.20	1	13	\$37.73
HPWH Tier 4 Basement 0-55 Gallons - Self Install - WA	\$4.20	1	13	\$38
HPWH Tier 4 Indoor Electric Resistance Heat 0-55 Gallons - Self Install - WA	\$2.81	1	13	\$25.28
HPWH Tier 4 Ducted Electric Resistance Heat 0-55 Gallons - Self Install - WA	\$3.06	1	13	\$27



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Insulation - Floor - Zonal or DHP - R0 to R30 - WA	\$27.86	2	45	\$397.07
Insulation - Attic - Gas Heated - R11 to R49 - WA	\$15.15	2	45	\$213
Insulation - Wall - eFAF - R0 to R13 - WA	\$13.52	2	45	\$192.98
Insulation - Floor - eFAF - R0 to R30 - WA	\$15.28	2	45	\$218
Insulation - Attic - Heat Pump - R19 to R49 - WA	\$47.59	2	45	\$669.74
Insulation - Wall - Heat Pump - R0 to R13 - WA	\$7.67	2	45	\$109
Insulation - Wall - Zonal or DHP - R0 to R13 - WA	\$10.37	2	45	\$148.49
Insulation - Floor - eFAF - R0 to R19 - WA	\$13.93	2	45	\$199
Single Family - Central Air Conditioner - SEER 15.0 / EER 12.0 - WA	\$11.08	2	18	\$115.20
Clothes Washers - Front Load - Electric DHW & Gas Dryer - WA	\$419.66	2	13	\$3,585
LED - Direct install - TLED - 2ft - WA	\$23.21	2	12	\$190.96
Insulation - Floor - Heat Pump - R0 to R30 - WA	\$8.09	2	45	\$115
Single Family - Central Air Conditioner - SEER 16.0 / EER 12.0 - WA	\$23.43	2	18	\$243.55
Single Family - Central Air Conditioner - SEER 18.0 / EER 13.0 - WA	\$30.24	2	18	\$321
Single Family - Central Air Conditioner - SEER 17.0 / EER 13.0 - WA	\$23.56	2	18	\$250.39
Clothes Washers - Front Load - Gas DHW & Electric Dryer - WA	\$419.61	2	13	\$3,585
Clothes Washers - Front Load - Any fuel type - WA	\$419.58	1	12	\$3,584.75
Insulation - Floor - Zonal or DHP - R0 to R19 - WA	\$25.74	2	45	\$367
Insulation - Attic - Gas Heated - R19 to R49 - WA	\$5.29	2	45	\$74.39
Windows - Ufactor > 0.30 to Ufactor <= 0.25 - eFAF - WA	\$0.18	2	45	\$2
Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Heat Pump - WA	\$0.07	2	45	\$0.96
Clothes Dryer - Vented_UCEF 4.20 to 4.69 - WA	\$0.03	2	12	\$0
Single Family Duct Sealing and Insulation- Electric Heat Visual and Test - No CAC - Any HZ - WA	\$87.96	1	20	\$940.65
Single Family Duct Sealing and Insulation- Electric Heat Visual and Test - CAC - Any HZ - WA	\$95.15	1	20	\$1,018
Line Voltage Connected Thermostat - Retail - Any Heating System - Any Housing Type - WA	\$24.80	1	15	\$227.63
Line Voltage Connected Thermostat - Direct Install - Any Heating System - Any Housing Type - WA	\$45.84	2	15	\$569
HPWH Tier 3 Any Location - 0-55 Gallons - Existing Home - WA	\$13.33	1	13	\$112.17
HPWH Tier 3 Any Location - Any Size - Existing Home - WA	\$12.68	1	13	\$107
HPWH Tier 4 Any Location - 0-55 Gallons - Existing Home - WA	\$14.83	1	13	\$124.80



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
HPWH Tier 4 Any Location - Any Size - Existing Home - WA	\$14.00	1	13	\$118
HPWH Tier 3 Any Location - Any Size - New Construction - WA	\$12.92	1	13	\$108.75
HPWH Tier 4 Any Location - Any Size - New Construction - WA	\$14.32	1	13	\$121
HPWH Tier 3 Any Location - 0-55 Gallons - New Construction - WA	\$13.58	1	13	\$114.30
HPWH Tier 4 Any Location - 0-55 Gallons - New Construction - WA	\$15.17	1	13	\$128
HPWH Tier 3 Any Location - 0-55 Gallons - Existing Home - Self-Install - WA	\$10.00	1	13	\$84.12
HPWH Tier 3 Any Location - Any Size - Existing Home - Self-Install - WA	\$9.51	1	13	\$80
HPWH Tier 4 Any Location - 0-55 Gallons - Existing Home - Self-Install - WA	\$11.12	1	13	\$93.60
HPWH Tier 4 Any Location - Any Size - Existing Home - Self-Install - WA	\$10.50	1	13	\$88
HPWH Tier 3 Any Location - Any Size - New Construction - Self-Install - WA	\$12.92	1	13	\$108.75
HPWH Tier 4 Any Location - Any Size - New Construction - Self-Install - WA	\$14.32	1	13	\$121
HPWH Tier 3 Any Location - 0-55 Gallons - New Construction - Self-Install - WA	\$13.58	1	13	\$114.30
HPWH Tier 4 Any Location - 0-55 Gallons - New Construction - Self-Install - WA	\$15.17	1	13	\$128
Manufactured Home - Central Air Conditioner - SEER 15.0 / EER 12.0 - WA	\$1.92	2	18	\$19.46
Manufactured Home - Central Air Conditioner - SEER 16.0 / EER 12.0 - WA	\$4.05	2	18	\$41
Manufactured Home - Duct Sealing - Direct Install - Electric Ducted - WA	\$938.44	1	20	\$10,035.23
Manufactured Home - Duct Sealing - Not Direct Install - Electric Ducted - WA	\$450.45	1	20	\$4,817
Named Communities - Manufactured Home Ductless Heat Pump - Zonal to DHP - WA	\$54.84	1	15	\$503.29
Multifamily - Insulation - Attic - Ductless Heat Pump - R0 to R49 - WA	\$97.14	2	45	\$1,341
Multifamily - Insulation - Attic - Ductless Heat Pump - R19 to R49 - WA	\$28.57	2	45	\$394.48
Multifamily - Insulation - Attic - eFAF - R0 to R49 - WA	\$203.81	2	45	\$2,814
Multifamily - Insulation - Attic - eFAF - R19 to R49 - WA	\$60.95	2	45	\$841.55
Multifamily - Insulation - Attic - Heat Pump - R0 to R49 - WA	\$72.38	2	45	\$999
Multifamily - Insulation - Attic - Heat Pump - R19 to R49 - WA	\$20.95	2	45	\$289.28
Multifamily - Insulation - Attic - Zonal - R0 to R49 - WA	\$135.71	2	45	\$1,874



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Multifamily - Insulation - Attic - Zonal - R19 to R49 - WA	\$40.00	2	45	\$552.27
Multifamily - Windows - Double Pane to Ufactor <= 0.22 - HZ1 - DHP - WA	\$1.48	1	45	\$20
Multifamily - Windows - Double Pane to Ufactor <= 0.22 - HZ1 - Furnace - WA	\$3.15	1	45	\$43.46
Multifamily - Windows - Double Pane to Ufactor <= 0.22 - HZ1 - Heat Pump - WA	\$1.25	1	45	\$17
Multifamily - Windows - Double Pane to Ufactor <= 0.22 - HZ1 - Zonal - WA	\$2.79	1	45	\$38.49
Multifamily - Windows - Single Pane to Ufactor <= 0.22 - HZ1 - DHP - WA	\$0.84	1	45	\$12
Multifamily - Windows - Single Pane to Ufactor <= 0.22 - HZ1 - Furnace - WA	\$1.79	1	45	\$24.75
Multifamily - Windows - Single Pane to Ufactor <= 0.22 - HZ1 - Heat Pump - WA	\$0.72	1	45	\$10
Multifamily - Windows - Single Pane to Ufactor <= 0.22 - HZ1 - Zonal - WA	\$1.59	1	45	\$21.96
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.22 - HZ1 - DHP - WA	\$0.12	1	45	\$2
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.22 - HZ1 - Furnace - WA	\$0.27	1	45	\$3.68
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.22 - HZ1 - Heat Pump - WA	\$0.10	1	45	\$1
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.22 - HZ1 - Zonal - WA	\$0.24	1	45	\$3.27
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Ductless Heat Pump - WA	\$0.10	2	45	\$1
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.25 - eFAF - WA	\$0.22	2	45	\$3.07
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Heat Pump - WA	\$0.08	2	45	\$1
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Zonal - WA	\$0.20	2	45	\$2.72
Named Communities - Multifamily Ductless Heat Pump - Electric Resistance Heating to DHP 9.0 HSPF and above - WA	\$219.93	1	15	\$2,018
Named Communities Ductless Heat Pump - Oil to DHP - WA	\$458.81	1	15	\$4,210.63
Named Communities Ductless Heat Pump - Propane to DHP - WA	\$284.66	1	15	\$2,612
Named Communities Ductless Heat Pump - Wood to DHP - WA	\$277.66	1	15	\$2,548.20
Fuel Switching Ductless Heat Pump - Oil to DHP - WA	\$802.91	1	15	\$7,369
Fuel Switching Ductless Heat Pump - Propane to DHP - WA	\$569.33	1	15	\$5,224.92
Fuel Switching Ductless Heat Pump - Wood to DHP - WA	\$647.88	1	15	\$5,946



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Single Family - Duct Sealing - Visual and Test - Electric Ducted - NoCAC - WA	\$287.51	1	20	\$3,074.46
Single Family - Duct Sealing - Visual and Test - Electric Ducted - CAC - WA	\$316.26	1	20	\$3,382
Single Family - Duct Sealing - Direct Install - Visual and Test - Electric Ducted - NoCAC - WA	\$9,583.54	1	20	\$102,482.03
Single Family - Duct Sealing - Direct Install - Visual and Test - Electric Ducted - CAC - WA	\$10,541.90	1	20	\$112,730
Named Communities - Single Family Ductless Heat Pump - eFAF to DHP 9.0 HSPF and above - WA	\$1,038.18	1	15	\$9,527.71
Named Communities - Single Family Ductless Heat Pump - Zonal to DHP - WA	\$822.61	1	15	\$7,549
Smart Thermostat - Heat Pump - SF and MH - Retail - WA	\$919.50	1	7	\$4,976.25
Smart Thermostat - eFAF - SF and MH - Retail - WA	\$448.01	1	7	\$2,425
Smart Thermostat - Heat Pump - MF - Direct Install wResistance Optimization - WA	\$178.65	1	7	\$966.81
Smart Thermostat - Heat Pump - MF - Direct Install - WA	\$89.32	1	7	\$483
Smart Thermostat - eFAF - MF - Direct Install - WA	\$35.59	1	7	\$192.63
Single Family - Windows - Single Pane to Class 30 - Heating Zone 1 (Electric FAF)	\$0.01	1	45	\$0
Single Family - Windows - Single Pane to Class 22 - Heating Zone 1 (Electric FAF)	\$0.01	1	45	\$0.08
Single Family - Windows - Double Pane to Class 22 - Heating Zone 1 (Electric FAF)	\$0.01	1	45	\$0
Single Family - Windows - Double Pane to Class 30 - Heating Zone 1 (Zonal or DHP)	\$0.01	1	45	\$0.12
Single Family - Windows - Single Pane to Class 22 - Heating Zone 1 (Zonal or DHP)	\$0.01	1	45	\$0
Single Family - Windows - Single Pane to Class 30 - Heating Zone 1 (Heat Pump)	\$0.01	1	45	\$0.12
Single Family - Windows - Double Pane to Class 30 - Heating Zone 1 (Heat Pump)	\$0.01	1	45	\$0
Single Family - Windows - Double Pane to Class 22 - Heating Zone 1 (Heat Pump)	\$0.01	1	45	\$0.08
Fuel Switching - Manufactured Home - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert Oil/Propane/Wood - WA	\$124.64	1	16	\$1,187
Fuel Switching - Manufactured Home - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert Oil/Propane/Wood - WA	\$216.48	1	16	\$2,061.41
Fuel Switching - Manufactured Home - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert Oil/Propane/Wood - WA	\$111.06	1	16	\$1,058



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Fuel Switching - Single Family - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert Oil/Propane/Wood - WA	\$258.28	1	16	\$2,459.42
Fuel Switching - Single Family - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert Oil/Propane/Wood - WA	\$463.37	1	16	\$4,412
Fuel Switching - Single Family - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert Oil/Propane/Wood - WA	\$234.61	1	16	\$2,234.05
Named Communities - Manufactured Home - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Any Conversion - WA	\$124.64	1	16	\$1,187
Named Communities - Manufactured Home - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Any Conversion - WA	\$324.73	1	16	\$3,092.11
Named Communities - Manufactured Home - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Any Conversion - WA	\$222.13	1	16	\$2,115
Named Communities - Single Family - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Any Conversion - WA	\$1,033.13	1	16	\$9,837.68
Named Communities - Single Family - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Any Conversion - WA	\$1,390.10	1	16	\$13,237
Named Communities - Single Family - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Any Conversion - WA	\$1,173.07	1	16	\$11,170.25
NC Heat Pump to 12.0 HSPF/18.0 SEER - Standalone - WA	\$138.42	1	18	\$1,405
Air Purifier - Energy Star - CADR 30-99 - WA	\$0.01	1	9	\$0.06
Air Purifier - Energy Star - CADR 100-149 - WA	\$0.01	1	9	\$0
Air Purifier - Energy Star - CADR 150-224 - WA	\$0.01	1	9	\$0.07
Air Purifier - Energy Star - CADR >= 225 - WA	\$0.01	1	9	\$0
Engine Block Heater Control - Wall Mounted - WA	\$0.16	1	5	\$0.68
Engine Block Heater Control - Engine Mounted - WA	\$0.16	1	5	\$1



Table 18: Wattsmart Business Savings Non-Energy Impacts - PY2022 and PY2023

Measure	Annual Non-Energy Impacts per Measure	Total Installs	Measure Life	Total Present Value NEIs
Additional Measures	\$3,041.75	4	15	\$28,315
Compressed Air	\$9,184.35	6	14	\$34,868.56
Energy Management	\$504,340.40	10	3	\$1,729,678
HVAC	-\$8,017.57	10	13	-\$145,905.22
Motors	\$46,682.54	6	13	\$430,803
Refrigeration	\$10,557.38	4	14	\$96,914.28
Wastewater	\$972.97	2	15	\$9,239
Sprinkler	\$8,896.14	16	6	\$47,342.17
Nozzle	\$234.14	2	6	\$1,158
Gasket for wheel line, hand line, or portable main line	\$970.60	2	6	\$4,801.62
Drain for wheel line, hand line, portable main line, pivot, or linear	\$226.80	2	6	\$1,122
Wheel line leveler	\$168.92	2	7	\$997.73
Irrigation Pump VFD	\$2,887.52	2	10	\$21,107
Adaptive Refrigeration Control	\$2,184.19	2	12	\$17,757.05
Fast Acting Doors	\$2,396.04	2	8	\$14,779
Custom Capital Projects	\$2,384.29	2	15	\$22,170.37
Low Power Mixer	-\$4,926.60	1	15	-\$48,324
Lighting	\$513,363.89	62	8	\$2,749,796.61
Anti-Sweat Heater Control	\$122.15	1	13	\$1,028
ECM	\$741.25	1	13	\$6,237.47



MEMORANDUM

To: Nancy Goddard and Peter Schaffer, Pacific Power
From: Eli Morris, Andy Hudson, and Dylan Royalty, AEG
Date: November 9, 2022
Re: Washington Home Energy Savings Program Cost-Effectiveness Analysis – 2022-2023 Biennium

AEG estimated the cost-effectiveness of Pacific Power's Home Energy Savings Program in the state of Washington based on Program Year (PY) 2022 and PY2023 costs and savings estimates provided by Pacific Power.¹ The memo provides analysis inputs and results in the following tables:

Table 1: Cost-Effectiveness Analysis Inputs

Table 2: Annual Program Costs, Nominal - PY2022 and PY2023

Table 3: Annual Savings - PY2022 and PY 2023

Table 4: Benefit/Cost Ratios by Measure Category - PY2022 and PY2023

Table 5: Home Energy Savings Program Cost-Effectiveness Results - PY2022 and PY2023

Table 6: Appliances Cost-Effectiveness Results - PY2022 and PY2023

Table 7: Water Heating Cost-Effectiveness Results - PY2022 and PY2023

Table 8: HVAC Cost-Effectiveness Results - PY2022 and PY2023

Table 9: Whole Home Cost-Effectiveness Results - PY2022 and PY2023

Table 10: Building Shell Cost-Effectiveness Results - PY2022 and PY2023

Table 11: Electronics Cost-Effectiveness Results - PY2022 and PY2023

Table 12: Lighting Cost-Effectiveness Results - PY2022 and PY2023

Table 13: Home Energy Savings Program with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 14: Appliances with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 15: Water Heating with NEIs Cost-Effectiveness Results - PY2022 and PY2023

¹ Consistent with Section 480-109-100 (10) (b) of the Washington Administrative Code, the Low-Income Weatherization program is excluded from this analysis.



Table 16: HVAC with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 17: Whole Home with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 18: Building Shell with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 19: Electronics with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 20: Lighting with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 21: Home Energy Savings Non-Energy Impacts - PY2022 and PY2023

The following assumptions were utilized in the analysis:

- **Avoided Costs:** derived from PacifiCorp's 2021 Integrated Resource Plan (IRP) Preferred Portfolio "PO2-MM-CETA" converted into annual values using load shapes from the same IRP.
- **Modeling Inputs:** measure savings, costs, non-energy impacts (NEIs), measure lives, incentive levels, program delivery, and portfolio costs were based on estimates provided by PacifiCorp.
- **Net-to-Gross (NTG):** All cost effectiveness calculations utilize a Net-to-gross ratio of 1.0 consistent with the Council's methodology and 8(a) of Order 01 in Docket UE-210830.
- **Retail Rates:** 2021 rates provided by PacifiCorp and escalated by inflation for future years.

The following tables summarize cost-effectiveness assumptions and results for the Washington Home Energy Savings Program. The cost-effectiveness analysis inputs are shown in Table 1 through Table 3 below:

Table 1: Cost-Effectiveness Analysis Inputs

Parameter	Value
Discount Rate	6.88%
Residential Line Loss	7.68%
Residential Energy Rate (\$/kWh)	\$0.0881
Inflation Rate ²	2.16%
Net-to-Gross	100%
Realization Rate	100%

² Future rates determined using a 2.16% annual escalator.



Table 2: Annual Program Costs, Nominal - PY2022 and PY2023

Measure Category	Program Delivery	Utility Admin	Incentives	Total Utility Budget	Gross Customer Costs
Appliances	\$27,858	\$588	\$28,150	\$56,596	\$22,342
Water Heating	\$121,900	\$2,518	\$81,000	\$205,418	\$80,004
HVAC	\$4,615,147	\$97,464	\$3,226,050	\$7,938,661	\$7,683,974
Whole Home	\$276,382	\$5,255	\$204,875	\$486,512	\$266,274
Building Shell	\$206,879	\$3,974	\$307,749	\$518,603	\$836,959
Electronics	\$21,265	\$397	\$2,600	\$24,262	\$5,940
Lighting	\$136,750	\$3,090	\$81,678	\$221,518	\$30,833
Total Program	\$5,406,180	\$113,287	\$3,932,102	\$9,451,569	\$8,926,325

Table 3: Annual Savings - PY2022 and 2023

Measure Category	Gross kWh Savings at Site	Net kWh Savings at Site	Gross kWh Savings at Generator	Net kWh Savings at Generator	Measure Life
Appliances	29,862	29,862	32,154	32,154	13
Water Heating	132,883	132,883	143,083	143,083	13
HVAC	4,941,494	4,645,005	5,320,803	5,001,555	17
Whole Home	320,379	275,526	344,971	296,675	30
Building Shell	238,102	197,625	256,379	212,795	45
Electronics	24,950	21,457	26,865	23,104	5
Lighting	137,903	108,943	148,488	117,306	4
Total Program	5,825,574	5,411,301	6,272,745	5,826,672	18

Table 4 presents the cost-effectiveness results by measure category and the total program with and without non-energy impacts (NEIs). Including NEIs, the program is cost-effective from the PacifiCorp TRC, UCT, and PCT perspectives.



Table 4: Benefit/Cost Ratios by Measure Category - PY2022 and PY2023

Measure Category	PTRC	TRC	UCT	PCT	RIM
Appliances	0.57	0.52	0.47	2.45	0.32
Appliances (with NEIs)	0.86	0.81	0.47	3.11	0.32
Water Heating	0.61	0.55	0.55	2.50	0.35
Water Heating (with NEIs)	0.62	0.57	0.55	2.54	0.35
HVAC	0.45	0.41	0.64	1.05	0.40
HVAC (with NEIs)	0.57	0.53	0.64	1.23	0.40
Whole Home	1.04	0.95	1.06	2.32	0.58
Whole Home (with NEIs)	1.04	0.95	1.06	2.32	0.58
Building Shell	0.45	0.41	0.83	0.78	0.49
Building Shell (with NEIs)	0.47	0.43	0.83	0.80	0.49
Electronics	0.38	0.34	0.39	2.02	0.28
Electronics (with NEIs)	0.38	0.34	0.39	2.02	0.28
Lighting	0.31	0.28	0.22	3.88	0.19
Lighting (with NEIs)	0.43	0.41	0.22	4.56	0.19
Total Program	0.48	0.43	0.66	1.09	0.41
Total Program (with NEIs)	0.58	0.53	0.66	1.25	0.41

Tables 5 through 12 present detailed cost-effectiveness results for the total program and for each measure category, excluding NEIs.

Table 5: Home Energy Savings Program Cost-Effectiveness Results - PY2022 and PY2023³

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2586	\$13,911,784	\$6,612,089	(\$7,299,696)	0.48
Total Resource Cost Test (TRC) No Adder	\$0.2586	\$13,911,784	\$6,010,990	(\$7,900,794)	0.43
Utility Cost Test (UCT)	\$0.1689	\$9,086,855	\$6,010,990	(\$3,075,866)	0.66
Participant Cost Test (PCT)		\$8,593,531	\$9,368,497	\$774,966	1.09
Rate Impact Test (RIM)		\$14,686,751	\$6,010,990	(\$8,675,761)	0.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002640
Discounted Participant Payback (years)					15.31

³ Note that the values in the table have been discounted to 2022 dollars. Therefore, the program and administrative costs are slightly lower than shown in Table 2.



Table 6: Appliances Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1909	\$48,958	\$27,954	(\$21,004)	0.57
Total Resource Cost Test (TRC) No Adder	\$0.1909	\$48,958	\$25,413	(\$23,545)	0.52
Utility Cost Test (UCT)	\$0.2127	\$54,547	\$25,413	(\$29,135)	0.47
Participant Cost Test (PCT)		\$21,502	\$52,656	\$31,154	2.45
Rate Impact Test (RIM)		\$80,112	\$25,413	(\$54,699)	0.32
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000021
Discounted Participant Payback (years)					5.17

Table 7: Water Heating Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1715	\$196,091	\$119,676	(\$76,415)	0.61
Total Resource Cost Test (TRC) No Adder	\$0.1715	\$196,091	\$108,796	(\$87,295)	0.55
Utility Cost Test (UCT)	\$0.1722	\$196,953	\$108,796	(\$88,156)	0.55
Participant Cost Test (PCT)		\$76,662	\$191,725	\$115,063	2.50
Rate Impact Test (RIM)		\$311,154	\$108,796	(\$202,358)	0.35
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000084
Discounted Participant Payback (years)					5.20

Table 8: HVAC Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2620	\$11,970,076	\$5,422,920	(\$6,547,155)	0.45
Total Resource Cost Test (TRC) No Adder	\$0.2620	\$11,970,076	\$4,929,927	(\$7,040,148)	0.41
Utility Cost Test (UCT)	\$0.1675	\$7,652,213	\$4,929,927	(\$2,722,286)	0.64
Participant Cost Test (PCT)		\$7,419,853	\$7,797,649	\$377,796	1.05
Rate Impact Test (RIM)		\$12,347,871	\$4,929,927	(\$7,417,944)	0.40
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002687
Discounted Participant Payback (years)					15.32



Table 9: Whole Home Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1492	\$514,446	\$535,429	\$20,983	1.04
Total Resource Cost Test (TRC) No Adder	\$0.1492	\$514,446	\$486,754	(\$27,692)	0.95
Utility Cost Test (UCT)	\$0.1326	\$457,160	\$486,754	\$29,593	1.06
Participant Cost Test (PCT)		\$249,777	\$580,123	\$330,346	2.32
Rate Impact Test (RIM)		\$844,792	\$486,754	(\$358,038)	0.58
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000152
Discounted Participant Payback (years)					12.90

Table 10: Building Shell Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.3603	\$988,728	\$444,186	(\$544,542)	0.45
Total Resource Cost Test (TRC) No Adder	\$0.3603	\$988,728	\$403,805	(\$584,923)	0.41
Utility Cost Test (UCT)	\$0.1780	\$488,499	\$403,805	(\$84,694)	0.83
Participant Cost Test (PCT)		\$790,069	\$618,322	(\$171,747)	0.78
Rate Impact Test (RIM)		\$816,981	\$403,805	(\$413,176)	0.49
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000147
Discounted Participant Payback (years)					57.50

Table 11: Electronics Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2763	\$25,825	\$9,731	(\$16,094)	0.38
Total Resource Cost Test (TRC) No Adder	\$0.2763	\$25,825	\$8,847	(\$16,979)	0.34
Utility Cost Test (UCT)	\$0.2429	\$22,700	\$8,847	(\$13,854)	0.39
Participant Cost Test (PCT)		\$5,558	\$11,238	\$5,681	2.02
Rate Impact Test (RIM)		\$31,506	\$8,847	(\$22,659)	0.28
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000012
Discounted Participant Payback (years)					2.68



Table 12: Lighting Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.3957	\$167,661	\$52,193	(\$115,468)	0.31
Total Resource Cost Test (TRC) No Adder	\$0.3957	\$167,661	\$47,448	(\$120,213)	0.28
Utility Cost Test (UCT)	\$0.5069	\$214,782	\$47,448	(\$167,335)	0.22
Participant Cost Test (PCT)		\$30,110	\$116,783	\$86,673	3.88
Rate Impact Test (RIM)		\$254,334	\$47,448	(\$206,886)	0.19
Lifecycle Revenue Impacts (\$/kWh)					\$0.000072
Discounted Participant Payback (years)					1.30

In addition to the energy benefits reported above, the Home Energy Savings Program measures offer significant non-energy impacts (NEIs). Tables 13 through 20 present detailed cost-effectiveness results for the total program and each measure category with the inclusion of NEIs. Table 21 details the non-energy impacts included in this analysis.

Table 13: Home Energy Savings Program with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2586	\$13,911,784	\$8,025,486	(\$5,886,298)	0.58
Total Resource Cost Test (TRC) No Adder	\$0.2586	\$13,911,784	\$7,424,387	(\$6,487,397)	0.53
Utility Cost Test (UCT)	\$0.1689	\$9,086,855	\$6,010,990	(\$3,075,866)	0.66
Participant Cost Test (PCT)		\$8,593,531	\$10,781,895	\$2,188,364	1.25
Rate Impact Test (RIM)		\$14,686,751	\$6,010,990	(\$8,675,761)	0.41
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002640
Discounted Participant Payback (years)					13.16



Table 14: Appliances with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1909	\$48,958	\$42,274	(\$6,683)	0.86
Total Resource Cost Test (TRC) No Adder	\$0.1909	\$48,958	\$39,733	(\$9,225)	0.81
Utility Cost Test (UCT)	\$0.2127	\$54,547	\$25,413	(\$29,135)	0.47
Participant Cost Test (PCT)		\$21,502	\$66,977	\$45,475	3.11
Rate Impact Test (RIM)		\$80,112	\$25,413	(\$54,699)	0.32
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000021
Discounted Participant Payback (years)					4.02

Table 15: Water Heating with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1715	\$196,091	\$122,353	(\$73,738)	0.62
Total Resource Cost Test (TRC) No Adder	\$0.1715	\$196,091	\$111,473	(\$84,618)	0.57
Utility Cost Test (UCT)	\$0.1722	\$196,953	\$108,796	(\$88,156)	0.55
Participant Cost Test (PCT)		\$76,662	\$194,402	\$117,740	2.54
Rate Impact Test (RIM)		\$311,154	\$108,796	(\$202,358)	0.35
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000084
Discounted Participant Payback (years)					5.13

Table 16: HVAC with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2620	\$11,970,076	\$6,781,254	(\$5,188,821)	0.57
Total Resource Cost Test (TRC) No Adder	\$0.2620	\$11,970,076	\$6,288,261	(\$5,681,814)	0.53
Utility Cost Test (UCT)	\$0.1675	\$7,652,213	\$4,929,927	(\$2,722,286)	0.64
Participant Cost Test (PCT)		\$7,419,853	\$9,155,983	\$1,736,130	1.23
Rate Impact Test (RIM)		\$12,347,871	\$4,929,927	(\$7,417,944)	0.40
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002687
Discounted Participant Payback (years)					13.02



Table 17: Whole Home with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1492	\$514,446	\$535,429	\$20,983	1.04
Total Resource Cost Test (TRC) No Adder	\$0.1492	\$514,446	\$486,754	(\$27,692)	0.95
Utility Cost Test (UCT)	\$0.1326	\$457,160	\$486,754	\$29,593	1.06
Participant Cost Test (PCT)		\$249,777	\$580,123	\$330,346	2.32
Rate Impact Test (RIM)		\$844,792	\$486,754	(\$358,038)	0.58
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000152
Discounted Participant Payback (years)					12.90

Table 18: Building Shell with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.3603	\$988,728	\$461,792	(\$526,936)	0.47
Total Resource Cost Test (TRC) No Adder	\$0.3603	\$988,728	\$421,411	(\$567,317)	0.43
Utility Cost Test (UCT)	\$0.1780	\$488,499	\$403,805	(\$84,694)	0.83
Participant Cost Test (PCT)		\$790,069	\$635,928	(\$154,141)	0.80
Rate Impact Test (RIM)		\$816,981	\$403,805	(\$413,176)	0.49
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000147
Discounted Participant Payback (years)					55.91

Table 19: Electronics with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.2763	\$25,825	\$9,733	(\$16,092)	0.38
Total Resource Cost Test (TRC) No Adder	\$0.2763	\$25,825	\$8,848	(\$16,977)	0.34
Utility Cost Test (UCT)	\$0.2429	\$22,700	\$8,847	(\$13,854)	0.39
Participant Cost Test (PCT)		\$5,558	\$11,240	\$5,682	2.02
Rate Impact Test (RIM)		\$31,506	\$8,847	(\$22,659)	0.28
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000012
Discounted Participant Payback (years)					2.68



Table 20: Lighting with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.3957	\$167,661	\$72,651	(\$95,010)	0.43
Total Resource Cost Test (TRC) No Adder	\$0.3957	\$167,661	\$67,907	(\$99,754)	0.41
Utility Cost Test (UCT)	\$0.5069	\$214,782	\$47,448	(\$167,335)	0.22
Participant Cost Test (PCT)		\$30,110	\$137,242	\$107,132	4.56
Rate Impact Test (RIM)		\$254,334	\$47,448	(\$206,886)	0.19
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000072
Discounted Participant Payback (years)					1.11

Table 21: Home Energy Savings Non-Energy Impacts - PY2022 and PY2023

Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Single Family - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert FAF w/CAC - WA	\$7,201.73	2	15	\$67,376
Single Family - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert FAF w/out CAC - WA	\$7,380.80	2	17	\$75,389.26
Single Family - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert FAF w/CAC - WA	\$7,737.21	2	15	\$71,542
Single Family - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert FAF w/out CAC - WA	\$6,978.02	2	17	\$70,313.12
Manufactured Home - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert FAF w/CAC - WA	\$2,386.14	2	15	\$24,547
Insulation - Floor - Heat Pump - R0 to R19 - WA	\$7.64	2	45	\$108.86
Manufactured Home - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert FAF w/out CAC - WA	\$2,272.30	2	17	\$24,055
Single Family Ductless Heat Pump - eFAF to DHP 9.0 HSPF and above - WA	\$25,739.91	2	15	\$248,761.90
Manufactured Home - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert FAF w/CAC - WA	\$1,193.42	2	15	\$11,320
Manufactured Home - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert FAF w/out CAC - WA	\$1,728.93	2	17	\$18,034.24
Single Family Ductless Heat Pump - Zonal to DHP - WA	\$9,671.65	2	15	\$91,924
Manufactured Home - Duct Sealing - Direct Install - Heat Pump - Test and Seal - WA	\$2,271.76	1	18	\$24,636.96
Single Family - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert FAF w/CAC - WA	\$6,057.34	2	15	\$57,866
Smart Thermostat - Heat Pump - WA	\$922.54	1	5	\$4,055.86
Single Family - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert FAF w/out CAC - WA	\$5,842.03	2	17	\$59,940



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Smart Thermostat - eFAF - WA	\$648.00	1	5	\$2,848.89
Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Zonal or DHP - WA	\$0.17	2	45	\$2
LEDs - General Purpose & Three-Way - 250 to 1049 Lumens - WA	\$947.00	2	9	\$12,940.03
Manufactured Home - Duct Sealing - Not Direct Install - eFAF - WA	\$161.28	1	18	\$1,749
Manufactured Home - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert FAF w/CAC - WA	\$1,819.26	2	15	\$18,616.03
Manufactured Home - Duct Sealing - Direct Install - eFAF - Test, Seal, & Crossover - WA	\$3,594.18	1	18	\$38,978
Manufactured Home - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert FAF w/out CAC - WA	\$1,741.51	2	17	\$18,391.99
HPWH Tier 3 Ducted Heat Pump 0-55 Gallons - WA	\$3.39	2	13	\$61
HPWH Tier 3 Indoor Heat Pump 0-55 Gallons - WA	\$3.37	2	13	\$60.59
HPWH Tier 3 Ducted Heat Pump 0-55 Gallons - Self Install - WA	\$6.77	2	13	\$122
HPWH Tier 3 Indoor Heat Pump 0-55 Gallons - Self Install - WA	\$6.74	2	13	\$121.17
Insulation - Attic - eFAF - R11 to R49 - WA	\$73.59	2	45	\$1,046
Manufactured Home - Duct Sealing - Not Direct Install - Heat Pump - WA	\$116.50	1	18	\$1,263.43
Manufactured Home - Smart Thermostat - eFAF - WA	\$648.00	1	5	\$2,849
Single Family - Heat Pump Upgrade to 12.0 HSPF/18.0 SEER - WA	\$919.38	2	18	\$9,970.61
New Manufactured Home - Air Source Heat Pump - WA	\$271.41	2	15	\$2,662
LED - Direct install - Exterior - General Purpose and Three-Way - 250 to 1049 lumens - WA	\$379.51	2	2	\$1,277.14
Manufactured Home Ductless Heat Pump - eFAF to DHP 9.0 HSPF and above - WA	\$721.07	2	15	\$6,823
HPWH Tier 3 Basement 0-55 Gallons - WA	\$7.16	2	13	\$128.74
HPWH Tier 3 Garage 0-55 Gallons - WA	\$7.14	2	13	\$128
Manufactured Home - Smart Thermostat - Heat Pump - WA	\$937.66	1	5	\$4,122.35
Multifamily Ductless Heat Pump - Electric Resistance Heating to DHP 9.0 HSPF and above - WA	\$3,549.18	2	15	\$33,563
LEDs - Reflectors & Outdoor - 250 to 1049 Lumens - WA	\$1,251.09	2	8	\$15,580.21
HPWH Tier 3 Ducted Electric Resistance Heat 0-55 Gallons - WA	\$5.82	2	13	\$105
HPWH Tier 4 Garage 0-55 Gallons - WA	\$8.39	1	13	\$75.47
HPWH Tier 4 Basement 0-55 Gallons - WA	\$4.20	1	13	\$38
LED - Direct install - High Use - General Purpose and Three-Way - 250 to 1049 lumens - WA	\$251.27	2	2	\$1,360.24



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Single Family - Heat Pump Upgrade to 9.0 HSPF/14.0 SEER - WA	\$394.45	2	18	\$4,073
Clothes Washers - Front Load - Electric DHW & Electric Dryer - WA	\$419.71	2	13	\$3,585.92
HPWH Tier 4 Indoor Heat Pump 0-55 Gallons - WA	\$3.79	1	13	\$34
HPWH Tier 4 Indoor Heat Pump 0-55 Gallons - Self Install - WA	\$3.79	1	13	\$34.06
HPWH Tier 3 Indoor Electric Resistance Heat 0-55 Gallons - WA	\$2.47	2	13	\$0
HPWH Tier 4 Ducted Heat Pump 0-55 Gallons - WA	\$3.70	1	13	\$33.31
HPWH Tier 4 Ducted Heat Pump 0-55 Gallons - Self Install - WA	\$3.70	1	13	\$33
HPWH Tier 3 Basement 0-55 Gallons - Self Install - WA	\$3.58	2	13	\$0.00
Clothes Dryer - Vented_UCEF 3.80 to 4.19 - WA	-\$1.06	2	12	\$0
HPWH Tier 3 Garage 0-55 Gallons - Self Install - WA	\$3.57	2	13	\$0.00
Clothes Dryer - Vented_UCEF 4.70 to 5.29 - WA	-\$1.41	2	12	\$0
Insulation - Attic - Heat Pump - R11 to R49 - WA	\$87.25	2	45	\$1,227.85
Manufactured Home Ductless Heat Pump - Zonal to DHP - WA	\$351.21	2	15	\$3,306
Insulation - Attic - Zonal or DHP - R19 to R49 - WA	\$47.59	2	45	\$669.74
HPWH Tier 4 Ducted Electric Resistance Heat 0-55 Gallons - WA	\$3.06	1	13	\$27
LED - Direct install - Exterior - Decorative and Mini-Base - 250 to 1049 lumens - WA	\$218.52	2	2	\$604.86
HPWH Tier 3 Ducted Electric Resistance Heat 0-55 Gallons - Self Install - WA	\$2.91	2	13	\$0
LED - Direct install - Exterior - Reflectors and Outdoor - 250 to 1049 lumens - WA	\$231.09	2	1	\$121.94
HPWH Tier 3 Indoor Electric Resistance Heat 0-55 Gallons - Self Install - WA	\$2.47	2	13	\$0
LED - Direct install - TLED - 4ft - WA	\$43.45	2	12	\$357.42
Insulation - Attic - Zonal or DHP - R11 to R49 - WA	\$113.69	2	45	\$1,600
LED - Direct install - High Use - Decorative and Mini-Base - 250 to 1049 lumens - WA	\$161.98	2	2	\$451.80
LED - Direct install - High Use - Reflectors and Outdoor - 250 to 1049 lumens - WA	\$164.02	2	2	\$24
LED - Direct install - Moderate Use - General Purpose and Three-Way - 250 to 1049 lumens - WA	\$143.53	2	4	\$519.12
LED - Direct install - MR - 46 to 59W equivalent - WA	\$142.64	2	3	\$27
Manufactured Home - Heat Pump Upgrade to 12.0 HSPF/18.0 SEER - WA	\$215.86	2	18	\$2,341.01
Manufactured Home - Heat Pump Upgrade to 9.0 HSPF/14.0 SEER - WA	\$110.83	2	18	\$1,153



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
HPWH Tier 4 Indoor Electric Resistance Heat 0-55 Gallons - WA	\$2.81	1	13	\$25.28
Insulation - Attic - eFAF - R19 to R49 - WA	\$66.10	2	45	\$930
LED - Direct install - Moderate Use - Decorative and Mini-Base - 250 to 1049 lumens - WA	\$99.91	2	3	\$279.95
Duct Sealing - Electric Forced Air Furnace - WA	\$178.16	1	20	\$2,036
LED - Direct install - Moderate Use - Reflectors and Outdoor - 250 to 1049 lumens - WA	\$106.84	2	4	\$386.82
Duct Sealing - Heat Pump - WA	\$140.56	1	20	\$1,606
HPWH Tier 4 Garage 0-55 Gallons - Self Install - WA	\$4.20	1	13	\$37.73
HPWH Tier 4 Basement 0-55 Gallons - Self Install - WA	\$4.20	1	13	\$38
HPWH Tier 4 Indoor Electric Resistance Heat 0-55 Gallons - Self Install - WA	\$2.81	1	13	\$25.28
HPWH Tier 4 Ducted Electric Resistance Heat 0-55 Gallons - Self Install - WA	\$3.06	1	13	\$27
Insulation - Floor - Zonal or DHP - R0 to R30 - WA	\$27.86	2	45	\$397.07
Insulation - Attic - Gas Heated - R11 to R49 - WA	\$15.15	2	45	\$213
Insulation - Wall - eFAF - R0 to R13 - WA	\$13.52	2	45	\$192.98
Insulation - Floor - eFAF - R0 to R30 - WA	\$15.28	2	45	\$218
Insulation - Attic - Heat Pump - R19 to R49 - WA	\$47.59	2	45	\$669.74
Insulation - Wall - Heat Pump - R0 to R13 - WA	\$7.67	2	45	\$109
Insulation - Wall - Zonal or DHP - R0 to R13 - WA	\$10.37	2	45	\$148.49
Insulation - Floor - eFAF - R0 to R19 - WA	\$13.93	2	45	\$199
Single Family - Central Air Conditioner - SEER 15.0 / EER 12.0 - WA	\$11.08	2	18	\$115.20
Clothes Washers - Front Load - Electric DHW & Gas Dryer - WA	\$419.66	2	13	\$3,585
LED - Direct install - TLED - 2ft - WA	\$23.21	2	12	\$190.96
Insulation - Floor - Heat Pump - R0 to R30 - WA	\$8.09	2	45	\$115
Single Family - Central Air Conditioner - SEER 16.0 / EER 12.0 - WA	\$23.43	2	18	\$243.55
Single Family - Central Air Conditioner - SEER 18.0 / EER 13.0 - WA	\$30.24	2	18	\$321
Single Family - Central Air Conditioner - SEER 17.0 / EER 13.0 - WA	\$23.56	2	18	\$250.39
Clothes Washers - Front Load - Gas DHW & Electric Dryer - WA	\$419.61	2	13	\$3,585
Clothes Washers - Front Load - Any fuel type - WA	\$419.58	1	12	\$3,584.75
Insulation - Floor - Zonal or DHP - R0 to R19 - WA	\$25.74	2	45	\$367
Insulation - Attic - Gas Heated - R19 to R49 - WA	\$5.29	2	45	\$74.39
Windows - Ufactor > 0.30 to Ufactor <= 0.25 - eFAF - WA	\$0.18	2	45	\$2



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Heat Pump - WA	\$0.07	2	45	\$0.96
Clothes Dryer - Vented_UCEF 4.20 to 4.69 - WA	\$0.03	2	12	\$0
Single Family Duct Sealing and Insulation- Electric Heat Visual and Test - No CAC - Any HZ - WA	\$87.96	1	20	\$940.65
Single Family Duct Sealing and Insulation- Electric Heat Visual and Test - CAC - Any HZ - WA	\$95.15	1	20	\$1,018
Line Voltage Connected Thermostat - Retail - Any Heating System - Any Housing Type - WA	\$24.80	1	15	\$227.63
Line Voltage Connected Thermostat - Direct Install - Any Heating System - Any Housing Type - WA	\$45.84	2	15	\$569
HPWH Tier 3 Any Location - 0-55 Gallons - Existing Home - WA	\$13.33	1	13	\$112.17
HPWH Tier 3 Any Location - Any Size - Existing Home - WA	\$12.68	1	13	\$107
HPWH Tier 4 Any Location - 0-55 Gallons - Existing Home - WA	\$14.83	1	13	\$124.80
HPWH Tier 4 Any Location - Any Size - Existing Home - WA	\$14.00	1	13	\$118
HPWH Tier 3 Any Location - Any Size - New Construction - WA	\$12.92	1	13	\$108.75
HPWH Tier 4 Any Location - Any Size - New Construction - WA	\$14.32	1	13	\$121
HPWH Tier 3 Any Location - 0-55 Gallons - New Construction - WA	\$13.58	1	13	\$114.30
HPWH Tier 4 Any Location - 0-55 Gallons - New Construction - WA	\$15.17	1	13	\$128
HPWH Tier 3 Any Location - 0-55 Gallons - Existing Home - Self-Install - WA	\$10.00	1	13	\$84.12
HPWH Tier 3 Any Location - Any Size - Existing Home - Self-Install - WA	\$9.51	1	13	\$80
HPWH Tier 4 Any Location - 0-55 Gallons - Existing Home - Self-Install - WA	\$11.12	1	13	\$93.60
HPWH Tier 4 Any Location - Any Size - Existing Home - Self-Install - WA	\$10.50	1	13	\$88
HPWH Tier 3 Any Location - Any Size - New Construction - Self-Install - WA	\$12.92	1	13	\$108.75
HPWH Tier 4 Any Location - Any Size - New Construction - Self-Install - WA	\$14.32	1	13	\$121
HPWH Tier 3 Any Location - 0-55 Gallons - New Construction - Self-Install - WA	\$13.58	1	13	\$114.30
HPWH Tier 4 Any Location - 0-55 Gallons - New Construction - Self-Install - WA	\$15.17	1	13	\$128
Manufactured Home - Central Air Conditioner - SEER 15.0 / EER 12.0 - WA	\$1.92	2	18	\$19.46



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Manufactured Home - Central Air Conditioner - SEER 16.0 / EER 12.0 - WA	\$4.05	2	18	\$41
Manufactured Home - Duct Sealing - Direct Install - Electric Ducted - WA	\$938.44	1	20	\$10,035.23
Manufactured Home - Duct Sealing - Not Direct Install - Electric Ducted - WA	\$450.45	1	20	\$4,817
Named Communities - Manufactured Home Ductless Heat Pump - Zonal to DHP - WA	\$54.84	1	15	\$503.29
Multifamily - Insulation - Attic - Ductless Heat Pump - R0 to R49 - WA	\$97.14	2	45	\$1,341
Multifamily - Insulation - Attic - Ductless Heat Pump - R19 to R49 - WA	\$28.57	2	45	\$394.48
Multifamily - Insulation - Attic - eFAF - R0 to R49 - WA	\$203.81	2	45	\$2,814
Multifamily - Insulation - Attic - eFAF - R19 to R49 - WA	\$60.95	2	45	\$841.55
Multifamily - Insulation - Attic - Heat Pump - R0 to R49 - WA	\$72.38	2	45	\$999
Multifamily - Insulation - Attic - Heat Pump - R19 to R49 - WA	\$20.95	2	45	\$289.28
Multifamily - Insulation - Attic - Zonal - R0 to R49 - WA	\$135.71	2	45	\$1,874
Multifamily - Insulation - Attic - Zonal - R19 to R49 - WA	\$40.00	2	45	\$552.27
Multifamily - Windows - Double Pane to Ufactor <= 0.22 - HZ1 - DHP - WA	\$1.48	1	45	\$20
Multifamily - Windows - Double Pane to Ufactor <= 0.22 - HZ1 - Furnace - WA	\$3.15	1	45	\$43.46
Multifamily - Windows - Double Pane to Ufactor <= 0.22 - HZ1 - Heat Pump - WA	\$1.25	1	45	\$17
Multifamily - Windows - Double Pane to Ufactor <= 0.22 - HZ1 - Zonal - WA	\$2.79	1	45	\$38.49
Multifamily - Windows - Single Pane to Ufactor <= 0.22 - HZ1 - DHP - WA	\$0.84	1	45	\$12
Multifamily - Windows - Single Pane to Ufactor <= 0.22 - HZ1 - Furnace - WA	\$1.79	1	45	\$24.75
Multifamily - Windows - Single Pane to Ufactor <= 0.22 - HZ1 - Heat Pump - WA	\$0.72	1	45	\$10
Multifamily - Windows - Single Pane to Ufactor <= 0.22 - HZ1 - Zonal - WA	\$1.59	1	45	\$21.96
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.22 - HZ1 - DHP - WA	\$0.12	1	45	\$2
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.22 - HZ1 - Furnace - WA	\$0.27	1	45	\$3.68
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.22 - HZ1 - Heat Pump - WA	\$0.10	1	45	\$1
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.22 - HZ1 - Zonal - WA	\$0.24	1	45	\$3.27
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Ductless Heat Pump - WA	\$0.10	2	45	\$1



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.25 - eFAF - WA	\$0.22	2	45	\$3.07
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Heat Pump - WA	\$0.08	2	45	\$1
Multifamily - Windows - Ufactor > 0.30 to Ufactor <= 0.25 - Zonal - WA	\$0.20	2	45	\$2.72
Named Communities - Multifamily Ductless Heat Pump - Electric Resistance Heating to DHP 9.0 HSPF and above - WA	\$219.93	1	15	\$2,018
Named Communities Ductless Heat Pump - Oil to DHP - WA	\$458.81	1	15	\$4,210.63
Named Communities Ductless Heat Pump - Propane to DHP - WA	\$284.66	1	15	\$2,612
Named Communities Ductless Heat Pump - Wood to DHP - WA	\$277.66	1	15	\$2,548.20
Fuel Switching Ductless Heat Pump - Oil to DHP - WA	\$802.91	1	15	\$7,369
Fuel Switching Ductless Heat Pump - Propane to DHP - WA	\$569.33	1	15	\$5,224.92
Fuel Switching Ductless Heat Pump - Wood to DHP - WA	\$647.88	1	15	\$5,946
Single Family - Duct Sealing - Visual and Test - Electric Ducted - NoCAC - WA	\$287.51	1	20	\$3,074.46
Single Family - Duct Sealing - Visual and Test - Electric Ducted - CAC - WA	\$316.26	1	20	\$3,382
Single Family - Duct Sealing - Direct Install - Visual and Test - Electric Ducted - NoCAC - WA	\$9,583.54	1	20	\$102,482.03
Single Family - Duct Sealing - Direct Install - Visual and Test - Electric Ducted - CAC - WA	\$10,541.90	1	20	\$112,730
Named Communities - Single Family Ductless Heat Pump - eFAF to DHP 9.0 HSPF and above - WA	\$1,038.18	1	15	\$9,527.71
Named Communities - Single Family Ductless Heat Pump - Zonal to DHP - WA	\$822.61	1	15	\$7,549
Smart Thermostat - Heat Pump - SF and MH - Retail - WA	\$919.50	1	7	\$4,976.25
Smart Thermostat - eFAF - SF and MH - Retail - WA	\$448.01	1	7	\$2,425
Smart Thermostat - Heat Pump - MF - Direct Install wResistance Optimization - WA	\$178.65	1	7	\$966.81
Smart Thermostat - Heat Pump - MF - Direct Install - WA	\$89.32	1	7	\$483
Smart Thermostat - eFAF - MF - Direct Install - WA	\$35.59	1	7	\$192.63
Single Family - Windows - Single Pane to Class 30 - Heating Zone 1 (Electric FAF)	\$0.01	1	45	\$0
Single Family - Windows - Single Pane to Class 22 - Heating Zone 1 (Electric FAF)	\$0.01	1	45	\$0.08
Single Family - Windows - Double Pane to Class 22 - Heating Zone 1 (Electric FAF)	\$0.01	1	45	\$0
Single Family - Windows - Double Pane to Class 30 - Heating Zone 1 (Zonal or DHP)	\$0.01	1	45	\$0.12



Measure	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Single Family - Windows - Single Pane to Class 22 - Heating Zone 1 (Zonal or DHP)	\$0.01	1	45	\$0
Single Family - Windows - Single Pane to Class 30 - Heating Zone 1 (Heat Pump)	\$0.01	1	45	\$0.12
Single Family - Windows - Double Pane to Class 30 - Heating Zone 1 (Heat Pump)	\$0.01	1	45	\$0
Single Family - Windows - Double Pane to Class 22 - Heating Zone 1 (Heat Pump)	\$0.01	1	45	\$0.08
Fuel Switching - Manufactured Home - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert Oil/Propane/Wood - WA	\$124.64	1	16	\$1,187
Fuel Switching - Manufactured Home - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert Oil/Propane/Wood - WA	\$216.48	1	16	\$2,061.41
Fuel Switching - Manufactured Home - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert Oil/Propane/Wood - WA	\$111.06	1	16	\$1,058
Fuel Switching - Single Family - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Convert Oil/Propane/Wood - WA	\$258.28	1	16	\$2,459.42
Fuel Switching - Single Family - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Convert Oil/Propane/Wood - WA	\$463.37	1	16	\$4,412
Fuel Switching - Single Family - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Convert Oil/Propane/Wood - WA	\$234.61	1	16	\$2,234.05
Named Communities - Manufactured Home - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Any Conversion - WA	\$124.64	1	16	\$1,187
Named Communities - Manufactured Home - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Any Conversion - WA	\$324.73	1	16	\$3,092.11
Named Communities - Manufactured Home - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Any Conversion - WA	\$222.13	1	16	\$2,115
Named Communities - Single Family - Heat Pump - Conversion to 12.0 HSPF/18.0 SEER - Any Conversion - WA	\$1,033.13	1	16	\$9,837.68
Named Communities - Single Family - Heat Pump - Conversion to 8.5 HSPF/14.0 SEER - Any Conversion - WA	\$1,390.10	1	16	\$13,237
Named Communities - Single Family - Heat Pump - Conversion to 9.0 HSPF/14.0 SEER - Any Conversion - WA	\$1,173.07	1	16	\$11,170.25
NC Heat Pump to 12.0 HSPF/18.0 SEER - Standalone - WA	\$138.42	1	18	\$1,405
Air Purifier - Energy Star - CADR 30-99 - WA	\$0.01	1	9	\$0.06
Air Purifier - Energy Star - CADR 100-149 - WA	\$0.01	1	9	\$0
Air Purifier - Energy Star - CADR 150-224 - WA	\$0.01	1	9	\$0.07
Air Purifier - Energy Star - CADR >= 225 - WA	\$0.01	1	9	\$0
Engine Block Heater Control - Wall Mounted - WA	\$0.16	1	5	\$0.68
Engine Block Heater Control - Engine Mounted - WA	\$0.16	1	5	\$1



MEMORANDUM

To: Nancy Goddard and Peter Schaffer, Pacific Power
From: Eli Morris, Andy Hudson, and Dylan Royalty, AEG
Date: November 9, 2022
Re: Washington Home Energy Report Program Cost-Effectiveness Analysis – 2022-2023 Biennium

AEG estimated the cost-effectiveness of Pacific Power’s Home Energy Report Program in the state of Washington based on Program Year (PY) 2022 and PY2023 costs and savings estimates provided by Pacific Power.¹ The memo provides analysis inputs and results in the following tables:

Table 1: Cost-Effectiveness Analysis Inputs

Table 2: Annual Program Costs, Nominal - PY2022 and 2023

Table 3: Annual Savings - PY2022 and 2023

Table 4: Home Energy Reports Cost-Effectiveness Results - PY2022 and 2023

The Home Energy Report Program will be implemented in PY2022 and PY2023, with savings persisting into PY2024. The program was analyzed jointly for the PY2022 and PY2023 period. The following assumptions were utilized in the analysis:

- **Avoided Costs:** derived from PacifiCorp’s 2021 Integrated Resource Plan (IRP) Preferred Portfolio “P02-MM-CETA” converted into annual values using load shapes from the same IRP.
- **Modeling Inputs:** measure savings, costs, non-energy impacts (NEIs), measure lives, incentive levels, program delivery, and portfolio costs were based on estimates provided by PacifiCorp.
- **Net-to-Gross (NTG):** All cost effectiveness calculations utilize a Net-to-gross ratio of 1.0 consistent with the Council’s methodology and 8(a) of Order 01 in Docket UE-210830.
- **Retail Rates:** 2021 rates provided by PacifiCorp and escalated by inflation for future years.

¹ Consistent with Section 480-109-100 (10) (b) of the Washington Administrative Code, the Low-Income Weatherization program is excluded from this analysis.



Tables 1 through 3 below summarize cost-effectiveness assumptions for the Washington Home Energy Report program.

Table 1: Cost-Effectiveness Analysis Inputs

Parameter	Value
Discount Rate	6.88%
Residential Line Loss	7.68%
Residential Energy Rate (\$/kWh)	\$0.0881
Inflation Rate ²	2.16%
Measure Life	1
NTG	100%
Realization Rate	100%

Table 2: Annual Program Costs, Nominal - PY2022 and 2023

Program Year	Program Delivery	Utility Admin	Incentives	Total Utility Budget
2022	\$360,860	\$20,448	\$0	\$381,308
2023	\$442,036	\$20,960	\$0	\$462,996

Table 3: Annual Savings - PY2022 and 2023

Program Year	Gross kWh Savings at Site	Net kWh Savings at Site	Gross kWh Savings at Generator	Net kWh Savings at Generator
2022	3,126,053	3,126,053	3,366,009	3,366,009
2023	3,558,528	3,558,528	3,831,681	3,831,681

Table 4 presents the cost-effectiveness results. The program is cost-effective for the UCT, PCT, PacifiCorp TRC, and TRC tests. Costs and benefits are identical in the TRC and UCT tests because there is no customer cost to participate in the program.

² Future rates determined using a 2.16% annual escalator.



Table 4: Home Energy Reports Cost-Effectiveness Results - PY2022 and 2023 ³

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1262	\$814,500	\$870,523	\$56,023	1.07
Total Resource Cost Test (TRC) No Adder	\$0.1262	\$814,500	\$791,385	(\$23,115)	0.97
Utility Cost Test (UCT)	\$0.1262	\$814,500	\$791,385	(\$23,115)	0.97
Participant Cost Test (PCT)		\$0	\$575,052	\$575,052	n/a
Rate Impact Test (RIM)		\$1,389,552	\$791,385	(\$598,167)	0.57
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001829
Discounted Participant Payback (years)					0.00

³ Note that the values in the table have been discounted to 2022 dollars. Therefore, the program and administrative costs are slightly lower than shown in Table 2.



MEMORANDUM

To: Nancy Goddard and Peter Schaffer, Pacific Power
From: Eli Morris, Andy Hudson, and Dylan Royalty, AEG
Date: November 9, 2022
Re: Washington Wattsmart Business Program Cost-Effectiveness Analysis – 2022-2023 Biennium

AEG estimated the cost-effectiveness of Pacific Power's Wattsmart Business Program in the state of Washington based on Program Year (PY) 2022 and PY2023 costs and savings estimates provided by Pacific Power. The memo provides analysis inputs and results in the following tables:

Table 1: Cost-Effectiveness Analysis Inputs

Table 2: Annual Program Costs, Nominal - PY2022 and PY2023

Table 3: Annual Savings - PY2022 and PY2023

Table 4: Benefit/Cost Ratios by Delivery Channel and Measure Category - PY2022 and PY2023

Table 5: Wattsmart Business Program Cost-Effectiveness Results - PY2022 and PY2023

Table 6: WSB Managed Accounts Custom - Additional Measures Cost-Effectiveness Results - PY2022 and PY2023

Table 7: WSB Managed Accounts Custom - Compressed Air Cost-Effectiveness Results - PY2022 and PY2023

Table 8: WSB Managed Accounts Custom - Energy Management Cost-Effectiveness Results - PY2022 and PY2023

Table 9: WSB Managed Accounts Custom – HVAC Cost-Effectiveness Results - PY2022 and PY2023

Table 10: WSB Managed Accounts Custom – Motors Cost-Effectiveness Results - PY2022 and PY2023

Table 11: WSB Managed Accounts Custom – Refrigeration Cost-Effectiveness Results - PY2022 and PY2023

Table 12: WSB Managed Accounts Custom – Wastewater Cost-Effectiveness Results - PY2022 and PY2023

Table 13: Midstream – Lighting Cost-Effectiveness Results - PY2022 and PY2023

Table 14: Midstream – Lighting (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 15: Small Business – Anti-Sweat Heater Control Cost-Effectiveness Results - PY2022 and PY2023

Table 16: Small Business – ECM Cost-Effectiveness Results - PY2022 and PY2023

Table 17: Small Business – ECM Controller Cost-Effectiveness Results - PY2022 and PY2023

Table 18: Small Business – HVAC Cost-Effectiveness Results - PY2022 and PY2023

Table 19: Small Business – Lighting Cost-Effectiveness Results - PY2022 and PY2023

Table 20: Small Business – Smart Thermostat Cost-Effectiveness Results - PY2022 and PY2023

Table 21: Small Business – Water Heater Cost-Effectiveness Results - PY2022 and PY2023

Table 22: Small Business – Anti-Sweat Heater Control (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 23: Small Business – ECM (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 24: Small Business – Lighting (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 25: Trade Ally / Project Facilitation – Adaptive Refrigeration Control Cost-Effectiveness Results - PY2022 and PY2023

Table 26: Trade Ally / Project Facilitation – Building Shell Cost-Effectiveness Results - PY2022 and PY2023

Table 27: Trade Ally / Project Facilitation – Compressed Air Cost-Effectiveness Results - PY2022 and PY2023

Table 28: Trade Ally / Project Facilitation – Custom Capital Projects Cost-Effectiveness Results - PY2022 and PY2023

Table 29: Trade Ally / Project Facilitation – Drain for wheel line, hand line, portable main line, pivot, or linear Cost-Effectiveness Results - PY2022 and PY2023

Table 30: Trade Ally / Project Facilitation – Energy Management Cost-Effectiveness Results - PY2022 and PY2023

Table 31: Trade Ally / Project Facilitation – Engine Block Heater Controls Cost-Effectiveness Results - PY2022 and PY2023

Table 32: Trade Ally / Project Facilitation – Farm & Dairy Cost-Effectiveness Results - PY2022 and PY2023

Table 33: Trade Ally / Project Facilitation – Fast Acting Doors Cost-Effectiveness Results - PY2022 and PY2023

Table 34: Trade Ally / Project Facilitation – Food Service Equipment Cost-Effectiveness Results - PY2022 and PY2023

Table 35: Trade Ally / Project Facilitation – Gasket for wheel line, hand line, or portable main line Cost-Effectiveness Results - PY2022 and PY2023

Table 36: Trade Ally / Project Facilitation – HVAC Cost-Effectiveness Results - PY2022 and PY2023

Table 37: Trade Ally / Project Facilitation – Irrigation Pump Upgrades, Custom Cost-Effectiveness Results - PY2022 and PY2023

Table 38: Trade Ally / Project Facilitation – Irrigation Pump VFD Cost-Effectiveness Results - PY2022 and PY2023

Table 39: Trade Ally / Project Facilitation – Lighting Cost-Effectiveness Results - PY2022 and PY2023

Table 40: Trade Ally / Project Facilitation – Low Power Mixer Cost-Effectiveness Results - PY2022 and PY2023

Table 41: Trade Ally / Project Facilitation – Motors Cost-Effectiveness Results - PY2022 and PY2023

Table 42: Trade Ally / Project Facilitation – NEXANT PF NON-LIGHTING PROJECTS Cost-Effectiveness Results - PY2022 and PY2023

Table 43: Trade Ally / Project Facilitation – Nozzle Cost-Effectiveness Results - PY2022 and PY2023

Table 44: Trade Ally / Project Facilitation – Sprinkler Cost-Effectiveness Results - PY2022 and PY2023

Table 45: Trade Ally / Project Facilitation – Water Heater Cost-Effectiveness Results - PY2022 and PY2023

Table 46: Trade Ally / Project Facilitation – Wheel Line Leveler Cost-Effectiveness Results - PY2022 and PY2023

Table 47: Trade Ally / Project Facilitation – Adaptive Refrigeration Control (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 48: Trade Ally / Project Facilitation – Compressed Air with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 49: Trade Ally / Project Facilitation – Custom Capital Projects with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Table 50: Trade Ally / Project Facilitation – Drain for wheel line, hand line, portable main line, pivot, or linear (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 51: Trade Ally / Project Facilitation – Energy Management (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 52: Trade Ally / Project Facilitation – Fast Acting Doors (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 53: Trade Ally / Project Facilitation – Gasket for wheel line, hand line, or portable main line (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 54: Trade Ally / Project Facilitation – HVAC (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 55: Trade Ally / Project Facilitation – Irrigation Pump VFD (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 56: Trade Ally / Project Facilitation – Lighting (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 57: Trade Ally / Project Facilitation – Low Power Mixer (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 58: Trade Ally / Project Facilitation – Motors (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 59: Trade Ally / Project Facilitation – Nozzle (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 60: Trade Ally / Project Facilitation – Sprinkler (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 61: Trade Ally / Project Facilitation – Wheel Line Leveler (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Table 62: Wattsmart Business Savings Non-Energy Impacts - PY2022 and PY2023

The following assumptions were utilized in the analysis:

- **Avoided Costs:** derived from PacifiCorp’s 2021 Integrated Resource Plan (IRP) Preferred Portfolio “P02-MM-CETA”, converted into annual values using load shapes from the same IRP.
- **Modeling Inputs:** measure savings, costs, non-energy impacts (NEIs), measure lives, incentive levels, program delivery, and portfolio costs were based on estimates provided by PacifiCorp.
- **Net-to-Gross (NTG):** All cost effectiveness calculations utilize a Net-to-gross ratio of 1.0 consistent with the Council’s methodology and 8(a) of Order 01 in Docket UE-210830.
- **Retail Rates:** 2021 rates provided by PacifiCorp and escalated by inflation for future years.

The following tables summarize cost-effectiveness assumptions and results for the Washington Wattsmart Business Program. The cost-effectiveness analysis inputs are shown in Table 1 through Table 3 below:

Table 1: Cost-Effectiveness Analysis Inputs

Parameter	Value
Discount Rate	6.88%
Commercial Line Loss	7.60%
Industrial Line Loss	6.82%
Irrigation Line Loss	7.68%
Commercial Energy Rate (\$/kWh)	\$0.0836
Industrial Energy Rate (\$/kWh)	\$0.0665
Irrigation Energy Rate (\$/kWh)	\$0.0713
Inflation Rate ¹	2.16%

¹ Future rates determined using a 2.16% annual escalator.

Table 2: Annual Program Costs, Nominal - PY2022 and PY2023

Delivery Channel	Measure Category	Program Delivery	Admin/Marketing/Program Development	Incentives	Total Utility Budget	Gross Customer Costs
Total Program		\$7,788,327	\$1,059,261	\$13,956,487	\$22,804,074	\$16,539,228

Table 3: Annual Savings - PY2022 and PY2023

Delivery Channel	Measure Category	Gross kWh Savings at Site	Realization Rate	Adjusted Gross kWh Savings at Site	Net to Gross Ratio	Net kWh Savings at Site	Measure Life
WSB Managed Accounts Custom	Additional Measures	2,525,968	99%	2,498,182	100%	2,498,182	15
WSB Managed Accounts Custom	Compressed Air	3,119,437	95%	2,957,226	100%	2,957,226	15
WSB Managed Accounts Custom	Energy Management	9,168,099	100%	9,158,931	100%	9,158,931	3
WSB Managed Accounts Custom	HVAC	910,817	100%	910,817	100%	910,817	15
WSB Managed Accounts Custom	Motors	3,192,064	100%	3,192,064	100%	3,192,064	15
WSB Managed Accounts Custom	Refrigeration	8,767,227	99%	8,688,322	100%	8,688,322	14
WSB Managed Accounts Custom	Wastewater	807,995	100%	807,995	100%	807,995	15
Trade ally/project facilitation	Sprinkler	147,253	90%	132,233	100%	132,233	9
Trade ally/project facilitation	Nozzle	12,060	90%	10,830	100%	10,830	6

Trade ally/project facilitation	Gasket for wheel line, hand line, or portable main line	22,680	90%	20,367	100%	20,367	6
Trade ally/project facilitation	Drain for wheel line, hand line, portable main line, pivot, or linear	2,780	90%	2,496	100%	2,496	6
Trade ally/project facilitation	Wheel line leveler	646	90%	580	100%	580	7
Trade ally/project facilitation	Irrigation Pump VFD	854,000	90%	766,892	100%	766,892	10
Trade ally/project facilitation	Irrigation Pump Upgrades, Custom	433,000	90%	388,834	100%	388,834	15
Trade ally/project facilitation	Compressed Air	860,221	95%	815,490	100%	815,490	13
Trade ally/project facilitation	Farm & Dairy	162,000	99%	160,218	100%	160,218	11
Trade ally/project facilitation	Adaptive Refrigeration Control	802,587	99%	795,364	100%	795,364	12
Trade ally/project facilitation	Fast Acting Doors	880,000	99%	872,080	100%	872,080	8
Trade ally/project facilitation	Custom Capital Projects	1,980,000	99%	1,958,220	100%	1,958,220	15
Trade ally/project facilitation	Low Power Mixer	700,000	100%	700,000	100%	700,000	15
Trade ally/project facilitation	HVAC	1,152,665	100%	1,152,665	100%	1,152,665	11
Trade ally/project facilitation	Energy Management	3,120,000	100%	3,116,880	100%	3,116,880	3
Small Business	Lighting	6,918,556	99%	6,842,452	100%	6,842,452	9
Trade ally/project facilitation	NEXANT PF NON-LIGHTING PROJECTS	0	0%	0	0%	0	0
Trade ally/project facilitation	Building Shell	50,000	100%	50,000	100%	50,000	15

Trade ally/project facilitation	Food Service Equipment	38,424	100%	38,424	100%	38,424	12
Trade ally/project facilitation	Lighting	21,733,737	99%	21,494,666	100%	21,494,666	8
Trade ally/project facilitation	Motors	98,000	94%	92,120	100%	92,120	8
Midstream	Lighting	719,076	99%	711,167	100%	711,167	7
Trade ally/project facilitation	Engine Block Heater Controls	250,000	100%	250,000	100%	250,000	10
Trade ally/project facilitation	Water Heater	65,000	100%	65,000	100%	65,000	13
Small Business	Smart Thermostat	60,000	100%	60,000	100%	60,000	5
Small Business	HVAC	300,000	100%	300,000	100%	300,000	15
Small Business	Water Heater	112,500	100%	112,500	100%	112,500	18
Small Business	Anti-Sweat Heater Control	75,000	100%	75,000	100%	75,000	13
Small Business	ECM	45,000	100%	45,000	100%	45,000	13
Small Business	ECM Controller	0	0%	0	0%	0	0
Total Program		70,086,793	99%	69,243,015	100%	69,243,015	10

Table 4 presents the cost-effectiveness results by delivery channel, measure category and the total program. Table 5 presents the Wattsmart Business Program cost-effectiveness; the program is cost-effective for the PacifiCorp TRC, TRC, UCT and PCT.

Table 4: Benefit/Cost Ratios by Delivery Channel and Measure Category - PY2022 and PY2023

Delivery Channel	Measure Category	PTRC	TRC	UCT	PCT	RIM
WSB Managed Accounts Custom	Additional Measures	2.41	2.19	3.27	2.84	0.87
WSB Managed Accounts Custom	Compressed Air	2.80	2.55	3.54	3.11	0.96
WSB Managed Accounts Custom	Energy Management	3.63	3.30	3.38	9.00	1.10
WSB Managed Accounts Custom	HVAC	3.89	3.54	4.64	4.71	0.95
WSB Managed Accounts Custom	Motors	2.68	2.44	3.45	3.12	0.90
WSB Managed Accounts Custom	Refrigeration	3.47	3.15	4.50	4.35	0.92
WSB Managed Accounts Custom	Wastewater	2.77	2.52	3.77	3.61	0.83
Trade ally/project facilitation	Sprinkler	0.87	0.79	2.84	0.72	1.03
Trade ally/project facilitation	Sprinkler (with NEIs)	1.21	1.13	2.84	1.12	1.03
Trade ally/project facilitation	Nozzle	2.44	2.22	2.96	3.41	1.08
Trade ally/project facilitation	Nozzle (with NEIs)	2.82	2.59	2.96	4.27	1.08
Trade ally/project facilitation	Gasket for wheel line, hand line, or portable main line	1.59	1.44	2.31	1.75	0.98
Trade ally/project facilitation	Gasket for wheel line, hand line, or portable main line (with NEIs)	2.12	1.98	2.31	2.59	0.98
Trade ally/project facilitation	Drain for wheel line, hand line, portable main line, pivot, or linear	0.99	0.90	2.01	0.97	0.92
Trade ally/project facilitation	Drain for wheel line, hand line, portable main line, pivot, or linear (with NEIs)	1.62	1.53	2.01	1.79	0.92
Trade ally/project facilitation	Wheel line leveler	0.39	0.36	2.00	0.35	0.90
Trade ally/project facilitation	Wheel line leveler (with NEIs)	1.21	1.18	2.00	1.23	0.90
Trade ally/project facilitation	Irrigation Pump VFD	1.66	1.51	2.50	1.74	0.98
Trade ally/project facilitation	Irrigation Pump VFD (with NEIs)	1.70	1.55	2.50	1.80	0.98
Trade ally/project facilitation	Irrigation Pump Upgrades, Custom	2.29	2.08	3.25	2.35	1.05
Trade ally/project facilitation	Compressed Air	1.68	1.53	2.47	2.04	0.87
Trade ally/project facilitation	Compressed Air (with NEIs)	1.78	1.63	2.47	2.18	0.87
Trade ally/project facilitation	Farm & Dairy	2.05	1.86	2.33	2.80	0.86
Trade ally/project facilitation	Adaptive Refrigeration Control	1.73	1.57	2.57	2.36	0.78
Trade ally/project facilitation	Adaptive Refrigeration Control (with NEIs)	1.77	1.61	2.57	2.42	0.78
Trade ally/project facilitation	Fast Acting Doors	1.38	1.26	1.97	1.97	0.74
Trade ally/project facilitation	Fast Acting Doors (with NEIs)	1.42	1.29	1.97	2.02	0.74
Trade ally/project facilitation	Custom Capital Projects	1.85	1.68	2.80	2.17	0.90
Trade ally/project facilitation	Custom Capital Projects (with NEIs)	1.87	1.70	2.80	2.20	0.90
Trade ally/project facilitation	Low Power Mixer	2.72	2.47	3.05	3.61	0.94
Trade ally/project facilitation	Low Power Mixer (with NEIs)	2.55	2.30	3.05	3.34	0.94
Trade ally/project facilitation	HVAC	1.00	0.91	1.41	1.68	0.66
Trade ally/project facilitation	HVAC (with NEIs)	0.94	0.85	1.41	1.57	0.66



Trade ally/project facilitation	Energy Management	2.22	2.02	2.05	8.73	0.88
Trade ally/project facilitation	Energy Management (with NEIs)	2.87	2.66	2.05	12.58	0.88
Small Business	Lighting	1.88	1.71	1.21	4.12	0.57
Small Business	Lighting (with NEIs)	1.90	1.73	1.21	4.15	0.57
Trade ally/project facilitation	NEXANT PF NON-LIGHTING PROJECTS	0.00	0.00	0.00	0.00	0.00
Trade ally/project facilitation	Building Shell	0.86	0.78	1.80	1.01	0.78
Trade ally/project facilitation	Food Service Equipment	3.30	3.00	3.82	5.72	0.87
Trade ally/project facilitation	Lighting	2.11	1.92	1.84	3.89	0.70
Trade ally/project facilitation	Lighting (with NEIs)	2.56	2.36	1.84	4.63	0.70
Trade ally/project facilitation	Motors	1.57	1.43	1.72	3.46	0.76
Trade ally/project facilitation	Motors (with NEIs)	1.72	1.58	1.72	3.86	0.76
Midstream	Lighting	1.63	1.48	2.10	2.77	0.72
Midstream	Lighting (with NEIs)	1.97	1.82	2.10	3.35	0.72
Trade ally/project facilitation	Engine Block Heater Controls	2.21	2.01	2.45	3.76	0.74
Trade ally/project facilitation	Water Heater	2.52	2.29	2.77	4.55	0.71
Small Business	Smart Thermostat	1.16	1.06	0.99	2.15	0.62
Small Business	HVAC	1.04	0.94	0.98	1.84	0.54
Small Business	Water Heater	1.72	1.56	0.93	3.85	0.48
Small Business	Anti-Sweat Heater Control	2.39	2.18	3.00	3.46	0.81
Small Business	Anti-Sweat Heater Control (with NEIs)	2.43	2.21	3.00	3.51	0.81
Small Business	ECM	1.92	1.75	1.89	3.01	0.70
Small Business	ECM (with NEIs)	2.20	2.02	1.89	3.38	0.70
Small Business	ECM Controller	0.00	0.00	0.00	0.00	0.00
Small Business	ECM Controller (with NEIs)	0.00	0.00	0.00	0.00	0.00
Total Program		2.27	2.07	2.30	3.49	0.79
Total Program (with NEIs)		2.50	2.29	2.30	3.84	0.79

Table 5: Wattsmart Business Program Cost-Effectiveness Results - PY2022 and PY2023²

Delivery Channel	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0505	\$24,367,846	\$55,354,441	\$30,986,595	2.27
Total Resource Cost Test (TRC) No Adder	\$0.0505	\$24,367,846	\$50,322,219	\$25,954,374	2.07
Utility Cost Test (UCT)	\$0.0455	\$21,922,534	\$50,322,219	\$28,399,685	2.30
Participant Cost Test (PCT)		\$15,836,292	\$55,245,665	\$39,409,373	3.49
Rate Impact Test (RIM)		\$63,777,218	\$50,322,219	(\$13,454,999)	0.79
Lifecycle Revenue Impacts (\$/kWh)					0.00
Discounted Participant Payback (years)					2.65

² Note that the values in the table have been discounted to 2020 dollars. Therefore, the program and administrative costs are slightly lower than shown in Table 2.



Tables 6 through 12 present the PY2022 and PY2023 cost-effectiveness results for the WSB Managed Accounts Custom delivery options.

Table 6: WSB Managed Accounts Custom - Additional Measures Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0463	\$1,076,487	\$2,595,141	\$1,518,655	2.41
Total Resource Cost Test (TRC) No Adder	\$0.0463	\$1,076,487	\$2,359,219	\$1,282,733	2.19
Utility Cost Test (UCT)	\$0.0310	\$720,742	\$2,359,219	\$1,638,477	3.27
Participant Cost Test (PCT)		\$883,134	\$2,506,751	\$1,623,617	2.84
Rate Impact Test (RIM)		\$2,700,104	\$2,359,219	(\$340,884)	0.87
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000676
Discounted Participant Payback (years)					5.28

Table 7: WSB Managed Accounts Custom - Compressed Air Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0398	\$1,092,018	\$3,061,887	\$1,969,869	2.80
Total Resource Cost Test (TRC) No Adder	\$0.0398	\$1,092,018	\$2,783,534	\$1,691,516	2.55
Utility Cost Test (UCT)	\$0.0286	\$786,422	\$2,783,534	\$1,997,112	3.54
Participant Cost Test (PCT)		\$856,101	\$2,660,543	\$1,804,442	3.11
Rate Impact Test (RIM)		\$2,896,461	\$2,783,534	(\$112,926)	0.96
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000725
Discounted Participant Payback (years)					4.83

Table 8: WSB Managed Accounts Custom - Energy Management Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0390	\$956,723	\$3,475,019	\$2,518,297	3.63
Total Resource Cost Test (TRC) No Adder	\$0.0390	\$956,723	\$3,159,109	\$2,202,386	3.30
Utility Cost Test (UCT)	\$0.0381	\$934,865	\$3,159,109	\$2,224,244	3.38
Participant Cost Test (PCT)		\$240,439	\$2,163,111	\$1,922,671	9.00
Rate Impact Test (RIM)		\$2,879,394	\$3,159,109	\$279,714	1.10
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002024
Discounted Participant Payback (years)					0.33



Table 9: WSB Managed Accounts Custom – HVAC Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0326	\$282,729	\$1,100,017	\$817,288	3.89
Total Resource Cost Test (TRC) No Adder	\$0.0326	\$282,729	\$1,000,015	\$717,286	3.54
Utility Cost Test (UCT)	\$0.0248	\$215,666	\$1,000,015	\$784,349	4.64
Participant Cost Test (PCT)		\$205,943	\$970,665	\$764,723	4.71
Rate Impact Test (RIM)		\$1,047,452	\$1,000,015	(\$47,437)	0.95
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000262
Discounted Participant Payback (years)					3.18

Table 10: WSB Managed Accounts Custom – Motors Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0416	\$1,235,616	\$3,310,000	\$2,074,384	2.68
Total Resource Cost Test (TRC) No Adder	\$0.0416	\$1,235,616	\$3,009,091	\$1,773,475	2.44
Utility Cost Test (UCT)	\$0.0294	\$872,652	\$3,009,091	\$2,136,439	3.45
Participant Cost Test (PCT)		\$992,874	\$3,098,607	\$2,105,733	3.12
Rate Impact Test (RIM)		\$3,341,349	\$3,009,091	(\$332,258)	0.90
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000836
Discounted Participant Payback (years)					4.81

Table 11: WSB Managed Accounts Custom – Refrigeration Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0340	\$2,715,151	\$9,419,133	\$6,703,982	3.47
Total Resource Cost Test (TRC) No Adder	\$0.0340	\$2,715,151	\$8,562,848	\$5,847,698	3.15
Utility Cost Test (UCT)	\$0.0238	\$1,902,076	\$8,562,848	\$6,660,772	4.50
Participant Cost Test (PCT)		\$1,966,124	\$8,549,410	\$6,583,286	4.35
Rate Impact Test (RIM)		\$9,298,436	\$8,562,848	(\$735,588)	0.92
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002415
Discounted Participant Payback (years)					3.22



Table 12: WSB Managed Accounts Custom – Wastewater Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0404	\$309,621	\$859,014	\$549,394	2.77
Total Resource Cost Test (TRC) No Adder	\$0.0404	\$309,621	\$780,922	\$471,302	2.52
Utility Cost Test (UCT)	\$0.0270	\$207,179	\$780,922	\$573,743	3.77
Participant Cost Test (PCT)		\$242,496	\$876,081	\$633,585	3.61
Rate Impact Test (RIM)		\$943,205	\$780,922	(\$162,283)	0.83
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000236
Discounted Participant Payback (years)					4.15

Tables 13 and 14 presents the PY2022 and PY2023 cost-effectiveness results for the Midstream Lighting delivery options without NEIs and with NEIs.

Table 13: Midstream – Lighting Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0675	\$280,530	\$456,419	\$175,889	1.63
Total Resource Cost Test (TRC) No Adder	\$0.0675	\$280,530	\$414,927	\$134,396	1.48
Utility Cost Test (UCT)	\$0.0476	\$197,929	\$414,927	\$216,998	2.10
Participant Cost Test (PCT)		\$165,334	\$457,464	\$292,130	2.77
Rate Impact Test (RIM)		\$572,661	\$414,927	(\$157,734)	0.72
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000149
Discounted Participant Payback (years)					2.63

Table 14: Midstream – Lighting (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0675	\$280,530	\$553,017	\$272,487	1.97
Total Resource Cost Test (TRC) No Adder	\$0.0675	\$280,530	\$511,525	\$230,994	1.82
Utility Cost Test (UCT)	\$0.0476	\$197,929	\$414,927	\$216,998	2.10
Participant Cost Test (PCT)		\$165,334	\$554,062	\$388,729	3.35
Rate Impact Test (RIM)		\$572,661	\$414,927	(\$157,734)	0.72
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000149
Discounted Participant Payback (years)					2.17



Tables 15 through Table 24 present the PY2022 and PY2023 cost-effectiveness results for the Small Business delivery options without NEIs and with NEIs.

Table 15: Small Business – Anti-Sweat Heater Control Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0487	\$30,711	\$73,512	\$42,801	2.39
Total Resource Cost Test (TRC) No Adder	\$0.0487	\$30,711	\$66,829	\$36,118	2.18
Utility Cost Test (UCT)	\$0.0353	\$22,290	\$66,829	\$44,538	3.00
Participant Cost Test (PCT)		\$21,052	\$72,880	\$51,828	3.46
Rate Impact Test (RIM)		\$82,540	\$66,829	(\$15,711)	0.81
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000025
Discounted Participant Payback (years)					3.76

Table 16: Small Business – ECM Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0605	\$22,918	\$44,107	\$21,189	1.92
Total Resource Cost Test (TRC) No Adder	\$0.0605	\$22,918	\$40,097	\$17,180	1.75
Utility Cost Test (UCT)	\$0.0561	\$21,234	\$40,097	\$18,864	1.89
Participant Cost Test (PCT)		\$17,122	\$51,587	\$34,465	3.01
Rate Impact Test (RIM)		\$57,383	\$40,097	(\$17,286)	0.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000017
Discounted Participant Payback (years)					4.31

Table 17: Small Business – ECM Controller Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0000	\$0	\$0	\$0	n/a
Total Resource Cost Test (TRC) No Adder	\$0.0000	\$0	\$0	\$0	n/a
Utility Cost Test (UCT)	\$0.0000	\$0	\$0	\$0	n/a
Participant Cost Test (PCT)		\$0	\$0	\$0	n/a
Rate Impact Test (RIM)		\$0	\$0	\$0	n/a
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000
Discounted Participant Payback (years)					n/a



Table 18: Small Business – HVAC Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1245	\$342,834	\$355,321	\$12,487	1.04
Total Resource Cost Test (TRC) No Adder	\$0.1245	\$342,834	\$323,019	(\$19,815)	0.94
Utility Cost Test (UCT)	\$0.1202	\$331,022	\$323,019	(\$8,003)	0.98
Participant Cost Test (PCT)		\$304,196	\$559,426	\$255,230	1.84
Rate Impact Test (RIM)		\$598,064	\$323,019	(\$275,045)	0.54
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000166
Discounted Participant Payback (years)					8.16

Table 19: Small Business – Lighting Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0575	\$2,870,623	\$5,389,562	\$2,518,939	1.88
Total Resource Cost Test (TRC) No Adder	\$0.0575	\$2,870,623	\$4,899,602	\$2,028,979	1.71
Utility Cost Test (UCT)	\$0.0808	\$4,037,478	\$4,899,602	\$862,123	1.21
Participant Cost Test (PCT)		\$1,847,372	\$7,615,292	\$5,767,921	4.12
Rate Impact Test (RIM)		\$8,638,543	\$4,899,602	(\$3,738,941)	0.57
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002732
Discounted Participant Payback (years)					2.24

Table 20: Small Business – Smart Thermostat Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1379	\$34,040	\$39,656	\$5,615	1.16
Total Resource Cost Test (TRC) No Adder	\$0.1379	\$34,040	\$36,051	\$2,010	1.06
Utility Cost Test (UCT)	\$0.1474	\$36,379	\$36,051	(\$329)	0.99
Participant Cost Test (PCT)		\$21,052	\$45,334	\$24,283	2.15
Rate Impact Test (RIM)		\$58,323	\$36,051	(\$22,272)	0.62
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000036
Discounted Participant Payback (years)					2.32



Table 21: Small Business – Water Heater Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0624	\$71,258	\$122,516	\$51,257	1.72
Total Resource Cost Test (TRC) No Adder	\$0.0624	\$71,258	\$111,378	\$40,119	1.56
Utility Cost Test (UCT)	\$0.1049	\$119,747	\$111,378	(\$8,370)	0.93
Participant Cost Test (PCT)		\$56,769	\$218,489	\$161,720	3.85
Rate Impact Test (RIM)		\$232,978	\$111,378	(\$121,601)	0.48
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000058
Discounted Participant Payback (years)					4.68

Table 22: Small Business – Anti-Sweat Heater Control (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0487	\$30,711	\$74,540	\$43,829	2.43
Total Resource Cost Test (TRC) No Adder	\$0.0487	\$30,711	\$67,857	\$37,146	2.21
Utility Cost Test (UCT)	\$0.0353	\$22,290	\$66,829	\$44,538	3.00
Participant Cost Test (PCT)		\$21,052	\$73,908	\$52,856	3.51
Rate Impact Test (RIM)		\$82,540	\$66,829	(\$15,711)	0.81
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000025
Discounted Participant Payback (years)					3.70

Table 23: Small Business – ECM (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0605	\$22,918	\$50,345	\$27,427	2.20
Total Resource Cost Test (TRC) No Adder	\$0.0605	\$22,918	\$46,335	\$23,417	2.02
Utility Cost Test (UCT)	\$0.0561	\$21,234	\$40,097	\$18,864	1.89
Participant Cost Test (PCT)		\$17,122	\$57,825	\$40,703	3.38
Rate Impact Test (RIM)		\$57,383	\$40,097	(\$17,286)	0.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000017
Discounted Participant Payback (years)					3.85



Table 24: Small Business – Lighting (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0575	\$2,870,623	\$5,449,152	\$2,578,529	1.90
Total Resource Cost Test (TRC) No Adder	\$0.0575	\$2,870,623	\$4,959,191	\$2,088,569	1.73
Utility Cost Test (UCT)	\$0.0808	\$4,037,478	\$4,899,602	\$862,123	1.21
Participant Cost Test (PCT)		\$1,847,372	\$7,674,882	\$5,827,510	4.15
Rate Impact Test (RIM)		\$8,638,543	\$4,899,602	(\$3,738,941)	0.57
Lifecycle Revenue Impacts (\$/kWh)					\$0.0002732
Discounted Participant Payback (years)					2.23

Table 25 through Table 46 present the PY2022 and PY2023 cost-effectiveness results for the Trade Ally / Project Facilitation delivery options without NEIs.

Table 25: Trade Ally / Project Facilitation – Adaptive Refrigeration Control Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0675	\$436,548	\$754,331	\$317,783	1.73
Total Resource Cost Test (TRC) No Adder	\$0.0675	\$436,548	\$685,755	\$249,207	1.57
Utility Cost Test (UCT)	\$0.0413	\$266,853	\$685,755	\$418,902	2.57
Participant Cost Test (PCT)		\$322,420	\$761,608	\$439,187	2.36
Rate Impact Test (RIM)		\$875,736	\$685,755	(\$189,980)	0.78
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000248
Discounted Participant Payback (years)					5.08

Table 26: Trade Ally / Project Facilitation – Building Shell Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1701	\$78,050	\$67,305	(\$10,745)	0.86
Total Resource Cost Test (TRC) No Adder	\$0.1701	\$78,050	\$61,186	(\$16,864)	0.78
Utility Cost Test (UCT)	\$0.0743	\$34,075	\$61,186	\$27,111	1.80
Participant Cost Test (PCT)		\$65,494	\$66,026	\$532	1.01
Rate Impact Test (RIM)		\$78,582	\$61,186	(\$17,396)	0.78
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000022
Discounted Participant Payback (years)					14.88



Table 27: Trade Ally / Project Facilitation – Compressed Air Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0658	\$465,081	\$783,169	\$318,088	1.68
Total Resource Cost Test (TRC) No Adder	\$0.0658	\$465,081	\$711,972	\$246,891	1.53
Utility Cost Test (UCT)	\$0.0408	\$288,400	\$711,972	\$423,572	2.47
Participant Cost Test (PCT)		\$340,748	\$695,816	\$355,069	2.04
Rate Impact Test (RIM)		\$820,150	\$711,972	(\$108,178)	0.87
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000222
Discounted Participant Payback (years)					6.37

Table 28: Trade Ally / Project Facilitation – Custom Capital Projects Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0604	\$1,099,841	\$2,031,604	\$931,762	1.85
Total Resource Cost Test (TRC) No Adder	\$0.0604	\$1,099,841	\$1,846,913	\$747,071	1.68
Utility Cost Test (UCT)	\$0.0362	\$658,514	\$1,846,913	\$1,188,398	2.80
Participant Cost Test (PCT)		\$819,607	\$1,777,137	\$957,530	2.17
Rate Impact Test (RIM)		\$2,057,371	\$1,846,913	(\$210,459)	0.90
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000515
Discounted Participant Payback (years)					6.92

Table 29: Trade Ally / Project Facilitation – Drain for wheel line, hand line, portable main line, pivot, or linear Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1433	\$1,770	\$1,751	(\$19)	0.99
Total Resource Cost Test (TRC) No Adder	\$0.1433	\$1,770	\$1,591	(\$178)	0.90
Utility Cost Test (UCT)	\$0.0640	\$791	\$1,591	\$801	2.01
Participant Cost Test (PCT)		\$1,366	\$1,323	(\$43)	0.97
Rate Impact Test (RIM)		\$1,726	\$1,591	(\$135)	0.92
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001
Discounted Participant Payback (years)					6.14



Table 30: Trade Ally / Project Facilitation – Energy Management Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0640	\$538,623	\$1,198,126	\$659,503	2.22
Total Resource Cost Test (TRC) No Adder	\$0.0640	\$538,623	\$1,089,205	\$550,583	2.02
Utility Cost Test (UCT)	\$0.0630	\$530,458	\$1,089,205	\$558,747	2.05
Participant Cost Test (PCT)		\$89,811	\$784,176	\$694,364	8.73
Rate Impact Test (RIM)		\$1,232,987	\$1,089,205	(\$143,782)	0.88
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000867
Discounted Participant Payback (years)					0.34

Table 31: Trade Ally / Project Facilitation – Engine Block Heater Controls Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0488	\$86,231	\$190,790	\$104,559	2.21
Total Resource Cost Test (TRC) No Adder	\$0.0488	\$86,231	\$173,445	\$87,214	2.01
Utility Cost Test (UCT)	\$0.0401	\$70,793	\$173,445	\$102,652	2.45
Participant Cost Test (PCT)		\$54,033	\$202,956	\$148,924	3.76
Rate Impact Test (RIM)		\$235,154	\$173,445	(\$61,709)	0.74
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000085
Discounted Participant Payback (years)					2.66

Table 32: Trade Ally / Project Facilitation – Farm & Dairy Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0540	\$67,295	\$137,752	\$70,457	2.05
Total Resource Cost Test (TRC) No Adder	\$0.0540	\$67,295	\$125,229	\$57,934	1.86
Utility Cost Test (UCT)	\$0.0431	\$53,806	\$125,229	\$71,423	2.33
Participant Cost Test (PCT)		\$43,839	\$122,551	\$78,712	2.80
Rate Impact Test (RIM)		\$146,007	\$125,229	(\$20,778)	0.86
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000044
Discounted Participant Payback (years)					3.93



Table 33: Trade Ally / Project Facilitation – Fast Acting Doors Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0851	\$457,869	\$633,124	\$175,255	1.38
Total Resource Cost Test (TRC) No Adder	\$0.0851	\$457,869	\$575,567	\$117,698	1.26
Utility Cost Test (UCT)	\$0.0544	\$292,358	\$575,567	\$283,210	1.97
Participant Cost Test (PCT)		\$331,022	\$652,990	\$321,968	1.97
Rate Impact Test (RIM)		\$779,837	\$575,567	(\$204,269)	0.74
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000284
Discounted Participant Payback (years)					4.06

Table 34: Trade Ally / Project Facilitation – Food Service Equipment Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0351	\$11,141	\$36,724	\$25,583	3.30
Total Resource Cost Test (TRC) No Adder	\$0.0351	\$11,141	\$33,385	\$22,244	3.00
Utility Cost Test (UCT)	\$0.0275	\$8,730	\$33,385	\$24,656	3.82
Participant Cost Test (PCT)		\$5,784	\$33,100	\$27,316	5.72
Rate Impact Test (RIM)		\$38,457	\$33,385	(\$5,072)	0.87
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000011
Discounted Participant Payback (years)					2.10

Table 35: Trade Ally / Project Facilitation – Gasket for wheel line, hand line, or portable main line Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0892	\$8,991	\$14,284	\$5,293	1.59
Total Resource Cost Test (TRC) No Adder	\$0.0892	\$8,991	\$12,985	\$3,995	1.44
Utility Cost Test (UCT)	\$0.0557	\$5,616	\$12,985	\$7,369	2.31
Participant Cost Test (PCT)		\$5,697	\$9,954	\$4,257	1.75
Rate Impact Test (RIM)		\$13,247	\$12,985	(\$262)	0.98
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000006
Discounted Participant Payback (years)					3.40



Table 36: Trade Ally / Project Facilitation – HVAC Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1283	\$1,125,531	\$1,122,392	(\$3,139)	1.00
Total Resource Cost Test (TRC) No Adder	\$0.1283	\$1,125,531	\$1,020,356	(\$105,174)	0.91
Utility Cost Test (UCT)	\$0.0824	\$722,948	\$1,020,356	\$297,408	1.41
Participant Cost Test (PCT)		\$627,339	\$1,053,164	\$425,825	1.68
Rate Impact Test (RIM)		\$1,551,356	\$1,020,356	(\$530,999)	0.66
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000388
Discounted Participant Payback (years)					6.13

Table 37: Trade Ally / Project Facilitation – Irrigation Pump Upgrades, Custom Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0614	\$225,248	\$514,760	\$289,512	2.29
Total Resource Cost Test (TRC) No Adder	\$0.0614	\$225,248	\$467,964	\$242,715	2.08
Utility Cost Test (UCT)	\$0.0392	\$143,849	\$467,964	\$324,115	3.25
Participant Cost Test (PCT)		\$162,800	\$382,268	\$219,469	2.35
Rate Impact Test (RIM)		\$444,717	\$467,964	\$23,246	1.05
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000111
Discounted Participant Payback (years)					6.39

Table 38: Trade Ally / Project Facilitation – Irrigation Pump VFD Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0838	\$469,621	\$778,885	\$309,263	1.66
Total Resource Cost Test (TRC) No Adder	\$0.0838	\$469,621	\$708,077	\$238,456	1.51
Utility Cost Test (UCT)	\$0.0506	\$283,580	\$708,077	\$424,497	2.50
Participant Cost Test (PCT)		\$345,504	\$599,580	\$254,076	1.74
Rate Impact Test (RIM)		\$723,697	\$708,077	(\$15,620)	0.98
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000229
Discounted Participant Payback (years)					5.76



Table 39: Trade Ally / Project Facilitation – Lighting Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0513	\$7,458,376	\$15,770,665	\$8,312,289	2.11
Total Resource Cost Test (TRC) No Adder	\$0.0513	\$7,458,376	\$14,336,968	\$6,878,592	1.92
Utility Cost Test (UCT)	\$0.0536	\$7,805,696	\$14,336,968	\$6,531,272	1.84
Participant Cost Test (PCT)		\$4,474,929	\$17,414,546	\$12,939,617	3.89
Rate Impact Test (RIM)		\$20,397,993	\$14,336,968	(\$6,061,025)	0.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0006893
Discounted Participant Payback (years)					2.08

Table 40: Trade Ally / Project Facilitation – Low Power Mixer Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0413	\$283,875	\$772,616	\$488,741	2.72
Total Resource Cost Test (TRC) No Adder	\$0.0413	\$283,875	\$702,379	\$418,503	2.47
Utility Cost Test (UCT)	\$0.0336	\$230,475	\$702,379	\$471,903	3.05
Participant Cost Test (PCT)		\$178,000	\$643,171	\$465,171	3.61
Rate Impact Test (RIM)		\$749,046	\$702,379	(\$46,668)	0.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000195
Discounted Participant Payback (years)					4.15

Table 41: Trade Ally / Project Facilitation – Motors Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0694	\$38,363	\$60,328	\$21,965	1.57
Total Resource Cost Test (TRC) No Adder	\$0.0694	\$38,363	\$54,843	\$16,481	1.43
Utility Cost Test (UCT)	\$0.0578	\$31,944	\$54,843	\$22,899	1.72
Participant Cost Test (PCT)		\$13,754	\$47,536	\$33,782	3.46
Rate Impact Test (RIM)		\$72,144	\$54,843	(\$17,301)	0.76
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000031
Discounted Participant Payback (years)					2.31



Table 42: Trade Ally / Project Facilitation – NEXANT PF NON-LIGHTING PROJECTS Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0000	\$28,395	\$0	(\$28,395)	0.00
Total Resource Cost Test (TRC) No Adder	\$0.0000	\$28,395	\$0	(\$28,395)	0.00
Utility Cost Test (UCT)	\$0.0000	\$28,395	\$0	(\$28,395)	0.00
Participant Cost Test (PCT)		\$0	\$0	\$0	n/a
Rate Impact Test (RIM)		\$28,395	\$0	(\$28,395)	0.00
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000
Discounted Participant Payback (years)					n/a

Table 43: Trade Ally / Project Facilitation – Nozzle Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0580	\$3,111	\$7,600	\$4,489	2.44
Total Resource Cost Test (TRC) No Adder	\$0.0580	\$3,111	\$6,909	\$3,798	2.22
Utility Cost Test (UCT)	\$0.0435	\$2,333	\$6,909	\$4,576	2.96
Participant Cost Test (PCT)		\$1,359	\$4,640	\$3,280	3.41
Rate Impact Test (RIM)		\$6,392	\$6,909	\$517	1.08
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003
Discounted Participant Payback (years)					1.73

Table 44: Trade Ally / Project Facilitation – Sprinkler Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1604	\$139,402	\$121,094	(\$18,308)	0.87
Total Resource Cost Test (TRC) No Adder	\$0.1604	\$139,402	\$110,086	(\$29,317)	0.79
Utility Cost Test (UCT)	\$0.0447	\$38,824	\$110,086	\$71,262	2.84
Participant Cost Test (PCT)		\$118,019	\$85,053	(\$32,965)	0.72
Rate Impact Test (RIM)		\$106,437	\$110,086	\$3,649	1.03
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000034
Discounted Participant Payback (years)					11.66



Table 45: Trade Ally / Project Facilitation – Water Heater Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0402	\$22,008	\$55,359	\$33,351	2.52
Total Resource Cost Test (TRC) No Adder	\$0.0402	\$22,008	\$50,327	\$28,318	2.29
Utility Cost Test (UCT)	\$0.0333	\$18,196	\$50,327	\$32,131	2.77
Participant Cost Test (PCT)		\$13,637	\$62,040	\$48,403	4.55
Rate Impact Test (RIM)		\$70,412	\$50,327	(\$20,085)	0.71
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000021
Discounted Participant Payback (years)					2.86

Table 46: Trade Ally / Project Facilitation – Wheel Line Leveler Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.3544	\$1,217	\$479	(\$738)	0.39
Total Resource Cost Test (TRC) No Adder	\$0.3544	\$1,217	\$436	(\$781)	0.36
Utility Cost Test (UCT)	\$0.0634	\$218	\$436	\$218	2.00
Participant Cost Test (PCT)		\$1,123	\$388	(\$736)	0.35
Rate Impact Test (RIM)		\$481	\$436	(\$46)	0.90
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000
Discounted Participant Payback (years)					20.59

Tables 47 through Table 61 present the PY2022 and PY2023 cost-effectiveness results for the Trade Ally / Project Facilitation delivery options with NEIs. Table 63 details the non-energy benefits included in this analysis.

Table 47: Trade Ally / Project Facilitation – Adaptive Refrigeration Control (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0675	\$436,548	\$772,088	\$335,540	1.77
Total Resource Cost Test (TRC) No Adder	\$0.0675	\$436,548	\$703,512	\$266,964	1.61
Utility Cost Test (UCT)	\$0.0413	\$266,853	\$685,755	\$418,902	2.57
Participant Cost Test (PCT)		\$322,420	\$779,365	\$456,944	2.42
Rate Impact Test (RIM)		\$875,736	\$685,755	(\$189,980)	0.78
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000248
Discounted Participant Payback (years)					4.96



Table 48: Trade Ally / Project Facilitation – Compressed Air with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0658	\$465,081	\$829,613	\$364,531	1.78
Total Resource Cost Test (TRC) No Adder	\$0.0658	\$465,081	\$758,416	\$293,334	1.63
Utility Cost Test (UCT)	\$0.0408	\$288,400	\$711,972	\$423,572	2.47
Participant Cost Test (PCT)		\$340,748	\$742,260	\$401,512	2.18
Rate Impact Test (RIM)		\$820,150	\$711,972	(\$108,178)	0.87
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000222
Discounted Participant Payback (years)					5.97

Table 49: Trade Ally / Project Facilitation – Custom Capital Projects with NEIs Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0604	\$1,099,841	\$2,053,774	\$953,933	1.87
Total Resource Cost Test (TRC) No Adder	\$0.0604	\$1,099,841	\$1,869,083	\$769,242	1.70
Utility Cost Test (UCT)	\$0.0362	\$658,514	\$1,846,913	\$1,188,398	2.80
Participant Cost Test (PCT)		\$819,607	\$1,799,308	\$979,700	2.20
Rate Impact Test (RIM)		\$2,057,371	\$1,846,913	(\$210,459)	0.90
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000515
Discounted Participant Payback (years)					6.83

Table 50: Trade Ally / Project Facilitation – Drain for wheel line, hand line, portable main line, pivot, or linear (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1433	\$1,770	\$2,873	\$1,103	1.62
Total Resource Cost Test (TRC) No Adder	\$0.1433	\$1,770	\$2,714	\$944	1.53
Utility Cost Test (UCT)	\$0.0640	\$791	\$1,591	\$801	2.01
Participant Cost Test (PCT)		\$1,366	\$2,445	\$1,079	1.79
Rate Impact Test (RIM)		\$1,726	\$1,591	(\$135)	0.92
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000001
Discounted Participant Payback (years)					3.32



Table 51: Trade Ally / Project Facilitation – Energy Management (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0640	\$538,623	\$1,543,850	\$1,005,227	2.87
Total Resource Cost Test (TRC) No Adder	\$0.0640	\$538,623	\$1,434,929	\$896,307	2.66
Utility Cost Test (UCT)	\$0.0630	\$530,458	\$1,089,205	\$558,747	2.05
Participant Cost Test (PCT)		\$89,811	\$1,129,899	\$1,040,088	12.58
Rate Impact Test (RIM)		\$1,232,987	\$1,089,205	(\$143,782)	0.88
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000867
Discounted Participant Payback (years)					0.24

Table 52: Trade Ally / Project Facilitation – Fast Acting Doors (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0851	\$457,869	\$647,903	\$190,034	1.42
Total Resource Cost Test (TRC) No Adder	\$0.0851	\$457,869	\$590,346	\$132,477	1.29
Utility Cost Test (UCT)	\$0.0544	\$292,358	\$575,567	\$283,210	1.97
Participant Cost Test (PCT)		\$331,022	\$667,769	\$336,747	2.02
Rate Impact Test (RIM)		\$779,837	\$575,567	(\$204,269)	0.74
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000284
Discounted Participant Payback (years)					3.97

Table 53: Trade Ally / Project Facilitation – Gasket for wheel line, hand line, or portable main line (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0892	\$8,991	\$19,085	\$10,095	2.12
Total Resource Cost Test (TRC) No Adder	\$0.0892	\$8,991	\$17,787	\$8,796	1.98
Utility Cost Test (UCT)	\$0.0557	\$5,616	\$12,985	\$7,369	2.31
Participant Cost Test (PCT)		\$5,697	\$14,756	\$9,058	2.59
Rate Impact Test (RIM)		\$13,247	\$12,985	(\$262)	0.98
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000006
Discounted Participant Payback (years)					2.30



Table 54: Trade Ally / Project Facilitation – HVAC (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1283	\$1,125,531	\$1,053,952	(\$71,578)	0.94
Total Resource Cost Test (TRC) No Adder	\$0.1283	\$1,125,531	\$951,917	(\$173,614)	0.85
Utility Cost Test (UCT)	\$0.0824	\$722,948	\$1,020,356	\$297,408	1.41
Participant Cost Test (PCT)		\$627,339	\$984,725	\$357,385	1.57
Rate Impact Test (RIM)		\$1,551,356	\$1,020,356	(\$530,999)	0.66
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000388
Discounted Participant Payback (years)					6.53

Table 55: Trade Ally / Project Facilitation – Irrigation Pump VFD (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0838	\$469,621	\$799,991	\$330,370	1.70
Total Resource Cost Test (TRC) No Adder	\$0.0838	\$469,621	\$729,184	\$259,562	1.55
Utility Cost Test (UCT)	\$0.0506	\$283,580	\$708,077	\$424,497	2.50
Participant Cost Test (PCT)		\$345,504	\$620,687	\$275,183	1.80
Rate Impact Test (RIM)		\$723,697	\$708,077	(\$15,620)	0.98
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000229
Discounted Participant Payback (years)					5.57

Table 56: Trade Ally / Project Facilitation – Lighting (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0513	\$7,458,376	\$19,072,020	\$11,613,644	2.56
Total Resource Cost Test (TRC) No Adder	\$0.0513	\$7,458,376	\$17,638,324	\$10,179,948	2.36
Utility Cost Test (UCT)	\$0.0536	\$7,805,696	\$14,336,968	\$6,531,272	1.84
Participant Cost Test (PCT)		\$4,474,929	\$20,715,901	\$16,240,972	4.63
Rate Impact Test (RIM)		\$20,397,993	\$14,336,968	(\$6,061,025)	0.70
Lifecycle Revenue Impacts (\$/kWh)					\$0.0006893
Discounted Participant Payback (years)					1.75



Table 57: Trade Ally / Project Facilitation – Low Power Mixer (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0413	\$283,875	\$724,293	\$440,418	2.55
Total Resource Cost Test (TRC) No Adder	\$0.0413	\$283,875	\$654,055	\$370,180	2.30
Utility Cost Test (UCT)	\$0.0336	\$230,475	\$702,379	\$471,903	3.05
Participant Cost Test (PCT)		\$178,000	\$594,848	\$416,848	3.34
Rate Impact Test (RIM)		\$749,046	\$702,379	(\$46,668)	0.94
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000195
Discounted Participant Payback (years)					4.49

Table 58: Trade Ally / Project Facilitation – Motors (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0694	\$38,363	\$65,945	\$27,583	1.72
Total Resource Cost Test (TRC) No Adder	\$0.0694	\$38,363	\$60,461	\$22,098	1.58
Utility Cost Test (UCT)	\$0.0578	\$31,944	\$54,843	\$22,899	1.72
Participant Cost Test (PCT)		\$13,754	\$53,153	\$39,399	3.86
Rate Impact Test (RIM)		\$72,144	\$54,843	(\$17,301)	0.76
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000031
Discounted Participant Payback (years)					2.07

Table 59: Trade Ally / Project Facilitation – Nozzle (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0580	\$3,111	\$8,758	\$5,647	2.82
Total Resource Cost Test (TRC) No Adder	\$0.0580	\$3,111	\$8,067	\$4,956	2.59
Utility Cost Test (UCT)	\$0.0435	\$2,333	\$6,909	\$4,576	2.96
Participant Cost Test (PCT)		\$1,359	\$5,798	\$4,439	4.27
Rate Impact Test (RIM)		\$6,392	\$6,909	\$517	1.08
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000003
Discounted Participant Payback (years)					1.38



Table 60: Trade Ally / Project Facilitation – Sprinkler (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.1604	\$139,402	\$168,057	\$28,654	1.21
Total Resource Cost Test (TRC) No Adder	\$0.1604	\$139,402	\$157,048	\$17,646	1.13
Utility Cost Test (UCT)	\$0.0447	\$38,824	\$110,086	\$71,262	2.84
Participant Cost Test (PCT)		\$118,019	\$132,016	\$13,997	1.12
Rate Impact Test (RIM)		\$106,437	\$110,086	\$3,649	1.03
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000034
Discounted Participant Payback (years)					6.63

Table 61: Trade Ally / Project Facilitation – Wheel Line Leveler (with NEIs) Cost-Effectiveness Results - PY2022 and PY2023

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.3544	\$1,217	\$1,477	\$260	1.21
Total Resource Cost Test (TRC) No Adder	\$0.3544	\$1,217	\$1,433	\$216	1.18
Utility Cost Test (UCT)	\$0.0634	\$218	\$436	\$218	2.00
Participant Cost Test (PCT)		\$1,123	\$1,385	\$262	1.23
Rate Impact Test (RIM)		\$481	\$436	(\$46)	0.90
Lifecycle Revenue Impacts (\$/kWh)					\$0.0000000
Discounted Participant Payback (years)					5.76



Table 62: *Wattsmart Business Savings Non-Energy Impacts - PY2022 and PY2023*

Measure Category	Annual Non-Energy Impacts per Measure	Annual Installs (Years)	Measure Life	Total Present Value NEIs
Additional Measures	\$3,041.75	4	15	\$28,315
Compressed Air	\$9,184.35	6	14	\$34,868.56
Energy Management	\$504,340.40	10	3	\$1,729,678
HVAC	-\$8,017.57	10	13	-\$145,905.22
Motors	\$46,682.54	6	13	\$430,803
Refrigeration	\$10,557.38	4	14	\$96,914.28
Wastewater	\$972.97	2	15	\$9,239
Sprinkler	\$8,896.14	16	6	\$47,342.17
Nozzle	\$234.14	2	6	\$1,158
Gasket for wheel line, hand line, or portable main line	\$970.60	2	6	\$4,801.62
Drain for wheel line, hand line, portable main line, pivot, or linear	\$226.80	2	6	\$1,122
Wheel line leveler	\$168.92	2	7	\$997.73
Irrigation Pump VFD	\$2,887.52	2	10	\$21,107
Adaptive Refrigeration Control	\$2,184.19	2	12	\$17,757.05
Fast Acting Doors	\$2,396.04	2	8	\$14,779
Custom Capital Projects	\$2,384.29	2	15	\$22,170.37
Low Power Mixer	-\$4,926.60	1	15	-\$48,324
Lighting	\$513,363.89	62	8	\$2,749,796.61
Anti-Sweat Heater Control	\$122.15	1	13	\$1,028
ECM	\$741.25	1	13	\$6,237.47



MEMORANDUM

To: Nancy Goddard and Peter Schaffer, Pacific Power
From: Eli Morris, Andy Hudson, and Dylan Royalty, AEG
Date: November 9, 2022
Re: Washington NEEA Cost-Effectiveness – 2022-2023 Biennium

AEG estimated the cost-effectiveness of Pacific Power's allocation of the Northwest Energy Efficiency Alliance's (NEEA's) Washington business plan in the state of Washington based on Program Year (PY) 2022 and PY2023 costs and savings estimates provided by Pacific Power. The memo provides analysis inputs and results in the following tables:

Table 1: Cost-Effectiveness Analysis Inputs

Table 2: Annual Program Costs, Nominal - PY2022 and PY2023

Table 3: Annual Savings - PY2022 and PY2023

Table 4: NEEA Cost-Effectiveness Results - PY2022 and PY2023

The NEEA business plan will be implemented in PY2022-2023. The following assumptions were utilized in the analysis:

- **Avoided Costs:** derived from PacifiCorp's 2021 Integrated Resource Plan (IRP) Preferred Portfolio "P02-MM-CETA", converted into annual values using load shapes from the same IRP.
- **Modeling Inputs:** measure savings, costs, non-energy impacts (NEIs), measure lives, incentive levels, program delivery, and portfolio costs were based on estimates provided by PacifiCorp.
- **Net-to-Gross (NTG):** All cost effectiveness calculations utilize a Net-to-gross ratio of 1.0 consistent with the Council's methodology and 8(a) of Order 01 in Docket UE-210830.
- **Retail Rates:** 2021 rates provided by PacifiCorp and escalated by inflation for future years.

Tables 1 through 3 below summarize cost-effectiveness assumptions and results for the PacifiCorp's allocation of NEEA's Washington business plan.



Table 1: Cost-Effectiveness Analysis Inputs

Parameter	Value
Discount Rate	6.88%
Residential Line Loss	7.68%
Commercial Line Loss	7.60%
Industrial Line Loss	6.82%
Residential Energy Rate (\$/kWh)	\$0.0881
Commercial Energy Rate (\$/kWh)	\$0.0836
Industrial Energy Rate (\$/kWh)	\$0.0665
Inflation Rate ¹	2.16%
Net-to-Gross	100%
Realization Rate	100%

Table 2: Annual Program Costs, Nominal - PY2022 and PY2023

Parameter	Value
Program Delivery	\$1,684,538
Utility Admin	\$55,000
Incentives	\$0
Total Utility Budget	\$1,739,538
Gross Customer Costs	\$0

Table 3: Annual Savings - PY2022 and PY2023

Parameter	Value
Gross kWh Savings at Site	6,776,658
Realization Rate	100%
Adjusted Gross kWh Savings at Site	6,776,658
Net to Gross Ratio	100%
Net kWh Savings at Site	6,776,658
Measure Life	15

¹ Future rates determined using a 2.16% annual escalator.



Table 4 presents the Washington NEEA business plan cost-effectiveness; the program is cost-effective for the UCT, PCT, PacifiCorp TRC, and TRC tests. Note that since no gross customer costs have been analyzed, the PCT is cost-effective by default with an immediate participant payback.

Table 4: NEEA Cost-Effectiveness Results - PY2022 and PY2023²

Cost-Effectiveness Test	Levelized \$/kWh	NPV Costs	NPV Benefits	Net Benefits	Benefit/Cost Ratio
Total Resource Cost Test (PTRC) + Conservation Adder	\$0.0272	\$1,683,056	\$6,992,527	\$5,309,471	4.15
Total Resource Cost Test (TRC) No Adder	\$0.0272	\$1,683,056	\$6,356,843	\$4,673,787	3.78
Utility Cost Test (UCT)	\$0.0272	\$1,683,056	\$6,356,843	\$4,673,787	3.78
Participant Cost Test (PCT)		\$0	\$6,201,518	\$6,201,518	n/a
Rate Impact Test (RIM)		\$7,884,574	\$6,356,843	(\$1,527,731)	0.81
Lifecycle Revenue Impacts (\$/kWh)					\$0.0001716
Discounted Participant Payback (years)					0.00

² Note that the values in the table have been discounted to 2022 dollars. Therefore, the program and administrative costs are slightly lower than shown in Table 2.