

Appendix 1
Conservation Forecast Adjustments

Appendix 1 - Conservation Forecast Adjustments

WAC 480-109-100 (2) (b) referring to a utility's ten-year conservation potential, states "This projection must be derived from the utility's most recent IRP, including any information learned in its subsequent resource acquisition process, or the utility must document the reasons for any differences." Accordingly, in developing this projection, the Company assessed the need to adjust IRP energy efficiency selections and identified the categories of required updates described below.

The general methodology for updating 2019 IRP energy efficiency selections found in the P-18 proxy portfolio for the 2020-2029 forecast period is summarized in the main body of this Biennial Conservation Plan. This process updated Unit Energy Savings (UES) assumptions from PacifiCorp's 2019 CPA to the most current and applicable available data and included the impacts of new standards found in House Bill 1444. A summary of the adjustment amounts by technology and year can be found in Table 4 in the main body of this Plan. This appendix details the process and data sources used to determine these adjustment amounts.

Updates to CPA measure savings resulting from updated RTF information: The Company's CPA relied on the most current and applicable data available at the time of the analysis (through January 2016). As part of the analysis to identify PacifiCorp's ten-year conservation potential and biennial conservation target, AEG reviewed updated data sources since the time of that analysis, including updates to RTF deemed measures.

Updates to CPA measure savings resulting from House Bill 1444 standards: The CPA relied upon applicable data on standards when the work was completed (April 2018). House Bill, signed into law in May 2019 added a meaningful number of new standards that were not included in the 2019 CPA. New standards change the baseline and available conservation. Impacts depend on when the standard is effective and how it is applied. AEG performed a review of the 2019 CPA, P-18 selections and the new standards imposed by the bill and determined if an adjustment/modification was necessary.

Updates to key measures to improve alignment between target and business plan:
Applicable to residential lighting and selected electric heating equipment and controls.

Changes in residential lighting baseline equipment shares as measured by the most recent RTF workbook, the recent federal rollback of the USDOE "backstop" standard (including the expanded classification of general service lamps) and the Washington implementation of the same standard through House Bill 1444 all present challenges to the cost effectiveness of lighting programs and whether incentives should be available for this equipment in the upcoming biennial period. Discontinuing incentives for high quality LEDs generates theoretical risk of the market backsliding to halogens or lower quality/efficacy LEDs and these risks, while unknown at this point, are likely to vary by channel and/or consumer and/or geography. To mitigate the risk of backsliding and equity impacts (making quality efficient lighting less affordable for income qualified consumers), the Company is planning to a) expand incentive availability in smaller retail locations where income qualified consumers may shop, (such as Dollar Stores) and, b) continue to offer incentives in traditional high volume locations where shelf surveys indicate the

share inefficient lighting equipment is above the regional information utilized by the RTF in their latest workbook. Incentives in these locations will be available until measurement of the baseline equipment shares indicates it has reached the regional average. The general service lighting adjustment found in the RTF table below reduces potential based on lower UES and removes a portion of the potential (based on an analysis of lamp sales) through a membership warehouse store that does not stock any baseline equipment.

Ductless heat pumps savings vary depending on where (home type) the equipment is installed. Variations make the measure(s) slightly cost effective or slightly non-cost effective under the P-18 proxy assumptions. Other factors (head count/cost, supplemental heat, administrative cost assumptions, and the possibility of additional non-energy impact value) all contribute to the effect. There is also ongoing RTF work to update savings to account for a better understanding of interactive effects. Ductless heat pumps are important efficiency options for many customers with zonal electric heat and limited options for adding ducting and are a key technology in the clean energy landscape. The ductless heat pump adjustment found in the RTF table below reflects adding the remaining configurations in and results in an upward adjustment to the efficiency forecast.

Line voltage thermostats savings are highly dependent on many of the factors affecting ductless heat pumps. They also represent a lower cost way to generate electric heat savings (compared to DHP installations). They were also screened them in to insure we have a complete set of electric heat options for all home types. The adjustment includes a combination of a downward adjustment for reduced UES from the RTF and an overall increase by including the potential for the reasons described above.

Updates to CPA measure savings resulting from updated RTF information

The equipment affected by the updated RTF workbook is provided in the tables below. Table A1-1 indicates if an adjustment is required and the updated information primarily responsible for the change. Table A1-2 illustrates the magnitude of the adjustment by year for the forecast period. Table A1-2 also includes the impact of *Updates to key measures to improve alignment between target and business plan* described above. The adjustment methodology focuses on the unit energy savings of the affected equipment and most adjustments are performed utilizing a ratio between the prior and the updated unit energy savings. Except where noted (residential lighting), assumptions in the CPA about turn-over and availability are not modified in this analysis.

Table A1-1 RTF Adjustment Summary

Workbook to be Updated	Last Updated	Version	Notes
Residential Lighting	4/2/2019	7.1	Lower General Service Lamp (GSL) UES, but reflector UES increases. Results in small change from v6.1
Heat Pump Water Heaters	7/8/2019	4.2	DHW and Heating impacts nearly the same, but Cooling savings reduced by roughly 100 kWh/unit
Thermostatic Shower Restriction Valve	6/27/2019	3.1	Very small reduction in UES (~5 kWh) between v1.3 and v3.1
Ductless Heat Pumps for Multifamily	6/26/2019	1.1	Updated and screened in.
Duct Sealing SF	5/17/2019	5.1	UES for increased by roughly 20% between v4.4 and v5.1
Display Case Evaporator Fan Motor Retrofit	5/3/2019	4.1	UES increased by roughly 25% between v3.3 and v4.1
Compressor Head Fan Motor Retrofit to ECM	4/9/2019	3.1	Substantial decrease in UES between v2.1 and v3.1 (~30%)
Display Case Lighting	3/29/2019	1.2	Very minor increase in UES due to recalculation of Refrigeration and HVAC interactions
Non-Residential Lighting Midstream	2/25/2019	2.1	Substantial Gen. Purpose UES decrease for Period 2 (~75% reduction), small Exempted decrease
Commercial Advanced Power Strips	1/24/2019	4.1	Roughly 45% drop in UES since v3.4
Combination Ovens	12/7/2018	3.1	Only a small UES decrease after market baseline accounted for. Already embedded in CPA baseline.
Convection Ovens	11/28/2018	3.1	Notable UES decrease (~35%) after market baseline accounted for. Already embedded in CPA baseline.
ECMs for Walk-ins	10/22/2018	3.1	Very slight negative UES adjustment between v2.3 and v3.1
Hot Food Holding Cabinets	9/26/2018	3.1	Substantial change in RTF baseline and efficient case consumption results in much higher UEC
Walk-in Evaporator Fan ECM Motor Controllers	8/22/2018	3.1	Very minor UES decrease due to revision in refrigerator interactive savings calculation
Irrigation Hardware Maintenance and Upgrades	7/23/2018	4.1	Updated affected measures, but market baseline substantially lowers UES

Table A1-2 RTF Adjustment by Year

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2020-2029
RTF adjustments (total)	936	860	1,886	2,265	2,363	2,957	3,156	2,914	2,334	1,574	21,245
Residential Lighting v7.1 (General S	(692)	(612)	(250)	(312)	(310)	(50)	(45)	(119)	(141)	(99)	(2,630)
Residential Lighting v7.1 (Exempted	760	352	403	468	32	52	142	119	109	9	2,446
Residential Lighting v7.1 (Linear Lig	(1)	(2)	(2)	(2)	(3)	(10)	(11)	(12)	(12)	(13)	(69)
Ductless Heat Pumps SF v4.2, MF v1.	870	1,067	1,241	1,418	1,660	1,825	1,867	1,763	1,518	1,177	14,404
Ductless Heat Pumps v2.1 (Central F	871	1,055	1,211	1,367	1,580	1,715	1,733	1,616	1,374	1,052	13,574
Heat Pump Water Heaters v4.2	(91)	(140)	(200)	(266)	(337)	(403)	(462)	(513)	(599)	(661)	(3,672)
Thermostatic Shower Restrictor Valv	(11)	(11)	(11)	(11)	(10)	(8)	(6)	(5)	(4)	(3)	(80)
Duct Sealing SF v5.1	180	178	175	175	157	124	98	78	61	51	1,276
Display Case Evaporator Fan Motor F	16	16	16	16	15	12	10	8	6	5	119
Compressor Head Fan Motor Retrofi	(146)	(147)	(149)	(149)	(136)	(110)	(88)	(71)	(58)	(46)	(1,100)
Display Case Lighting v1.2	9	9	9	9	8	6	5	3	2	2	61
Non-Residential Lighting Midstream	(494)	(596)	(276)	(202)	(134)	(150)	(125)	(45)	(38)	(30)	(2,090)
Commercial Advanced Power Strips	(27)	(29)	(30)	(25)	(21)	(14)	(9)	(7)	(6)	(5)	(173)
Combination Ovens v3.1	(4)	(5)	(6)	(7)	(9)	(10)	(11)	(12)	(13)	(10)	(86)
Convection Ovens v3.1	(9)	(12)	(15)	(18)	(21)	(23)	(26)	(29)	(31)	(25)	(208)
ECMs for Walk-Ins v3.1	(6)	(6)	(6)	(6)	(6)	(5)	(4)	(3)	(2)	(2)	(47)
Hot Food Holding Cabinets v3.1	19	31	46	63	83	105	124	146	159	172	947
Walk-in Evaporator Fan ECM Motor C	(3)	(3)	(3)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(18)
Irrigation Hardware Maintenance an	(393)	(392)	(390)	(389)	(348)	(276)	(218)	(172)	(137)	(109)	(2,823)
Residential Electronic Line Voltage T	88	107	124	141	164	179	182	171	145	111	1,412

Updates to CPA measure savings resulting from House Bill 1444 standards

The equipment affected by the standard and the effective year are provided in the tables below. Table A1-3 indicates if an adjustment is required. Table A1-4 illustrates the magnitude of the adjustment by year for the forecast period. The adjustment methodology focuses on the unit energy consumption of the affected equipment. Assumptions in the CPA about turn-over and availability are not modified in this analysis. In the case where the standards move the baseline to (or reasonably equivalent to) the measure, the remaining conservation potential is set to zero and displayed as a deduction in Table A1-4.

Table A1-3 HB 1444 Adjustment Summary

C&S Adjustment Summary			
RCW 19.260.50 Limitations on	Modifying CPA?	Effective Year	If Excluded from reconsideration, why?
Hot water dispensers and mini t	Included	2021	Covered under broader ESTAR Water Cooler measure in CPA
Bottle-type water dispensers an	Included	2021	Covered under broader ESTAR Water Cooler measure in CPA
Residential pool pumps and por	Included	2020/2021	Spas go into effect in 2020, but pool pumps in 2021
Tub spout diverters	No modification	2021	Small saver not included in CPA therefore no adjustment made
Commercial hot food holding ca	No modification	2010/2011	Not updated in HB 1444
Air compressors	Included	2022	Lubricated, rotary-type only, reduce applicability starting in 2022 accordi
Commercial fryers, commercial c	Included	2021	Incorporated into analysis
Computers and computer monit	Included	2021	Incorporated into analysis
Faucets	Included	2021	Incorporated into analysis
High CRI Fluorescent Lamps	No modification	2023	Currently known standard (2017 CFR), could be updated if CA makes prog
Portable air conditioners	No modification	2/1/2022	Small saver not included in CPA therefore no adjustment made
Residential ventilating fans	No modification	2021	Small saver not included in CPA therefore no adjustment made
Showerheads	Included	2021	Incorporated into analysis
Spray sprinkler bodies	No modification	2021	Water savings code, not energy savings (no hot water)
Uninterruptible power supplies	No modification	2021	Not modeled outside of data centers in CPA and this only applies to smal
Urinals and water closets	No modification	2021	Water savings code, not energy savings (no hot water)
Water coolers	Included	2021	Incorporated into analysis
General service lamps	No modification	2020	Reinforces backstop already included in CPA baseline
Electric storage water heaters	No modification	2021	Code is a DR control connection, does not affect energy savings directly.

Three measures have remaining potential - faucet aerators, showerheads and air compressors. All the rest of the measures set baseline equal to measure and the impact of the adjustment is to remove all potential. The impacts (MWh) of the adjustments by measure and year are included in the table below.

Table A1-4 HB 1444 Adjustment by Year

C&S Potential Adjustments

Measure	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Pool Pumps	0	-401	-451	-485	-520	-541	-561	-577	-593	-612
Hot Tub/Spas	0	0	0	-7	-119	-151	-166	-121	-130	-119
Fryers	-7	-20	-28	-37	-52	-70	-86	-94	-99	-129
Dishwashers	0	-45	-55	-63	-71	-78	-99	-117	-128	-104
Steamers	0	-80	-115	-153	-195	-234	-267	-295	-316	-332
Personal Computers/Desktops	0	-370	-403	-308	-119	-175	-129	-87	-74	-21
Monitors	0	-419	-434	-414	-63	-117	-77	-50	-34	-26
Faucet Aerators	-13	-117	-127	-153	-184	-211	-231	-238	-231	-205
Low-Flow Showerheads	0	-185	-176	-170	-151	-120	-95	-76	-61	-46
Water Coolers	0	-26	-28	-29	-31	-30	-31	-32	-33	-34
Air Compressors	0	0	-297	-301	-277	-225	-183	-149	-122	-72
Total C&S	-20	-1,665	-2,113	-2,120	-1,781	-1,953	-1,925	-1,837	-1,821	-1,699