

# Appendix 1

## Conservation Forecast Adjustments

The general methodology for updating 2017 IRP energy efficiency selections for the 2018-2027 forecast period is summarized in the main body of this Biennial Conservation Plan. This process updated UES assumptions from PacifiCorp's 2017 CPA to the most current and applicable available data.<sup>22</sup> 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 primarily focused on residential measures where UES's are the dominant metric for planning and reporting savings. Consistent with WAC 480-109-100, the 2017 CPA relied on RTF deemed savings,<sup>23</sup> except in cases where the measure was not assessed by the RTF or where more relevant or reliable data were available. Appendix G of Volume 4 of the 2017 CPA report provides an accounting of RTF and Seventh Power Plan UES values used in the development of the potential for the 2017 IRP. As noted in that appendix, UES values used in the CPA were based on the latest RTF or Council guidance at the time the analysis was performed in early 2016. However, the RTF periodically updates deemed measure assumptions as new data become available, and some of the CPA assumptions are no longer consistent with current RTF deemed savings analysis.

### **Advanced Power Strips**

The 2017 CPA assessed the potential for two tiers of advanced power strips, consistent with the analysis from the Seventh Power Plan. Of these, the CPA and IRP indicated that only the higher efficiency (infrared sensing) power strip was projected to be cost-effective. In December of 2016, the RTF updated its UES for infrared sensing power strips,<sup>24</sup> which the Company used to adjust the forecast for advanced power strips. This update changed the UES value from 185 kWh to 216 kWh, leading to a modest increase in forecasted potential for this measure.

### **Ductless Heat Pumps**

The RTF distinguishes between two applications for ductless heat pumps based on whether they are replacing ducted or zonal heating systems:

- **Ducted:** The RTF updated its UES value for ducted applications in December of 2016.<sup>25</sup> Incorporating this update into PacifiCorp's conservation forecast led to a small increase in potential, as the updated RTF value of 3,836 kWh was slightly higher than the 3,655 kWh used for the CPA.
- **Zonal:** The 2017 IRP did not identify ductless heat pumps in zonal applications as cost-effective at any time during the 2018-2027 period. However, this assessment of cost-effectiveness relied solely on benefits quantified in RTF or Council workbooks (i.e., saved electricity and avoided wood purchases), and did not include public health benefits of reduced particulate matter emissions from avoided wood burning. Because of the work that has already been performed in the region to show that reduced particulate matter emissions can be directly attributed to the installation of a ductless heat pump to replace zonal heating, the Company collaborated with its DSM Advisory Group and the other Washington

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<sup>22</sup> The Company used data available as of July 31, 2017, to inform this analysis, to allow sufficient time for incorporation into the conservation forecast and biennial conservation target and for DSM Advisory Group review.

<sup>23</sup> Current and archived RTF UES workbooks are available at: <http://rtf.nwccouncil.org//measures/Default.asp>.

<sup>24</sup> RTF workbook ResAdvancedPowerStrips\_IR\_Sensing\_v1\_3.xlsx.

<sup>25</sup> RTF workbook ResDHPonFAF\_v1\_5.

investor-owned utilities to develop a plan to quantify the impacts in its service territory. Including this benefit is expected to make the measure cost-effective for the 2018-2019 biennium. Additional information on this effort is provided in the DSM Business Plan (Appendix 2 to this Plan).

In addition to assessing and incorporating public health benefits, the Company also updated the UES value to the latest value from the RTF from July of 2016,<sup>26</sup> leading to a decrease in estimated savings from 2,3,19 kWh per home to 2,146 kWh per home. However, because this measure was not deemed cost-effective in the IRP, the combined effect of the updated UES and incorporation of public health benefits was an increase in the cost-effective potential.

### **Low Flow Showerheads**

The UES for low flow showerheads was updated to the latest value from the RTF, based on an update in November of 2016.<sup>27</sup> This update led to a downward adjustment in available potential, as the UES decreased from 252 kWh assumed in the CPA to 200 kWh.

### **Residential Light Bulbs**

In April of 2017, the RTF released an updated residential lighting workbook containing 180 different measure permutations based on technology, lamp type, lumen category, hours of use, and delivery channel.<sup>28</sup> However, as it would be impractical to estimate potential at this level, the CPA modeled five categories of light bulbs, as shown in Table A1-1.<sup>29</sup> Because RTF and CPA values could not be directly compared, the Company engaged RTF staff to create weighted average UES values matching the CPA categories, and used these values to adjust forecasted lighting savings.

**Table A1-1. Residential Light Bulb UES Comparison**

CPA				RTF Staff Weighted Average
Location	Technology	Lamp Type	UES (kWh)	Updated UES (kWh)
Interior	CFL	General Purpose	16	11
Interior	LED	General Purpose	18	
Exterior	LED	General Purpose	39	
Interior	CFL	Specialty	16	21
Interior	LED	Specialty	19	

<sup>26</sup> RTF workbook ResSFExistingHVAC\_v4\_1.xlsm.

<sup>27</sup> RTF workbook Showerheads\_v3.1.xlsm.

<sup>28</sup> RTF workbook ResLighting\_v5.1.xlsm.

<sup>29</sup> Although Pacific Power no longer incentivizes compact fluorescent light bulbs (CFLs), potential for this technology was included in the early years of the CPA analysis for consistency with the methodology used by the Council in its Seventh Power Plan.

## **Wi-Fi Thermostats**

In April of 2017, the RTF updated its UES values for wi-fi, or “connected,” thermostats.<sup>30</sup> The RTF analysis has two distinct UES values for Pacific Power’s heating zone, depending on whether the home has an electric forced air furnace (434 kWh) or a heat pump (628 kWh). For direct comparison with the modeling of this measure in the CPA, with average savings for heating and cooling systems, the Company weighted the RTF UES values based on the relative saturation of electric furnaces and heat pumps in its service area, arriving at a weighted average UES of 536 kWh. This value represented a slight upward adjustment to the 525 kWh UES from the CPA, leading to a modest increase in the conservation forecast.

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<sup>30</sup> RTF workbook ResConnectedTstats\_v1.2.xlsm.