Substitute Biennial Conservation Plan

PacifiCorp's 2018 - 2019 Biennial Conservation Plan for its Washington Service Area

November 1, 2017
Updated November 27, 2017

PACIFIC POWER
A DIVISION OF PACIFICORP

Table of Contents

Index of Tables

Preface

Pursuant to WAC 480-109-110 (3), Pacific Power provided a draft of this Biennial Conservation Plan (Plan) to its Demand Side Management (DSM) Advisory Group on October 2, 2017. Washington Utilities and Transportation Commission (WUTC) Staff (Staff) provided comments on the draft Plan on October 20th and October 23rd. No other members of the DSM Advisory Group provided comments on the draft Plan. Minor updates identified by Staff (e.g., an additional footnote reference) are incorporated into this Plan. More substantive requests and updates are described in this Preface.

Home Energy Report Update

On September 19, 2017, Pacific Power presented its draft biennial conservation target to the DSM Advisory Group. As part of that discussion, Pacific Power described its ongoing procurement efforts for the continuation of its Home Energy Report program, explaining that the draft target reflected the best information available at the time, but that the target may change in the final Plan based on ongoing vendor selection and contract negotiations. Based on updated information obtained through these ongoing negotiations, the expected costs and savings of the Home Energy Report program for the 2018-2019 biennial period have decreased. This updated information was incorporated into the biennial conservation target presented in this Plan, decreasing the target from 80,014 Megawatt-hours (MWh, presented in the draft Plan) to 78,008 MWh.

Treatment of Northwest Energy Efficiency Alliance (NEEA) Savings and Pacific Power's Decoupling Commitment

To develop its 2018-2019 biennial conservation target, Pacific Power treated forecasted savings from NEEA's initiatives and the five percent decoupling commitment consistently with Commission direction:

- In acknowledging that Pacific Power achieved its 2010-2011 biennial conservation target, the Commission ordered Pacific Power to work with Avista Corporation and Puget Sound Energy to develop and jointly propose a consistent approach to claiming NEEA conservation savings for future biennia.[1] On October 31, 2012, Pacific Power filed this joint utility proposal with the WUTC, and used this approach to establish its 2014-2015 and 2016-2017 biennial conservation targets, which the WUTC approved.
- On September 1, 2016, the Commission issued Order 12 in Docket UE-152253, approving the decoupling mechanism and directing Pacific Power to increase its biennial conservation target by 2.5 percent for 2016-2017 and by five percent in future biennia. The methodology for increasing the biennial conservation target was shared with the DSM Advisory Group on September 30, 2016, and included in Pacific Power's 2017 Annual Conservation Plan, which was acknowledged by the WUTC at the January 27, 2017, public meeting.

Pacific Power communicated its plans to continue to use the established methodology for NEEA and decoupling for the 2018-2019 biennium to the Advisory Group through the following process:

[1] Docket UE-100170, Order 03 at ¶28 (Sept. 13, 2012).

- At the June 29, 2017 DSM Advisory Group meeting, Pacific Power presented an overview of the target-setting process, reminding stakeholders of the established method for addressing NEEA and decoupling in biennial conservation target development.
- At the August 18, 2017 DSM Advisory Group meeting, Pacific Power presented a preliminary calculation of the biennial conservation target, illustrating how the NEEA forecast would be removed from the conservation potential (consistent with current practice) and how the decoupling adder would be applied for the purpose of establishing a biennial conservation target.
- On October 2, 2017, the draft Plan sent to the DSM Advisory Group provided the draft biennial conservation target using the same calculation methodology presented at the August 18, 2017 meeting.

On October 23, 2017, Staff sent an email expressing concerns that the established method for accounting for forecasted savings from NEEA initiatives creates confusion and unnecessary discussion. While Pacific Power appreciates Staff's comments, it is concerned that changing the methodology at this time would be inconsistent with prior Commission guidance and could be contrary to the Commission's intent in ordering the three utilities to develop a common methodology for accounting for forecasted savings from NEEA initiatives. That is, if Pacific Power deviated from the established treatment of NEEA in this Plan, the new treatment may then be inconsistent with one or both of the other investor-owned utilities, who will be filing their 2018-2019 biennial conservation plans on the same day. Pacific Power looks forward to exploring this issue further once all three biennial conservation plans are filed, allowing the Commission to assess how best to ensure consistency in treatment of NEEA and decoupling moving forward.

The National Standard Practice Manual and Resource Value Test

In August of 2017, Staff began expressing interest in considering the Resource Value Test (RVT) established in the new *National Standard Practice Manual* (NSPM)[2], as an alternative means of assessing the cost-effectiveness of conservation resources. In an October 23, 2017, email, Staff requested that Pacific Power's Plan include a timeline for reviewing the RVT and identifying all non-energy impacts that should be quantified.

As defined in the NSPM, "[t]he RVT is the primary cost-effectiveness test designed to represent a regulatory perspective, which reflects the objective of providing customers with safe, reliable, low-cost energy savings, while meeting a jurisdiction's other applicable policy goals and objectives."[3] Importantly, the NSPM establishes a seven step process for developing an RVT in a given jurisdiction:

> **Step 1**. Identify and articulate the jurisdiction's applicable policy goals.
> **Step 2**. Include all the utility system costs and benefits.
> **Step 3**. Decide which non-utility impacts to include in the test, based on applicable policy goals.
> **Step 4**. Ensure that the test is symmetrical in considering both costs and benefits.
> **Step 5**. Ensure the analysis is forward looking and incremental.

[2] The National Efficiency Screening Project, *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources* (Spring 2017).
[3] Id. at ix.

Step 6. Develop methodologies to account for all relevant impacts, including hard to quantify impacts.

Step 7. Ensure transparency in presenting the inputs and results of the cost-effectiveness test.

In adopting rules for how utilities identify cost-effective conservation[4] and in approving Pacific Power's 2016-2017 Biennial Conservation Plan[5], the WUTC has established cost-effectiveness tests for Pacific Power to use in planning for and pursuing conservation resources. Per the definition above from the NPSM, the Total Resource Cost test, as modified by the Northwest Power and Conservation Council, is the current RVT for Washington investor-owned utilities. If the WUTC is concerned that the current cost-effectiveness test no longer aligns with policy goals, then, consistent with Step 1 in the NSPM, Pacific Power recommends that the WUTC have further discussion that allows stakeholders to work collaboratively to identify these policy goals and to determine whether modifications to the existing cost-effectiveness test, and the Washington Administrative Code (WAC) rules, are required for future biennia.

[4] WAC 480-109-100 (8) and (10).

[5] Docket UE-152072, Order 01 Attachment A (8) (Dec. 17, 2015).

Introduction

Background

Seeking to increase energy conservation in Washington, voters passed Initiative Measure No. 937 (codified as Revised Code of Washington 19.285 and WAC 480-109) in 2006. As a result, each electric utility subject to the jurisdiction of the Washington Utilities and Transportation Commission (Commission) is required to project its cumulative ten-year electric conservation potential and to establish biennial conservation targets.

When determining its ten-year conservation potential, WAC 480-109-100 (2) (a) states that a utility must "…consider all available conservation resources that are cost-effective, reliable, and feasible." The potential must be derived from the utility's most recent Integrated Resource Plan (IRP), including any information learned in its subsequent resource acquisition process, or the utility must document the reasons for any differences. When developing this projection, utilities must use methodologies that are consistent with those used in the Northwest Conservation and Electric Power Plan. The projection must include a list of each measure used in the potential, its unit energy savings value, and the source of that value.[6]

With respect to establishing a biennial conservation target, WAC 480-109-100 (3) states that: a) the biennial conservation target must identify, and quantify in megawatt-hours, all available conservation that is cost-effective, reliable and feasible, and b) the biennial conservation target must be no lower than a pro rata share of the utility's ten-year conservation potential. In WAC 480-109-060 (19) "pro rata" is defined as "the calculation dividing the utility's projected ten-year conservation potential into five equal proportions to establish the minimum biennial conservation target."

In compliance with these requirements, the Company provides this Biennial Conservation Plan and requests that the Commission approve the ten-year conservation potential and biennial conservation target established in this Plan.

Types of Conservation Included in the Ten-Year Forecast

WAC 480-109-100 (1) (b) establishes six types of conservation for consideration in establishing a conservation forecast:

1. End-use efficiency;
2. Behavioral programs;
3. High-efficiency cogeneration;
4. Production efficiency;
5. Distribution efficiency; and
6. Market transformation.

The Company's method for forecasting the potential for each of the above types of conservation is described below.

[6] WAC 480-109-100 (2) (a) through (c).

End-Use Efficiency, Behavioral Program, and Market Transformation

As required by WAC 480-109-100 (2) (b), PacifiCorp's projection of cumulative ten-year conservation potential is derived from the Company's 2017 IRP, filed with the Commission in Docket UE-160353. The Company's 2017 IRP was informed by the energy efficiency potential identified in PacifiCorp's *Demand-Side Resource Potential Assessment for 2017-2036* (Conservation Potential Assessment, or CPA), performed by Applied Energy Group, using methodologies consistent with those used by the Northwest Power and Conservation Council (Council) and representing opportunities specific to the Company's Washington service area.[7] The amount of cost-effective, reliable and feasible conservation identified in the 2017 IRP encompasses three of the six types of conservation: end-use efficiency, behavioral programs,[8] and market transformation.[9]

Efficiency opportunities from waste heat-to-power and regenerative technologies were not captured in the Company's CPA or offered as a resource option in the 2017 IRP. For the development of this conservation forecast the Company relied on a 2014 evaluation of these technologies performed by CLEAResult and included as Appendix 4 to this Plan. The potential for waste heat-to-power and regenerative technologies that have estimated levelized costs lower than the most expensive energy efficiency resource selected by the 2017 IRP is included in the ten-year conservation forecast.

High-Efficiency Cogeneration

The potential for high-efficiency cogeneration was derived from PacifiCorp's *Private Generation Long-Term Resource Assessment (2017-2036)* (Private Generation Study), performed by Navigant Consulting, Inc.[10] The Private Generation Study is an economic assessment providing forecasts of projected penetration levels of private generation resources within PacifiCorp's service areas through 2036, including a Washington-specific assessment of high-efficiency cogeneration. The Private Generation Study did not identify any cost-effective high-efficiency cogeneration opportunities for inclusion in the Company's 2018-2027 conservation forecast.

Production Efficiency

To identify cost-effective, reliable and feasible opportunities for production efficiency during the 2018-2027 period, Pacific Power reviewed its analysis of opportunities, barriers and costs and models developed for the 2016-2017 biennial target-setting process. Through this review, the Company found that prices and model inputs[11] have not changed enough for the cost-effectiveness determination of these projects to have changed. As a result, the Company is not forecasting any

[7] The 2017 Conservation Potential Assessment and all previous studies are available on the Company's website: http://www.pacificorp.com/env/dsm.html.

[8] Because savings from behavioral programs, such as PacifiCorp's Home Energy Reports program, are already reflected in actual and forecasted sales, IRP selections include only behavioral program savings incremental to current program achievements.

[9] Savings from market transformation are included in the Council's assumption that 85 percent of energy efficiency potential is achievable over 20 years; an assumption that PacifiCorp uses in its CPA.

[10] The Private Generation study is available on the Company's website: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2017_IRP/PacifiCorp_IRP_DG_Resource_Assessment_Final.pdf.

[11] Inputs are outlined in Production Efficiency Economic Evaluation Methodology in Cost Effectiveness section of Appendix 2 – Washington DSM 2018-2019 Business Plan.

cost-effective, reliable and feasible opportunity for production efficiency during the 2018-2027 period, and thus, no savings from production efficiency are included in the Company's 2018-2019 Biennial Conservation Target.

Distribution Efficiency

In 2012, Pacific Power completed a conservation voltage reduction (CVR) pilot on four of its most promising circuits, utilizing the Regional Technical Forum's simplified protocol for measuring savings. All four circuits failed to meet the efficiency thresholds before and after the voltage reduction and savings could not be verified. As part of the 2016-2017 biennial target-setting process, the Company reviewed current measurement protocols and technologies and didn't find material changes from the 2012 period. The Company is currently migrating to the CYME distribution analysis software, which will enable more robust analyses of complex scenarios and may inform the assessment of cost-effective, reliable, and feasible distribution efficiency opportunities for future biennia. However, for the 2018-2027 forecast period, the Company has not identified any such potential for distribution efficiency.

Overview of 2018-2027 Conservation Forecast & 2018-2019 Biennial Conservation Target

Collectively, the analyses described above, and in greater detail later in this Plan, form the basis of the ten-year cumulative conservation potential available in PacifiCorp's Washington service area before applying adjustments to account for updates since the time of the analysis. These adjustments are described later in this Plan and are detailed in Appendix 1. The ten-year cumulative conservation potential deemed cost-effective, reliable, and feasible in PacifiCorp's Washington service area is 394,473 MWh, as shown in Table 1.

Table 1. Cumulative 2018-2027 Conservation Potential by Type

Conservation Category	10-Year Cumulative Potential (MWh at Generator)
2017 IRP Selections (End-use Efficiency, Market Transformation, and Incremental Behavioral Programs)	334,670
Energy Efficiency Adjustments*	59,803
High-Efficiency Co-Generation	0
Distribution Efficiency	0
Production Efficiency	0
Total	**394,473**

* Includes existing behavioral programs, waste heat-to-power and regenerative technologies, and measure-level adjustments based on updated information

To establish a biennial conservation target, consistent with WAC 480-109-100 (3), the Company identified all available conservation that is cost-effective, reliable and feasible for the 2018-2019 period. This amount, 81,500 MWh, is larger than the pro-rata share of 78,895 MWh, and thus satisfies the requirement of WAC 480-109-100 (3) (b). The identified 2018-2019 level of

conservation is then adjusted, per Commission guidance described later in this Plan, to develop Pacific Power's biennial conservation target of 78,008 MWh, as shown in Table 2.

Table 2. 2018-2019 Biennial Conservation Target

Conservation Category	2018-2019 MWh
Cost-effective, reliable and feasible conservation	81,500
Less savings forecasted by the Northwest Energy Efficiency Alliance	7,207
	74,293
Plus 5% decoupling commitment	3,715
2018-2019 Biennial Conservation Target	**78,008**

Budget and Savings by Program

The Company's 2018-2019 Demand-Side Management Business Plan (DSM Business Plan) is provided as Appendix 2 to this report. The DSM Business Plan contains forecasted savings and expenditures from the Company's existing programs as well as information on adaptive management strategies, pilots, outreach, and evaluation efforts for the 2018-2019 period. The DSM Business Plan also provides cost-effectiveness results in support of the Company's direction and program strategies. The Company may add programs or make changes to existing programs as filed tariff attachments or as revisions to the business plan during the 2018-2019 biennium under the adaptive management program delivery structure, which includes consultation with the Company's DSM Advisory Group. Forecasted savings and budgets are based on the best information available at the time of this filing; a small variance between planned and actual savings and spending is expected, given uncertainty in customer participation levels in the programs during the biennium period. As required by WAC 480-109-120 (2) the Company will file an Annual Conservation Plan for 2019 on or before November 15, 2018.

Frozen and Floating Unit Energy Savings

For consistency between target-setting and reporting, the Company has historically used consistent measure unit energy savings (UES) values throughout a biennial period, regardless of whether the Regional Technical Forum or a program evaluation indicates that an update to the value is warranted. These values are typically referred to as "frozen" UES values, as opposed to "floating" UES values, which would be updated during a biennial period.

In response to stakeholder input during the 2014-2015 biennial target setting process, the Company performed a parallel savings analysis in its 2014-2015 Biennial Conservation Report to quantify the level of risk associated with "floating" UES values. To perform this analysis, the Company chose to replicate Puget Sound Energy's method of updating UES values once during the biennial period, effective January 1st of the second year based on updated information available by October 1st of the first year. The Company shared the proposed methodology with its DSM Advisory Group on March 18, 2015, and Advisory Group members agreed that the method was appropriate for the purpose of this risk assessment.

The analysis indicated that allowing UES values to float during the 2014-2015 biennium would have decreased total claimed savings by 3,300 MWh at site, or 3.3 percent of savings claimed towards satisfying the 2014-2015 Biennial Conservation Target. While the percentage impact was relatively small during the 2014-2015 biennium, the analysis illustrated that many measures are affected by Regional Technical Forum (RTF) updates and that floating UES values do create risk for a utility in meeting its biennial conservation target.[12] Despite this risk, to be responsive to stakeholder input and to better align with the other Washington investor-owned utilities, the Company plans to begin using floating UES values for reporting in the 2018-2019 biennium.

Excess Conservation

WAC 480-109-100 (3) (c) (i) states that "cost-effective conservation achieved in excess of a biennial conservation target may be used to meet up to twenty percent of each of the immediately subsequent two biennial targets." And that "[t]he presence of excess conservation does not relieve a utility of its obligation to pursue the level of conservation in its biennial target."

As stated in Order 03 in Docket UE-132047, "Pacific Power achieved excess savings during the 2014-2015 biennium. Pacific Power is entitled to claim 24,178 megawatt-hours of excess savings." At the time of this filing, final achievement from the 2016-2017 biennium is not available, however, the Company's 2017 Annual Conservation Plan forecasted an additional 4,117 MWh of excess conservation for the 2016-2017 biennium. While Pacific Power fully expects to meet or exceed the 2018-2019 conservation target established in this Plan, the Company notes that excess conservation will help serve as a hedge against risks, including potential impacts of moving to a floating UES methodology.

[12] For measure-level impacts of floating UES values during the 2014-2015 biennium, refer to Table 7 of Pacific Power's *2014-2015 Biennial Conservation Report.*

Stakeholder Engagement

Pacific Power appreciates the collaboration and guidance of stakeholders, in particular it's DSM Advisory Group, in the development of the conservation forecast and biennial conservation target established in this Plan. A timeline of stakeholder meetings and topics applicable to the biennial planning process is provided below. These meetings, coupled with email communications in which supporting information was shared, were pivotal in helping the Company develop the conservation forecast and biennial target. Additional detail on how the Company complied with stakeholder engagement requirements established in WAC 480-109-110 and Attachment 1 to Order 01 in Docket UE-152072 is provided in the "Plan Compliance Information" section later in this document.

March 22, 2016 – DSM Advisory Group Meeting

- Presented 2017 potential study highlights including schedule, contractor selection, scope of work and key changes including use of 7th Power Plan ramp rates in place of ramp rates used in prior potential assessments.

June 21, 2016 – IRP Public Input Meeting

- Kickoff meeting. Review 2017 IRP schedule and supplemental studies (including Conservation Potential Assessment. Provide highlights from 2015 IRP update including impacts of energy efficiency.

June 27, 2016 – DSM Advisory Group Meeting

- Non-energy impacts for the next planning cycle. Reviewed current practice of incorporating impacts reliably quantified by third parties. Discussed challenges on how to include non-energy impacts when the research (specifically health benefits from reduced wood smoke attributable to ductless heat pump installations) did not meet the RTF quality standards. Presented and reviewed approaches to completing the RTF work.

August 25-26, 2016 – IRP Public Input Meeting

- Private Generation Study (includes assessment of Washington high efficiency co-generation).
- Review of draft 2017 CPA results and comparison to 2015 results.

September 22-23, 2016 – IRP Public Input Meeting

- Smart Grid update
- CYME Distribution Analysis Software

March 2-3, 2017 – IRP Public Input Meeting

- 2017 IRP draft Preferred Portfolio selection and sensitivity cases
- Regional Haze and Core Cases

April 5, 2017 – DSM Advisory Group Meeting

- Non-energy impacts. Review of the Seventh Power Plan action plan directives on non-energy impacts, Pacific Power's engagement with the Bonneville Power Administration Working Group including concerns about moving ahead with research ahead of established RTF guidelines.

June 29, 2017 – DSM Advisory Group Meeting

- Provided detailed overview of the conservation target development process including types of conservation that must be considered in the target-setting process, data sources for the

conservation types, process for adjusting resource selections from the IRP, application of pro-rata requirement and the impacts of the decoupling commitment. Presented key changes when compared to the 2015 IRP including decreased cost-effective potential and lower avoided costs. Presented NEEA's current forecast for Pacific Power Washington territory.

- Presented Pacific Power's plan to contract with Abt Associates to quantify the directly attributable health impacts for ductless heat pumps from reduced wood smoke for 2018-2019.
- Review of 2019 CPA scope of work comments including expanding the emerging technology assessments, including efficient home electric vehicle chargers, ensuring a measure list is shared with DSM Advisory Group for comments and ensuring the final potential assessment model can be provided to Staff.

August 18, 2017 - DSM Advisory Group Meeting (telephone conference)

- Presented proposed conservation forecast, conservation adjustments. Presented data sources and forecasts for production efficiency, distribution efficiency and high efficiency co-generation in addition to the conservation forecast derived from the IRP selections. Discussed treatment of savings from NEEA including the Pacific Power's proposal to exclude the new "trackable" savings category from forecasted NEEA savings. Presented initial conservation target including pro-rata calculations and decoupling commitment.

September 19, 2017 DSM Advisory Group Meeting

- Provided an update on the Home Energy Report RFP evaluation and how the target incorporated information from a proposal prior to final negotiations. Discussed risks inherent in higher savings proposal and Pacific Power's approach to including the best available information in the biennial target. Explained that the final Biennial Conservation Plan could have a different Home Energy Report target than the one presented at this meeting as the contract is negotiated.
- Presented PacifiCorp's intention to offer the following pilots; residential on-bill financing, geo-targeted efficiency, non-residential lighting controls, targeted delivery for manufactured homes, deep energy retrofits and heat pump dryers.
- Presented initial forecasted costs, savings, and cost-effectiveness results for the 2018-2019 biennium.
- Addressed Staff's areas of interest including low income program design, non-energy impacts, on-bill financing, hard to reach markets and Measurement and Verification (M&V) 2.0.
- Refreshed group on the process to update the evaluation, measurement, and verification (EM&V) framework for the 2018-2019 biennium.

Conservation Potential and Conservation Targets

Ten-Year Conservation Potential

The forecast of cost-effective, reliable and feasible conservation for the 2018-2027 period is provided in Table 3. This section describes the process for developing the ten-year potential forecasts for each of the six types of conservation described above and provides a description of the technologies, data collection, processes, procedures, and assumptions used to develop this figure as required by WAC 480-109-120 (1) (b) (iv).

Table 3. 2016-2025 Annual and Ten-Year Conservation Forecast

Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Cumulative 2018-2027
Adjusted Energy Efficiency	42,238	39,262	43,715	39,666	46,734	35,982	45,307	33,566	39,582	28,420	394,473
High-Efficiency Co-Generation	-	-	-	-	-	-	-	-	-	-	-
Distribution Efficiency	-	-	-	-	-	-	-	-	-	-	-
Production Efficiency	-	-	-	-	-	-	-	-	-	-	-
Total	**42,238**	**39,262**	**43,715**	**39,666**	**46,734**	**35,982**	**45,307**	**33,566**	**39.582**	**28,420**	**394,473**

End-Use Efficiency, Behavioral Program, and Market Transformation

The conservation forecast for end-use efficiency, behavioral programs and market transformation (collectively referred to in this document as energy efficiency) is developed through the following steps:

1. Completion of a Conservation Potential Assessment;
2. Economic screening/selection of resources through the 2017 IRP;
3. Addition of projected savings from the existing Home Energy Reports (behavioral) program;
4. Identification of adjustments to the 2017 IRP conservation resource selections based on updates to RTF UES values, Company program evaluations, and other supplemental studies.

The 2017 Conservation Potential Assessment

The Company's 2017 Conservation Potential Assessment, performed by Applied Energy Group (AEG), identifies energy efficiency that is feasible (technical potential) and reliable (achievable technical potential) and the 2017 IRP identifies the share of this potential that is cost-effective (economic achievable technical potential). To estimate the amount of feasible potential that is reliable, the Company uses the Council's assumption that up to 85 percent of potential is achievable over a 20-year period. It is important to note that the Council's achievability assumption extends beyond utility incentive programs:

> The Council assumes that up to 85 percent of all technical potential can be achieved by the end of the plan period (20 years) to determine the technically achievable potential. Finally, through the RPM [Regional Portfolio Model], the Council looks at whether potential conservation measures are economically achievable. This

> potential is then translated into savings targets, to be achieved from utility programs, market transformation activities of NEEA, and activities outside of programs including market-induced savings and savings from codes and standards (also known as momentum savings).[13]

Because of what the achievable potential captures, the amount of energy efficiency selected by the IRP model is inclusive of savings from market transformation efforts, including those claimed through NEEA. It also includes incremental savings from behavioral programs, to the extent they are cost-effective. Because of the short measure life associated with Pacific Power's existing Home Energy Reports program, the existing impacts are assumed to be reflected in the Company's load forecast and are excluded from the IRP energy efficiency selections. These impacts are added back into the conservation forecast for the purpose of establishing a ten-year conservation forecast and two-year target.

AEG identified energy efficiency potential in the 2017 CPA through the following steps:

1. Perform a market characterization to describe sector-level electricity use for the residential, commercial, industrial, irrigation, and street lighting sectors for the base year of 2014. To perform the market characterization, AEG used results from primary market research conducted by PacifiCorp wherever possible, supplemented by secondary data sources available from regional and national organizations such as the NEEA and the Energy Information Administration.
2. Develop a baseline projection of energy consumption by sector, segment, and end use for 2015 through 2036, building upon the base year characterization performed in step 1 above.
3. Define and characterize energy efficiency measures to be applied to all sectors, segments, and end uses. This work relied heavily on the measure characterization work performed by the RTF and Council staff in the development of the Seventh Power Plan. The 2017 CPA considered 324 unique measures across sectors, which expand to over 30,000 permutations when assessed separately by state, vintage, and market segment. Consistent with WAC 480-109-100 (2) (c), a list of each measure used in the potential, its unit energy savings value, and the source of that value are provided in Appendix 4-H to the 2017 CPA.
4. Estimate the potential from the efficiency measures by applying achievability and ramp rate assumptions, based on the Council's methodology.

AEG used its Load Management Analysis and Planning tool (LoadMAP™) version 5.0 to perform the steps above. AEG developed LoadMAP in 2007 and has enhanced it over time, using it for the EPRI National Potential Study and numerous utility-specific forecasting and potential studies since. The LoadMAP model:

- Incorporates the Council's methodology and the core principles of rigorous end-use models (such as EPRI's REEPS and COMMEND), but in a simplified and more accessible form.
- Includes stock-accounting algorithms that treat older, less efficient appliance/equipment stock separately from newer, more efficient equipment. Equipment is replaced according to the measure life and appliance vintage distributions.
- Balances the competing needs of simplicity and robustness by incorporating important modeling details related to equipment saturations, efficiencies, vintage, and the like, where

[13] Northwest Power and Conservation Council, *Seventh Northwest Conservation and Electric Power Plan*, p. 12-11 (Feb. 2016)

market data are available, and treats end uses separately to account for varying importance and availability of data resources.
- Isolates new construction from existing equipment and buildings and treats purchase decisions for new construction and existing buildings separately.
- Uses a simple logic for appliance and equipment decisions, rather than complex decision choice algorithms or diffusion assumptions which tend to be difficult to estimate or observe and sometimes produce anomalous results that require calibration or manual adjustment.
- Includes appliance and equipment models customized by end use. For example, the logic for lighting is distinct from refrigerators and freezers.
- Accommodates various levels of segmentation. Analysis can be performed at the sector level (e.g., total residential) or for customized segments within sectors (e.g., housing type or income level).
- Provides forecasts of baseline energy use by sector, segment, end use, and technology for existing and new buildings. It also provides forecasts of total energy use and energy-efficiency savings associated with the various types of potential.

The estimated potential was grouped by levelized cost of conserved energy and converted to hourly shapes for modeling in the 2017 IRP.

Energy Efficiency in the 2017 IRP

PacifiCorp's 2017 IRP presents the Company's plans to provide reliable and reasonably priced service to its customers. The primary objective of the IRP is to identify the best mix of resources to serve customers in the future, identified through analysis that measures cost and risk. The least-cost, least-risk resource portfolio—defined as the "preferred portfolio"—is the portfolio that can be delivered through specific action items at a reasonable cost and with manageable risks, while considering customer demand for clean energy and ensuring compliance with state and federal regulatory obligations.

PacifiCorp relies on two models in the development and evaluation of resource portfolios: a deterministic capacity expansion optimization model called *System Optimizer ("*SO*"),* and a stochastic chronological production cost simulation model called *Planning and Risk* ("PaR).[14] The vendor for both models is ABB (formerly Ventyx). Both SO and PaR are modules in the Energy Portfolio Management ("EPM") client-server system that uses the ABB *ProSym* simulation engine and Microsoft SQL Server as the database server. For more detailed discussion on how the SO and PaR models are used in the development of PacifiCorp's IRP, refer to Chapter 7 of the 2017 IRP.

PacifiCorp models energy efficiency (referred to as Class 2 DSM in the IRP) on a comparable basis with supply-side resources in the IRP models, consistent with state IRP standards and guidelines. For resource portfolio development, conservation is structured as a supply curve that provides capacity and energy (based on predetermined hourly load shapes) at a given marginal levelized cost. Levelized costs of Washington energy efficiency resources are adjusted, consistent with the Council's methodology, to account for the following credits:

- Transmission and distribution investment deferral credit

[14] See Chapter 7 of the Company's 2015 IRP for more detailed discussion on how the System Optimizer and Planning and Risk models are used in the development of PacifiCorp's IRP.

- Stochastic risk reduction credit
- Northwest Power Act ten percent credit

Modeling energy efficiency as a resource with hourly impacts and costs levelized over the planning period allows the IRP to directly compare demand-side and supply side options in assessing cost and risk of different portfolio options. The amount of energy efficiency selected by the IRP represents the optimal amount of savings for the Company to pursue based on the best information available at the time of the analysis, recognizing that some savings is likely to be achieved outside of utility incentive programs (e.g., codes and standards, market transformation), as discussed previously in this Plan.

Adjustments to the 2017 IRP Energy Efficiency Potential

WAC 480-109-100 (2) (b) referring to ta 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 following categories of required updates:

1. **Energy efficiency opportunities not assessed in the CPA:** Projected savings from existing behavioral programs and waste heat-to-power and regenerative technologies.
    - The behavioral program forecast is based on the Company's recent request for proposals process, as described in Appendix 2 to this Plan. The forecast, and associated cost-effectiveness analysis, assumes a two-year measure life and that the savings repeat every two year to ensure projected savings are accurately reflected in the pro-rata calculation.
    - The forecast for waste heat-to-power and regenerative technologies is taken from the 2014 CLEAResult evaluation, for technologies with levelized costs below that of the most expensive Class 2 DSM resource selected in the 2017 IRP.

2. **Updates to CPA measure savings:** 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, the Company reviewed updated data sources since the time of that analysis, including updates to RTF deemed measures and recent PacifiCorp program evaluations. These measure-level updates are described in detail in Appendix 1 to this Plan.

3. **Updates to directly quantifiable and attributable non-energy impacts**: The CPA included all available non-energy impacts quantified in RTF or Council 7th Plan measure workbooks, which excludes public health benefits from reduced wood smoke due to the installation of ductless heat pumps. Action Item ANLYS-8 from the 7th Power Plan called on the RTF to establish guidelines on quantifying non-energy impacts, however, at this time, this work is not complete. Nonetheless, because the RTF has found a causal link between ductless heat pumps and wood smoke and has established a methodology for quantifying and monetizing these impacts, the Company engaged Abt Associates to customize the work already performed by the RTF for ductless heat pumps to its Washington service territory. As this work gets finalized, it's assumed this additional benefit caused ductless heat pumps to become cost-effective in all years of the forecast period. Including this additional benefit in this conservation analysis is directly linked to

the prior RTF work that established causality for this measure. Including this benefit is not intended to establish a precedent in other conservation analysis or other areas prior to further policy discussions or additional direct attribution/causality research that would be required and would need to satisfy the yet to be developed RTF guidelines.

The forecast for energy efficiency (encompassing end-use efficiency, behavioral programs and market transformation), accounting for the above adjustments, is provided in Table 4.

Table 4. 2018-2027 Energy Efficiency Forecast – Summary of Adjustments

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Cumulative 2018-2027
2017 IRP Selections	**34,300**	**36,170**	**33,650**	**38,370**	**35,970**	**34,060**	**34,300**	**31,830**	**28,860**	**27,160**	**334,670**
Behavioral Programs	9,103	-	9,103	-	9,103	-	9,103	-	9,103	-	45,513
Waste Heat-to-Power	-	4,199	-	-	-	-	-	-	-	-	4,199
Total Measure-Level Adjustments*	(1,165)	(1,107)	963	1,296	1,662	1,922	1,904	1,736	1,620	1,260	10,091
Advanced Power Strips - Tier 2	0	0	1	51	72	91	106	113	112	102	649
Ductless Mini Split Heat Pump (Ducted Forced Air)	-	-	-	68	78	84	85	79	68	100	562
Ductless Mini Split Heat Pump (Zonal)	1,185	1,426	1,627	1,822	2,092	2,258	2,273	2,116	1,800	1,383	17,981
Residential Lighting	(2,167)	(2,353)	(487)	(500)	(461)	(429)	(504)	(534)	(332)	(305)	(8,071)
Low Flow Showerheads	(182)	(180)	(178)	(176)	(156)	(123)	(97)	(76)	(60)	(45)	(1,274)
Thermostat - WiFi/Interactive	-	-	-	32	37	40	40	38	32	24	243
Adjusted Energy Efficiency Forecast	**42,238**	**39,262**	**43,715**	**39,666**	**46,734**	**35,982**	**45,307**	**33,566**	**39,582**	**28,420**	**394,473**

*Total of six measure level adjustment rows below

High-Efficiency Cogeneration

As part of the 2017 IRP process, Navigant Consulting, Inc. prepared the *Private Generation Long-Term Resource Assessment (2017-2036)* on behalf of PacifiCorp.[15] This study provided information on the potential for, and expected penetration of, private generation resource in PacifiCorp's service territory over the IRP planning horizon. The study estimated adoption under base, low, and high penetration scenarios, with differing assumptions about technology costs, performance and retail rates.

WAC 480-109-060 (13) defines high-efficiency cogeneration as "the sequential production of electricity and useful thermal energy from a common fuel source," Two of the resources included in the Navigant study, combined heat and power ("CHP") reciprocating engines and CHP micro turbines, meet this definition and were investigated in detail to determine whether any cost-effective, reliable and feasible potential could be identified in Washington for the 2018-2027 period.

[15] The study is available on PacifiCorp's website: http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2017_IRP/PacifiCorp_IRP_DG_Resource_Assessment_Final.pdf.

Inputs and levelized costs specific to Washington high-efficiency cogeneration resources are provided in Appendix D to the Navigat Private Generation study. The study did not project any penetration of CHP micro turbines in any of the low, base, or high scenarios. While the study did project some penetration for CHP reciprocating engines, the levelized cost of $98/MWh was higher than the highest cost energy efficiency resource selected in Washington from 2018-2027 in the 2017 IRP, and is thus not considered cost-effective. As such, the Company is not projecting any cost-effective, reliable and feasible potential for high-efficiency cogeneration for 2018-2027.

Distribution Efficiency

As discussed in previous Pacific Power Biennial Conservation Plans, the ability to cost-effectively conserve energy through distribution system initiatives is highly dependent on the characteristics of a given utility's system. Regional awareness of distribution efficiency challenges and lessons learned has grown over the past several years, due in large part to Regional Technical Forum efforts and the Company's input based on its experience in this area. The Council's Seventh Power Plan recognized these challenges and lessons learned, estimating lower potential for distribution efficiency than in the Sixth Power Plan (215 aMW vs. 400 aMW).[16] Nevertheless, the Company continues to investigate available market technologies, with recent efforts centering on software and engineering process enhancements.

Efficiency improvements to the distribution system, such as phase balancing, improved reactive power management and flattened voltage profiles, are often the result of addressing load growth and reliability-related issues. The Company's recent transition to CYME distribution analysis software allows our engineering group to perform more robust analyses of complex scenarios, helping to ensure future planning efforts and project definitions are as accurate as possible. CYME is an essential part of the Company's planning process and efforts around systemic industry changes, such as the integration of distributed energy resources. It is also expected to permit future integration of Advanced Metering Infrastructure data where it becomes available.

Reliable conclusions from the CYME model require detailed and accurate model inputs, and CYME users continue to focus their efforts on improving model accuracy and developing trust in the application. The Company will continue to monitor opportunities and when appropriate will incorporate measurable cost-effective savings from distribution efficiency opportunities in future conservation forecasts and targets.

For the reasons above, the Company is not forecasting any cost-effective, reliable and feasible potential for distribution efficiency during the 2018-2027 period, and thus, no savings from distribution efficiency are included in the Company's 2018-2019 Biennial Conservation Target.

Production Efficiency (in non-hydro generation facilities)

The Company provides energy to Washington customers from the following plants:

- Thermal Plants
    - Jim Bridger (jointly owned with Idaho Power)
    - Chehalis

[16] https://www.nwcouncil.org/media/7149926/7thplanfinal_chap12_conservationres.pdf, p12-42.

    - Hermiston (jointly owned with Hermiston Power)
    - Colstrip (joint owner of units 3 and 4 with other utilities)
- Wind Projects
    - Goodnoe Hills
    - Marengo I
    - Marengo II
    - Leaning Juniper

Determining electrical energy savings opportunities and estimating the resultant energy savings for a thermal generation facility is a fairly straightforward process similar to that of a retail customer's industrial facility. As with any industrial facility, the results of the energy savings analysis must be modified to address:

- The impact of the introduction of new or modified equipment on the availability and reliability of the overall system,
- The ability to implement the recommendations given space, system compatibility and configuration, etc., and
- Costs refined through a procurement process.

Starting in 2011 through the end of 2012, detailed studies[17] were conducted by Cascade Energy at seven of the eight non-hydro facilities[18] that serve Washington customers. Initially, 22 projects were identified for potential cost-effective energy efficiency upgrades. The Company performed a comprehensive review of the standard energy efficiency cost-effectiveness methodology and determined that some credits and methods needed to be assessed differently for the production efficiency. This "production-side" cost test model was presented to the Washington DSM Advisory Group and accepted. Identified projects were then screened using the production-side cost-effectiveness methodology, which was provided as an Appendix to the Company's DSM Business Plans for the last two biennial periods. Fewer projects were available as a result of the new screening.

Of the generating facilities above, only three had cost-effective energy efficiency projects identified: Chehalis, Hermiston and Jim Bridger. All of the cost-effective projects identified at the Company's wholly owned Chehalis plant and the jointly owned Hermiston plant have now been completed. The non - PacifiCorp share of the cost-effective plant-wide capital lighting project at the Jim Bridger facility were not approved by the joint owners, therefore the project was not funded and was not forecasted as available conservation potential. All plant projects requiring joint owner approval have to compete for funding and other projects of a more critical nature were funded by the joint owners ahead of the lighting project. Absent joint owner approval for funding, the Company would have been responsible for the full cost of the project while only recouping their allocated share of the benefits which is inconsistent with how costs are incurred and recovered at the generation facilities.

However, plant personnel at the Jim Bridger plant have been upgrading the high pressure sodium lighting to light emitting diode (LED) lighting upon failure, resulting in a slow but steady upgrade to LED lighting which will eventually capture much of the identified opportunity. Additionally,

[17] In total, 7 studies were conducted between 2011 and 2012 and were provided in prior biennial conservation plans. The studies are voluminous and not provided again in this report.

[18] The majority owners of the plant do not sell power in Washington and didn't agree to study this plant or participate in any energy efficiency facility upgrades at this time.

the plant has upgraded certain rooms where poor lighting can cause work safety concerns. Upgrades of this type have typically been to high-efficacy fluorescent lighting. In establishing its 2018-2027 conservation forecast, the Company reviewed costs for previously identified projects that did not pass the production-side cost test to see if labor or equipment prices had changed materially. The Company also reviewed the financial model to ensure inputs were up-to-date. Through this review, the Company found that prices and model inputs have not changed enough for the cost-effectiveness determination of these projects to have changed.

While the Company remains committed to installing energy efficient equipment at production facilities when systems are upgraded or replaced, the Company's review didn't identify any additional cost-effective production efficiency opportunities. As a result, the Company is not forecasting any cost-effective, reliable and feasible opportunity for production efficiency during the 2018-2027 period, and thus, no savings from production efficiency are included in the Company's 2018-2019 Biennial Conservation Target.

2016-2017 Biennial Conservation Target

Pacific Power's biennial conservation target for 2018-2019 is 78,008 MWh,[19] as shown in Table 5. The process of converting the ten-year forecast to a biennial target is described in detail below.

Table 5. 2018-2019 Biennial Conservation Target

Conservation Category	2018-2019 MWh
Cost-effective, reliable and feasible conservation (sum of 2018 and 2019 potential in Table 4)	81,500
Less savings forecasted by the Northwest Energy Efficiency Alliance	7,207
	74,293
Plus 5% decoupling commitment	3,715
2018-2019 Biennial Conservation Target	**78,008**

Cost-Effective, Reliable and Feasible Conservation

As described in WAC 480-109-100 (3), the biennial conservation target must quantify all available conservation that is cost-effective, reliable and feasible, and be no less than a pro-rata share of the ten-year conservation forecast. As shown in Table 4 above, the forecast for 2018 and 2019 is 42,238 MWh and 39,262 MWh, respectively, for a total of 81,500 MWh for the biennium. This value is larger than the pro rata share of 78,894 MWh, calculated as twenty percent of the cumulative ten-year forecast for 2018-2027.

Treatment of NEEA Initiatives

Section 4 of Order 03 in Docket UE-100170 directed PacifiCorp to collaborate with Puget Sound Energy and Avista Corporation to develop a consistent approach to claiming NEEA savings in the

[19] To remain consistent with the Council's regional power plan, the ten-year potential and two-year target values in this report are shown prior to any net-to-gross adjustment and except for production efficiency, where applicable, include line losses between the installed equipment or customer site and the generation source.

2014-2015 biennium. The three utilities met multiple times in the fall of 2012, arriving at and submitting a joint proposal for how savings from NEEA initiatives would be treated in the 2014-2015 biennium.[20] The key component of the joint proposal are:

- Each utility will work with NEEA to obtain a forecast of savings over the biennial period based on baseline and technical assumptions consistent with those found in the Council's current Power Plan.
- To avoid double-counting savings claimed through utility programs, the forecast provided by NEEA will represent the utility's share of Total Regional Savings (TRS) less projected local utility program savings.
- Each utility will then subtract its adjusted estimate of TRS from the first two years of its ten-year electric conservation potential to determine its Biennial Conservation Target (BCT).
- Each utility will report actual NEEA savings (using the same methodology and baseline assumptions used in the forecast), however NEEA savings will not be credited to utilities for the purpose of achieving a utility's Biennial Conservation Target.

In preparation for the 2018-2019 biennial target-setting process, Pacific Power engaged NEEA to provide a savings forecast for the 2018-2019 period using baselines consistent with the Council's Seventh Power Plan. NEEA's initial forecast highlighted two key changes relative to forecasts from previous biennia:

1. NEEA forecasted large savings from codes and standards, primarily driven by a new federal standard for commercial rooftop HVAC units. The standard, which takes effect in 2018, was established in 2016, after the development of the Seventh Power Plan. Thus, the standard was not accounted for in the Seventh Plan baseline forecast.
2. As a product of enhanced engagement with retailers, NEEA has access to data on sales of efficient equipment, including equipment not directly tied to a NEEA market transformation initiative. With these data, NEEA was able to estimate the volume of equipment, particularly LED light bulbs that are being sold, but not claimed, by utility programs. This category of savings, referred to by NEEA as "trackable savings," was not calculated in previous biennia.

Pacific Power reviewed NEEA's draft forecast with its DSM Advisory group in June of 2017. Because, as with the Seventh Power Plan, the Company's 2017 CPA did not account for the new commercial rooftop unit standard, the Company recommended continuing to remove these savings from the target, consistent with previous biennia. For "trackable savings", given the likelihood that unclaimed light bulbs are already accounted for in RTF market baseline assumptions, the Company recommended excluding these savings from the NEEA target adjustment. The DSM Advisory Group agreed with the proposed approach and an updated NEEA forecast was provided at the August 2017 meeting.

Forecasted savings from NEEA, inclusive of programs and codes and standards initiatives, totaled 7,207 MWh (including line losses) for the 2018-2019 period. Consistent with previous biennia and Commission guidance, these savings are subtracted from the Company's identified conservation

[20] Joint Proposal for consistent approach to Northwest Energy Efficiency Alliance claimed conservation savings, filed October 31, 2012 in Docket UE-111880.

potential for the purpose of establishing a Biennial Conservation Target. NEEA's forecast for the 2018-2019 period is described in additional detail in Appendix 3 to this Plan.

Decoupling Commitment

On September 1, 2016, the Commission issued Order 12 in Docket UE-152253. Section (7)(4) of the Order specifies:

> Pacific Power must increase its annual conservation targets by 2.5 percent for the current 2016-2017 biennium, and by 5 percent per biennium thereafter through the period when decoupling is in effect. The Company's failure to meet its incremental conservation target will be subject to financial penalties.

As ordered, the Company increased its 2016-2017 biennial conservation target by 2.5 percent in its 2017 Annual Conservation Plan. For the 2018-2019 biennium, the Company is applying the full five percent decoupling adjustment, adding 3,810 MWh to the biennial conservation target.

PacifiCorp's 2018-2019 Business Plan

In addition to providing the ten-year conservation potential and the biennial conservation target, WAC rules require utility Biennial Conservation Plans to provide additional detail relating to conservation program implementation outreach, and evaluation. To satisfy the WAC requirements while clearly delineating between target-setting and implementation activities, the Company includes its DSM Business Plan as Appendix 2 to this Plan. The DSM Business Plan includes the following information:

- Biennial program details, biennial program budgets, and cost-effectiveness calculations, consistent with WAC 480-109-120 (1) (b) (iii),
- Information on evaluation, measurement and verification activities for the biennium, consistent with WAC 480-109-120 (1) (b) (vi),
- Pilot initiatives identified for the 2018-2019 biennium, consistent with WAC 480-109-100 (1) (c), and
- A discussion of Pacific Power's efforts to address areas of interest identified by the WUTC for the 2018-2019 biennium.

The savings, budgets, and cost-effectiveness results presented in the Business Plan represent Pacific Power's current forecast based on the best information available at the time of this filing. On or before November 15, 2018, Pacific Power will file an Annual Conservation Plan for 2019, reflecting updated forecasts for savings and budgets for the remainder of this biennial period.

Cost Recovery Mechanism

PacifiCorp recovers costs associated with its demand-side management programs through the System Benefits Charge (SBC), which is administered through Schedule 191. The SBC was originally approved by the Commission in Docket UE-001457. The SBC was last adjusted in August 2017 when it was increased from an annual collection rate of approximately $12.9 million to the current collection rate of $13.9 million. The current SBC collection rate was approved in Docket UE-170678 with an effective date of August 1, 2017. The current SBC collection rate represents approximately 4.14 percent of Washington retail electric revenues.

For the 2018-2019 biennium, PacifiCorp intends to recover through the SBC costs associated with approved conservation programs, planning (including Pacific Power's estimated share of NEEA's end use load research initiative) and program administrative costs, and costs associated with compliance with WAC 480-109 and conditions from Commission's Order 01 in Docket UE-152072. As specified in condition (9) (d) of that order, costs associated with distribution and production efficiency will be recovered through a general rate case, rather than through the SBC. Projected costs for the 2018-2019 biennium are provided in Business Plan, Appendix 2 to this Plan.

Consistent with WAC 480-109-130, related to conservation cost recovery adjustment, Pacific Power will review the adequacy of Schedule 191 collections each year and make a filing, if necessary, to adjust the collection rate no later than June 1, with an effective date of at least 60 days after the filing. If no adjustment is needed, the Company will file a request for exception and supporting documents explaining why an adjustment is not needed no later than May 1.

Plan Compliance Information

Table 6 lists key compliance requirements from WAC 480-109 and Attachment A to Order 01 in Docket UE-152072, and how the Company has addressed each requirement in the preparation of this Plan.

Table 6. 2018-2019 Plan Development Compliance Requirements

DSM Advisory Group	
WAC 480-109-110 (1)	
A utility must maintain and use an external conservation advisory group of stakeholders to advise the utility on conservation issues, including those listed in the above-referenced section of the code.	A list of DSM Advisory Group meetings and topics covered is provided in the "Stakeholder Engagement" section of this Plan.
WAC 480-109-110 (2)	
A utility must meet with its conservation advisory group at least four times per year.	A list of the relevant 2016 and 2017 DSM Advisory Group meetings and IRP Public Input meetings is provided in the Stakeholder Engagement section of this Plan. To date, the DSM Advisory Group has met four times in 2016 and four times in 2017. One more meeting is planned for 2017.
WAC 480-109-110 (3)	
A utility must provide its conservation advisory group an electronic copy of all conservation filings that the utility intends to submit to the commission at least thirty days in advance of the filing.	A draft version of this Plan was provided to the DSM Advisory Group on October 2, 2017. The Company will continue to comply with this requirement during the 2018-2019 biennium.
Docket UE-152072 Order 01 Attachment A (3) (c)	
Pacific Power will consult the DSM Advisory Group members on the scope and design of the conservation potential assessment that will inform the 2019 IRP and Washington 2020-2029 conservation forecast in advance of beginning that work.	On June 12, 2017, Pacific Power sent the draft scope of work for its 2019 CPA to the DSM Advisory Group for review and comment. Feedback was incorporated, as appropriate, into the final Request for Proposal.
Docket UE-152072 Order 01 Attachment A (3) (d)	
Pacific Power must consult with its DSM Advisory Groups starting no later than July 1, 2017, to begin to identify achievable conservation potential for 2018-2027 and to begin to set annual and biennial targets for the 2018-2019 biennium, including necessary revisions to program details.	Pacific Power began discussing the development of its 2018-2027 conservation forecast and 2018-2019 biennial conservation target at the June 28, 2017, DSM Advisory Group meeting. Conversations continued leading up to the filing of this Plan.

Conservation Forecast and Target Development	
WAC 480-109-100 (2) and (3)	
By January 1, 2010, and every two years thereafter, a utility must project its cumulative ten-year conservation potential and establish a biennial conservation target.	This Plan provides the projection for the 2018-2027 period and the target for the 2018-2019 biennium.
This projection must consider all available conservation resources that are cost-effective, reliable and feasible. 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.	The process for identifying cost-effective, reliable and feasible potential, beginning with the results of PacifiCorp's 2017 IRP, is described in the Conservation Potential and Conservation Targets section of this Plan.
When developing this projection, utilities must use methodologies that are consistent with those used in the Northwest Conservation and Electric Power Plan.	As discussed in depth in previous Pacific Power Biennial Conservation Plans, and documented in Appendix 3 of Pacific Power's 2016-2017 Biennial Conservation Plan, the Company worked closely with Council staff and other stakeholders to understand and align with Council methodologies as part of the Methodology Sub-Committee of the Washington Collaborative Working group on Avoided Costs and Total Resource Cost Determinants. The methodology used by the Company to develop its conservation forecast is detailed in Chapter 2 of Volume 2 of the 2017 CPA[21] and in the Conservation Potential and Conservation Targets section of this Plan.
The projection must include a list of each measure used in the potential, its unit energy savings value, and the source of that value.	A list of each measure used in the potential, including the required information, is provided as Appendix H in Volume 4 of the 2017 Conservation Potential Assessment.
The biennial conservation target must identify, and quantify in megawatt-hours, all available conservation that is cost-effective, reliable and feasible and (b) The biennial conservation target must be no lower than a pro rata share of the utility's ten-year conservation potential.	The process for developing the 2018-2019 biennial conservation target is detailed in the Conservation Potential and Conservation Targets section of this Plan. The identified target, before adjusting for NEEA and decoupling, is larger than a pro-rata share of the ten-year forecast.

[21] The 2017 Conservation Potential Assessment and all previous studies are available on the Company's website: http://www.pacificorp.com/env/dsm.html.

Program Implementation, Management and Evaluation	
WAC 480-109-110 (4)	
A utility must notify its conservation advisory group of company and commission public meetings scheduled to address its conservation programs, its conservation tariffs, or the development of its conservation potential assessment.	"Stakeholder Engagement" section in this Conservation Plan provides list of meetings where information relevant to the development of the ten-year conservation potential and/or conservation program information was presented. In a prior biennial period, Company confirmed that members of the Company's DSM Advisory Group were included on the Company's IRP stakeholder contact/email list. Communications to the DSM Advisory group are also sent to UTCenerg@utc.wa.gov.
Docket UE-152072 Order 01 Attachment A	
Pacific Power must provide its proposed annual budgets in a detailed format with a summary page indicating the proposed budget and savings levels for each electric conservation program, and subsequent supporting spreadsheets providing further detail for each program and line item shown in the summary sheet.	Projected annual budgets for the 2018-2019 biennium are provided in the DSM Business Plan. The projection for 2019 will be updated and filed by November 15, 2018, as the Company's Annual Conservation Plan.
Docket UE-132047 Order 01 (5)	
Pacific Power must maintain its conservation tariffs with program descriptions on file with the Commission. Program details about specific measures, incentives, and eligibility requirements must be filed as tariff attachments or as revisions to the Company DSM Business Plan.	This process is described in the DSM Business Plan (Appendix 2 to this Plan).
WAC 480-109-100 (5) (a) & (b)	
A utility must use RTF deemed savings or other reliable and relevant source data that has verified savings levels and been presented to the Advisory Group for comment.	Data sources used to develop the conservation forecast and biennial target are outlined beginning on page 3-1 of Volume 2 of the 2017 CPA. Volume 4, Appendix G of the 2017 CPA provides a direct comparison of unit energy savings values used in that study to those developed by the RTF and by the Council for its Seventh Power Plan. Adjustments to those values, where appropriate, are described in detail in Appendix 1 of this Plan.
Docket UE-152072 Order 01 Attachment A (6) (c)	
Pacific Power must spend a reasonable amount of its conservation budget on EM&V.	Pacific Power's planned evaluation activities and associated budgets are provided in the DSM Business Plan (Appendix 2 to this Plan).

WAC 480-109-100 (7)	
A utility must offer a mix of conservation programs to ensure it is serving each customer sector, including programs targeted to the low-income subset of residential customers.	The comprehensive portfolio of programs, available services and incentives described in the DSM Business Plan (Appendix 2 to this Plan) are relevant to all customer sectors, including limited income customers.
WAC 480-109-100 (10)	
A utility may fully fund low-income conservation measures that are determined by the implementing agency to be cost-effective consistent with the *Weatherization Manual* maintained by the department. A utility may exclude low-income conservation from portfolio-level cost-effectiveness calculations. A utility must count savings from low-income conservation toward meeting its biennial conservation target.	The Company plans to continue to fully fund low income conservation measures through its Low Income Weatherization program. Projected savings from these efforts are included in the Biennial Conservation Target, but excluded from portfolio-level cost-effectiveness analysis. Program details, including projected savings and budgets, are provided in the DSM Business Plan (Appendix 2 to this Plan).
Docket UE-152072 Order 01 Attachment A (7) (c)	
PacifiCorp may spend up to 10 percent of its conservation budget on programs whose savings impact has not yet been measured, as long as the overall portfolio of conservation passes the Total Resource Cost (TRC) test. As modified by the Council. These programs may include information-only, behavior change, and pilot projects. Pacific Power may ask the Commission to modify this spending limit following full Advisory Group consultation.	As described in the Business Plan, the only conservation effort without EM&V is the "Be ***watt***smart, Begin at Home" school initiative. Forecasted expenditures for this effort during the biennial period are $120,000 and represent 0.60 percent of the preliminary PacifiCorp conservation budget of $21,066,707.
Docket UE-152072 Order 01 Attachment A (8) (a) & WAC 480-109-100 (8) & (10)	
The Commission uses the Total Resource Cost Test (TRC), as modified by the Council, as its primary cost-effectiveness test. The Council-modified TRC test includes quantifiable non-energy benefits, a risk adder, and a 10 percent conservation benefit adder. Pacific Power's portfolio must pass the TRC test. All cost-effectiveness calculations will assume a Net-to-Gross ratio of 1.0, consistent with the Council's methodology.	Pacific Power uses the Total Resource Cost test, as modified by the Council, to screen Washington energy efficiency resources in its IRP. Program- and portfolio-level cost-effectiveness results for the 2018-2019 biennial period, showing that the portfolio is expected to be cost-effective from the TRC perspective, are provided in the DSM Business Plan (Appendix 2 to this Plan).

List of Appendices

1) Conservation Forecast Adjustments made to PacifiCorp's Ten-Year Conservation Forecast
2) PacifiCorp's Washington Demand-side Management 2018-2019 Business Plan
3) Northwest Energy Efficiency Alliance 2018-2019 Forecast for PacifiCorp's Washington service territory
4) Waste Heat to Power and Regenerative Technology Evaluation

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.[22] 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, [23] 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,[24] 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.[25] 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

[22] 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.
[23] Current and archived RTF UES workbooks are available at: http://rtf.nwcouncil.org//measures/Default.asp.
[24] RTF workbook ResAdvancedPowerStrips_IR_Sensing_v1_3.xlsm.
[25] 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,[26] 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.[27] 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.[28] 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.[29] 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	

[26] RTF workbook ResSFExistingHVAC_v4_1.xlsm.
[27] RTF workbook Showerheads_v3.1.xlsm.
[28] RTF workbook ResLighting_v5.1.xlsm.
[29] 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.[30] 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.

[30] RTF workbook ResConnectedTstats_v1.2.xlsm.

Appendix 2
PacifiCorp's Washington Demand-Side Management Business Plan For 2018-2019

Appendix 3
Northwest Energy Efficiency Alliance 2018-2019 Forecast

Appendix 4
Waste Heat-to-Power and Regenerative Technology Evaluation