



Exhibit i

2018-2027 Ten-year Conservation Potential
and

2018-2019 Two-year Electric Target

Development Summary

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I. 10-Year Conservation Potential and Two-Year Conservation Target Development Summary

Exhibit i: 10-Year Conservation Potential and 2-Year Conservation Target Development provides summary discussions of the steps PSE employed to reach its 2018-2019 electric and natural gas conservation savings targets. PSE provides detailed information on the development of its Conservation Potential Assessment (CPA) in its 2017 Integrated Resource Plan (IRP). Specifically, PSE discusses the electric potential in Appendix J of the 2017 IRP, including a detailed list of the measures included.

II. Cumulative Ten-Year Conservation Potential

PSE developed its 10-year conservation potential with the involvement of both the Integrated Resource Plan Advisory Group (IRPAG) and Conservation Resource Advisory Group (CRAG) over a two-year timeframe. The following discussion provides a summary of the development steps.

A. Statutory and Regulatory Requirements

RCW 19.285.040 requires that, beginning in 2010 and every two years thereafter, utilities must project their “cumulative ten-year conservation potential”, including all electric savings that are “cost-effective, reliable and feasible”. WAC 480-109-100 (2) says that this projection must be derived from the utility’s most recent IRP and must consider all available conservation resources that are cost-effective, reliable, and feasible. Further, when developing this projection, utilities must use methodologies consistent with those used in the Northwest Conservation and Electric Power Plan.

As defined by WAC 480-109-060 (6), “conservation” means “any reduction in electric power consumption” due to increased efficiency of:

- Energy Use, where PSE includes energy efficient building systems, high efficiency electric end use equipment, conversion of electric end uses to high-efficiency natural gas equipment, and high efficiency cogeneration systems to meet on-site customer load;
- Distribution, where PSE includes line phase balancing and conservation voltage reduction;
- Production, where PSE includes energy efficiency improvements at PSE electric production facilities.

The remainder of this section describes determination of the conservation potential and consistency of the company’s methodology with that of the Northwest Power and Conservation Council (hereafter referred to as the “Council”).

B. Identifying All Conservation Opportunities That Are Cost-Effective, Reliable, and Feasible

The ten-year cumulative conservation potential consists of the optimized level of cost-effective energy use and distribution system conservation potential selected by PSE's resource portfolio model for the 2017 Integrated Resource Plan (IRP). It includes ramping the timing for achieving this potential so that all the economic achievable retrofit potential in existing buildings would be achieved in 10 years or sooner, not the full 20-year planning horizon of the IRP. The methodology and results of the conservation potential assessment (CPA) were reviewed with stakeholders over the course of 15 meetings in 2016-2017 with PSE's IRP Advisory Group (IRPAG). The results of the CPA were also presented and discussed during two meetings in 2017 with PSE's Conservation Resource Advisory Group (CRAG).

The 2017 IRP potential represents the total amount of conservation that is technically available, cost-effective, and achievable in the long run, based on the best information and analysis available. This includes all potential savings from any combination of utility programs, new codes and standards, and market transformation.

The conservation potential in the 2017 IRP is based on commercially available technologies and includes updates from the previous IRP. These updates most notably include:

- PSE's updated load forecast, including 2014-2015 and projected 2016-2017 efficiency accomplishments.
- Updated Commercial Building Stock Assessment (CBSA) data.
- Measure savings and ramp rates consistent with the Seventh Northwest Conservation and Electric Power Plan
- Incorporation of new federal and state codes and standards.
- New and expanded measures were incorporated. For instance, behavior change, smart thermostats, and tubular LED lighting (TLED).
- Updated energy and peak capacity supply costs.

In addition, PSE estimated the potential for electric energy savings from improvements to the efficiency of PSE's power generation facilities in Washington State. However, no cost-effective opportunities for conservation from energy production facilities were identified.

C. Consistency with Council Methodology

The methodology used to determine these potentials was consistent that that used by the Northwest Power and Conservation Council (the "Council") to develop the 7th Northwest Conservation and Electric Power Plan.

The conservation potential was built with a bottom-up approach, using individual energy-efficient technologies applied to appropriate end uses and building types to determine technical, achievable, economic potential.

Both PSE and the Council use similar Total Resource Cost (TRC) approaches to their economic analyses. In the spring of 2011, a sub-group of the Washington State Conservation Work Group was convened to examine the methodologies of all the state's electric investor-owned utilities relative to the Council methodology. That sub-group concluded that all the utilities, including PSE, were generally consistent with the Council methodology. PSE continues to use the same methodology that was reviewed at that time.

A few minor differences in methodology exist, but none of these have significant impacts on the results. One minor difference in the economic analysis is that PSE analyzed bundles of measures with similar costs while the Council analyzes individual measures, but this does not appear to cause significant differences in results.

Another minor difference is that PSE expresses its benefits and costs in nominal terms (includes inflation) while the Council uses real terms (excludes inflation), which does not cause any difference in relative cost-effectiveness since benefits and costs are treated equally.

Finally, PSE uses its own after-tax cost of capital as the discount rate for present value calculations, while the Council uses a regional discount rate that combines utilities, customers, and BPA. Again, the absolute difference in discount rates is small and does not materially affect results.

Figure II-1 identifies the key elements of PSE's methodology, consistent with the methodology published on the [Council's website](#), except for minor differences noted above. Complete descriptions of PSE's technical and achievable potential are in [Appendix J](#) of the 2017 IRP.

The derivation of the economic potential is presented in [Chapter 6](#) and [Appendix J](#) of the 2017 IRP under chapter titled “General Approach and Methodology.”

Figure II-1: PSE Conservation Potential Consistency with Council Methodology

Technical Potential	Achievable Potential	Economic Potential
<ul style="list-style-type: none"> • Wide array of technologies, applied to all customer sectors • “Applicable” units, as determined by <ul style="list-style-type: none"> ○ Building characteristics ○ Fuel & equipment saturations ○ Equipment life/turnover ○ New & existing units ○ Measure interactions & substitutions • Calibrated to customer & load forecasts for PSE service area 	<ul style="list-style-type: none"> • Annual acquisition levels based on IRP portfolio modeling where conservation competes against all other resources • Discretionary & lost opportunity potentials identified • Use ramp rates that accelerate discretionary retrofit measures, with 85% maximum market penetration • Potentials are revised based on new information and market experience gained since previous IRP 	<ul style="list-style-type: none"> • Economic screen uses TRC approach • Based on forecast of wholesale market prices • Energy and capacity savings shaped for time and seasonal differences • Use range of scenarios to account for uncertainty and risk • Use full incremental measure costs, plus applicable O&M and program admin. Costs • Benefits include energy, capacity, T&D losses and deferral • Non-energy benefits, 10% Power Act credit & environmental externalities included

Efficiency improvements at electric production facilities were not included in the IRP resource portfolio analysis because these savings are not cost-effective. This assessment included all hydro and thermal plants operated by PSE in the state of Washington.

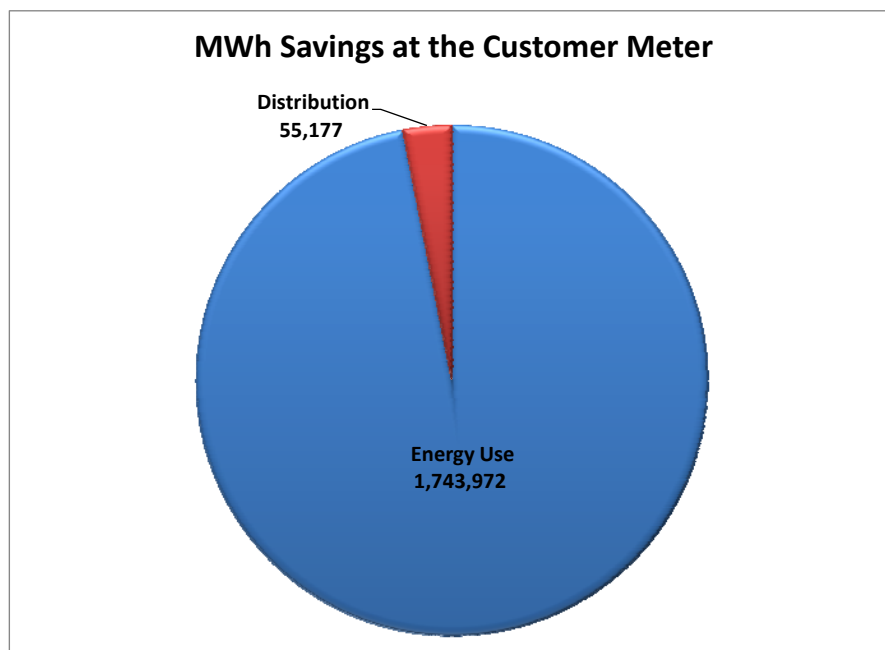
D. Total Ten-year Conservation Potential

Based on the analysis described previously, PSE’s total cumulative ten-year conservation potential is 1,799,149 MWh (205.4 aMW) at the customer meter, which excludes line loss savings from the customer meter back to the power generator and intra-year ramping of annual savings (these were included in the IRP portfolio analysis). This potential also excludes federal and state codes and standards that are scheduled to take effect during the planning period. These codes and standards are quantified and modeled separately in the IRP.

Figure II-2 shows how the cumulative ten-year potential breaks out by type of conservation resource. As can be seen, the vast majority (97 percent) of the ten-year potential comes from Energy Use Conservation.

Energy Use Conservation consists of improved building shell efficiency, high-efficiency electric end use equipment and controls, electric-to-gas customer fuel conversion, and small scale distributed generation.

Figure II-2: PSE Cumulative Ten-Year Electric Conservation Potential (2018-2027)



III. Biennial Conservation Target

A. Statutory and Regulatory Requirements

RCW 19.285.040(1) and WAC 480-109-100(3) require that, once the ten-year conservation potential has been developed, utilities shall set a biennial electric conservation acquisition target which is no lower than the utility's two-year pro rata share of its ten-year potential.

The WAC rules further define "pro rata" simply as "the calculation dividing the utility's projected ten-year conservation potential into five equal proportions"(WAC 480-109-060 (19)).

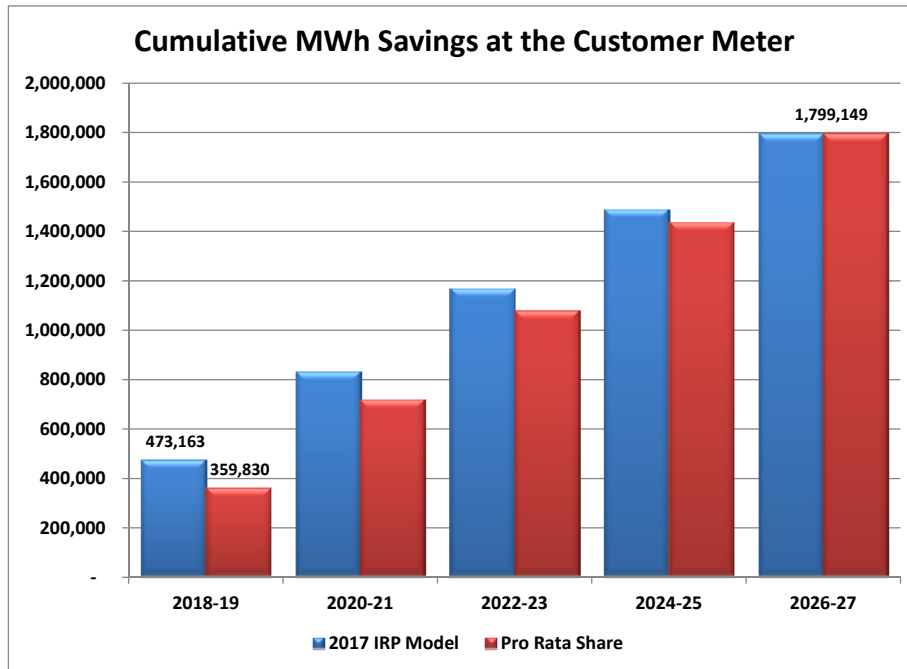
B. Determination of Pro Rata Share of the Ten-Year Conservation Potential

The 2018–2019 two-year pro rata portion of the cumulative ten-year potential is 359,830 MWh (41.1 aMW) at the meter level. This represents one fifth of the ten-year potential.

C. Biennial Conservation Target

The pro rata IRP conservation potential does not represent the highest amount of achievable economic conservation potential in 2018-2019. PSE compared the timing of 2018-2019 savings potential with the ramp rates modeled in the IRP with the two-year pro rata share of the ten-year potential and selected the greater of those values as the guidance from the IRP. This resulted in selection of the savings potential as modeled by the IRP. As shown by Figure III-1, the 2017 IRP-modeled guidance for 2018-2019 was 473,163 MWh (54 aMW) compared to 359,830 MWh (41.1 aMW) using the pro-rata approach.

Figure III-1: Electric Conservation Ten-Year Potential, IRP Ramping vs. Pro Rata Share



The IRP also does not differentiate between savings that are best achieved by local utility or regional market transformation programs. PSE and the CRAG agreed to exclude market transformation savings acquired through NEEA because these savings are outside of PSE’s control and NEEA’s forecasts are subject to fluctuation.

PSE excludes NEEA savings, consistent with PSE’s reporting methodology, provided in the Joint Utility Proposal, filed under Docket UE-100177. For the 2018-2019 period, the three Washington IOU’s, including PSE, requested NEEA to provide its savings estimate segregated into three categories.

- Program Measures: These savings come from measures NEEA worked on and must be subtracted from the IRP guidance to calculate the EIA target.
- Codes and Standards Measures: These savings come from codes and standards that NEEA worked on, but are already accounted for in PSE’s IRP so no further adjustment is necessary.
- Trackable Measures: NEEA often collects additional data for measures that it did not work on and the estimated savings are therefore not part of any target calculations.

The projected savings provided by NEEA from its Program Measures result in a reduction of the EIA target by 25,054 MWh (2.86 aMW).

Making these adjustments, the total biennial EIA target is 448,109 MWh (51.2 aMW) to be achieved through PSE-sponsored programs, as shown in Figure III-2. Additional adjustments to the total portfolio savings are also made for a commitment that PSE exceed its base EIA target by 5 percent to be eligible for revenue decoupling and avoid additional financial penalty, as well as savings from Schedule 449 Retail Wheeling customers, and savings from pilots with uncertain savings. However, these adjustments are not part of the biennial target required by WAC 480-109.

Figure III-2: 2018–2019 Electric Biennial Conservation Target

Puget Sound Energy 2018-2019 Electric Portfolio Savings					
	Description	MWh	aMW	Comment	Calculation
	Colored cells correspond to indicated lines in Exhibit 1: <i>Savings and Budgets, 2-Year Portfolio View</i> .				
	Add			These are specific elements that comprise the Portfolio View of Exhibit 1.	
a	Total Biennial Potential <i>IRP & CPA Guidance</i>	473,163	54.0	Represents all available conservation that is cost-effective, reliable, and feasible, per RCW 19.285.040(1).	Figure 3, Exhibit i
b	Add Decoupling Commitment (5% add)	23,658	2.7	Based on IRP Total Biennial Potential	= a * 0.05
c	Add 449 Customers	18,693	2.1	Excluded from CPA. Savings included in Large Power User/Self-Directed program	line <i>u</i> of Exhibit 1 Portfolio View
d	Add Pilots with Uncertain Savings	4,480	0.5	Commercial Pay For Performance pilot	line <i>aa</i> of Exhibit 1 Portfolio View
e	Total 2018-2019 Portfolio Savings	519,994	59.4	This figure is what Energy Efficiency is managing to.	= a + b + c + d: lines <i>bb</i> & <i>be</i> of Exhibit 1 Portfolio View
	Exclude			Remove these elements in order to calculate the EIA penalty target.	
f	Subtract NEEA Savings	-25,054	-2.86	(RV "codes & standards", "trackable" measures from NEEA forecast)	line <i>ac</i> of Exhibit 1 Portfolio View
g	Subtract Decoupling Commitment Amount	-23,658	-2.7		Provided by NEEA staff
h	Subtract 449 Customers	-18,693	-2.1		= c
i	Subtract Pilots with Uncertain Savings	-4,480	-0.5		= d
j	Total Exclusion	-71,885	-8.2		= f + g + h + i
	Resultant Targets				
k	EIA Penalty Target	448,109	51.2	\$58.77/MWh shortfall penalty, based on 2016 inflation, per RCW 19.285.060.	= e + j
l	Decoupling Commitment	23,658	2.7		= b