

ATTACHMENT A

**PACIFIC POWER & LIGHT COMPANY
AVOIDED COST CALCULATION**

WASHINGTON - DECEMBER 2017

Washington Utilities and Transportation Commission rule WAC 480-107-055, related to schedules of estimated avoided costs, states that avoided costs should be based on:

- (a) The most recent project proposals received pursuant to an RFP issued under these rules;
- (b) Estimates included in utility's current integrated resource plan filed pursuant to WAC 480-100-23;
- (c) The results of the utilities most recent bidding process;
- (d) Current projected market prices for power.

The starting point for the avoided cost calculation in this filing is the load and resource balance from the company's 2017 Integrated Resource Plan (IRP), filed on April 4, 2017. The avoided cost prices are then developed consistent with the West Control Area inter-jurisdictional allocation methodology adopted by the Washington Utilities and Transportation Commission in Docket UE-061546.

Loads and Resources

Table 1 presents the company's west control area loads and resource balance. Table 1 shows an energy balance with a surplus of 139 aMW in 2018 declining to a deficit of 59 aMW in 2027. The winter peak has a capacity surplus of 150 MW in 2018 changing to a deficit of 773 MW in 2027. The summer peak has a capacity deficit of 339 MW in 2018 increasing to a deficient of 571 MW in 2027.

Avoided Cost Calculation

Resource deficiency period is assumed to begin when the load and resource balance is short in both energy and capacity on annual basis. Based on the load and resource balance shown in **Table 1**, the avoided cost calculation is separated into two distinct periods: (1) the Short Run – a period of resource sufficiency (2018); and (2) the Long Run – a period of resource deficiency (2019 through 2027).

1. Short Run Avoided Costs

During periods of resource sufficiency, the company's avoided energy costs are based on the displacement of purchased power and existing thermal resources as modeled by the company's GRID model. The model input data includes the monthly load and resource data, which are the basis for the annual summary of loads and resources shown in **Table 1**. To calculate short-run avoided costs, two production cost studies are prepared, where the only difference between the two studies is an assumed 50 aMW resource modeled at zero cost. The results of the production cost model runs are provided as **Table 2**.

Winter capacity costs in this period are based on a three-month capacity purchase using the cost of a simple cycle combustion turbine (SCCT). The annual value as shown in **Table 3** is one-fourth of the capacity cost of a simple cycle combustion turbine.

2. Long Run Avoided Costs

During the resource deficiency period, avoided costs are the fixed and variable costs of a combined cycle combustion turbine (CCCT).¹

Long Run Avoided Costs use the peak credit method to separate the non-fuel costs of the proxy CCCT into capacity and energy components. Under the method, non-fuel costs associated with the construction of a CCCT that exceed the cost of a SCCT are designated as capitalized energy and added to the variable production (fuel) cost of the CCCT in the total avoided energy costs. **Table 3** shows the capitalized energy costs. In the current study, the fixed costs of the SCCT are greater than the fixed costs of a CCCT so capitalized energy costs are zero.

The fuel cost of the CCCT defines the avoided variable energy costs. **Table 4** shows the CCCT fuel cost and the total avoided energy costs.

Because energy generated by a qualifying facility may vary, avoided costs at 75 percent, 85 percent, and 95 percent capacity factors are prepared to illustrate the impact of differing generation levels. These calculations are shown in **Table 5**.

Avoided energy costs are differentiated between on-peak and off-peak periods. To make this calculation, the company applies all capacity costs to meet on-peak prices. On an annual basis, approximately 57 percent of all hours are on-peak and 43 percent are off-peak. **Table 6** shows the calculation of on-peak and off-peak avoided energy prices.

For informational purposes, **Table 7** shows a comparison between the avoided costs currently in effect in Washington and the proposed avoided costs in this filing.

Table 8 shows the calculation of the total fixed costs and fuel costs of the CCCT and SCCT that are used in **Table 3** and **Table 4**.

Gas Price Forecast

The electricity and natural gas prices used in this filing are from the company's Official Forward Price Curve dated September 2017. Both the electricity and natural gas prices are inputs to the Company's GRID model in the calculation of the proposed short-run avoided energy costs in this filing. Natural gas prices are also used to calculate the fuel costs of the CCCT proxy resource for the Long Run avoided costs, as shown in **Table 9**.

¹ CCCT (Dry "g/H", 1x1) - West Side Options (1500') as modeled for the 2017 IRP. Fuel costs are from the Company's September 2017 Official Forward Price Curve.