

Renewable Resource Cost Analysis Workpaper

Background

Under Washington Administrative Code (WAC) 480-109-210(2), PacifiCorp is required to present the incremental cost of eligible renewable resources and the cost of renewable energy credits, and the ratio of this investment relative to the its total annual retail revenue requirement. WAC 480-109-210 characterizes the incremental cost as the difference between an eligible resource’s levelized cost and the levelized delivered cost of an equivalent amount of a non-eligible resource. This work paper describes the methodology that the company used to estimate the incremental costs, as required under WAC 480-109-210.

Methodology

The methodology described in WAC 480-109-210 and used by PacifiCorp is a one-time calculation of incremental cost using the levelized cost of each eligible renewable resource at the time of acquisition, compared to the levelized cost of a non-eligible resource available to the utility at the time of the eligible resource’s acquisition.

Eligible Resource Costs - Wind

As required under WAC 480-109-210(2)(a)(i), each eligible historical renewable resource’s cost was calculated using the best information available at the time of acquisition, which was the company’s resource acquisition analysis and the Integrated Resource Plan (IRP) from the time of acquisition. Eligible costs were derived using the following data:

Table 1

Cost Component	Data Source
Capital	Resource acquisition analysis for each resource
Operation and Maintenance	
Transmission	
Production Tax Credit	
Inflation Rate	
Weight Average Cost of Capital	
Generation Forecast	
Resource Capacity Contribution	2007 IRP, Table 7.29, Wind Resource Additions Schedule for Risk Analysis Portfolios, p. 180
Integration	2007 IRP, Appendix J, Wind Resource Methodology, p. 195

Updates in 2019 Report

None

Eligible Resource Costs – Incremental Hydro Upgrades

In PacifiCorp’s previous RPS compliance filings, the company reported the incremental costs associated with the equipment replacements for Lemolo 1, Lemolo 2, JC Boyle, and Prospect 2 as zero, on the economic basis that the marginal cost of gaining output from these resources was less than the cost of an equivalent alternative.

However, beginning in PacifiCorp’s 2016 Report, as requested by Commission Staff, PacifiCorp calculates the levelized incremental costs associated with these eligible hydro upgrades, rather than assume a zero RPS incremental cost. Utilizing the same methodology described in WAC 480-109-210(2)(a)(i), the eligible costs pertaining to these hydro upgrades were derived using the best information available from the time of the resource acquisition.

Non-eligible Resource Selection Costs

The incremental cost methodology described in WAC 480-109-210(2)(C) requires the selection of the lowest-reasonable-cost non-eligible resource available to the utility at the time of the eligible resource’s acquisition. To meet the guidelines set forth in WAC 480-109-210(2), the company used the lowest-cost, non-eligible capacity resource identified in its most recent IRP acknowledged by the commission at the time of the acquisitions.

For each of PacifiCorp’s eligible resources, the non-eligible resources selected for the incremental costs are combined cycle combustion turbines (CCCTs). The table below identifies the relevant IRP and the corresponding non-eligible resource (proxy plant) selected for the incremental cost calculations:

Table 2

Resource	Relevant IRP	Non-eligible Resource from IRP
Goodnoe Hills	2007 IRP	602-megawatt west side CCCT water-cooled “F” class 2x1 with duct firing
Leaning Juniper		
Marengo I and II		
Lemolo 1 – Upgrade 2003	2003 IRP	570-megawatt west side CCCT “7FA” class 2x1 with duct firing
Lemolo 2 – Upgrade 2009	2008 IRP	569.67-megawatt west side CCCT water-cooled “F” class 2x1 with duct firing
JC Boyle – Upgrade 2005	2004 IRP	525-megawatt east side CCCT air-cooled “F” class 2x1 with duct firing
Prospect 2 – Upgrade 1999	2003 IRP ¹	570-megawatt west side CCCT “7FA” class 2x1 with duct firing

¹ The 2003 IRP was used was Prospect 2, as this is the earliest IRP from which the Company has data.

Capital and energy costs for the non-eligible resource are based on the IRP and the non-eligible resource is sized to produce the same amount of energy as expected to be produced by the eligible resource.

Energy cost of the non-eligible resource includes fuel and emission costs associated with producing the same amount of energy as expected to be produced by the eligible resource, levelized over the time period equal to facility life of the eligible resource. Capital costs of the non-eligible resource include fixed costs of the CCCT (including operation and maintenance costs). The capacity costs of the energy-equivalent combined cycle combustion turbine are reduced, based on the fixed costs of a simple cycle combustion turbine (SCCT) identified in each relevant IRP, until the non-eligible resource capacity is equivalent to the capacity value of the eligible resource.

For PacifiCorp owned resources not included in the West Control Area Inter-Jurisdictional Allocation Methodology (WCA)², these resources were assigned a weighted average cost of the wind resources in the WCA (Goodnoe Hills, Leaning Juniper, Marengo I and Marengo II). The weighted average is calculated by multiplying each WCA resource's levelized incremental cost per MWh, by its proportionate contribution to Washington's RPS. Incremental costs for PacifiCorp owned resources not included in the WCA (Top of the World, Dunlap I, Glenrock I, and Campbell Hill), were calculated using 2018 levelized resource costs.

Comparison of Eligible Resource Cost to Non-eligible Resource

To arrive at the cost per MWh, or the incremental cost of the eligible renewable resource, the company calculated the cost difference between the eligible renewable resource and the non-eligible resource for each year, beginning with the year the resource was placed into service. The resultant annual values are nominal and levelized over the life of the eligible resource to arrive at a single nominal cost value applicable to the facility life. The annual cost differential is calculated in dollars and is divided by the annual generation to arrive at an annual dollars-per-megawatt-hour resource cost, which is also nominal levelized over the life of the eligible renewable resource.

Annual Calculation of Revenue Requirement Ratio

The revenue requirement ratio for a given compliance year was calculated by summing the costs of compliance (incremental costs of all eligible resources used plus the cost of any unbundled RECs purchased for the target year compliance), and dividing the total renewable costs by the utility's annual revenue requirement for the target year.

² Only refers to the portion of PacifiCorp resources allocated to Washington in order to fulfill Washington's total CAGW share of west control area resources. Washington's resource allocations are explained in detail on pp. 13-14 of PacifiCorp's 2019 Annual Renewable Portfolio Standard Report.