PacifiCorp's Avoided Cost Calculation

Utah – July 2006

The starting point for the avoided cost calculation is the load and resource (L&R) balance developed in conjunction with PacifiCorp's updated 2004 Integrated Resource Plan (2004 IRP Update) filed in Utah in November 2005. Due to the age of the input assumptions, some of the inputs have been updated for known changes.

Loads and Resources

The May 2006 Official Load Forecast was used in this study. This load forecast has been developed for use in the company's next IRP report.

Long-term sales and purchase contracts were updated to include information available as of June 2006. These changes include the addition of long-term purchase contracts including: (1) AMPS Resources (Cove Fort), (2) Constellation p268849, (3) Idaho RTSA, (4) Schwendiman QF, (5) ExxonMobil QF, (6) Monsanto Curtailment, (7) Weyerhaeuser Reserve, (8) PSCo Exchange (9) Two UBS purchases and (10) Five Morgan Stanley purchases.

Table 1 shows the company's load and resource balance. **Table 1** shows an energy surplus of 290 aMW in 2006 declining to an energy deficit of 101 aMW in 2012. The summer peak has a capacity surplus of 300 MW in 2006 declining to a capacity deficit of 2,232 MW in 2012. The winter peak has a capacity surplus of 462 MW in 2006 declining to a capacity deficit of 261 MW in 2012.

Avoided Cost Calculation

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 – the period of energy sufficiency (2006- 2011) in which the avoided costs are based on the marginal production cost of existing resources, plus the cost of purchasing summer capacity; and (2) the Long Run – the period (2012 and beyond) in which new resources are required to provide capacity (summer and winter) and energy to meet the company's resource requirements. Avoided costs during the second period are based on the blended cost of two deferrable IRP resources; a Utah based coal-fired resource and a west-side combined cycle combustion turbine (CCCT). As described in the 2004 IRP Update, both of these resources are planned to be on-line January 2012.

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. The only difference between the two studies is an assumed 10 aMW increase, at zero running cost. The 10 aMW resource serves as a proxy for qualifying facility generation. The avoided energy cost could be viewed as the highest variable cost incurred to serve total system load from existing and non-deferrable resources. The outputs of the production cost model run are provided as **Table 2**.

Summer capacity costs in this period are based on capacity purchases for the number of months that the company is capacity deficit. For example, if the company is capacity deficit for five months in a given year, the purchases would be for five twelfths of the year and the annual value as shown in **Table 3** would be five twelfths of the capacity cost of a simple cycle combustion turbine (SCCT).

2. Long Run Avoided Costs

During periods of resource inadequacy, the avoided costs are based on the fixed and variable costs of the planned resources that could be avoided or deferred. In the 2004 IRP Update, there are two resources (a Utah coal-fired resource and a west-side CCCT) assumed to be on-line during 2012; both could be deferred. For this purpose, the company uses a blend of the coal-fired and CCCT resources (the blended resource) as a proxy of future resource costs. For capacity purposes, the two resources fixed costs are blended together using nameplate capacity. For energy purposes, costs and heat rates are blended together using expected generation levels.

Since coal-fired and CCCT resources are built as base load units that provide both capacity and energy, it is appropriate to split the fixed costs of the blended resource into capacity and energy components. The fixed cost of a single cycle combustion turbine (SCCT), which is usually acquired as a capacity resource, defines the portion of the fixed cost of the blended resource that is assigned to capacity. Consistent with the Commission Order in Docket 03-035-14, 50% of the fixed costs associated with the construction of the blended resource in excess of the fixed costs of a SCCT is assigned to energy and is added to the variable production (fuel) cost of the blended resource to determine the total avoided energy costs. **Table 3** shows this calculation.

Table 4 shows the blended resource fuel cost, the addition of capitalized energy costs at an assumed 85% capacity factor and the total avoided energy costs. The fuel cost of the blended resource defines the avoided variable energy costs. The fuel price forecast used as the basis for the blended resource fuel cost is discussed on page 3.

Since energy generated by a qualifying facility may not exactly match the 85% capacity factor shown in **Table 4**, we have shown the calculation at 75%, 85% and 95% to illustrate the impact of differing generation levels. This calculation is shown in **Table 5**.

Avoided energy costs can be differentiated between on-peak and off-peak periods. To make this calculation, the company assumed that all capacity costs are incurred to meet on-peak load requirements. On an annual basis, approximately 57% of all hours are on-peak and 43% 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 Utah and the proposed avoided costs in this filing.

Table 8 shows the calculation of the total fixed costs and fuel costs from the blended resource used in Table 3 and Table 4. **Tables 9** through **11** shows similar costs for the CCCT, the coal-fired and the SCCT resources. **Table 12** shows the expected generation of the coal-fired and the CCCT resources which is used in Table 8 to blend fuel price and heat rates.

Fuel Price Forecast

Coal prices in 2006 and 2007 are the most current near term coal price forecast available to the company. Coal prices used in the filing after 2007 were prepared by the company's fuels group for use in the 2004 IRP Update.

Gas prices were developed by the company's Market Price Steering Committee and represent the company's "Official Market Price Projection." The Market Price Steering Committee developed three different scenarios that represent a reasonable range of future market prices. The medium future "Base Case" was used in this calculation.

The Official Forward Gas Curve consists of a blend of the March 31, 2006 market gas curve and the gas prices used in the company's market price clearing model (Midas) to produce the power curve. (The Midas input gas prices, in turn, were a combination of the March 2006 market gas projections and PIRA long-term gas forecast dated February 27, 2006.) The proportions used in this blending are shown in the table below.

	Market*	**Midas**
Through Month 72 (April 2012)	100%	0%
Months 73 - 84 (May 2012 – April 2013)**	50%	50%
Month 85 (May 2013 and beyond)	0%	100%

* The Forward Power Curve and gas curve use market data from March 31, 2006.
** Months 73-84 are the average of corresponding adjacent market and Midas
e. g. month 73 = (market month 61 + Midas month 85)/2

Table 13 shows the coal and natural gas price used in this avoided cost calculation.