

MEMO
April 17, 2006

To: Carbon Allocation Task Force

From: Phil Carver, ODOE

Subject: Ranges of Costs for the Straw Proposal for PacifiCorp, Portland General Electric and an Example Consumer-Owned Utility

INTRODUCTION

This memo provides utility-specific estimates of the cost of the straw proposal for capping CO₂ emissions for Portland General Electric (PGE), PacifiCorp and a example consumer-owned utility (COU) that buys all of its power from the Bonneville Power Administration (BPA). Consistent with the Northwest Power and Conservation Council's (NWPPCC) *5th Power Plan*, these estimates assume that all load growth can be met with cost-effective conservation and renewable generation.

It appears that programs to acquire all cost-effective conservation will require between 3 to 5 percent of utility revenue. This is more than most utilities are spending now. The public purpose charge for PGE and PacifiCorp provides roughly 2 percent of revenues to cost-effective conservation. While cost-effective conservation programs tend to increase rates, they lower the total cost of providing electric services. Under the placeholder assumptions, costs of these conservation programs would be funded, in part, by allowance auction revenues.

There are continuing efforts to refine the estimates of the above-market costs (\$ per MWh) of conservation and renewable resources beyond those included in the Northwest Power Planning Council's *5th Power Plan*. Even so, the ranges provided below are firm estimates because the straw proposal effectively caps the cost of compliance at \$40 per metric ton of CO₂ (real 2004 dollars). **There appear to be sufficient average MWs of currently cost-effective and above-market renewable generation and conservation to meet the 2020 targets, which means cost should be lower than the top of the ranges provided below.**

All estimates assume that all free allowances are allocated based on historical emissions in the base period and 5 percent of allowance are auctioned. Cost estimates include the cost of buying all the allowances that are auctioned. These auction revenues are dedicated to energy efficiency and renewable resources, which would lower utilities' costs of reducing CO₂ emissions. Even if that does not occur, the estimate below are still valid. Loss of the auction revenues would tend to move utility costs toward the higher end of the range, other things equal.

UTILITY COST ESTIMATES FOR 2020**Table 1**

**Costs in 2020 of Reducing CO₂ 17 Percent Below 2004 Emissions Level
(As a Percent of 2004 Retail Revenues)**

Cost of Reductions (\$2004/tonne CO₂)	<u>\$5</u>	<u>\$35</u>
PacifiCorp	1.9%	13.1%
Portland General Electric	0.8%	5.4%
Example Consumer-Owned Utility (100 % BPA power in 2004)	0.1%	0.7%

The differences in costs in Tables 1 and 2 are primarily driven by differences in 2004 emission levels per MWh.

If the only method of compliance were buying CO₂ allowances, PacifiCorp's costs would be more than twice PGE's. However, the primary method of meeting the CO₂ cap would be to acquire cost-effective and above-market conservation and renewable generation. For this method of compliance, PacifiCorp has roughly twice the opportunities to lower its compliance costs than does PGE.

Under the accounting proposal, PacifiCorp gets credit for CO₂ reductions from conservation and above market renewables at the PacifiCorp system rate of 1,933 lb. of CO₂ per MWh. In this analysis PGE is assumed to be credited for CO₂ reductions at the Northwest net system mix rate of 1,043 lb. While PacifiCorp has more than twice the cost exposure of PGE, it gets almost twice the CO₂ credit per MWh for zero-CO₂ resources. This allows PacifiCorp to limit its costs to roughly the same level as PGE if zero-CO₂ resources are available at \$15 per MWh above the costs of market power.

PGE. If in order to get below 2004 emissions levels, PGE acquired zero-CO₂ resources with an average above-market cost of \$15 per MWh, it would lower its compliance cost from 5.4 percent of 2004 revenues to 4.9 percent for 2020. For PacifiCorp the same strategy would lower its 2020 compliance cost from 13.1 to 6.4 percent of 2004 revenues.

PGE also has the opportunity to lower its compliance costs by reducing gas-fired generation rather than by reducing its reliance on purchases at the net system mix CO₂ rate. Whether this will lower its costs will depend on wholesale natural gas and electric prices, the heat rate of the gas-fired plant, and the rate of emissions attributed to the net-system-mix purchases in a particular year.

It is unlikely that reducing coal-fired generation at Boardman will have a lower cost of compliance cost than reducing gas-fired generation or purchases because of the low fuel cost of coal. There is the possibility of co-firing Boardman with biomass. The Technical Work Group is investigating the feasibility and cost of the co-firing option.

PacifiCorp. For PacifiCorp the compliance impacts of reducing fossil-fueled generation would depend on how the reduction is credited to the Oregon part of its system. Where the specific cost of a project could not be identified, the CO₂ benefit would be spread throughout PacifiCorp’s service territory. However, under the straw proposal, if Oregon customers paid the extra cost of a project to reduce emissions, the CO₂ reduction would flow to its Oregon territory. It is unlikely that CO₂ reduction projects that cannot be specifically assigned to Oregon would be cheaper than buying allowances at auction or from another utility.

COUs. Consumer-owned utilities in Oregon emit about 100 lb of CO₂ per MWh. This is true for COUs that rely solely on BPA and COUs that have some of their own resources. No Oregon COU currently owns or needs significant fossil-fueled generation.

As a result of their low emission rate, COUs would only be credited about 100 lb of CO₂ for reducing their load below the 2004 level. This means that purchasing CO₂ allowances either from the auction or from PGE or PacifiCorp is likely to be the lowest cost compliance method. This cost is under one percent of 2004 revenues in all cases for 2020.

UTILITY COST ESTIMATES FOR 2009-2011

For this period, it is assumed that the CO₂ cap for each utility for 2009-2011 is set equal to its 2004 emissions. If load growth can be met with cost-effective conservation and renewable generation, this cap would impose no extra costs on utilities.

The assumed reductions from 2004 emissions for the other three-year compliance periods of 2012-2014, 2015-2017 and 2018-2020 are 1, 8 and 15 percent, respectively. This is consistent with a 17 percent reduction in 2020, which is accounted for in the average 15 percent reduction from 2018-2020. Note that under the straw proposal there are no year-by-year costs. There are only costs for each compliance period.

UTILITY COST ESTIMATES FOR 2012-2014

Table 2

Costs in 2012-2014 of Reducing CO₂ 1 Percent Below 2004 Emissions Level (As a Percent of 2004 Retail Revenues)

Cost of Reductions (\$2004/tonne CO₂)	\$5	\$35
PacifiCorp	0.5%	3.7%
Portland General Electric	0.2%	1.5%
Example Consumer-Owned Utility (100 % BPA power in 2004)	Under 0.1%	0.2%

As with the case for 2020, PGE and PacifiCorp would meet most of their reductions though conservation and renewable generation. If the average above-market cost of these resources were \$15 per MWh, then the 2012-2014 compliance costs for PGE and PacifiCorp would be 1.4 and 1.8 percent of 2004 retail revenues, respectively.